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Plurality in Patenting: Medical Technology and Cultures of Protection

James F. Stark

Patenting has had neither a single strategy nor a simple meaning. In almost all developed countries the process of securing a patent has become increasingly convoluted, whilst the functions of patents once conferred reach far beyond the confines of these narrow, complex legal documents. Indeed, even the very text of patents themselves has contested legal and political significance and can fulfil multiple social functions.¹ Recent historical research on electrical technologies in Britain has shown that patents could at once be used to make profit, subsidise future research activities, support family income through investment, attract capital investment in business with the promise of patent-protected returns, bargain with other corporate entities, assure purchasers of quality and efficacy, and provide legal protection over creative assets against predation by competitors. Similarly, when patenting did not take place it could be for comparably diverse reasons, whether because the claimed invention lack novelty, the company or individual sought instead to profit in non-monetary terms through professional, moral credit, or patenting was regarded by the inventor(s) as being unprincipled and a breach of gentlemanly etiquette.² That this narrative of patents as multi-functional documents and key architects of inventive strategy relates only to Britain during the critical decades around 1900 serves to further highlight the disparate meanings, practices and cultures associated with patenting and the use of patents.

The concurrent development of different national systems of patenting across the world has yielded an international landscape of patent law and practices characterised by diversity.

Furthermore, beyond the confines of patents as legal entities, the process of obtaining and using a patent has become cloaked in layers of socio-cultural meaning. These wider “patent cultures” – the ideas, meanings and motivations associated with invention – have been to a large extent informed by professional norms and practices in a wide range of fields, including electrical and aeronautical engineering and plant breeding.³ Disciplinary constraints of professionalism, profit

and ethics, as well as the limitations of patents themselves provided the backdrop against which corporate interests and entrepreneurial individuals attempted to expand the meaning and function of intellectual property. Others shunned the mechanism of patenting, trademarking and copyright in favour of softer, broader forms of intellectual property, preferring instead to exercise moral property rights through strategies such as eponymity and professional credit and recognition.⁴

The relationship between commercial activity and medical practice is now well established in current scholarship, emerging from landmark studies by Dorothy and Roy Porter focusing on the eighteenth century.⁵ Medicine, and in particular medical technologies and pharmaceuticals, therefore offers another lens through which to examine the use (and non-use) of patenting strategies, the implications of these for the inventive process, and the wider cultures of ownership, consumerism and protection within healthcare. By taking seriously not just patents themselves as historical source materials, but the wider cultural, professional and technological context in which patenting took place, the essays in this collection move beyond a narrow view of intellectual property which still dominates within the literature.⁶ Similarly, accounts of both contemporary and historical patenting within biomedicine have focused largely on pharmaceuticals and big business, thus presenting a misleading view of both the role of intellectual property in medicine and of patenting itself.⁷

The essays in this collection focus on patent cultures in the Anglo-American context. They represent diverse examples within the development, implementation and impact of patenting regimes – from patent medicines in Georgian England to early twentieth century pharmaceuticals in the US – yet these differences serve to highlight the multiplicity of patent approaches across the period, even within the confines of the Anglo-American model. The meaning and function of patents changed radically over the course of the long nineteenth century, with far-reaching consequences for medical practices. It is in some ways a messy history – littered with dissenting voices, intra- and inter-professional conflict and a complex and heterogeneous landscape of

different patent systems, each reflecting different national cultures and priorities – yet several clear themes are visible across this long durée.

First, choices about whether or not to engage in patenting and other forms of protection were rooted in a wide range of factors, from the desire to establish control in a given market to a need to prevent others from doing so. The motivations underpinning these decisions were similarly diverse, whether to protect professional integrity, profit from commercial activity or enable investment in future research. Second, patents themselves functioned in different ways for consumers, acting variously as symbols of ownership, markers of efficacy and claims to novelty. In the context of medical practice, these different meanings became the source of intense negotiations, not infrequently leading to damaging, lengthy and expensive legal battles. Third, it is clear that the relationship between patenting and the medical profession was transformed during this period, from one of cautious denial to active engagement. Ultimately, professional medical bodies recognised that patenting was just one of many different ways of establishing credit, alongside, for example, eponymity; yet patenting acquired new legitimacy and respectability as the value and necessity of the collaborative relationship between practitioners, entrepreneurs and manufacturers became more widely-recognised during the early twentieth century.

Until the turn of the twentieth century it was far from certain that protecting innovations using patents in any field of scientific or technical endeavour conferred authority and expertise on the patentee. However, amongst the many examples of extensive patentees in Britain, individuals such as William Thomson (later Lord Kelvin), James Swinburne and Sebastian de Ferranti were increasingly able to maintain scientific credibility (all became Fellows of the Royal Society) whilst at the same time engaging in commercial activities and taking out a significant number of patents.⁸ Thomson himself used the proceeds from his business ventures to provide financial backing for his Glasgow laboratories, and his collaborators were able to enjoy similar benefits, demonstrating the synchronicity between science and commerce.

The successful occupation of spheres of knowledge and profit in science was by no means transferrable to other fields, however. Even in the early twentieth century the relationship between physicians, entrepreneurs and patenting remained complex in the realm of devices related to medicine and health. Guglielmo Marconi was able to exploit his status as an outsider to successfully repurpose the thermionic valves which underpinned his radio technology (first patented by his collaborator John Ambrose Fleming) to launch the Marconi Otophone in 1923. The technology which was patented by Fleming, then assigned to the Marconi Company, had become far less valuable by the early 1920s as the patent expired.⁹ Marconi therefore sought to extract an alternative form of value from the valves by producing a new ‘Scientific aid to the Deaf’ and the first widely-marketed electronic hearing aid: the Otophone.¹⁰ By employing the services of the prestigious hearing aid and medical manufacturer T. Hawksley Ltd., Marconi further established his credibility in the field and was able to re-assert the philanthropic and benevolent reputation of his company after a series of damaging court battles concerning the ownership of key aspects of radio technology. Although the Otophone was heavy, ill-suited to the subtleties of hearing loss and in many respects inferior to the then more popular, lighter, cheaper and more effective acoustic hearing aids, the Marconi Company persisted with several different models into the 1930s in order to assert to their reputation as innovators, making novel use of a formerly-patented technology which was now freely available to their competitors.¹¹

In a different vein, obtaining new patents formed a key part of the marketing strategy for a number of influential medical devices in the early twentieth century, such as the Kromayer Lamp and Overbeck Rejuvenator. The first of these emerged from patents taken out by the Berlin-based dermatologist Ernst Kromayer, the second was the brainchild of British entrepreneur Otto Overbeck.

Kromayer collaborated with the Newark-based Hanovia Chemical and Manufacturing Company who manufactured a new design of UV lamp based on Kromayer’s specifications.¹² In a phototherapy marketplace dominated by the prestigious (unpatented) Finsen Lamp, Kromayer

claimed that his device offered improved clinical outcomes for patients in the case of numerous skin complaints.¹³ Although it bore his name, Kromayer himself remained at a distance from the commercial world inhabited by Hanovia (he was not mentioned in their promotional material, for example) and instead sought to use the device to increase his professional standing through improved medical practice.¹⁴ Meanwhile the Hanovia Company were free to engage in litigation to try and protect their devices from infringement, the kind of action which would have been damaging for Kromayer's reputation as an impartial medical practitioner.¹⁵ Kromayer therefore followed in a long tradition of eponymity as a form of professional credit in medicine, despite in fact taking out patents to protect his invention.

Whilst Kromayer was encumbered by his professional status and chose to pursue alternative forms of credit despite lending his name to a medical device, there were no such barriers for inventors outside the medical profession. Otto Overbeck was a British brewer's chemist who used patents as part of an aggressive marketing strategy associated with his eponymous electrotherapy device, first produced in 1925.¹⁶ Overbeck used patents to enhance his credentials as an innovator and purveyor of efficacious medical devices for use in the home. These patents formed part of a commercial culture which saw forms of intellectual property function alongside testimonials from professionals and users, appeals to novelty, and claims of scientific authenticity on the part of the inventor. For Overbeck, the patents which he took out were not designed to protect against infringement from competitors, but rather to reinforce the status of the Rejuvenator as a trustworthy and effective alternative to mainstream medical practice.¹⁷ The use of patents as marketing tools in this way elevated their meaning and significance from legal documents which conferred a recognition of novelty to statements of effectiveness.

Whilst patenting could therefore form an important part of the commercial efforts of individuals and medical manufacturers, we know, for example, that many large companies and individual practitioners chose to approach patenting with caution. In the case of Burroughs, Wellcome and Co. it was not self-evident that seeking to protect new products through intellectual property was

an appropriate or commercially desirable strategy. During the interwar period the company balanced scholarly publication with active patenting in an attempt to ‘preserve the reputation of the laboratories’ from where these products originated.¹⁸ This approach – favouring publication over patenting – was only abandoned as competitors began to cramp the field by taking out so-called ‘blocking patents’ in order to prevent the exploitation of potentially fruitful research areas.¹⁹ In a similar vein, the fruitful collaboration from the 1960s in the development of modern total hip replacement prostheses between the noted orthopaedic surgeon Sir John Charnley (1911-1982) and the Thackray Company was originally characterised by the absence of patenting. Only after infringement by US competitors led to a spate of inferior imitations did Charnley and his collaborators attempt to protect the integrity of their products by taking out patents.²⁰ The function of patents in both of these cases was therefore primarily defensive; they were designed to prevent potential infringers from dominating the market. Seen in this context, patents and the motivation to obtain them, offer a window into professional and commercial norms in biomedicine.

In this collection of papers, just as in the case of these three medical devices from the early twentieth century, we therefore encounter patents and patentees acting in a diverse range of ways. Alan Mackintosh begins with the secret, owned, Georgian medicines which were normally known as patent medicines, though few had a current patent. Up to 1830, only 118 medicines had been patented, while over 1,300 were listed in that year for taxation purposes as ‘patent medicines’. So what were the benefits of patenting and why did so many owners prefer to forgo them? Did medicine patenting affect consumer perception, and how was this used as a marketing tool? Could any medical device or therapy be patented?

Mackintosh shows that the authority of the patent was primarily a marketing tool for medicines: owners relied on recipe secrecy to maintain the value of their product, not the legal uncertainties of what was a disorganised, chaotic and expensive patent system. The patent was also exploited as a form of copyright to define ownership of a medicine’s name. In contrast to later periods,

novelty was not a prerequisite for obtaining a patent, and few applications seem to have been refused. Medicine patenting grew and declined, peaking in the 1750s. It was deterred by the high cost and inconvenience of application, but particularly by the increasing legal uncertainty about maintaining the recipe secrecy, the growing reputational considerations for the proposer, and the provision, from 1783, of the excise stamp as an alternative form of authority.

For the consumer, Mackintosh argues, the patent provided an apparent government guarantee on the source and composition of a widely-available product. Wholesalers sought to extend this assurance to all their medicines, resulting in the common name for all these owned medicines. In contrast to medicines, the patenting of medical devices or other therapies was largely unknown before the last third of the eighteenth century and seems to have been used for its stated purpose, the granting of a temporary monopoly for the inventor's benefit. Improved mechanical devices dominated this group with the patenting of other forms of therapy, such as electrical machines, being restrained by developing codes of conduct, demonstrating that this period saw the emergence of sophisticated and complex cultures of patenting in the field of medicine.

In contrast to the more clearly-defined scope of patenting in relation to a single mechanism or product, the apportioning of credit and ownership in the case of surgical procedures and other forms of tacit knowledge was far more complex. Sally Frampton begins her examination of the place of surgical procedures in nineteenth century Britain with an episode during the 1840s which seemed to clarify to the British medical profession the inapplicability of patents to surgical practice: the controversial attempt by two American practitioners to patent the anaesthetic agent ether under the name 'Letheon'. A growing consensus emerged soon after that patenting in surgery was both morally dubious and practically untenable. Instead, surgeons pursued other routes in order to secure credit – both social and financial – for their inventions, although the nature of surgical practice, where constant modifications to operations were taking place, meant that negotiating credit was rarely a straightforward process.

While surgical methods were not deemed patentable in the nineteenth century, Frampton argues, surgeons were nonetheless embedded within a culture which increasingly valued the intellectual labour of successful innovators. In an atmosphere of heightened awareness about the role of the inventor in society, and while an influx of new operations were being introduced into practice, the question of how surgeons should be recognised and rewarded for their inventions was considered one of paramount importance, both within the surgical community and outside of it.

Forms of ownership, protection and recognition associated with tacit knowledge has always been ambiguous, and surgical procedures exemplify this. On the other hand, the pharmaceutical industry appears to be inextricably bound up with patenting and profitability. Joseph Gabriel explains changes in attitudes towards the patenting of drugs in the American medical market from the mid-nineteenth century to the period immediately following the Second World War. Gabriel argues that protracted yet substantial shifts took place in the ethical sensibilities surrounding these practices. Manufacturers and physicians alike viewed patenting as morally questionable activity; reputable manufacturers did not engage in patenting, while medical practitioners frequently refused to prescribe drugs which had been patented.

This scorn towards patenting, mirroring in some ways the case of earlier English medical patenting discussed by Mackintosh, was gradually softened in the latter part of the nineteenth century and, Gabriel shows, by the outbreak of the First World War many physicians had begun to argue that patenting and the associated profitability enabled companies to pour greater resources into developing new products, even if physicians themselves were unable to profit from their own patented preparations. This stipulation too, however, was eventually to make way for an ethical framework which permitted medical practitioners to protect their innovations using patents and to receive profit from the use of these drugs.

Gabriel therefore charts a significant sea change in both the informal attitudes towards and formal ethical guidance governing the wider patent culture of drug development, manufacture and usage

in the United States. Meanwhile, for the British case, Claire Jones examines the parallel context of medical and surgical patenting around the turn of the twentieth century. Jones argues that many in the medical profession regarded patenting of medical and surgical devices as a dangerous hindrance which impacted negatively on the treatment options which they could recommend to patients. However, Jones argues, the strict codes of conduct which arose from this approach led many practitioners to consciously rebel and assert their right to protect and profit from their innovations. The legacy of the discord outlined by Jones was long-lived, and the repercussions of an assertive approach to regulating medical practitioners' patenting habits continue to affect the landscape of medical practice in Britain, where the regulation governing innovation in pharmaceuticals and devices is markedly different.

Looking at across the papers in this collection it is clear that the professional status of patented medicines, practitioners who engaged in patenting and the companies who sought to explore the market for new products was transformed from the 1780s to around the 1920s. The very meaning of the word 'patent' in relation to pharmaceutical preparations was virtually unrecognisable, whilst attempts to protect surgical devices and procedures during the nineteenth century met with various degrees of resistance from the medical establishment. Parallels between Britain and the US are clearly visible as both countries shared a similar model of patenting and common professional ethical guidelines for practitioners.

The overall argument which emerges from the papers is three-fold: firstly, that the motivations for choosing to patent or not to patent were highly variable. Within the medical profession some sought financial gain from sales or patent licensing achieved by legal protection from infringements by rivals, whilst for others the imperative was to make their devices freely available, often in exchange for other forms of professional credit or eponymous recognition. By contrast, manufacturers and others outside the medical profession were able to capitalise on their exemption from medical codes of conduct, free to use the patent system more creative and without fear of professional repercussions. Secondly, patents associated with a device affected

not just its status as novel or new, but also its price, availability, and even perceived therapeutic or diagnostic efficacy. When patents expired this had a knock-on effect on the commercial and clinical role of medical technologies. Consequently, patented instruments and/or products and those named eponymously after specific individuals influenced the cachet and credibility among both professionals and high-street entrepreneurs. Finally, this collection demonstrates that initial, strong taboos against proprietary appropriation seem eventually to have been overcome by the precepts of Anglo-American liberalism that privileged novelty above ethics. In essence, potential commercial encroachment into medicine was rationalised and justified through claims of increased innovation. However existing scholarship does not explain how, why and when this transition occurred.

The transition from abstention to engagement with patenting cultures reflected a broader shift which took place from the late nineteenth century onwards, with a particular form of Anglo-American liberalism coming to dominate the landscape of intellectual property. This model, in which patenting was a key strand, challenged traditional resistance to proprietary appropriation in medicine and has come to dominate the global medical industry. Further, whilst the origins of this particular approach did indeed lie in the patenting systems of the US and Britain, other countries, such as Japan, looked to these as a model for implementing strategies of their own. The essays in this collection explore the development of and resistance to the implementation and export of new approaches to patenting in biomedicine, the role of physicians and manufacturers in both directing and responding to these changes, and the impact of this complex interplay between invention and market on healthcare practices.

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and John Law (eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change*, Cambridge MA: MIT Press, 1992.

² Graeme Gooday and Stathis Arapostathis, *Patently Contestable: Electrical Technologies and Inventor Identities on Trial in Britain*, Cambridge MA: MIT Press, 2013.

³ Jonathan Hopwood-Lewis and Christine MacLeod, 'Patents, Publicity and Priority: The Aeronautical Society of Great Britain, 1897-1919', *Studies in History and Philosophy of Science Part A* (2013) 44:2, pp. 212-221; Berris Charnley and Gregory Radick, 'Intellectual Property, Plant Breeding and the Making of Mendelian Genetics', *Studies in History and Philosophy of Science Part A* (2013) 44:2, pp. 222-233.

⁴ Christine MacLeod and Gregory Radick, 'Claiming Ownership in the Technosciences: Patents, Priority and Productivity', *Studies in History and Philosophy of Science Part A* (2013) 44:2, pp. 188-201.

⁵ Roy Porter, *Health for Sale: Quackery in England 1650-1850*, Manchester: Manchester University Press, 1989; Mark Jenner and Patrick Wallis (eds), *Medicine and the Market in England and its Colonies, c. 1450-1850*, Basingstoke: Palgrave Macmillan, 2007; Takahiro Ueyama, *Health in the Marketplace: Professionalism, Therapeutic Desires, and Medical Commodification in Late-Victorian London*, California: The Society for the Promotion of Science and Scholarship, 2010.

⁶ Adrian Johns, *Piracy: The Intellectual Property Wars from Gutenberg to Gates*, Chicago: University of Chicago Press, 2009.

⁷ Neil Gerlach, Sheryl N. Hamilton and Rebecca Sullivan (eds), *Becoming Biosubjects: Bodies, Systems, Technologies*, Toronto: University of Toronto Press, 2011; Herbert Gottweis, Brian Salter and Catherine Waldby, *The Global Politics of Human Embryonic Stem Cell Science: Regenerative Medicine in Transition*, Basingstoke: Palgrave Macmillan, 2009;

David Magnus, Arthur L. Caplan and Glenn McGee (eds.), *Who Owns Life?*, Amherst, NY: Prometheus, 2002.

⁸ Giuliano Pancaldi, 'The Web of Knowing, Doing and Patenting: William Thomson's Apparatus Room and the History of Electricity', in Mario Biagioli and Jessica Riskin (eds.), *Nature Engaged: Science in Practice from the Renaissance to the Present*, Basingstoke: Palgrave Macmillan, 2012, pp. 263-285; Gooday and Arapostathis, *op. cit.* (2), pp. 19-20.

⁹ 'Instrument for converting alternating electric currents into continuous currents', US Patent Number 803684, 7 November 1905.

¹⁰ 'British Wireless Exhibition: Development of the Industry', *The Times*, 29 September 1924, p. 7.

¹¹ 'London Medical Exhibition', *The Lancet*, 29 October 1932, pp. 973-975; 'The London Medical Exhibition', *The Lancet*, 28 October 1933, pp. 1005-1008.

¹² Details of the principal patents, including dates and patent numbers, taken out by Kromayer were emblazoned on a metal plate on the Kromayer Lamp. These included, most prominently: 'Therapeutic Apparatus', US Patent Number 834209, 23 October 1906.

¹³ Annie Jamieson, 'More than Meets the Eye: Revealing the Therapeutic Potential of "Light", 1896-1910' *Social History of Medicine* (2013) 26:4, pp. 715-737.

¹⁴ Hanovia Chemical and Manufacturing Company, *Presenting Hanovia Quartz Lamps*, Newark, NJ: Hanovia Chemical & Mfg. Co., 1932.

¹⁵ 'Westinghouse Electrical Corporation v. Hanovia Chemical & Mfg. Co.' 179 F.2d 293, 84 U.S.P.Q. 110, United States Court of Appeal Third Circuit, 27 December 1949.

¹⁶ James Stark, "'Recharge my Exhausted Batteries': Overbeck's Rejuvenator, Patenting and Public Medical Consumers, 1924-37', *Medical History* (2014) 58:4, pp. 498-518.

¹⁷ Otto Overbeck, *A New Electronic Theory of Life*, Grimsby: Chantry House, 1925.

¹⁸ Roy Church and E. M. Tansey, *Burroughs, Wellcome & Co.: Knowledge, Trust, Profit and the Transformation of the British Pharmaceutical Industry, 1880-1940*, Lancaster: Crucible, 2007, p. 319.

¹⁹ Church and Tansey, *op. cit.* (7), p. 321.

²⁰ Julie Anderson, Francis Neary and John V. Pickstone, *Surgeons, Manufacturers and Patients: A Transatlantic History of Total Hip Replacement*, Basingstoke: Palgrave Macmillan, 2007; P. Gomez and J. Morcuende, 'A Historical and Economic Perspective on Sir John Charnley, Chas F. Thackray Limited, and the Early Arthroplasty Industry', *Iowa Orthopaedic Journal* (2005) 25, pp. 30-37.