Introduction: the relationship between intellectual property and its physical embodiments

Jessica C. Lai and Antoinette Maget Dominicé

Intellectual property is typically considered to be exclusively incorporeal property since its products (particularly works and inventions) emanate from the mental labour of a creator. What is often forgotten is that even immaterial objects are usually (or arguably have to be) protected and used through a certain materiality, such as on canvas or as a pharmaceutical or trade-marked product. It is nevertheless the case that copyright protects “works” and not their materialisations, patent law protects ideas/inventions and not the physical good embodying them and trade marks protect marks used in trade and not the goods/services on which they are placed. However, despite being intangible in nature, intellectual property has hindered or controlled the access and use of the embodiments of intellectual products. We see this in many ways, such as the resale royalty right (for original art works), which does not attach to the intangible work, but to the physical embodiment.¹ Moral rights are a further illustration, as they are about the reputation of the author, and also the integrity of the work in many civil-law jurisdictions,² and thereby allow artists to prevent certain uses of the physical embodiments of their

---

¹ As noted by Graham Dutfield and Uma Suthersanen, *Global Intellectual Property Law* (Edward Elgar 2008) 53.

² Many civil law states do not require any harm to the reputation or honour of the author, but just a negative impact on the integrity of the work; see Jacques de Werra, ‘The Moral Right of Integrity’, in Estelle Derclaye (ed.), *Research Handbook on the Future of EU Copyright* (Edward Elgar 2009) 268–9. In contrast, common law countries tend to interpret the right narrowly such that it is not about the integrity of the work, but the reputation and honour of the author. See, generally, Mira T Sundara Rajan, *Moral Rights: Principles, Practice and New Technology* (OUP 2011).

works.³ Conversely, the embodiment can often restrict access to the intangible, as is often the case with original art works and inventions constituting biological specimens, discussed further below.

The dematerialisation of certain works such as music and “born-digital” games, the broad development of digital technologies and, generally speaking, the increased consideration of the intangible have led to a new (or at least perceived to be new) relationship between copyright, its corresponding material object and the access to it. As a result, we see the line between the work and its embodiment fade away.⁴ Advances in technological creation have equally changed the way in which we perceive the “intangible invention”. For example, biotechnology has proved to be either too intangible (with arguments that patents for genetic sequences cover mere abstract information), or too tangible (covering biological materials that cannot be broken down and described in words). At the same time, the ever-broadening reach of trade marks so as to include shapes has resulted in a collapse of the distinction between the intangible mark and its physical embodiment. Legal doctrine and jurisprudence have been slow to take these changes into account, when perhaps the law needs to readapt itself – the way it always has – to match changing conditions of access to certain goods.

Thinking about the history of intellectual property is also a means to think about its future, and it is the approach taken by Peter Yu in his analysis of the changing concept of “copy” and move towards the verb “to copy” (Chapter 3), and Jessica Lai in her historical and critical review of the “invention” in this volume (“A tale of two histories”, Chapter 4). Today, we tend to see intellectual property systems and the propertisation of the immaterial as having existed since time immemorial and set in stone, forgetting that modern intellectual property is indeed quite modern, becoming as we now know it to be only in the nineteenth century, following the French Revolution and gradual reconceptualisation in England.⁵ Not something recognised by Roman law, intellectual property most certainly developed from and with changes in technology and society.⁶ As an illustration, the advent of printing saw the first royal

---

³ Dawn M Leach, ‘Art World Thinking versus Legal Thinking’ (2002) 18(3) *Visual Resources: An International Journal of Documentation* 205.

⁴ Philippe Le Tourneau, ‘Folles idées sur les idées’ (2001) *Communication commerce électronique*, chron. n° 4.

⁵ Brad Sherman and Lionel Bently, *The Making of Modern Intellectual Property Law: The British Experience, 1760–1911* (CUP 1999).

⁶ Although Roman law recognised that certain laws related to things that were *incorporalis*, the protection of intellectual property as we know it today is

privileges granted to an individual person in France, usually attributed to Louis XII granting royal privileges in 1507 for the printing of Paul's "Epistles". Many other grants followed. However, they were strictly bound to a commercial privilege for a long time.⁷ In France, 1777 was a historic year for intellectual property, as a regulation concerning book-sellers and authors came into force, explicitly distinguishing one from another. The first laws promulgated after the French Revolution were predecessors of intellectual property as we know it today,⁸ because they did not consider moral rights and, in this sense, did not differentiate between copyright, patents and trade marks. The distinction from other intangible property rights, like business and clientele assets (including trade secrets), also had to be established. Further developments of intellectual property permitted the separation and qualification of its three main branches; in some countries this was followed by related rights (such as performers' rights and plant variety rights) and then a fourth branch, the so-called "*sui generis*" rights.

Similarly, in England, copyright law or the recognition of "authors" did not exist before the low-cost mechanical reproduction of works was made possible.⁹ Furthermore, as discussed by Yu in this volume (Chapter 3), the first copyright statute in England (Statute of Anne 1710) granted copyright in new books to authors and their assigns, not booksellers, and was to prevent printing or reprinting (not "reproduction" more broadly) of the protected work. Although the Statute of Monopolies 1623 is often stated to be the first patent law statute in the English-speaking world, copyright and patent law were often confused and used interchangeably until the mid-nineteenth century in England. The appearance of trade marks law as an area of intellectual property followed shortly thereafter.¹⁰

With changes in society and the development of new technologies (and, thus, new types of creativity), intellectual property has expanded

---

relatively new. Indeed, "intellectual property" is a twentieth-century term, believed to have first been used in the 1950s to refer to industrial property and copyright. See Peter Drahos, *A Philosophy of Intellectual Property* (Ashgate 1996) 14 and 16–17.

⁷ On this development, see Elizabeth Armstrong, *Before Copyright. The French Book Privilege System* (CUP 2002) 1498–526; and Mark Rose, *Owners and Authors. The Invention of Copyright* (Harvard University Press 1995).

⁸ Jane C Ginsburg, 'A Tale of Two Copyrights: Literary Protection in Revolutionary France and America' in Robert P Merges and Jane C Ginsburg (eds), *Foundations of Intellectual Property* (Foundation Press 2004) 285.

⁹ William Cornish, 'Conserving Culture and Copyright: A Partial History' (2009) 13(1) Edin L Rev 8.

¹⁰ Sherman and Bently (n 5) 166–72.

over time and this expansion is ongoing. Today, in the common-law world, the main reason we protect intellectual property (particularly works and inventions) is to incentivise or catalyse creativity and to ensure its dissemination.¹¹ Intellectual property is theorised around utilitarian and consequentialist “pseudo-economic” thinking.¹² In contrast, civil-law countries tend to be far more author-centric, as a consequence of basing their intellectual property reasoning in natural-rights theories, particularly Kantian and Hegelian theories related to personality and individuality.¹³ It is important not to exaggerate the differences between the way that common-law and civil-law countries justify intellectual property. It is clear from the literature that, during the development of modern intellectual property, England was influenced by natural rights theories and France was prone to utilitarian reasoning.¹⁴ Today, both common-law and civil-law jurisdictions depend heavily on utilitarian justifications and use natural-rights theories. Nevertheless, it is important to keep these philosophical roots in mind, as differences in law and jurisprudence can be seen as a consequence.

The digital revolution,¹⁵ and the influence of the Anglo-American or common-law conceptualisation of copyright, put into question the author-centric nature of many civil-law conceptualisations of intellectual property, such as the French one. Arguably, the two positions are not polar opposites, as the author-based conceptualisation gains by considering solutions developed around a consequence-centred conceptualisation,¹⁶ and vice versa. The “malignancy” of the latter (perceived as such because of its economic-centric nature) should not be overstated and opposed by the pseudo “naïve optimism” of the former. This opposition plays out not only between two conceptualisations of copyright, but also within a

---

¹¹ Séverine Dusollier, *Droit d'auteur et protection des œuvres dans l'environnement numérique* (Larcier 2005) 419.

¹² Sherman and Bently (n 5) 173–6.

¹³ Immanuel Kant, ‘On the Injustice of Counterfeiting Books’ (1785), reprinted in JAL Sterling, *World Copyright Law* (2nd edn, Sweet & Maxwell 2003); and Georg Wilhelm Friedrich Hegel, *Philosophy of Right* (Thomas M Knox tr., OUP 1967).

¹⁴ See, e.g., Paul Goldstein and Bernt Heugenholtz, *International Copyright: Principles, Law, and Practice* (3rd edn, OUP 2013) 6.

¹⁵ Jan Corbet, ‘Le développement technique conduit-il à un changement de la notion d’auteur?’ (1991) 2(148) RIDA 59.

¹⁶ Alain Strowel, *Droit d'auteur et copyright. Divergences et convergences, Etude de droit comparé* (Bruylant/LGDJ 1993).

single system between copyright maximalists and copyright minimalists, or between utilitarian theorists and non-utilitarian theorists.¹⁷

The concept of the public domain falls into an analogous opposition – or, one could say, balance. With varying opinions on its scope, role and importance, the notion and the content of the public domain vary from one country to the next. Depending on regulations,¹⁸ works created by governmental officials, “guillotine clauses” stating that all works from a certain date are in the public domain or how long the protection of the work lasts, for example, the public domain also varies in size. Unsurprisingly, the relationship between the public domain and intellectual property also differs from jurisdiction to jurisdiction. With a focus on the author rather than consequentialist/utilitarian theory, civil-law countries do not place as much value on the balance between intellectual property as an incentive to create and ensuring a viable public domain.¹⁹ At the same time, utilitarian theory and seeking balance allow common-law countries to look at the public domain with more flexibility than countries that centre intellectual property on natural-rights theory. We see this difference play out when access to works in the public domain come into question. Whereas in France it is strongly believed that everything in the public domain should be publicly accessible, including original art works, many common-law countries debate whether there are valid reasons why we might want to restrict access to what is in the public domain, so as to meet the interests of traditional or indigenous communities, which may consider certain works to be private, secret and/or sacred. In other words, civil-law jurisdictions tend to want to overcome access barriers to the intangible caused by possession of material embodiments, whereas many common-law countries see cause to maintain those barriers, regardless of whether a work is in the public domain. The relationship between the public domain and exceptions to copyright infringement is also contentious, mostly because there is no definition of “public domain”. The antithesis of copyright, the public domain is not positively protected in any piece of intellectual property legislation (as far as the authors are aware). This means that one could consider

---

¹⁷ See Peter S Menell, ‘Intellectual Property. General Theories’ in Boudewijn Bouckaert and Gerrit De Geest (eds), *Encyclopedia of Law and Economics, Vol II. Civil Law and Economics* (Edward Elgar 2000) 129; and Jeanne C Fromer, ‘Expressive Incentives in Intellectual Property’ (2012) 98 Va L Rev 1745, 1750.

¹⁸ A guide on the status of the public domain in the US by Peter B Hirtle can be found at <https://copyright.cornell.edu/resources/publicdomain.cfm> (accessed 29 March 2016).

¹⁹ Dutfield and Suthersanen (n 1) 56.

exceptions to infringement (that is, pseudo-copyright-free actions) as forming part of the public domain and, thus, any restriction of access to copyrighted works and the ability to carry out permitted uses contrary to the concept of the public domain.

This protection–exceptions–public domain triad of intellectual property helps us to think about the divide between the immaterial and material, but also raises further issues. The public domain comprises ideas, notions and works that are usable by all. As a consequence, ensuring a viable public domain is considered of great import,²⁰ and the public domain is challenged by the categorisation of an immaterial work as property, particularly in comparison to real or chattel property. This has continued to be discussed since Justice Yates’ strong dissent in *Millar v Taylor*, arguing against perpetual common-law protection of works,²¹ and the seminal work of Augustin-Charles Renouard, in France, who similarly was opposed to copyright as property because it would mean perpetual protection.²² Renouard instead proposed that we should be speaking of “rights” rather than “property”.²³

The public domain, therefore, has a central and challenging role within the intellectual property constellation. It is characterised by certain values, which combine access to cultural heritage with education and social cohesion, as well as creation.²⁴ A further characteristic of the public domain is that it is in itself not equivalent to a totally free dimension of the use of goods.²⁵ For Abraham Drassinover, “the rights-based account of authorship is also a rights-based account of the public domain”.²⁶ Further limitations exist, as illustrated by the privilege associated with physical possession or chattel property, or when a person can invoke a right to block use by another, such as with moral rights. The

---

²⁰ Pamela Samuelson, ‘Mapping the Digital Public Domain: Threats and Opportunities’ (2003) *Law & Contemp Probs* 66, 147.

²¹ *Millar v Taylor* (1769) 98 ER 201.

²² Augustin-Charles Renouard, *Traité des droits d’auteurs dans la littérature, les sciences et les beaux-arts*, Vol II (Paris 1838).

²³ Renouard believed that authors should have rights over their works, but not equal to rights in real or chattel property, which would have been perpetual. See *ibid.*, 374.

²⁴ Samuelson (n 20).

²⁵ This question has been and still is linked to the idea of a paying public domain, as already developed by the end of the nineteenth century in Pierre-Jules Hetzel, *La propriété littéraire et le domaine public payant* (Bruxelles 1858).

²⁶ Abraham Drassinover, ‘Incentives, Rights, and the Public Domain’ (2011) 86 *Notre Dame L Rev* 1870, 1871.

public domain personifies the duality of the problems relating to intellectual property and its physical embodiments, and the difficulty of proposing an ultimate and miracle solution. And the most burning issue is that the public domain is a semi-reality for immaterial goods. The “concretisation” of the immaterial good and its intangible nature *per se* influence the perception of intellectual property rights. The easy-to-copy character of digital works of art makes them seem immediately “available”.²⁷ As a result, they have to be protected, not only on a legal level, but also on a technical one. These technical barriers – often not ruled in any way by the state²⁸ – may represent an obstacle to the public domain, or at least to one undertaking permitted uses. A further issue is the re-use or re-appropriation of immaterial goods in a new immaterial good,²⁹ as this has the potential to withdraw the very essence of the initial immaterial good from the public domain through a kind of renewed protection. This is not only a problem with works, but also the evergreening of inventions and the commodification of traditional knowledge.³⁰ Similar issues arise in relation to works licensed under Creative Commons,³¹ which is often incorrectly perceived as an alternative to copyright that places works in the public domain, when, in most cases, the copyright remains intact and, though some rights are waived, certain re-uses of works are restricted or limited. In contrast, limiting the way that one can use physical goods, such as books, is not so simple.

Equally important with respect to the commons (or that which is right-free) is the issue of the exhaustion of rights. Though, as noted by Susy Frankel in this volume (Chapter 8), the “first-sale” doctrine and rules regarding exhaustion with respect to trade are not the same

---

²⁷ Emily Hudson and Robert Burrell, ‘Abandonment, Copyright and Orphaned Works: What Does it Mean to Take the Proprietary Nature of Intellectual Property Rights Seriously?’ (2011) 35 *Melb Univ L Rev* 971.

²⁸ That is, their use is not regulated by the State. However, if used, such technical protection measures are often protected by anti-circumvention laws. *See, e.g.*, WIPO Performances and Phonograms Treaty, 2186 UNTS 203; 36 ILM 76 (adopted 20 December 1996, entered into force 20 May 2002), Arts 18 and 19; and WIPO Copyright Treaty, 36 ILM 65 (adopted 20 December 1996, entered into force 6 March 2002), Arts 11 and 12.

²⁹ Leonhard Dobusch, ‘The Digital Public Domain: Relevance and Regulation’ (2012) 21 *ICTL* 179, 186.

³⁰ On evergreening, *see* Rebecca S Eisenberg, ‘The Problem of New Uses’ (2005) 5(2) *Yale J Health Pol’y L & Ethics* 717. On traditional knowledge, *see, e.g.*, Peter K Yu, ‘Cultural Relics, Intellectual Property, and Intangible Heritage’ (2008) 81 *Temp L Rev* 433.

³¹ Dobusch (n 29) 192.

(because, while the first-sale doctrine is about the rights over the physical embodiment, “exhaustion” is about rights over the intangible intellectual property), all of these rules affect a user’s ability to utilise the tangible embodiments of intellectual property goods. Frankel discusses exhaustion (and accordingly parallel importing) rules within the international trade law context and thereby the complex interrelationship between intellectual property and the international trade of tangible goods or services, and why we sometimes conflate intellectual property with its physical embodiments in the international trade context.

The challenges faced by the commons are also addressed by Aisling McMahon in this volume (Chapter 7), who discusses the relationship between human body parts/specimens (usually considered by law to be property-free), research over those materials, intellectual property over resultant inventions or information/knowledge and public access to these. McMahon examines the contextual nature of the existence of property, including the tangible/intangible context and the fact that intellectual property only deals with intangible contributions, with a particular focus on issues relating to public access to healthcare products/services. Issues relating to the creation, access and management of knowledge resources more generally are analysed by Michael Madison in Chapter 1. Defining “commons” as an institution that governs resources, Madison looks at the environment around shared or collective knowledge resources, via taking into account the various attributes of a given resource (such as “the resource’s physical properties, its creative or inventive properties, or its natural, factual or ideational properties”) and all the interests surrounding it. Through this examination, he highlights the interrelated nature of the tangible and the intangible with respect to knowledge resources and, in particular, the copyright concepts of “the work”, “fixation” and the relevance of medium.

Considering the evolution of intellectual property, the extension of cultural heritage and the continued development of new technologies in all disciplines, the authors of the chapters in this book highlight the diversity of challenges raised by the divide between immaterial and material. They show that in no area of intellectual property have real and stable solutions been established that robustly deal with the relationship between the tangible and the intangible, and the balance between intellectual property and the public domain, and ultimately access to chattel property and intellectual goods. The question of access to goods remains open and neither judges nor lawmakers have reached viable, durable or broadly accepted positions.

In this respect, the notion of copy is central. The perceived dematerialisation of contents such as music files or computer programs – or in other

words the uncoupling of content and support – in previous decades has aroused interesting jurisprudence, stimulating consideration of the doctrine and innovative implementation in practice. The lively questioning of the first-sale doctrine has given rise to leading cases in the EU and in the US. They concern files and computer programs as well as transfer methods, as Dan Burk relates in Chapter 2. One may wonder, as he underlines, if pure theory such as the consideration of “new materialism” might offer copyright the coherence it currently lacks and allow us to see the relevance of physical materiality in a new light and, thereby, develop more cogent protection for works. The notion of copy is also central in Yu’s chapter (Chapter 3), in which he discusses the current trend to disavow “copies” as a consequence of digital technologies, which make “copy counting” untenable as an enforcement approach. There may be an intermediate position between the negation of copies and their overprotection. Perhaps “copy” should be detached from its underlying framework and reconsidered with regard to its cultural, scientific and creative nature.

What may or may not constitute a “copy” and questions pertaining to physical materiality also have consequences for debates regarding cultural heritage, as highlighted by Giorgio Spedicato in Chapter 6. Spedicato outlines difficulties relating to the digital lending of eBooks by public libraries with respect to the rights to reproduction, distribution and communication to the public, which result from the disembodied nature of the materials. In his chapter, Spedicato explains why the classic lending mechanism used by libraries does not work for eBooks from both a technological and legal perspective.

The consideration of immaterial cultural heritage has been rather delayed compared to the protection of the tangible manifestations of culture (such as buildings and objects). It has since gone through a process of trying to resolve the definition of “heritage” as distinct from its material aspects.³² This development went together with the premise of the protection of the knowledge and cultural expressions of indigenous peoples and traditional communities. Trying to fit these types of knowledge and expressions into the classical framework of copyright, trade marks and patent law has not been without problems, as Michael Blakeney explains in Chapter 9. The tangible/intangible divide of our Western comprehension of cultural property/cultural heritage and of intellectual property is severely challenged by this issue and, as discussed

---

³² Marilena Vecco, ‘A Definition of Cultural Heritage: From the Tangible to the Intangible’ (2010) 11 *J Cult Herit* 321.

by Blakeney, having gone down the rabbit warren of intellectual property, indigenous peoples and traditional communities have found themselves unsuccessfully trying to push the concept of “holism” through a system defined by the intangible/tangible divide. It is interesting to consider whether the theories discussed by Burk and Madison, which seek to see past the intangible/tangible dichotomy, could ultimately assist indigenous peoples and traditional communities in their quest to have their “holistic” knowledge systems recognised by the law.

This divide between immaterial and material, as well as questions linked to access to these goods, affects all areas of creation in its broader sense. Cultural institutions – such as museums – face, on the one hand, complex questions related to the digitisation of goods and, on the other hand, difficult decisions regarding their physical possession and control of works and third-party access, whether material or immaterial. In a way, these cultural institutions revive the Roman conceptualisation of property, as stated by Gaius in his work;³³ by controlling the physical embodiment of works and, thus, being able to prevent others from accessing them,³⁴ cultural institutions illustrate the idea that the owner of an object is the owner of all related rights.³⁵ Their physical possession of works essentially allows cultural institutions to control access via a mixture of chattel property law and contract law, often despite in-built policy goals of intellectual property (for example those relating to the public domain), as discussed by Catherine Bell, Lai and Laura Skorodenski in Chapter 10 in this volume. Mere physical possession also gives cultural institutions some scope to use the works in their collection themselves. However, as examined by Susan Corbett in Chapter 11, copyright law – that is, a law regarding the intangible – often restricts the way that cultural institutions may use the works in their collection.³⁶

---

³³ Gaius, *Institutes*, t. II (Julien Reinach tr, Les belles lettres 1950) 77–8.

³⁴ Marie C Marano and Ildiko Pogány DeAngelis, *A Legal Primer on Managing Museum Collections* (3rd edn, Smithsonian Books 2012) 215; and Susan Corbett and Mark Boddington, ‘Copyright Law and the Digitisation of Cultural Heritage’ (2011) Centre for Accounting, Governance & Taxation Research Working Paper No 77, 13, available 29 March 2016 at <http://ssrn.com/abstract=1806809>.

³⁵ Alain Marciano and Nathalie Moureau, ‘Property Rights, Copyright and Abuse of Dominance: The Case of Museums and Photographers’ (2012) ANR PROPICE WP 2, 9, available 29 March 2016 at http://www.mshparisnord.fr/ANR-PROPICE/docus-pdf/wp23_Marciano_Moureau.pdf.

³⁶ See also Thomas Margoni, *The Digitisation of Cultural Heritage: Originality, Derivative Works and (Non) Original Photographs* (2014), available 29 March 2016 at <http://ssrn.com/abstract=2573104>.

Corbett discusses the preservation of born-digital works by cultural heritage institutes. Her analysis highlights the irony that digital technologies are often pushed forward as a viable means of preserving our cultural heritage, such as by creating digital scans of manuscripts and digital versions of analogue sound recording, when – in fact – digital works have proved to be far harder to preserve than analogue ones. Her chapter teases out the complex relationship between cultural heritage institutes, analogue works, born-digital works and copyright law, highlighting that copyright's control over the intangible intrinsically affects cultural heritage institutes' ability to preserve both born-digital and analogue works, but is arguably worse for the former, particularly those that are “orphan works”.³⁷ Moreover, as also discussed by Corbett, sometimes materiality can affect the intangible, as dating and degrading support technologies can equally make the intangible work obsolete through inaccessibility.

Lest it should be thought that the problem is only a copyright one, we should point out that biotechnologies of the twentieth and twenty-first centuries have challenged the tangible/intangible divide in a different way than digital technologies, as, rather than attempting to chase down some form of physical materiality to which we can link intellectual property law, we try to draw a line between the physical and non-physical where there may not be one. We see this in the debates surrounding whether genetic sequences are chemical compounds or information,³⁸ when they are arguably both. The im/material dichotomy also raises problems when it comes to plant patents in the US and patents for microorganisms in general, as has been discussed in depth by Alain Pottage and Brad Sherman. A core difference between organisms and manufactures (whether mechanical, electrical or chemical) is that the invention of the latter involves a concept or idea that can be “translated into and out of a

---

³⁷ P Bernt Hugenholtz et al, *The Recasting of Copyright & Related Rights for the Knowledge Economy* (2006) European Commission DG Internal Market Study, 164–6.

³⁸ See, e.g., *D'Arcy v Myriad Genetics Inc* [2014] FCAFC 115 [143], which considered claims for isolated genetic sequences to be for mere chemical compounds. In comparison, the decision was overturned on appeal, largely on the holding that the claims were for information; *D'Arcy v Myriad Genetics Inc* [2015] HCA 35 [89]–[90] French CJ et al. The US Supreme Court similarly held that claims for genetic sequences were actually for information; *Association for Medical Pathology v Myriad Genetics*, 569 US ___, slip op. 18 (2013) Thomas J for the Court.

written form” and that is reduced to – usually physical – practice.³⁹ In contrast, Pottage and Sherman note that one of the difficulties that plant breeders faced to get plant patents in the US was posed by the sufficiency or enabling requirement, because it is impossible to reduce plants to written or pictorial form such that a person skilled in the art could replicate it.⁴⁰ They state:

In modern patent law, the distinction between the mental and the material was stabilised by a number of mutually-reinforcing manoeuvres: the reduction of the inventive idea to text; the separation of the dimension of the invention from the process of manufacturing and marketing; and the consequent reduction of material form to a mere embodiment of the invention. *The trouble with biological inventions is that they cannot be easily divided into such neat, mutually exclusive registers: the metabolic processes of living organisms cannot be reduced to anything resembling an engineering blueprint, so the inventive idea cannot be clearly delineated and distinguished from the process in which it intervenes. The idea is not reducible to text, but remains embedded in, and animated by, the tissues in which it is expressed ...* Patent law may be committed to making the distinction between ideas and embodiments, but as a result, it is compelled to search within the texture of the invention for a dividing line that can ultimately only be a line of its own making. Hence, the endless diffraction of the invention itself.⁴¹

In other words, patent law is struggling to find the dividing line between the idea and its embodiments with many biotechnology inventions.⁴² Closely connected to this, it can be very difficult to locate biological materials. One cannot search for them online the way one can do for written information,⁴³ raising the question of what exactly the

³⁹ Alain Pottage and Brad Sherman, ‘Organisms and Manufactures: On the History of Plant Inventions’ (2007) *Melb Univ L Rev* 31, 539, 566 [hereinafter Pottage and Sherman, ‘Organisms and Manufactures’].

⁴⁰ Alain Pottage and Brad Sherman, *Figures of Invention: A History of Modern Patent Law* (OUP 2010) 183 [hereinafter Pottage and Sherman, *Figures of Invention*].

⁴¹ Pottage and Sherman, ‘Organisms and Manufactures’ (n 39) 542 (emphasis added).

⁴² There are arguments against the need for any kind of physicality; see, e.g., Sam Ricketson, ‘Business Method Patents – A Matter of Convenience?’ (2003) 2 *IPQ* 97; and Ben McEniery, ‘Is There a Physicality Requirement at Common Law?: A Survey of the Pre-NRDC Cases Discussing “Manufacture”’ (2011) 32 *Adel L Rev* 109.

⁴³ Tinh Nguyen, ‘Case 6. The Science Commons Material Transfer Agreement Project’ in Geertrui van Overwalle (ed.), *Gene Patents and Collaborative Licensing Models* (CUP 2009) 143, 144–5.

intangible invention is. Moreover, one can only reproduce an organism if one has a copy of it or already possesses it. As a consequence, shortly after the passing of the US Plant Patents Act 1930, it was suggested that “type plants” (or a physical copy of the plant) be deposited as part of the registration process, which would then be kept alive by dedicated farms, gardens and herbariums. This was rejected and registration was purely paper-based.⁴⁴ However, § 112 of the Patent Act 1930 exempted plant inventions from the written disclosure requirement,⁴⁵ because “Congress conceded that ‘intellectual possession’, or the ability to provide a recipe for the fabrication of the artefact, mattered less than the physical possession of the biological ‘means of production’”.⁴⁶ The irreproducibility from a written description is true for all organisms, including microorganisms.⁴⁷ This has led to patent offices around the world requiring the deposit of biological materials in recognised biobanks when written disclosure would not be sufficient,⁴⁸ as discussed by McMahon in this volume. We again see the importance of the physical embodiment and its inseparability from the idea. This of course changes the nature of the written specification: it is no longer a written embodiment of the invention that acts as a disclosure of the idea, but instead has the function of “signpost[ing] the location of material from which the invention can be elicited. The ‘description’ in question is effectively just a set of accession numbers to the public depository ...”.⁴⁹ Pottage and Sherman note that this is not so different from the historical use and role of patent models,⁵⁰ which Lai discusses in “A tale of two histories”, Chapter 4 in this volume. In her second chapter on “The nebulous ‘invention’” (Chapter 5), she highlights that issues relating to the collapse of the idea/embodiment dichotomy are by no means restricted

---

⁴⁴ Pottage and Sherman, ‘Organisms and Manufactures’ (n 39) 563 and 565–6.

⁴⁵ Pottage and Sherman, *Figures of Invention* (n 40) 183.

⁴⁶ Pottage and Sherman, ‘Organisms and Manufactures’ (n 39) 566.

⁴⁷ Rebecca S Eisenberg, ‘Proprietary Rights and the Norms of Science in Biotechnology Research’ (1987) 97 Yale LJ 177, 198; and Lisa Mandrusiak, ‘Balancing Open Source Paradigms and Traditional Intellectual Property Models to Optimise Innovation’ (2010) 63(1) Maine L Rev 303, 316–17.

⁴⁸ E.g., European Patent Convention Implementing Regulations (last amended 1 April 2014), Rule 31; UK Intellectual Property Office, ‘Examination Guidelines for Patent Applications Relating to Biotechnology in the Intellectual Property Office’ (2013) paras 120–24; and French Intellectual Property Code, Art. L612-5.

⁴⁹ Pottage and Sherman, ‘Organisms and Manufactures’ (n 39) 566.

⁵⁰ Pottage and Sherman, *Figures of Invention* (n 40) 206.

to the field of biotechnology, but are also observable with software, computer-implemented inventions and methods of medical treatment and diagnosis.⁵¹

* * *

This volume continues with two theoretical analyses from Madison and Burk that examine the interrelated nature of the intangible and tangible from different perspectives; namely, new materialism and knowledge commons. This is followed by historical reflections on copyright and the “copy” and patent law and “inventions” by Yu and Lai, respectively, and challenges posed by new technologies as reflected in twenty-first-century case law. Part III of the volume addresses practical issues relating to access of the intangible/tangible dichotomy. Spedicato addresses particular problems faced by public libraries wanting to digitally lend eBooks and why models and legal presumptions that we have in relation to the lending of normal books cannot be relied upon. McMahon then looks at the modern challenges posed by biotechnologies across the donor–research–patent–consumer access spectrum, specifically with respect to biobanks and the distinction between ownership and access to physical specimens and the knowledge/ideas obtained from them. Susy Frankel’s chapter deals with how rules regarding the exhaustion of certain rights and parallel importing reflect the complicated relationship between intellectual property and the international trade of in/tangible goods and services. The final part of this volume looks at issues relating to cultural heritage. Blakeney opens this part with a chapter exploring the holistic nature of indigenous knowledge systems, in contrast to Western intellectual property, and the struggle to have this recognised in international law. Bell, Lai and Skorodenski follow with an examination of how cultural heritage institutes can use the overlaps and spaces between chattel property law and intellectual property law, as well as contract law, to meet the interests of indigenous peoples with respect to their cultural heritage. The final chapter in this volume by Corbett addresses the tangible/intangible contrast in light of attempts by cultural heritage institutes to preserve born-digital works, many of which are orphan works.

---

⁵¹ See, e.g., Mario Biagioli, ‘Between Knowledge and Technology: Patenting Methods, Rethinking Materiality’ (2012) 22(3) *Anthropol Forum* 285.