



**British Society for the History of Science
Postgraduate Conference 2007**

4-6 January 2007

Durham University



Organising Committee:

Beth Hannon
Vicky Blake
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PROGRAMME

THURSDAY 4TH JANUARY

Panel No.	Time	Panel Title	Speaker	Title
*	1200-1315	Arrivals & Registration at Hatfield College		
*	1230-1330	Lunch at Elvet Riverside 2		
*	1330-1340	Welcome & Introduction in Elvet Riverside 2 (R207)		
1	1340-1525	Ancient & Early Modern Medicine Chair: Fern Elsdon-Baker	Melanie Sapsford:	The Use of Sodium Salts in Ancient Egypt
			Karen Buckle:	'More liable to infirmities and diseases than any other': Corporeality and the Eye in Eighteenth-century England
			Gaby Robilliard:	Midwives and midwifery in Early Modern Germany: Social identity, knowledge, and practice
			Hannah Newton:	Children and Parents' Emotional Responses to Illness in England, 1550-1700
*	1525-1540	Tea & Coffee		
2a	1540-1700	Popular & Public Science Chair: John Francis	Melissa Smith:	Nuclear Spin: The Government, the Media and the Public in Cold War Britain
			Melanie Keene:	Bangs and stinks and colour-changes': Making senses with Ede's 'Youth's Laboratory' in 1837
			Charlotte Nicklas:	Supplying the Wants of Capricious Fashion: Chemistry, language, and women's dress in mid-nineteenth century periodicals
*	1700-1705	Quick Break		
2b	1705-1825	Popular & Public Science Chair: Etienne Brun-Rovet	Thomas Lean:	'Consumerising' the Computer
			Svenja Matusall:	Neurones, Parents and Children
			Stine Grumsen:	Science and Rhetoric - PR strategies of religious movements
*	1825-1900	Free Time		
*****	From 1900	Wine Reception at Hatfield College		

FRIDAY 5TH JANUARY

Panel No.	Time	Panel Title	Speaker	Title
3a	0900-1015	Ancient & Early Modern Science Chair: Louise Thorn	Jennifer Gray:	Observed and Predicted Planetary Phenomena in Late Babylonian Astronomical Texts
			Neil Tarrant:	The true philosophers country is all the world: Giordano Bruno on the Role of the Philosopher
			Benjamin Wardaugh:	Harmonics and Acoustics. Thoughts on the Musical Work of Brook Taylor (1685-1731)
*	1015-1020	Quick Break		
3b	1020-1140	Early Modern Science Chair: Jay Bosanquet	Gry Vissing Jensen:	The art of imitating nature - Alchemy as the mediator between man and God-given nature before the scientific revolution
			Isabelle Charmantier:	Emblematics and Ornithology in the Sixteenth and Seventeenth Centuries
			Eleanor Sheppard:	Calendar Reform in Sixteenth Century Florence
*	1140-1155	Tea & Coffee		
4	1155-1315	19 th Century Science Chair: Emily Steel	Carolin Artz	Photograms of the Unseen: Lensless Photography in Late 19th century Science
			Aashish Velkar	Standardizing Quantity: Markets and Metrology in the 19th Century
			Leucha Veneer	Mineral History, Stratigraphy and Practical Geology: Changing Conflict in the Early Years of the Geological Society of London, 1807-1820
*	1315-1405	Lunch		
5	1405-1525	19 th &20 th Century Science Chair: Leucha Veneer	Hans Henrik Hjerimitslev	Anti-Darwinism in Denmark around 1900: The Case of the Grundtvigians
			Samuel Volfson:	The economic history of the U.S. Soviet-American technological collaboration in the 1920s-1930s
			Daniel Mitchell	Un Coup de Maître: Gabriel Lippmann, Electrocapillarity and the Style of French Physics
*	1525-1540	Tea & Coffee		

6a	1540-1655	Collecting Science / Science on Display Chair: Christopher Baxfield	Helen Cowie	The Marvellous and the Monstrous: Nurturing Nature in Late Imperial Spain
			Katariina Mauranen	Maritime history in the Science Museum: Dockyard technology in eighteenth and early nineteenth century England.
			Emily Winterburn	How Museums Collect
*	1655-1700	Quick Break		
6b	1700-1750	Collecting Science / Science on Display Chair: Melanie Keene	Louise Thorn	History on Display: Selecting and Presenting Topics about Trust in Science for a Museum Setting
			Anna K. Mayer	Eleven More: the new project of the National Cataloguing Unit for the Archives of Contemporary Scientists in Bath
*	1750-1800	Quick Break		
*****	1800-1900	Special Exhibition & Talk: Professor David Knight's tour of old & rare HSTM texts (Palace Green Library)	Professor David Knight	
*****	1930	Conference Dinner at Hatfield College	With a friendly address from Professor Frank James, President of the BSHS!	

SATURDAY 6TH JANUARY

Panel No.	Time	Panel Title	Speaker	Title
7	0900-1045	(Post-) Colonial Medicine Chair: Charlotte Nicklas	Christopher Baxfield	The (re)Enlightenment of Watkin Tench: Colonization, ethnography and Enlightenment in Australia and France, 1788-1796
			Ryan Johnson:	European Cloth and 'tropical' Skin: Clothing Material and British Ideas of Medicine and Hygiene in Warm Climates, 1870-1914
			Casper Andersen:	An Engineer, an Artist and the Flooding of Philae Temples
			Heloise Finch:	It's like a child you see being born: landscapes of national progress in Reunion Island
*	1045-1100	Tea & Coffee		
8	1100-1245	Victorian Pain, Death & Affliction Chair: Melanie Sapsford	Stephanie Eichberg	Pain, 'Sensibility' and the Problem of Analogy: Aspects of the Vivisection Debate in Early Nineteenth-Century Britain
			Annie Jamieson	An Intolerable Affliction: Lupus vulgaris in Fin-de-Siècle Britain
			Kseniya Hatal'skaya	The rise and development of suicidology in the Russia Empire and Soviet Union in 1820 - 1920s
			Anthony Ballenato	The Diagnosis of Death and Victorian Medicine
*	1245-1335	Lunch		
9	1335-1520	Medicine: Public & Political Chair: Ryan Johnson	Madeleine Morgan	William Acton on Prostitution: Social Nuisance or Social Necessity?
			Holly Ennis	The Lungs in Health and Disease: knowledge about the lungs within British society c1900 to 1960
			Suzanne Taylor	Medicalising Cannabis: Science, Medicine and Policy, 1950-2003
			Lena Eckert	Recent research into intersexuality - the ongoing construction of 'in-between'?
*	1520-1535	Tea & Coffee		

10	1535-1720	Influencing Science: Frameworks, Philosophy & Politics Chair: Ian Kidd	Juan He:	Two Representation in One Failed Framework: the Chinese Nomenclatures for Inorganic Compounds of the Educational Association of China and DU Yaquan
			Etienne Brun-Rovet:	The consequences on science of the emergence of analytic philosophy
			Thomas Gonderman n:	Politics of Science and the Evolutionary Transformation of Racial Theories in Victorian anthropology, 1860-1871
			Michael Rayner	Dictating Science Policy: Establishing Astrophysics at Oxford
*****	1720-1730	Closing Remarks	Organising Committee	

ABSTRACTS

Caspar Andersen (University of Aarhus)

An Engineer, an Artist and the Flooding of the Philae Temples

For two decades cultural historians of imperialism have explored the writings of ‘western’ artists and scholars in Africa in the early colonial period. They have devoted too little attention to the writings of the often no less influential ‘western’ engineers in Africa. This paper sets out to change this imbalance.

In 1894 in the periodical *The Nineteenth Century* consulting engineer Sir Benjamin Baker crossed intellectual swords with the watercolour painter and ‘orientalist’ Frank Dillon. The subject of dispute was the proposed damming of the Nile at Assuan. Construction of a dam of the magnitude and at the location suggested by Baker would result in the flooding of the ancient Philae Temples. In his clash with the artist Baker articulated a civilising mission and vision for Africa in which engineers were the driving force. Baker shared this view with the leading British consulting engineers working in Africa at the time. These engineers represented themselves to British literary publics as the ‘civilisers’ of a continent urgently in need of their expertise.

Drawing on published and unpublished autobiographies, articles in newspapers, technical journals and general periodicals this paper identifies the central components in representations produced by British engineers from 1890-1914. By focusing on the Philae controversy it furthermore demonstrates that the representations of engineers as ‘civilisers’ at times were strongly contested in the public. The eventual fate of the Philae Temples shows that such controversies mattered beyond the columns of highbrow periodicals.

As a study in the cultural history of engineering the paper takes up a line of research suggested by Ben Marsden & Crosbie Smith *Engineering Empires* (2005). In the approach to debates and controversies in the late Victorian public the study is inspired by the *Science in the Nineteenth-Century Periodical* project (SciPer) launched at the Universities of Leeds and Sheffield (www.sciper.leeds.ac.uk). The paper adds to the research field ‘Science, technology and imperialism’.

Carolin Artz (University of Duisburg-Essen)

Photograms of the Unseen: Lensless Photography in Late 19th Century Science

Even before it was possible to create photographs by the use of a Camera Obscura, pioneers of photography were able to produce photograms: photographic pictures that were generated without any optical apparatus only by the agency of light.

The fact that silver halides are influenced by the whole range of the solar spectrum, gave Johann Wilhelm Ritter (1776 – 1810) the possibility to demonstrate and visualize the existence of the ultraviolet spectrum in 1801.

In the 19th century the photogram was the only pictorial medium which enabled scientists to detect invisible rays and to chart them at the same time.

For the study of the solar spectrum, but also for the discovery and examination of X-rays and radioactivity the photogram was of great significance.

The correct interpretation of photograms of the unseen was then and still is difficult, as the example of the American scientist Arthur Goodspeed shows, who misjudged the spontaneous recording of X-rays as an error of the photographic material used, only five years before Roentgen's discovery.

Theses

1. Although lensless photographs of the unseen are no informatory *dicents* in terms of Charles Sanders Peirce, they are treated as evident signs for the existence of invisible rays.
2. Even more than in the examination of photographs, the awareness of the material and condition of the exposure is necessary for the correct interpretation of the photograms of the invisible.
3. The producers of photograms of the unseen could not use established pictorial compositions. They therefore had to generate a new visual language. The aesthetic of the photograms and their belonging to this visual language became important for the reproduction and distribution of scientific facts.

Anthony Ballenato (Université Paris 7)

The Diagnosis of Death and Victorian Medicine

English physicians try to make clear that the way they establish death diagnosis is thoroughly reliable throughout the nineteenth century. Thus, they simply regard the fear to be buried alive as incongruous and irrational. However, people's anguish around themes' of death grows inexorably during the period because of alarmists' literature, images spread by gothic novels, spectacular experiments made on dead bodies, the discovery of a massive traffic of corpses and an always greater medical interventionism on body. The mistrust towards physicians' ability to tell whether a person is still alive or truly dead reaches a climax between the *fin de siècle* and the First World War and coincides with the strong anti medical activism notably led by William Tebb. This paper discusses how Victorian medicine has grasped death as a new biological field to explore, leading physicians to reconsider the boundaries between life and death and, how this issue changed the way Victorians perceived death.

Christopher Baxfield (University of Leeds)

The (re)Enlightenment of Watkin Tench: Colonization, ethnography and Enlightenment in Australia and France, 1788-1796.

Recent major studies of eighteenth-century European thought seek to analyze the interaction between colonization, ethnography, and Enlightenment ideals (e.g. Muthu 2003, Pocock 2005, Kidd 2006). This paper contributes to such literature through an analysis of the writings of the English marine Watkin Tench, whose three published books of the 1790's on his experiences in Australia and France offer fascinating insights into late Enlightenment ethnographic study. Tench's perspective is particularly valuable: he is a practical military man, focused on discipline and "activity and exertion" to ensure the secure establishment of a new penal colony; yet, he is not uninformed by contemporary science and philosophy. Consequently, Tench's analyses of

Australian aboriginal culture and later, Revolutionary France, have a dialectical, developmental form. In one respect, Tench's writings show a distinct maturation in thought, from an initial and definitive separation of European and Aboriginal cultures, to an intriguing argument for the universal similarities among human beings. Specifically, Tench deduces that Revolutionary France and Aboriginal Australia are united by barbarism, but also believes that humanitarian religious principles shared by Aboriginals and Europeans alike condemn the Revolution's destructive impulse. However, this progress in ethnographic deduction is always held in creative tension with the idea that civilised progress occurs only within traditional social institutions. Reflecting the contemporary contentions of Edmund Burke, Tench sees both the growing prosperity of the Botany Bay colony and the outright chaos of the French Revolution as confirming his conviction that progressive societies can only grow on a foundation of individualist, protestant culture and hierarchical, gentry-led institutions.

Etienne Brun-Rovet (Université Paris 1, Panthéon-Sorbonne)

The consequences on science of the emergence of analytic philosophy

In his *Russell, Idealism, and the Emergence of Analytic Philosophy*, Peter Hylton describes how a rejection of the metaphysical positions inherent in a form of Idealism led to the emergence of a new philosophical method in the early 20th Century. This account has been much discussed. David Bell, for instance, has suggested that this philosophical revolution was as much determined by advances in the nascent psychological sciences, disseminated within Britain in this period in such publications as *Mind*, as by the conceptual issues put forward by Hylton.

I propose to present briefly two arguments inspired by these debates on the respective roles of emerging sciences and conceptual changes at the end of the 19th Century. But it is my intention to take the question from a different perspective: to what extent did this emergent analytic method in philosophy itself affect the future development of the natural sciences? My basic contention will be that the emergence of analytic philosophy was instrumental in the long-term evolution of our thinking about science.

First, I will argue that there exists a form of long-term continuity between the criticism by Russell and Moore of internal relations and the growing scepticism about the relevance of laws of nature towards the end of the 20th Century. Demonstrations of the incoherence of a theory of internal relations played a part in the undermining of the realist notion of laws as statements bearing on the essential structure of the world. This, in turn, affected the unity of the sciences by reducing the motivation for a search for all-encompassing universal laws valid in all contexts of application.

Second, I will suggest that the very same ontological questions at the basis of the conceptual shift within philosophy with Russell and Moore are at the root of a number of current debates at the border between the sciences and the philosophy of science. These ontological questions – about the nature of relations, properties and universals, or about the foundations of meaning and truth – did not only constitute a very special moment in the history of philosophy: they also heralded significant new ways at looking at science, for instance by reinvigorating research on the explanatory role and possible nature of capacities in science.

Karen Buckle (University College London)

'More liable to infirmities and diseases than any other': Corporeality and the Eye in Eighteenth-century England.

In eighteenth-century natural philosophical and medical discourses, the eye was fragmented into fields of knowledge (or interest) such as anatomy, optics, and theories of vision: divisions that have been carried forward into modern historical scholarship. This presents substantial problems for anyone trying to get a grip on the later early moderns' understandings and conceptions of the eye and of eyesight.

As part of my wider research into practices surrounding the eyes and their treatment I have come up against the difficulty which I pose here as my central question - what *was* the eighteenth-century corporeal eye? While it is possible to define narrow areas of study on paper and to cast aside alternative aspects of the eye and vision, either seen as irrelevant, or outside of the author's expertise; in lived experience these fragmented interpretations resided in a single organ.

For the layman it would seem that the functioning and understanding of the eye typically went unquestioned, or at least unwritten, until failing in expectations, function, or acting as a source of pain. What we have emerging from diaries, letters, commonplace books as well as treatises of the eye written for the public by the occasional entrepreneurial oculist, then, is the fallible and highly corporeal eye. These accounts of rheums, of pins, pearls and webs, purblindness and obstructions, offer a valuable counterpoint to progressive accounts of anatomy and optical theory. The diversity of hazards, complaints and forms of causation of distempered eyes or weak sight, furthermore, cautions against the use of normative assessments. Conceptions of, and efforts to distinguish between (or construct the differences between), problems of sight or the eyes caused by external or internal, constitutional problems, by disease, accident, or the causes of deterioration of vision, had significant implications. This was not only for the logic of healing and type of treatment adopted by the individual, but also for justifications for the occupation of certain medical men, for whom the notion of the eye as an organ 'more liable to infirmities and diseases than any other' helped to justify specialised practice in the treatment of the eyes.

Isabelle Charmantier (University of Sheffield)

Emblematics and Ornithology in the sixteenth and seventeenth centuries

Drawing on the re-discovery of a French seventeenth-century encyclopaedia of ornithology written by Jean-Baptiste Faultrier, I will review the existing theories about the links between emblem books and natural history – and more specifically ornithology – in the sixteenth and seventeenth century. While emblem books were very popular in the sixteenth century, and were used extensively by naturalists such as Conrad Gessner (1555) and Ulisses Aldrovandi (1603), it has been argued that emblematics disappeared from natural history by the middle of the seventeenth century, starting with the works of Jan Jonston (1650). By closely analysing ornithological treatises of the sixteenth (William Turner, Pierre Belon, Gessner and Aldrovandi) and seventeenth centuries (Jonston, Faultrier), I will show that the emblematic world view was not only present in Gessner, but also in the works of Belon (1555), and still apparent in Jonston and Faultrier. The presence of emblematics in these works has not been noted before, and there has been a tendency in the history of sixteenth-century zoology to

separate Gessner and Aldrovandi as 'the Encyclopaedists' from all the other naturalists. In fact, the boundaries were much less clear: the 'emblematic world view' permeated the whole of ornithology, and is apparent in literary references to emblematic images in most works, both in the sixteenth and early seventeenth centuries. The use of emblematics in ornithology effectively ended in 1678, when John Ray wrote his *Ornithology of Francis Willughby* and explicitly stated that from now on, he would abandon 'Hieroglyphics, Emblems, Morals, Fables, Prefaces, or ought else appertaining to Divinity, Ethics, Grammar, or any sort of Humane Learning'.

Helen Cowie (University of Warwick)

The Marvellous and the Monstrous: Nurturing Nature in Late Imperial Spain

My research explores the development of natural history in the Spanish Empire (1750-1850). I examine why the Spanish Crown promoted scientific institutions and expeditions and how naturalists fashioned a distinct professional identity for themselves in the Hispanic world. I situate Spanish engagement with natural history within an imperial context and suggest that Spain's capacity to procure and exhibit exotic natural treasures reflected the potency of her imperial structures. One Spanish commentator, scrutinising the contents of the Real Gabinete de Historia Natural in 1788, gloried that 'we have seen form this immense collection of singularities of nature, brought at considerable expense, not only from all regions of Europe, but also from Asia, Africa and America; so that all parts of the world may contribute to forming the most complete treasure of Natural History that exists in the universe'.

My paper focuses on the dissemination of scientific knowledge to a non-specialist audience. Drawing upon contemporary periodical articles, instructive texts and museum guides - particularly Juan Mieg's *Paseo por el Real Gabinete de Historia Natural* (1818), I evaluate attempts to impart the uses of natural history to a wider spectrum of society. Mieg censured the 'sterile admiration' that the riches of the Real Gabinete evoked in some visitors and resolved to substitute it for something more meaningful. I assess the didactic techniques he deployed in order to do so, including the use of fictional dialogues and the promotion of interactive forms of learning. I trace parallels with other contemporary works of a similar nature, such as John Ripplingham's 1815 guide to the London Museum.

The second half of the paper addresses the moral benefits associated with natural history. The journalist Juan Blasco Negrillo exhorted wealthy Spaniards to 'employ in [the collection of natural objects] the money they squander on gambling or any other amusement of a similar nature'. Mieg, meanwhile, adduced the elephant's trunk as evidence of 'the wisdom of the Creator'. I conclude that the contents of the natural history museum attested the bounty of God as well as the munificence of the King, and I situate science within a wider social context.

Lena Eckert (University of Leeds)

Recent research into intersexuality – the ongoing construction of 'in-between'?

Research into intersexuality has a long tradition. The former term of 'hermaphroditism' derives from Greek mythology and has only been replaced in the early 1920 in endocrinological research (Oudshoorn, 1994). Since the 1950s it has been established as a term to describe individuals who do not fit into the definitions of 'normal' formation of 'sex-determining'

features (chromosomes, hormones, genitals, sexual organs). My paper will look into the ongoing process of re-defining and re-evaluating of intersexuality as a deviant (arrested) development in reference to 'normal' psychosexual development and gender identity development. Critical feminist accounts will be of special interest. They helped to de-pathologize intersexuality (Kessler 1990), but at the same time have fostered the ongoing problematization of intersexuality through adapting sex-biased bio-medical concepts (Fausto-Sterling, 1993, 2000).

My focus will be on the question, how varying concepts of 'sex/ual difference', 'gender' and 'sexuality' intermingle in debates about intersexuality. I will explore what is at stake in argumentative structures and underlying beliefs of the categories 'sex/ual difference', 'gender', and 'sexuality'. By investigating how the problem of intersexuality has been expounded in different ways, I will explore how sex/gender has been constructed. The construction of the "sexual deviant" will serve in this endeavour to search for the ongoing construction of the norm through the "abject" as Butler has shown (Butler 1990). My method will be a micro study of discourses of intersex. I conduct a close reading of academic literature deploying methods used in literary criticism to examine medical, psychological and feminist literature published during the 1990s. In doing so I am able to discern the intrinsically used rhetorical figures, which make the texts understandable in a specific time and place. However, I also read the texts in order to discern something of the broader culture from which these texts arise and will treat the works under consideration as primary sources, reading them as products of their historical context of poststructuralist and queer thinking.

Stephanie Eichberg (Durham University)

Pain, 'Sensibility' and the Problem of Analogy: Aspects of the Vivisection Debate in Early Nineteenth-Century Britain

Within the history of vivisection, most historians have concentrated on the late Victorian pro- and antivivisectionist debates leading to the Cruelty to Animals Act (1876). Others have traced the beginnings of these debates (scientific as well as ethical) within the 17th/ 18th centuries. My paper, however, will focus on the rather neglected first half of the nineteenth century assuming that this was a crucial period within the vivisection debate as a whole.

Two developments which influenced the discourse on vivisection seem to have reached a climax in this period: within science, there was a rising interest in the nervous system which generated a new wave of physiological experiments. In society, on the other hand, there was an increasing obsession with (animal) pain or occurrences in which pain was inflicted (resulting in various animal protection movements).

I will link these two phenomena by referring to one contemporary example of a scientific vindication of animal experimentation (George F. Etherington, *Vivisection Investigated and Vindicated*, 1842). The author applies different argumentative strategies to vindicate vivisection that seem to reflect both developments in science and society. Depending on whether he addresses other members of science or a non-scientific audience, Etherington applies the concepts of pain, sensibility and the human-animal analogy in different ways, thus showing the multifaceted uses of them.

Pain, for instance, featured as the main unit of measuring the excitability ('sensibility') of nerves in physiological research. The transfer of experimental results onto the human body,

however, required the necessary conclusion that animals and humans alike shared the way in which pain was experienced. This might explain why the human-animal analogy was repeatedly emphasised by scientists, furnishing animals even with emotional properties to account for their ability to 'feel' pain. The debate on analogy within science seem to reflect the rising anthropomorphism within society in which animals were equally furnished with intellectual and emotional traits. This raises the question to which degree popular and scientific debates might have influenced one another.

The concept of 'sensibility' is of an equally interesting nature. The overlapping meanings of the term – representing a keyword within physiological research (physical sensibility), as well as a keyword of humanitarian concerns at the time (moral sensibility) – evidently posed some terminology problems for physiologists. The struggle over its meaning exemplifies the fact that scientists tried to rid themselves of any metaphysical intrusion into their domains. This might be regarded as one discursive symptom of a growing gap between scientific thought and sentiment within society which would eventually be turned into a 'Great Controversy' at the end of the century.

Holly Ennis (University of Manchester)

The Lungs in Health and Disease: knowledge about the lungs within British society c1900 to 1960

Lung disease was prevalent during this period of British history with high mortality and morbidity rates. Attempts to prevent or treat respiratory complaints were an everyday preoccupation for many and, increasingly, for medical and public health practitioners. This paper concerns my attempts to examine the existence of different bodies of knowledge about the lungs, and of lung health and disease, within British society. It studies the changing medical response to this part of the body, and the relationship between medical ideas and often well established popular beliefs and practices. It also traces debates about the maintenance or achievement of healthy lungs, and what factors were regarded as harmful. By looking at how the lungs have been understood, portrayed and approached, I hope to show that many different ideas about the lungs were held and that these were bound up with the social, political and cultural context of the day. My approach has been to examine different groups within the medical profession and the public health service as well as sources of popular health advice and activities within the home and community in an attempt to construct a history of the lungs during this period.

Heloise Finch (University of Michigan)

It's like a child you see being born: technological environments of national progress in Reunion Island

How do ideologies such as democracy, nationality and progress transform natural and built environments over time? How are such ideas themselves transformed by environments? In an era where some anthropologists have claimed that state authority is increasingly fractured and is no longer strongly attached to ideologies of nation how has the power of the nation-state been emplaced and located by the populations of Réunion

Island and how have local spatial practices influenced this process?

My paper is an overview of a dissertation chapter: A 1600-foot Omega antenna was set up on Réunion Island in the Indian Ocean from 1974 to 1999. This antenna was part of United States military infrastructure, one of eight positioned around the world and used by aircraft, ships and submarines to fix positions. The French, the British and other allied countries in the Cold War era had access to this technology. While the Réunion Island Omega antenna could be seen as indicative of the growing scope of US power, the tower was understood locally as a sign of French high technology. The Omega antenna was known as Réunion's 'Eiffel Tower'; people wept when the tower was finally taken down, few islanders ever knowing that it came from the USA. My paper investigates how the tower was used and understood differently by US strategists, local and national politicians and Réunion Islanders in the context of a larger project which analyzes the relationship between the ideologies of French national progress, democracy and nationality and the simultaneous material transformation of the environment.

Thomas Gondermann (University of Bielefeld)

Politics of Science and the Evolutionary Transformation of Racial Theories in Victorian Anthropology, 1860-1871.

In the middle of the nineteenth century, in the aftermath of Charles Darwin's *Origin of Species*, an evolutionary interpretation of race superseded the traditional approaches to race, the theories of polygenism and monogenism. Yet, although there is no doubt about the fact that evolutionary theories of race entered the mainstream in the second half of the nineteenth century, the question how this implementation took place, remains unclear.

In my paper I will show that the transformation of the natural sciences by evolutionary theory did not simply induce corresponding changes in theories on race. Evolutionary theories of race did not echo a discursive dominance of the concept of evolution. Rather, I shall argue that the evolutionary turn of race-theories was actively conducted by possibly the most influential pressure-group in Victorian sciences: the X-Club.

The X-Club, founded in the early 1860s, was an exclusive coterie, the majority of its only nine members were friends of Darwin and their aim was the professionalization of sciences, to undermine the so called Oxbridge supremacy and the establishment of the theory of evolution. However, some X-Club-members also campaigned in controversies on issues of race-theories. They launched debates on the zoological classification of man, on his natural-historical genesis, on the development of culture and social structures and introduced an evolutionary view in the science of humankind in the 1860s. Their campaigns culminated in their intervention in a controversy between two rival anthropological societies in London, the polygenistic Anthropological Society and the monogenistic Ethnological Society. The X-Club-members took over the ruling positions of the Ethnological Society. From an evolutionary perspective, they argued against polygenism as well as against monogenism and, after several years, managed to unite the two societies in the Anthropological Institute which worked for many decades on an evolutionary agenda.

My paper discusses the role of the X-Club in the controversy between the Anthropological Society and the Ethnological Society and emphasises the element of active political debates in the transformation of scientific knowledge. I will analyse the convergence of several scientific and political discourses in that controversy and demonstrate that the transformation of traditional theories on race into evolutionary theories on race has been propelled by concrete social and political processes.

Jennifer Gray (University of Durham)

Observed and predicted planetary phenomena in Late Babylonian astronomical texts

Astronomers in Mesopotamia in the Late Babylonian Period (approx. 750BC-1AD) made nightly observations of planetary and lunar phenomena. The observations were used to develop methods for predicting future occurrences of the same phenomena by identifying periods over which the phenomena occur on roughly the same date in the Babylonian calendar. However, the methods of making these predictions are not explained in any Babylonian source.

In this talk I will describe the contents of the different types of Babylonian astronomical text that contain observations and predictions. Through a comparison of records of the distances of the planets from stars given in the various texts I will investigate the relationship between the different groups of texts. This analysis provides important information about how the predictions were made, contributing to our understanding of the Babylonian computational procedures and more generally of the relationship between observation and theory in Babylonian astronomy.

Stine Grumsen (University of Aarhus)

Science and Rhetoric - PR strategies of religious movements

This paper will give examples of the frequent use of scientific language, authorities and iconography in texts by Jehovah's Witnesses and Scientology aimed at people outside their organisations. It will raise the question why science plays such an important role in these texts and argue that the scientific terms is used to obtain legitimacy in a society where science sets the agenda.

The strategy of the religious movements is twofold: On the one hand they wish to place themselves in opposition to science and on the other hand they use science to legitimize themselves. The use of scientific terms in non-scientific environments such as advertisements and religious PR undermines the credibility of the scientific vocabulary in public understanding by broadening the conceptual meaning of the scientific vocabulary. Science then becomes a question of conviction and belief and loses what I will define as obvious legitimacy. When the authority of the scientific vocabulary is thus undermined, it seems likely that the value of the scientific terms as legitimizing factors is lessened. However this appears not to be the case. On the contrary, the religious movements are using a dual strategy: On the one hand they are legitimizing themselves through the use of scientific vocabulary, whereby it is undermined, and on the other hand they take advantage of the consequence that science loses obvious legitimacy, to promote their own explanations on scientific subjects and on how science is defined.

The paper is based on a study of the Danish magazine *Another World* published by Scientology and the books *Bibelen – Guds ord eller menneskers?* (also available in the English edition *The Bible – God's Word or Man's*) and *Findes der en skaber som interesserer sig for os?* (also available in the English edition *Is there a creator who cares about you?*) both published by Jehovah's Witnesses.

The methodology is inspired by the complexity thesis of John Hedley Brooke and Geoffrey Cantor, Quentin Skinner's concept of how a rational player uses speech acts to legitimize his agenda and Merete Onsberg and Charlotte Jørgensen's theory of argumentation.

Kseniya Hatal'skaya (Polish Academy of Sciences, Warsaw)

The rise and development of suicidology in the Russia Empire and Soviet Union in 1820 – 1920s.

Russian suicidology has been traversed a difficult but extremely interesting path within the centenary period from the 1820s to 1920s. After having got into the sphere of scientific interests in the very beginning of the 1820s, suicide became a popular object of research for medics, psychologists, sociologists, jurists, pedagogues and other specialists in the end of the 19th – beginning of the 20th centuries. Within this period, suicide had been recognized as one of the most important problems of public health; its scales had been considered as epidemical in the Russian Empire. Suicide became a popular theme for scientific and public discussions. The period under review is characterized by sober and multifaceted approach in studying the nature and reasons for committing suicide; a number of different opinions aiming to understand and interpret this phenomenon occurred. Russian suicidology was developing according to the international tendencies, but, at the same time, it remained to be unique in many aspects. The 1917 revolution and further global ideologization of science changed the orientation of suicide research in Russia. Suicidology of 1920s was forced to perform the political order of the Soviet authorities. Within the scopes of the Soviet ideology, suicide was considered as a temporal remnant of the bourgeois past; it was believed to have completely disappeared as a phenomenon in itself when the new society is built. The Soviet system changed the technique and improved the registration of suicidal cases. However, the large-scale studies of the mid-1920s witnessed that, contrary to the initial hopes, the quantity of suicides in the USSR increased and became higher than in the Russian Empire. The growth in the number of suicides was particularly related to the forced collectivization which broke the traditional peasant way of life and introduced new forms of collective house-keeping with negligence of private property rights). Since the statistical data gained about suicidal cases did not comply with the Soviet conception of suicide and indicated that the declarations of the Soviet authorities on unconditional improvement of life in the USSR did not correspond to the reality, all the studies of the phenomenon of suicide were turned down and became closed for the public in the very end of the 1920s. Soviet suicidology stopped its existence for 50 years until the 1980s and all the information about suicides in the USSR became secret and available to NKVD (later - KGB) service only. However, the achievements of Russian suicidology for the centenary period remain to be in many aspects interesting nowadays. They well illustrate not only the development of the science itself, but the evolvement of the whole social organism within the period under review.

Juan He (Imperial College, London)

Two Representations in One Failed Framework: the Chinese Nomenclatures for Inorganic Compounds of the Educational Association of China and DU Yaquan

In the early 20th century, the Educational Association of China, an organization of foreign missionaries, and DU Yaquan, a Chinese scholar, proposed Chinese nomenclatures for inorganic compounds successively. Generic names and some qualitative prefixes were established in both nomenclatures, but there were differences. The generic names of the former utilized Chinese traditional names, as was the case with the latter, but the latter established more generic names. The meanings of the Chinese generic names and their western ones did not always correspond, but more often overlapped, as a result of the interaction between Chinese language and western chemical terms. Since the Chinese prefixes of the former were corresponding to the qualitative affixes of Western chemical names, its nomenclature could not avoid copying the confusion and pitfalls of western names of the time, and hence failed to convey the exact information of the composition of a compound. The latter improved on the former, and established Chinese prefixes that strictly correspond with the valences of elements. Though these prefixes were equally qualitative, one could write correct formulas according to the nomenclature if he gets some basic chemical knowledge about periodic table of the elements. Therefore the nomenclature of the latter could reflect the composition of a compound in an indirect way. It is concluded that, Chinese and western cultures and languages as well as other complicated factors exerted different influences on the Educational Association of China and DU Yaquan that were located in different cultural backgrounds, and hence shaped their different nomenclatures.

Hans Henrik Hjermitsev (University of Aarhus)

Anti-Darwinism in Denmark around 1900 – The Case of the Grundtvigians

Since the introduction of Darwin's theory of evolution in the 1860s, the ideology of naturalism played a central role in the cultural struggles in Denmark. One of the major groups in these debates concerning science, education, enlightenment and religion, the Grundtvigians – the followers of the theologian and educational philosopher N.F.S. Grundtvig (1783-1872) – attacked a naturalistic conception of man maintaining an idealistic and Christian world view. This paper will examine how Grundtvigian writers criticised Darwinism in periodicals and pamphlets, and how they around 1900 accepted the general theory of evolution without endorsing the ideology of naturalism. Moreover, the paper will focus on how the Grundtvigians applied in their argument the scientific critique of Darwinism raised by leading biologists, which was particular strong in the beginning of the 20th century.

Methodologically, Peter J. Bowler's and Ronald L. Numbers' works on Anti-Darwinism and Creationism will function as guidelines. The paper will also engage in the historiography of science and religion by embracing the complexity thesis advocated by John Brooke and Geoffrey Cantor. Finally, the approach is inspired by the SciPer Project at the universities of Leeds and Sheffield and Jonathan Topham's historiography of popular science.

Annie Jamieson (University of Leeds)

An intolerable affliction: Lupus vulgaris in *Fin-de-Siècle* Britain

“[Lupus] *has wrought irreparable destruction on the parts attacked, leaving hideous scars, obliterated passages, and deformed limbs, which would render life all but intolerable for most people.*” (Malcolm Morris. *Diseases of the Skin: An Outline of the Principles and Practice of Dermatology*. London; Paris; New York; Melbourne: Cassell and Company Limited, 1898.)

The term lupus has a long history, being used since the 15th century to refer to various erosive skin conditions which eat away the skin and flesh in the manner of a wolf. Today, we are more familiar with lupus as a systemic autoimmune disease. However, in the nineteenth century, the term lupus, particularly lupus vulgaris, was used to describe cutaneous tuberculosis. This condition, although very rare in the West today, was common in *fin-de-siècle* Britain, where it stimulated a great deal of concern, both public and medical. Lupus sufferers were often severely disfigured and subject to the accompanying social implications. Many were unable to work, or even reluctant to leave their homes, and, because of the similarity with the symptoms of syphilis, often subject to moral censure.

In the medical realm, as well as stimulating vigorous pursuit of effective treatments, lupus vulgaris played a role in discussions of nosology and disease theories and in the understanding the tuberculous disease process, via the use of tuberculin as a treatment.

Lupus also played a role in the introduction of new technologies into the medical arena. It will be shown that, in some cases, treatment of lupus was an important factor in the acquisition of X-ray apparatus, that there was a significant relationship between X-rays and another therapeutic technology, invented specifically to treat lupus, the Finsen lamp and that this relationship may help to elucidate the role of technological innovation in medicine.

This paper will examine the relationship between the disease, its victims and their physicians and will demonstrate that an understanding of the contemporary perception of lupus can give important insights into late-19th century attitudes to disease and treatments.

Despite all of this, and despite the widespread historical interest in pulmonary tuberculosis, the cutaneous form has previously been overlooked by historians of medicine and the paper will attempt to explain why this should be the case.

Gry Vissing Jensen (University of Aarhus)

The art of imitating nature – Alchemy as the mediator between man and godgiven nature before the scientific revolution

The alchemist is usually portrayed as a ‘proto-scientist’, an early chemist, working rationally and methodically in the lab, or a ‘pseudo-scientist’, a non-scientist, using non-scientific and esoteric methods to find the Elixir of life. These anachronistic approaches are inadequate and simplifying. As recent research has shown, the role of alchemy in the history of science has to be redefined.

This paper will argue that the alchemist, who in his alchemical praxis believed he was imitating the processes of nature, understood these processes within the framework of the Medieval and Renaissance world picture. He believed that nature was created by God and that insights into the processes of nature would provide him with insights into the laws of nature, as the

alchemical processes corresponded with the processes of nature. Alchemy thereby served as a mediator between man and godgiven nature, offering insights into the workings of nature and showing the splendour of God's creation. This is shown through an analysis of the alchemical writings of Roger Bacon (1214-1290) and John Dee (1527-1608). Finally the paper will discuss which effect the scientific revolution had on the alchemical writings.

Methodologically this paper will take its starting point from the distinction between nature and art as described by William Newman in his book *Promethean Ambitions*, but it will also draw insights from readings of David C. Lindberg, Betty J.T. Dobbs and Allen Debus. All of the aforementioned has contributed to a new understanding of alchemy in the historiography of alchemy, writing in a contextualistic tradition, and focusing on the crucial relationship between religion and science in the history of alchemy.

Ryan M. Johnson (Oxford University)

European cloth and indigenous skin: clothing material and British ideas of medicine and hygiene in warm climates, 1870-1914

Discussions of tropical clothing in medical textbooks and manuals between 1870 and 1914 focused on the best type of material to maintain equilibrium of physiological functions, and later, protection from the photochemical effects of the sun. In both cases the skin and practice of local inhabitants was the source of much inspiration. Historians have portrayed wool as the hegemonic material of choice for such clothing, but considerable debate existed over the best type of clothing material. This paper argues that such debates over tropical clothing material reflect the great local variation encountered in the tropical colonies. By the late nineteenth century the tropics were generally portrayed as uniformly dangerous and diseased, however, the history of tropical clothing suggests this was neither universally accepted, nor dominate in Britain. Rather than contributing to a view that British tropical medicine and hygiene was transformed into a stable metropolitan discourse in the maintenance of a 'new' imperialism, tropical clothing reflects the tension and uncertainty it created and encountered.

Tropical clothing also informs us about how British travellers perceived themselves in tropical climates. Historians have tended to over-emphasise the fact that clothing worn in the tropics served the purpose of maintaining strict separations between coloniser and colonised—identifying and legitimating the rule of a few over many. Rather than maintaining a strict boundary, tropical clothing helped create identities that were neither distinctly British, nor indigenous. When adorned in clothing designed to mimic indigenous skin, while blending the sartorial effects of metropolitan gentleman and colonial explorer, the wearer assumed an identity that at once separated and connected them with Britain and the tropical colonies. Rather than simply reinforcing British values, civility and class, clothing worn in the tropics helped create a unique identity vastly different than when located in the 'safe' and 'civil' climates of Britain. Wearing cloth believed to provide benefits nature had bestowed naturally upon indigenous inhabitants reminded white Britons of the drastically different environment they found themselves in, and rather than simply reinforcing and upholding their Britishness, tropical clothing reflected how far away they were from it.

Melanie Keene (Cambridge University)

'Bangs and stinks and colour-changes': Making senses with Ede's 'Youth's Laboratory' in 1837

Bang! As generations of singed parental eyebrows can attest, if you put together a youth and a laboratory, you often get an explosive result. Part of a PhD project exploring the sensory experiences of elementary education, this paper will be an investigation of that pre-eminently smelly, noisy, messy, colourful, and dextrous of disciplines: chemistry. I will analyse Robert Best Ede's 'Youth's Laboratory' (c.1836-1845) as an object lesson in the practical ways in which early Victorian children learnt about the sciences. I will ask how those using a home chemical cabinet for the first time could make sense of their set, looking at its contents alongside the dedicated literary guide to performing its experiments, John Ward's 'Footsteps to Experimental Chemistry' (1837). I will argue that Ward's prose was self-consciously an experiment itself, an evaporative procedure reducing language to minimal but sufficient instructions. This process, however, often effaced the bodily engagement involved in doing experiments, replacing complex practices with singular imperatives.

I will therefore attempt to read through the text to demonstrate how the laboratories could be used to make senses themselves: users trained their abilities of touching, tasting, and smelling, through chemical manipulation and combination, developing 'sensuous technologies'. Other types of sensory connections can be traced, from the common aim to inculcate a 'taste' for knowledge to more advanced techniques of using blowpipes. Moreover, Ede's laboratories were closely linked to the production of smells: they were sold alongside his perfumed products, the patented 'Odiferous Compound' and renowned 'Hedyosmia', and advertised with a shared language of elegance, refinement, and boudoirs.

I hope to conclude with some reflections on how to study texts and objects in the history of science, arguing that a box, a book, and an historian, just like Ede's 'Laboratory', 'Footsteps to Experimental Chemistry', and an eager, active, and imaginative child, can prove a potent combination.

Thomas Lean (University of Manchester)

'Consumerising' the Computer

The history of the computer is often seen as a relentless tale of technological progression. With so much attention paid to what is new, it sometimes seems that the cutting edge of computer technology is all that matters. But the story of the personal microcomputer cannot be considered merely as a series of technological advances.

The first personal computers of the 1970's were so far from the cutting edge of technology that only attention to the social and cultural issues that surrounded them adequately explains their birth. Most accounts present the first few years of the personal microcomputer as an example of social shaping, leading to the creation of a 'consumer electronic.' However, they either end the story there, or view its maturing into the Windows PC as a result of "improved technology" and little else.

In this paper I shall put forward a view of personal microcomputer development over the 1980's as due to the continued 'consumerisation' of the microcomputer. I will suggest how technological innovations like the graphical user interface, the business vision of consumer

electronics companies, and customer choice and retail practices, combined to repackage computers into blacker, more user friendly, boxes than before. Through attention to sources from the wider sphere of home computing, including magazines, advertising and user experiences, as well the machines and software themselves, I will present an analysis of how the microcomputer changed over the 1980s.

Through this process the computer in the home gradually evolved from an overtly complex gadget, over which the user could exercise complete control, to a user friendly appliance, whose complexities were hidden beneath increasing layers of software and plastic. This change in the microcomputer's form had wider consequences in use, mediation and representation. This altered the 1980's 'micro scene', a culture of computer literacy and DIY, to the simplified 'plug and play' computer consumption of the 1990's and today.

Svenja Matusall (Durham University)

Neurones, Parents and Children

Brain scientists claim that chemical – neuronal – processes are the foundation of all thinking, feeling and acting. In this perspective the brain becomes the control centre of the human self.

From this viewpoint on the one hand the individual becomes an appendage to his or her own neurones, on the other hand is he or she challenged by popularised brain science to understand him- or herself as active user of his or her neuronal potential. The individual should intentionally use his or her brain and train it. It has to act permanently in the contradiction of disempowerment on the one side and the demand to activate, form oneself on the other side.

The increasing diagnoses of attention deficit hyperactivity disorder (ADHD) – this is the neurological redefinition of fidgety and/or unruly children – show the impact of brain science in education and pedagogy: the reasons for their impulsive behaviour, their unconventional acting, as well as they want and wish become unimportant. Other possible impacts that might cause the troubles are not considered at all. Experts like psychologists, teachers or consultants explain desperate parents the actions of their unruly children as results of invisible, chemical processes. This perspective allows it to think of the children's troubles as a problem of conduct or control. Current parental guide books teach to see children in a particular focus: they have a neurological defect. Hence parents should design their education in a way that it normalises and optimises their children's neurological potential. They should train themselves as experts in the management and conduct of their children.

The discourse of ADHD is part of a historically new concept of the self and the body: the self is determined by its neuronal networks but is at the same time responsible for its success and has the duty to succeed.

Katariina Mauranen (Imperial College London)

Maritime history in the Science Museum: Dockyard technology in eighteenth and early nineteenth century England.

The Science Museum houses a large maritime collection, part of which is currently displayed in a rather dated exhibition in the shipping gallery. This collection is the focus of my study, which

aims to explore ways to present academic research to the museum-going public, and to raise questions about the role of maritime history in a non-maritime museum environment.

It may not seem immediately obvious why the Science Museum should have a maritime history collection. Maritime history is often seen as the history of sea battles, sailors and ships, dividing the maritime world from land. A case study on dockyard communities in the late 18th and early 19th centuries will demonstrate that not all maritime history happens at sea. The main focus is on employment patterns and the wider effect of technological change on the community. The case study will form the basis for a museum display intended for the shipping gallery, emphasising the importance of technology in maritime history.

As one of the aims of my study is to present recent historiography to the public through museum displays, the case study is based mainly on secondary sources. However, some primary research will also be necessary. The aim is to cover both naval and commercial shipbuilding by examining the naval dockyard in Portsmouth and a small number of private yards in London. The government funded naval dockyards were part of a large organisation with central administration, whereas the private industry was dominated by small builders. This is reflected in the availability of sources for this period.

In this paper I will argue that the Science Museum's shipping gallery could be an ideal place to display the technological sides of seafaring, less often seen in other museums. I will also highlight the human side of shipbuilding, and argue this should be more visible in both research and museums.

Anna-K. Mayer (Bath University)

Eleven more: the new project of the National Cataloguing Unit for the Archives of Contemporary Scientists in Bath

The NCUACS has processed the papers of eminent 20th-century British scientists for over thirty years. Recently, the Unit has acquired funding from the Arts and Humanities Research Council to process the archives of eleven major physicists and mathematicians, among them refugee scholars (such as Nicholas Kurti, Herbert Froehlich and his brother Albrecht) and a number of women scientists (including Kathleen Lonsdale). Work on the radio astronomer R. Hanbury Brown (allegedly the original 'boffin') and Bertha Swirles - Lady Jeffreys - has already started. This presentation will introduce graduate students to the NCUACS, its operating procedures and its new AHRC project.

Daniel Mitchell (University of Oxford)

Charging Batteries: Gabriel Lippmann, Electrocapillarity and the Style of French Physics

Gabriel Lippmann's (1845-1921) work on electrocapillarity – the study of the variation in surface tension of two liquids in contact with the difference in electric potential between them – was regarded by his French contemporaries as a masterstroke, the equal to his Nobel-prize winning research into colour photography.

Based on his research Lippmann invented the capillary electrometer, a device sensitive to differences of potential of the order of one ten-thousandth of a volt. It was employed in the

same laboratory where Lippmann worked, the laboratoire de recherche at the Sorbonne, by some of France's top physicists, such as Edmond Bouty (1846-1922), Georges Gouy (1854-1926), Henri Pellat (1850-1909) and René Blondlot (of N-Ray fame, 1849-1930) to shed new light on old questions relating to the source of electromotive force in batteries. By studying its development, and then its use in these contexts, I present some initial findings on the progress of a major French research tradition.

My research on Lippmann and his colleagues at the Sorbonne, drawing upon the content of original papers, textbooks and review articles, is part of a wider attempt to understand the distinctive style of French physics during the period c.1870-1900. The notion of style incorporates the aims, practices and products of research. These are embodied in a single, entwined community of physicists in Paris sharing common educational roots.

My particular focus is on physicists who were highly respected by their contemporaries but who are now either obscure or disregarded. Lippmann's work on electrocapillarity perfectly exemplifies an experimental methodology committed to the search for covering laws through precise measurement; a style on which access to the top teaching positions and election to the Académie des Sciences partly depended. The recognition and explicit formulation of a French style of physics will permit the first comprehensive assessment of French physics, in terms of institutions, laboratories, people, courses and research, at the end of the nineteenth century according to its own criteria. This approach should allow a reappraisal of French physics at the end of the nineteenth century in an international context.

Madeleine Morgan (Exeter University)

William Acton on Prostitution: Social Nuisance or Social Necessity?

It is only within recent historiography of nineteenth century British prostitution and venereal disease that there has been a call for a reassessment of the impact of William Acton. Acton has been criticised as a quack by some historians and by others viewed as a critical player in the regulation and restriction of women's sexuality. Recent studies suggest that Acton is neither, but that he needs to be re-contextualised in medical literature on prostitution and venereal disease of the mid nineteenth century. This paper will demonstrate that Acton's work fits neatly into the genre of medical texts dealing with prostitution published before and directly after the passing of the first Contagious Diseases Act in 1864, focusing not only on Acton's publications on prostitution but also those by various French and British physicians including Parent-Duchatelet, Ryan, Tait, Miller plus contributions to the Select Committee on the Contagious Diseases Acts.. His work represents a shift in mid-nineteenth century British literature on prostitution, moving away from the influence of the evangelical commentators to a more sophisticated medical examination of women informed by physicians' own experiences with prostitutes in Britain and in Europe.

My thesis seeks to re-contextualise Acton's influence on the development of the understanding on venereal disease and sexuality between 1830 - 1870. In particular I have focused upon the new discoveries about gonorrhoea and syphilis in the 1830's and 1840's, Acton's work on spermatorrhoea and the panic over masturbation and the medical justifications for the Contagious Diseases Acts.

Hannah Newton (University of Exeter)

Children and Parents' Emotional Responses to Illness in England,

1550-1700

My MA dissertation and PhD are on the subject of sick children and the concept of paediatrics in England, 1550 to 1700. The contemporary diarist, Simonds D'Ewes, reveals why this subject is important: 'there scarce lives any man but hath escaped sickness and danger in his infancy'. The ubiquity of sick children is suggested by the fact that some 36 to 40 percent of England's population was under the age of fifteen for the majority of the period. Additionally, historians with the exception of Margaret Pelling and Michel MacDonald have ignored children's illnesses; therefore by embarking on this research, I hope to act as pioneer and evangelist of such history.

This paper will present a section of my MA dissertation's research findings. The objective of this section was to unveil the emotional responses of children and their parents to the former's sickness. In other words, what emotions did sick children feel? Were they terrified of death and the pain of illness, or did they piously resign themselves to it? How did parents respond – were they also fearful? Did they feel guilty for provoking God's wrath in sending the sickness? How intense was their grief upon the death of their children? The research also sheds light on the emotional intensity of parent-child relationships, early modern attitudes to death and grief, and the psychological impact of providentialism on Christians.

My primary sources included some 25 diaries and autobiographies. Admittedly, these sources are imperfect because they are unrepresentative, selective, and from the perspective of adults rather than children. However, they are also uniquely rich sources, for their writers frequently provided detailed descriptions of their own childhood illnesses, and their children's. The clergyman Ralph Josselin, for example, included 136 instances of child illnesses in his diary.

It will be argued in this paper that the child's emotional experience of sickness was ambivalent: for whilst fear, guilt, sorrow and other pernicious emotions were expressed during illness, more positive feelings were sometimes also experienced, including genuine resignation and even occasionally happiness on the contemplation of heaven. Parents' feelings were less ambivalent: although they attempted to show resignation out of respect for God's will, they also felt searing and long-lasting grief following the deaths of their children. Thus the views of historians like Lawrence Stone have once again been discredited, for clearly, parent-child relations were extremely intense emotionally.

Charlotte Nicklas (University of Brighton)

Supplying the Wants of Capricious Fashion: Chemistry, language, and women's dress in mid-nineteenth century periodicals

In 1868, the *Popular Science Review* claimed that '[t]he beauty of the aniline colours and their importance as a staple manufacture render their history a matter of interest to everyone.' Significant developments in mid-nineteenth century dye chemistry, especially the creation of dyes from coal-tar aniline, had dramatically changed the palette of colours available for women's clothing. These changes had also affected the discipline and practice of chemistry, especially the growing field of organic chemistry. This paper will examine mid-nineteenth

century discussions of dye developments in both women's magazines and popular science periodicals.

Recent work on nineteenth-century periodicals has underscored the importance of considering a periodical text as a whole, not simply studying individual articles. This inclusive method of examination reveals many overlapping discussions and similarities in language in the seemingly disparate subjects of chemistry and fashion. Periodicals such as Godey's Lady's Book and Magazine, the Englishwoman's Domestic Magazine, and the Popular Science Review all contain specific references to female fashion, organic chemistry, and the importance of applied science.

Although women were frequently marginalised in scientific practice during the nineteenth century, women's magazines did not avoid science in their pages. Articles and reviews frequently referred to the uses of science for domestic duties and positioned mothers as potential science educators for their children.

The language used in nineteenth-century periodicals reveals especially significant similarities in the discussion of fashion and science. Writers on both subjects emphasised the necessity of specialised languages to communicate their precepts and, to gain full understanding, readers needed to learn these respective vocabularies. One strand of discussion which runs through both kinds of magazine is the effort to make fashion itself a science, by establishing 'laws' to follow.

Alkalies, sulphur, and aniline appear in monthly reports on dress, as explicitly-mentioned sources of new colours in dress textiles. One article in the Englishwoman's Domestic Magazine in March 1875 observes that the great variety of colours created in laboratories 'must prove thoroughly bewildering and embarrassing to the weak-minded who have not made up their minds exactly as to what they want.' Popular science magazines, in turn, acknowledged the importance of 'supplying the wants of capricious fashion' as a spur to the development of new products and processes.

Michael Rayner (University of Manchester)

Dictating Science Policy: Establishing Astrophysics at Oxford

During the interwar period the University of Oxford developed an astrophysical group under Harry Hemley Plaskett, after the death of the previous Savilian Chair of Astronomy Herbert Hall Turner. This case study plots the development of an astrophysical department at the University of Oxford demonstrating several different facets of university and national politics. In this paper I will explore why the University of Oxford decided to move away from the previous policies of the astronomy department under Turner, and deliberately seek out an astrophysicist to take his place as the professor of astronomy. This exploration will include a discussion on the clash of personalities between some of the main participants including the failed rearguard action by some of the older astronomers in defence of what they believed to be a devaluation of their work.

The case I present will show that members of the physical science community at Oxford were pushing for the establishment of astrophysics as the primary subject of study within astronomy department at the University. I will examine the motives behind the University's change in science policy, as well as the interactions between the University and the Radcliffe Observatories, and why the Radcliffe trust wished to move its Observatory away from both

Oxford and the United Kingdom. This decision by the Radcliffe Trust eventually became a conflict of interests between the Trust and University over scientific research and teaching policy. This evolved into a courtroom battle, between the influential and affluent Radcliffe Trust and the University of Oxford. This legal dispute shows the underlying politics of a university institution and sheds light onto the changing role of the astronomical observatories such as the Radcliffe Observatory, as well as how scientific policy was eventually dictated by the courts. The court case also shows the differing perspectives and values of the different institutions involved in scientific research during the interwar period that I will elaborate on by explaining the arguments presented by both sides, and attempt to explain why the Judge ruled in favour of the Radcliffe trust.

Gabrielle Robilliard (University of Warwick)

Midwives and midwifery in Early Modern Germany: Social identity, knowledge, and practice.

This project is a microhistorical study of midwives and midwifery in seventeenth and eighteenth-century Leipzig, one of the most important commercial and intellectual urban centres in the early modern German territories. I aim firstly to examine the everyday world of midwives in Leipzig from a social historical perspective by tracing social-occupational networks, looking for evidence of concrete midwifery practices, and investigating the role the midwife played in municipal life. Secondly, I will attempt to explore the epistemological world of midwives with regards to ideas about pregnancy, childbirth, and the parturient female body in Leipzig. My analysis is based on the substantial collection of criminal court cases involving midwives, which provide a particularly rich source, and municipal council records present in the communal archive in Leipzig, as well as Saxon state records relating to midwives and midwifery in Leipzig present in the Saxon State Archive in Dresden. The time frame chosen is premised on the idea that the late seventeenth and in particular the eighteenth centuries constituted a period of significant change to both the social and the epistemological world of the midwife as the ferment of new ideas about knowledge and how knowledge was to be derived based on programmes of experiment gradually (however messy and incomplete the process was) replaced an understanding of the world governed by the analogy and similitude of the macro/micro cosmos. Whilst the introduction of the lying-in hospital and the establishment of midwifery schools has received a good deal of attention as the point of rupture in the history of midwifery and new ways of organising midwifery, I intend to examine other areas of midwifery in Leipzig (e.g. new training or appointment strategies, religious duties, or the revised legal function of midwives as court experts) that were already undergoing change prior to the late eighteenth and early nineteenth century. Leipzig provides good material for a study of how such changes affected midwifery in a city that stood at the centre of intellectual activity, in particular in both medicine and law, prior to clinical institutionalisation (1810 in Leipzig), and permits me to test how midwifery in Leipzig fits into the broader Foucauldian historical narrative of medicine.

Melanie Sapsford (Cranfield University)

The Use of Sodium Salts in Ancient Egypt

Ancient Egyptian society made wide use of salt and natron from evaporitic lakes in a variety of industries ranging from medicine and mummification to glass manufacture. A number of sites where sodium salts were extracted in antiquity have been proposed but, few studies have been initiated into the chemical composition of the sodium salts in these locations. The work being conducted at Cranfield University aims to assess how the sodium salts were used, utilising chemical analysis as well as iconographic and documentary evidence. X-Ray Diffraction analysis is being conducted on samples from the Wadi Natrun, believed to be the largest source of sodium salts in Egypt. The results will be used to enable us to understand how changes in man's exploitation of lakes have fundamentally altered their composition and vice versa. This exploitation has often been overlooked in commentaries on Egyptian materials and industries, and it is hoped that this paper will present new work, examining the function of these sodium salt deposits and will also assess the way they were used in Egyptian society.

Eleanor Sheppard (University of Oxford)

Calendar reform in sixteenth century Florence.

In sixteenth century Italy, alongside those mathematicians who debated and developed their theories in the Renaissance universities, a perhaps larger body of "practical mathematicians" was to be found mostly outside the universities. This body included the civil and military architects who built the great Palazzi and Fortresses, the engineers working for the Papal court, the Venetian Republic or the Dukes of Tuscany, Urbino or Milan, the painters and sculptors perfecting the ancient art of perspective, and the astronomers, astrologers and instrument makers who measured the heavens, hoping to perfect or replace Ptolemy's cosmos, who used the movements of the heavens to predict good fortune and bad, or provided the church with the observations needed to regulate the religious and civic calendars. In my thesis, I will be looking at a number of practical mathematics working for the Medici court during the later sixteenth century, and hope to show how these different activities fit into the career of the sixteenth century Florentine mathematician. In this paper, I would like to single out two of these men, who were involved in projects of calendar reform. The first is Egnatio Danti, Ducal cosmographer to Cosimo I de' Medici, the first Grand Duke of Tuscany, who, along side his other duties at court, built several large astronomical instruments with which to measure the length of the solar year, and which can still be seen in their original setting in Florence. I will outline here their astronomical function, as well as the function they played in Danti's career as a professional cosmographer. The second man I will look at is Antonio Lupicini, Grand Ducal engineer to Cosimo's son, Francesco I. Lupicini's career as an engineer was very different to Danti's, but alongside various publications on military architecture and hydrology, we find a short treatise on Gregory XIII's proposed calendar reform. Though Lupicini's time was taken up with engineering projects commissioned by Francesco, his mathematical interests appear to have been much wider, coinciding in many respects with those of the Ducal cosmographer.

Melissa Smith (University of Manchester)

Nuclear Spin: The Government, the Media and the Public in Cold War Britain

In the late 1940s, in response to the emerging threat of a nuclear attack on Britain, the British government initiated a new civil defence programme. The programme differed little from the measures which had been used to defend against the conventional explosives of the Second World War, and adapted little when the threat of the new, much more powerful hydrogen bomb emerged in the early 1950s.

To “educate” the British public about the nuclear threat, the Home Office issued civil defence pamphlets which cheerfully offered advice on how to decontaminate radioactive clothes and discussed the difficulties of using a vacuum cleaner to clear up fallout. Meanwhile, the government’s insistence on exercising strict control over the public presentation of the bomb ensured that the population had little access to other sources of information about nuclear weapons.

But behind the scenes at Whitehall, officials were under no illusions about the reality of a nuclear attack and what it would mean for the British population. In 1954-5, a committee of civil servants produced a highly secret report – known as the Strath Report – which painted a detailed picture of the effects of a nuclear attack on Britain. The vision of post-nuclear Britain contained in the report was grim, with projections of millions dead, huge swathes of land uninhabitable for weeks or months, and a breakdown of law and order. Without an extensive re-think of existing civil defence measures, the report warned, the country could not hope to survive.

This paper will examine the contrast between this bleak account of nuclear war and the “official story” of nuclear war as presented to the British public. I will argue that civil defence, ostensibly a way of protecting the British population, in fact came to be used more as a government propaganda tool to maintain the legitimacy of British nuclear policy in the eyes of the public. I will also offer suggestions as to why the government decided to suppress information about the potential effects of the hydrogen bomb – despite recommendations to the contrary by the Strath committee – and examine the implications of this for the relationship between citizen and the state in the thermonuclear age.

Neil Tarrant (Imperial College London)

“The true philosopher’s country is all the world”’: Giordano Bruno on the role of the philosopher

Since the nineteenth century Giordano Bruno has been tagged with various categories, hermeticist, scientist, philosopher and heretic. In this paper I aim to establish Bruno’s own perception of his social role, and what he considered to be the purpose of his intellectual activity. I consider this question in the context of recent work on structure of knowledge in early modern Europe. Following the lead of Robert Westman and Andrew Cunningham, many historians of science have become increasingly sensitive to the nature of early modern academic disciplines. In particular they have explored the identity of natural philosophy and its relationship to other disciplines like mathematics and theology. The main impulse behind these efforts has been the desire to avoid importing anachronistic conceptions of modern science into the discussion of contemporary discourse about the natural world. By examining Bruno’s conception of the role of philosopher I aim to situate him on the contemporary social

map without imposing anachronistic or inappropriate categories. I also argue that the complex social and intellectual identity articulated by Bruno in his written works, and during the course of his trial, ruptured the contemporary ordering of the disciplines. Even setting aside his most glaringly heterodox statements, I suggest that these disciplinary transgressions would have been sufficient to arouse the suspicions of the theological authorities.

Suzanne Taylor (London School of Hygiene & Tropical Medicine)

Medicalising Cannabis: Science, Medicine and Policy 1950-2003.

Cannabis has been the subject of much policy and media attention in the last few years and the recent legal changes under the Misuse of Drugs Act in the UK have been widely, although incorrectly, presented as liberalisation or legalisation of the drug. Contemporary debates over cannabis' value both as a medicine and a threat as an illegal drug reflect a long and often controversial history. Historiography on the contemporary history of therapeutic cannabis is limited and this project aims to analyse how the status of cannabis began to change. Framed as a history of science and policy-making, the project aims to study the process whereby boundaries shift between an illicit 'drug' and a licit 'medicine' and the issues and interests which are involved in that transaction.

The objectives are to:

1. Analyse the trajectory of cannabis research since the 1960s.
2. Analyse the interests involved, in particular, the role of scientific research; industry; drug technology; and user activism.
3. Analyse the interaction of science and medicine with policy, through the examination of the policy role of expert committees and their membership.
4. Assess the impact of medicalisation on the policy environment.

Research themes include: the role of scientific research, encompassing the importance of different professional communities; the role of lay knowledge, especially within the MS community; the role of scientific and policy transfer in which the role of professional organisations and expert committees such as the 1997 House of Lords Science and Technology Committee will be considered. The project has an international dimension examining the impact of international agencies (WHO/INCB) and international policy exchange.

The methods used are standard historical ones, involving the assessment of research questions against a range of source materials. A wide variety of written and unpublished sources will be utilised including the papers of Sir William Paton at the Wellcome Trust Library and minutes of the Advisory Council on the Misuse of Drugs at the National Archives. Semi-structured oral history interviews will be carried out with key scientific, industry and policy participants.

Louise Thorn (Imperial College London)

History on display: Selecting and presenting topics about trust in science for a museum setting

In this paper I would like to review and summarise the historical and sociological literature on trust in science and present possible scenarios of how this topic can be presented within a museum setting. This is part of my overall thesis on how themes from the academic scholarship in the history of science can be selected, interpreted and displayed to a public audience.

In the first section I will consider the nature of trust between scientists, ranging from the gentlemanly code of honour between natural philosophers in the seventeenth century (Shapin and Schaffer 1985; Shapin 1994), to the importance of 'cycles of credit' based on educational achievements (Latour and Woolgar 1979) and the realities of replication (Collins 1985). Over the past 25 years there has also been a growing interest in the nature of scientific fraud (Broad and Wade 1982) and the integrity of the peer review process (Chubin and Hackett 1990), both within the historical and current science literature.

In the second section I will shift in focus towards public trust of scientists. The historical examples of Robert Boyle and Michael Faraday demonstrate that the practice of scientists explaining their work to a public audience is not new. However, in recent decades, this industry of 'science communication' has been formalised with the creation of dedicated postgraduate courses and professional associations. Creating engagement and dialogue between scientists and the public is now a priority for many research institutions and government consultations but does this have any real impact on levels of trust? I will outline some of the literature that seeks to answer this question.

Finally, I would like to present some possible case studies from this review that could be developed and interpreted with relevant artefacts as part of a museum display.

Aashish Velkar (London School of Economics and Political Science)

Standardizing Quantity: Markets and Metrology in the 19th century

This paper explores how ambiguous, variable measures were replaced by uniform, standardized measurements in commercial transactions. For example, the Carysfort Committee, reporting to the Parliament in 1759 on the weights and measures in Britain, had remarked that the most reliable way of measuring dry goods was by weight. Yet it would be another seventy years before dry goods began to be sold by weight, and not volume or heaped measure. I present such changes to occur as a result of changing transparency mechanisms from older institutional forms that had evolved in medieval markets. I argue that standardizing measurements, and hence quantity, eliminated the necessity to continue with institutional forms of ensuring transparency, such as the public measurement systems. In France the variable weights and measures of the *ancien régime* were replaced by the uniform and unambiguous metric measures often through direct and coercive state action. The manner in which this transition occurred in Britain remains largely unexplored.

I explore this issue using the case of the London coal trade c1830. Using various primary sources - including the archives of the Corporation of London, evidence from various parliamentary committees between 1800 and 1830, and letters to *The Times* in London - I demonstrate how the system of public measurement, operating since the fourteenth century, was replaced by the Imperial measures to ensure delivery of standardized quantities. Switching standards was a complex and negotiated process, involving several distinct social groups exercising different degrees of political power. Furthermore, I argue that the measurement

standards were embedded in an 'institutional package' of artefacts, customary practices, and regulations and that switching standards involved not only changing the measurement artefact, but also making changes to the rest of the package. In other words, quantities became standardized once heaped measurements were made redundant, weight measures were substituted for customary volumetric measures for measuring dry goods, and the public metage system was abolished. The moral economy of variable measurements was transformed into a modern economy of standardized measurements involving a greater degree of quantification.

Leucha Vencer (University of Leeds)

Mineral History and Practical Geology: Changing aims and conflicts in the Geological Society of London, 1807-1815

Accounts of the interests and activities of the Geological Society of London (GSL) often consider the Society as a ready-formed scientific body, uninterested in practical geology and focused on fieldwork and gentlemanly debate. However, the formative years of the Society's development were fraught with internal and external conflict. The Society's struggle for independence from the Royal Society and the difficulties the founders faced in establishing their authority in the relatively new field of geology are well-documented, particularly in Martin Rudwick's 'The foundation of the Geological Society of London'. It is also generally agreed that, in its formative years at least, the new Society as a body wished to escape the grand theoretical speculations regarding earth history and concentrate solely on geological fact-gathering, although different members took individual stances within their own fieldwork and publications.

However, less attention has been focused on the early debates between members regarding the methods and motives that the Society should adopt to advance the science. In this paper I wish to examine two major points of debate between different sub-groups of members, drawing on David Miller's identification of these two groups. Firstly, there were those who wished to pursue a chemical-mineralogical history of the British Isles, and who found themselves in opposition to those who wished to take a geological approach based on stratigraphy. There was also debate regarding the basis and usefulness of stratigraphy itself, and I shall briefly touch on this. Secondly, there was disagreement regarding the extent to which the Society should interest itself in the practical applications of geology and mineralogy, most particularly mining. The resolution of these issues was important, not only in the GSL itself, but also in the growth of geology as a discipline and in the later development of provincial geological societies with practical interests.

Samuel Volfson (State University for Humanities, Moscow)

Standardization: The Tie of Science, Economics, and Politics. American, English, German and Russian routes of vessels' standardization in the end of the XIX – XX centuries

Standardization is a unique phenomenon, through the prism of which it is possible to discern political and economical realities of different countries in epochs of its (standardization) establishment, as well as the main trends of the scientific thought. Probably the history of standardization is almost as long as the history of civilization. In manuals its beginning is

usually described from the times of Ancient Egypt. In the land of pyramids there were used stones of standard size, and special appointive officials looked after the execution of the standard. Middle Ages contributed its share in the history of standardization. These times people established unified sizes of the textiles' width, requirements to its raw materials. Indeed, at that time and even later the units of measure were established, to a great extent, accidentally. For example the length of Henry I's sceptre or the foot of Charles the Great. These accidents, seeming only amusing, can influence our life even nowadays, who can establish causation between sizes of fuel tanks for modern space shuttles and the standard of Roman chariot.

Not every measurement was spin out of thin air. For example, the "meter" – one ten millionth part of the length of the earth's meridian. Meter became an international recognized measure only in 1875. The same year it was established an International Board of Weights and Measures, therefore 1875 is usually considered as the year of the beginning of the international standardization.

Exerted a great influence upon the history of the XIX and XX centuries the process of standardization was passed by different countries in quite opposite ways: in some countries, like the United States, the initiator of standardization was non-governmental unions (ASME), in other cases, like in Russia, standardization was inculcated by the government. This distinction did not only determine future development of standardization in these countries, but also reflected the level of the social responsibility of business, government's regulation in economics and social sphere. Standardization was a hostage of all great conflicts of the XX century: from the First World war to the Cold War.

The technical side of the question is not less interesting. Since in different countries the standardization was began in different times and epochs and proceeded by various ways, surviving sources – standardization documents and codes (ASME Code, AD Merkblatter, GOST etc.), different scientific works, on which standards were based, like works of S.P. Timoshenko and other founders of the resistance of materials' science – are the distillation of the scientific conceptions of that time, as well as in the prosperous United States of 1920's, both in Nazi Germany of 1930's or in the communistic Soviet Union of 1960's.

Nowadays, when the great level of world trade is one of the most significant economic features, old differences between standards have become more crucial than whenever, and all the more it is important to follow and understand the history of standardization.

Benjamin Wardaugh (University of Oxford)

Harmonics and acoustics: thoughts on the musical work of Brook Taylor (1685-1731)

In the early eighteenth century the mathematical study of acoustics was pursued by a number of individuals, including Brook Taylor (1685-1731), who published the solution of the differential equation for the vibrating string in 1713. However, another way of applying mathematics to music also existed, one which used only elementary ratio theory and appealed explicitly to ancient Greek models.

The latter tradition ('harmonics') in the mathematical study of music underwent a revival in late-seventeenth-century England, but has often been assumed to have died out after the publication of Newton's *Principia* (1687) with the mathematical description of the sound wave. In fact this was not the case, and musical ratio theory continued to attract serious attention from mathematicians and, increasingly, musicians, until the end of the eighteenth century. One

of its followers early in the century was the same Brook Taylor, as is shown by a wealth of unpublished manuscripts in Cambridge.

I will explore some of the intriguing questions this situation raises. What was the perceived relationship between these two mathematical studies of music? One might expect them to arise from two separate cultures, say mathematicians and musicians, or academics and amateurs. In fact the two methods could be pursued concurrently even by a single individual, as in the case of Taylor.

I propose to use the case of music as a route into work which I am starting on the emergence in the early eighteenth century of the concept of 'applied mathematics' as opposed to the 'mixed sciences' of the renaissance. These two concepts, though superficially similar, seem to stand for strikingly different sets of assumptions about both the nature of the world and the meaning and proper use of mathematics; assumptions which are exemplified in the case of 'harmonics' and acoustics.

Emily Winterburn (Imperial College London)

How Museum's Collect

The National Maritime Museum in London has a collection of objects, manuscripts, prints and drawings originally collected by three generations of the Herschel family. This collection has both inspired and informed my PhD, where using ideas around scientific biography I have been looking at these three generations of Herschels to see how they went about ensuring each subsequent generation entered and succeeded in a life in science. A study of the collection itself, how it came about and how this part of a greater whole came to be housed within the NMM however offers an interesting story in its own right. It came into the Museum in the 1950s at a time when the Museum was looking to strengthen its collections in astronomy. The Museum therefore attempted to select only that material which reflected the family member's lives in astronomy. At the same time much of the material was offered to the museum in batches sometimes with conditions attached limiting their ability to be selective. Material was preserved which did not directly fit with the Museum's objectives, but which do now offer valuable insights into the domestic and educational lives of the family members. In some cases they provide the only publicly held source material on certain members of the family. In looking at this story of the collection I will in this paper conclude by considering how the knowledge of these sources' provenance can be fed back into the story I tell in my PhD.