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

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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.\textsuperscript{4} The nascent aviation industry prior to 1918 generated legal scholarship concerned with the sovereignty of airspace,\textsuperscript{5} liability arising from aeroplanes\textsuperscript{6} and the aeronautical laws of war.\textsuperscript{7} Similarly, the commercialisation of radio in the 1920s prompted legal writing on radio and the law of war,\textsuperscript{8} ownership of radio-waves\textsuperscript{9} and regulation.\textsuperscript{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.\textsuperscript{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).\textsuperscript{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 \textit{Harvard Law Review} (2007–8) printed a note concerning biotechnology and the challenge of ‘liberal eugenics’,\textsuperscript{13} two notes and three case notes dealing with internet

\textsuperscript{4} Xenophon P Huddy, ‘The Motor Car’s Status’ (1905) 15 \textit{Yale Law Journal} 83, 86.
\textsuperscript{7} Robert E Heinselman, ‘Aerial Warfare’ (1913) 33 \textit{Canadian Law Times} 741.
\textsuperscript{8} William L Rodgers, ‘The Laws of War concerning Aviation and Radio’ (1923) 17 \textit{American Journal of International Law} 629.
\textsuperscript{12} JOLT seems to be emerging as common parlance within the US student-run law and technology journals. See \url{http://jolt.law.harvard.edu} (accessed 7 June 2011).
law, and a case note concerning the evidential status of computer-generated reports.


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, 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. 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) has specifically been an area of expansion.

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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) 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. 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. Second, technology was problematic. It was good as seen in the celebration of material prosperity of an emerging suburbia of domestic appliances. However, it was also bad in the fallout blowing from Hiroshima and Nagasaki which eventually registered in the popular cultural souring of technology beginning with the counterculture of the late 1960s. The third was change. The general category of technology was needed as the machines were, to borrow from Bob Dylan, ‘a-changin’; seemingly evolving independent of human agency. 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

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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) *Social Research* 965, 967, 981–4.
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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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


\textsuperscript{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

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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.\textsuperscript{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’.\textsuperscript{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\textsuperscript{38} which would allow ‘satellite platforms …[and] exploration teams …on the Moon or on a planet’\textsuperscript{39} and the use of satellites to control weather as a weapon.\textsuperscript{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.\textsuperscript{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

our history’. John C Cooper worried that ‘progress’ has ‘loosed forces which, uncontrolled, may well destroy the civilisation which has created them’. Sputnik’s Cold War parentage and its nuclear sibling were never far from the surface. 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?’ 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.

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’. 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’. 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

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42 Gorove (n 40) 305.
46 Haley (n 38) 262.
47 Wurfel (n 34) 287.
48 Gorove (n 40) 308.
technology enterprise’s lexicon: technology had ‘outstripped’ law;\textsuperscript{49} technology created a legal ‘vacuum’;\textsuperscript{50} lawyers should ‘speculate’\textsuperscript{51} on issues that can be ‘anticipated’;\textsuperscript{52} and the proper reception of Sputnik was within the legal ‘imagination’.\textsuperscript{53} After triggering legal imaginings of space future that needed law, Sputnik orbited out of first generation space law scholarship. \textbf{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.\textsuperscript{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.\textsuperscript{55} Rhetorical questions were asked as to whether Sputnik interfered with sovereign airspace,\textsuperscript{56} and were generally answered in the negative.\textsuperscript{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;\textsuperscript{58} an international

\textsuperscript{49} John Cobb Cooper, ‘Legal Problems of Upper Space’ (1956) 50 \textit{Proceedings of the American Society of International Law} 85, 85; Haley (n 38) 262; Gorove (n 40) 308.
\textsuperscript{50} Ward (n 44) 11; Lyons (n 34) 271; Joseph J Simeone, Jr, ‘Space—A Legal Vacuum’ (1962) 16 \textit{Military Law Review} 43.
\textsuperscript{52} HB Jacobini, ‘Effective Control as Related to the Extension of Sovereignty in Space’ (1958) 7 \textit{Journal of Space Law} 97, 97.
\textsuperscript{53} McDougal and Lipson (n 36) 428; Gorove (n 40) 305.
\textsuperscript{57} Haley (n 38) 265–74; Cooper (n 43) 319–320; Jacobini (n 52) 108–110; Pépin (n 35) 229.
\textsuperscript{58} Pépin 1956 (n 55) 75; Editors (n 55) 6; Lyons (n 34) 283–6; IH Ph de Rode-Verschoor, \textit{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 satellites \(^{60}\) 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.


\(^{63}\) Hogan (n 51) 348.

\(^{64}\) *Ibid*.


\(^{66}\) 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.
President Eisenhower’s several public endorsements of outer space for peace were cited with approval.\textsuperscript{73} Western lawyers included the opinion of Soviet jurists in their analysis\textsuperscript{74} 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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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

\begin{itemize}
\item \textsuperscript{73} Wurfel (n 34) 281; Gorove (n 40) 316; Haley (n 72) 445; Lipson and de B Katzenbach (n 66) 5.
\item \textsuperscript{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.
\item \textsuperscript{75} A Kislov and S Krylov, ‘State Sovereignty in Airspace’; G Zadorozhnyi, ‘The Artificial Satellite and International Law’, both in Galloway (n 60).
\item \textsuperscript{76} Ward (n 44) 12.
\item \textsuperscript{77} Ibid, 21–27.
\end{itemize}
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.
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
*Proceedings of the American Society of International Law* 174; José Delascio, ‘Space Explorations and
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
6 *Journal of Space Law* 47; Theodore E Wolcott, ‘Some Aspects of Third Party Liability in Space Shuttle
(1979) 13 *International Lawyer* 153); SpaceShipOne and space tourism (Steven Freeland, ‘Up, Up and …
*Chicago Journal of International Law* 1; Catherine E Parsons, ‘Space Tourism: Regulating Passage to the
Space Development and the Necessity of an International Framework Embracing Private Property Rights to
84 Public Law #85-568, 72 Stat, 426.
eventually comprised the Outer Space Treaty of 1967, the Rescue Agreement of 1968, the Liability Convention of 1972 and the Registration Convention of 1976, provided further opportunities for scholarly inspection. 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

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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).
significance of viewing and evaluating the social relationships of man in a totally controlled environment.\textsuperscript{90}

Robinson’s law and [cybernetic] society re-conceptualising found little support.\textsuperscript{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; \textcolor{red}{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.

\section*{In Vitro Fertilisation}

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

\textsuperscript{90} George S Robinson, ‘NASA’s Space Station and the Need for Quantifiable Components of a Responsive Legal Regime’ (1972) 6 \textit{International Lawyer} 292, 292.

\textsuperscript{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 \textit{Hastings International and Comparative Law Review} 211, 229.
Brown, on 25 July 1978\textsuperscript{92} 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,\textsuperscript{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’;\textsuperscript{94} however, in their own writing IVF was received as another development within what was called the ‘New Biology’.\textsuperscript{95} As such IVF was located as the next step in a continuum of ‘artificial human reproduction’\textsuperscript{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.\textsuperscript{97} Indeed, IVF had already been placed into this future history by lawyers in


\textsuperscript{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.


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


\textsuperscript{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. Mary Anne Oakley in 1974 located IVF in a technological future that involved AI (present), IVF (near future) and cloning (more distant). 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?’ David G Dickman in 1985 suggested that ‘[t]he clinical application of IVF opens up a Pandora’s Box of problems’. This registering of IVF as predominately a ‘peril’ 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.


Turner (n 94) 459.


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

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.

Venturatos Lorio (n 97) 1641.
technology’. 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’. Bernard M Dickens wrote that the ‘biomedical realities of in vitro fertilization and embryo transfer show the extent of legal lag in Canada’. Indeed, most IVF and law scholars were of the opinion that ‘no direct legal regulation has yet been imposed on IVF’. In making this assessment lawyers did have to describe the existing law that concerned IVF. Del Zio v Manhattan’s Columbia Presbyterian Medical Center 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. The later decision of Smith v Hartigan similarly was described as not providing a determinative decision on the legalities of IVF. 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. However, this description usually focused on the limits of the regulations to research

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105 Steeves (n 96) 1077.
106 Humphreys (n 97) 430.
109 No 74-3588 (SDNY, filed 12 April 1978).
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. The conclusion of these surveys was that the existing law was regarded as inadequate. This justified the demand that IVF be ‘properly controlled’ 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.

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?

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’. They were encouraged to ‘brainstorm’ and be ‘creative’. It was suggested that ‘[t]he prescience of the law in the area of IVF will

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115 Oakley (n 99) 386.
116 Davies (n 97) 354.
119 Waddington (n 94) 467.
preclude abuses of this novel technology’,\textsuperscript{121} and ‘a concerted effort should be made to regulate the foreseeable problems generated by currently available procedures’.\textsuperscript{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’\textsuperscript{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,\textsuperscript{124} the second on medical liability,\textsuperscript{125} and the third, quaint (at least to twenty-first century sensibilities) discussions of whether AI amounted to adultery at common law.\textsuperscript{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,\textsuperscript{127} medical liability arising from harm to the children or

\textsuperscript{121} McCartan (n 114) 727.
\textsuperscript{122} Steeves (n 96) 1077.
\textsuperscript{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.
\textsuperscript{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.
women, and, to a lesser extent, adultery. The second manifestation, flowing from the belief that ‘[l]egal clarification of AI was a necessary prerequisite for regulating IVF and embryo transplanting’, was that most papers had a dedicated section, usually towards the beginning, reviewing the legal response to AI. 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. 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. The possibility of gamete and embryo freezing gave rise to two imagined concerns. The first was with the rights of children-to-be, a concern that


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.

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

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. 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, suggested a ‘right of reproductive freedom’ that might limit

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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) 373–73; 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.
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.
federal and state regulative powers. 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. 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.

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’, 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’.

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Most IVF and law scholarship had a section titled ‘Ethical Issues’. 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. Similarly, the Catholic position, and especially Pope Pius XII’s 1956 decree condemning artificial human reproduction, was documented. Parallel with these were statements by IVF pioneers, like Robert Edwards or Alan Trounson, on the positive application of IVF technology. 

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.’ 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’. Lawyers noted that positions regarding the ethics of IVF depended on the ‘legal and moral definitions of humanity, life and person’ and the answering of questions like ‘is sterility an illness?’ and ‘when is the origin of human life?’ 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

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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.
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.
150 eg Mahlon Blow (n 118) 169; Venturatos Lorio (n 108) 979.
151 Waddington (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,\textsuperscript{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 \textit{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.\textsuperscript{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.\textsuperscript{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 report\textsuperscript{159} was widely covered.\textsuperscript{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.\textsuperscript{161} In Australia the various jurisdictional inquires and reports were described,\textsuperscript{162} with particular emphasis given to

\begin{footnotesize}
\begin{enumerate}
\item Brahams (n 143) 859.
\item Two writers go so far as to print the text of their suggested legislation; see Frey (n 110) 334–41; Crabtree (n 108) 925.
\item 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 \textit{Australian Journal of Family Law} 197, 204–210.
\item See eg George J Annas and Sherman Ellis, ‘Social Policy Considerations in Noncoital Reproduction’ in A Milunsky and GJ Annas (eds), \textit{Genetics and the Law III} (Plenum, 1985) 147; Robertson (n 128) 967–1032.
\item Drahos (n 144) 283; Family Law Council (n 142) 18–24, 124–5.
\end{enumerate}
\end{footnotesize}
the Waller Reports in Victoria\textsuperscript{163} and the subsequent Status of Children (Amendment) Act 1984 (Vic) and Infertility (Medical Procedures) Act 1984 (Vic).\textsuperscript{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 bibliographies\textsuperscript{165} and comments regarding bulk.\textsuperscript{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.\textsuperscript{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.\textsuperscript{168} The third was the emergence of law student authors. There were law student contributors to first generation space

\textsuperscript{163} Louis Waller, \textit{Report on Donor Gametes in IVF} (Committee to Consider the Social, Ethical and Legal Issues Arising from In Vitro Fertilization, 1983); Louis Waller, \textit{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).


\textsuperscript{165} eg McNabb (n 123).

\textsuperscript{166} Annas and Elias (n 108) 207; Drahos (n 144) 270.

\textsuperscript{167} Porte (n 137) 87.

\textsuperscript{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 \textit{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; however, by 1978–86 the numbers of student contributors seemed to be increasing. 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’ task of implementing public policy that has been decided elsewhere.

Virtual Worlds
Online virtual gaming environments, or ‘virtual worlds’, 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’ income for her ‘player’, Ailin Graef. As with Sputnik and Louise Brown, the media attention

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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.
quickly translated into copy in law journals\textsuperscript{176} 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,\textsuperscript{177} virtual sexual abuse,\textsuperscript{178} virtual financial collapses,\textsuperscript{179} and reports of real world concerns of addiction,\textsuperscript{180} money laundering\textsuperscript{181} and murders arising from virtual world disputes\textsuperscript{182} 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.


\textsuperscript{181} Abrahams (n 178) 299; Rosette (n 179) 290–3.

\textsuperscript{182} Abrahams (n 178) 305; Chen (n 177) 1059.
First, the ‘cross-border problem’, the connection between the real economy and virtual economy, was noted. 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. The secondary representation was the existence of virtual property and player accounts for sale on eBay, and the citing of Edward Castronova’s foundational 2001 study on the virtual and real economics of Sony’s EverQuest. Virtual worlds had become a ‘multi-billion dollar economy’ and it was commonly noted that in 2007 many transnational corporations had acquired a virtual presence. 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, and questions of protecting that property from real or virtual appropriation, as well as the question of appropriation of real world intellectual property

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. The third related to the crossover between virtual behaviour and real world crimes, particularly theft and child pornography. 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. However, balancing these concerns were more optimistic assessments. Jerry Kang in 2000 saw in the emergence of avatars the possibility for ‘cyber-passing’: 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. 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.

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

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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.
197 Chin (n 176) 1315–16.
amounts of capital into the online world.’ 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.

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’).

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

199 Kayser (n 187) 62.
200 Holdaway (n 177) 6–7.
202 Meek-Prieto (n 178) 95–97.
204 Meek-Prieto (n 178) 97.
205 Fairfield (n 187) 1059; Kane and Duranske (n 188) 14.
education or as a simulation environment for assessing legal, political and economic responses to normative structures.

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.’ F Gregory Lastowka and Dan Hunter, in a highly cited 2004 article, 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.’ 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.’

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.’ Further, because the ‘traditional problems of human nature and conflict persist’ there would be

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208 Rosette (n 179) 299.


210 Lastowka and Hunter (n 184) 72.

211 Reuveni (n 187) 302.


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 increasing 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

214 Meek-Prieto (n 178) 98; Keupink (n 176) 167.
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.’
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]’ and as involving ‘hypotheticals’. 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. Sony’s attempts to prevent the sale of EverQuest items, which was defeated by threats of a class action by players and the inconclusive litigation concerning gold farming (the aborted Blacksnow Interactive litigation and the class action Antonio Hernandez and others v Internet Gaming Entertainment) were evidence of the uncertainty surrounding ‘ownership’ of virtual property and also the difficulty of getting virtual property into real world courts. Bragg v Linden Research Inc, litigation arising from a decision by Linden Labs to exclude Bragg from Second Life because of improper virtual real estate transactions, was regularly overviewed. 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. Similarly, Marvel Enterprises, Inc v NCSoft, litigation concerning the alleged

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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.
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).
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 rightness\(^{235}\) 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

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\(^{230}\) 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.


\(^{234}\) *Ibid*, 32.

\(^{235}\) Indeed, Jankowich argued that without virtual property rights, players in virtual worlds are ‘serfs’.

\(^{236}\) Jankowich (n 183) 216.

\(^{237}\) 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:

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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.
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

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245 Davis (n 218) 199.
246 Dougherty and Lastowka (n 191) 778–98.
250 On game owners see Kunze (n 179) 107; Archinaco (n 187) 27.
virtual worlds and that regulation was tilted in favour of the game owner.\textsuperscript{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.’\textsuperscript{254} The game owner could terminate a player’s account, as happened in Lundlow and Bragg, without compensation;\textsuperscript{255} further, the game owner had the right to turn off, or massively change, the world.\textsuperscript{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.\textsuperscript{257} Within this framework it was unsurprising that lawyers found that virtual property was not protected by EULAs.\textsuperscript{258} Also, the suggestion in Bragg that the arbitration provisions in Linden Lab’s EULA were unconscionable\textsuperscript{259} 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’.\textsuperscript{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,\textsuperscript{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’.\textsuperscript{262} However, notwithstanding Lastowka’s and Hunter’s optimism that there were strong policy grounds for EULAs to be struck down,\textsuperscript{263} most commentators were cautious as to how courts would balance the policy grounds in favour
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 1990s ²⁶⁵ 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.
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,\textsuperscript{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.\textsuperscript{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,\textsuperscript{274} unless the regulation was directed towards one of the First Amendment exemptions such as harm to children.\textsuperscript{275} Some US writers went on to examine the reach of the Child Pornography Protection Act (2000),\textsuperscript{276} as explained in \textit{Ashcroft v Free Speech Coalition},\textsuperscript{277} to argue that pornography involving ‘child avatars’\textsuperscript{278} was not sufficiently real harm to real children to be subject to that law.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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-

\textsuperscript{273} Balkin (n 216) 2076–8, 2083–90; Zack (n 209) 239–52.
\textsuperscript{274} Saunders (n 186) 192–227.
\textsuperscript{275} \textit{Ibid}, 215–27.
\textsuperscript{277} 535 US 234 (2002).
\textsuperscript{278} By ‘child avatars’ the literature meant an avatar in the image of a child.
\textsuperscript{279} Meek-Prieto (n 178) 91–95; Saunders (n 186) 218–19; Barfield (n 203) 688; Brenner (n 177) 92–94.
\textsuperscript{280} Abrahams (n 178) 298.
\textsuperscript{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 reliterated. 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 ‘\textit{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 \textit{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, \textit{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.

\(^{286}\) \textit{Ibid}, 417.

\(^{287}\) On examples of code developed by game owners to direct avatar conduct in contemporary virtual worlds see Edward Castronova, \textit{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.\textsuperscript{289} Although not a lawyer, Castronova, writing in the \textit{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.\textsuperscript{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’.\textsuperscript{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’.\textsuperscript{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.’\textsuperscript{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’.\textsuperscript{294} Appropriating Castronova’s ‘Act of Interration’,\textsuperscript{295} Balkin argued that there should be legislative intervention that provides for EULAs and game owner governance, but which fixes basic

\begin{itemize}
  \item \textsuperscript{289} Mayer-Schönberger and Crowley (n 185) 1802–3, 1805–8. See also Stoup (n 179) 338; Kane and Duranske (n 188) 9.
  \item \textsuperscript{291} \textit{Ibid}, 200.
  \item \textsuperscript{292} \textit{Ibid}, 201.
  \item \textsuperscript{293} Balkin (n 216) 2070.
  \item \textsuperscript{295} Balkin (n 216) 2090.
\end{itemize}
rights concerning conduct and property. Following from Balkin, various authors, adopting the unexceptionalist perspective, argued for ‘comprehensive legislative solution[s]’. 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.*, where the Beijing Chaoyang District People’s Court enforced return of virtual objects, and the South Korean first step towards an Act of Interration in legislating for player intellectual property, 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.

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’; they were planning for a smooth and inevitable virtual future. Second, there were charges of ‘bulk’.

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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, brought about by significant numbers of student authors 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.

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’. 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.

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.
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


\(^{310}\) 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 indentified 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; Louise 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’. 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. 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. In his *Channeling Technology through Law* (1973), technology offers problematic futures that positive law can regulate. At this level Tribe, like Michael Kirby and CG Weeramantry in Australia in the early 1980s, articulated institutional structures and general techniques through which legal-political-social solutions to technological problems could be produced. 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. 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

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311 Drahos (n 144) 271.
316 Michael Kirby, *The Law and Modern Technology* (Deakin University Press, 1982).
318 Tribe (n 313) 592–633.
the law and technology interface has a past.\textsuperscript{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.\textsuperscript{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,\textsuperscript{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.\textsuperscript{323} The differences between the two concern matters of method; the ‘law, technology and society’ scholarship draws upon regulatory theory,\textsuperscript{324} history,\textsuperscript{325} criminology,\textsuperscript{326} technology studies\textsuperscript{327} and social research\textsuperscript{328} to gain

\begin{footnotesize}
\begin{enumerate}
\item[\textsuperscript{322}] See eg Bennett Moses, ‘Recurring Dilemmas’ (n 321).
\end{enumerate}
\end{footnotesize}
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.\textsuperscript{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.\textsuperscript{330} Through contemporary rights theorising Brownsword has produced not only a general framework

\begin{footnotesize}
\begin{enumerate}
\item Ben Bowling, Amber Marks and Cian Murphy, ‘Crime Control Technologies: Towards an Analytical Framework and Research Agenda’ in Brownsword and Yeung (n 324).
\item 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, Enthnography, 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.
\item 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).
\end{enumerate}
\end{footnotesize}
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. 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. 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. 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.

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331 Roger Brownsword, ‘Human Dignity, Ethical Pluralism, and the Regulation of Modern Biotechnologies’ in Murphy (n 328).
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.\textsuperscript{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,\textsuperscript{336} Roger Brownsword and Hans Somsen argued for scholarship that

\begin{quote}
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.\textsuperscript{337}
\end{quote}

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

V. CONCLUSION


\textsuperscript{336} Brownsword and Somsen (n 324) 73.

\textsuperscript{337} Ibid, 1.

\textsuperscript{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 JOLSTs

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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.

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.
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