



BSHS Postgraduate Conference

University of Leeds, UK

3 – 5 January 2008

Conference Programme



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This conference would not have been possible without the financial support of the BSHS, and particularly the help of the Programmes Committee and the Executive Secretary, as well as the support of the Division of History and Philosophy of Science and the Department of Philosophy at the University of Leeds.

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Information in this handbook is based on that available on 2nd Jan 2008. Whilst every effort will be made to achieve the advertised programme, the Society reserves the right to change any aspect of the programme and other arrangements where good reason calls for this to be done.

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Rooms for various conference events

- Registration will be held in G37 in Baines Wing, in the Department of Philosophy
- Lunch will be held each day in G36 in Baines Wing, in the Department of Philosophy
- Conference sessions on Thursday and Friday will be held in seminar room 1.16 in 11-14 Blenheim Terrace, 2 minutes' walk down the road from the Department of Philosophy; tea and coffee during the breaks will be served close by in seminar room 1.17
- The wine reception will be held in the Brotherton Room, on the top floor in the Brotherton Library in the Parkinson Building (the main university building with the clock tower)
- Conference sessions on Saturday will be held in G37 in Baines Wing, in the Department of Philosophy; tea and coffee during the breaks will be served G36 in Baines Wing
- G31 in Baines Wing will be available for secure luggage storage throughout the conference – please see Leucha for access to the room

Programme

Thursday January 3, 2008

11:00 – 12:00 Registration

12:00 – 1:00 LUNCH

1:15 – 1:20 Welcome

1:20 – 2:20 **Panel 1: History of Biology** Chair: Efram Sera Shriar

1. **Berris Charnley (Leeds)** Who was Sir Rowland Harry Biffen FRS?
2. **Darren Wagner (Saskatchewan)** The Tint of the Lens: The Use of Technology and Imagination in Eighteenth-Century and Contemporary Reproductive Science
3. **Jamie Stark (Leeds)** Science, Politics or Lamarckism? C. H. Waddington's alternative approach to Darwinism

2:20 – 2:30 Quick Break

2:30 – 3:50 **Panel 2A: History of Medicine – 19th century** Chair: Claire Jones

1. **Niels van Manen (York)** Occupational health and Climbing Boy Reform (1773-1819)
2. **Ian Miller (Manchester)** The National Stomach c.1790-1850: Abdominal Illness in the Early Nineteenth Century
3. **Jacob Steere-Williams (Minnesota)** “From Drains to Dairies: Rethinking Water-borne Disease Epidemiology in Victorian Britain
4. **Daniel Becker (Durham)** The Case of Myxœdema: The Formation, Standardisation and Dissemination of Medical Knowledge in late Nineteenth-Century Britain by means of the Professional Journal

3:50 – 4:15 Tea and Coffee Break

4:15 – 5:15 **Panel 2B: History of Medicine – 20th century** Chair: Ian Miller

1. **Joanna Baines (Manchester)** Cancer Personalities: A Comparison of Theories
2. **Alice Nicholls (Manchester)** The history of intensive care: life support in twentieth-century medicine
3. **Joel Tannenbaum (Hawaii)** The “commodification” of the human kidney

5:20- 5:30 **BSHS Publicity Session: Dr Fern Elsdon-Baker (University of Leeds)**
Why you should join the BSHS (if you haven't already)

6:00 – 7:30 Wine Reception

Friday January 4, 2008

9:00 – 10:20 **Panel 3: Science and Religion** Chair: Chris Baxfield

1. **Nadiya Midgley (Birkbeck)** 'Of Water and Mineral feeders (the Earth's Blood)' – Robinson's Organic Theory of the Earth
2. **Steve Ridge (Wellcome)** Regulating health before the invention of 'the social': 1650-1750 conduct books and their appeals to divine, state and humanist law.
3. **Jay Bosanquet (Durham)** 'An Absurdity in Canonicals': John Phillips (1800-74), William Cockburn, Dean of York (1773-1858) and the Mosaic record
4. **Efram Sera Shriar (Leeds)** Quaker Roots: The Making of E.B. Tylor and British Anthropology

10:20 - 10:40 Tea and Coffee Break

10:40 – 12:00 **Panel 4: Classification of Knowledge** Chair: Don Leggett

1. **Lydia Wilson (Cambridge)** Hunting for Genre in Medieval Arabic Philosophy
2. **Ian Kidd (Durham)** Charles Hoy Fort and the Historiography of Scientific Anomalies
3. **Ilaria Corda (Leeds)** Ontology-based Representation and Reasoning about the History of Science
4. **Anna Carlson (Manchester)** An introduction to the Historical Anatomy of the Storm

12:00 – 1:00 LUNCH

1:00 – 2:20 **Panel 5: Technology in the 20th century** Chair: Ray Macauley

1. **Don Leggett (Kent)** Marine Turbine and Marine Pageant: The Cultural Measurement of Technology
2. **Hermione Giffard (Imperial)** Inventing an Inventor: Frank Whittle and the early history of the British jet engine
3. **Massimiliano Pagani (Exeter)** Fingerprints On Blackshirts: A Case Study On The Social Shaping Of Forensic Technologies
4. **Paul Marshall (Manchester)** Whatever Happened to Mechanical Television?

2:20 – 2:40 Tea and Coffee Break

2:40 – 3:40 **Panel 6: Local Learning, Global Medicine** Chair: Jennifer Gold

1. **Laura Kelly (Galway)** Irish medical students at the University of Glasgow, 1859-1900
2. **Ryan Johnson (Oxford)** 'Half a Loaf!': Livingstone College, London and Medical Training for Missionaries, 1890-1914
3. **Conceição Pimenta (Lisboa)** Sleeping Sickness and the Portuguese Innovation: The Use of Atoxyl at the Lisbon School of Tropical Medicine, 1902-1935

3:40 – 4:00 Tea and Coffee Break

4:00 – 5:00 **Panel 7: Astronomy, Ancient and Modern** Chair: Laura Kelly

1. **Jennifer Gray (Durham)** Tracing the development of the zodiac in Late Babylonian astronomical texts
2. **Katie Taylor (Cambridge)** Mogg's Celestial Sphere (1813): The Construction of Polite Astronomy
3. **Ray Macauley (Manchester)** Inscribing scientific knowledge: interstellar communication and NASA's *Pioneer* plaque

5.00-5.45 **BSHS Skills Session: Dr Greg Radick (University of Leeds)**
How to Turn Your Talk into a Publication

7:00- CONFERENCE DINNER (3, Albion Place)

Saturday January 5, 2008

9:30 – 9:50 **BSHS Outreach Session: Melanie Keene (Cambridge) & Louise Thorn (Imperial)**

10:00 – 11:20 **Panel 8: Representing and Communicating Science** Chair: Mel Keene

1. **Mirjam Brusius (Cambridge)** Preserving the Forgotten: William Henry Fox Talbot, Photography and the Antique
2. **Geoff Belknap (Cambridge)** Visual of Science within The Graphic
3. **James Farry (Manchester)** Peter 'Ritchie' Calder: science journalism, socialism, and science-media interactions
4. **Louise Thorn (Imperial)** Opening up the black box: how can scholarship from the history and sociology of science be presented to a museum audience?

11:20 – 11:40 Tea and Coffee Break

11:40 – 12: 40 **Panel 9: 20th-century Science.** Chair: Ryan Johnson

1. **Stine Grumsen (Aarhus)** "In reality folks get 'acid mouth' from reading ads and cure it with toothpaste" - American Dentifrice Adverts and their critics 1920-1940
2. **Melissa Smith (Manchester)** Architects of Armageddon: scientific advice and the state in Cold War Britain
3. **Jennifer Gold (Cambridge)** The 'paradox of resettlement': the British Overseas Civil Service and the post-imperial reconfiguration of scientific networks, 1957-1981

12:40 – 1:40 LUNCH

1:40 – 3:00 **Panel 10: Communication across the Boundaries** Chair: Steve Ridge

1. **Chris Plumb (Manchester)** Parrots, Politeness, and the Parlour: Women and the production of knowledge about exotic birds in eighteenth century Britain.
2. **Stephanie Eichberg (Durham)** Crossing Boundaries in the Life Sciences: Experiment and the question of the Human-Animal Boundary
3. **Daniel Mitchell (Oxford)** Gabriel Lippmann and the Form of French Physics
4. **Boris Jardine (Cambridge)** The Constructive Idea: Aesthetics, Ideology, and Science in 1930s Cambridge and London.

END OF CONFERENCE

Abstracts

Panel 1: History of Biology

Berris Charnley (University of Leeds)

Who was Sir Rowland Harry Biffen FRS?

To answer this question I will provide a characterisation of one small but important aspect of Biffen's work. This will be done through a detailed analysis of Biffen's experimental procedure and relation of it in his inaugural paper, "Mendel's Laws of Inheritance and Wheat Breeding", written for the first edition of the *Journal of Agricultural Science* (JAS) and published in 1905 at Cambridge University. As editor, founder and first contributor to the JAS, Biffen played a key role in establishing the journal and its aims and scope even though at the time he was only a lecturer and MA at the newly founded Cambridge School of Agriculture. One explicit aim of the journal was to provide a forum for the new constituency of Agricultural Scientists and especially those who worked with Biffen. Paolo Palladino has emphasised that the journal's editorial policy was also used by its founders to demarcate Agricultural Science from Farming, and so codify Agricultural Science's status as a scientific subject suitable to Cambridge's academic context. However given Biffen's description by contemporary plant breeders as "the wheat wizard", his artisanal methodologies, and his commitment to the practical application of plant breeding to economic problems, how in this early paper did he stake initial claims to the scientific high-ground? Furthermore how did such claims help Biffen in making his first major contribution to academia at the start of his career? I will flesh out Palladino's overview by analysing the strategies deployed by Biffen to firstly generate an air of scientism for this newly established and under-funded discipline insecure about its place at Cambridge and secondly further his own career. In doing this I will provide an analysis of a fascinating example of discipline and career building with relevance to other scholars interested in these processes in their own fields of study.

Darren Wagner (University of Saskatchewan)

The Tint of the Lens: The Use of Technology and Imagination in Eighteenth-Century and Contemporary Reproductive Science

The eighteenth century witnessed the emergence of preformationism, a relatively popular notion about human reproductive biology which postulated that either the sperm or the egg encapsulated a miniature homunculus, or essentially a microscopic and anatomically intact baby. My presentation will highlight how this remarkable perspective materialized partially as a response to Leeuwenhoek's breakthrough advances in light microscopy, which enabled the preformationists to view sperm for the first time. This enhancement in observation allowed people to invest imaginatively into the frontiers of scientific understanding. However, the preformationist notions that emerged largely reflected the thick socio-cultural milieu, which typically involved gender politics, religious debate, or other sorts of power struggles, and in which reproductive biology was (and still is) entrenched. I argue that, in a manner analogous to the production of the preformationist ideas, an insertion of sociologically driven imagination occurs in contemporary

reproductive visual imaging which consequently alters scientific thought and, more broadly, social attitudes.

My methodology involves comparing the eighteenth-century textual record, such as anatomical texts, midwifery manuals, and pop sexologies, to contemporary embryological understandings, practices, and technologies. The historical analysis incorporates texts created by Johann Caspar Lavater, Nicolaus Hartsoeker, John Marten, and Nicolas Venette, among others. Additionally, to examine how the modern imagination interacts with the aesthetics of reproductive science, images will be sourced from the Reproductive Biology Research Unit at the University of Saskatchewan, and will include technologies such as ultrasound, MRI, electron microscopy, computer-generated models, and endoscopy. By using this distinctly interdisciplinary approach I hope to characterize the subjective or imaginative input that arises within the objective designs of science from both the historical and the, often less apparent, contemporary perspectives.

Jamie Stark (University of Leeds)

Science, Politics or Lamarckism? C. H. Waddington's alternative approach to Darwinism

Neo-Lamarckism was a strong tendency both in certain fields of biology and amongst the public in the early 20th century. However, by the 1960s, the movement had largely become obscure amongst mainstream professional biologists. Conrad Hal Waddington, a prominent British developmental geneticist working in the mid-20th century, took up the mantle of Lamarckism and blended aspects of the synthetic theory of evolution with the inheritance of acquired characters. The question arises as to why Waddington would move to a position which advocated the inclusion of Lamarckian principles in his work? The key aspect of Waddington's approach is to be found at the interface between biological theory and personal philosophy; he was considerably influenced by the writings of Alfred North Whitehead much earlier in his career and felt that this was intimately related to his theoretical approach to biology.

Other central questions to this paper concern Waddington's motivation for adopting such an unusual position: What was he responding to? Was he simply attacking what he saw as an extreme form of Darwinism? Or was he defending and furthering his own approach to biology? The politics of these questions are particularly pertinent to Waddington particularly with respect to his involvement with the Theoretical Biology Club at Cambridge and his relationship with Lysenkoism. In this respect, this paper links together concerns covering the relationship between the philosophy and politics of science, bringing these together with historical issues addressing Darwinism in the 20th century, and the challenges levelled against it.

Niels van Manen (University of York)

Occupational health and Climbing Boy Reform (1773-1819)

Historians of occupational health tend to use a narrow definition of “work-related health”. In line with the medical paradigm that dominated the so-called ‘dangerous trade regulations’ (1890s-1910s), they focus on responses to ‘disease caused by a particular substance in the work-environment’. Yet, as my study aims to show, this narrow understanding of the work-health relationship does *not* hold for earlier periods. Inspired by a medical paradigm that focused on “predisposing causes” of ill-health, early C19 medics showed a broad interest in the body-environment relationship.

Using medical responses to the well-being of chimney sweeps as my case study, my research traces how this broad interest got gradually narrowed down to a substance-disease preoccupation. Chimney sweeps are an interesting case study because their health, in Britain, was a major concern in three different reform campaigns, regarding child labour (1770s-1870s), domestic hygiene (1840s-1890s) and industrial disease (1880-1920s).

In this paper I will present my early findings for the first of these, the so-called climbing boy reform campaigns (1773-1819). Comparing medics’ testimonies in front of parliamentary committees with depictions of the climbing boys in medical texts, novels, poetry, songs and prints (drawn from the Ernestine Henry Collection), I will address the following questions:

- How did contemporaries try to improve the well-being of sweeps’ child assistants?
- What do these initiatives reveal about their perceptions of the impact of work on health?
- And what do these perceptions reveal about contemporary understandings of the body?

Ian Miller (University of Manchester)

The National Stomach c.1790-1850: Abdominal Illness in the Early Nineteenth Century

The increasing emphasis on the nervous system in the eighteenth century allocated the stomach a prioritised location within the body as well as endowing it with pivotal functions towards the maintenance of a healthy system. The popular work of contemporaries such as John Abernethy in the early 1800s in promoting the importance of the healthy stomach inevitably increased popular anxiety over the consequences of the unhealthy stomach. For instance, within contemporary models, the sympathetic relationships of the nervous system meant that the stomach might be considered responsible for insanity, blindness or skin conditions.

The history of illnesses such as dyspepsia and peptic ulcer reveal that stomach illness was also persistently presented as a collective problem. As well as crippling the lives of important figures such as Charles Darwin, James Joyce and Thomas Carlyle they appeared to be closely associated with poverty in new industrial areas. Consequently, abdominal disorder was employed to interpret themes including the location of the body within shifting processes of civilisation and industrialisation, and the national health of

Britain and America in comparison to countries with alternative national diseases. For instance, dyspepsia might be viewed as a source of national pride, a price to pay for the privileges of progress.

Stomach illness therefore did not act solely as a set of physiological anomalies within the body but reflected wider social themes including race, culture, nationality and gender. This explains why explanations for perceived increases in disease incidence were blamed, for example, on the popularity of German romantic drama or novel reading. Furthermore, gendered interpretations of the weaker female nervous system ensured that abdominal illness became perceived as a primarily feminine disease while its explanation in males could be attributed to the more reckless lifestyle choices made by men, forging links between socio-cultural trends and disease.

Crucially, I shall argue that the organ in its living state could not be observed, making accurate diagnosis and treatment impossible. There existed a mass of contradictory and unsatisfactory texts on the subject at a time when the organ's importance to national health was emphasised. Knowledge of specific diseases such as peptic ulcer emerged less as a result of medical agreement, but through alternative socio-cultural channels and processes interested in promoting clearer understandings of the healthy and unhealthy stomach. Awareness of perforated ulcer was initially disseminated due its medico-legal significance, as its symptoms resembled that of poisoning. In Britain, the Temperance Movement disseminated concepts of the 'ulcerated stomach of the drunkard' in order to advance their interpretation of the cause of stomach disorder, while the Vegetarian Society argued that the state of the national stomach was due to modernity and civilisation encouraging alternative forms of diet that strayed from God's intended natural diet.

Jacob Steere-Williams (University of Minnesota)

From Drains to Dairies: Rethinking Water-borne Disease Epidemiology in Victorian Britain

This paper focuses on the earliest investigations of milk-borne typhoid fever conducted by British epidemiologists Edward Ballard and John Netten Radcliffe, Medical Inspectors to the Local Government Board during the 1870s. I examine Ballard's investigation in Islington (1870) and Radcliffe's in Marylebone (1873) to show that both were committed to the water-borne theory of disease first established by John Snow and William Budd in the 1850s. It was only because they first accepted this theory that Ballard and Radcliffe were able to trace typhoid to infected milk supplies. Indeed, the water-borne theory was an integral component of the growing idea of "state medicine" in Britain. Moving from cholera spread via water to typhoid spread via milk was also a crucial step in advancing British epidemiology that has been largely neglected. My research shows that a larger contingent of British epidemiologists were committed to the water-borne theory than has previously been acknowledged. Under the control of the bona fide public health leader in late Victorian Britain, John Simon, Ballard and Radcliffe provided crucial epidemiological research that played a key role in shaping public health decisions. I use Ballard and Radcliffe to show how British epidemiologists turned their attention from water-borne cholera in the 1860s to milk-borne typhoid in the 1870s and 1880s. Once recognized as a medium for severe outbreaks, the epidemiological investigation of milk-

borne typhoid expanded the explanatory power of the water-borne theory of disease and heated up several important debates; local versus central public health authority, water quality, the adulteration of food, dairy practices, and the disposal of waste. My research shows that the emerging science of epidemiology was at the center of a new era of state medicine in Britain.

Daniel Becker (University of Durham)

The Case of Myxædema: The Formation, Standardisation and Dissemination of Medical Knowledge in late Nineteenth-Century Britain by means of the Professional Journal

On Friday 25 May 1888 the Clinical Society of London presented its report on the subject of myxœdema, a then incurable disease affecting mainly middle-aged women. After five years of intensive study it arrived at two conclusions. Firstly, that myxœdema was practically identical with sporadic cretinism in children and occurred either spontaneously, or after total thyroidectomy. Secondly, that these syndromes were dependent on destruction or loss of the thyroid gland, which previously had no known function.

Professional interest in the myxœdema case was unusually high as evinced the extraordinarily high number of attendees at the Society's annual meeting and the publication of the full two hundred pages of the committee's report in a special issue of the *British Medical Journal*.

In the first part of my talk, I will contextualise the professional discussion about myxœdema in England, which ranged from total neglect (formerly, patients with these symptoms were often regarded as only vaguely ill), to curiosity, since there did not appear to be an immediate cause for these symptoms. The second part will deal with a discussion about the nature of the report, the members of the committee, and the means of the reports dissemination. Why did there occur an increased public interest in a disorder that was comparatively rare? Why was a committee appointed to investigate this disease and why for so long? and: Why was it deemed necessary to reach the broadest medical public possible by publishing the report not only in the Society's *Transactions*, but also in the *BMJ*? These are the questions I want to address in this paper.

Overall, this paper deals with the relationship between a professional medical discourse and the emergence of myxœdema as a medical object.

Panel 2B: History of Medicine – 20th Century

Joanna Baines (University of Manchester)

Cancer Personalities: A Comparison of Theories

Since the second century AD, when Galen attributed cancer to the melancholic temperament, individual mental, emotional, and physical characteristics have often been associated with both the onset, and subsequent progression, of the disease. Although this conceptual relationship has been mentioned in numerous studies, it has rarely been the main focus, and has been left un-historicized, commented on but not explored. The framework in which we understand our 'self' is more fluid than a purely mental/physical

dualism can convey. At different times, and in different discourses, such varied aspects as the nervous system, the mind, the immune system, and a person's genetic make-up, have all been prioritized, both as mechanisms through which this phenomenon can operate, and as a defining feature of the self. In my work I explore how individual factors that are thought to determine which people will develop cancer, or influence the course of the disease, relate to contemporary conceptions of both the self, and cancer, within their historical context. In this paper I will compare the ideas of two strident commentators on the subject: Hans Eysenck (1916-1997), renowned and controversial behavioural psychologist, and Herbert Snow (1847-1931), much published surgeon at the Cancer Hospital, Brompton. Though initially similar, a closer analysis of these theorists' ideas raises a number of issues, particularly in relation to gender, and to historically specific behavioural norms. This comparison also illustrates the interesting and complex cognitive relationship we have had, and continue to have, with cancer.

Alice Nicholls (University of Manchester)

The history of intensive care: life support in twentieth-century medicine

Co-operation and conflict shaped the emergence of intensive care during the period 1950-1995. From the start, the intensivist approach was holistic, both in terms of the technology and the medical and nursing care, working together to sustain the failing body as a whole. At the same time, the development and utilisation of life support technologies created some of the twentieth century's most vexing questions about life's end – new ethical dilemmas about applying, withholding and withdrawing life support. The question of who held the knowledge, skills and experience to be an expert in the fledgling discipline was also disputed.

This paper will introduce my recently-begun research project. I will explain how I intend to use archival materials, contemporary publications such as medical journals and newspapers, material culture and oral history interviews, to address my key research questions:

How did intensive care emerge and develop as a socio-technical field within medicine in the period 1950-1995?

What factors shaped the development of clinician, nursing and technician roles in the emerging discipline?

How were the new ethical issues dealt with by staff, patients and their families?

What was the wider social impact of this new medical speciality?

I will then describe how my preliminary research findings suggest that the emergence of intensive care was not as elementary as that portrayed in the existing literature. Instead, the discipline appears to have taken shape from local stories of co-operation, conflict and circumstance.

Joel Tannenbaum (University of Hawaii)

The "commodification" of the human kidney

Since the late 1970s, advances in tissue typing and immunosuppression have made it possible for people living in dire poverty to sell one of their kidneys, via a system of brokers and medical professionals, to persons suffering from severe renal failure. As this

practice has become more common, two things have happened: the sums received by the donors have generally decreased, and worldwide awareness of and reprobation towards the practice has grown. Much of the anxiety is articulated as a fear of the “commodification” of the kidney and, by extension, of the human body. This reasoning has a distinct teleological slope to it, suggesting a point in the past in which nothing was commodified and a point in the future in which, if present trends continue, everything will be commodified. The attachment of monetary value to parts of the human body, it is implied, indicates that the latter point is nearer than the former. The “commodification” of human kidneys takes place at the intersection of the histories of medical and social sciences. To clarify its role in both, this paper will examine the role of the commodity as a unit of analysis in the history of economic thought, and its deployment in the ongoing debate over how national and international organizations might respond to the worldwide “black market” in human kidneys.

Panel 3: Science and Religion

Nadiya Midgley (Birkbeck, University of London)

‘Of Water and Mineral feeders (the Earth's Blood)’ – Robinson's Organic Theory of the Earth

My paper is about a seventeenth century Theory of the Earth that described an organic earth. I aim to show that the organic aspect of such works, so often overlooked, were prominent in the Theories of the Earth publications and manuscripts.

Thomas Robinson's 'Anatomy of the Earth' is the best example of this sort of writing in the seventeenth century as it could not be more explicitly organic. Interestingly though, he went on to write two more books on the earth, clearly developing his theory as he went along, and clearly dealing with the challenges as well as the support he received from his contemporaries on the subject.

Theorists of the Earth read each other's writings seriously, and strived to respond constructively, in print. Some compared specimens and data, others amended calculations, still others corrected points of theology, philosophy or history. Organic ideas are scattered within the text and imagery of the resulting papers and books. For example: the earth's interior described just like a human being's body and organs, descriptions of spirits of the earth that have life cycles, ideas of transmutation and others modified from Aristotle.

Robinson's work shows an amalgamation of new mechanical ideas and practical empirical knowledge with more traditional organic ideas about the earth. This mixture of concerns was actually quite representative of the material Theorists of the Earth were concerned with at the time.

Steve Ridge (UCL Wellcome)

Regulating health before the invention of ‘the social’: 1650-1750 conduct books and their appeals to divine, state and humanist law

My thesis is an investigation of medical truth and the governance of servants, labourers and paupers, 1650-1750. An obvious place to start an investigation of the regulation of these categories of people from the perspective of their health is the pages of guides to behaviour intended particularly for them. One may be surprised to discover that the imperatives and suggestions regarding health and sickness in such books are in fact scarce and superficial. Why so? I argue that we perceive a lacuna of medical content in these books because we hold a certain view of what 'the medical' is. From the late eighteenth century onwards, medicine has been at the very heart of the invention of 'the social' or biological 'population' as a realm of reality irreducible to the individual. This realm has been both studied and brought into being by the twin sciences of statistics and state administration. Medicine has played a central role in the modern political task of regulating the conduct of individuals and groups in a territory. This is why the reader of late seventeenth- and early eighteenth-century guides to behaviour is surprised that they do not refer to the expertise of the physician or the public official. How does one avoid describing these texts as 'lacking' medical content and therefore offering a negative analysis? I consider the commands, warnings, persuasions and suggestions contained in their pages within the context of three juridical ensembles operating in the period: Christian providentialism, the legal system of the state, and the humanist concern for reputation. I show that a belief in providence is held by the majority of the authors of conduct books to be a sufficient basis for the regulation of the behaviour of servants and labourers. Imperatives to health are formulated primarily in reference to the sixth commandment.

Jay Bosanquet (University of Durham)

'An Absurdity in Canonicals': John Phillips (1800-74), William Cockburn, Dean of York (1773-1858) and the Mosaic record

My paper is derived from my MA dissertation on the geologist John Phillips and the age of the earth. Phillips wrote in 1837 that the age of the earth was a 'magnificent problem' which was incapable of solution in the current state of knowledge. A year later, he was reluctantly drawn into a newspaper exchange on the subject with the combative Dean of York, William Cockburn, who defended the biblical account of creation. Cockburn was irritated by the prevalence of old-earth views at meetings of the British Association for the Advancement of Science (BAAS), of which Phillips was assistant secretary. They had a second exchange in 1840, on the origin of coal, when Cockburn denied that it derived from vegetable matter. The dispute arose from remarks which Phillips had made at the Glasgow meeting of the BAAS. The purpose of re-examining these controversies is not to revive the now-discredited 'conflict thesis' of the relations between science and religion, but simply to suggest that where outright conflict did occur, there were specific local and personal reasons for it. It is also valuable in showing how Phillips was willing to defend the autonomy of geology against scriptural dogmatism, although he was a devout Anglican who later disagreed with Darwin over both evolution and the age of the earth. He was an old-earth geologist compared with the literalist Cockburn (whom he referred to as 'an absurdity in canonicals' in a letter to his sister Anne), but disputed Darwin's calculation of 300 million years for the denudation of the Weald.

My primary sources are the exchanges in the *York Courant* and *York Herald*, and several pamphlets by Cockburn such as *A Remonstrance, Addressed to His Grace the Duke of Northumberland, upon the Dangers of Peripatetic Philosophy*. Methodologically I use a 1975 book on the Yorkshire Philosophical Society by Orange, Morrell and Thackray's book about the early years of the BAAS, *Gentlemen of Science* (1981), the recent (2005) biography of Phillips by Jack Morrell, and Ralph O'Connor's forthcoming book *The Earth on Display*. I have also found Terry Mortenson's book *The Great Turning Point* useful – and it is written by an avowed creationist!

Efram Sera Shriar (University of Leeds)

Quaker Roots: The Making of E.B. Tylor and British Anthropology

Edward Burnett Tylor's impact within the discipline of anthropology cannot be underestimated. His contributions formed the foundation of many theories still employed in cultural studies and social sciences today. Tylor's methodological and theoretical approach laid the groundwork for successive generations of anthropologists. Most examinations of Tylor's career have focused on his connection to scientific naturalism and evolutionary theory. Little attention towards Tylor's Quaker upbringing has been analysed. Thus, this paper will not be another analysis of E.B. Tylor's impact within the field of anthropology. Rather, this paper shall discuss the cultural forces (including science) that influenced the construction of his anthropological perspective. Unlike traditional examinations of Tylor's career, I shall investigate how Tylor's connection to Quakerism produced an anthropological view that appears more culturally sensitive than other Victorian examinations of non-European societies. It is my intention to propose that Quaker values of equality informed Tylor's views of 'racial uniformity'. In order to demonstrate that Tylor was influenced by Quaker values and that his writing illustrated a cultural perspective that emphasised 'racial parity', I shall utilise three of his main texts *Researches into the Early History of Mankind* (1865), *Primitive Culture* (1871), and *Anthropology* (1881). It is my hope that through a thorough examination of these texts I shall be able to formulate a comprehensive case study that illustrates Tylor's 'cultural sensitivity'.

Panel 4: Classification of Knowledge

Lydia Wilson (University of Cambridge)

Hunting for Genre in Medieval Arabic Philosophy

How do historians identify genres in texts separated from us by time and/or culture? Using reader reception theory from Jauss, I explore the example of a text by Al-Farabi (d.950, Damascus): "The Classification of the Sciences", looking at its (previously unattested in the Arabic tradition) form from two different angles. The first is a chronological account: the text's place in a tradition which started with Aristotle and moved through Late Antiquity via the Baghdad translation movement of the 8th-9th centuries. Within this tradition of classification Al-Farabi's text stands out; the form he has chosen for the text is unusual, even innovative, compared to the

texts that he has inherited. The second angle provides an insight into this choice through a close internal reading of the text, given that Al-Farabi gives very strong indications of how it should be read. There is a self-consciousness in his writing, especially in the introduction, that is typical of some types of medieval Arab writing, and gives the contemporary reader both a justification in classifying a text and clear guidance in how to read it. Based on this information from Al-Farabi himself and the background to it, I explore questions about the uses and importance of the text. What does the introduction tell us about the unusual form Al-Farabi has chosen for his exposition on classification of knowledge? What does this choice tell us about what he is trying to say with the text?

Ian James Kidd (University of Durham)

Charles Hoy Fort and the Historiography of Scientific Anomalies

In this paper I consider the historiography of scientific anomalies developed by the American historian and philosopher of science Charles Hoy Fort (1878-1932). Since Fort remains largely unknown to contemporary academia, I offer a brief intellectual and biographical description, identifying his motivations and philosophical concerns. Fort's research methodology is described by drawing upon his surviving books, correspondence, and papers. This took the form of a bibliographical study of the scientific literature from the years 1850 to 1932 with an emphasis upon reports of anomalous phenomena and the responses of scientific communities to them.

In *The Book of the Damned* (1919) and its sequels (1923, 1931, 1932) Fort drew upon these bibliographical studies to describe how the reporting, discussion, and investigation of scientific anomalies was regulated by a system of what he termed 'exclusionist' mechanisms. These served to constrain scientific discourse in line with orthodox bodies of thought, which he termed 'Dominants', these being the substantive yet unarticulated theoretical and methodological commitments within a given disciplinary community. This was particularly evidenced in the increasing orthodoxy evident in the editorial attitudes of major scientific journals from the late nineteenth century onwards.

Fort's work is particularly important since it criticises scientific discourse 'from without' by focusing upon 'excluded' data. His work describes how the epistemological formation of scientific disciplines is facilitated by the regulation of scientific discourse. I conclude by proposing that such constraints upon discourse are an essential part of the formation of scientific disciplines.

Ilaria Corda (University of Leeds)

Ontology-based Representation and Reasoning about the History of Science

For philosophers, Ontology is a branch of Metaphysics dealing with "existence" and categorization of what exists. Over the past decade, the need for computers to handle complex information has led to the use of semantically enriched representations of the world; and hence has demonstrated that ontological issues have become increasingly relevant to computer scientists.

In Computer Science, the term 'ontology' refers to a logical representation of a conceptual system, usually restricted to a particular domain. Formalisations of many domains have been developed especially relating to highly-systematised disciplines, such as Medicine,

Genetics and Chemistry. However, only little progress has been made towards the formalisation of less structured fields, such as the Humanities.

The subject of this work is the development of an ontology for describing (a part of) the History of Science. Historical domains involve dealing with vagueness, subjectivity in interpretations, uncertainty in historical facts, and present a number of challenges to formulating adequate logical representations.

A key feature of historical domains is the pervasiveness of temporal concepts and relationships, which are poorly dealt with in most established ontologies. Nevertheless, the literature of both Philosophical Logic and Artificial Intelligence includes many proposals for representing time. This research develops an approach to conceptualising and reasoning about the History of Science, which combines an adaptation of Davidson's theory of events and Allen's interval algebra (a theory of temporal relationships that is well known in Artificial Intelligence).

Anna Carlsson (University of Manchester)

An introduction to the Historical Anatomy of the Storm

For my PhD I will look at how public and professional reactions to weather and the practices related to it have changed over time, concentrating on North Atlantic storms. Using a select number of British model storms, such as the one in 1987, the project will provide a framework for understanding reactions to twentieth century English weather. I aim to reconstruct the ways in which the authorities in the socio-economic sector and local populations behaved during such storms. The result of such an approach will be a historical 'anatomy of the storm' highlighting the integrated set of interactions between the physical and social dimensions of extreme weather.

While the history of meteorological sciences has to some extent been studied, little attention has been paid to the everyday attitudes and the institutional behaviour related to weather. We know relatively little of how people and local authorities around the world, and particularly in Britain, relate to and deal with extreme weather. We also know little regarding whether there is a history to such dealings.

A prominent aspect of this problematic is the modern culture of environmental blame. With the rise of 'weatherproof' welfare technocracies, the causal attribution in the analyses of disasters has shifted from 'nature' to 'society' and have thus instituted a systemic ascription of blame in situations associated with large scale destruction, material loss and human casualties.

The main sources of material will be official reports, media releases and a variety of post-mortem analyses of select storm events. Other sources would include personal accounts in diaries and correspondences. For the more contemporary events the research could also involve focus groups and in-depth interviews.

Don Leggett (University of Kent)

Marine Turbine and Marine Pageant: The Cultural Measurement of Technology

‘Judged as a pageant nothing could be more impressive than the long lines of ships anchored in perfect order, spreading over miles of water in apparently endless array.’ In 1897 Charles Parsons took the *Turbinia* through the lines of ships at the Spithead Naval Review. The *Turbinia* was the first vessel to use turbines for motive power; every other vessel under steam at Queen Victoria’s Diamond Jubilee naval celebration used reciprocating engines. On this occasion – the first public display of the marine turbine – the sea became the laboratory, and the crowds of dignitaries, aristocrats and patriotic citizens the witnesses and interpreters of technology. While the scientific community grappled with how to ‘scientifically measure’ the energy efficiency of the engine, the wider community made its own ‘measurement’ of this new technology – beginning at this ‘marine pageant’.

By utilising scholarship on spectacle and display I explore how non-experts observed and formed meaning for science and technology based on the theatrics and spatial context of display. While marine engineers argued the pros and cons of the turbine over the reciprocating engine, non-experts read/wrote newspapers, magazines and letters; naval officers engaged in the politics of progress; and artists painted pictures and wrote poetry. In this paper I offer an alternative to traditional, economic and political histories of the steam turbine by exploring the cultural space of the Spithead Naval Review as both laboratory and museum.

Hermione Giffard (Imperial College, London)

Inventing an Inventor: Frank Whittle and the early history of the British jet engine

The list of firms involved in the design and production of the first British production jet engine is both extensive and distinguished. Given the many contributors, constructors, and enablers necessary to this undertaking – which ultimately represented a significant proportion of British industry – it seems unproblematic to suggest that a history of the jet engine must include the contributions of these firms (not to mention those involved in airframe and auxiliary design and development).

Yet in Britain the story of the jet invariably starts, and often ends, with Frank Whittle. Much of the centrality of Whittle in the British story has to do with Whittle's popular identification as the inventor of the jet engine. But invention, like discovery and authorship, is much more problematic than it popularly appears. The creation of an engineering hero goes far beyond a narrow inquiry into technical authorship. How is it that a man who did not claim to have invented the jet engine became widely known as its inventor?

Because the historiography and popular story of the jet engine is so focused on Frank Whittle and ‘his’ firm, Power Jets, it is important to approach the question of Whittle’s role, as engineer and icon, head-on. If Frank Whittle was an inventor, as these stories insist, what did he invent? Or conversely, if he was the inventor of the jet engine, what does inventing entail? Government archival materials, the histories of enthusiasts, press

archives, company records and comparison with historical works on other popular inventors yield insight into many different aspects of the process of invention and its popular valuation. Approaching invention from this perspective offers an explanation of how and why certain engineers become popular heroes at certain times.

Massimiliano Pagani (University of Exeter)

Fingerprints on Blackshirts: A Case Study on the Social Shaping of Forensic Technologies

In 1927 a case was brought in Turin before the Royal Penal Court: Giulio Canella, WWI veteran missed in action who had returned home after eleven years, was accused to be the swindler Mario Bruneri in hiding for years. The two supporting families were engaged in four trials that lasted five years. In those arenas, both parts made use of the scientific weaponry of the time: psychological exams, hypnosis, blood tests, testimony evaluations, anthropometry, and, of course, fingerprinting.

The unpredictable result was a milestone in the development of Italian scientific policing. In my thesis I intend to use the case of Giulio/Mario as a starting point to explore the historical and sociological dynamics that made it possible for fingerprinting to be both invoked and rejected as reliable identification technique in tribunals.

In order to collect the relevant data I followed eclectic methodology involving historical as well as sociological techniques. This perspective detected plausible connections between micro and macro historical situations, linking fascist policy of criminal prevention to individual performances in the courts, and eventually revealed to be useful in understanding contemporary forensic debates.

Paul Marshall (University of Manchester)

Whatever Happened to Mechanical Television?

Most people in Britain have heard of John Logie Baird and link his name with the invention of television. To associate him with the creation of the 'box in the corner' (that we all insist that we don't watch much of) is actually a dubious proposition. However, the British public believes that Baird invented television . . .

He actually invented a *type* of television, one based on spinning wheels and revolving mirrors. This was *electro-mechanical television*, and it was sufficiently practical by 1930 to be given a public trial. *All-electronic* television similar to that of today was still in the corporate development laboratories and almost unknown to the public. For a few years in the late 1920s and through to 1935 electro-mechanical television enjoyed some very limited success; but was it just being used by the British government and industry to prepare the public for later developments? An unlikely and unwieldy contraption, commonly known to be so even at the time, did it ever have any purpose or prospects?

This presentation will explore some of the background to the rise of mechanical television, how the illusion of success was maintained by publicity and then killed off at a stroke by the British government to make way for all-electronic television in 1936. What were the reasons for this official backing for mechanical television when it was already known to be of such very limited use and all-electronic television imminent?

My approach has been to compare government files and reports with the public presentation of television (both electro-mechanical and all-electronic) by the BBC, government and industry.

A brief demonstration of low definition electro-mechanical television will be shown to illustrate the technology. Would *you* have bought an electro-mechanical television?

Panel 6: Local Learning, Global Medicine

Laura Kelly (National University of Ireland, Galway)

Irish medical students at the University of Glasgow, 1859-1900

The body of medical students at the University of Glasgow in the late nineteenth century has been the subject of recent studies, including one focused specifically on female medical students. The aim of my paper is to examine the history of the Irish medical students who made up a considerable portion of the student body. I will focus on the students' social backgrounds, the medical education they received at the University of Glasgow, and their subsequent careers. With regard to social backgrounds: who were the Irish medical students at the University of Glasgow in the nineteenth century? What parts of Ireland did they most commonly come from and what were their social and demographic backgrounds? What were their reasons for choosing the University of Glasgow for their medical education? The paper will contrast the differences between medical education at the University of Glasgow with what was available in Ireland at the time in an attempt to understand students' reasons for choosing Glasgow over Irish universities. The state of medical education in Ireland and Britain as well as the history of working-class Irish migrants in Glasgow during this period are also examined in order to provide a context for the discussion. Finally, the paper will examine what happened to Irish medical students after graduation in terms of geographical destination and early careers. The main sources for this paper include student matriculation records from the University of Glasgow and the *Medical Directory* and *Medical Register* were used in order to trace student career paths after graduation. I will demonstrate that although Irish medical students came from different social backgrounds to their Scottish counterparts, they followed similar paths in the early stages of their careers.

Ryan Johnson (University of Oxford)

'Half a Loaf!': Livingstone College, London and Medical Training for Missionaries, 1890-1914

This paper will consider lay medical training for missionaries and wishes to demonstrate that missionaries, despite the rising dominance of medical missionaries, were still providing a significant amount of medical and surgical care in the European tropical colonies, creating medical knowledge about travelling and living in 'unhealthy' climates. Founded in 1893, Livingstone College was an institution providing a nine month course in scientific and practical medical training for missionaries going abroad. It was inter-denominational, with missionary societies from all over Europe represented. Students were able to walk the wards of the Seamen's Hospital, assisting patients suffering from

common ‘tropical’ diseases, while also receiving lectures from prominent tropical physicians such as Patrick Manson and James Cantlie. While there was some debate amongst medical professionals over providing missionaries with such an intensive course in scientific medical and surgical training, it was generally agreed that some—‘half a loaf’—was better than none, especially when many missionaries were stationed in isolated posts.

Reports from students indicate that they were constantly engaged in medical work—one former student treating up to 6,000 cases in one year. While schools of tropical medicine in the local context of Britain might have been creating knowledge about ‘tropical’ disease, Livingstone College, and former students, were helping create knowledge about practical and hygienic aspects of living and treating disease in tropical climates.

Conceição Barreira Pimenta (Universidade Nova de Lisboa)

Sleeping Sickness and the Portuguese Innovation: The Use of Atoxyl at the Lisbon School of Tropical Medicine, 1902-1935

The Lisbon School of Tropical Medicine, founded in 1902, was the result of the process of colonization carried out by the Portuguese State during the twentieth century. The creation of this specialized institution reflects a global interest in tropical medicine by European empires such as the British and the French.

This paper aims to reflect on the role of Lisbon School of Tropical Medicine in tropical diseases scenery, analysing both in the research and clinical activity undertaken by the medical staff between 1902 and 1935. Particularly we will reflect about the sleeping sickness and the innovation on therapeutics by using the atoxyl.

The methodology chosen is an analysis of the scientific production led by Ayres Kopke and their collaborators, as well as of the reports and the scientific missions in the tropics and the reports of clinic activity, during the first forty years of the Lisbon School of Tropical Medicine.

The therapeutics appears to be a crucial tool for medicine in the first decades of the twentieth century in Portugal and a most effective vehicle for colonization, particularly in Africa, where Portugal shared frontiers with other Europeans Countries. This approach to medicine is crucial to understand the role of the western medicine spread in colonies, which Portugal took its place.

Panel 7: Astronomy, Ancient and Modern

Jennifer Gray (University of Durham)

Tracing the development of the zodiac in Late Babylonian astronomical texts

Astronomers in Mesopotamia in the Late Babylonian Period (approx. 750 BC - AD 75) made nightly observations of planetary and lunar phenomena. Positions of the planets on key dates were initially noted relative to nearby constellations, but gradually throughout the period astronomers developed the idea of dividing the sky into regions of equal length, allowing positions to be recorded and calculated more easily. In this way the

Babylonian astronomers had devised the zodiac – a concept of dividing the sky into 12 equal regions marked by the Sun’s path, which is still in use today.

In this talk I will use examples of records from a number of Babylonian observational texts dating from across the whole of the Late Babylonian Period to demonstrate that they show a gradual conceptual change from recording planetary positions using constellations to using the idealised zodiacal signs. The texts will be used to analyse in exactly what circumstances the Babylonian astronomers used the zodiac, and how this usage evolved over time. Additionally I will examine how their terminology used for describing the zodiac changes over time, and whether this corresponds to a change in the precision of the records.

Katie Taylor (University of Cambridge)

Mogg’s Celestial Sphere (1813): The Construction of Polite Astronomy

In 1813, Edward Mogg published a dissected globe consisting of twelve interlocking cardboard pieces and an accompanying booklet explaining the construction of the sphere and providing an introduction to astronomy. This paper reports on practical investigation of Mogg’s sphere, contextualised through research into early nineteenth-century education manuals, juvenile learning aids and children’s paintings.

I use a cost analysis, assessment of relevant iconography, and consideration of contemporary educational practices, to infer the probable audience for Mogg’s sphere. My investigation shows that early-nineteenth century astronomical education consisted of much more than the inculcation of facts and figures. In a world of self-fashioning, polite astronomy afforded an arena in which socially aspiring middle-class parents could play out ambitions for their children. Through the use of Mogg’s sphere, young users gained a sense of unwritten rules delineating the contributions they were expected to make to polite astronomical discourse. A novel technical vocabulary was internalised, haptic know-how was gained, and appropriate, that is to say polite, contemporary debates in which these new linguistic and manual skills could be dispatched were highlighted.

This paper reinforces the need to consider objects and texts together, and crucially to assume the role of user when we do so. By following instructions, identifying relevant pieces, constructing and deconstructing we encounter Mogg’s sphere as a whole. This practical experience opens the sphere up in new forms, suggesting novel historiographical possibilities. A replica is provided with this paper – it is hoped that today’s users will be motivated through experience of Mogg’s sphere to pursue research on other neglected ludic objects. Just as manual interaction provided Mogg’s audience with a way to converse with their peers, so it furnishes us with an illuminating form of dialogue with the past.

Ray Macauley (University of Manchester)

Inscribing scientific knowledge: interstellar communication and NASA’s Pioneer plaque

In the ‘Space Race’ of the second half of the twentieth century, humanity sought to propagate human knowledge beyond the solar system through social and technological means, such as radio messages and artifacts attached to NASA spacecraft during the 1970s. My paper will review and analyse material practice and discourse associated with

‘interstellar communication’ – collective endeavours to convey intelligible messages between star systems and establish contact with supposed extraterrestrial intelligence. The need to communicate knowledge and meaning using non-linguistic means posed major challenges for scientists, because the unspecified recipient must be assumed to have had no prior contact with humankind; scientists must therefore imagine how these alien entities will relate to human knowledge and culture. The production and transmission of interstellar messages became interdisciplinary design problems that included collaboration and exchange of ideas between scientists, visual artists and others. My presentation will explore not only the role of visualization in knowledge production, but also the ways in which we relate to knowledge as a valuable resource and convey theoretical or practical understanding to others. I will review socio-cultural aspects of interstellar communication since the late 1950s and focus on key issues regarding conception, design and production of a specific interstellar message launched into space during the 1970s – NASA’s *Pioneer* plaque. In addition, I will discuss how my research relates to previous historical and sociological studies on rhetorical aspects of visual representation and mathematics in scientific practice. In particular, I will discuss application of Latour’s notion of ‘inscription’ as an appropriate conceptual tool for analyzing how scientists have used pictures to articulate and validate ‘matters of fact’ in the form of interstellar messages such as the *Pioneer* plaque.

Panel 8: Representing and Communicating Science

Mirjam Brusius (University of Cambridge)

Preserving the Forgotten: William Henry Fox Talbot, Photography and the Antique

The two decades after 1830 seem to be the most productive years in the life of W. H. F. Talbot (1800-1877). The period not only marks the moment of his first success in the field of photography but is also the link to Talbot’s successful scholarship beyond it. My research project aims to explain Talbot’s interest in photographic inventions in connection to his lifelong significant scholarship in Archaeology, Classics and Assyriology, fields still largely unexplored by contemporary Talbot research. I attempt to ask if Talbot’s interest in the Antique will expose new opportunities to gain further understanding of his photographic achievements.

In the 1840s Talbot had already suggested that archaeologists could use photography for their archaeological studies. Talbot considered photographic use on archaeological expeditions, advocated the photographing of cuneiform tablets in the British Museum, and verified advances in the particular area of archaeological photography. Thus, photography – although still in its infancy – started to become an instrument of comparison and preservation for other scholars around Talbot and an institutional part of Archaeology. As a result, besides the revelation of Talbot’s role within classical scholarship and the question if this interest is linked to his investigations on photography I will also suggest that at this time the medium of photography begins to become an institutional research tool to preserve the Antique. By the 1870s it had become the indispensable object of evidence in archaeological research.

In phenomenological terms, photography and archaeology have some substantial characteristics in common. Both disciplines attempt to preserve fading objects. They keep them from falling into oblivion. Talbot offers an exceptional case study to show how the two disciplines have been closely linked to each other in practical terms, ever since photography was invented.

Geoff Belknap (University of Cambridge)
Visual of Science within The Graphic

For the BSHS graduate conference I would like to present a paper that examines how the technology of the photograph acted as a tool of scientific change while it simultaneously functioned as a mode for interpreting this change. My paper focuses on a thorough examination of a widely circulated 19th century illustrated periodical entitled The Graphic. This periodical is an important source for popular visual representations of science and it has hitherto been largely ignored within the secondary literature. In my work on The Graphic I utilize the works of Geoffrey Cantor, Gowan Dawson and Jim Secord, among others, to understand how periodicals and scientific literature could impact both the scientific and non-scientific communities alike. By looking at the representations of scientific discovery within a popular periodical, I am able to analyze the impact of the photograph as a tool for the proliferation of scientific imagery. The analytical framework of my paper is framed around understanding how science was interpreted and visualized by periodicals that maintained their audiences primarily through their illustrations. An important aspect of my analysis of these periodicals focuses on how photographs perpetuated gendered representations of women. I focus my analysis on how The Graphic gendered scientific devices through photographs and wood cuts in order to solidify or undermine the use of that device. Through this paper, I hope to address some of the issues surrounding how photographs were used to popularize science, and how the medium of photography in general mediated both the conception and perception of scientific devices.

James Farry (University of Manchester)
Peter 'Ritchie' Calder: science journalism, socialism, and science-media interactions

Science journalism thrived as a profession in the postwar era resulting from the increased public interest in science as news following the events of the Second World War. However, a small circle of science journalists and popularisers, including J. G. Crowther, Gerald Heard, and Ritchie Calder, forged careers in newspaper and radio work with many also appointed to committees of governmental, scientific, and science writing institutions in the interwar period as their reputations grew.

The appearance of these early science journalists coincided with a burgeoning socialist movement inspired by the Soviet example, the rise of fascism and the acute economic difficulties of the Great Depression. Increased socialist sympathies were especially evident in the younger members of the scientific community, for example J. D. Bernal, and literary figures such as George Bernard Shaw and H. G. Wells. These individuals saw science as the answer to social problems if utilised correctly and the need for greater public understanding of science.

This paper will concentrate on one member of the coterie, Calder, through this formative period. I will show how his background, training, work situations and contacts led to openly socialist stances in his scientific popularisation even if the tone and enthusiasm regarding the utilisation of science could vary dramatically. I will also explore the postwar effects that the new ‘social implications’ science journalism had on the profession and the effects of this literary style on the public, alongside the implications of increased status of science journalists for science-media interactions. A link to my present research on the British space programme will be demonstrated, again through the writing of Calder, on the social aspects of space exploration and the characteristics of space journalism and popularisation from the interwar years onwards.

Louise Thorn (Imperial College, London)

Opening up the black box: how can scholarship from the history and sociology of science be presented to a museum audience?

Working in collaboration with the Science Museum, I am investigating the challenges and consequences involved in interpreting scholarship using museum artefacts. In the first year of my PhD I reviewed the literature about trust between scientists and over the past year I have developed several key case studies into plans for a hypothetical museum exhibition. In October 2007 I assembled the proxy version of this exhibition using a mixture of display cases and posters. The first display case was based on the role of scientific lectures in London during the early nineteenth century when scientists used popular lectures to assert their authority, both among fellow scientists and the general public. The second display case considered the story of Percival Lowell and his claims about canals on Mars during the 1890s and poses questions such as: why were Lowell’s ideas initially accepted but later rejected? What caused this decline of trust?

High-quality A1-sized posters were used to convey topics from the rest of the exhibition such as: the witnessing of air pump demonstrations at the Royal Society in the late seventeenth century; the curious appearance and later disappearance of N-rays in 1904; the acceptance of general relativity based on an eclipse expedition in 1919 and the continuing debate over the existence and detection of gravitational waves.

In the final section of my talk I will extrapolate from my experience of creating the display to talk about wider issues in the presentation of history of science within museums, such as the interpretation of objects and the interaction between museum curators and historians of science today.

Panel 9: 20th-Century Science

Stine Grumsen (University of Aarhus)

*“In reality folks get ‘acid mouth’ from reading ads and cure it with toothpaste”-
American Dentifrice Adverts and their critics 1920-1940*

Following the publication of Willoughby D. Miller’s *Microorganisms of the Human Mouth* in 1890 preventive dentistry was launched in America with the slogan “a clean tooth never decays!” American dentists hailed the importance of mouth hygiene and a

new market for mass produced toothbrushes appeared. Toothbrushes became affordable for a wider public during the first decades of the 20th century, and by 1924 20% of the American population used a toothbrush on a daily basis. The dentifrice industry flourished and extensive advertising campaigns hailing the wonderful effects of competing toothpaste brands were printed in magazines and newspapers.

This paper traces the changing advertising strategies applied by American toothpaste manufacturers in the period 1920 to 1940, and shows how the changes were not only a result of the rise of new sections of consumers, but directly invoked by fierce debates in professional dental journals. Dentists discussed the pros and cons of the advertising industry. Whereas some claimed that toothpaste advertising played an important role in educating the public on mouth hygiene and tooth brushing, others warned against harmful dentifrices, pseudoscience and the “humbugging of a credulous public”.

My study of the advertisements of Pepsodent, Sanitol and Dr. West’s and of critical articles published in the journal *Dental Cosmos* shows not only how advertising strategies of the early 1930s were influenced by the professional criticism of the late 1920s, but also how advertising campaigns acted as catalysts for self reflection within the dental profession.

Melissa Smith (University of Manchester)

Architects of Armageddon: scientific advice and the state in Cold War Britain

In the late 1940s the British Government embarked on a new civil defence programme. Based initially on ideas familiar from the last war – shelter, evacuation and a voluntary civil defence service – the programme was intended to mitigate the effects of the atomic attack on Britain which, planners believed, would almost certainly occur in any future war between East and West. By the early 1950s, however, secret Government reports were already warning that British civil defence preparations were inadequate and that policymakers would have to step up their civil defence preparations to deal with the new threat of the hydrogen bomb. Despite such warnings, by the early 1960s civil defence had suffered a series of drastic spending cuts, and many officials privately viewed civil defence as little more than a façade.

The story of the political and economic considerations which led the Government to choose this course of action for civil defence in the 1950s is itself important, but behind the high-level political debates lies another, more complex story: that of the expert advisers enlisted by the state to provide the scientific and technical data which was to inform Britain’s civil defence plans. The scientific advisers of the Home Office, whose role in British war-planning has received little attention from historians, were responsible for advising policymakers on everything from bomb shelters, building construction, blast damage and radiological effects, to questions of maintaining public morale and predicting civilian behaviour under attack.

In this paper, I will consider how Government advisers produced this scientific “knowledge” about nuclear war, analysing their methods for conceptualising nuclear war as a solvable problem, and exploring how they sought to rationalise problems which often had clear human and moral dimensions. Drawing on the sociology of scientific knowledge and ideas about modernity and bureaucracy, I explore the consequences for British civil defence of the methods and approaches to nuclear war taken by the Home

Office scientists, and ask whether this study allows us to draw wider conclusions regarding the role of the “expert” in the state.

Jennifer Gold (University of Cambridge)

The ‘paradox of resettlement’: the British Overseas Civil Service and the post-imperial reconfiguration of scientific networks, 1957-1981

The immediate postwar years witnessed rapid expansion in recruitment of scientific personnel within the Overseas Civil Service (HM Colonial Service until 1954), as scientific expertise assumed a more central role in British imperial planning. Yet, as early as 1957, the British Government established the Overseas Services Resettlement Bureau to facilitate the relocation and re-employment of thousands of scientific personnel in addition to administrative and professional officers, whose employment across the crown colonies was being terminated as part of the process of postwar decolonization. This paper analyses the reconfiguration of colonial scientific networks as scientific officers obtained second careers post independence. In particular, while many tropical specialists found it difficult to adapt to the UK employment market, substantial numbers of officers returned overseas working as scientific advisers under the auspices of newly independent governments, commercial companies, the British Government’s Overseas Services Aid Scheme and international aid organisations (e.g. the FAO and World Bank).

Through examining official documentation, media publications and oral historical testimony, this paper examines the discursive construction in the official imaginary of the redeployment of colonial scientists, before considering the role of government-funded institutional agencies in shaping the process of resettlement. Moreover, it is argued that a focus on the formal and informal professional networks forged in the colonial era and utilised by officers as the basis for postcolonial career advancement is critical to a more nuanced understanding of the process of relocation. This is demonstrated particularly by a case study of one scientific branch of the Service – the Colonial Forest Service.

Panel 10: Communication across the Boundaries

Christopher Plumb (University of Manchester)

Parrots, Politeness, and the Parlour: Women and the production of knowledge about exotic birds in eighteenth century Britain

My research project investigates the collection and display of both living and dead exotic animals in Britain between 1660 and 1800. I am interested in the political and cultural meanings that these animals articulated and particularly: Why did people look at animals? What did they see? This paper is a brief attempt to capture a case study in the scientific and cultural reception of exotic birds in eighteenth century Britain.

I shall demonstrate how women became particularly associated with parrots as part of discourse on appropriate feminine sensibility and affect. The caged parrot in the parlours and salons of the affluent can articulate contemporary concerns about the consumption of luxuries and sexual profligacy. Male literary commentators used the parrot as a medium for creating knowledge about the female body, emotions, and sexual appetitive.

Significantly for some women however, the caged parrot was a powerful avian token of their own social captivity.

But alongside this ‘parlour parrot’ was the ‘paper parrot’ that featured in paper menageries: illustrated works of natural history. I shall show how women were significant in the production of the scientific knowledge and authorities embedded in these texts.

As patrons, collectors, illustrators, and consumers, women were instrumental in the production of paper menageries – including George Edwards’ *A Natural History of Birds* (1743-1751) and William Hayes’ *Portraits of Rare and Curious Birds* (1794). Some women like Sarah Child and Lady Martha Wager used their wealth and social connections to build vast collections of parrots and other exotic birds. Other women like Elizabeth Albin and Sarah Stone drew both living and dead birds for the pages of the paper menageries that visualised such collections.

Utilising paper menageries, novels, personal correspondence, and satirical works I will explore the presence of ‘parlour parrot’ and ‘paper parrot’ in eighteenth century Britain. I shall argue that as the parrot, both living and dead, moved through differing social spaces and texts; it was capable of producing very different knowledge about women and birds.

Stephanie Eichberg (University of Durham)

Crossing Boundaries in the Life Sciences: Experiment and the question of the Human-Animal Boundary

Since Allan Franklin’s *The Neglect of Experiment* (1986), experimental practice has become a major trend in the history, philosophy and sociology of science. The majority of works, though, still focus on physics, chemistry and technology whereas studies on the history of experimentalism in the life sciences remain rather scarce. One aspect in particular has so far failed to receive much attention: the beginnings of a systematic reliance on animal models for the formation of knowledge in (human) physiology and medicine.

My paper will address this vital constituent of ‘life science in the making’ by focussing on two examples of eighteenth- and early nineteenth-century investigations of the nervous system. I will argue that the adjustment and/or modification of the species’ difference was an essential aspect of the experimental practice in physiology, influencing the formation of physiological concepts, such as sensation, as well as our understanding of bodily experience in health and disease.

I will mainly focus on two leading figures in the early days of ‘neurophysiological’ research: Albrecht von Haller (1708-1777) and Francois Magendie (1785-1855). Both were influential for establishing animal experimentation as a viable method to gain knowledge about (human) bodily functions and both tackled the question of ‘sensibility’ as the most fundamental property of living bodies. In analyzing some of their experiments on the nervous system, I will address the following questions in my paper: What does ‘sensibility/sensation’ signify in eighteenth- and nineteenth-century physiology? How was it assessed or measured during experiment? How were nervous functions ‘read’ that is observable behaviour of the experimental subject interpreted? And

finally: How did experimentalists address the alleged difference between humans and animals in the context of their investigations?

Daniel Mitchell (University of Oxford)

Gabriel Lippmann and the Form of French Physics

Historians have typically treated textbooks as both a pedagogical tool and a means of presenting the finished products of scientific enquiry. I argue instead that Gabriel Lippmann's (1845-1921) electricity and thermodynamics textbooks – *Absolute Electrical Units* (1899) and *Lessons in Thermodynamics* (1889) – were aimed at giving these sciences their definitive form, in accordance with the aims of French mathematical physics. This eschewed causal hypotheses in favour of capturing experimental results in a network of covering laws derived from a minimum of experimentally-established principles.

Unsurprisingly, French physicists regarded the science of thermodynamics, unconcerned with the specific nature of heat and based on supposedly universal principles, as an exemplar for the remodelling of other branches of physics. I chart its influence on Lippmann's presentation of electricity, and relate this to his interest in the type of phenomena known as reciprocal macroscopic effects, in which one form of energy is converted into another.

My research on Lippmann, drawing upon the content of original papers, textbooks and review articles, is part of a wider attempt to understand the distinctive values of French physics during the period c.1870-1900, of which the perfection in the form of a science is an example. These values shaped the aims, practices and products of research, and defined a single, entwined community of physicists in Paris sharing common educational roots. I take Lippmann's science to represent the purest application of these values, and demonstrate its influence on important French physics research projects during the period.

Boris Jardine (University of Cambridge)

The Constructive Idea: Aesthetics, Ideology, and Science in 1930s Cambridge and London

Since the publication, in 1978, of Gary Werskey's seminal book "The Visible College", the 'social relations of science' movement has been the subject of a great deal of study, understood generally as the product of a coherent and self-contained network of scientists who shared a highly politicized view of the social function of scientific research. Less well known, however, are the aesthetic interests of these and other like-minded scientists, and the artistic network concomitant and overlapping with Werskey's group. This side of the left-wing intellectual community centres around the chemist and crystallographer J.D.Bernal, whose links to the sculptors Barbara Hepworth, Naum Gabo, and László Moholy-Nagy point not only to the common ideology of scientists and artists in the inter-war period, but also to the existence of a complex network of patronage, socialising, correspondence, and collaborative work. Within the broader project of fully describing this milieu, the present paper deals specifically with Bernal and his artist friends, focusing on Bernal's writings on art and Gabo's writings on science. The

questions I explore are: How closely related were Bernal's philosophy and sociology of science to the ideological concerns of the Marxist-Constructivist artists who lived in Britain in the 1930s? Can we clearly delimit the network of artists and scientists in the period, and, if so, what does their 'collective biography' tell us about the content and movement of their ideas?