



**NORWEGIAN  
CONFERENCE  
ON THE  
HISTORY OF  
SCIENCE**

11—13 FEBRUARY 2015

THE NORWEGIAN MUSEUM OF  
SCIENCE AND TECHNOLOGY

organised by

**NORSK  
TEKNIISK  
MUSEUM**

supported by

**The Science Studies  
Colloquium Series,**  
University of Oslo





**NORWEGIAN CONFERENCE ON THE  
HISTORY OF SCIENCE  
11–13 FEBRUARY 2015  
THE NORWEGIAN MUSEUM OF  
SCIENCE AND TECHNOLOGY, OSLO,  
NORWAY**

We are happy to welcome you to The Norwegian Museum of Science and Technology for the 6th Norwegian Conference on the History of Science. We were particularly pleased with the great number of papers that blend the history of science, medicine and technology, thus marvelously also showcasing the vision of the Museum, which in 2014 celebrated its 100th anniversary.

We wish to thank The Science Studies Colloquium Series at the University of Oslo and The British Society for the History of Science for their generous support.

Without further ado, thank you all very much, welcome to Oslo, and we hope to have a stimulating conference, and an opportunity to enjoy the rich collections of the Museum!

To contact the organisers before, during or after the conference, please email:

***6nchs2015@tekniskmuseum.no***

**Emergency Contact**

If you have an emergency and need to contact the organisers out of hours during the period of the conference, you may call **+47 48633441**.

## USEFUL INFORMATION

### Conference web page

<http://6nchs2015.weebly.com>

### Norsk Teknisk Museum

Kjelsåsveien 143, 0491 Oslo

switchboard: +47 22 79 60 00

<http://www.tekniskmuseum.no/besok-oss/finn-oss>

(including directions in norwegian)

### Local Transport Services

Kjelsås can easiest be reached by local trains departing from Oslo Central Station towards Jaren or Hakadal (appr. 11 min). Alternatively, the buses 22, 25 and 54, and tram 11, all reach Kjelsås from various places in the city center.

Please visit [ruter.no](http://ruter.no) (for bus, tram, and metro services) and [nsb.no](http://nsb.no) (for train schedules).

## ON ARRIVAL

- Pick up your registration pack from the Museum reception desk on arrival to the conference venue.
- Tea and Coffee will be provided before the conference begins in the foyer above the reception.
- All conference rooms will be clearly signposted, but if help is needed please go to the reception desk.
- If you need some place to temporarily store your baggage, please ask at the reception desk.

## INSTRUCTIONS TO SPEAKERS

Conference rooms have PowerPoint facilities. Please bring your presentation on a USB stick and come to the session room where you are to present at least 10 minutes before the start of the session to upload it. We recommend that you save your presentation as a PDF file to avoid any incompatibility issues. Presentations should be max. 20 minutes, followed by 10 minutes of questions/discussion.

## WELCOME RECEPTION

The welcome reception will be held on the evening of **Wednesday 11th February** at the Museum.

## PLENARY LECTURES

The opening plenary lecture will be given by Prof. Greg Radick on the evening of **Wednesday 11th February**, and the second plenary lecture will be given by Dr. Gard Paulsen on the morning of **Thursday 12th February**.

## CONFERENCE DINNER

The conference dinner will be held on the evening of **Thursday 12th February** at the Museum.

## PUBLIC LECTURE

The conference public lecture will be given by Prof. Vassiliki Betty Smocovitis on the evening of **Thursday 12th February** at the Museum.

**WEDNESDAY 11TH FEBRUARY 2015**

**14.00 – onwards**

**Registration, Tea & Coffee**

**15.15 – 16.45**

**Session 1**

**Meteorology as “Useful Science”**

Room: Lab

Chair: Svein Atle Skålevåg

Organiser: Gunnar Ellingsen, Magnus Vollset, Yngve Nilsen

*‘Weather, Climate, and Scientific Authority in Norway, 1860s to 1880s’*

Gunnar Ellingsen, University of Bergen

*‘Asking Too Much? Postwar Climate Research in Norway’*

Magnus Vollset, University of Bergen

*‘The Definite Fall of the Norwegian Research Meteorologist by the Turn of the Millennium’*

Yngve Nilsen, University of Bergen

**Session 2**

**Getting to the Nerves**

Room: Activity Room

Chair: Ageliki Lefkaditou

*‘Soma and Psyche in Norwegian Neurasthenia 1880-1930’*

Kristine Lillestøl, University of Oslo

*‘Medusae, the Mental, and the Electrical: How Experimentation on Nervous Systems and the Nature of Electricity Supported Lamarckism, 1850-1880’*

John Lidwell-Durnin, University College Oxford

*‘Touching Nerves: A Case Study from the Exhibition “Mind Maps: Stories from Psychology”’*

Phil Loring, The Norwegian Museum of Science and Technology

**17.00 – 18.00**

**Welcome Reception**

**18.00 – 19.00**

**Opening Plenary Lecture**

*‘Mendel the Fraud? A Social History of Truth in Genetics’*

Gregory Radick, University of Leeds

Room: Teletorium

**End of Day 1**

**THURSDAY 12TH FEBRUARY 2015**

**9.00 – 10.00**

**Morning Plenary Lecture**

*'The Norwegian Truth: On the Legitimacy of Ship Classification and Commissioned History'*

Gard Paulsen

Room: Teletorium

**10.00 – 10.30**

**Tea & Coffee**

**10.30 – 12.30**

**Session 3**

**Debating Standards, Risks and Values**

Room: Lab

Chair: Annette Lykknes

*'The International Organization for Standardization (ISO) and their Environmental Standards (the ISO 14000 family)'*

Kristin Stanwick Bårnås, Norwegian University of Science and Technology

*'The Rig and the Reactor: Risk Analysis for Hazardous Technologies'*

Iver Tangen Stensrud, Oslo School of Architecture and Design

*'Weeding Out the Sea: Adding "Value" to Norwegian Seaweed'*

Sophia Efstathiou and Bjørn Myskja, Norwegian University of Science and Technology

**Session 4**

**Sources, Resources, the Sciences and the Public**

Room: Activity Room

Chair: Hallvard Fossheim

*'Science of a 'Freer Kind'? Scientific Autonomy, Democracy and the Establishment of Research Councils in Post-War Norway'*

Thomas Brandt, Norwegian University of Science and Technology

*'Evidence/Memory – the Archival Praxis at the National Archives of Norway'*

Åsmund Svendsen, The National Archives of Norway

*'Return of the Ancestors. Archaeology, Ancient DNA and the Public'*

Åsa M. Larsson, Verksamhetschef, Societas Archaeologica Upsaliensis

*'Archaeology and the Natural Sciences: A Look at the Use of Natural Sciences in Archaeology from the 18th Century until Today'*

Nils Anfinset, University of Bergen

**12.30 – 13.30**

**Lunch Break**

**13.30 – 15.00**

**Session 5**

**Conceptualizations of Race in Postwar Genetics and Anthropology**

Room: Lab

Chair: Åsa M. Larsson

Organiser: Jon Røyne Kyllingstad

*'A Constant Anthropologist: J. Lawrence Angel and his Research in Greece in the 1940s'*

Ageliki Lefkaditou, University of Oslo / University of Leeds

*'Racial Typology and Population Genetics at the Swedish state Institute for Race biology 1940s-1950s'*

Jon R. Kyllingstad, The Norwegian Museum of Science and Technology

*'The Ethical Relevance of History as a Source of Responsibility in Research on Ethnicity'*

Hallvard Fossheim, University of Bergen

**Session 6**

**Constructing Networks, Negotiating Science**

Room: Activity Room

Chair: Gunnar Ellingsen

*'Shaping Identities as Professors of an Institute of Technology – How Two Chemistry Professors at NTH in Trondheim Found their Place between Industry and Academy in the 1910s'*

Annette Lykknes, Norwegian University of Science and Technology

*'Citizen Cuvier: Radical Appropriations of Georges Cuvier's Law of Correlation in Edinburgh and London, 1801–1837'*

Gowan Dawson, University of Leicester

*'Making America in His Own Image: Pehr Kalm, Publishing, and the Pursuit of Science'*

Paul Sivitz, Idaho State University

*(programme continues on next page)*

**THURSDAY 12TH FEBRUARY 2015**

*(continued)*

**15.00 – 15.30**

**Tea & Coffee**

**15.30 – 17.00**

**Session 7**

**Roundtable: The History of Science and the History of Exploration: Perspectives on a Changing Relationship**

*Room:* Lab

*Chair:* Thale Sørli

*Organiser:* Peder Roberts

*Participants:*

Peder Roberts, KTH Royal Institute of Technology

Robert Marc Friedman, University of Oslo

Ulrike Spring, University College of Sogn and Fjordane

**Session 8**

**Realities and Challenges for Nutrition Science and Safety**

*Room:* Activity Room

*Chair:* Olav Hamran

*'Humans, Animals, Apparatus and the Material Cultures of Nutrition Experimentation'*

Elizabeth Neswald, Brock University, Ontario

*'The Science of Nutrition in Norway: Institutions, Actors and Orientation 1870-1970'*

Kari Tove Elvbakken, University of Bergen

*'At the End of the Chain: Contesting Conceptualizations of Food Safety in Norway in the 1980s'*

Terje Finstad, Norwegian University of Science and Technology

**17.00 – 19.00**

**Conference Dinner**

**19.00 – onwards**

**Late at the Museum Open Public Event**

including

19.30

*Hitler's Stone (Guided Tour)*

Ketil Andersen, The Norwegian Museum of Science and Technology

*Room:* Lab

**20.00 – 21.00**

**Public Lecture**

*'It's Not Nice to Fool Mother Nature: The History and Evolution of Infectious Disease'*

Vassiliki Betty Smocovitis, University of Florida

*Room:* Teletorium

**End of Day 2**

**FRIDAY 13TH FEBRUARY 2015**

**10.00 – 11.30**

**Session 9**

**Revisiting Useful Knowledge**

Room: Lab

Chair: Frode Weium

*'Kristian Birkeland Today'*

Terje Brundtland, University of Tromsø

*'A Norwegian Roadmaster's 1838 Tour of Britain and Beyond'*

Hans Seland, Norwegian Public Roads Administration

*'The Understanding of Parallel Lines in Early 19th Century*

*Textbooks: An Analysis of Two Norwegian Geometry Books from 1827 and 1835'*

Andreas Christiansen, Stord / Haugesund University College

**Session 10**

**Interpreting Beyond Normality**

Room: Activity Room

Chair: Svein Atle Skålevåg

Organiser: Øyvind Thomassen, Hilde Dahl, Eivind Myhre

*'When Access to Records Opens up a New World of Understanding'*

Øyvind Thomassen, Norwegian University of Science and Technology

*'Dangerousness and Psychiatry 1895-1940'*

Hilde Dahl, Norwegian University of Science and Technology

*'Castration in High Security Psychiatry, 1920-45'*

Eivind Myhre, Norwegian University of Science and Technology

**11.30 – 12.00**

**Tea & Coffee**

**12.00 – 13.30**

**Session 11**

**As a Matter of Technology**

Room: Lab

Chair: Tone Rasch

*'Ice and Steam in the Logistic and Dietary Revolution of the 19th and early 20th Century'*

Per G. Norseng, Norwegian Maritime Museum / Telemark University College

*'As Good as Gold: The Technological Translation of the Gold Standard's Abstract Immutability into Bank of England Paper Notes, cc. 1800-1855'*

Stefan Fisher-Høyrem

*'Technology on Trial. The Hammond Case'*

Frode Weium, Norwegian University of Science and Technology / The Norwegian Museum of Science and Technology

**Session 12**

**Medical Hypothesis and the Geographies of Science**

Room: Activity Room

Chair: Sophia Efstathiou

*'"Germ Destroyers": Germs and Advertisements in the British Popular Press, c. 1870-1900'*

Laura Newman, King's College London / Science Museum London

*'Origin of the Concept of Lipoprotein'*

Elisa Campos, Universidade Nova de Lisboa

*'"The Most Constructive Part of Medicine": Medical Responses to Infertility in Norway 1939-1984'*

Eira Bjørvik, University of Oslo

**13.30 – 15.00**

**Lunch Break & Conference General Meeting**

**End of Conference**

**Plenary Lectures**

**Greg Radick**

*Mendel the Fraud? A Social History of Truth in Genetics*

Commonly people tend to know two things about Gregor Mendel: first, that he was the “monk in the garden” whose experiments with peas in mid-nineteenth-century Moravia became the starting point for genetics; and second, that, despite that exalted status, there is something fishy, maybe even fraudulent, about the data that Mendel reported. In the year (indeed the month) marking the 150th anniversary of Mendel’s first lecture on his experiments, this talk will explore the cultural politics of this accusation of fraudulence against Mendel. Although the notion that Mendel’s numbers were, in statistical terms, too good to be true was well understood almost immediately after the famous “rediscovery” of his work in 1900, the problem only became widely discussed and agonized over from the 1960s, for reasons having as much to do with Cold War geopolitics as with traditional concerns about the objectivity of science. Appreciating the Cold War origins of the problem as we have inherited it can, I will suggest, be a helpful step towards appreciating what’s “really” wrong with Mendel’s work -- and what, 150 years later, we should do about it.

**Gard Paulsen**

*The Norwegian Truth: On the Legitimacy of Ship Classification and Commissioned History*

In 1864 the classification society Det norske Veritas (DNV) was established with the aim of providing “reliable and uniform classification and taxation of Norwegian ships”. In brief, the Norwegian Truth, as the name translates, judged the quality of Norwegian ships. The growth of DNV relied on its ability to make judgements that were considered valid by a range of stakeholders, such as shipowners, shippers, insurers, agents and traders. Today, DNV GL is the world’s largest classification society and provides a range of different services and consequently, its powers rests on an equally diversified set of arrangements. Drawing on my involvement in the writing of a 150 year anniversary history of DNV, I will discuss the relationship between the practice and the legitimacy of ship classification as an institution, but at the same time relate it to the practice and credibility of commissioned history. In particular, I will discuss how reliable and uniform assessments of the quality of ships were achieved in practice and how various “styles of reasoning” contributed to ship classification. In short, I will explicate how the “Norwegian truth” claimed by DNV, over time, rested on knowledge won through relationships, experience, experiments, engineering and science. Following this, I will relate the changing sources of institutional legitimacy of ship classification to the practice of writing its history. This comparison will attend to questions related to what constitutes historical knowledge to me as an historian, to a business such as DNV, and to a community of scholars.

**Public Lecture**

**Vassiliki Betty Smocovitis**

*It’s Not Nice to Fool Mother Nature: The History and Evolution of Infectious Disease*

Ebola, SARS, and HIV. The mere utterance of these terms incites fears of global epidemics, with catastrophic consequences that were thought diminished, if not eliminated by modern medicine only a generation ago; yet fears of epidemics now dominate the headlines, reminding us of our biological frailty in an era of mysterious new or “emerging” pathogens. This presentation, based on a popular course, seeks to understand our current situation in light of historical examples from the past and in light of evolutionary and ecological thinking. It focuses on what I term the “long history” of infectious disease in the way of understanding the historical specificity, or the distinct “signature” of a number of infectious diseases, and then locates them in an ecological as well as an evolutionary context. The lesson learned is that infectious disease is by definition a social process that takes on meaning and biological significance in the context of changing environments and social practices. Understanding the long history of infectious disease, in other words, enables us to think critically—and creatively—about emerging pathogens in terms of both biology and culture.

**Themed Sessions and Round Tables**  
(*alphabetical by title*)

**1. Conceptualizations of Race in Postwar Genetics and Anthropology**

*Session Organizer:* Jon Røyne Kyllingstad

In the early 1950s, UNESCO issued two expert statements on race which are often referred to as the final death toll of scientific racism. They were written by world-leading geneticist and anthropologists, who used scientific arguments to rebut racial ideas that until recently had been considered scientifically sound. A dichotomy was set up between the racist race-science of the past, which was based on outdated concepts of racial typology, and a modern, and inherently non-racist, approach to human variation based on population genetics. This narrative of scientific progress leading to the downfall of racism, was subsequently adopted in many historical accounts, but is now increasingly being questioned. Based on two case studies, this session deals with conceptualizations of human genetic diversity in postwar population genetics and physical anthropology and discusses to what extent and in what way these conceptualizations were different from the alleged racist notions of race within prewar physical anthropology.

**Ageliki Lefkadiou**

*A constant anthropologist: J. Lawrence Angel and his research in Greece, 1940s-1970s*

In this paper I focus on the work on skeletal remains conducted in Greece by the British-American biological anthropologist John Lawrence Angel from the 1940s until early 1970s by studying exchanges with his colleagues at the American School of Classical Studies at Athens and his publications. Angel made detailed examinations of skeletal material in close collaboration with archaeologists to explore issues related to migration and immigration in the Mediterranean basin with a special interest in Greece. His work represents a fine blend of innovative empirical research with theoretical investigations, and a conscious attempt to understand anthropology as part of the wider context of evolutionary synthesis. At the same time, he appears reluctant to abandon the concept of race—always considered in correlation with cultural changes—as an instrument for classification of populations. The paper asks both why and how Angel developed such an interest in Greece, but also how he managed to overcome a seemingly apparent dichotomy between typological race science and non-racist population thinking.

**Jon Røyne Kyllingstad**

*Racial Typology and Population Genetics at the Swedish State Institute for Race biology 1940s-1950s*

The Swedish State Institute for Race Biology existed as an autonomous institution from 1922 to 1958. Its first leader, Herman Lundborg, advocated a strand of racial hygiene that aimed to protect and expand the assumed superior “Nordic race”. Under his leadership the Institute undertook extensive studies of the relative distribution of various racial types that was assumed to exist within the Swedish population. In contrast to this, Lundborg’s successor as head

of the Institute from 1936, Gunnar Dahlberg, was a staunch antiracist and a leading proponent of the new synthesis who used arguments from population genetics to argue against scientific racism. Dahlberg associated racism with an outdated and unscientific ‘typological’ concept of race, and claimed that up-to-date population genetics did not support any racist notions.

Dahlberg did not dismiss the race-concept. Instead he advocated the redefinition of the race-concept to make it compatible with the new synthesis. The same goes for geneticist and antiracist Lars Beckman, who in the late 1950s did a doctoral work at the Institute for Race biology on the distribution of blood groups within the Swedish population, and who in the following decade stood out as an antiracist and a scientific expert on race. In likeness with Dahlberg, Beckman strongly opposed an alleged outdated “typological” concept of race. The question which will be discussed in this paper is to what extent and in what way the actual concept of race upon which Beckman’s population genetic studies were based, differed from the alleged typological race concept of his racist predecessors within prewar race biology and racial anthropology.

**Hallvard Fossheim**

*The Ethical Relevance of History as a Source of Responsibility in Research on Ethnicity*

It is a common tenet of research ethics that the researcher has a set of responsibilities. Furthermore, it seems that certain breaches of the responsibilities attendant on the researcher can affect not only the standing of the individual researcher, but that of her discipline as well. Perhaps less obviously, past actions of researchers might be said to have a corresponding effect on the activities of later-day research related activities, in extreme cases affecting even the standing of the results by somehow “tainting” them for future use or further research.

To the extent that it is correctly deemed a morally relevant relation, this tendency will be a general feature of most, if not all, research. What is particular about research producing results affecting our understanding of ethnicity, is that the research activity in this case contributes to defining a group of human beings. Such co-definition will by various mechanisms tend to modify not only the understanding of the group within the discipline, but among wider groups as well and, ultimately, the population at large. Not least, a partial result to be expected is that the research comes to co-define—directly and indirectly—how the group in question views itself. As such results are rarely unproblematically and purely non-normative, the effect will in practice include an evaluative dimension.

I will suggest that this state of affairs engenders a responsibility, on the part of the researcher investigating such issues, to familiarize herself not only with the history and identity of the group in question, but also with the history of interaction between the group in question and the discipline the researcher herself represents.

## 2. Interpreting Beyond Normality

*Session Organisers:* Øyvind Thomassen, Hilde Dahl, Eivind Myhre

The first modern Norwegian legislation on culpability was introduced in the Criminal code of 1842. Six years later The Insanity Act of 1848 stated that non-criminal insane people could not be treated together with those who were criminally insane. Together these Acts created a dilemma: what should be done with the insane criminals who could not be confined either in regular asylums or prisons. In 1894 the Parliament solved this dilemma by establishing Kriminalasylet in Trondheim (1895) and later, in 1919, by opening Reitgjerdet asylum (1923) as high security asylums.

In 2011 St. Olav hospital/Brøset regional high security unit opened the entire archive from Reitgjerdet asylum/hospital (1923-87) for historical research. Firstly, the session will invite discussion of some theoretical and methodological challenges derived from the empirical investigations of this archive, with relevance to recent international developments in the history of psychiatry. Secondly, the session will present some results challenging previous interpretations of psychiatric confinement in the 20th century.

### Øyvind Thomassen

*When Access to Records Opens up a New World of Understanding*

Since the 1970s the anti-psychiatric movement has had a strong influence on interpretations of psychiatry and psychiatric care in humanities and social sciences. Historical studies of psychiatry have been conducted with a variety of perspectives by criminologists, psychiatrists, psychologists, historians etc. This presentation will discuss theoretical and methodological challenges developing when the archives accessible to historians confront both the anti-psychiatric interpretations and the internalistic interpretations characterizing psychiatrists' writing of history of psychiatry. The theoretical and methodological approach will use Majerus and Hess' article in *History of Psychiatry* (2-2011) as an analytical point of departure when asking: Is it time for reinterpreting the Norwegian history of psychiatry?

### Hilde Dahl

*Dangerousness and Psychiatry 1895-1940*

Dangerousness is, historically speaking, a powerful metaphor that helps justify the expulsion of those who do not comply with the norms and rules of society. Such descriptions have been applied to a number of groups, and gradually the task of labelling was granted to certain professionals. Psychiatrists became the holders of special knowledge about 'dangerousness' towards the end of the 1800s. During this time, psychiatry as a profession developed a liaison with the law and its practitioners. Psychiatrists would now serve as specialists when it came to assessing dangerousness, both in court and outside. However, the societal expulsion of dangerous people required institutions tailored for such a purpose.

Whilst Europe and the US established high security wards connected to asylums or prisons, Norway chose a different model. Kriminalasylet and Reitgjerdet were high security

asylums established separately from ordinary asylums and prisons, and the only two of that kind in Norway. The patients in these asylums were either 'criminally insane' or 'insane criminals', and some of them were considered dangerous to the public. The protection of society from dangerous and difficult individuals was the main purpose behind establishing these institutions, hence the high security level. The attempt to hospitalize criminal insanity and to incapacitate dangerousness at the turn of the century highlights the complex interaction between the judicial and medical professions as well as the interests of the state and community. When establishing security asylums in Norway; how was perceived dangerousness important, and what characterized these dangerous patients?

### Eivind Myhre

*Castration in High Security Psychiatry, 1920-45*

Castration has for decades been used both as a method for punishment and medical treatment for various purposes. Its scientific efficacy in relation to the sexual drive and as a treatment for sex offenders has historically been a controversial topic. Surgical castration involves surgically removing the testicles, which causes infertility, and reduces the production of testosterone. In Europe, castration was used for the first time in modern psychiatry in the early 1890s. At Reitgjerdet Hospital, in Trondheim, the first surgical castration was conducted in 1931. Chemical castration is most commonly used today and has been developed as a preventive measure for sex offenders, mainly because surgical castration is currently perceived as a more controversial method that raises a number of ethical issues. Both methods impose significant side effects.

At Kriminalasylet and Reitgjerdet in the period 1931-1945, it can be argued that castration was a way of constructing an accepted masculinity that would provide the foundation for a more normalized, more responsible and less dangerous man who could be accepted by society. Sterilization and castration had two different purposes. Sterilization was mainly used for social and racial hygiene reasons. Castration was mainly used for criminal prophylactic reasons and as a treatment that could help reduce the patient's sexual drive. Psychiatrists were in general reluctant to respond to patients' and others requests for surgery. The casebooks show that both the psychiatrist and the patients were involved in the process of negotiating what was in the best interest of the patients.

## 3. Meteorology as "Useful Science"

*Session Organisers:* Gunnar Ellingsen, Magnus Vollset, Yngve Nilsen

Was meteorology a science; was meteorology useful, and was there a discrepancy between these two goals? The aim of this session is to investigate how Norwegian meteorologists have sought authority by presenting themselves as being scientific and as being useful. Through cases from Norwegian meteorology was institutionalized in the 1860s until today, the session will show how these two claims to authority have shaped Norwegian meteorology in different ways.

In the 1860s and 1870s, science was not a universal ideal in European meteorology. In the 1950s, competing claims to scientific usefulness led to climate research being

abandoned. At the turn of the millennium researchers at the Meteorological Institute constituted themselves as a meteorological sub-profession of their own, sharply separated from the more practically oriented meteorologists.

**Gunnar Ellingsen**

*Weather, Climate, and Scientific Authority in Norway, 1860s to 1880s*

The two professors Henrik Mohn (1835-1916) and Axel Blytt (1843-1898) in Christiania studied climate and weather using quite different approaches. Mohn, professor of meteorology and director of the Norwegian meteorological institute, emphasized that his research was strictly based on what he called “secure conclusions” and that he refrained from “the field of guesses”. His research included weather forecasts and storm warnings based on meteorological observations, collecting and publishing data on the Norwegian climate, and writing scientific articles on a variety of topics relating to weather and climate.

Blytt, on the other hand, was a botanist with an interest in geology. By analyzing the Norwegian plant geography he studied climate in the past. In 1876 he published a theory of alternating rainy and dry periods in Scandinavia since the last Ice Age. Hoping that debate itself would bring more knowledge, Blytt published different “working hypotheses” related to this theory in the following decades. Both Mohn and Blytt had profound empirical foundations for their arguments about climate. However, while Mohn regarded observations as the primary source of new knowledge, Blytt looked just as much to the scientific debate itself.

Mohn’s and Blytt’s studies represented different types of science, different claims to the usefulness of knowledge, different views on scientific authority and different disciplines – in short, different views on how and why knowledge about climate and weather should be produced. In this paper, I will discuss how these two approaches coexisted, how they contrasted and influenced each other and how they in separate ways represented authority in climate and weather studies.

**Magnus Vollset**

*Asking Too Much? Postwar Climate Research in Norway*

After an extreme drought in the summer of 1947, the head of the Norwegian Water Resources and Electricity Works, Fredrik Vogt, wrote a worried letter to the Norwegian Academy of Science asking if the climate was changing, and if this would be possible to forecast: “If you can develop fairly reliable prognosis for climate variations in the coming years or decades, this would be of great practical importance for how we manage the power supply.”

A multidisciplinary taskforce was established, with representatives from meteorology, oceanography, physics, botany, astrophysics, history and geology. They soon established that the climate in Norway had changed more in the past fifty years than it had in the previous two centuries. After two years, the taskforce gave birth to the Norwegian Institute for Weather and Climate Research, under the leadership of Einar Høiland. More interested in hydrodynamics, and supported by a new generation of

meteorologists who saw the search for patterns in previous observations as second-rate science with limited usefulness, systematic research into climate was soon abandoned in all but name. In their view, Vogt was simply asking too much.

This paper will discuss how competing claims to what made meteorology a science gave birth to a disciplinary hierarchy where the physics-based forecasting reigned supreme.

**Yngve Nilsen**

*The Definite Fall of the Norwegian Research Meteorologist by the Turn of the Millennium*

The historian of science Robert Marc Friedman has explained the success of Norwegian meteorology in the early 20th century by pointing out that the group surrounding Vilhelm Bjerknes were engaged in both practical weather forecasting and in advanced theoretical research. The Norwegian research meteorologist was institutionalized by the first director of the Meteorological institute, Henrik Mohn, in the 1880s and 1890s.

During the decades after World War II, meteorologists engaged in research gradually became less common. By the 1990s, however, a renaissance for the research meteorologist was at sight, thanks to less intensive forecasting routines and new sources for research funding. What actually happened, however, was that the traditionally small very group of specialized employees entitled “researchers” grew rapidly, and they soon outnumbered the meteorologists. At the Meteorological institute’s units in Bergen and Tromsø and at the private weather bureau StormGeo, the two groups are still physically integrated, but at Blindern in Oslo, where you find most of the researchers, this group is located in their own facilities, into which the meteorologists have limited access. To a certain degree, the researchers are better paid. On the other hand, both groups have the same basic academic education and skills.

This paper will discuss the background for this division of the meteorological profession, with regard to themes of research, commercialization and different academic cultures in the two groups. Can we see any corresponding weakening of the meteorologists’ authority during the two last decades?

**4. The History of Science and the History of Exploration: Perspectives on a Changing Relationship**

*Roundtable Organiser:* Peder Roberts

*Participants:* **Peder Roberts, Robert Marc Friedman, Ulrike Spring**

This roundtable panel is inspired by the strong interest in recent years in the history of exploration, particularly—but by no means exclusively—from historians of science. Critical histories of exploration by scholars such as Michael Robinson, Max Jones, and Patricia Seed have focused scholarly attention on expeditions as cultural performances in addition to acts of data acquisition. In Jones’s memorable phrase, exploration has involved measuring men in addition to measuring the world. We see powerful possibilities for connecting the history of exploration with emergent trends in the history of science that address the function of knowledge in asserting cultural and geopolitical values in addition to acting as a source of data for practical statecraft. Notably,

Robert Marc Friedman has considered how expeditions with overtly scientific goals could function as expressions of civilization and national honor. This dual function of science as a source of power and an expression of power points historians toward a more nuanced approach to the role of science in expeditions. Attempts to assess (and too often rank) expeditions in terms of how “scientific” they were may thus be replaced by studies of how science legitimized expeditions as serious entities, and how the particular forms of science that expeditions conducted reflected the cultural and political contexts within which expeditions possessed meaning. We have selected the roundtable format to facilitate discussion beyond just the presenters, given that so many Nordic-based historians of science have helped to drive these exciting changes.

**Individual Papers  
(alphabetical by author)**

**Nils Anfinset**

*Archaeology and the Natural Science: A Look at the Use of Natural Sciences in Archaeology from the 18th Century until Today*

Today archaeology is going through radical changes, with a strong impact of a number of new research methods stemming from the natural sciences. This has opened for an array of new research fields in archaeology, as well as a number of ethical challenges. However, this strong impact of natural sciences is nothing new. This paper takes a look back to the mid 19th century when archaeology was still a young discipline, through the 20th century with a strong focus on positivism for a few decades, to the early 21st century. This paper starts with the impact of sciences in archaeology starting with the Swedish archaeologist Sven Nilsson, with a strong focus on experiments, technology and unilinear evolution in order to interpret prehistory. In the mid 20th century archaeology had a new strong influence from the natural sciences, with the rise of processual archaeology. This paper ends with a reflection on the history of science and archaeology, and how archaeologists today use the natural sciences to interpret prehistory.

**Kristin Stanwick Bårnås**

*The International Organization for Standardization (ISO) and their Environmental Standards (the ISO 14000 family)*

The International Organization for Standardization (ISO) started their work towards environmental standards in 1991. Five years later the organization published their first environmental standard. This standard was titled ISO14001, Environmental Management Standards. I argue that there were two main reasons for why ISO decided to create standards on the environment. The first one was the successful expansion of ISOs work into non-technical standards. The beginning of this was the creation and successfulness of the ISO 9000, Quality management standards, in 1987. The second reason for why ISO started the work on the environmental standards was the increased focus on international environmental problems. Environment had gone from being a national to an international issue with the presentation of the “Our Common Future” report in 1987. The preparations for the “The United Nations Conference on Environment and Development” which was held in 1992 future spurred the interest for international environment issues.

ISO created a Strategic Advisory Group on the Environment in 1991 which had the task of looking into the possibilities for an environmental standard. Several significant international businesses and standardization organizations contributed in the work which led to the establishment of a technical committee in 1993, and the first standard in 1996. The environmental standards and how successful they have been, is a well-researched topic, but no other researched has been done on why ISO decided to create standards on such a debated topic as the environment.

**Eira Bjørvik**

*The Most Constructive Part of Medicine": Medical Responses to Infertility in Norway 1939-1984*

In this paper I discuss the coming-into-being of 'involuntary childlessness' as a social, political and medical concern. I will revise a common national understanding of assisted reproductive technology as the product of an era of visionary gynecology, by relocating it in a world between medical, social and political approaches to human reproduction.

Starting with the introduction of artificial insemination in the 1950s, I trace how the concepts of 'infertility' and 'childlessness' evolved towards the mid-1980s when a broader range of assisted reproductive technologies came into use. In the 1930s, infertility could variably be perceived as a matter of unlucky destiny, failure of volition, the result of stressful modern living, or portrayed as a biological response to a social incapability to parent a child. This paper will show that by the late 1970s, infertility came to be understood in relation to the mental suffering caused by the lack of fulfillment of what was perceived as a basic biological need. Ultimately, infertility evolved as a pathological condition in its own right. This, I argue, premised the framing of assisted reproductive technology as "the most constructive part of medicine". However, this medical version of infertility as a problem in need of medical attention did not necessarily echo in political priorities regarding which medical conditions should be given prioritized access to public health care. Such tension and dispute, I hold, enables us to shed light on the role of philanthropic activism in shaping public health policy.

The paper draws on hospital archive material from the National hospital (Rikshospitalet) and St Olav hospital, medical textbooks, medical journals and popularized texts on public health issues from the period in question.

**Thomas Brandt**

*Science of a 'Freer Kind'? Scientific Autonomy, Democracy and the Establishment of Research Councils in Post-War Norway*

In 1945, a committee led by Fredrik Vogt discussed proposals for the establishment of a research organization in Norway that could co-ordinate and strengthen the nation's scientific research. Three alternatives were put on the table; an office for research organized under a State department; an academy for science similar to the Swedish Engineering Science Academy; or a research organization of a 'freer kind' based on representation from science, state and industry. The latter solution was eventually recommended and became the model for establishing a set of research councils in Norway in the years to come.

It was however by no means clear what the phrase a 'freer kind' entailed. As noted by Kvaal (1997), the term 'freer' lacks precision and is so wide it could encompass a broad range of meanings. Ultimately, the relationships between science, industry and the state, as they were organized through the research councils, need to be discussed in terms of scientific autonomy and democracy.

In this paper, I will investigate how issues of autonomy and democratic influence over scientific research were discussed

during the establishment of the first three research councils in Norway between 1945 and 1950. What forms of scientific research organization should be of a 'freer kind'? How should the interests of the State, the science communities and the industries be represented? What were important boundary issues when various fields of research were sought allocated into the different research councils?

**Terje Brundtland**

*Kristian Birkeland Today*

Professor Kristian Birkeland (1867-1917) is well known among Norwegian physicists and historians of science. He lived an active life doing laboratory physics, arranged expeditions to the Arctic, wrote articles and books, established an auroral observatory on the mountain of Haldde in Northern Norway, founded industries, and took out about 60 patents. Today there exists a long series of works on him, ranging from popular and scientific articles and books, to films and plays.

While much is already said and written about Birkeland, it comes clear that there are still many unvisited areas concerning his life and work. There is a rich material on him, found in libraries and archives as well as in museums and university collections. Moreover, the largest collection of papers and artefacts after Birkeland is found here at the Museum of Science and Technology.

In Norway, there seems to be two different approaches to the professor, from the camp of the physicists and the camp of the historians. In this paper, I will describe the present status of research and popularization on him, claiming that a professional, scientific biography on Kristian Birkeland is still to be written.

**Elisa Campos**

*Origin of the Concept of Lipoprotein*

This paper addresses the origin of the concept of lipoprotein. First described in France by Michel Macheboeuf (1900-1953), lipoproteins were the subject of his doctoral dissertation in 1929 at the Université de Paris. While a scholar at the Carlsberg Laboratory in Copenhagen, Denmark, Macheboeuf was trained with Soeren Sørensen (1868-1939) in routine practices, standardization of methods and duplicating equipment, as part of the spatial dimension underlying an effective circulation of scientific knowledge. Macheboeuf also maintained contacts with Uppsala University in Sweden, at the laboratory from which two fundamental techniques came, ultracentrifugation and electrophoresis, designed for the study of macromolecules and proteins, respectively; Macheboeuf applied them to the study of 'lipidoproteic cenapses', so named in 1937. Thus, because Uppsala had created a-geography-becoming an obligatory point of passage, it was possible for Macheboeuf, in the late 1930s, to work with the innovative tools of his time. Paris, however, never became an obligatory point of passage. I will show that Macheboeuf could not or did not know how to apply all the resources at his disposal to publicize his work and I compare his situation with that of Edwin Cohn (1892-1953), working in the laboratory of Harvard University. I point out the differences between the institutional dynamics of biomedicine of the two countries, France and USA, which

may have contributed to the lower recognition of Macheboeuf's studies until the 1950s, along with the fact that this researcher has chosen to publish exclusively in French.

**Andreas Christiansen**

*The Understanding of Parallel Lines in Early 19th Century Textbooks: An Analysis of Two Norwegian Geometry Books from 1827 and 1835*

Bernt Michael Holmboe (1795–1850), professor in mathematics, wrote several textbooks on mathematics, and they were used in the learned schools of Norway for many years. Christopher Hansteen (1784–1873), professor in applied mathematics, wrote a textbook on plane geometry in 1835 where he challenged the traditional textbooks. I will in this presentation introduce and compare the understanding of parallel lines in the textbooks by Holmboe and Hansteen. The difference between the two textbooks was rooted in whether one in mathematics education should present the subject matter in a traditional Euclidean way or not. Holmboe's presentation of geometry was traditional and in conformity with Euclidean ideas, while Hansteen let utilitarian considerations overrule logical deduction and theoretical thinking. I will also comment on the understanding and interpretation of parallel lines, and Euclid's parallel postulate, presented in the works of earlier mathematicians. An additional source to the understanding of Holmboe's and Hansteen's views, is a newspaper polemics that occurred in two Norwegian newspapers in 1835–36.

**Gowan Dawson**

*Citizen Cuvier: Radical Appropriations of Georges Cuvier's Law of Correlation in Edinburgh and London, 1801–1837*

Georges Cuvier, the most revered naturalist in early nineteenth-century Europe, has generally been viewed as a staunch conservative. In particular, Cuvier's scientific authority was used in Britain to prop-up a number of conservative causes including the natural theological argument from design. But scholars who have studied Cuvier in his French context have increasingly questioned assumptions about his apparently intrinsic conservatism, with Dorinda Outram suggesting that Cuvier's theological and political outlook was more accurately that of a "cosmopolitan liberal", and Philippe Taquet emphasizing how his "principal rule to never go beyond the facts" induced Cuvier to maintain a scrupulous silence with regard to religion. Historians examining what Martin Rudwick has called the "anglicized Cuvier" have been slow to take account of this more nuanced picture of the Gallic Cuvier, and as such it has not yet been recognized that his liberalism was widely acknowledged in Britain. My paper argues that between 1801 and 1837 Cuvier's purportedly conservative law of correlation was appropriated by Whig republicans like John Allen, materialist surgeons such as William Lawrence, and atheistic plebeian radicals including Richard Carlile and Eliza Sharples, who all saw it as supporting aspects of their own political agendas. My paper locates these radical appropriations of Cuvier as part of a wider pattern, which indicates the complexity of the affiliations between particular scientific theories, especially those imported from France, and the diverse religious and political orientations, which characterized early-nineteenth-century Britain.

**Sophia Efstathiou and Bjørn Myskja**

*Weeding Out the Sea: Adding "Value" to Norwegian Seaweed*

This paper offers a historical and ethnographic analysis of seaweed harvesting that has been undertaken along the coast of Norway since the early 20th century, focusing on post-WWII developments in alginate production processes. We argue that adding commercial value to seaweed as a source of alginates (with applications in food and drug industries) comes with a re-valuation of seaweed as something other than sea weeds: seaweed becomes rather appreciated as a natural habitat for sea life valued by the fishing industry, as an ecosystem resource valued by local environmental groups, and as a national resource for Norwegian industry.

Our hypothesis is that practices of commercial and research sea-weed harvesting by sea-bottom trawling brought attention to the value of sea-weed as a condition for traditional forms of harvesting the material values of the sea. With increasing efficiency of harvesting methods, attention turned to the non-economic value of nature both as source of human appreciation and as a value in itself. Further, following the transition of the industry from private Norwegian to, in the early 2000s, American-owned the economic and symbolic value of the sea-weed as a national resource sharpened into focus.

We complement our historical analysis through a real-time study of seaweed harvesting currently undertaken by FMC Health and Nutrition in Trondelag, and by conversation and interviews with the MARPOL biotechnology research group led by NTNU. Through these discussions we investigate researcher and industry members' attitudes towards seaweed harvesting including whether and how attitudes may have changed during historical transitions of this industry's aims and ownership. Through this investigation we ask, what kind of value if any is being added to sea-weed through its commercial and research utilization?

**Kari Tove Elvbakken**

*The Science of Nutrition in Norway: Institutions, Actors and Orientation 1870-1970*

Inspired by H. Kummingsa and A.Cunningham (1995), and K. Carpenter (2003), focusing different aspects of the history of the science of nutrition, this paper will discuss the history of the science of nutrition in Norway. In an international context, the disciplines of chemistry and physiology were important for the formation of the discipline of nutrition, combined with surveys of food intake and eating habits. The science of nutrition might be viewed as a discipline within the framework of medicine, physiology and biochemistry, but might also be and certainly has been, social science.

In Norway nutrition was a theme, in research and teaching, for the professors of hygiene at the Faculty of medicine from the 1870s, and was later taken up by professors of physiology. The relations, and in some periods, controversies, between hygiene and physiology will be discussed. Research within chemistry, organic chemistry and the relations between university researchers and industry are also important in the Norwegian history of the science of nutrition. This history of the science of nutrition is a study of the history within universities, but has also taken an interest in research within

independent and governmental financed research institutes and private companies and agriculture. In addition relations to international research communities and networks are taken into account. This study of the history of the science of nutrition aims to show characteristics of the Norwegian situation and contribution to the international science of nutrition.

**Terje Finstad**

*At the End of the Chain: Contesting Conceptualizations of Food Safety in Norway in the 1980s*

In the middle of the 1980s the Norwegian professor of microbial ecology, Tore Midtvedt, wrote several critical articles about the liberal use of antibiotics in connection with a booming Norwegian fish farming industry. According to him this would produce resistant bacteria threatening human health. “The microbes will strike back!” he claimed in his straightforward attack on veterinarians and their use of antibiotics. It should come as no surprise that the veterinarians soon responded. The ensuing controversies reveal that veterinarians and Midtvedt had very different ideas about food safety and the food safety field as such. To make a long story short, some of the basic concepts of the veterinary food safety expertise were put into play through Midtvedts critique.

In this paper I will investigate Midtvedts critique further and the various ways in which it can be seen to have challenged the veterinary thinking about the relations between food, humans and animals. What was the scientific background for this controversy, how did Midtvedt challenge the veterinarians and their conceptualizations of food safety, and did it have any consequences for the food safety field? In addition to this, I will discuss how this particular controversy can be used to raise questions about the writing of history. In short, what can it say about our, the historians, use of concepts and conceptualizations developed by other sciences or fields of expertise?

**Stefan Fisher-Høyrem**

*As Good as Gold: The Technological Translation of the Gold Standard's Abstract Immutability into Bank of England Paper Notes, ca. 1800-1855*

Bank of England paper notes were central to the gradual integration of the economy conceived as a national (and indeed global) sphere, and so at the heart of Victorian debates over political economy. Though Victorian debates over the emerging economic sphere included a range of perspectives, there was a wide and often unarticulated agreement that the value of money was ultimately grounded in an abstract standard best represented by gold. But how could the immutability of this abstract standard be replicated in flimsy notes of paper so as to make them trustworthy and “as good as gold”? While some scholars have emphasized the use of national symbolism (and sheer state power) in the building of popular trust in paper notes, the present argument is that this counter-intuitive goal was achieved primarily through a deliberate mobilization and combination of technology and human skill. In 1819, the Society of Arts issued a report suggesting that the widespread problem of paper note forging could be eradicated through a

“combination of the arts” – that is, an extension of the chain of technological and human mediators involved in the production of paper notes. As a result, in 1855, the Bank presented a new and practically inimitable paper note, which as such was able to embody—in its tactile as well as visual aspects—the abstract immutability of the gold standard.

**Åsa M. Larsson**

*Return of the Ancestors. Archaeology, Ancient DNA and the Public*

Archaeology was initially a discipline strongly influenced by the search for origins of populations. From pots, arrows and skulls were drawn inferences about cultural and biological units, prehistoric groups who supposedly carried the seeds of current national identities. Most of post-war archaeology however, was a strong reaction against this search for ancestors. Instead culture and society were increasingly seen as social constructions, negotiable and contextual. The notion of “cultures” was deemed not just flawed but a frivolous pursuit by many influential theorists in the late 20th C. However, at the same time the study of ancient DNA was growing rapidly as a field within evolutionary biology. The study of the genetic makeup of prehistoric populations, often using archaeological cultures as units of study, has captured the public’s interest in an unprecedented way, even catching the geneticists off guard. The financial resources available to these more science based studies far outweigh the financing of the humanities, and get far wider exposure in high impact journals and mass media in general. I will discuss how the new field of ancient DNA challenges what archaeology can and should study, and highlight the challenges researchers in both camps are facing regarding a sensitive subject with possible political implications. Why this massive interest in identifying one’s ancestral genetic roots, at a time when identity is increasingly seen as a matter of personal choice?

**John Lidwell-Durnin**

*Medusae, the Mental, and the Electrical: How Experimentation on Nervous Systems and the Nature of Electricity Supported Lamarckism, 1850-1880*

In 1877, George Romanes published a series of papers in *Nature* outlining the results of his experiments on electrical stimulation of several varieties of jellyfish. This work was widely discussed in the press, won him the admiration of Charles Darwin and secured him his fellowship with the Royal Society at the age of 31, much of the attention he received no doubt due to his claim of having provided inductive evidence for Spencer’s Lamarckian-styled evolutionary theories. There has been little research into why Romanes’ experiments in electrophysiology were viewed as so invaluable by the evolutionary thinkers of his era-- or indeed, whether or not it is accurate to say that his research was really as influential as we think it to be. In this paper, I will show that

Romanes’ research into jellyfish is significant for two reasons. Firstly, Romanes’ research was carried out during a period of complexity in which a variety of competing theories as to what the correlation between electricity and nerve-force were, and it is by no means clear where to situate Romanes himself within this debate. Understanding Romanes’ position on this question helps us to appreciate finer aspects of his worldview.

Secondly, Romanes' research did more than confirm theories belonging to Spencer: it also lent support to a larger research project spearheaded by the physiologists William Carpenter, Michael Foster, and many others who endeavoured to explain the vital power of growth and development by appealing to the electrical properties of the nervous system.

**Kristine Lillestøl**

*Soma and Psyche in Norwegian Neurasthenia 1880-1930*

Neurasthenia, or «nervous weakness», was a widely used diagnostic label around 1900. Fatigue, headache and insomnia were among the most common symptoms. Although the “golden age” of neurasthenia ended several decades ago, it is not exclusively a historical phenomenon. The diagnosis is still in use in several countries, including Norway. Moreover, neurasthenia of the 19th century has been suggested as a precursor for several conditions which are common but contested in our time, such as chronic fatigue syndrome (CFS).

The historiography of neurasthenia has been dominated by an understanding of neurasthenia as a “cultural formation” rather than a “real” disease, and as a psychogenic more than a physical disorder. An understanding of a fundamental barrier between psyche and soma is also present when the history of neurasthenia is mobilized in current debates about CFS and similar syndromes. Divides of this kind do, however, not exist in and for themselves, but as something which is produced in different historical situations – if present at all. Therefore, my aim for this presentation is to explore the relationship between “psyche” and “soma” throughout the heyday of neurasthenia in the Norwegian context, 1880-1930. Drawing primarily on patient records and scientific literature, the questions I ask are: Was there an understanding of a psyche/soma divide at all – in clinical practice, and in the scientific texts about neurasthenia? If so – was Norwegian neurasthenia around 1880 perceived as “psychic” or “somatic”, and how did this change during the next few decades?

**Phil Loring**

*Touching Nerves: A Case Study from the Exhibition “Mind Maps: Stories from Psychology”*

One of the central privileges and pleasures of practicing history in museums is the opportunity it presents to bring together objects that previous generations of curators kept rigorously apart. This kind of juxtaposition can also, with luck, lead to the production of new historical understandings. In order to shed light on this process, this paper zooms in on one display case within “Mind Maps,” the temporary exhibition I recently curated at London’s Science Museum about the history of psychology. The case juxtaposed three items, all dating from 1800–1810: a glass musical instrument invented by Benjamin Franklin, an early electric battery said to have belonged to Luigi Galvani, and a notorious “quack” medical instrument known as Perkins Patent Tractors. Of these, only the battery had been displayed before, in an exhibit about nineteenth-century Galvanic medicine; the other items had been briefly catalogued upon accession and stored away behind locked doors with the museum’s many other musical or medical instruments. The challenge I gave myself

was to weave a story that emerged from these heterogeneous objects and did justice to their historical specificity while also linking them to psychology, a science that would not emerge until many decades after these instruments fell out of use. The solution I found was nerves. Each of these instruments, in a different way, had a direct connection to the emerging Enlightenment consensus that nerves, rather than spirits or humors, held the key to understanding the link between body and mind.

**Annette Lykknes**

*Shaping Identities as Professors of an Institute of Technology – How Two Chemistry Professors at NTH in Trondheim Found their Place between Industry and Academy in the 1910s*

Expectations were high when the Norwegian Institute of Technology (NTH) was established in Trondheim in 1910. Modelled on the German Technische Hochschule, NTH was an academic institution with modern teaching and research facilities. Professors were expected to conduct both academic research and engage in development projects with industry, thus to have a double competency.

Some professors felt squeezed between the scientific tradition on the one hand, and empirical-practical know-how on the other. How did this tension affect the expectations and roles of the professor? In addition to establishing laboratories and study programs, chairing a department and be inspiring teachers, each of the professors were meant to open up research which was industry-relevant and at the same time scientific and publishable. Also, the Institute of Technology was the first of its kind in Norway, and although many had studied at a Technische Hochschule in Germany NTH had to be developed from scratch, and adjusted to the needs of the budding Norwegian industry. How did the first chemistry professors solve this challenge?

As will be demonstrated in this paper, as a group the chemistry professors succeeded both at the academic level and as consultants, however to different degrees. I will argue that two of the four professors employed in the 1910s identified themselves mainly as “academics” while the remaining two considered themselves first and foremost industrial chemists. I will particularly look at how two of them shaped their roles as professors between academy and industry in the 1910s.

**Elizabeth Neswald**

*Humans, Animals, Apparatus and the Material Cultures of Nutrition Experimentation*

The specialist field of nutritional physiology began developing in the 1860s with the studies of Carl Voit and Max Pettenkofer in Germany. In particular from 1880 to the early twentieth century, physiologists in several countries developed a variety of apparatus to measure human and animal metabolism and techniques to deal with their living objects and the conditions of experimentation. This paper explores the material cultures of nutrition experimentation to show how local conditions and the variability of apparatus and experimental subjects shaped not only the experimental process, but also the ways in which experiments and results from one laboratory could or could not be translated and compared with the results of other laboratories. Instruments and apparatus in this early

phase depended greatly on the skill of individual investigators and technicians, who relied on bricolage and improvisation, as each lab built its own apparatus. Experimental subjects, for their part, often acted in unexpected or inconvenient ways, compelling investigators to engage with the materiality of their bodies and their excretions, their personalities and preferences in ways alien to the fields of physics and chemistry, from which they had taken their experimental models. By focusing on the material culture of nutrition experimentation in its early decades, this paper traces the uneven and incomplete process of methodological and apparatus standardization.

**Laura Newman**

*“Germ Destroyers”: Germs and Advertisements in the British Popular Press, c. 1870-1900*

Studies into the impact of the germ theory of disease in nineteenth century Britain have commonly limited their attention to institutional spaces of STM. This paper instead looks at the ways in which the new ideas, practices, and lexicons of germ theory were used by the commercial medicine trade in their advertising strategies. Looking specifically at adverts that appeared in the popular press, I will demonstrate how these advertisers utilized new terminologies of disease that emerged from germ theory as well as relied on older understandings of disease and disease prevention, such as humoralism. In these configurations germs were made coherent, combatable entities that did not signal certain rupture from older, local understandings of disease. In this way advertisements can contribute to a deeper understanding of the everyday health concerns of the British consumer in the period as well as the market that catered to them. My talk builds upon a variety of different fields, such as work done on the intersection between histories of health and the home, health and motherhood, and medical advertising. In this paper I seek to contribute a deeper and more interconnected understanding of the symbolic place of ‘germs’ in these histories, one which interrogates both how and why germs formed part of the rhetorical strategies deployed by medical advertisements in nineteenth century Britain.

**Per G. Norseng**

*Ice and Steam in the Logistic and Dietary Revolution of the 19th and early 20th Century*

The paper will discuss the Northern and Western European trade in natural ice in the latter half of the 19th and early decades of the 20th century in a wider context of transport history and logistic and dietary developments.

The international literature on food history and transportation history mostly emphasizes the role of modern transport technology in the making of modern patterns of fresh food consumption. This paper will argue that it was rather a combination of ancient methods of cooling and modern transport technologies that triggered changes in the food industries and made consumption of fresh foods and cold drinks more widespread and “democratic”. The following aspects will be highlighted:

- The technology and organization of the trade in natural ice

- The role of natural ice in enhancing production, distribution and consumption of fresh foods prior to large scale introduction of artificial ice and more modern cooling techniques

- The impact on economic integration, by extending the areas from which fresh foods could be imported, enhancing the possibility for farmers to sell their produce, fishermen to sell their catch, etc.

- The use of natural ice and modern means of transportation as a catalyst for the development of modern cooling technology

The main focus will be on Britain, the most important market for the international trade in natural ice, and Norway, the main exporter and transporter of natural ice in the European market, and also a major exporter of fresh fish “on the rocks”, by ship and by rail.

**Hans Seland**

*A Norwegian Roadmaster’s 1838 Tour of Britain and Beyond*

In Norway around 1840 a new generation of politicians and professionals looked abroad for technology to help modernize the productive sectors and associated transport infrastructure. In 1838, at a time when British mentors inspired a common international technological culture, Norwegian engineer and roadmaster Georg D. B. Johnson (1794-1872) went on a government mission to Britain and countries bordering the North Sea to study modern roads and bridges, harbours, canals and the new railroads. His report cum engineering textbook illustrates the historical value of little known foreign reports of the British Industrial Revolution. In Britain Johnson borrowed extensively from two northern suspension bridges to design and construct Norway’s first of the kind at Bakke in Flekkefjord. Johnson moved to Christiania (Oslo) in early 1842 and the young C. V. Bergh (1814-1873) was made project manager one year later. He modified and completed the bridge in 1844. Berg established himself as designer of suspension bridges and became Norway’s first director of roads in 1864. As national director of canals and harbours Johnson advised against Norwegian railroads and he worked in vain to introduce stone block tramways based on his own experience of the English section of Thomas Telford’s Holyhead Road. This paper is in part based on a manuscript published in the journal *Engineering History and Heritage* in London 2013, but includes new research on the once promising dead end of railway technology that made Johnson the Don Quixote of Norway’s contemporary family of technology.

**Paul Sivitz**

*Making America in His Own Image: Pehr Kalm, Publishing, and the Pursuit of Science*

This paper examines the ways Pehr Kalm, an “apostle” of Linnaeus, used Britons on both sides of the Atlantic to his own ends during his trip to North America from 1748-1751. Although in possession of letters of introduction, several colonial American scientific practitioners questioned Kalm’s motives after his arrival. Throughout his sojourn, and after his departure, Kalm raised the ire of the very community he needed to embrace. Two years after returning to Sweden

from North America, Pehr Kalm published, in Swedish, the first of several volumes recounting his journey to the British and French colonies. While Kalm's writings on natural history had a broad appeal, other facets of his journal were aimed specifically at a Swedish audience. Readers in Sweden appreciated the detailed scientific accounts, as well as those documenting everyday life in the American colonies. However, English readers had to wait until 1770, twenty years after Kalm's journey ended, to read of his North American exploits in their lingua franca. The delay and the work's contents brought sharp rebuke from Kalm's former hosts in British America. It seems that he had fabricated many of the stories attributed to people like Benjamin Franklin. Kalm, with his connection to Linnaeus, was the ultimate scientific insider. Through his actions, Kalm placed himself on the outside, in effect, becoming the "other." Moreover, participating in regular communication defined membership in the scientific community. Kalm's refusal to follow suit further distanced him from those who had made his North American trip possible.

**Iver Tangen Stensrud**

*The Rig and the Reactor: Risk Analysis for Hazardous Technologies*

The internal control regime in the Norwegian offshore industry has gained a great importance in both the historiography of the industry and for how we deal with technological risk and danger more generally in today's society. However, there was a change in how technologically produced hazards were understood and dealt with leading up to the introduction of internal control in 1980 that has largely gone unnoticed in Norwegian historiography. This change, which happened during the 1970s, was connected to both the oilrig and the nuclear reactor. One can talk about a shift from a way of thinking about technological dangers that was highly empirical and based on laboratory testing, to what Historian/Philosopher of science Ian Hacking has labeled a probabilistic style of reasoning. In this paper, I will show how risk analysis first came up during debates about the possibility of nuclear power in Norway in the early 1970s and then quickly moved over to the offshore industry. I will argue that the probabilistic shift that happened with the growth of the "risk sciences" during the 1970s made possible a goal-oriented approach to regulation. In short, an operator in the Norwegian offshore sector had to demonstrate a probability of a large accident of 10<sup>-4</sup> for their concept to gain a license. Subsequently, internal control in the offshore industry had a major influence on the reformation of health and safety regulations in the Norwegian society during the 1990s.

**Åsmund Svendsen**

*Evidence/Memory – the Archival Praxis at the National Archives of Norway*

In 1987 a Norwegian Law of Archives was proposed. In the following discussion two views arose on the purpose of the law. According to one view the law should secure archives for legal and administrative purposes. The other standpoint held that the law should make sure that a selection of the country's archives was secured for the documentation of the historical development of the society. The perspectives

correspond with what the Canadian archivist Terry Cook has described as an archive-theoretical dichotomy on the praxis of archive-institution, a legal-historical versus a memory-historical perspective.

Cook's concept reflects a duality that can be found at the National Archives of Norway. Firstly The National Archives help the public administration to create unique records, used for the management of the administration as well as legal evidence. Secondly the National Archives manage the deposited archives for use by scientists and citizens to create new research results and collective narratives.

In general, national archives are considered as part of a historical-scientific infrastructure, where sources are deposited and managed. Few have asked how The National Archives affects the production of scientific knowledge through its role as a consultative body for the public administration and through its work with management of deposited records. Based on Cooks dichotomy this contribution will shed light on these questions. The contribution is part of the on-going work with the history of the National Archives of Norway, due in 2017.

**Frode Weium**

*Technology on Trial. The Hammond Case*

In 1936 a remarkable trial started in the United States. The Federal Trade Commission charged the Hammond Clock Company with false and misleading advertising. The central issue was whether the electromechanical Hammond organ, which had been introduced the previous year, could be said to be comparable to the traditional pipe organ. This also brought up the question of whether the Hammond organ could actually be called an organ. Was it a true musical instrument or simply a machine – just a piece of technology? Discussions were heated, and several hearings and tests were held. The so-called Hammond case lasted more than two years.

New music technologies have often been viewed as something artificial and false, not really belonging to musical culture. According to the British music sociologist Simon Frith, the authenticity of music has repeatedly been at stake. At the same time, music without technology is more or less unthinkable. One may argue that the traditional pipe organ was no less a machine than the Hammond organ. So why was the pipe organ still considered a more authentic musical instrument? It seems the answers have to do with general attitudes towards new music technologies, and notions of whether an electromechanical or electronic musical instrument could express the "soul" of music.

In order to illuminate the reception of new music technologies, this paper will take a closer look at the Hammond case. What arguments were used against and in favor of the Hammond organ? And how did this reflect certain views of music technology?



**THANK YOU FOR ATTENDING!**

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