

The Law and Technology Enterprise: Uncovering the Template to Legal Scholarship on Technology

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INTRODUCTION

The law and technology interface has been much studied and much neglected. It has been much studied as witnessed by the constant turning of legal discourse to the question of technology. The law reviews regularly publish analysis concerning legal responses to technological change; legislatures are often confronted with the need to make law in response to public concern about technology; and the courts are often called upon to make sense of law within a changed technological context. This wealth of material is piecemeal. The focus is always on an immediate technology or application. This is why the interface of law and technology has been neglected. The political urgency of responding to an obvious concern has overshadowed more patient, general and theoretically sophisticated thinking through of the law and technology interface.

This article is a step towards the patient, general and theoretically sophisticated thinking through of the law and technology interface. It takes this step through an analysis of the existing legal discourse on law and technology to reveal its foundational assumptions about law, technology and the future. What this article reveals is a common template for legal writing on technology—the ‘law and technology enterprise’—that structures such writing. It is through exposing the basic commitments of this enterprise that a more sophisticated understanding of the law and technology interface can emerge.

This article is presented in three sections. Section I introduces the rise and rise of legal scholarship on technology and links this rise to wider public anxiety about technological change. Section II argues for the existence of the law and technology enterprise through examination of the legal scholarship that arose, predominately in the US, but also in the

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UK, Australia, Canada, New Zealand and South Africa, in response to three popular and culturally significant technological crisis events: Sputnik (1957–63), Louise Brown (1978–85), and virtual worlds (2004–8). What is shown is that the three literatures share a common structure in which the crisis event was captured by positive law doing public policy work, notwithstanding the 50-year timespan and the diversity of technologies involved. The elements of this structure—problematic technology, inadequate existing law and the call for new law—located within a voluminous scholarship of description and analogy, comprises the law and technology enterprise. Section III provides an overview of some contributions to the study of the law and technology interface that break with the enterprise and point towards a more patient, general and theoretically sophisticated approach.

I. THE RISE AND RISE OF LEGAL SCHOLARSHIP ON TECHNOLOGY

Lawyers, it seems, have a long history of writing about law and technologies. Reflecting the attitudes that David Nye identified as informing the industrialisation of the US from 1850 to 1900,¹ the inaugural issue of the *Yale Law Journal* (1891–2) contained an article by Harry G Day that congratulated US courts on getting it right by not awarding damages to property owners whose street outlook has been changed by the construction of electric tramways.² Day's touchstone was 'progress':

Rapid transit in particular is as indispensable to [American cities'] progress as light, sewerage and water, and a system which is clean, quiet, cheap, easily controlled and occupying as little space as possible is universally demanded.³

The appearance of motor vehicles inspired Xenophon P Huddy in 1905, also in the *Yale Law Journal*, to examine automobiles and the existing road rules. He concluded that 'the automobile [is] one of the least dangerous of conveyances if properly driven', and did not

¹ See David E Nye, *Narratives and Spaces: Technology and the Construction of American Culture* (University of Exeter Press, 1997).

² Harry G Day, 'The Operation of Electric Street Railways without Compensation to Abutting Owners' (1892) 1 *Yale Law Journal* 263.

³ *Ibid.*, 267.

require specific restrictive regulation.⁴ The nascent aviation industry prior to 1918 generated legal scholarship concerned with the sovereignty of airspace,⁵ liability arising from aeroplanes⁶ and the aeronautical laws of war.⁷ Similarly, the commercialisation of radio in the 1920s prompted legal writing on radio and the law of war,⁸ ownership of radio-waves⁹ and regulation.¹⁰

These discrete literatures provide evidence for a historical claim that lawyers have identified and written about the legal challenge of emerging technologies. However, these were isolated incidents. The law reviews were not inundated with lawyers writing about technology—even if, as Barton Beebe has observed, contemporary lawyers seem to write excessively about technology.¹¹ The Table in the Appendix shows there are at least 92 specialist law journals dedicated to law and technology (JOLTs) (Journals of Law and Technology) and also journals focused on the law of specific technologies (JOLSTs).¹² The existence of these journals discloses an active research community publishing on law and technology. Furthermore, many general law journals print articles on law and technology. For example, a brief survey of the content of leading law reviews in the US, UK and Australia discloses lawyers writing about technology. Volume 121 of the *Harvard Law Review* (2007–8) printed a note concerning biotechnology and the challenge of ‘liberal eugenics’,¹³ two notes and three case notes dealing with internet

⁴ Xenophon P Huddy, ‘The Motor Car’s Status’ (1905) 15 *Yale Law Journal* 83, 86.

⁵ Simeon Baldwin, ‘The Law of the Air-Ship’ (1910) 4 *American Journal of International Law* 95; Arthur Kuhn, ‘The Beginnings of an Aërial Law’ (1910) 4 *American Journal of International Law* 109; Hans Sperl, ‘The Legal Side of Aviation’ (1911) 23 *Green Bag* 298; GD Valentine, ‘Sovereignty or Freedom in the Atmosphere’ (1912) 23 *Juridical Review* 324; Lee Blewett, ‘Sovereignty of the Air’ (1913) 7 *American Journal of International Law* 470.

⁶ Simeon Baldwin, ‘Liability for Accidents in Aerial Navigation’ (1910) 9 *Michigan Law Review* 20.

⁷ Robert E Heinselman, ‘Aerial Warfare’ (1913) 33 *Canadian Law Times* 741.

⁸ William L Rodgers, ‘The Laws of War concerning Aviation and Radio’ (1923) 17 *American Journal of International Law* 629.

⁹ Carl Zollmann, ‘Radio and Copyright’ (1926) 11 *Marquette Law Review* 146; Frank S Rowley, ‘Problems in the Law of Radio Communication’ (1927) 1 *University of Cincinnati Law Review* 1; James Patrick Taugher, ‘The Law of Radio Communication with Particular Reference to a Property Right in Radio Wave Lengths’ (1928) 12 *Marquette Law Review* 179.

¹⁰ Jefferson W Davis, ‘The Radio Act of 1927’ (1927) 13 *Virginia Law Review* 611.

¹¹ Barton Beebe, ‘Law’s Empire and the Final Frontier: Legalizing the Future in the Early corpus Juris Spatialis’ (1999) 108 *Yale Law Journal* 1737, 1772–3.

¹² JOLT seems to be emerging as common parlance within the US student-run law and technology journals. See <http://jolt.law.harvard.edu> (accessed 7 June 2011).

¹³ ‘Regulating Eugenics’ (2008) 121 *Harvard Law Review* 1578.

law,¹⁴ and a case note concerning the evidential status of computer-generated reports.¹⁵ Volume 71 of the *Modern Law Review* (2008) contained an article examining the human rights implications of the deployment by state agencies of ethnic profiling technologies,¹⁶ while volume 32 of the *Melbourne University Law Review* (2008) contained an article examining the use of data-matching and surveillance technologies in social security administration.¹⁷

It is possible to argue that the incidence of legal scholarship on technology is increasing. Table 1 shows that out of the total of 92 JOLTs and JOLSTs, 51 (55 per cent) were established after 1994, and out of a total of 40 JOLTs, 32 (80 per cent) were established after 1994, providing greater opportunities for lawyers to publish on technology. Tempering this argument is that law reviews have proliferated in the last 20 years with the entry into the legal publishing market of new law schools publishing journals as a way of establishing and developing research credibility,¹⁸ and also with the reduction of production costs allowing the publishing of more focused, specialised journals. It seems that concerns in the late 1990s with the decline of the law review as a forum for the dissemination of legal research in the digital age have been misplaced.¹⁹ While this general expansion of law reviews could explain the increase of JOLTs and JOLSTs, it does not explain why the topic of law and technology (as opposed to self-reflective scholarship on legal scholarship, for example)²⁰ has specifically been an area of expansion.

¹⁴ 'Leegin's Unexplored "Change in Circumstance": The Internet and Resale Price Maintenance' (2008) 121 *Harvard Law Review* 1600; 'The Principles for User Generated Content Services: A Middle-Ground Approach to Cyber-Governance' (2008) 121 *Harvard Law Review* 1387; 'Internet Law—Communications Decency Act' (2007) 121 *Harvard Law Review* 930; 'Internet Law—Communications Decency Act' (2008) 121 *Harvard Law Review* 2246; 'Intellectual Property—Eighth Circuit Holds that the First Amendment Protects Online Fantasy Baseball Providers' Use of Baseball Statistics in the Public Domain' (2008) 121 *Harvard Law Review* 1439.

¹⁵ 'Evidence—Confrontation Clause' (2008) 121 *Harvard Law Review* 1937.

¹⁶ Olivier De Schutter and Julie Ringelheim, 'Ethnic Profiling: A Rising Challenge for Europeans Human Rights Law' (2008) 71 *Modern Law Review* 358.

¹⁷ Kieran Tranter, Lyndal Sleep and John Stannard, 'The Cohabitation Rule: Indeterminacy and Oppression in Australian Social Security Law' (2008) 32 *Melbourne University Law Review* 698.

¹⁸ John Gava, 'Scholarship and Community' (1994) 16 *Sydney Law Review* 442, 460.

¹⁹ Bernard J Hibbitts, 'Last Writes? Reassessing the Law Review in the Age of Cyberspace' (1996) 71 *New York University Law Review* 615, 687.

²⁰ See Ian Ramsay and GP Stapledon, 'A Citation Analysis of Australia Law Journals' (1997) 21 *Melbourne University Law Review* 676; Margaret Stone, 'The Academy's Contribution to the Development of the Law' (2002) 25 *University of New South Wales Law Journal* 798; Michael Kirby, 'Welcome to the Law Reviews' (2002) 26 *Melbourne University Law Review* 1.

Lawyers are writing more about technology because ‘technology’ has become a site of conscious popular concern in the West. Technology studies (itself a product of this concern)²¹ has identified that ‘technology’ enters public discourse in the Anglo-American West during the 1950s surrounded by a complex of narratives relating to progress and also destruction. Three elements of this public reckoning with technology can be identified. The first was that ‘technology’ emerged as a term and category for the material manifestation of applied scientific knowledge.²² Technology was in the world as a concept that was tied to material objects, but also encompassed the human networks that surrounded, and gave life, to the thing.²³ Second, technology was problematic.²⁴ It was good as seen in the celebration of material prosperity of an emerging suburbia of domestic appliances.²⁵ However, it was also bad in the fallout blowing from Hiroshima and Nagasaki²⁶ which eventually registered in the popular cultural souring of technology beginning with the counterculture of the late 1960s.²⁷ The third was change. The general category of technology was needed as the machines were, to borrow from Bob Dylan, ‘a-changin’;²⁸ seemingly evolving independent of human agency.²⁹ **These features framed public discussion about technology. Technology was newsworthy and the announcement of a new technology—a breakthrough, a crisis event—would see the** generation of public discussion—media reports, opinion pieces, feature articles, statements by political and

²¹ Andrew Feenberg, *Questioning Technology* (Routledge, 1999) 6.

²² Marx argues that ‘technology’ in its contemporary sense only begins to enter US public discourse after 1918. He warns scholars of attempting to reify ‘technology’ and push it back in history. Leo Marx, ‘*Technology: The Emergence of a Hazardous Concept*’ (1997) 64 *Social Research* 965, 967, 981–4.

²³ Allan Mazur, *True Warnings and False Alarms: Evaluating Fears about the Health Risks of Technology, 1948–1971* (Resources for the Future, 2004) 10–21.

²⁴ Langdon Winner, ‘Technology Today: Utopia or Dystopia?’ (1997) 64 *Social Research* 989.

²⁵ Cynthia Lee Henthorn, ‘Commercial Fallout: The Image of Progress and the Feminine Consumer from World War II to the Atomic Age, 1942–1962’ in AM Scott and CD Geist (eds), *The Writing on the Cloud: American Culture Confronts the Atomic Bomb* (University of America Press, 1997); Joan Rothschild, ‘Technology, Housework, and Women’s Liberation: A Theoretical Analysis’ in J Rothschild (ed), *Machina Ex Dea: Feminist Perspectives on Technology* (Pergamon, 1983); Christine E Bose, Philip L Bereano and Mary Malloy, ‘Household Technology and the Social Construction of Housework’ (1984) 25 *Technology and Culture* 53.

²⁶ Paul Boyer, *By the Bomb’s Early Light: American Thought and Culture at the Dawn of the Atomic Age* (Pantheon, 1985); William Gamson, ‘Media Discourse and Public Opinion on Nuclear Power: A Constructivist Approach’ (1989) 95 *American Journal of Sociology* 1, 12.

²⁷ Theodore Roszak, *The Making of a Counter Culture: Reflections of the Technocratic Society and its Youthful Opposition* (Faber and Faber, 1968); Allan Mazur, *The Dynamics of Technical Controversy* (Communications Press, 1981), 99.

²⁸ Bob Dylan, *The Times They Are a-Changin’* (Columbia, 1964).

²⁹ Bernhard Rieger, ‘“Modern Wonders”: Technological Innovation and Public Ambivalence in Britain and Germany, 1890s to 1933’ (2003) 55 *History Workshop Journal* 152.

cultural leaders, new journals, television documentaries and films—grounded on these three features.³⁰ Lewis Mumford, one of the founders of technology studies, articulated the genesis of this concern:

[U]ngoverned creativity in science and invention has reinforced unconscious demonic drives that have placed our whole civilisation in a state of perilous unbalance: all the more because we have cast away at this critical moment, as an affront to our rationality, man's earliest forms of moral discipline and self-control.³¹

This monstrous threat required willed order and control. This was exactly Francis Fukuyama's much more recent argument. For Fukuyama the possible monsters that might be spawned by biotechnology in 'our posthuman future' demanded law to prohibit and regulate to ensure that such demons remain fictions.³² It was here in this need to leash the demon and save civilisation that lawyers found a role.

III. FIFTY YEARS OF THE LAW AND TECHNOLOGY ENTERPRISE

In the following, what is argued is that the law and technology enterprise parallels this identified public concern with technology that becomes increasingly more noticeable since the 1950s with a succession of crisis events that were framed as involving 'technology' as 'problematic' and 'changing'. It will be shown how three specific crisis events, Sputnik (1957), Louise Brown (1978), and virtual real estate in *Second Life* (2006), generated legal scholarship. What is shown is that the three literatures share a common structure in which the crisis event was captured within a net of positive law doing public policy work. In this the elements of the law and technology enterprise

³⁰ Stephen Hilgartner, 'The Dominant View of Popularization: Conceptual Problems, Political Uses' (1990) 20 *Social Studies of Science* 519; Susanna Horning Priest, 'Structuring Public Debate on Biotechnology' (1994) 16 *Science Communication* 166; Susanna Horning Priest, 'Reading Risk: Public Responses to Print Media Accounts of Technological Risk' (1993) 2 *Public Understandings of Science* 95; Peter Conrad, 'Public Eyes and Private Genes: Historical Frames, News Constructions, and Social Problems' (1997) 44 *Social Problems* 139.

³¹ Lewis Mumford, *The Myth of the Machine: Technics and Human Development* (Harcourt Brace Jovanovich, 1966) 57–58.

³² Francis Fukuyama, *Our Posthuman Future: Consequences of the Biotechnological Revolution* (Farrah, Straus and Giroux, 2002).

structure are revealed as problematic technology, inadequate existing law and the call for new law; while its primary modus is revealed as description and analogy.

Sputnik

The legal scholarship that followed the launch of Sputnik I by the USSR on 4 October 1957 can be read as providing an early articulation of the elements of the law and technology enterprise. Lawyers responding to Sputnik saw through the rather modest satellite to focus on a general concern with future space technology that had positive and negative potential. This claim to the Sputnik literature, or more precisely, ‘first generation space law scholarship’, is made in preference to the literature that surrounded that other post-war technological crisis—nuclear armament. The legal literature on the bomb had a deadly serious tone; the devastating potential of that technology was not anticipated but demonstrated.³³ The whimsical theme that registers within first generation space law scholarship was absent.

In first generation space law scholarship Sputnik circulates as anticipation of space technology and anticipation of space law. It was not so much that the Soviet Union launched a satellite, but resounding within Sputnik’s radio beeps was the challenge and promise of a new world for lawyers. This had several facets. The first was excited anticipation of the feats and technologies to come: ‘It daily grows more certain that the space rocket, like the horse, the automobile, and the airplane before it, has come to stay.’³⁴ Eugène Pépin argued that ‘other satellites will be launched in the more or less near future’.³⁵ Myres S McDougal and Leon Lipson believed that in 1958 it was

not too early to *contemplate* the use of unmanned orbital satellites for radio and television relays, for photographic observation of the weather, and for photographic reconnaissance of

³³ See eg James R Newman, ‘Control of Information Relating to Atomic Energy’ (1947) 56 *Yale Law Journal* 758; ME Bathurst, ‘Legal Aspects of International Control of Atomic Energy’ (1947) 24 *British Year Book of International Law* 1; Robert Haydock, Jr, ‘Some Evidentiary Problems Posed by Atomic Energy Security Requirements’ (1948) 61 *Harvard Law Review* 468.

³⁴ Seymour W Wurfel, ‘Space Law—Is there Any?’ (1959) 37 *North Carolina Law Review* 269, 270. See also James T Lyons, ‘Space Vehicles, Satellites, and the Law’ (1961) 7 *McGill Law Journal* 271, 279: ‘but man has not yet, unless unreported, ventured into space. The time cannot be far distant, nevertheless, when efforts will be made to launch a manned satellite.’

³⁵ Eugène Pépin, ‘Space Penetration’ (1958) 52 *Proceedings of the American Society of International Law* 229, 230.

events on the earth's surface; rocket landings on the moon; the landing of scientific instruments on the moon in working condition; manned flight in an orbital satellite that can return its human passengers alive to the earth; manned flight to the vicinity of the moon and back; and the use of outer space for the part of the trajectory of peaceful missiles delivering (say) mail or cargo between distant points on earth.³⁶

In their 1959 text Philip C Jessup and Howard J Taubenfeld thought that 'man may reach the moon by 1963 or 1966 and might even send an eight man rocket to Mars by 1970 or 1980'.³⁷ Further along this technological future lawyers were perceiving leaps in rocket technology: 'thermodynamic nuclear rockets, electrical ion rockets and the ultimate, the photon rocket'³⁸ which would allow 'satellite platforms ...[and] exploration teams ...on the Moon or on a planet'³⁹ and the use of satellites to control weather as a weapon.⁴⁰ Even more speculative was:

the acquisition of economic resources now known or unknown, such as solar energy, new forms of radiation, and ultimately mineral or other resources that are present, and may conceivably become available, on the moon, or other celestial bodies; and finally, discussed with all casualness of a confident scientific era, the encounter with sentient or intelligent beings on other planets.⁴¹

Sputnik signified this technological future; however, this signification was coloured by danger. This was the second representation of Sputnik in first generation space law scholarship. Stephen Gorove saw Sputnik as 'boundless aspirations, infinite promise, and challenge-ridden perspectives, [representing] a panoramic phase with hardly a parallel in

³⁶ Myers S McDougal and Leon Lipson, 'Perspectives for a Law of Outer Space' (1958) 52 *American Journal of International Law* 407, 408–9.

³⁷ Philip C Jessup and Howard J Taubenfeld, *Controls for Outer Space and the Antarctic Analogy* (Columbia University Press, 1959) 200.

³⁸ Andrew G Haley, 'The Law of Space—Scientific and Technical Considerations' (1958) 4 *New York Law Forum* 262, 269.

³⁹ Pépin (n 35) 233. See also Lyons (n 34) 279.

⁴⁰ Stephen Gorove, 'On the Threshold of Space: Toward a Cosmic Law' (1958) 4 *New York Law Forum* 305, 307.

⁴¹ McDougal and Lipson (n 36) 408–9, referring specifically to the pre-Sputnik anticipation of Andrew G Haley. See Andrew G Haley, 'Space Law and Metalaw—A Synoptic View' *Harvard Law Record* 23, 8 November 1956; Andrew G Haley, 'Space Law—Basic Concepts' (1956) 24 *Tennessee Law Review* 643.

our history'.⁴² John C Cooper worried that 'progress' has 'loosed forces which, uncontrolled, may well destroy the civilisation which has created them'.⁴³ Sputnik's Cold War parentage and its nuclear sibling were never far from the surface.⁴⁴ Sputnik represented the promise of a space-faring future but also a possibility for earth bound destruction: 'Will it prove a boon to humanity, or are we getting nearer to the day of destruction?'⁴⁵ For lawyers Sputnik was problematic technology. This reveals the third representation of Sputnik as the need for law. Andrew G Haley, General Counsel of the American Rocket Society and Chairman of the International Affairs Committee of the International Astronautical Federation, believed:

Never before in the history of mankind has the necessity arisen so quickly to state legal parameters in connection with a vast new area of social change. The legal problems presented by the advent of space flight have been climacteric and technology has far outstripped the formulation of legal rules. The gap has widened to the point that the peace of the world is dependent upon our ability to contain the remarkable and precipitous advance of the science of technology of space flight within an effective system of laws.⁴⁶

Haley was not alone. Seymour W Wurfel suggested that 'an effective space jurisprudence may just possibly save the earth from destruction, conserve the solar system in its present form, and make the universe a bit safer'.⁴⁷ Gorove believed that at the 'dawn of the Cosmic Age ... technological progress poses a serious threat if the respective legal problems are not settled beforehand'.⁴⁸

So in Sputnik first generation space law scholars **had visions of** a problematic technological future that needed law today. In doing so it put into circulation a series of images and phrases that went on to become established components of the law and

⁴² Gorove (n 40) 305.

⁴³ John Cobb Cooper, 'Missiles and Satellites' (1958) 44 *American Bar Association Journal* 317, 318.

⁴⁴ Albert Wohlstetter, 'The Delicate Balance of Terror' (1959) 37 *Foreign Affairs* 211; Gorove (n 40) 305, 327; The Editors, 'Satellites and the Law of Space' (1958) 2 *International and Comparative Law Bulletin* 4, 7; Chester Ward, 'Space Law as a Way to World Peace' (1959) *JAG Journal* 10, 21-27; McDougal and Lipson (n 36) 410-11; Jessup and Taubenfeld (n 37) 222-4.

⁴⁵ Victor L Anfuso, *Is Space the Way to Peace and Abundance* (Springer, 1959) 1.

⁴⁶ Haley (n 38) 262.

⁴⁷ Wurfel (n 34) 287.

⁴⁸ Gorove (n 40) 308.

technology enterprise's lexicon: technology had 'outstripped' law;⁴⁹ technology created a legal 'vacuum';⁵⁰ lawyers should 'speculate'⁵¹ on issues that can be 'anticipated';⁵² and the proper reception of Sputnik was within the legal 'imagination'.⁵³ After triggering legal imaginings of space future that needed law, Sputnik orbited out of first generation space law scholarship. Replacing it was a more geostationary concern—the making of positive law. Sputnik explained why the lawyers were writing, but, having justified the project, it was replaced by more orthodox discussions concerning the making of law.

Sputnik called for law. This was revealed through three approaches in first generation space law scholarship. The first was analysis showing that satellites were outside of legal regimes. It was a common claim that the then existing international law did not define the upper limit of sovereign territory.⁵⁴ 'Rockets' and 'satellites', it was noted, were not classified as aircraft in the Annexes to the Chicago Convention on International Civil Aviation of 1944.⁵⁵ Rhetorical questions were asked as to whether Sputnik interfered with sovereign airspace,⁵⁶ and were generally answered in the negative.⁵⁷ The second approach involved an imaginative cataloguing of further gaps which space law must fill. These included: liability for damage on earth from space borne debris;⁵⁸ an international

⁴⁹ John Cobb Cooper, 'Legal Problems of Upper Space' (1956) 50 *Proceedings of the American Society of International Law* 85, 85; Haley (n 38) 262; Gorove (n 40) 308.

⁵⁰ Ward (n 44) 11; Lyons (n 34) 271; Joseph J Simeone, Jr, 'Space—A Legal Vacuum' (1962) 16 *Military Law Review* 43.

⁵¹ John C Hogan, 'The Law of Space' (1957) 33 *New Zealand Law Journal* 348, 348.

⁵² HB Jacobini, 'Effective Control as Related to the Extension of Sovereignty in Space' (1958) 7 *Journal of Space Law* 97, 97.

⁵³ McDougal and Lipson (n 36) 428; Gorove (n 40) 305.

⁵⁴ John Cobb Cooper, 'The Russian Satellite—Legal and Political Problems' (1957) 24 *Journal of Air Law and Commerce* 379, 380; Morton S Jaffe, 'Some Considerations in the International Law and Politics of Space' (1959) 5 *St Louis University Law Journal* 375, 377–8; Lyons (n 34) 273–7; McDougal and Lipson (n 36) 421–6.

⁵⁵ Convention on International Civil Aviation, opened for signature 12 July 1944, [1957] ATS 5 (entered into force 4 April 1947) (Chicago Convention); Eugène Pépin, 'The Legal Status of the Airspace in the Light of Progress in Aviation and Astronautics' (1956) 3 *McGill Law Journal* 70, 74; Eugène Pépin, 'Legal Problems Created by the Sputnik' (1957) 4 *McGill Law Journal* 66, 68; George J Feldman and Charles S Sheldon II, *Survey of Space Law: Staff Report of the Select Committee on Astronautics and Space Exploration* (United States House of Representatives, 1958); Michael Smirnoff, *The Need for a New System of Norms for Space Law and the Danger of Conflict with the Terms of the Chicago Convention* (Springer, 1958).

⁵⁶ John Cobb Cooper, 'Flight-Space and the Satellites' (1958) 7 *International and Comparative Law Quarterly* 82, 88–89; Andrew G Haley, *Space Age Presents Immediate Legal Problems* (Springer, 1958) 8–14.

⁵⁷ Haley (n 38) 265–74; Cooper (n 43) 319–320; Jacobini (n 52) 108–110; Pépin (n 35) 229.

⁵⁸ Pépin 1956 (n 55) 75; Editors (n 55) 6; Lyons (n 34) 283–6; IH Ph de Rode-Verschoor, *The Responsibility of States for Damage Caused by Launched Space-Bodies* (Springer, 1958) 103–4.

system for registering launches and inspections of launch sites;⁵⁹ regulation of radio frequencies broadcasted to satellites⁶⁰ prohibiting the orbital placement of nuclear armaments;⁶¹ ‘road rules’ for an anticipated cluttered orbit;⁶² property law for celestial real estate;⁶³ and whether ‘the concept of the “Reasonable Spaceman” will be applied to cases of negligence in the law of Space-Torts’.⁶⁴ Kenneth B Keating, Republican Congressman and member of the House Select Committee on Astronautics and Space Exploration, suggested that:

[L]awyers have their work cut out for them. They must begin to think now of a space navigation code, a space radio communication code and even a space rescue code. It may be that in our lifetime, we will be drafting agreements governing the carriage of goods and passengers in space ... Specific attention should be given to establishing law school courses devoted to these legal questions.⁶⁵

The third approach, which the other two were preparatory, was the outlining of the process for making space law. There was near uniform agreement among space lawyers that the forum for space law was international law: ‘lawyers are of the opinion that a worldwide agreement—a truly worldwide one—is necessary.’⁶⁶ However, there was dispute over whether such an agreement should provide a comprehensive legislative framework dealing with all the anticipated issues or a more narrow focus on the immediate issues surrounding the limit of sovereignty with the more speculative issues to be addressed when, and if, they became urgent.⁶⁷ McDougal and Lipson favoured the incremental strategy and argued against a ‘mechanical translation’ of existing legal

⁵⁹ Myers S McDougal, ‘Artificial Satellites: A Modest Proposal’ (1957) 51 *American Journal of International Law* 74, 77; McDougal and Lipson (n 36) 430.

⁶⁰ Andrew E Haley, ‘Law of Outer Space-Radio Controls Urgently Needed’ in E Galloway (ed), *Space Law—A Symposium* (Special Committee on Space and Astronautics, United States Senate, 1959).

⁶¹ McDougal and Lipson (n 36) 430–1.

⁶² *Ibid.*, 415.

⁶³ Hogan (n 51) 348.

⁶⁴ *Ibid.*

⁶⁵ Kenneth B Keating, ‘The Law and the Conquest of Space’ (1958) 25 *Journal of Air Law and Commerce* 182, 191.

⁶⁶ Pépin (n 35) 232. See also Pépin 1957 (n 55) 68; McDougal and Lipson (n 36) 412; Jacobini (n 52) 117; George J Feldman, *An American View of Jurisdiction of Outer Space* (Springer, 1958); Leon Lipson and Nicholas de B Katzenbach, *Report to the National Aeronautics and Space Administration on the Law of Outer Space* (American Bar Foundation, 1961) 32.

⁶⁷ This division was observed in Feldman and Sheldon (n 55) 5.

concepts to space in the absence of how space exploration and exploitation will proceed:⁶⁸

The conquest of space has barely begun. Yet the law of space, instead of lagging behind the astronauts as some lawyers fear, is threatening to outfly the attraction of the earth's gravity. Before legal speculation reaches escape velocity, we should perhaps remind ourselves of the specific problems that may confront us soon, the earthly origin of much of our law, and the earthly ways in which for some time we shall have to continue to think about law in outer space.⁶⁹

Wurfel articulated the alternative argument that a future-focused comprehensive space law was needed to legalise space exploitation in advance:

Suppose that the first 'soft' landing on the moon proves it to be made not of green cheese, but of pure platinum and radium in alternative layers. Suppose that space travel discloses that meteor particles provide a sure cure for cancer. Once consumer demand for space products exists, whether engendered by the free enterprise system or for the good of the commune, it will be too late to sit down and work out a dispassionate property law for space.⁷⁰

Unifying both incremental and comprehensive approaches to positing space law was a belief in the rule of law in outer space. Emphasis was given to the fact that space technology demanded international cooperation and in that cooperation there lay the possibility for lasting peace.⁷¹ Haley argued that:

... space flight is likely to contribute indirectly more to material and spiritual improvements in living standards all over the planet than any single economic or social measure. It brings this about simply by creating gradually a more intense feeling of belonging to the same planetary community.⁷²

⁶⁸ McDougal and Lipson (n 36) 420. This was also the position of Gorove (n 40) 309.

⁶⁹ McDougal and Lipson (n 36) 407.

⁷⁰ Wurfel (n 34) 286. See also C Wilfred Jenks, 'International Law and Activities in Space' (1956) 5 *International and Comparative Law Quarterly* 101.

⁷¹ McDougal and Lipson (n 36) 410; Keating (n 65) 189–92; Lyons (n 34) 286.

⁷² Andrew E Haley, 'The Law of Outer Space: Scientific and Anthropocentric Considerations' in Galloway (n 60) 440.

President Eisenhower's several public endorsements of outer space for peace were cited with approval.⁷³ Western lawyers included the opinion of Soviet jurists in their analysis⁷⁴ and the 1959 Space Law Symposium prepared by the Special Committee on Space and Astronautics of the US Senate contained translated papers by Soviet lawyers Sergei Krylov and G Zadorozhnyi.⁷⁵ This linking of space, the rule of international law and peace was challenged by a hawkish minority who saw in the Soviet Union an enemy that was lawless in its actions. According to Rear Admiral Chester Ward, Judge Advocate General of the US Navy:

[C]an peace be enforced through law, regardless of the **communists'** determination to conquer the world ... Failure to face this fundamental fact of twentieth century life on planet Earth can distort space law from a sensible source of hope for a far future in space, to a series of psychological and military traps to divert, anesthetize, and ultimately destroy the forces of freedom in this world.⁷⁶

While Ward's Cold War context explains his hostility to space law, his opposition disclosed a lasting feature of the law and technology enterprise: that there was always a small minority challenging the mainstream call for law on what amounted to a different assessment of the technology involved. Ward did not share the common assumption that Sputnik heralded a problematic technological future that needed law to ensure peace. Instead, he saw in space technology a highly advantageous field for US superiority that should be militarised to defeat global communism.⁷⁷

Ward's minority perspective also throws into relief a characteristic of first generation space law scholarship that was commented on by its predominately military critics. It was a verbose literature; 'the pages of law reviews and political journals have been drenched

⁷³ Wurfel (n 34) 281; Gorove (n 40) 316; Haley (n 72) 445; Lipson and de B Katzenbach (n 66) 5.

⁷⁴ JF McHahon, 'Legal Aspects of Outer Space' (1962) 38 *British Yearbook of International Law* 339, 345–8; Robert D Crane, 'Soviet Attitudes towards International Space Law' (1962) 56 *American Journal of International Law* 685.

⁷⁵ A Kislov and S Krylov, 'State Sovereignty in Airspace'; G Zadorozhnyi, 'The Artificial Satellite and International Law', both in Galloway (n 60).

⁷⁶ Ward (n 44) 12.

⁷⁷ *Ibid.*, 21–27.

with writings’, opinioned Lieutenant Colonel Hal H Bookout.⁷⁸ Indeed, as early as 1956 John C Hogan published the first space law biography, taking up eight pages in the *Journal of Air Law and Commerce*.⁷⁹ Hogan’s second iteration, published in 1958, had grown to 54 pages of the *St Louis University Law Journal*.⁸⁰ By 1962 there were several textbooks on space law,⁸¹ including McDougal, Lasswell and Vlasic’s 1,103-page (excluding appendices) opus *Law and Public Order in Space*.⁸²

First generation space law scholarship provided the foundation for the analysis that followed in later generations of space law. Each subsequent event—Yuri Gagarin’s flight, the race to and US landing on the moon, commercial communication satellites, the first launch of the space shuttle, the much more recent SpaceShipOne and space tourism—was used by lawyers to write about the need for law.⁸³ Further, the enacting of this called-for law, whether national law like the US National Aeronautics and Space Act (1958)⁸⁴ that established NASA, or the hoped-for international legal regime that

⁷⁸ Hal H Bookout, ‘Conflicting Sovereignty Interest in Outer Space: Proposed Solutions Remain in Orbit’ (1960) 7 *Military Law Review* 23, 25. See also Philip W Quigg, ‘Open Skies and Open Space’ (1958) 37 *Foreign Affairs* 95, 95; McDougal and Lipson (n 36) 411–12; Simeone (n 50) 44.

⁷⁹ John C Hogan, ‘Space Law Bibliography’ (1956) 23 *Journal of Air Law and Commerce* 317.

⁸⁰ John C Hogan, ‘A Guide to the Study of Space Law’ (1958) 5 *St Louis University Law Journal* 79.

⁸¹ eg Jessup and Taubenfeld (n 37).

⁸² Myers S McDougal, Harold D Lasswell and Ivan A Vlasic, *Law and Public Order in Space* (Yale University Press, 1962).

⁸³ Gagarin (Leon Lipson, ‘An Argument on the Legality of Reconnaissance Satellites’ (1961) 55 *Proceedings of the American Society of International Law* 174; José Delascio, ‘Space Explorations and Space Law’ (1961) 28 *Journal of Air Law and Commerce* 364; John A Johnson, ‘The Developing Law of Space Activities’ (1963) 3 *Virginia Journal of International Law* 75); Moon (Myers S McDougal *et al*, ‘The Enjoyment and Acquisition of Resources in Outer Space’ (1963) 111 *University of Pennsylvania Law Review* 521; John Cobb Cooper, ‘Who Will Own the Moon?: The Need for an Answer’ (1966) 32 *Journal of Air Law and Commerce* 155); commercial communication satellites (Abram Chayes and Leonard Chazen, ‘Policy Problems in Direct Broadcasting from Satellites’ (1970) 5 *Stanford Journal of International Studies* 4; Jan Busak, ‘The Need for an International Agreement on Direct Broadcasting by Satellites’ (1973) 1 *Journal of Space Law* 139; Clyde E Rankin III, ‘Utilization of the Geostationary Orbit: A Need for Orbital Allocation’ (1974) 13 *Columbia Journal of Transnational Law* 98); Space Shuttle (Gerald J Mossinghoff and George Paul Sloup, ‘Legal Issues Inherent in Space Shuttle Operations’ (1978) 6 *Journal of Space Law* 47; Theodore E Wolcott, ‘Some Aspects of Third Party Liability in Space Shuttle Operations’ (1980) 13 *Akron Law Review* 613; Stephen Gorove, ‘Legal Aspects of the Space Shuttle’ (1979) 13 *International Lawyer* 153); SpaceShipOne and space tourism (Steven Freeland, ‘Up, Up and ... Back: The Emergence of Space Tourism and its Impact on the International Law of Outer Space’ (2005) 6 *Chicago Journal of International Law* 1; Catherine E Parsons, ‘Space Tourism: Regulating Passage to the Happiest Place off Earth’ (2006) 9 *Chapman Law Review* 493; John Adolph, ‘The Recent Boom in Private Space Development and the Necessity of an International Framework Embracing Private Property Rights to Encourage Investment’ (2006) 40 *International Lawyer* 961).

⁸⁴ Public Law #85-568, 72 Stat, 426.

eventually comprised the Outer Space Treaty of 1967,⁸⁵ the Rescue Agreement of 1968,⁸⁶ the Liability Convention of 1972⁸⁷ and the Registration Convention of 1976,⁸⁸ provided further opportunities for scholarly inspection.⁸⁹ This subsequent literature built upon the positive foundations expressed in first generation space law scholarship, that law is a way of achieving public policy goals (peace, non-militarisation, fair frameworks for future exploitation), and the purpose of legal writing was to facilitate this function through exposing the gaps within existing regimes, describing new laws, and assessing the effectiveness of new laws according to public policy goals. This positivism of space law scholarship rarely went unchallenged. The military opponents questioned the need for law to restrict militarisation because they believed that future victory over the communists lay in space war. They did not question the more fundamental assumption that law, if appropriate, should be made. In this George S Robinson was a lone voice in his opposition to the positivism of international space law and space law scholarship:

Jurisprudentially inclined minds should be ripe for the opportunity, not simply to extend the usual anthropocentric legal positivism into the arena of man-in-space, but to grasp the

⁸⁵ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, opened for signature 27 January 1967, 610 UNTS 205 (entered into force 10 October 1967).

⁸⁶ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, opened for signature 22 April 1968, 672 UNTS 119 (entered into force 3 December 1968).

⁸⁷ Convention on the International Liability for Damage Caused by Space Objects, opened for signature 29 March 1972, 961 UNTS 187 (entered into force 1 September 1972).

⁸⁸ Convention on Registration of Objects Launched into Outer Space, opened for signature 12 November 1974, 1023 UNTS 15 (entered into force 15 September 1976).

⁸⁹ NASA (Ludwig Teller, 'Peace and National Security in the New Space Age: The National Aeronautics and Space Act of 1958' (1958) 4 *New York Law Forum* 276; Paul G Dembling, 'National Coordination for Space Exploration—The National Aeronautics and Space Act of 1958' (1959) 1959 *JAG Journal* 16); Outer Space Treaty (Ivan A Vlasic, 'Space Treaty: A Preliminary Evaluation' (1967) 55 *California Law Review* 507; Stephen Gorove, 'Interpreting Article II of the Outer Space Treaty' (1969) 37 *Fordham Law Review* 349; Thomas R Adams, 'Outer Space Treaty: An Interpretation in Light of the No-Sovereignty Provision' (1968) 9 *Harvard International Law Journal* 140); Rescue Agreement (Cargill R Hall, 'Rescue and Return of Astronauts on Earth and in Outer Space' (1969) 63 *American Journal of International Law* 197; Robert E Clute, 'The Law of Outer Space' (1970) 1 *Georgia Journal of International and Comparative Law* 105; Stephen Gorove, 'International Protection of Astronauts and Space Objects' (1971) 20 *DePaul Law Review* 597); Liability Convention (WF Foster, 'The Convention on International Liability for Damage Caused by Space Objects' (1972) 10 *Canadian Yearbook of International Law* 139; Michael Smirnoff, 'The Problem of Security in Outer Space in Light of the Recently Adopted International Convention on Liability in Outer Space' (1973) 1 *Journal of Space Law* 121); Registration Convention (Rebecca J Martin, 'Legal Ramifications of the Uncontrolled Return of Space Objects to Earth' (1980) 45 *Journal of Air Law and Commerce* 457).

significance of viewing and evaluating the social relationships of man in a totally controlled environment.⁹⁰

Robinson's law and [cybernetic] society re-conceptualising found little support.⁹¹ It stands as testament to what space law scholarship was not. It was not a literature that engaged with law and technology, and questioned modern law in technology's light. Indeed, outside of moments of imaginative conjuncture concerning futures, its description and analysis could hardly be called imaginative. It was a practical project concerned with making laws that regulate.

In summary, first generation space law scholarship arose as a legal reaction to Sputnik I that took the satellite as a harbinger of an emerging problematic technology that needed law. This was a literature where technology called forth law; and this law that was called was positive law. There was a lawless cosmos to be juridified. This foundation gave two characteristics to space law scholarship. The first was that lawyers wrote to show how existing law 'failed' to adequately address the challenge of space technology. The second was description. The lawyer's role was to describe laws; **existing laws were described so to highlight inadequacies, while new laws** were just described. Lawyers (again and again as the volume of space law scholarship attests) confidently assumed the practical role of describing and assessing the adequacy of posited law within an overarching public policy framework of desirable and undesirable technological futures. It is these features of first generation space law scholarship—problematic technology calling forth positive law to secure desirable futures encased in a voluminous legal literature of describing and gap finding—that is replicated in other legal literatures that surrounded subsequent technologies.

In Vitro Fertilisation

The announcement by Patrick Steptoe and Robert Edwards in the letters to the editor pages of the *Lancet* of the birth of the first in vitro fertilisation (IVF) child, Louise

⁹⁰ George S Robinson, 'NASA's Space Station and the Need for Quantifiable Components of a Responsive Legal Regime' (1972) 6 *International Lawyer* 292, 292.

⁹¹ Robinson is only cited by one other author, and then for a 'blackletter' proposition regarding contracts made between orbiting astronauts and earth-based parties. See Scott F March, 'Dispute Resolution in Space' (1983) 7 *Hastings International and Comparative Law Review* 211, 229.

Brown, on 25 July 1978⁹² was immediately regarded by lawyers as a crisis event. The media images of the newborn were received by lawyers as the next step towards the problematic future of artificial human reproduction. It was a future that needed law and needed lawyers to voluminously describe and identify gaps in the existing law. In the ‘IVF and law scholarship’ the positivism that sustained first generation space law became more obvious. The link between rule of law and peace, which for positivists has been an illicit source of values within their supposedly formal conception of law,⁹³ meant that early space lawyers (with the exception of the US military lawyers) tended to agree on the public policy aims of international space law. With IVF the public policy values to be secured by law were more contested. In this context lawyers cited the ‘ethical issues’, but focused more on identification of gaps and the abstract call for law.

The reception of IVF into legal scholarship was not accompanied by the lyrical descriptions of new horizons that greeted Sputnik. Lawyers acknowledged that Louise Brown’s birth was a major ‘media event’;⁹⁴ however, in their own writing IVF was received as another development within what was called the ‘New Biology’.⁹⁵ As such IVF was located as the next step in a continuum of ‘artificial human reproduction’⁹⁶ that began with artificial insemination (AI), then recombinant DNA (rDNA), then IVF, embryo transfer (ET) and surrogate motherhood, and would end with cloning and ectogenesis.⁹⁷ Indeed, IVF had already been placed into this future history by lawyers in

⁹² PC Steptoe and RG Edwards, ‘Birth after the Reimplantation of a Human Embryo’ (1978) 2 *The Lancet* 366, 366.

⁹³ This comment gestures towards Hart’s ‘basic truisms’ of human existence that ‘arguably’ provide the foundations for the minimum content of natural law. HLA Hart, *The Concept of Law* (Clarendon, 1961) 189–95.

⁹⁴ ‘Legal Implications of In Vitro Fertilisation of Human Eggs’ (1978) 52 *Australian Law Journal* 657, 657; Walter Wadington, ‘Artificial Conception: The Challenge for Family Law’ (1983) 69 *Virginia Journal of International Law* 465, 465. See also Zelman Cowen, ‘In the Rear and Limping a Little: Some Reflections on Medicine, Biotechnology, and the Law: The Roscoe Pound Lectures’ (1985) 64 *Nebraska Law Review* 549, 563; Mark E Cohen, ‘The “Brave New Baby” and the Law; Fashioning Remedies for Victims of In Vitro Fertilization’ (1979) 4 *American Journal of Law and Medicine* 319, 319; Paula Diane Turner, ‘Love’s Labor Lost: Legal and Ethical Implications in Artificial Human Procreation’ (1981) 58 *Journal of Urban Law* 459, 471.

⁹⁵ George P Smith II, ‘Manipulating the Genetic Code: Jurisprudential Conundrums’ (1976) 64 *Georgetown Law Journal* 697, 698.

⁹⁶ Deborah Clapshaw, ‘Legal Aspects of Artificial Human Reproduction: Can Law Afford to Play Ostrich?’ (1980–3) 4 *Auckland University Law Review* 254; Sharon M Steeves, ‘Artificial Human Reproduction: Legal Problems Presented by the Test Tube Baby’ (1979) 28 *Emory Law Journal* 1045.

⁹⁷ See eg Dennis J Tuchler, ‘Man-Made Man and the Law’ (1978) 22 *St Louis University Law Journal* 310; Sarah AL Humphreys, ‘Lawmaking and Science: A Practical Look at In Vitro Fertilization

the early 1970s.⁹⁸ Mary Anne Oakley in 1974 located IVF in a technological future that involved AI (present), IVF (near future) and cloning (more distant).⁹⁹ In these early writings IVF was anticipated as a further, and troublesome, step towards a problematic future of artificial human reproduction.

As a consequence IVF in the IVF and law scholarship was considered more of a peril than a promise. Paula Diane Turner in 1981 asked, with the ‘dangers of toxic pesticides and air pollution, and with so many other technological developments visibly damaging the quality of life, how is society to react to scientific manipulation of man’s inner nature?’¹⁰⁰ David G Dickman in 1985 suggested that ‘[t]he clinical application of IVF opens up a Pandora’s Box of problems’.¹⁰¹ This registering of IVF as predominately a ‘peril’¹⁰² occurred even when acknowledging its promise in addressing infertility:

Although IVF offers hope to infertile couples, it presents significant hazards. Because IVF is still experimental, most of the conceptuses fertilized *in vitro* will not survive to term. Those who do reach full term may face abnormally high risks of being born with severe defects.¹⁰³

IVF as peril opened the way for the call for law. The law was ‘outpaced’.¹⁰⁴ In 1979 Sharon M Steeves predicted that ‘[o]ur existing legal framework may be inadequate to protect either society or the individual from the consequences of artificial reproductive

and Embryo Transfer’ (1979) 3 *Detroit College of Law Review* 429, 429; Turner (n 94) 460; Iwan Davies, ‘Fabricated Man: The Dilemma Posed by Artificial Reproductive Techniques’ (1984) 35 *Northern Ireland Legal Quarterly* 354, 354; Kathryn Venturatos Lorio, ‘Alternative Means of Reproduction: Virgin Territory for Legislation’ (1984) 44 *Louisiana Law Review* 1641, 1665–72; George P Smith II and Roberto Iraola, ‘Sexuality, Privacy and the New Biology’ (1984) 67 *Marquette Law Review* 263.

⁹⁸ Harold P Green, ‘Genetic Technology: Law and Policy for the Brave New World’ (1973) 48 *Indiana Law Review* 559, 562–3. See also Judith W Munson, ‘Fetal Research: A View from Right to Life to Wrongful Birth’ (1975) 52 *Chicago-Kent Law Review* 133, 136; Smith (n 95) 711.

⁹⁹ Mary Anne B Oakley, ‘Test Tube Babies: Proposals for Legal Regulation of New Methods of Human Conception and Prenatal Development’ (1974) 8 *Family Law Quarterly* 385, 385. The Australian Law Reform Commission report into human tissue transplantation in 1977 anticipated IVF and ET and suggested a separate dedicated inquiry. See Australian Law Reform Commission, *Human Tissue Transplants* (1977), [38], [41]–[42].

¹⁰⁰ Turner (n 94) 459.

¹⁰¹ David G Dickman, ‘Social Values in a Brave New World: Toward a Public Policy Regarding Embryo Status and In Vitro Fertilization’ (1985) 29 *St Louis University Law Journal* 817, 826.

¹⁰² Davies placed IVF in the same category of concern as nuclear technology. Davies (n 97) 374.

¹⁰³ Cohen (n 94) 320. Another technique of turning the promise into a peril was to invoke the spectre of the commercialisation of children in the suggestion. See Joan Heifetz Hollinger, ‘From Coitus to Commerce: Legal and Social Consequences of Noncoital Reproduction’ (1986) 18 *University of Michigan Journal of Law Reform* 865, 870.

¹⁰⁴ Venturatos Lorio (n 97) 1641.

technology'.¹⁰⁵ Sarah AL Humphreys argued that the 'strides being made in these areas have not been accompanied by similar advances in the law to deal with the unique legal situations these processes [rDNA, cloning, IVF and ET] may produce'.¹⁰⁶ Bernard M Dickens wrote that the 'biomedical realities of *in vitro* fertilization and embryo transfer show the extent of legal lag in Canada'.¹⁰⁷ Indeed, most IVF and law scholars were of the opinion that 'no direct legal regulation has yet been imposed on IVF'.¹⁰⁸

In making this assessment lawyers did have to describe the existing law that concerned IVF. *Del Zio v Manhattan's Columbia Presbyterian Medical Center*¹⁰⁹ arose from a compensation claim when an IVF program was terminated. *Del Zio* was considered inadequate by IVF and law scholarship as the judgment only related to damages arising from the trauma to Mrs Del Zio of having the program cancelled.¹¹⁰ The later decision of *Smith v Hartigan*¹¹¹ similarly was described as not providing a determinative decision on the legalities of IVF.¹¹² Further, the 'soft-law' in the US that was directed to regulating IVF research, namely the 1976 moratorium and the revised 1979 guidelines imposed by the federal Department of Health, Education and Welfare (HEW), were outlined.¹¹³ However, this description usually focused on the limits of the regulations to research

¹⁰⁵ Steeves (n 96) 1077.

¹⁰⁶ Humphreys (n 97) 430.

¹⁰⁷ Bernard M Dickens, 'The Ectogenetic Human Being: A Problem Child of Our Time' (1980) 18 *University of Western Ontario Law Review* 241, 242.

¹⁰⁸ Cohen (n 94) 324. See also Margaret I Lane, Susan Cross Bolton and Rose M Alexander, 'In Vitro Fertilization: Hope for Childless Couples Breeds Legal Exposure for Physicians' (1983) 17 *University of Richmond Law Review* 311, 323, 327; Kathryn Venturatos Lorio, 'In Vitro Fertilization and Embryo Transfer: Fertile Areas for Litigation' (1982) 35 *Southwestern Law Journal* 973, 984–96; Ellen Crabtree, 'Protecting Inheritance Rights of Children Born through *In Vitro* Fertilization and Embryo Transfer: Suggestions for a Legislative Response' (1983) 27 *St Louis University Law Journal* 901, 902; Roger B Bernholz and G Nicholas Herman, 'Legal Implications of Human In Vitro Fertilization for the Practicing Physician in North Carolina' (1984) 6 *Campbell Law Review* 5, 9–16; Hollinger (n 103) 867; George J Annas and Sherman Elias, 'In Vitro Fertilization and Embryo Transfer: Medicolegal Aspects of a New Technique to Create a Family' (1983) 17 *Family Law Quarterly* 199, 208; Steeves (n 96) 1046–7.

¹⁰⁹ No 74-3588 (SDNY, filed 12 April 1978).

¹¹⁰ Lane *et al* (n 108) 321–3; Venturatos Lorio (n 97) 1670; Dickman (n 101) 837–9; Kelly L Frey, 'New Reproductive Technologies: The Legal Problem and a Solution' (1982) 49 *Tennessee Law Review* 303, 318.

¹¹¹ 556 F Supp 157 (ND Ill 1983).

¹¹² Crabtree (n 108) 911; Dickman (n 101) 839–41; Venturatos Lorio (n 97) 1669.

¹¹³ Turner (n 94) 477–8; Barbara F Katz, 'Legal Implications and Regulation of *In Vitro* Fertilization' in A Milunsky and GJ Annas (eds), *Genetics and the Law II* (Plenum, 1979) 363.

funded by HEW.¹¹⁴ The conclusion of these surveys was that the existing law was regarded as inadequate. This justified the demand that IVF be ‘properly controlled’¹¹⁵ through the making of tailor-made law:

[T]he question whether science is moving beyond our social and political ability to deal with the fruits and consequences of its discoveries is highly relevant. Since technology tends to develop a momentum of its own, ... early legal regulation is necessary so that society is not presented with one technological *fait accompli* after another.¹¹⁶

In 1981, not long after the birth of Australia’s first IVF baby, Candice Reed, Justice Michael Kirby, then Chairman of the Australian Law Reform Commission, wrote:

Statute law and common law are silent on the profound questions raised by this new technology. Should we tolerate such a silence, allowing scientists and technologists to take society where they will, with no prior opportunity for us as a nation, indeed as a species, to consider the implications and to lay down the acceptable rules within which these developments will occur?¹¹⁷

In short, the IVF and law scholarship established that IVF was a peril that needed law. In common with the first generation space law scholarship, the IVF and law scholarship had an imaginative dimension. Having identified gaps and called for law, the lawyers saw it as their role to consider the implications of IVF. In this the lawyers were called upon ‘of necessity [to] be speculative’.¹¹⁸ They were encouraged to ‘brainstorm’¹¹⁹ and be ‘creative’.¹²⁰ It was suggested that ‘[t]he prescience of the law in the area of IVF will

¹¹⁴ See Milunsky and Annas, *ibid*, 360; Venturatos Lorio (n 97) 1667; M Karen McCartan, ‘A Survey of the Legal, Ethical, and Public Policy Considerations of In Vitro Fertilization’ (1986) 2 *Notre Dame Journal of Law, Ethics and Public Policy* 695, 699.

¹¹⁵ Oakley (n 99) 386.

¹¹⁶ Davies (n 97) 354.

¹¹⁷ Michael Kirby, ‘Test-Tube Man’ (1981) 2 *Medical Journal of Australia* 1, 1. Similarly, the editors of the *Australian Law Journal* wrote in the December 1978 issue of ‘the necessity for legal controls in regard to these processes of laboratory fertilisation and of subsequent in utero implantment’. See ‘Legal Implications of In Vitro Fertilisation of Human Eggs’, 657–8.

¹¹⁸ Randall Mahlon Blow, ‘In Vitro Fertilization: New Territory for the Preconception Tort’ (1982) 5 *George Mason University Law Review* 169, 169.

¹¹⁹ Wadington (n 94) 467.

¹²⁰ *Ibid*, 477.

preclude abuses of this novel technology’,¹²¹ and ‘a concerted effort should be made to regulate the foreseeable problems generated by currently available procedures’.¹²² Having established IVF as problematic that called for law today, the IVF and law scholarship turned to the speculative task of identifying the ‘range of possible legal problems’.¹²³

These were confidently foreseen. In this the continuum of artificial human reproduction suggested that the known problems with AI would be replicated with IVF. By 1978 there was a dedicated literature considering law and AI that stretched back to the 1940s. This literature established that artificial human reproduction threw up three sets of issues: the first concerning the legitimacy of artificially conceived children,¹²⁴ the second on medical liability,¹²⁵ and the third, quaint (at least to twenty-first century sensibilities) discussions of whether AI amounted to adultery at common law.¹²⁶ Louise Brown represented an opportunity to revisit these concerns. This return had two manifestations. The first manifestation was that IVF and law scholarship focused on questions of the legitimacy of IVF children,¹²⁷ medical liability arising from harm to the children or

¹²¹ McCartan (n 114) 727.

¹²² Steeves (n 96) 1077.

¹²³ Gayle McNabb, *Ethical and Legal Aspects of Human In Vitro Fertilization: A Selected Annotated Bibliography* (Department of Librarianship, Melbourne College of Advanced Education, 1984) 11.

¹²⁴ This involved discussion of a line of authority in common law jurisdictions that began with the UK divorce case *REL v EL* [1949] 1 All ER 141. JC Schock, ‘The Legal Status of the Semi-Adopted’ (1942) 46 *Dickinson Law Review* 271; NC Masters, ‘Artificial Insemination’ (1953) 70 *South African Law Journal* 375, 379; Arthur A Levisohm, ‘Dilemma of Parenthood: Socio-Legal Aspects of Human Artificial Insemination’ (1959) 36 *Chicago-Kent Law Review* 1, 22, 24–26; Barry Stephen Verkauf, ‘Artificial Insemination: Progress, Polemics, and Confusion—An Appraisal of Current Medico-Legal Status’ (1966) 3 *Houston Law Review* 277, 302–6; C Thomas Dienes, ‘Artificial Donor Insemination: Perspectives on Legal and Social Change’ (1968) 54 *Iowa Law Review* 253, 276–84; Neal Weinstock, ‘Artificial Insemination—The Problem and the Solution’ (1971) 5 *Family Law Quarterly* 369, 384; Joseph E Carr IV, ‘Artificial Insemination: Problems, Policies, and Proposals’ (1973) 26 *Alabama Law Review* 120, 131–40.

¹²⁵ Alfred Koerner, ‘Medicolegal Considerations in Artificial Insemination’ (1948) 8 *Louisiana Law Review* 484, 494; Verkauf (n 124) 282–5, 306–7; Carr (n 124) 128.

¹²⁶ This involved discussion of a line of authority in common law jurisdictions that began with the Canadian divorce case of *Orford v Orford* 58 DLR 251 (1921). See Koerner (n 125) 495; Masters (n 124) 377–8; Levisohm (n 124) 20; Albert P Massey, Jr, ‘Artificial Insemination: The Law’s Illegitimate Child?’ (1963) 9 *Villanova Law Review* 77, 78–80; Verkauf (n 124) 294–7, 299–302; Dienes (n 124) 260–76; George P Smith II, ‘Through a Test Tube Darkly: Artificial Insemination and the Law’ (1968) 67 *Michigan Law Review* 127, 134–41; Weinstock (n 124) 380–4; Oakley (n 99) 386–90. De Stoop, writing in Australia, made the point that the passing of the Family Law Act 1974 (Cth) removed adultery as a concern for AI and Australian family law. Dominique FJJ De Stoop, ‘Human Artificial Insemination and the Law in Australia’ (1976) 50 *Australian Law Journal* 298, 300.

¹²⁷ Steeves (n 96) 1077–9; Dennis M Flannery *et al*, ‘Test Tube Babies: Legal Issues Raised by *In Vitro* Fertilization’ (1979) 67 *Georgetown Law Journal* 1295, 1319–21; Humphreys (n 97) 446–8; Kevin Andrews, ‘In Vitro Fertilisation—Laparoscopes, Life and the Law’ (1982) 56 *Law Institute Journal* 204,

women,¹²⁸ and, to a lesser extent, adultery.¹²⁹ The second manifestation, flowing from the belief that '[l]egal clarification of AI [wa]s a necessary prerequisite for regulating IVF and embryo transplanting',¹³⁰ was that most papers had a dedicated section, usually towards the beginning, reviewing the legal response to AI.¹³¹

This did not exhaust the legal imagination. Reflection on the possible legal dilemmas of IVF threw up a series of more novel concerns. In order for Louise Brown to be conceived in a test tube, **viable** ova had to be extracted from Lesley Brown, and ET was needed to place the embryo into her womb. In this IVF made possible both ovum donation, gamete and embryo freezing, and gestational surrogacy (that is where the birth mother would have no genetic relationship to the child). While sperm donation and the spectre of 'sperm banks' was a feature in the earlier AI and law scholarship, it had been discussed in legitimacy terms of ensuring that the male donor's identity be kept confidential and that no legal relationship be imposed between the donor and biological children.¹³² The possibility of ovum donation raised more fundamental questions about law's role in maintaining concepts such as 'motherhood' and 'family' where they no longer seemed as 'natural' as before.¹³³ The possibility of gamete and embryo freezing gave rise to two imagined concerns. The first was with the rights of children-to-be,¹³⁴ a concern that

209; Frey (n 110) 334–41; Crabtree (n 108) 917–28; Stephen Mason, 'Abnormal Conception' (1982) 56 *Australian Law Journal* 347, 347–8, 351–2; Michael Lupton, 'The Status of Children Born by Artificial Insemination in South African Law' (1985) 1985 *Journal of South African Law* 277, 290–5; Rosalind Atherton, 'Artificially Conceived Children and Inheritance in New South Wales' (1986) 60 *Australian Law Journal* 374.

¹²⁸ Katz (n 113) 357–60; Cohen (n 94) 328335; Flannery *et al* (n 127) 1333–45; Dickens (n 107) 262–7; Turner (n 94) 478–9; Mahlon Blow (n 118) 175–83; Venturatos Lorio (n 108) 996–1010; Lane *et al* (n 108) 334–44; Bernholz and Herman (n 108) 19–43; Davies (n 97) 363–6; John A Robertson, 'Embryos, Families, and Procreative Liberty: The Legal Structure of the New Reproduction' (1986) 59 *Southern California Law Review* 939, 991–1000.

¹²⁹ Venturatos Lorio (n 108) 987–8.

¹³⁰ Oakley (n 99) 390–1. See also Smith (n 95) 715.

¹³¹ Katz (n 113) 353–6; Steeves (n 96) 1050–1, 1071–6; Russell Scott, *The Body as Property* (Allen Lane, 1981) 199–214; Turner (n 94) 460–71; Andrews (n 127) 206; Mason (n 127) 348, 350; Frey (n 110) 312–16; Crabtree (n 108) 912–16; Wadington (n 94) 468–73; Clapshaw (n 96) 255–62; Venturatos Lorio (n 97) 1643–53; Lupton (n 127) 277–89; Jacqueline A Priest, 'Assisted Reproduction—Developments in England' (1988) 37 *International and Comparative Law Quarterly* 535, 537.

¹³² See eg Verkauf (n 124) 304–6; De Stoop (n 126) 303–4. The issue of incest arising through the widespread use of AI by donor from confidential sperm banks has been discussed by various writers. See eg Smith (n 126) 133.

¹³³ Annas and Elias (n 108) 214–16; Lane *et al* (n 108) 329–30; Davies (n 97) 373–4; Robertson (n 128) 1001–10, 1024–33.

¹³⁴ Annas and Elias (n 108) 210; Russell Scott, 'Test Tube Babies: Experimental Medicine and Allied Problems' (1984) 58 *Australian Law Journal* 405, 409.

became topical with the 1984 ‘orphaning’ of two frozen embryos due to the death of their ‘parents’ in an aeroplane accident.¹³⁵ The second related to the destruction of surplus embryos, which was analysed as analogous to the laws and ethics surrounding abortion.¹³⁶ Further, gestational surrogacy opened the way for questions on the proper regulation of the ‘womb market’,¹³⁷ an area of enquiry that that was later to be occupied by Richard A Posner and his critics.¹³⁸

At this point a difference between the IVF and law scholarship and first generation space law scholarship can be seen. Sputnik registered in international law, Louise Brown in domestic law. This domestic location created opportunities for lawyers, for specific literatures analysing specific technologies according to laws of specific jurisdictions were called for; and this also called for comparative literatures comparing jurisdictional responses.¹³⁹ In the IVF and law scholarship, while the speculative task of predicting the legal implications of IVF was common, the analysis of that impact was a task that needed to be repeated for each jurisdiction. Therefore US scholars also considered IVF in relation to the US Constitution and whether the right of privacy, particularly as it was explained in *Roe v Wade*,¹⁴⁰ suggested a ‘right of reproductive freedom’ that might limit

¹³⁵ George P Smith II, ‘Australia’s Frozen “Orphan” Embryos: A Medical, Legal and Ethical Dilemma’ (1985) 24 *Journal of Family Law* 27; Dickman (n 101) 834.

¹³⁶ Patricia A King, ‘The Juridical Status of the Fetus: A Proposal for Legal Protection of the Unborn’ (1979) 77 *Michigan Law Review* 1647, 1650–87; Cohen (n 94) 329–32; Dickens (n 107) 242–5, 251–2; Venturatos Lorio (n 108) 981; Dickman (n 101) 831; Bernholz and Herman (n 108) 17; Davies (n 97) 367–73; Robertson (n 128) 977–81.

¹³⁷ Humphreys (n 97) 442. See also Antia C Porte, ‘Government Regulation of In Vitro Fertilization, Recombinant DNA and Cloning Biotechnologies: Where Powers End and Rights Begin’ (1979) 3 *Nova Law Journal* 65, 85; Dickens (n 107) 259–62; Scott (n 131) 217–20; Venturatos Lorio (n 108) 983; Annas and Elias (n 108) 216–23; Wadington (n 94) 474–7; Carolyn Sappideen, ‘The Surrogate Mother—A Growing Problem’ (1983) 6 *University of New South Wales Law Journal* 79, 85–87; Clapshaw (n 96) 266; Venturatos Lorio (n 97) 1673–4; Hollinger (n 103) 870–928.

¹³⁸ Richard A Posner, ‘The Ethics and Economics of Enforcing Contracts of Surrogate Motherhood’ (1989) 5 *Journal of Contemporary Health Law and Policy* 21; Richard A Posner, *Sex and Reason* (Harvard University Press, 1992) 420–9; Patricia J Williams, ‘Spare Parts, Family Values, Old Children, Cheap’ (1994) 29 *New England Law Review* 913, 914; Aristides N Hatzis, ‘“Just the Oven”: A Law and Economics Approach to Gestational Surrogacy Contracts’ in K Boele-Woelki (ed), *Perspectives for the Unification or Harmonisation of Family Law in Europe* (Intersentia, 2003).

¹³⁹ For examples of IVF and law literature that presented a comparative analysis, see Scott (n 134) 413; Christopher P Litterio, ‘Artificial Insemination, In Vitro Fertilization, and Surrogate Motherhood: Breeding Life and Legal Problems in the United States and Great Britain’ (1986) 10 *Suffolk Transnational Law Journal* 533.

¹⁴⁰ *Roe v Wade* 410 US 113 (1973).

federal and state regulative powers.¹⁴¹ This mingling of IVF with rights was not prominent in the Canadian and Australian scholarship, where competency to regulate was assumed, and the constitutional issue, when it was addressed, concerned which tier in the federal structure had legislative authority.¹⁴² In unitary jurisdictions such as the UK, Northern Ireland, New Zealand and France, executive and legislative authority was a non-issue and the specific IVF literature was limited to the established artificial human reproduction concerns of legitimacy, liability and adultery, and discussion of the most appropriate regulative agency and model.¹⁴³

It is at this point, after establishing an absence of law within national jurisdictions to deal with ‘specific legal problems raised by existing or possible reproductive technology’,¹⁴⁴ that the positivism of the IVF and law scholarship becomes evident. It might be expected that all this talk of needed law would ground specific proposals. Instead there was a desire to make law but a reluctance to state the values that such law should possess. The called for law was, in the main, empty. The sign of this absence was the phrase ‘ethical issues’.

¹⁴¹ Ethics Advisory Board, *Report and Conclusions: HEW Support of Research Involving Human In Vitro Fertilization and Embryo Transfer* (Department of Health, Education and Welfare, 1979) 63–71; Steeves (n 96) 1052–61; Cohen (n 94) 325–7; Flannery (n 127) 1302–19; Porte (n 137) 69–73; Turner (n 94) 475; John A Robertson, ‘Procreative Liberty and the Control of Conception, Pregnancy and Childbirth’ (1983) 69 *Virginia Law Review* 405; Dickman (n 101) 845; Matthew R Eccles, ‘The Use of *In Vitro* Fertilization: Is there a Right to Bear or Beget a Child by Any Available Medical Means?’ (1985) 12 *Pepperdine Law Review* 1033, 1040–6; Robertson (n 128) 954–66.

¹⁴² Australia (Mason (n 127) 353–4; Family Law Council, *Creating Children: A Uniform Approach to the Law and Practice of Reproductive Technology in Australia* (1985) 12–13). In Canada Dickens’ analysis progressed on an assumption that IVF was provincial responsibility, Bernard M Dickens, ‘Reproduction Law and Medical Consent’ (1985) 35 *University of Toronto Law Journal* 255, 281–6. See also the Ontario Law Reform Commission’s *Report on Human Artificial Reproduction and Related Matters* (1985) 111. In Australia Kirby expressed concern in 1983 that IVF as a state responsibility created obstacles to uniform national IVF laws; see Michael Kirby, ‘IVF—The Scope and Limitation of the Law’, paper presented at the Conference on Bioethics and the Law of Human Conception by In Vitro Fertilisation, London, 29–30 September 1983, 8.

¹⁴³ UK (DJ Cusine, ‘Some Legal Implications of Embryo Transfer’ (1979) 129 *New Law Journal* 622; Diana Brahams, ‘The Legal and Social Problems of In Vitro Fertilisation: Why Parliament Must Legislate’ (1983) 133 *New Law Journal* 859); Northern Ireland (Davies (n 97)); New Zealand (Clapshaw (n 96)); France (Mariel Revillard, ‘Legal Aspects of Artificial Insemination and Embryo Transfer in French Law’ (1974) 23 *International and Comparative Law Quarterly* 383, 386–96).

¹⁴⁴ Peter Drahos, ‘Law, Science and Reproductive Technology’ (1985) 9 *Bulletin of the Australian Society of Legal Philosophy* 270, 270.

Most IVF and law scholarship had a section titled ‘Ethical Issues’.¹⁴⁵ In that section the lawyer surveyed the competing positions on IVF. What was remarkable was that this survey remained only a mapping of the ethical landscape. It usually made mention of Leon Kass’s project of establishing ‘bioethics’ as a brake on biomedical research, and particular mention was made of his 1971 article decrying IVF as unethical.¹⁴⁶ Similarly, the Catholic position, and especially Pope Pius XII’s 1956 decree condemning artificial human reproduction, was documented.¹⁴⁷ Parallel with these were statements by IVF pioneers, like Robert Edwards¹⁴⁸ or Alan Trounson,¹⁴⁹ on the positive application of IVF technology.¹⁵⁰ The lawyer wrote to appear even-handed with regard to these competing positions: ‘[s]ome even suggested that such research be monitored or possibly even banned. Others greeted the successful birth as a humanitarian milestone that could open the way to childbirth for many women previously unable to conceive.’¹⁵¹ Indeed, the imagery of the hand was prominent. The cataloguing of different positions was often smoothed over with phrases such as ‘[o]n the other hand’.¹⁵² Lawyers noted that positions regarding the ethics of IVF depended on the ‘legal and moral definitions of humanity, life and person’¹⁵³ and the answering of questions like ‘is sterility an illness?’¹⁵⁴ and ‘when is the origin of human life?’¹⁵⁵ However, these were not questions that the IVF and law scholarship answered. In this it played a curious role. It established a problematic technology, indeed the existence of competing positions was cited as evidence of its

¹⁴⁵ eg Venturatos Lorio (n 108) 978–84; Lane *et al* (n 108) 316–21; Scott (n 134) 415; Dickman (n 101) 830–3; McCartan (n 114) 701–10.

¹⁴⁶ Leon R Kass, ‘Babies by Means of In Vitro Fertilization: Unethical Experiments on the Unborn?’ (1971) 285 *New England Journal of Medicine* 1174; see eg Cohen (n 94) 320; Eccles (n 141) 1038; Davies (n 97) 354.

¹⁴⁷ Pius XII, *Address of His Holiness, Pope Pius XII, to the Second World Congress on Fertility and Sterility* (Institute of Clinical Obstetrics and Gynecology, University of Naples, 1956) 42; see eg Turner (n 94) 463; Scott (n 134) 408; Lane *et al* (n 108) 319.

¹⁴⁸ Robert Edwards, ‘Fertilization of Human Eggs In Vitro: Morals, Ethics and the Law’ (1974) 49 *Quarterly Review of Biology* 3.

¹⁴⁹ John F Leeton, Alan O Trounson and Carl Wood, ‘IVF and ET: What it is and How it Works’ in WAW Walters and Peter Singer (eds), *Test-Tube Babies: A Guide to Moral Questions, Present Techniques and Future Possibilities* (Oxford University Press, 1982).

¹⁵⁰ eg Mahlon Blow (n 118) 169; Venturatos Lorio (n 108) 979.

¹⁵¹ Wadington (n 94) 465.

¹⁵² Cohen (n 94) 324.

¹⁵³ Turner (n 94) 474.

¹⁵⁴ Revillard (n 143) 385.

¹⁵⁵ Dickens (n 107) 245–57; Venturatos Lorio (n 97) 1668; McCartan (n 114) 702–5.

vexed nature,¹⁵⁶ and from this problematic technology it called for law and then speculated on the problems that law might regulate. But, at the critical moment of considering the substance of this required law—concerning whether IVF should be banned, when embryos acquire legal personality, whether IVF should be limited to *de jure* married couples, and whether frozen embryos should be destroyed—it fell mostly silent. The only area where lawyers were confident to posit the substance of law was in regard to the inheritance rights of AI and IVF children, where it was agreed that equality demanded legislation to declare such children legitimate.¹⁵⁷

This aversion to values is what is to be expected of positivist legal scholarship in which the law is regarded as a tool to secure policy goals, but the lawyer remains aloof as to the value of those goals.¹⁵⁸ As was glimpsed in the first generation space law, the only direction for legal writing, once problem, gaps and speculation were catalogued, was description of law-making and description of made law. This meant that as IVF became more widespread over the early 1980s, lawyers could only turn to description of the emerging law-making processes and laws within the national jurisdictions. The UK Warnock Inquiry and subsequent report¹⁵⁹ was widely covered.¹⁶⁰ Indeed, even in US literature Warnock, as a documentation of the ‘ethical issues’ became the standard reference for the vexed and difficult nature of the IVF.¹⁶¹ In Australia the various jurisdictional inquiries and reports were described,¹⁶² with particular emphasis given to

¹⁵⁶ Brahams (n 143) 859.

¹⁵⁷ Two writers go so far as to print the text of their suggested legislation; see Frey (n 110) 334–41; Crabtree (n 108) 925.

¹⁵⁸ Brian Z Tamanaha, *Law as a Means to an End: Threat to the Rule of Law* (Cambridge University Press, 2006) 104; HLA Hart, *Law, Liberty and Morality* (Stanford University Press, 1963) 2.

¹⁵⁹ Mary Warnock, *Report of the Committee of Inquiry into Human Fertilisation and Embryology* (Warnock Report) (Blackwell, 1984).

¹⁶⁰ Davies (n 97) 373–4; Cowen (n 94); Priest (n 131) 535–7; Michael Kirby, ‘Medical Technology and New Frontiers of Family Law’ (1986) 1 *Australian Journal of Family Law* 197, 204–2]10.

¹⁶¹ See eg George J Annas and Sherman Ellis, ‘Social Policy Considerations in Noncoital Reproduction’ in A Milunsky and GJ Annas (eds), *Genetics and the Law III* (Plenum, 1985) 147; Robertson (n 128) 967–1032.

¹⁶² Drahos (n 144) 283; Family Law Council (n 142) 18–24, 124–5.

the Waller Reports in Victoria¹⁶³ and the subsequent Status of Children (Amendment) Act 1984 (Vic) and Infertility (Medical Procedures) Act 1984 (Vic).¹⁶⁴

In summary, the IVF and law scholarship followed commitments that were laid down in first generation space law scholarship; problematic technology, call for law, speculation on future legal problems, emphasis on gaps in existing law, and description of emerging laws and law-making processes. Further, like the Sputnik era literature, the IVF and law scholarship was accompanied by bibliographies¹⁶⁵ and comments regarding bulk.¹⁶⁶ It also shared a very small minority literature that questioned the orthodox narrative. Antia C Porte, like the military critics of first generation space law scholarship, argued against the need for legislation, based on an assumption that IVF was not problematic and it was best left to the market (and contract, consumer and medical negligence laws) to allow choice.¹⁶⁷ However, Porte was not anti-law. She merely believed that existing private law was adequate.

Through the IVF and law scholarship some features of the law and technology enterprise that were only traces in the earlier Sputnik scholarship can be seen more clearly. The most prominent was the positivist frame, the aversion to values, and the emphasis on gaps, description and law-making. The second was the inclusion of an ‘overview of the technology’ section in which the lawyer, with a degree or otherwise of comprehension, summarised the technical dimensions of AI, IVF and ET.¹⁶⁸ The third was the emergence of law student authors. There were law student contributors to first generation space

¹⁶³ Louis Waller, *Report on Donor Gametes in IVF* (Committee to Consider the Social, Ethical and Legal Issues Arising from In Vitro Fertilization, 1983); Louis Waller, *Report on the Disposition of Embryos Produced by In Vitro Fertilization* (Committee to Consider the Social, Ethical and Legal Issues Arising from In Vitro Fertilization, 1984).

¹⁶⁴ Kirby (n 142) 6–7; Christopher Corns, ‘Legal Regulation of *In Vitro* Fertilisation in Victoria’ (1984) 58 *Law Institute Journal* 838; Jim Kennan, ‘Science and the Law—Lessons from the Experience of Legislating for the New Reproductive Technology’ (1985) 59 *Australian Law Journal* 488, 489–90; Loane Skene, ‘Moral and Legal Issues in the New Biotechnology’ (1985) 59 *Australian Law Journal* 379, 385–9; Carolyn Sappideen, ‘In Vitro Fertilization—A General Survey of the Issues’ (1986) 4 *Journal of Population Research* 137. The Victorian legislation was also held up as a model by the Ontario Law Reform Commission. See Ontario Law Reform Commission (n 142) 131–37.

¹⁶⁵ eg McNabb (n 123).

¹⁶⁶ Annas and Elias (n 108) 207; Drahos (n 144) 270.

¹⁶⁷ Porte (n 137) 87.

¹⁶⁸ Katz (n 113) 351–3; Humphreys (n 97) 431–4; Cohen (n 94) 321–3; Venturatos Lorio (n 108) 975–8; Annas and Elias (n 108) 201–6; Lane *et al* (n 108) 313–16; Davies (n 97) 355–6; Bernholz and Herman (n 108) 6–9; Dickman (n 101) 820–925; Eccles (n 141) 1034–6; Robertson (n 128) 947–51.

law;¹⁶⁹ however, by 1978–86 the numbers of student contributors seemed to be increasing.¹⁷⁰ Read together, first generation space law scholarship and IVF and law scholarship reveal the key characteristics of the law and technology enterprise. Problematic technology grounded analysis concerned with speculation about future use, identification of gaps and the call for law, leading to descriptions of law-making and of laws as made, all against a positive backdrop of the lawyer (or law student) agnostic to the competing value positions, and concerned with the ‘practical’¹⁷¹ task of implementing public policy that has been decided elsewhere.

Virtual Worlds

Online virtual gaming environments, or ‘virtual worlds’,¹⁷² became a subject of popular concern in 2006. This was the year that *BusinessWeek* in the US ran a cover story featuring Anshe Chung, an avatar from Linden Lab’s *Second Life* who had successfully speculated on virtual property, and in the process made a ‘real world’¹⁷³ income for her ‘player’,¹⁷⁴ Ailin Graef.¹⁷⁵ As with Sputnik and Louise Brown, the media attention

¹⁶⁹ See eg Milton Cerny, ‘Law of Outer Space: Some Hypothetical Problems’ (1958) 7 *American University Law Review* 98; Bookout (n 78).

¹⁷⁰ See eg Cohen (n 94); Dickman (n 101). This increase in student authorship between 1950 and 1980 was a pattern identified by Stadler in her analysis of the *Harvard Law Review* from 1946 to 2003. See Sara K Stadler, ‘The Bulls and Bears of Law Teaching’ (2006) 63 *Washington and Lee Law Review* 25.

¹⁷¹ Humphreys (n 97).

¹⁷² There are multiple terms to cover these environments. ‘Virtual worlds’ is the most common in the legal literature. Castronova objects to the use of ‘virtual’ as it conjures up unhelpful imagery of full body immersion ‘virtual reality’ as it was anticipated in the 1990s. Instead, Castronova advocates use of the term ‘synthetic worlds’ (Edward Castronova, *Synthetic Worlds: The Business and Culture of Online Games* (Chicago University Press, 2006) 9–22). A more technical description from computer gaming is MMORPG (Massively Multiplayer Online Role Playing Games), reflecting their genealogy in paper and dice role playing games like *Dungeons and Dragons* (D&D) and the first generation, text-based online translations of D&D, MUDs (Multi-User Dungeon). See Jon Dovey and Helen W Kennedy, *Game Cultures: Computer Games as New Media* (Open University Press, 2006) 95; TL Taylor, *Play Between Worlds: Exploring Online Game Culture* (MIT Press, 2006), 21–29.

¹⁷³ The term for the non-virtual world is contested; however, the consensus in the legal and sociological literatures appears to be ‘real world’. See Tom Boellstorff, *Coming of Age in Second Life* (Princeton University Press, 2008) 20–21.

¹⁷⁴ Again, the term for the human who controls the avatar is contested, with no clear consensus between to ‘user’, ‘resident’ or ‘player’. While Boellstorff prefers the term ‘resident’ this article will use the term ‘player’ to keep the real world human separate from virtual existence. *Ibid*, 22.

¹⁷⁵ ‘My Second Life’ *BusinessWeek*, 1 May 2006; see Mark Stephen Meadows, *I, Avatar: The Culture and Consequences of Having a Second Life* (New Riders, 2008) 64.

quickly translated into copy in law journals¹⁷⁶ and lawyers, in what will be called the ‘virtual worlds and law scholarship’, compounded reports on virtual real estate with other reports concerning virtual theft and fraud,¹⁷⁷ virtual sexual abuse,¹⁷⁸ virtual financial collapses,¹⁷⁹ and reports of real world concerns of addiction,¹⁸⁰ money laundering¹⁸¹ and murders arising from virtual world disputes¹⁸² to suggest a crisis event that needed law. Virtual worlds and law scholarship manifested the same basic structure as first generation space law scholarship and the IVF and law scholarship. Lawyers established that virtual worlds heralded a problematic technological future that was inadequately regulated by existing law. As in the earlier literatures, law was perceived as needing to catch up. This call for law was, again, founded on speculation and descriptions of technologies, law and law-making, encased in a voluminous scholarship involving significant amounts of student authorship. While lawyers were **bolder** in the virtual worlds and law scholarship **in their espousing and adopting** diverse policy positions, the underlying positive frame of instrumental law remained.

For lawyers, virtual worlds were problematic because the boundaries between the ‘game’ and the real world were permeable. This permeability was mapped in several directions.

¹⁷⁶ Kurt Hunt, ‘This Land is Not Your Land: Second Life, CopyBot, and the Looming Question of Virtual Property Rights’ (2007) 9 *Texas Review of Entertainment and Sports Law* 141, 143; Bettina M Chin, ‘Regulating Your Second Life: Defamation in Virtual Worlds’ (2007) 72 *Brooklyn Law Review* 1303, 1306; Bart JV Keupink, ‘Virtual Criminal Law in Boundless New Environments’ (2007) 6 *International Journal of Technology Transfer and Commercialisation* 160–70, 168.

¹⁷⁷ Allen Chen, ‘A Practical Look at Virtual Property’ (2006) 80 *St John’s Law Review* 1059, 1067–8; Scott Holdaway, ‘I Don’t Know the Name, But the Avatar Sure Rings a Bell: An Analysis of the Law Relevant to the Appearance of Representations of Personalities in Cyberspace’ (2007) 13 *Canterbury Law Review* 1, 2; Melissa de Zwart, ‘Virtual Worlds: Copyright vs Contract—the New Frontier’ (2008) 26 *Copyright Reporter* 79, 79; Susan W Brenner, ‘Fantasy Crime: The Role of Criminal Law in Virtual Worlds’ (2008) 11 *Vanderbilt Journal of Entertainment and Technology Law* 1, 58–60.

¹⁷⁸ Nick Abrahams, ‘Media Laws for Virtual Worlds’ (2007) 30 *University of New South Wales Law Journal* 295, 298; Caroline Meek-Prieto, ‘Just Age Playing Around?: How Second Life Aids and Abets Child Pornography’ (2008) 9 *North Carolina Journal of Law and Technology* 88, 90, 102–4.

¹⁷⁹ Daniela Rosette, ‘The Application of Real World Rules to Banks in Online Games and Virtual Worlds’ (2008) 16 *University of Miami Business Law Review* 279, 284, 287–8; Jason T Kunze, ‘Regulating Virtual Worlds Optimally: The Model End User Licence Agreement’ (2008) 7 *Northwestern Journal of Technology and Intellectual Property* 102, 103; Ethan E White, ‘Massively Multiplayer Online Fraud: Why the Introduction of Real World Law in a Virtual Context is Good for Everyone’ (2008) 6 *Northwestern Journal of Technology and Intellectual Property* 228, 237–8; Phillip Stoup, ‘The Development and Failure of Social Norms in Second Life’ (2008) 58 *Duke Law Journal* 311, 342.

¹⁸⁰ F Gregory Lastowka, ‘User-Generated Content in Virtual Worlds’ (2008) 10 *Vanderbilt Journal of Entertainment and Technology Law* 893, 907; Rosette (n 179) 293–4.

¹⁸¹ Abrahams (n 178) 299; Rosette (n 179) 290–3.

¹⁸² Abrahams (n 178) 305; Chen (n 177) 1059.

First, the ‘cross-border problem’,¹⁸³ the connection between the real economy and virtual economy, was noted.¹⁸⁴ The primary representation of this was the formal exchange mechanism available for converting real world currency into L\$ (Linden dollars, the currency in *Second Life*) and L\$ into real world currency.¹⁸⁵ The secondary representation was the existence of virtual property and player accounts for sale on eBay,¹⁸⁶ and the citing of Edward Castronova’s foundational 2001 study on the virtual and real economics of Sony’s *EverQuest*.¹⁸⁷ Virtual worlds had become a ‘multi-billion dollar economy’¹⁸⁸ and it was commonly noted that in 2007 many transnational corporations had acquired a virtual presence.¹⁸⁹ The second element of permeability related to the real property–virtual property relationship. Linden Lab’s declaration that players possessed ‘rights’ in objects that the player created within *Second Life* was documented,¹⁹⁰ and questions of protecting that property from real or virtual appropriation, as well as the question of appropriation of real world intellectual property

¹⁸³ Andrew Jankowich, ‘Property and Democracy in Virtual Worlds’ (2005) 11 *Boston University Journal of Science and Technology Law* 173, 184–6.

¹⁸⁴ F Gregory Lastowka and Dan Hunter, ‘The Laws of the Virtual Worlds’ (2004) 92 *California Law Review* 1, 9.

¹⁸⁵ Viktor Mayer-Schönberger and John Crowley, ‘Napster’s Second Life? The Regulatory Challenges of Virtual Worlds’ (2006) 100 *Northwestern University Law Review* 1775, 1789; Megan B Caramore, ‘Help! My Intellectual Property is Trapped: Second Life, Conflicting Ownership Claims and the Problem of Access’ (2008) 15 *Richmond Journal of Law and Technology* 1, 11; David J Mack, ‘iTax: An Analysis of the Laws and Polices behind the Taxation of Property Transactions in a Virtual World’ (2008) 60 *Administrative Law Review* 749, 753–5; White (n 179) 231–2.

¹⁸⁶ Lastowka and Hunter (n 184) 38; Andrew Schwarz and Robert Bullis, ‘Rivalrous Consumption and the Boundaries of Copyright Law: Intellectual Property Lessons from Online Games’ (2005) 10 *Intellectual Property Law Bulletin* 13, 16; Kevin W Saunders, ‘Virtual Worlds—Real Courts’ (2007) 52 *Villanova Law Review* 188, 229.

¹⁸⁷ Edward Castronova, *Virtual Worlds: A First-Hand Account of Market and Society on the Cyberian Frontier* (Center for Economic Studies and Ifo Institute for Economic Research, Munich, 2001). Cited by Jankowich (n 183) 176; Joshua AT Fairfield, ‘Virtual Property’ (2005) 85 *Boston University Law Review* 1047, 1050; Charles Blazer, ‘The Five Indicia of Virtual Property’ (2006) 5 *Pierce Law Review* 137, 138; Jamie J Kayser, ‘The New New-World: Virtual Property and the End User Licence Agreement’ (2006) 27 *Loyola of Los Angeles Entertainment Law Review* 59, 60; Bobby Glushko, ‘Tales of the (Virtual) City: Governing Property Disputes in Virtual Worlds’ (2007) 22 *Berkeley Technology Law Journal* 507, 507; Jason A Archinaco, ‘Virtual Worlds, Real Damages: The Odd Case of American Hero, the Greatest Horse that *May* have Lived’ (2007) 11 *Gaming Law Review* 21, 25; David P Sheldon, ‘Claiming Ownership, but Getting Owned: Contractual Limitations on Asserting Property Interests in Virtual Goods’ (2007) 54 *UCLA Law Review* 7501, 754; Holdaway (n 177) 1–2; Erez Reuveni, ‘On Virtual Worlds: Copyright and Contract Law at the Dawn of the Virtual Age’ (2007) 82 *Indiana Law Review* 261, 267; Mark Macrae, ‘Taxation and Virtual Property’ (2008) 11 *Tax Specialist* 324, 325.

¹⁸⁸ Abrahams (n 178) 295; Sean F Kane and Benjamin T Duranske, ‘Virtual Worlds, Real World Issues’ (2008) 1 *Landslide* 9, 10.

¹⁸⁹ *Ibid*; Chin (n 176) 1314.

¹⁹⁰ Lawrence Lessig, *Code 2.0* (Basic Books, 2006) 111; Hunt (n 176) 150; Chin (n 176) 1321–3; Caramore (n 184) 1–2, 4; de Zwart (n 177) 81.

within virtual worlds, were being asked.¹⁹¹ The third related to the crossover between virtual behaviour and real world crimes, particularly theft¹⁹² and child pornography.¹⁹³ The fourth was the practice of ‘gold farming’ in Mexican and Chinese sweatshops, where badly paid workers toiled online to amass virtual property which their employers sold for real world currency.¹⁹⁴ However, balancing these concerns were more optimistic assessments. Jerry Kang in 2000 saw in the emergence of avatars the possibility for ‘cyber-passing’:¹⁹⁵ the potential for players to experience living as a different gender or race and the hope that such experiences could facilitate greater empathy and understanding.¹⁹⁶ Notwithstanding Kang’s early optimism, the balance of the virtual worlds and law scholarship framed virtual worlds as problematic. Parallel to the documenting of these concerns was legal analysis indicating that current real world law did not adequately regulate the virtual world–real world nexus. This task of examining the law was framed and rendered urgent by a belief that virtual worlds were the future. Bettina M Chin elaborated on this vision:

With the world paying close attention to the technological advancements in Internet usage and the opportunities that virtual worlds can offer, the law must do the same in order to protect the livelihood of Second Life residents. As more users participate and find innovative ways to make full use of the virtual platforms, Second Life will eventually evolve from a digital medium of social interaction to an actual, organic culture.¹⁹⁷

This inevitable framing of virtual worlds as destiny was common in the literature. ‘Data indicate that virtual environments of all types, not just *Second Life*, will continue to play an increasing role in modern society and more and more users join and bring increasing

¹⁹¹ Candidus Dougherty and F Gregory Lastowka, ‘Virtual Trademarks’ (2008) 24 *Santa Clara Computer and High Technology Law Journal* 749; Kane and Duranske (n 188) 1.

¹⁹² See eg Saunders (n 186) 234–40; Andrea Vanina Arias, ‘Life, Liberty, and the Pursuit of Swords and Armor: Regulating Theft of Virtual Goods’ (2008) 57 *Emory Law Journal* 1301, 1304. These accounts drew upon the 2005 study by Chen *et al* documenting Taiwanese police investigations of virtual world theft. See Ying-Chieh Chen *et al*, ‘An Analysis of Online Gaming Crime Characteristics’ (2005) 15 *Internet Research* 246, 249–58.

¹⁹³ Keupink (n 176) 167; Meek-Prieto (n 178) 89.

¹⁹⁴ Lastowka and Hunter (n 184) 39–40; Saunders (n 186) 230; Arias (n 192) 1303. A final example of the problematic nature of the virtual worlds was that Richard A Posner had used *Second Life* as a forum for book promotion. See Chin (n 176) 1315; Kane and Duranske (n 188) 9.

¹⁹⁵ Jerry Kang, ‘Cyber-Race’ (2000) 113 *Harvard Law Review* 1130, 1179.

¹⁹⁶ *Ibid*, 1181.

¹⁹⁷ Chin (n 176) 1315–16.

amounts of capital into the online world.’¹⁹⁸ Virtual worlds were considered destined to become more popular as an escape from the problems of the real world:

The real world is increasingly expensive, crowded, and legislated. The only place where many people can experience personal freedom is in the virtual world, where they can manifest their fantasies and explore the wide-open expanses that were once commonly available in the real world.¹⁹⁹

Often the inevitability of a virtual future was associated with technological speculation:

Bearing in mind the commercial applications [of virtual worlds] and the astounding and rapid uptake of technologies such as Google Earth, it is not out of the question that these technologies may fuse, and produce some kind of hybrid; a place where one wanders the globe through an avatar, walking into clothes stores in Paris or Rome, chatting to the assistant, and trying on virtual clothes (‘I’ll take two: a real one for me and a virtual one for my avatar’).²⁰⁰

Lawyers were convinced that virtual worlds would become more realistic,²⁰¹ and that motion sensor technology would eventually develop and merge with high resolution and complex virtual worlds to deliver the dream of virtual reality.²⁰² Woodrow Barfield foresaw the ‘intelligent avatar’ that would ‘create works independent of human input’.²⁰³ More immediately, lawyers anticipated the development of the ‘universal avatar’²⁰⁴ and portable virtual property²⁰⁵ that would allow avatars to move between worlds and retain their virtual possessions. Other lawyers saw virtual worlds as the future for legal

¹⁹⁸ Mack (n 185) 755–6. See also Jacob Rogers, ‘A Passive Approach to Regulation of Virtual Property’ (2007) 76 *George Washington Law Review* 405, 411.

¹⁹⁹ Kayser (n 187) 62.

²⁰⁰ Holdaway (n 177) 6–7.

²⁰¹ Albert C Lin, ‘Virtual Consumption: A *Second Life* for Earth?’ (2008) *Brigham Young University Law Review* 47, 86–88.

²⁰² Meek-Prieto (n 178) 95–97.

²⁰³ Woodrow Barfield, ‘Intellectual Property Rights in Virtual Environments: Considering the Rights of Owners, Programmers and Virtual Avatars’ (2006) 39 *Akron Law Review* 649, 653, 662.

²⁰⁴ Meek-Prieto (n 178) 97.

²⁰⁵ Fairfield (n 187) 1059; Kane and Duranske (n 188) 14.

education²⁰⁶ or as a simulation environment for assessing legal, political and economic responses to normative structures.²⁰⁷

Having framed virtual worlds as harbingers of a virtual future, the virtual worlds and law scholarship saw law as an inevitable aspect of this future: ‘As governments and other real-world agencies and regulators become cognizant of the personal risks involved, notably fraud and money laundering, they are certain to step in.’²⁰⁸ F Gregory Lastowka and Dan Hunter, in a highly cited 2004 article,²⁰⁹ wrote: ‘In the far future, as the world’s communities increasingly begin to operate through avatar agents in persistent virtual communities, courts will surely need to recognize cyborg rights in some form or another.’²¹⁰ As human occupation of virtual worlds increased, so would real law’s engagement: ‘In those increasingly common instances where a player utilizes the virtual world as his primary means of income, a court may strike terms directly impinging the player’s ability to earn a living.’²¹¹ David R Johnson wrote: ‘If the affordance of online games ... enable[s] us to create new kinds of organizations, then we’ll face the question whether and to what degree to grant these organizations legal personhood.’²¹² Further, because the ‘traditional problems of human nature and conflict persist’²¹³ there would be

²⁰⁶ Chen (n 177) 1082; Stephanie Francis Ward, ‘Fantasy Life, Real Life’ (2007) 93 *American Bar Association Journal* 43, 44; Kunze (n 179) 107; Diane Murley, ‘What Second Life Taught Me about Learning’ (2008) 100 *Law Library Journal* 787; Steven J Horowitz, ‘Bragg v Linden’s Second Life: A Primer in Virtual World Justice’ (2008) 34 *Ohio Northern University Law Review* 223, 230–40; Elizabeth Townsend Gard and Rachel Goda, ‘The Fizzy Experiment: *Second Life*, Virtual Property and a 1L Property Course’ (2008) 24 *Santa Clara Computer and High Technology Law Journal* 915.

²⁰⁷ Jennifer L Mnookin, ‘Virtual(ly) Law: The Emergence of Law in LambdaMOO’ (1996) 2 *Journal of Computer-Mediated Communication*, <http://jcmc.indiana.edu/vol2/issue1> (accessed 7 June 2011); James Grimmelmann, ‘Virtual Worlds as Comparative Law’ (2004) 49 *New York Law School Law Review* 147; Caroline Bradley and A Michael Froomkin, ‘Virtual Worlds, Real Rules’ (2004) 49 *New York Law School Law Review* 103; Lastowka and Hunter (n 184) 11; Ward (n 206) 43.

²⁰⁸ Rosette (n 179) 299.

²⁰⁹ Lastowka and Hunter (n 184), cited in Ethan M Katsh, ‘Bring Online Dispute Resolution to Virtual Worlds: Creating Process through Code’ (2004) 49 *New York Law School Law Review* 271, 289; Jankowich (n 183) 176; Kayser (n 187) 60; Blazer (n 187) 139; Mayer-Schönberger and Crowley (n 185) 1801; Glushko (n 187) 512; Chin (n 176) 1305; Leandra Lederman, ‘“Stranger than Fiction”: Taxing Virtual Worlds’ (2007) 82 *New York University Law Review* 1620, 1621; Sheldon (n 187) 760; Holdaway (n 177) 2; Reuveni (n 187) 264; Jason S Zack, ‘The Ultimate Company Town: Wading in the Digital *Marsh* of Second Life’ (2007) 10 *University of Pennsylvania Journal of Constitutional Law* 225, 228; Orin S Kerr, ‘Criminal Law in Virtual Worlds’ (2008) *University of Chicago Legal Forum* 415, 416.

²¹⁰ Lastowka and Hunter (n 184) 72.

²¹¹ Reuveni (n 187) 302.

²¹² David R Johnson, ‘How Online Games May Change the Law and Legally Significant Institutions’ (2004) 49 *New York Law School Law Review* 51, 59.

²¹³ Mayer-Schönberger and Crowley (n 185) 1790–1. See also Chin (n 176) 1348: ‘But the onslaught of real-world politics and law into the virtual space is, and should be, inevitable. As the next step in

the need for law to resolve disputes: ‘Criminal sanctions imposed offline for ... in-world conduct are not outside of the realm of possibilities.’²¹⁴ A cohort of lawyers anticipated the inevitability of taxation on virtual transactions and property.²¹⁵ Jack M Balkin, in another widely cited piece from 2004,²¹⁶ was particularly insistent on the inevitability of real law in virtual worlds: ‘As people spend more and more time in virtual worlds, and as their senses of self become increasingly bound up with them, these sorts of arguments [assault, theft, defamation] may become more plausible.’²¹⁷ However, this speculation was not limited to real law; lawyers were also dreaming of the need for in-game virtual law. Virtual worlds were like a ‘new state’:²¹⁸

Websites and other prior technologies of cyberspace served as remarkable tools for communication, but they did not build truly independent and self-governing communities. By contrast, avatar existence and avatar community *only* occurs within virtual worlds, making the emergence of virtual law within those worlds much more likely.²¹⁹

So the virtual worlds and law scholarship saw a problematic technology that was anticipated to be increasingly important in the future, and as such would inevitably involve law, both real world law and virtual law. This call for laws located analysis concerned with the inadequacies of the existing law. As with the Sputnik and IVF literatures, this analysis was a hybrid of speculation and description. Its speculative basis

technology, virtual worlds “are where video and VCRs were in the early 1980s, or where the Web was in 1993”, and the politicians and legislators in the United States have already taken sharp notice of this particular metaverse.’

²¹⁴ Meek-Prieto (n 178) 98; Keupink (n 176) 167.

²¹⁵ Arthur J Cockfield, ‘Designing Tax Policy for the Digital Biosphere: How the Internet is Changing Tax Laws’ (2002) 34 *Connecticut Law Review* 333, 355; Glushko (n 187) 507–8; Kane and Duranske (n 188) 10; Arias (n 192) 1303.

²¹⁶ Jack M Balkin, ‘Virtual Liberty: Freedom to Design and Freedom to Play in Virtual Worlds’ (2004) 90 *Virginia Law Review* 2043, cited in Jankowich (n 183) 187; Mayer-Schönberger and Crowley (n 185) 1801; Reuveni (n 187) 264; Rogers (n 198) 412; Chin (n 176) 1307; Zack (n 209) 242; Kerr (n 209) 416; Michael H Passman, ‘Transactions in Virtual Worlds’ (2008) 18 *Albany Law Journal of Science and Technology* 259, 262.

²¹⁷ Balkin (n 216) 2068. See also p 2071: ‘One might see the day when a platform owner is losing money, and the players petition a bankruptcy court to take over the game and keep it going, so that the players’ virtual property interests will not be destroyed.’

²¹⁸ Lucy Davis, ‘Creation and Protection of Trade Mark Rights in “Second Life”: Inadequacies in Australia’s Current Law’ (2007) 18 *Australian Intellectually Property Journal* 183, 199.

²¹⁹ Lastowka and Hunter (n 184) 69. See also Mayer-Schönberger and Crowley (n 185) 1791.

was acknowledged directly; articles were described as ‘thought experiment[s]’,²²⁰ and as involving ‘hypotheticals’.²²¹ This description ran in two directions: first, controversies involving virtual worlds were set out; and second, the inadequacies of law in addressing the controversies were canvassed. The **controversies/inadequacies** can be grouped under three headings: ‘property’, ‘contract’ and ‘wrongs’.

Lawyers were particularly concerned with the fate of property in virtual worlds, and several controversies were provided that demonstrated the problem of virtual property. The 2006 bank scam within CCP’s *EVE Online*, where a player established an in-game bank and then ‘vanished’ with billions in virtual currency, was used to show the failure of both real law and the game owners to protect virtual property.²²² Sony’s attempts to **prevent the sale** of *EverQuest* items, which was defeated by threats of a class action by players²²³ and the inconclusive litigation concerning gold farming (the aborted Blacksnow Interactive litigation²²⁴ and the class action *Antonio Hernandez and others v Internet Gaming Entertainment*)²²⁵ were evidence of the uncertainty surrounding ‘ownership’ of virtual property and also the difficulty of getting virtual property into real world courts.²²⁶ *Bragg v Linden Research Inc*,²²⁷ litigation arising from a decision by Linden Labs to exclude Bragg from *Second Life* because of improper virtual real estate transactions, was regularly overviewed.²²⁸ However, its resolution in an out-of-court settlement, the restoration of Bragg’s *Second Life* account and only an advisory opinion on the non-enforcement of the arbitration provision in Linden Lab’s EULA (End User Licence Agreement) meant that it was considered unclear authority concerning ownership of virtual property and the respective rights of players and game owners in real world law.²²⁹ Similarly, *Marvel Enterprises, Inc v NCSoft*,²³⁰ litigation concerning the alleged

²²⁰ Chen (n 177) 1061.

²²¹ Saunders (n 186) 188.

²²² Glushko (n 187) 522–3; Abrahams (n 178) 300; Rosette (n 179) 284, 287–8.

²²³ Kayser (n 187) 66; Theodore J Westbrook, ‘Owned: Finding a Place for Virtual World Property Rights’ (2006) 2006 *Michigan State Law Review* 779, 787.

²²⁴ Lastowka and Hunter (n 184) 39–40; Kayser (n 187) 65–66; Abrahams (n 178) 304.

²²⁵ Case No 07-21403-Civ-Cohn/Snow (SD Fla Ahug 29, 2007).

²²⁶ Dan E Lawrence, ‘It Really Is Just a Game: The Impracticability of Common Law Property Rights in Virtual Property’ (2008) 47 *Washburn Law Journal* 505, 530.

²²⁷ 487 F Supp 2d 593 (ED Pa 2007) (No 06-04925).

²²⁸ Glushko (n 187) 524–6; Abrahams (n 178) 304; de Zwart (n 177) 85–86.

²²⁹ Kunze (n 179) 102–3; Lawrence (n 226) 528–30; Horowitz (n 206) 225–6; Caramore (n 184) 7–9, 15.

infringement of Marvel's intellectual property in caped crusaders by the Korean production house NCSoft, makers of the superhero virtual world *City of Heroes*, was described. However, like *Bragg*, *Marvel Enterprises* was settled out of court and was cited as evidence of the difficulty of arguing virtual infringement of real world intellectual property.²³¹

The inconclusiveness of existing case law to point to how controversies involving virtual property should be resolved allowed virtual worlds and law scholarship to speculate and analogise. Indeed, the bulk of virtual worlds and law scholarship comprised an assessment of how existing real law regimes might respond to virtual property controversies. Like the IVF and law scholarship, this assessment was one to be made according to the real laws of specific jurisdictions. The ground of this analysis, and one that was rarely acknowledged, was that in virtual worlds '[p]rivate property is default'.²³²

Perhaps the most striking feature of the property system of the virtual worlds is how closely they mirror the real world, or at least the subset known as the Western capitalist economy. No virtual world, not even a community-conscious, social MUD like *LambdaMoo*, has an entirely communal property system.²³³

Even in virtual worlds inspired by fantasy or science fiction, the 'transfer of virtual chattels occurs in very familiar ways'.²³⁴ Lawyers found this parallel reassuring, and a regularly repeated exercise was to assess virtual property according to Lockean and Hegelian theories of property to demonstrate the philosophical rightness²³⁵ of the emergence of private virtual property.²³⁶ Having established a conceptual similarity between virtual and real world property, the analysis morphed into speculative analogies

²³⁰ US District Court No 04 CV 9253 (unreported, 10 November 2004).

²³¹ Jankowich (n 183) 214; Abrahams (n 178) 305; Lastowka (n 180) 913–14.

²³² Lastowka and Hunter (n 184) 30.

²³³ *Ibid*, 30.

²³⁴ *Ibid*, 32.

²³⁵ Indeed, Jankowich argued that without virtual property rights, players in virtual worlds are 'serfs'. Jankowich (n 183) 216.

²³⁶ This analysis was first undertaken in detail by Lastowka and Hunter (n 184) 44–51 and Fairfield (n 187) 1093–5 and was repeated in less detail by some of the student authors: Westbrook (n 223) 791–801; Sheldon (n 187) 758–60; Steven J Horowitz, 'Competing Lockean Claims to Virtual Property' (2007) 20 *Harvard Journal of Law and Technology* 443, 450–8; Reuveni (n 187) 277–80; Caramore (n 184) 11–14.

on dealing with the in-game appropriation of virtual property and the appropriation of real world property in-game.

The controversy of in-game appropriation of virtual property was assessed according to a diverse array of laws. Daniela Rosette, taking as her case study the *EVE Online* bank scam, concluded that the existence of the ‘poker’ defences in US fraud law—that courts deferred to the rules of the game—meant that fraud law would not protect virtual property from appropriation.²³⁷ Other writers noted that in 2007 a scam involving unauthorised access to player accounts and the selling of virtual furniture (which could only be purchased with real world money) in Sulake’s *Habbo Hotel* was prosecuted as fraud in Holland.²³⁸ Susan W Brenner, after an exhaustive survey of applicable US property crime laws, suggested that ‘we *could* extrapolate the principles of criminal liability to encompass the conduct that inflicts ... “virtual harms”. The real issue is whether we *should* do so.’²³⁹ Moving on to torts, US lawyers argued that domestic tort law as it related to chattels was inconclusive concerning virtual infringements²⁴⁰ and were divided on whether the federal Computer Fraud and Abuse Act (1986)²⁴¹ would allow standing and a remedy to a player deprived of virtual property.²⁴² In Australia and New Zealand it was argued that intellectual property regimes would have difficulty with virtual property.²⁴³ These antipodean conclusions mirrored the finding concerning US intellectual property law, which would not, on balance, protect virtual property.²⁴⁴

Similar conclusions were reached concerning the appropriation of real world property in-game. In Australia Lucy Davis concluded:

²³⁷ Rosette (n 179) 289–90. See also White (n 179) 239–40; Arias (n 192) 1318–27; Kerr (n 209) 420.

²³⁸ *Ibid.*, 422–3; Dougherty and Lastowka (n 191) 763–4; Stoup (n 179) 340.

²³⁹ Brenner (n 177) 75.

²⁴⁰ Arias (n 192) 1337–8.

²⁴¹ 18 USC § 1030.

²⁴² Lawrence (n 226) 532–41.

²⁴³ Australia (Davis (n 218) 186–93; Lyria Bennett Moses, ‘The Application of Property Law in New Contexts: From Cells to Cyberspace’ (2008) 30 *Sydney Law Review* 639, 646, 661. See also Abrahams (n 178); Nick Abrahams, ‘Issues for Corporates and Regulators in Second Life and Virtual Worlds’ (2007) 26 *Communication Law Bulletin* 5); New Zealand (Holdaway (n 177) 8–14, 17–22).

²⁴⁴ Daniel C Miller, ‘Determining Ownership in Virtual Worlds: Copyright and License Agreements’ (2003) 22 *Review of Litigation* 435, 456; Balkin (n 216) 2064; Schwarz and Bullis (n 186) 25; Todd David Marcus, ‘Fostering Creativity in Virtual Worlds: Easing the Restrictiveness of Copyright for User-Created Content’ (2007) 52 *New York Law School Law Review* 67, 78–85; Kane and Duranske (n 188) 13. On the image of the avatar see Barfield (n 203) 672–80.

It is uncertain whether the Australian law relating to trade marks would assist either a physical world trade mark owner preventing misuse in Second Life or a Second Life owner taking action against misappropriation in Second Life, in another virtual world, or the real world.²⁴⁵

This conclusion mirrored US analysis. In the US it was argued that use of trademarks in virtual worlds would be a technical breach;²⁴⁶ however the defences available to players²⁴⁷ and pragmatic constraints relating to proof would render virtual breach of trademarks unenforceable in real world courts. The perceived failure of real law to adequately respond to virtual property stimulated Dan E Lawrence to argue that contract law should be explored in the context of virtual property controversies.²⁴⁸ Again this analysis was contested. Andrew Jankowich argued that virtual property could not be considered ‘goods’ nor virtual ‘sales’, under the Uniform Commercial Code.²⁴⁹ The conclusion to be drawn from these myriad analyses was that virtual property remained under-regulated by real world law. A constant consideration in these analyses was the rights and obligations as set out in the EULA.

The Ludlow controversy and *Bragg* circulate in the virtual worlds and law scholarship as representing the ‘godlike’²⁵⁰ powers of game owners vis-à-vis players as established by EULAs.²⁵¹ In the Ludlow controversy, Peter Ludlow established within Electronic Arts’ *Sims Online* a virtual newspaper—the *Alphaville Herald*. Within that forum he ‘published’ a report on children controlling avatars engaging in sex talk with adults for in-world currency. In response Electronic Arts terminated his account.²⁵² For virtual world lawyers the EULA represented what amounted to existing legal regulation of

²⁴⁵ Davis (n 218) 199.

²⁴⁶ Dougherty and Lastowka (n 191) 778–98.

²⁴⁷ *Ibid.*, 798–807.

²⁴⁸ Lawrence (n 226) 521–4, 542. See also Ryan Kriegshauser, ‘The Shot Heard Around Virtual Worlds: The Emergence and Future of Unconscionability in Agreements Relating to Property in Virtual Worlds’ (2008) 76 *UMKC Law Review* 1077, 1088.

²⁴⁹ Andrew Jankowich, ‘EULaw: The Complex Web of Corporate Rule-Making in Virtual Worlds’ (2006) 8 *Tulane Journal of Technology and Intellectual Property* 1, 271–3.

²⁵⁰ On game owners see Kunze (n 179) 107; Archinaco (n 187) 27.

²⁵¹ Balkin (n 216) 2075–6; Kayser (n 187) 64; Eric Goldman, ‘Speech Showdown at the Virtual Corral’ (2005) 21 *Santa Clara Computer and High Technology Law Journal* 845.

²⁵² For a detail account from Ludlow’s perspective see Peter Ludlow and Mark Wallace, *The Second Life Herald: The Virtual Tabloid that Witnessed the Birth of the Metaverse* (MIT Press, 2007) 145–62.

virtual worlds and that regulation was tilted in favour of the game owner.²⁵³ Several studies described in detail the EULAs for various worlds, and the common conclusion was the finding that: ‘With unlimited discretion found in the EULA signed by all virtual world inhabitants, the game [owner] wields extreme power over virtual world inhabitants.’²⁵⁴ The game owner could terminate a player’s account, as happened in *Lundlow* and *Bragg*, without compensation;²⁵⁵ further, the game owner had the right to turn off, or massively change, the world.²⁵⁶ Even Linden Lab’s declaration of players’ intellectual property was not sustained in an analysis of the *Second Life* EULA, as Linden Lab, in reserving its godlike powers over *Second Life*, **retained a veto**.²⁵⁷ Within this framework it was unsurprising that lawyers found that virtual property was not protected by EULAs.²⁵⁸ Also, the suggestion in *Bragg* that the arbitration provisions in Linden Lab’s EULA were unconscionable²⁵⁹ meant that ‘although EULAs that govern the virtual worlds provide a method for resolving disputes, their unenforcement and uncertainty ... do not provide an adequate framework to protect players’ investments’.²⁶⁰ Having found that **EULAs** do not protect players’ virtual property, lawyers examined wider laws relating to contract, such as unconscionability, misrepresentation, promissory estoppel and consumer protection laws,²⁶¹ which might bestow greater rights on players. Indeed, for Sean F Kane and Benjamin T Duranske the advisory opinion in *Bragg* ‘may be the first chink in the EULA armor and may call into question the validity of some of the other general provisions’.²⁶² However, notwithstanding Lastowka’s and Hunter’s optimism that there were strong policy grounds for EULAs to be struck down,²⁶³ most commentators were cautious as to how courts would balance the policy grounds in favour

²⁵³ Balkin (n 216) 2049.

²⁵⁴ Kayser (n 187) 63. Other studies were undertaken by Sheldon (n 187) 766–71 and Jankowich (n 249) 12–48. On Linden Lab’s EULA see Caramore (n 184) 4–6; Abrahams (n 178) 302; Roxanne E Christ and Curtis A Peele, ‘Virtual Worlds: Personal Jurisdiction and Click-Wrap Licences’ (2008) 20 *Intellectual Property and Technology Law Journal* 1, 3; Lisa Jarrett, ‘Virtual Worlds, Real Legal Issues’ (2008) 21 *Australian Intellectually Property Bulletin* 50, 53.

²⁵⁵ Mayer-Schönberger and Crowley (n 185) 1793.

²⁵⁶ Lastowka and Hunter (n 184) 55–56.

²⁵⁷ Lederman (n 209) 1641; Caramore (n 184) 2.

²⁵⁸ Chen (n 177) 1089; Hunt (n 176) 150–3; de Zwart (n 177) 84–85.

²⁵⁹ Kane and Duranske (n 188) 11.

²⁶⁰ Glushko (n 187) 508.

²⁶¹ Hunt (n 176) 153–5; see also Sheldon (n 187) 773–85; Reuveni (n 187) 274–303; Kriegshauser (n 248) 1094–107.

²⁶² Kane and Duranske (n 118) 11.

²⁶³ Lastowka and Hunter (n 184) 50.

of striking out the EULA against considering virtual worlds as ‘only a game’ which players can choose to leave.²⁶⁴

Another line of analysis concerning EULA was the regulation of avatar conduct within (the virtual) world. The virtual worlds and law scholarship used the well-documented virtual sexual assault that occurred in *LambdaMOO* in the early 1990s²⁶⁵ as evidence of the possibility of virtual wrongs and the remedy of removing the offending avatar.²⁶⁶ However, this example showed the limits of game administration. *LambdaMOO* was a ‘community based’ virtual world that was ‘owned’ by a handful of dedicated programmers collectively known by the old-MUD term ‘wizards’.²⁶⁷ With arguments raging between *LambdaMOO* citizens concerning process and punishment, one of the wizards made the decision to ‘toad’²⁶⁸ the offending avatar.²⁶⁹ The scholarship noted that contemporary virtual worlds were commercial activities, and while EULAs imposed ‘Community Standards’ with which players were expected to comply, it was argued that the absence of functional investigatory, dispute resolution and punishment processes rendered these insufficient to address inter-avatar harassment.²⁷⁰ Indeed, the power to close player accounts, as demonstrated by the Ludlow and *Bragg* controversies, appeared only to be exercised by game owners when players upset the game owner’s interests.²⁷¹ For US scholars the regulation of inter-avatar conduct raised the problems of the protection of speech by the First Amendment. This cut two ways: first, whether game owners were restricted in exercising EULA exclusion power as a form of censorship; and second, whether the First Amendment prevented federal or state regulation of virtual conduct. While it was noted that, as private entities, game owners were not *prima facie*

²⁶⁴ See eg Jankowich (n 249) 48.

²⁶⁵ The details of this event have been documented by Dibbell. See Julian Dibbell, ‘A Rape in Cyberspace; Or How an Evil Clown, a Haitian Trickster Spirit, Two Wizards, and Cast of Dozens Turned a Database into a Society’ in Peter Ludlow (ed), *High Noon on the Electronic Frontier* (MIT Press, 1996); Julian Dibbell, *My Tiny Life: Crime and Passion in a Virtual World* (Henry Holt, 1998) 11–30.

²⁶⁶ Lastowka and Hunter (n 184) 67; Balkin (n 216) 2062–3; Mayer-Schönberger and Crowley (n 185) 1798–9; Brenner (n 177) 75–77.

²⁶⁷ Pavel Curtis, ‘MUDding: Social Phenomena in Text-based Virtual Realities’ in Ludlow (n 255) 358–60.

²⁶⁸ This was an early MUD term meaning that the avatar was turned into an immobile and incoherent toad. In *LambdaMOO* the offender, ‘Mr Bungle’, was deleted.

²⁶⁹ Dibbell 1998 (n 265) 25; Lawrence Lessig, *Code and Other Laws of Cyberspace* (Basic Books, 1999) 78; Lastowka and Hunter (n 184) 70.

²⁷⁰ *Ibid*, 51–52; Chin (n 176) 1319–21.

²⁷¹ Katsh (n 209) 281; Mayer-Schönberger and Crowley (n 185) 1794–7.

subject to the First Amendment,²⁷² it was argued that their quasi-governmental role might suggest some limit. To this end, First Amendment decisions looking at censorship activities by private universities, shopping malls, company towns and the Boy Scouts were examined, but were considered inconclusive concerning game owners.²⁷³ On stronger ground was analysis considering restrictions on US governmental regulation of virtual conduct. It was agreed that the First Amendment would prevent regulations that attempted to censor virtual worlds,²⁷⁴ unless the regulation was directed towards one of the First Amendment exemptions such as harm to children.²⁷⁵ Some US writers went on to examine the reach of the Child Pornography Protection Act (2000),²⁷⁶ as explained in *Ashcroft v Free Speech Coalition*,²⁷⁷ to argue that pornography involving ‘child avatars’²⁷⁸ was not sufficiently real harm to real children to be subject to that law.²⁷⁹ In Australia the issue of the application of real law to virtual wrongs produced a different outcome. Nick Abrahams argued that virtual assault could be addressed using Commonwealth laws concerning harassment and stalking via electronic communications, and sexualised actions by child avatars would be considered child pornography.²⁸⁰ The one area where the virtual worlds and law scholarship was clear on the application of real world to virtual world disputes was when actions within a virtual world led to real world crimes. The example given was the Qui Chengwei matter from China, where a player in the real world murdered another player who had stolen virtual property.²⁸¹

The virtual worlds and law scholarship had established virtual worlds as a problematic technology of the future that suggested controversies involving property, contract and wrongs which current real world law of specific jurisdictions seemed inadequate to resolve. This survey grounded the call for law; or more precisely, like the first generation space law scholarship and the IVF and law scholarship, it grounded a call for law-

²⁷² Mark Bartholomew, ‘Advertising in the Garden of Eden’ (2007) 55 *Buffalo Law Review* 737, 772.
²⁷³ Balkin (n 216) 2076–8, 2083–90; Zack (n 209) 239–52.
²⁷⁴ Saunders (n 186) 192–227.
²⁷⁵ *Ibid*, 215–27.
²⁷⁶ 18 USC §§ 1466, 1466A (2000 & Supp IV 2004).
²⁷⁷ 535 US 234 (2002).
²⁷⁸ By ‘child avatars’ the literature meant an avatar in the image of a child.
²⁷⁹ Meek-Prieto (n 178) 91–95; Saunders (n 186) 218–19; Barfield (n 203) 688; Brenner (n 177) 92–94.
²⁸⁰ Abrahams (n 178) 298.
²⁸¹ Chen (n 177) 1059; Abrahams (n 178) 305; Rogers (n 198) 409–10.

making, and the tension that had been evident in the Sputnik era scholarship concerning piecemeal versus comprehensive legislating was reiterated. In this respect the virtual worlds and law scholarship represented an ongoing debate within cyberlaw scholarship between the ‘exceptionalists’, who regarded cyberspace as new and radically different, and as such **should develop** its own laws, and the ‘unexceptionalists’, **who argued the** unproblematic application of existing law to cyberspace.²⁸² In the virtual worlds and law scholarship Lastowka and Hunter articulated the exceptionalist position:

Given the complexity of ascertaining a virtual world’s emerging legal rules and balancing them with avatar rights and wizardly omnipotence, the prospect of real-world courts entertaining virtual disputes is in some ways not very appealing. Perhaps, therefore, it would be best to require that the law of virtual worlds develops within their own jurisdiction ... the wiser course may be for courts to keep their distance.²⁸³

Part of this position was influenced by Lawrence Lessig’s well-known synthesis of the exceptionalist thesis and unexceptionalist antithesis in the catchphrase ‘*Code is law*’:²⁸⁴ that cyberspace is a lawful realm; it is governed by the code it is written in. So, while some authors conceded that ‘criminal law provides a terribly blunt and awkward instrument for social control’²⁸⁵ and ‘[v]irtual worlds at bottom are computer games, and games are artificial structures better regulated by game administrators’,²⁸⁶ there were concrete **calls for** better code to deal with identifiable controversies.²⁸⁷ While Phillip Stoup argued for more surveillance and recording of avatar conduct to be built into virtual worlds,²⁸⁸ Viktor Mayer-Schönberger and John Crowley argued that the universal avatar and portable property would necessitate game owners developing better governance structures, including code and in-game law aimed at preventing objectionable

²⁸² These terms were coined by David G Post, *In Search of Jefferson’s Moose: Notes on the State of Cyberspace* (Oxford University Press, 2009) 166–8.

²⁸³ Lastowka and Hunter (n 184) 71.

²⁸⁴ Lessig (n 269) 6, emphasis in original.

²⁸⁵ Kerr (n 209) 425.

²⁸⁶ *Ibid.*, 417.

²⁸⁷ On examples of code developed by game owners to direct avatar conduct in contemporary virtual worlds see Edward Castronova, *Exodus to the Virtual World: How Online Fun is Changing Reality* (Palgrave Macmillan, 2007) 109–33.

²⁸⁸ Stoup (n 179) 336.

conduct and also adequate resolution of in-game disputes, to attract and retain players.²⁸⁹ Although not a lawyer, Castronova, writing in the *New York Law School Law Review* in 2004, presented a novel justification for the exceptionalist policy position and its relation to real world law. For Castronova the application of real world law relating to property, contract and wrongs, to virtual worlds would destroy their utopian potential:

The recent appearance of massively immersive play spaces ... is a tremendous gift to us all, a great moment of liberation, and a drastically powerful reconnection between human beings and the artists who sustain them. The technology to create these play spaces now exists. If deployed properly, it will spread joy and self-esteem across the planet.²⁹⁰

However, Castronova did not argue against real world law per se; instead he argued for an 'Act of Interration', a 'general statement that play spaces are a unique form of commons, a unique collective good, whose value can only be sustained under certain restrictions on individual behaviour'.²⁹¹ For Castronova real world law was needed which 'grant[ed] EULAs a legal status robust enough to allow them to preserve synthetic worlds as play spaces'.²⁹² Castronova wanted real world law to declare virtual worlds an exception.

The exceptionalist policy position of code and in-game law was directly challenged by Balkin: '[T]he single most important reason why it is unreasonable to regard virtual worlds as separate jurisdictions untouched by real-world law is the accelerating real-world commodification of virtual worlds.'²⁹³ Balkin conceived of virtual controversies as a complex mat of conflicting rights; of individual players' 'right to play' conflicting and players' right to play conflicting with game owners' 'right to design'.²⁹⁴ Appropriating Castronova's 'Act of Interration',²⁹⁵ Balkin argued that there should be legislative intervention that provides for EULAs and game owner governance, but which fixes basic

²⁸⁹ Mayer-Schönberger and Crowley (n 185) 1802–3, 1805–8. See also Stoup (n 179) 338; Kane and Duranske (n 188) 9.

²⁹⁰ Edward Castronova, 'The Right to Play' (2004) 49 *New York Law School Law Review* 185, 202.

²⁹¹ *Ibid.*, 200.

²⁹² *Ibid.*, 201.

²⁹³ Balkin (n 216) 2070.

²⁹⁴ *Ibid.*, 2047–51; Jack M Balkin, 'Law and Liberty in Virtual Worlds' (2004) 49 *New York Law School Law Review* 63, 63–67.

²⁹⁵ Balkin (n 216) 2090.

rights concerning conduct and property.²⁹⁶ Following from Balkin, various authors, adopting the unexceptionalist perspective, argued for ‘comprehensive legislative solution[s]’.²⁹⁷ Another activity by the unexceptionalist virtual worlds and law scholars was setting out examples of the unexceptional regulation of virtual worlds by various jurisdictions. The decision of *Li Hongchen v Beijing Arctic Ice Technology Development Co.*,²⁹⁸ where the Beijing Chaoyang District People’s Court enforced return of virtual objects,²⁹⁹ and the South Korean first step towards an Act of Interration in legislating for player intellectual property³⁰⁰, were commonly examined examples of the unexceptional regulation of virtual worlds. The final argument of the unexceptionalists was the adequacy of existing real world laws to accommodate virtual controversies. Andrea Vanina Arias argued that in the US virtual theft could be prosecuted under ‘current theft penal statutes’, and tax lawyers in the US and Australia were convinced that existing tax law applied to real world income realised when ‘cashing out’ of virtual worlds.³⁰¹ However, notwithstanding the policy disagreement driving the differences between the exceptionalists and the unexceptionalists, they shared the now familiar account of instrumental law that can be posited. Both wanted law, whether code, in-game law, new real world law or the application of existing real world law; law was the instrument through which problematic dimensions of virtual worlds should be addressed. Whether it was problems with property, contract or wrongs, the solutions were better laws. The disagreements concerned the perceived effectiveness of various species of law to achieve the desired public policy ends. This commonality with first generation space law and IVF and law scholarship was mirrored in more superficial ways. First, there was the belief that virtual worlds and law scholars were being ‘practical’;³⁰² they were planning for a smooth and inevitable virtual future. Second, there were charges of ‘bulk’: ‘[v]irtual

²⁹⁶ *Ibid.*, 2091–2.

²⁹⁷ Passman (n 216) 285 (arguing for a Sales of Virtual Goods Act). See also Marcus (n 244) 90–91; Hunt (n 176) 169–73; Kunze (n 179) 112–18 (arguing for a legislated for, standard form EULA); Westbrook (n 223) 810–11 (arguing for a statutory ban on real money trading of virtual property). Meek-Prieto (n 178) 107–9 (arguing for laws prohibiting child avatar pornography); Caramore (n 184) 19 (arguing for legislation making compensation available for the deprivation of virtual property when a player is excluded from a game or the game is terminated).

²⁹⁸ Beijing Chaoyang District People’s Court, 19 December 2003; see Abrahams (n 178) 304.

²⁹⁹ Westbrook (n 223) 805–6; Kayser (n 187) 67; Glushko (n 187) 518–19; Arias (n 192) 1342.

³⁰⁰ Abrahams (n 178) 303.

³⁰¹ US (Lederman (n 209) 1671; Mack (n 185) 762–4); Australia (Macrae (n 187)).

³⁰² Chen (n 177) 1059.

worlds have been the subject of much legal writing during the past few years',³⁰³ brought about by significant numbers of student authors³⁰⁴ reiterating much of the substance of either Balkin or Lastowka and Hunter. Finally, virtual worlds and law scholarship possessed the seemingly mandatory 'technical' section in which virtual worlds, their origins and the experience of the player were described.³⁰⁵

In summary, the virtual worlds and law scholarship manifested the same basic structure as was evident 50 years earlier in the first generation space law scholarship and also 30 years earlier in the IVF and law scholarship. The primary commitments were: a problematic technology of the future; existing law that does not adequately address the anticipated future problems; and the call for law, or more precisely law-making to enact public policy goals.

Elements of the Law and Technology Enterprise

Underpinning the three literatures examined was a common structure. Notwithstanding the difference in time and technologies, there was a structure that understood and tied together technology, law and future in specific and stable ways. First, technology was considered problematic: it promised progress and perils. This grounded the initial characteristics identified in the review of the literatures; a problematic technology (satellites, IVF, virtual worlds) represented an inevitable future (space colonisation, artificial human reproduction, virtual reality) that could be positive (lasting peace on earth, freedom to have children and the possibilities to free women from the physicality of human reproduction, untrammelled expression and experiences) or negative (space

³⁰³ Lastowka (n 180) 903.

³⁰⁴ Miller (n 244); Grimmelmann (n 207); Jankowich (n 249); Westbrook (n 223); Blazer (n 187); Chen (n 177); Horowitz (n 236); Holdaway (n 177); Rogers (n 198); Hunt (n 176); Chin (n 176); Marcus (n 244); Sheldon (n 187); Caramore (n 184); Meek-Prieto (n 178); Rosette (n 179); Kunze (n 179); Passman (n 216); Lawrence (n 226); White (n 179); Stoup (n 179); Arias (n 192); Mack (n 185); Horowitz (n 206); Kriegshauser (n 248).

³⁰⁵ Lastowka and Hunter (n 184) 14–29. See also Lederman (n 209) 1625–30. Caramore (n 184) 3–4; Lin (n 201) 82–87; Chen (n 177) 509–11; Chin (n 176) 1303–6, 1308–11; Tal Z Zarsky, 'Information Privacy in Virtual Worlds: Identifying Unique Concerns Beyond the Online and Offline Worlds' (2004) 49 *New York Law School Law Review* 231, 236–8; Castronova (n 290) 192–6; Macrae (n 187) 325–6; Holdaway (n 177) 4–7; Reuveni (n 187) 264–70; Bartholomew (n 272) 741–4; White (n 179) 230–1; Dougherty and Lastowka (n 191) 757–73; Bradley and Froomkin (n 207) 121–8; Saunders (n 186) 190–3; Sheldon (n 187) 756–7; Cory Ondrejka, 'Escaping the Gilded Cage: User Created Content and Building the Metaverse' (2004) 49 *New York Law School Law Review* 81, 87–90; Stoup (n 179) 315–20; Brenner (n 177) 19–51.

warfare, the diminishment of humanity in mechanised reproduction, replication of violence and inequalities in virtual worlds). This uncertain future grounded the call for law. Law, the three literatures disclosed, was called forth to legislate and regulate for desirable technological futures and to prohibit and ban undesirable ones. Law was modern humanity's reinstatement of Mumford's 'earliest forms of moral discipline and self-control'.³⁰⁶ The three literatures confidently suggested that human law could direct the future, or at least mitigate some of the worst fears. International space law could legislate for space-faring peace and prosperity; national regulation could balance the competing ethical concerns surrounding IVF; and laws, whether code, in-game virtual law, new real world law, or application of existing real world law, could address the concerns of property, contract and wrongs in virtual worlds.

Having constructed these relationships, the literatures then turned to the practical tasks of description and analogy. Existing laws were shown to be inadequate. The merits of alternative law-making approaches were considered. Analogies of doctrines and precedents from existing law were assessed, and law-making processes and new laws were described. The lawyer tried to save the future through a hybrid of speculation and description. In summary, lawyers writing about technology were thoroughly positivist: law was a tool to secure a desirable future, to direct a problematic technology's impact, according to values decided elsewhere. This is profoundly unsurprising. As James Boyd White expressed in 1985, this is what law and legal scholarship has become in the modern era:

Law then becomes reducible to two features: policy choices and techniques of implementation. Our questions are 'What do we want?' and 'How do we get it?' In this way the conception of law as a set of rules merges with the conception of law as a set of institutions and processes. The overriding metaphor is that of the machine.³⁰⁷

The law and technology enterprise merely expressed the foundational conceptions of modern law; law as policy choice and techniques of implementation. However, it does something more. Boyd White's identification that the 'overriding metaphor' within the

³⁰⁶ Mumford (n 31) 57–58.

³⁰⁷ James Boyd White, 'Law as Rhetoric, Rhetoric as Law: The Arts of Cultural and Communal Life' (1985) 52 *University of Chicago Law Review* 684, 686.

project of modern law ‘is that of the machine’ suggests an intriguing circularity to the law and technology enterprise. The law and technology interface can be seen to be occupied by set conceptions about law, technology and future that not only produce a narrow style of scholarship, but ultimately—and ironically—reduce the law to technology.³⁰⁸ The binary of problematic technology and saving law is erased. At the essential level law does not save humanity from problematic technology; rather the law and technology enterprise delivers humanity up to technology. In truth there is no ‘law and technology enterprise’, there is just the ‘technology enterprise’ that manifests itself within the world.³⁰⁹

In summary, what can be seen is that the law and technology enterprise narrows how the law and technology interface has been explored. It begins with concern with technological futures. However, the sheer open-endedness of this beginning is then curtailed. The first curtailment is the call for law: law, the expression of human control in the present, is called-for to legislate, prohibit, regulate and facilitate desired technological futures. Having confidently suggested that law can control the impacts of technological change, a further narrowing takes place. The dominant method has been positivism. Law is to be made, but the values and policies that inform this law-making should come from elsewhere.

What emerges from the three literatures serves as a basis for the claim that it is this structure, the law and technology enterprise, that is manifested through the vast caverns of the JOLTs, JOLSTs and generalist law reviews.³¹⁰ The law and technology enterprise can be seen as the default modus for lawyers writing on technology. This is the claim that the law and technology interface has been neglected. Legal scholarship on technology comes across as voluminous, yet hollow. There is talk of technological crisis events and problematic technological futures. There are calls for law, gap identification and analogies from existing law. Then there are descriptions of law-making processes and of

³⁰⁸ Annelise Riles, ‘A New Agenda for the Cultural Study of Law: Taking on the Technicalities’ (2005) 53 *Buffalo Law Review* 973, 975–6; Arthur J Cockfield, ‘Towards a Law and Technology Theory’ (2005) 30 *Manitoba Law Journal* 382, 402; Kieran Tranter, ‘Nomology, Ontology and Phenomenology of Law and Technology’ (2007) 8 *Minnesota Journal of Law, Science and Technology* 449, 454.

³⁰⁹ *Ibid.*, 465; Philippe Nonet, ‘What is Positive Law?’ (1990) 100 *Yale Law Journal* 667, 686.

³¹⁰ See also Kieran Tranter, ‘Biotechnology, Media and Law-making: Lessons from the Cloning and Stem Cell Controversy in Australia 1997–2002’ (2010) 2 *Law, Innovation and Technology* 51, 89–91, where similar concepts were identified as grounding the Australian legal scholarship on cloning and stem cells.

recently made law. What lies outside is more fundamental questioning. Should the current anxieties about certain technological futures be taken seriously? What are the costs of devoting legal and law reform resources to responding to these anxieties? What can be learned from a more general and historical perspective, instead of the piecemeal specific technology focus of the law and technology enterprise? And ultimately, what is to be made of the dark secret at the positivistic heart of the law and technology enterprise that the law championed to save humanity from technology is itself a manifestation of the technological mindset? These questions demark a going beyond the strictures of the law and technology enterprise.

IV. BEYOND THE LAW AND TECHNOLOGY ENTERPRISE

Having identified the law and technology enterprise and argued that investigation into the law and technology interface has been piecemeal and narrowly conceived, the question becomes one of how to go beyond the law and technology enterprise—in other words, how to found legal discourses on the law and technology interface that escape the pull of problematic technological futures and positivism. Here identification of the core commitments of the law and technology enterprise, problematic technology, future and law-making, provides a place to begin again.

The starting point of legal literature founded on the law and technology enterprise is the crisis event—a social, political or cultural anxiety about the contours of human futures represented by a specific technology or anticipated technology: Sputnik and the future of space-faring humanity; Louse Brown and artificial human reproduction; virtual worlds and digital freedom. This immediate concern gave an immediate focus. While what has been argued is that the law and technology enterprise gave rise to very similar styles of legal analysis, the specific literatures were silos. First generation space law scholarship, beyond referencing antecedent literatures on aeronautic and nuclear proliferation law, did not engage with other technological changes. The IVF and law scholarship did not consider IVF in any wider context than artificial human reproduction. The virtual worlds and law scholarship did not consider the promised vistas for human freedom within any wider context than earlier cyberlaw literatures. In short, ‘technology’ comes to legal

scholarship via the law and technology enterprise as a specific technology that, in itself, presents a possible future. Rarely did legal scholars consider ‘technology’ more broadly, or ‘technology-as-a-category’.³¹¹ Indeed, this has only really occurred at a very specific historical moment within the study of the law and technology interface.

Laurence H Tribe, writing in the early 1970s, has generally been credited with the first systemic attempt to articulate a relationship between technology-as-a-category and law.³¹² Tribe drew upon the ambient souring of technology of the late 1960s and early 1970s to suggest that legal and political institutions needed to **become more sophisticated in their assessment of** technological risks.³¹³ In his *Channelling Technology through Law* (1973), technology offers problematic futures³¹⁴ that positive law can regulate.³¹⁵ At this level Tribe, like Michael Kirby³¹⁶ and CG Weeramantry³¹⁷ in Australia in the early 1980s, articulated institutional structures and general techniques through which legal-political-social solutions to technological problems could be produced.³¹⁸ What this means is that the early literature on law and technology-as-a-category did not move very far from the basic commitments of the law and technology enterprise; the focus was future and the method was positivism. It too aspired to practicality, to provide the blueprint for building institutions that could respond to technological change.

In recent years a second generation of law and technology-as-a-category literature has emerged. This literature arose from reflection on, first, the sheer volume of cyberlaw literature that emerged in the mid-1990s, and, second, the internal cyberlaw debates on the ‘exceptionalist’ and ‘unexceptionalist’ responses to the internet.³¹⁹ This literature reveals a more sophisticated temporal **horizon** than Tribe. While **the final emphasis remains** the making of law for the future, the defining characteristic is recognition that

³¹¹ Drahos (n 144) 271.

³¹² Gaia Bernstein, ‘Towards a General Theory of Law and Technology’ (2007) 8 *Minnesota Journal of Law, Science and Technology* 441, 442.

³¹³ Laurence H Tribe, *Channeling Technology through Law* (Bracton, 1973).

³¹⁴ *Ibid*, 6–9.

³¹⁵ *Ibid*, 634–40.

³¹⁶ Michael Kirby, *The Law and Modern Technology* (Deakin University Press, 1982).

³¹⁷ Christopher Gregory Weeramantry, *The Slumbering Sentinels: Law and Human Rights in the Wake of Technology* (Penguin, 1983).

³¹⁸ Tribe (n 313) 592–633.

³¹⁹ Monroe E Price, ‘The Newness of New Technology’ (2001) 22 *Cardozo Law Review* 1885, 1888–9. See also Justin Hughes, ‘Of World Music and Sovereign States, Professors and the Formation of Legal Norms’ (2003) 35 *Loyola University Chicago Law Journal* 155, 157.

the law and technology interface has a *past*.³²⁰ While the law and technology enterprise was concerned with technological futures, this scholarship began to identify the history of legal engagement with technology. In this scholarship examples of law and technology are taken from across jurisdictions, technologies and times, to be woven into basic ‘observations’ or ‘algorithms’ concerning past regulation of technology by law.³²¹ In this literature the positivist preoccupation with gap identification and law-making is supplemented by historical material and analysis to create a more sophisticated understanding of the effectiveness of law in the channelling of technology.

This literature, which draws upon more specific and methodologically diverse research that uses social scientific methods to provide understandings of the effectiveness of rules and models of regulation in specific moments within the law and technology interface,³²² can be seen as the ‘law and society’ or, more correctly, ‘law, technology and society’ supplement to the basic positivistic ‘legal science’ of description and analogy provided by the law and technology enterprise.³²³ The differences between the two concern matters of method; the ‘law, technology and society’ scholarship draws upon regulatory theory,³²⁴ history,³²⁵ criminology,³²⁶ technology studies³²⁷ and social research³²⁸ to gain

³²⁰ Gregory N Mandel, ‘History Lessons for a General Theory of Law and Technology’ (2007) 8 *Minnesota Journal of Law, Science and Technology* 551, 552. See also Alain Pottage and Brad Sherman, ‘Organisms and Manufactures: On the History of Plant Inventions’ (2007) 31 *Melbourne University Law Review* 539.

³²¹ Lyria Bennett Moses, ‘Recurring Dilemmas: The Law’s Race to Keep Up with Technological Change’ (2007) 7 *Journal of Law, Technology and Policy* 239, 282–3; Lyria Bennett Moses, ‘Adapting the Law to Technological Change: A Comparison of Common Law and Legislation’ (2003) 26 *University of New South Wales Law Journal* 394, Lyria Bennett Moses, ‘The Legal Landscape following Technological Change: Paths to Adaption’ (2007) 27 *Bulletin of Science, Technology and Society* 408. See also Arthur J Cockfield and Jason Pridmore, ‘A Synthetic Theory of Law and Technology’ (2007) 8 *Minnesota Journal of Law, Science and Technology* 475; Gregory N Mandel, ‘Regulating Emerging Technologies’ (2009) 1 *Law, Innovation and Technology* 75.

³²² See eg Bennett Moses, ‘Recurring Dilemmas’ (n 321).

³²³ Richard Collier, “‘We’re All Socio-Legal Now?’” Legal Education, Scholarship, and the “Global Knowledge Economy”—Reflections on the UK Experience’ (2004) 26 *Sydney Law Review* 503. See an acknowledgement of this by Bernstein: Gaia Bernstein, ‘The Socio-Legal Acceptance of New Technologies: A Close Look at Artificial Insemination’ (2002) 77 *Washington Law Review* 1035.

³²⁴ Roger Brownsword, ‘So What Does the World Need Now? Reflections on Regulating Technologies’ in Roger Brownsword and Karen Yeung (eds), *Regulating Technologies: Legal Futures, Regulatory Frames and Technological Fixes* (Hart Publishing, 2008); Roger Brownsword and Hans Somsen, ‘Law, Innovation and Technology: Before We Fast Forward—A Forum for Debate’ (2009) 1 *Law, Innovation and Technology* 1, 4–48. See also Hailemichael Teshome Demissie, ‘Is Beneficent Regulation the New Better Regulation? Nano-Regulation in the Wake of the “New Better Regulation” Movement’ (2010) 2 *Law, Innovation and Technology* 115; Paul De Hert and Ellyne Erika, ‘The Law and Ethics of Belgian Biobanking: A Reversal for the Logic of Regulation’ (2010) 2 *Law, Innovation and Technology* 27.

better understandings of the relationship between law, technology and society, in order both to better regulate technology but also to conceive of technology as regulation.³²⁹

Another identifiable recent literature that moves beyond the law and technology enterprise is the recent emphasis in Europe on thinking the law and technology interface through human rights. By taking humans right as a focus, scholars like Roger Brownsword have been able to make more detailed connections, particularly by expanding the bioethical frame beyond the utilitarian-dignity divide and the privacy-sovereignty-body concerns that surround information and nano technologies.³³⁰ Through contemporary rights theorising Brownsword has produced not only a general framework

³²⁵ See eg Peter K Yu, 'Of Monks, Medieval Scribes, and Middlemen' (2006) 2006 *Michigan State Law Review* 1; Gaia Bernstein, 'Accommodating Technological Innovation: Identity, Genetic Testing and the Internet' (2004) 57 *Vanderbilt Law Review* 965; Brad Sherman and Lionel Bently, *The Making of Modern Intellectual Property Law: The British Experience, 1760–1911* (Cambridge University Press, 1999); Roger B Dworkin, *Limits: The Role of the Law in Bioethical Decision Making* (Indiana University Press, 1996); Kieran Tranter, "'The History of the Haste-Wagons": The Motor Car Act 1909 (Vic), Emergent Technology and the Call for Law' (2005) 29 *Melbourne University Law Review* 843.

³²⁶ Ben Bowling, Amber Marks and Cian Murphy, 'Crime Control Technologies: Towards an Analytical Framework and Research Agenda' in Brownsword and Yeung (n 324).

³²⁷ See eg Cockfield and Pridmore (n 321) (using macro-accounts of society and technology from technology studies); Gaia Bernstein, 'The Paradoxes of Technological Diffusion: Genetic Discrimination and Internet Privacy' (2006) 39 *Connecticut Law Review* 241 (using studies of technology diffusion); Gregory N Mandel, 'Technology Wars: The Failure of Democratic Discourse' (2005) 11 *Michigan Telecommunications and Technology Law Review* 117 (using sociological data on public attitudes to technologies); Tranter (n 310) (using media analysis on cloning and stem cell research in Australia).

³²⁸ For example, Caudill used interviews with scientists and other stakeholders involved in pollution controversies. See David S Caudill, 'Legal Responses to Body Burdens: Discourses on Low-Dose Toxicity' (2009) 18 *Griffith Law Review* 259, 266; David S Caudill and Donald E Curley, 'Strategic Idealization of Science to Oppose Environmental Regulation: A Case Study of Five TMDL Controversies' (2009) 51 *Kansas Law Review* 251. Caudill also uses textual analysis in examining 'sociotechnical' arguments in tobacco litigation. See David S Caudill, "'Sociotechnical" Arguments in Scientific Discourse: Expert Depositions in Tobacco Litigation' (2005) 24 *Review of Litigation* 1. While Caudill's focus is on the circulation of scientific evidence within legal areas, this use of social scientific methods and his conception of science within a more sophisticated 'technoscience' frame, locates these studies within 'law, technology and society' scholarship. See also Serge Gutwirth, Paul de Hert and Laurent de Sutter, 'The Trouble with Technology Regulation: Why Lessig's "Optimal Mix" Will Not Work' in Brownsword and Yeung (n 324) 212–14, who use Latour's courtroom ethnography to argue against lawyers as source of regulatory innovation, and Thérèse Murphy, 'The Texture of Reproductive Choice: Law, Ethnography, and Reproductive Technologies' in Thérèse Murphy (ed), *New Technologies and Human Rights* (Oxford University Press, 2009) 213–20, who also draws upon ethnography of women involved in artificial reproduction.

³²⁹ See eg Bert-Jaap Koops, 'Criteria for Normative Technology: The Acceptability of "Code as Law" in Light of Democratic and Constitutional Values' in Brownsword and Yeung (n 324); Mireille Hildebrandt, 'A Vision of Ambient Law' in Brownsword and Yeung (n 324).

³³⁰ See Roger Brownsword, *Rights, Regulation and the Technological Revolution* (Oxford University Press, 2008); Roger Brownsword, 'Regulating Human Enhancement: Things Can Only Get Better?' (2009) 1 *Law, Innovation and Technology* 125. See also Hans Somsen, 'Regulating Human Genetics in a Neo-Eugenic Era' in Murphy (n 328).

of law and contemporary technology but also a sophisticated theoretical matrix that incorporates the more specific insights into regulation from the law, technology and society scholarship.³³¹ However, the guiding motive in this scholarship has been regulation grounded on anxiety about human rights within technological futures and confidence that better techniques and strategies of regulation can successively build a technological rights-filled tomorrow.

What can be seen in these quick surveys is that while these literatures challenged some of the foundational assumptions of the law and technology enterprise, they shared with it **some of the same basic concepts**; technology represented problematic futures that **law could** control. All have as their lodestar the use of law to regulate and guide technological futures. What has not been challenged is the identified irony of a technological law to control technology that comes with the law and technology enterprise and also is within the alternative literatures. Parallel to his foundational work in the early 1970s on first generation law and technology-as-a-category research, Tribe also recognised the irony in instrumental thinking addressing instrumentality. In two articles Tribe questioned instrumentality, and in so doing affirmed a very counter-culture notion of human intellectual transcendence of the material.³³² In this Tribe escaped the law and technology enterprise. His small body of work represents a thorough rejection of each element of the law and technology enterprise. Technology is considered not in a material sense—not as a crisis event holding within it germs of problematic technological futures—but in a Heideggerian sense as an occupation of human reasoning and being.³³³ Law is considered not as something external to this conception of technology but as a clear manifestation of it, and the primary focus of concern is not with future, or past, but with *presence* and how to come to a proactive engagement with the technological present.³³⁴

³³¹ Roger Brownsword, 'Human Dignity, Ethical Pluralism, and the Regulation of Modern Biotechnologies' in Murphy (n 328).

³³² Laurence H Tribe, 'Technology Assessment and the Fourth Discontinuity: The Limits of Instrumental Rationality' (1973) 46 *Southern California Law Review* 616; Laurence H Tribe, 'Ways Not to Think about Plastic Trees: New Foundations for Environmental Law' (1974) 83 *Yale Law Journal* 1315.

³³³ Tribe 1973 (n 332) 641. On Heidegger and technology in law and technology see Tranter (n 308) 462–6.

³³⁴ Tribe 1973 (n 332) 652; Tribe 1974 (n 332) 1338–46.

While Tribe escaped the law and technology enterprise, his exit vector has rarely been followed by subsequent scholars.³³⁵ What is shown in Tribe's radical alternative to the law and technology enterprise, but also in the law and technology-as-a-category literature and law, technology and society research and the technology and human rights framework, are investigations of the law and technology interface that go beyond the law and technology enterprise. The critical element shared by these non-law and technology enterprise literatures is *innovation*. Innovation through going beyond the silos of discrete technologies of the law and technology enterprise, innovation through going beyond legal science to embrace methods and insights about law, technology and society from different disciplines, and innovation through radically recasting the foundational conceptions of technology, law and humanity. It is this call for innovation in the study of the law and technology interface that has positioned this article in this journal. In opening the journal as a forum for debate,³³⁶ Roger Brownsword and Hans Somsen argued for scholarship that

might engage more productively with technological innovation, whether by more imaginative application of legal and regulatory resources, or by developing synergies between legal and technological instruments of regulation, or by improving institutional arrangements.³³⁷

In identifying the law and technology enterprise and sketching different literatures that challenge its elements, this article hopes to help 'fast-forward'³³⁸ the debate by encouraging general and theoretically sophisticated thinking through of the law and technology interface.

V. CONCLUSION

³³⁵ An Australian scholar who did follow in Tribe's metaphysical direction was Bell. See Dean Bell, 'Human Cloning and International Human Rights Law' (1999) 21 *Sydney Law Review* 202, 277–9. Campbell follows some of this in his recent critique of the theoretical poverty of bioethics. Alastair V Campbell, 'Being Mindful of the Body: Enriching the Conceptual Background of Bioethics' (2009) 1 *Law, Innovation and Technology* 171.

³³⁶ Brownsword and Somsen (n 324) 73.

³³⁷ *Ibid.*, 1.

³³⁸ *Ibid.*, 2.

This article argued that legal scholarship on technology is generally framed by the ‘law and technology enterprise’. What this means is that investigation of the law and technology interface has been limited. The law and technology enterprise starts with a crisis event, a specific technology which holds within it problematic technological futures. This technology promises benefits but also perils. What then occurs within scholarship based on the law and technology enterprise is a process of gap identification within existing law. The law *as is* is shown to be inadequate to respond to the demands of the technological future. This opens up the next stage within the literature—law-making. The lawyer/scholar calls for law, surveys other jurisdictions’ laws and describes law-making processes. A critical characteristic is that this discussion is often short on values. The content of the called-for law is not analysed; instead it is determined elsewhere. The message is that it is law’s function to implement policy, not to debate the merits of policy. This characteristic, along with the penchant for description, rightly labels the reigning method of the law and technology enterprise positivist. This structure, it was argued, underpins the vast bulk of law writing on technology. This was shown through a detailed analysis of three literatures on law and technology: first generation space law scholarship from 1957 to 1962, IVF and law scholarship from 1978 to 1985, and virtual worlds and law scholarship from 2002 to 2008. It was shown that, notwithstanding differences in time, technologies and concerns, these literatures manifested the law and technology enterprise.

Having identified the elements of the law and technology enterprise, some notes on how to move to a patient, general and theoretically sophisticated thinking through of the law and technology interface were made. Existing literature that does not manifest some elements of the law and technology enterprise, namely ‘law and technology-as-a-category scholarship’, ‘law, technology and society’ research and ‘technology and human rights’, were considered. The law and technology-as-a-category literature avoids the piecemeal specific technology focus of the law and technology enterprise, and more recent iterations of this scholarship challenge the future focus through consideration of past engagements of law with technology, yet this literature retains the overarching commitment to legal regulation of future. The law, technology and society research replaces the legal science methodology of positivism with the social sciences to build more detailed specific

pictures of past and present happenings within the law and technology interface. However, again it shares with the law and technology enterprise a motivation to control future through law. This was also the endpoint of the technology and human rights scholarship, a lasting claim to be able to **better control of future** through regulation and rights. The irony in the law and technology enterprise—of a triumphing of law as technology—remains in these alternative literatures. In challenging this foundational irony, Tribe's early 1970s counter-culture/Heideggerian critique of law and technology was offered as an exemplar of an investigation of the law and technology interface that wholly departs from the law and technology enterprise.

Appendix: Table of JOLTs and JOLSTs³³⁹

Journal	Start	Technology³⁴⁰	Country	Institution
<i>Albany Law Journal of Science and Technology</i>	1991	General	USA	Albany Law School, University at Albany, State University of New York
<i>Air and Space Law</i>	1975	Aeronautics	The Netherlands	Wolters Kluwer
<i>American Journal of Law and Medicine</i>	1974	Health/Biotech	USA	American Society of Law, Medicine and Ethics
<i>Annals of Air and Space Law</i>	1975	Aeronautics	Canada	Institute of Air and Space Law, McGill University
<i>Annals of Health Law: The Health Policy and Law Review of Loyola University Chicago</i>	1992	Health/Biotech	USA	Beazley Institute for Health Law and Policy, Loyola University Chicago
<i>Australian Intellectual Property Journal</i>	1990	IT/Biotech	Australia	Thomson Reuters
<i>Berkeley Technology Law Journal (1986–95 High Technology Journal)</i>	1986	General	USA	Boalt Hall School of Law at University of California Berkeley
<i>Bio-Science Law Review</i>	2000	Biotech	UK	LawText Publishing
<i>Biotechnology Law Report</i>	1982	Biotech	USA	Mary Anne Liebert
<i>Boston College Intellectual Property and Technology Forum</i>	1997	General	USA	Boston College Law School
<i>Boston University Journal of Science and Technology Law</i>	1995	General	USA	Boston University School of Law
<i>Buffalo Intellectual Property Law Journal</i>	1999	IT/Biotech	USA	University at Buffalo Law School, State University of New York
<i>Canadian Journal of Law and Technology</i>	2002	General	Canada	CCH Canadian and Dalhousie Law School
<i>Columbia Science and Technology Law Review</i>	1999	General	USA	Columbia Law School
<i>Computer and Telecommunications Law Review</i>	1995	IT	UK	Sweet & Maxwell
<i>Computer Law and Security Report</i>	1985	IT	UK	Elsevier
<i>Computer Law Review International: A Journal of Information Law and Technology (1988–2000 Computer und Recht)</i>	1988	IT	Germany	Verlag Dr Otto Schmidt
<i>DePaul Journal of Art, Technology and Intellectual Property Law (1991–2007 DePaul-LCA Journal of Art and Entertainment Law)</i>	1991	General	USA	DePaul University College of Law
<i>Digital Technology Law Journal</i>	1999–2004	IT	Australia	Murdoch School of Law
<i>Duke Law and Technology Review</i>	2001	General	USA	Duke University School of Law
<i>European Intellectual Property Review</i>	1978	IT/Biotech	UK	Sweet & Maxwell
<i>European Journal of Health Law</i>	1994	Health/Biotech	The Netherlands	Brill
<i>Fordham Intellectual Property, Media and Entertainment Law Journal</i>	1990	IT	USA	Fordham University School of Law
<i>Harvard Journal of Law and Technology</i>	1988	General	USA	Harvard Law School

³³⁹ Sources: Westlaw; HeinOnline; and the Australian Research Council ranking of journals produced as part of the Excellence in Research for Australia exercise, available at http://www.arc.gov.au/era/era_journal_list.htm (as at 10 June 2011). Magazine style ‘trade’ journals were excluded. No claim is made that the list is entirely comprehensive.

³⁴⁰ The following categories were used: ‘General’ refers to JOLTS; ‘Aeronautics’ refers to air and space technologies; ‘Biotech’ refers to biotechnologies; ‘Health’ refers to health related technologies; ‘IT’ refers to information technologies. Specialist health law journals were included, as these journals publish a steady stream of research concerning health technology and biotechnology. Specialist intellectual property journals were included, as these journals also publish a preponderance of research concerning information technology and biotechnology.

<i>Health Law Journal</i>	1993	Health/Biotech	Canada	Health Law Institute, University of Alberta
<i>Health Law Review</i>	1991	Health/Biotech	Canada	Health Law Institute, University of Alberta
<i>Health Matrix: Journal of Law-Medicine</i>	1989	Health/Biotech	USA	Law-Medicine Center, Case Western Reserve University
<i>Houston Journal of Health Law and Policy</i>	2001	Health	USA	Health Law and Policy Institute, University of Houston Law Center
<i>IDEA: The Intellectual Property Law Review</i> (1957–72 <i>Patent, Trademark and Copyright Journal of Research and Education</i> ; 1974–6 <i>IDEA: The PTC Journal of Research and Education</i> ; 1977–2005 <i>IDEA: The Journal of Law and Technology</i>)	1957	IT/Biotech	USA	Franklin Pierce Center for Intellectual Property, University of New Hampshire School of Law
<i>I/S: A Journal of Law and Policy for the Information Society</i>	2005	IT	USA	Moritz College of Law, Ohio State University, HJ Heinz III School of Law and Public Policy, Carnegie Mellon University
<i>Indian Journal of Law and Technology</i>	2005	General	India	National Law School of India University
<i>Indiana Health Law Review</i>	2003	Health/Biotech	USA	Indiana University School of Law
<i>Intellectual Property Journal</i>	1984	IT/Biotech	Canada	Carswell
<i>Intellectual Property Quarterly</i>	1997	IT/Biotech	UK	Sweet & Maxwell
<i>International Journal of Law and Information Technology</i>	1993	IT	UK	Oxford University Press
<i>International Review of Law, Computers and Technology</i>	1985	General	UK	Routledge
<i>Issues in Law and Medicine</i>	1985	Health/Biotech	USA	National Legal Center for the Medically Dependent and Disabled and the Horatio R Storer Foundation, Inc
<i>John Marshall Review of Intellectual Property Law</i>	2001	IT/Biotech	USA	John Marshall Law School
<i>Journal of Air Law and Commerce</i>	1931	Aeronautics	USA	Southern Methodist University Dedman School of Law, Dallas
<i>Journal of Business and Technology Law</i>	2005	General	USA	Maryland Law, University of Maryland
<i>Journal of Contemporary Health Law and Policy</i>	1985	Health/Biotech	USA	Columbus School of Law, Catholic University of America
<i>Journal of Health and Biomedical Law</i>	2004	Health/Biotech	USA	Suffolk University Law School
<i>Journal of Health and Life Sciences Law</i>	2007	Health/Biotech	USA	American Health Lawyers Association and LexisNexis
<i>Journal of Health Politics, Policy and Law</i>	1976	Health/Biotech	USA	Duke University Press
<i>Journal of High Technology Law</i>	2002	General	USA	Suffolk University Law School
<i>Journal of Information, Law and Technology</i>	1996	IT	UK	University of Warwick and University of Strathclyde
<i>Journal of Intellectual Property</i>	1999	IT/Biotech	USA	Chicago-Kent College of Law
<i>Journal of Intellectual Property Law and Practice</i>	2005	IT/Biotech	UK	Oxford University Press
<i>Journal of International Biotechnology Law</i>	2004	BioTech	Germany	Walter de Gruyter
<i>Journal of International Commercial Law and Technology</i>	2006	General	Denmark	International Association of IT Lawyers
<i>Journal of Law and Health</i>	1985	Health/Biotech	USA	Cleveland-Marshall College of Law, Cleveland State University
<i>Journal of Law and Information Science</i>	1989	IT	Australia	Faculty of Law, University of Tasmania
<i>Journal of Law and Medicine</i>	1993	Health/Biotech	Australia	Law Book Company
<i>Journal of Law, Medicine and Ethics</i>	1972	Health	USA	American Society of Law, Medicine and Ethics
<i>Journal of Law, Technology and Policy</i> (also known as <i>University of Illinois Journal of Law, Technology and Policy</i>)	2001	General	USA	College of Law and National Centre for Supercomputing Applications, University of Illinois
<i>Journal of Legal Medicine</i>	1978	Health/Biotech	USA	American College of Legal Medicine and Taylor and Francis

<i>Journal of Medicine and Law</i>	1997	Health/Biotech	USA	Michigan State University College of Law
<i>Journal of Space Law</i>	1973	Aeronautics	USA	National Center for Remote Sensing, Air and Space Law, University of Mississippi Law School
<i>Journal of Technology Law and Policy</i>	1996	General	USA	Fredric G Levin College of Law, University of Florida
<i>Journal on Telecommunications and High Technology Law</i>	2002	General	USA	Colorado Law, University of Colorado
<i>Law, Innovation and Technology</i>	2009	General	UK	Hart Publishing
<i>Loyola Law and Technology Annual (1996–9 Loyola Intellectual Property and High Technology Law Quarterly; 2000–1 Loyola Intellectual Property and High Technology Journal)</i>	1996	General	USA	Loyola University New Orleans College of Law
<i>Marquette Intellectual Property Law Review</i>	1997	IT/Biotech	USA	Marquette University Law School
<i>Masaryk University Journal of Law and Technology</i>	2007	General	Czech Republic	Masaryk University
<i>Medico-Legal Journal (1933–47 Medico-Legal and Criminological Review)</i>	1933	Health/Biotech	UK	Medico-Legal Society
<i>Medicine and Law: An International Journal</i>	1982	Health/Biotech	Israel	International Center for Health, Law and Ethics, Faculty of Law, Haifa University
<i>Medicine, Science and the Law</i>	1960	Health/Biotech	UK	British Academy of Forensic Sciences
<i>Michigan Telecommunications and Technology Law Review</i>	1994	General	USA	University of Michigan Law School
<i>Minnesota Journal of Law, Science and Technology (2000–4 Minnesota Intellectual Property Review)</i>	2000	General	USA	University of Minnesota Law School
<i>North Carolina Journal of Law and Technology</i>	2000	General	USA	University of North Carolina
<i>Northwestern Journal of Technology and Intellectual Property</i>	2003	General	USA	Northwestern University School of Law
<i>Oklahoma Journal of Law and Technology</i>	2003	General	USA	University of Oklahoma College of Law
<i>Quinnipiac Health Law Journal</i>	1996	Health/Biotech	USA	Quinnipiac University School of Law
<i>Richmond Journal of Law and Technology</i>	1995	General	USA	University of Richmond School of Law
<i>Rutgers Computer and Technology Law Journal (1970–8 Rutgers Journal of Computers and the Law; 1979–80 Rutgers Journal of Computers, Technology, and the Law)</i>	1970	General	USA	Rutgers University School of Law
<i>Santa Clara Computer and High Technology Law Journal</i>	1985	General	USA	Santa Clara Law, Santa Clara University
<i>SCRIPTed: A Journal of Law, Technology and Society</i>	2004	General	UK	Centre for Intellectual Property and Technology Law, University of Edinburgh
<i>Shidler Journal of Law, Commerce and Technology</i>	2004	General	USA	University of Washington Law School
<i>SMU Science and Technology Law Review (1997–2004 Computer Law Review and Technology Journal)</i>	1997	General	USA	Dedman School of Law, Dallas
<i>Stanford Technology Law Review</i>	2004	General	USA	Stanford Law School
<i>Studies in Ethics, Law, and Technology</i>	2007	General	USA	Berkeley Electronic Press
<i>Temple Journal of Science, Technology and Environmental Law (1982 Outlook Environmental Journal; 1983 Outlook Environmental Law Journal; 1984–2004 Temple Environmental Law and Technology Journal)</i>	1982	General	USA	Temple University Beasley School of Law
<i>Texas Intellectual Property Law Journal</i>	1991	IT/Biotech	USA	State Bar of Texas Intellectual Property Law Section, University of Texas School of Law

<i>Tulane Journal of Technology and Intellectual Property</i>	1999	General	USA	Tulane University Law School
<i>UCLA Journal of Law and Technology</i>	1996	General	USA	UCLA School of Law
<i>University of Baltimore Intellectual Property Law Journal</i>	1992	IT/Biotech	USA	University of Baltimore School of Law
<i>University of Ottawa Law and Technology Journal</i>	2003	General	Canada	University of Ottawa Faculty of Law
<i>Vanderbilt Journal of Entertainment and Technology Law (1999–2005)</i>	1999	General	USA	Vanderbilt University Law School
<i>Vanderbilt Journal of Entertainment Law and Practice)</i>				
<i>Virginia Journal of Law and Technology</i>	1997	General	USA	University of Virginia School of Law
<i>Wake Forest Intellectual Property Law Journal</i>	1999	IT/Biotech	USA	Wake Forest University School of Law
<i>Yale Journal of Law and Technology</i>	2000	General	USA	Yale Law School
<i>Yale Journal of Health Policy, Law, and Ethics</i>	2000	Health/Biotech	USA	Yale Law School