Institution: University of Leeds

Unit of Assessment: 32 Philosophy (including History of Science)

Title of case study: Impact Case Study 2: Unlocking the Technoscientific Past through New Approaches to Intellectual Property

1. Summary of the impact (indicative maximum 100 words)

This case demonstrates the impact of collaborative research undertaken at the University of Leeds with regard to the role of intellectual property (IP) in the technosciences. It has shed new light on historical resources and helped to deepen public understanding of IP. In the Thackray Medical Museum and Oxford Museum of the History of Science, curators, educators and exhibition designers have benefited from **Gooday's** work on the history of patenting in electrical technology, enabling more effective interpretation of their collections. At the National Institute for Agricultural Botany, research undertaken within **Radick's** 'expanded IP' framework is being used to strengthen the Institute's position and importance.

2. Underpinning research (indicative maximum 500 words)

Today the sciences are taken for granted as a major source of new and useful technologies potentially beneficial to all. Yet when researchers, or the companies they work for, claim ownership rights over their discoveries or inventions, the result is often profound unease. What, in the twenty-first century, are the most valuable lessons to learn from history about the proper place of ownership claims in the technosciences? It was with the aim of answering this question that **Graeme Gooday** (at Leeds since 1994) and **Gregory Radick** (at Leeds since 2000 and working on this project since 2006) established an AHRC-funded project in 2007 **(i)** with Professor Christine MacLeod (Bristol) looking at IP as shaping, and shaped by, British science and technology in the decades around 1900. Each brought to bear distinctive research expertise: **Gooday** in Victorian electrical technoscience and its contexts **(1)**; **Radick** in the history of genetics and its intersections with IP **(2)**; and MacLeod in early aeronautics and the British patent system.

A major outlet for the research of the project team (which included a Leeds-based postdoctoral fellow, Dr Stathis Arapostathis, and a postgraduate student Berris Charnley) is a recent special issue of the journal *Studies in History and Philosophy of Science*, edited by MacLeod and **Radick (3)**. The nine papers make use of a new and general conceptual framework developed by **Radick** for the analysis of IP claims in the technosciences. The core proposal is to study interactions between IP claims narrowly construed – the familiar legal instruments of patents, trademarks and so on ('IP-narrow') – and other, broader sorts of ownership claims ('IP-broad'), notably claims to have discovered something first ('priority claims') and, on behalf of a discipline, claims that its theoretical principles explain the success of useful techniques and technologies ('productivity claims'). This recognition of intersecting narrow and broad concepts of IP is making possible a more comprehensive mapping of the complex ways in which ownership claims have conditioned innovation in the sciences.

Beyond the special issue, project outputs include journal articles by **Gooday (4 & 5)**, the PhD thesis by the Leeds-based AHRC project student Berris Charnley, and an MIT Press monograph co-authored by **Gooday** with Arapostathis (based at Leeds during the research and drafting), which offers a detailed reconstruction of a number of extraordinary patent controversies in late Victorian electrical technoscience **(6)**. In this work, Arapostathis and **Gooday** urge that the presumption in patent law of a "true and first" inventor unhelpfully perpetuates the myth that invention is an individual, rather than collective, activity.

The project has also generated 'spin off' funded research initiatives, notably collaborative PhD and postdoctoral projects on patents and innovation in telecommunications and medicine and on the history of the National Institute of Agricultural Botany, which was shown by **Radick's** research to have been instrumental in securing the reputation of genetics among British plant breeders (**ii-v**). In addition, **Radick** established the IPBio regional and international research network on intellectual property and the technosciences, serving to bring together academics, lawyers and policymakers **(vi)**.

3. References to the research (indicative maximum of six references)

Books and articles

(1) Graeme Gooday, *The Morals of Measurement: Accuracy, Irony and Trust in Late Victorian Electrical Practice* (Cambridge: Cambridge University Press, 2004). *Available on request.*

(2) Gregory Radick, "Discovering and Patenting Human Genes," in A. Bainham et al., *Body Lore and Laws*, pp. 63-78. Oxford: Hart Publishing, 2002. A pioneering article that emerged through participation in the Cambridge Socio-Legal Group, it was cited in two Nuffield Council on Bioethics reports, among other publications. *Available on request.*

(3) Christine MacLeod and Gregory Radick (eds.) *Owning and Disowning Invention: Intellectual Property and Identity in the Technosciences in Britain, 1870-1930*. Part Special issue of *Studies in History and Philosophy of Science*, June 2013 http://www.sciencedirect.com/science/journal/00393681/44/2, with a substantial analytical introduction co-authored by Radick, and two papers each, as sole author and co-author, from Radick (on IP and agricultural botany) and Gooday (on IP and electrical technoscience). Radick's papers are listed in REF 2. *Available on request.*

(4) Graeme Gooday, "'Vague and artificial': The Historically Elusive Distinction Between Pure and Applied Science", Focus: Applied Science, ed. R. Bud, *Isis* 103 (2012): 546-54 DOI: 10.1086/667978 *Available on request.*

(5) Graeme Gooday "Liars, experts and authorities", *History of Science* 46 (2008), 431-56. http://www.shpltd.co.uk/History%20of%20Science%20December%202008.pdf. *Available on request.*

(6) Stathis Arapostathis and Graeme Gooday, *Patently Contestable: Electrical Technologies and Inventor Identities on Trial in Britain.* MIT. (Cambridge MA/London, MIT Press, 2013). *Included in REF 2*.

Grants

(i) AHRC Research Grant: "Owning and Disowning Invention: Intellectual Property, Authority and Identity in British Science and Technology, 1880-1920", 2007-10, £325,075.40, PI Gooday, co-I Radick.

(ii) AHRC Collaborative Doctoral Awards in telecommunications history: "The Telegraphic Life: Recovering the Work of Submarine Cable Technicians, 1850-1914'", with the National Maritime Museum and Porthcurno Telegraph Museum, 2008-14; "'Beyond Marconi: The Roles of the Institution of Electrical Engineers (IEE) and the General Post Office in the Collective Invention of Radio up to 1914", with the IEE and BT Archives, 2009-12; "Whose call? Mapping the early usage and non-usage of the telephone in Britain", with BT Archives, 2 studentships, 2010-14 – ca. £250,000 in total, PI Gooday.

(iii) AHRC Follow-on Funding in telecommunications history: "Innovating in Combat: Telecommunications and Intellectual Property in the First World War", with the Museum of the History of Science, University of Oxford, 2013-14, £103,390, PI Gooday.

(iv) AHRC Knowledge Transfer Fellowship in medical history: "Patently Innovative? Re-interpreting the History of Industrial Medicine", with the Thackray Museum, 2011-12, £77,855, PI Gooday.

(v) AHRC Collaborative Doctoral Awards with the National Institute of Agricultural Botany: "Forging a Science of Food Security: Testing, Statistics and Regulation at the National Institute of

Agricultural Botany, 1919-1969", 2010-13; "Food Security in the Biotech Age: The National Institute of Agricultural Botany from 1970 to the Present", 2 studentships, 2012-16 – ca. £150,000 in total, PI Radick.

(vi) Research network funding: "The White Rose IPBio Project", White Rose Consortium, 2009-11, ca. £13,350, PI Radick, funding the first stage of the international IPBio Network, www.ipbio.org

4. Details of the impact (indicative maximum 750 words)

The research projects led by **Gooday** and **Radick** in collaboration with research students and postdoctoral fellows have allowed UK museums and science institutions to develop a deeper understanding of IP and its critical bearing on learning resources and on building institutional legacies. The research has had a sustainable impact across two major areas of collaboration: first through **Gooday's** leadership on projects with the Thackray Medical Museum in Leeds and the Museum of the History of Science at the University of Oxford, which have helped motivate shifts in historical understanding and generated novel engagement with schools; and second, through **Radick's** research and regular consultation with the NIAB at joint supervisions of their Leeds CDA students, which have helped re-position the NIAB archive as a significant resource.

Museums and Archives

The above perspectives on patenting were brought to bear on ca. 1900 electrical medical technologies and the question of how to display these so as to engage 21st Century audiences. The Thackray Medical Museum (Leeds) has welcomed input on the multiple meanings of patents for its displays. A one-year AHRC Knowledge Transfer Fellowship for a follow-up project on re-interpreting the history of medical patents generated outcomes that included revised interpretation of patented artefacts in Thackray museum collections and a range of online materials **(A);** articles for general medical audiences in the *BMJ* **(B)** and general science audiences in the *New Scientist* **(C)**; and training workshops for six Thackray staff on 20th and 31st January 2012 (corroboration in **E**). The Thackray's Assistant Curator noted how *"the staff training was an opportunity to challenge preconceptions around medical patents, the outcome of which was a more diverse range of interpretation methods and enabled museum staff to look at a collection differently, the outcome of which is inevitably a more diverse range of interpretation methods."* **(D)** In a post-project interview, the Joint CEO at the Thackray reported that the project *"was the first time the museum had worked in this way with academic partners, but that this had proved so successful that she had included the model in funding applications made since."* **(E)**

Gooday's research on communications technologies have also emerged as especially instructive for clarifying ca. 1900 IP relationships, narrowly and broadly construed, providing the framework, for example, for the interview with Elizabeth Bruton (a PhD student on **Gooday's** AHRC-funded CDA project with BT Archives) on Marconi and patents in the BBC television series, *The Story of Electricity* (2011) and *The Genius of Invention* (2013) **(F)**. Bruton is now a Leeds postdoctoral researcher on an AHRC-funded Follow-on collaboration with the Museum of the History of Science at the University of Oxford on 'Innovation in Combat', exploring IP issues in First World War telecommunications. In collaboration with Leeds teachers, she has developed a schools pack from **Gooday's** research on the patented Fullerphone of 1916 that offers pupils a fresh approach to interpreting WWI by focusing on inventions, especially in telecommunications, rather than on weapons. The lead collaborative partner at Oxford anticipates that this project will provide the Museum with *"an opportunity for novel schools engagement, and the creation and delivery of new resources".* A project workshop on 28 June 2013 engaged 40+ museums and archives staff from across the UK with these results and collected evidence of impact achieved. **(G)**.

National Institute of Agricultural Botany

A seminar for NIAB staff in 2009 by **Radick** and AHRC project student Charnley led to further collaborations, with the aim of using **Radick's** IP-and-genetics research as a framework for putting NIAB's history on a firmer scholarly footing. The research was also effective in redefining that

history, within NIAB and more widely, as a vital resource for thinking through pressing questions about private/public relations in the sciences today. In her letter of support for the most recent AHRC CDA application with NIAB, its CEO noted (10 November 2011) that the partnership with Leeds had identified key issues that enhanced the understanding of NIAB's historical foundation. The IP-narrow/-broad distinction has been central to revealing how NIAB's past is relevant to its present, notably in energizing research on the difficulties surrounding its foundation as servant of both the British state and commercial plant breeders. Stressing that the challenges of funding the NIAB's applied, translational work have never gone away, the CEO reported that *"exploring that early rationale is helping us to position NIAB firmly at the interface between basic plant science and application, providing a pathway to impact for research."* The strategic importance of the work of the Leeds researchers in the run-up to NIAB's centenary plans, in 2019, was further underscored, especially with regard to facilitating understanding of how NIAB has adapted to major changes affecting the ecosystem in which it operates. In expanding its work with Leeds, it was noted, NIAB will be better able to make use of its history *"to strengthen and guide our strategy, developing key messages about our ability to adapt and respond, and positioning us to take advantage of development opportunities."* **(I)**

Taking forward this collaborative project, NIAB and **Radick** have worked together to secure three CDA awards, funding research on the Institute's value as a knowledge-making site over three periods: from its founding in 1919 to 1969; from 1969 to the present; and in the present day. The project student on the first CDA, Dominic Berry, has not only organized NIAB's archive (**J**) but has presented his research at the NIAB Founders Day (10 Feb. 2012) and other on-site events. As a result of these activities (informed by **Radick's** IP-narrow/-broad framework), key aspects of NIAB's past have been made newly accessible and relevant to staff there. In praising the transformation of NIAB's archive into *"a much-valued resource,"* NIAB's Communications Manager expressed particular appreciation for the way that the Leeds team's work has revealed how far *"NIAB's original aims and objectives in supporting the development of improved crop varieties and seeds to safeguard food supplies are as relevant today in terms of addressing food security as they were in 1919."* **(K)**

5. Sources to corroborate the impact (indicative maximum of 10 references)

(A) Project website at the Thackray Museum http://www.thackraymedicalmuseum.co.uk/library-resources/collaborative-research/recent-projects/ (accessed 24/09/13)
(B) "A New Electronic Theory of Life", *British Medical Journal*, 17 March 2012, p. 34
(C) Quoted in "The Ultimate Recharge", NEW SCIENTIST 16 February 2013: 41-43.
(D) Assistant Curator, Thackray Museum, Leeds, testimonial available upon request, (dated 07/03/13)
(E) Joint CEO, Thackray Museum, Leeds, interview summary available upon request, (dated 19/12/12)
(F) BBC websites: The Story of Electricity website: http://www.bbc.co.uk/programmes/p00kjq6h; (accessed 24/09/13) The Genius of Invention, http://www.bbc.co.uk/mediacentre/proginfo/2013/04/the-genius-of-invention.html (accessed 24/09/13)
(G) Educational material and impact evidence for this joint Leeds/Oxford project available at http://blogs.mhs.ox.ac.uk/innovatingincombat/ (accessed 24/09/13); testimonials available upon request, (dated 25/02/13)
(I) Letter from NIAB CEO, available upon request, (dated 10/11/11)
(J) For the NIAB archive handlist, see http://niabarchive.org/archive-search (accessed 17/10/13); also see: http://www.niab.com/news_and_events/article/222 (accessed 24/09/13) and http://www.niab.com/uploads/files/NIAB_Focus_4pp_A4_1-12_final.pdf (accessed 24/09/13)
(K) Letter from NIAB Communications Manager, available upon request, (dated 16/10/13)