War in the Expanse: The Metaphysics of Cyberspace

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The future space traveler who has not first made the simple walk of wonder will find his journey beyond our solar system ultimately a disappointment.

—Fred Schaaf[1]

I. THE GOLDEN AGE

Looking toward the night sky another place of existence becomes visible. This night sky is a doorway to a universe that dwarfs any type of attempted quantification by human beings. It reminds of greatness and of a grander expanse of which humanity is only a small part. Our population is growing and our resources dwindling and for that reason we continue looking upward in search of answers. This quest that now must continue is one of wonders and mysteries, marvels and opportunities. But above all, that great motivator to go in search of the unknown is the resources gained by simply exploring. The pollution of our oceans and the visible and invisible consequences of climate change, along with the potential inaction of our civilization, may slowly fade life from Earth.[2] Humanity has a challenge and a duty as a sentient species to move past this period in history. Thoughts about the meaning of survival reminds of serving the public trust. While the improvement and development of technologies for the benefit of humanity is a powerful motivator, the reality is that the required resources for such endeavors signal additional considerations. A long-term development of humanity will require that it returns to space and ventures to other worlds. This journey of exploration will offer many treasures. The 1,284 newly discovered exoplanets are only a glimpse of new opportunities.[3] One

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1 Fred Schaaf, *The Starry Room: Naked Eye Astronomy in the Intimate Universe* (North Chelmsford, Mass: Courier Corporation, 2002) at 251–252 [Schaaf].

2 See generally World Wildlife Foundation, "Threats: Pollution," online: < www.worldwildlife.org/threats/pollution > .

3 National Aeronautics and Space Administration (NASA), Press Release, 16-051,

particular goal, the mining of helium-3, can potentially provide the power necessary for nuclear fusion, and in that manner, could meet the demands for global energy for hundreds of years.[4] This reason alone may be an intriguing proposition. To consider how our global civilization has evolved takes us to the true gem behind space exploration: *knowledge*. The acquisition of knowledge to aid in the development of human ingenuity has always been tied to its availability and protection.[5] Then again, history shows what happens when information is not protected, and worse, when it is deliberately destroyed. The legacy found in history is a representation of the realities encountered today in the ambit of both cyberspace and outer space. History shows how the correct use of technologies and the knowledge it provides offers humanity endless benefits. For this reason, the future of space exploration is tied to another great expanse that defies any type of attempted quantification: *cyberspace*.

Cyberspace has become the compendium of all human knowledge. This concept takes us back to the writings in Egypt previously available in the Library of Alexandria, which would have offered a wealth of technological achievements to any lucky visitor with the opportunity to enter its halls.[6] The awe and wonder that the visitor would have had while entering for the first time would have been spectacular.[7] The shelves in those halls harbored more than information. They harbored technological marvels — from hydraulics and water supply, to mechanisms, and calculations on computer programming.[8] Seven hundred years later, during the glory days of the Byzantine Empire, the same technological curiosity would have been found along with Emperor Justinian and his commission for the organization of Roman law.[9] Technological discoveries within the last 200 years may have been known to those visitors.[10]

"NASA's Kepler Mission Announces Largest Collection of Planets Ever Discovered" (10 May 2016) online: < www.nasa.gov/press-release/nasas-kepler-mission-announces-largest-collection-of-planets-ever-discovered > .

4 Kathryn Nave, "Space Mining Will Take a Giant Leap in 2016," *Wired* (5 January 2016) online: < www.wired.co.uk/article/space-mining-a-reality-in-2016 > .

5 See generally Roy Balleste, *Internet Governance: Origins, Current Issues, and Future Possibilities* (Lanham, Md: Rowman & Littlefield, 2015) at ch 1.

6 See Carl Sagan, *Cosmos* (New York: Random House, 1980) at 19–21 [Sagan].

7 *Ibid.*

8 See Frank Granger, trans, *Vitruvius, On Architecture*, (Cambridge Mass: Harvard University Press) vol II: books 6-10 at 132—267. See also Georges Ifrah, *The Universal History of Computing: From the Abacus to the Quantum Computer* (New York: John Wiley, 2001) at 9–16. See also, Raúl Rojas & Ulf Hashagen, eds., *The First Computers: History and Architectures* (Cambridge, Mass: The MIT Press, 2002).

9 See generally Justinian, *Corpus Juris Civilis: The Civil Law*, ed. by Samuel Parsons Scott (Brooklyn, NY: AMS Press, 1998). See also Timothy E Gregory, *A History of Byzantium* (Malden, Mass: Blackwell Publishing, 2005) at 56–60.

10 See Derek J de Solla Price, "An Ancient Greek Computer" (1959) 200:6 Scientific American at 60–67. [Professor de Solla Price suggested that an ancient computer was a later copy of one of Archimedes's machines lost to the world since the destruction of the

Unfortunately, those wonders stored in its halls were lost forever when the library was destroyed by the middle of the 5th century A.D.[11] Knowledge was lost in time, and the lack of access to information interfered for millennia with humanity's development and its understanding of the universe.

Today, instead of a world library, we have a digital space that connects all libraries, and also serves as the repository of all knowledge. The internet is one of those human achievements that became a new tool to help develop human communications. It was a tool for the military that evolved into something better.[12] The internet was crafted and developed in the United States and for that reason the United States Supreme Court had an early opportunity to study this new medium of communication. In 1997, the court drafted the first definition for the internet as "a unique and wholly new medium of worldwide human communication."[13] The court noted that the internet provided "anyone with access" to the advantage of "a wide variety of information retrieval methods"[14] But above all, the court described it as "'cyberspace' — located in no particular geographical location but available to anyone, anywhere in the world, with access to the Internet."[15] It is this definition that truly captures what cyberspace really is: a virtual reality expanse. While the word *internet* is merely a label, the word *cyberspace* truly embodies its essence: an endless gallery of information and a doorway to another universe.

The visitor of cyberspace is always in search of some kind of information. When properly utilized, cyberspace is an avenue that improves the human being. Cyberspace becomes a source of education. Access of information, on the other hand, is tied to human rights. The enjoyment of civil and political rights requires access and openness to cyberspace, and this is compatible with the United Nations *Universal Declaration of Human Rights*.[16] The *Declaration* was supposed to make the world better. Unfortunately, this is not the case. True, cyberspace leads to every corner of the world. However, this expanse is no longer working properly because there are those who believe that it should be molded to fit their control and that includes less democracy and more interference with freedom of expression.[17] On the one hand, we struggle with the security of the internet and

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Library of Alexandria. The mechanism was designed to calculate the relative movements of the sun, planets and moon.] See also Sagan, *supra* note 6.

11 See, Luciano Canfora & Martin H Ryle, The Vanished Library (London: Hutchinson Radius, 1989) at 119–122.

12 See generally Katie Hafner & Matthew Lyon, *Where Wizards Stay Up Late: The Origins of the Internet* (New York, Simon & Shuster Paperbacks, 1996).

13 *Reno v. American Civil Liberties Union*, 117 S. Ct. 2329 (U.S. Sup. Ct., 1997) at 2334.

14 *Ibid* at 2335.

15 *Ibid*.

16 *Universal Declaration of Human Rights*, GA Res 217A (III), UNGAOR, 3rd Sess, Supp No 13, UN Doc A/810 (1948) 71 [*Universal Declaration*].

17 See, Freedom House, *Freedom in the World Report 2016: Anxious Dictators, Wavering*

on the other, we see the gradual erosion of human rights in cyberspace.[18] The *Universal Declaration* states that "everyone has the right freely to . . . share in scientific advancement and its benefits."[19] The treaty that followed, the *International Covenant on Civil and Political Rights*, states that "everyone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers . . . through any other media of his choice."[20] In particular, the openness of cyberspace requires access to information in light of a world public order of human dignity and one that seeks the optimum access by all human beings to the things they cherish.[21]

Human dignity is an inescapable concept found at the centre of metaphysics. Looking at the guidance of Immanuel Kant, the reader discovers in humanity a race that could reason with autonomy and morality.[22] Kant noted that dignity was the equivalent of having a worth — and one of "intrinsic value that is absolute and irreplaceable."[23] Leo Tolstoy would note that the meaning of life required endeavors that would leave a positive change in our world.[24] Tolstoy called attention to the importance of self-sacrifice, which could be understood as the touchtone for success in both outer space exploration and cyberspace management.[25] But, outer space exploration will require knowledge and this important endeavor will require open access to cyberspace. And, cyberspace requires that its resources be open and accessible so that humanity may explore its true expanse.

Jean-Jacques Rousseau would evaluate the value of freedom and what it means to properly limit it. Rousseau explained that he imagined "men reaching a point when the impediments that endangered their survival in the state of nature prevailed by their resistance over the forces that each individual could use to

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Democracies: Global Freedom under Pressure, online: <www.freedomhouse.org/report/freedom-world/freedom-world-2016>.

18 *Ibid.*

19 *Universal Declaration*, *supra* note 16 art. 27(1),

20 *International Covenant on Civil and Political Rights*, GA Res 2200A (XXI), 21 UNGAOR, 1966, Supp No 16, UN Doc A/6316 (1966) 52, art. 19(2).

21 See Myres S McDougal, Harold D Lasswell, & James C Miller, *The Interpretation of Agreements and World Public Order: Principles of Content and Procedure*, (New Haven: Yale University Press, 1967) at 3.

22 Niels Petersen, "Human Dignity, International Protection" in *Max Planck Encyclopedia of Public International Law* (Oxford: Oxford University Press, 2012 last updated) at para. 5. [The concept was further elaborated by Immanuel Kant in his work, *Groundwork for the Metaphysic of Morals*, ed. by Herbert James (New York: Harper and Row, c1956).]

23 *Ibid.*

24 Thaddeus Metz, "*The Meaning of Life*" in *The Stanford Encyclopedia of Philosophy*, Summer 2013 ed. by Edward N Zalta, online: <www.plato.stanford.edu/entries/life-meaning/#SouCenVie>.

25 *Ibid.*

survive in that state."[26] With these words he introduced the importance of the social contract. He explained that humanity could not "create any new forces, but only combine and control those that do exist," while choosing self-preservation "to form by aggregation a sum of forces" and "to put them in action by a single motive power, and to make them work in concert."[27] But, above all, he noted that the social contract was one not to be violated and that to exist, it needed to be a form of association that would "defend and protect with the whole force of the community the person and property of every associate, and by means of which each, joining together with all, may nevertheless obey only himself, and remain as free as before'"[28] The concept of the social contract also extends to cyberspace. Vinton Cerf, one of the fathers of the internet, offered the following guidance:

> The remarkable social impact and economic success of the Internet is in many ways directly attributable to the architectural characteristics that were part of its design. The Internet was designed with no gatekeepers over new content or services.[29]

Like those great thinkers, Jon Postel, another father of the internet, observed that governance of internet activities required the concept of a trust for all members of the global community.[30] Postel suggested that concerns about ownership were inappropriate and that the focus should be on responsibility and community service.[31] When associating cyberspace and outer space, it is useful to note that at present, historically and technologically, both futures are tied to a similar outlook. If we could look back to September 12, 1962, we would discover how on that day humankind moved further in history toward what would become an active space age. Russia was moving forward and America roused the imagination of many around the world. The repercussions of the event on September 12, 1962 can still be felt in 2016. On that day, U.S. President John F. Kennedy delivered what became known as the "Moon Speech" at Rice Stadium

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[26] Jean-Jacques Rousseau, *The Social Contract and the First and Second Discourses*, ed. by Susan Dunn, (New Haven: Yale University Press, 2002) at 163.

[27] *Ibid.*

[28] *Ibid.*

[29] Letter from Vinton Cerf, (8 November 2005) submitted to the hearing of the Subcommittee on Telecommunications and the Internet, a staff discussion draft of legislation to create a statutory framework for Internet Protocol and Broadband Services, as part of the Energy and Commerce Committee, U.S. House of Representatives. For additional information on the impact of the information society, see generally Roy Balleste, "Persuasions and Exhortations: Acknowledging Internet Governance and Human Dignity for All" (2011) 38:2 Syracuse J Intl L & Com 227.

[30] Jon Postel, "Domain Name System Structure and Delegation, Request for Comments: 1591," Information Sciences Institute, March 1994, online <www.ietf.org/rfc/rfc1591.txt.> [Postel].

[31] *Ibid.*

in Houston, Texas.[32] The speech was not only inspirational, but it also made an invitation for all citizens to get involved and support the space program.[33]

> We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too.

As humanity prepares for a second space age, there are also commercial and political motivators that will reinitiate the expansion of technology, create new industries, and allow for peaceful cooperation with other nations.[34] But, there is also the shadow of space weapons and the potential expansion of human conflict into outer space. In 2015, a documentary, titled *Planetary*, was released in select theaters and on Vimeo.[35] A short online article introduced the video and pondered about how space travel fundamentally changed the understanding of humanity toward our planet.[36] Indeed, the documentary talked about a "different perspective on the Earth."[37] Perhaps this is a perspective about seeing the planet as humanity's home. If the planet is a home, then a question emerges: what is the name of that neighborhood where Earth resides? Is it our solar system? Is it the Milky Way galaxy? The answer to the question has several consequences. Probably the most important is that the physical address of humanity is ultimately the universe. Indeed, Plato noted that "astronomy . . . compels the soul to look upwards, and draws it from the things of this world to the other."[38]

At present we are looking at missions of exploration beyond the moon. Outer space offers humanity the opportunity to travel and potentially reach the planets and other celestial bodies. This other great expanse requires exploring and its immeasurability is full of mysteries. It is one that challenges all notions of time and space. Thomas Hobbes would say that there is no conception of

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[32] John F Kennedy, "Moon Speech" (Speech delivered at Rice University, Houston, Tex, 12 September 1962), online: <www.jfklibrary.org/JFK/Historic-Speeches.aspx> [JFK, "Moon Speech"].

[33] Douglas Brinkley, "50 Years Ago, Kennedy Reached for Stars in Historic Rice Address," *Houston Chronicle* (10 September 2012), online: <www.chron.com/news/nation-world/article/50-years-ago-Kennedy-reached-for-stars-in-3852085.php>.

[34] NASA, "Beyond Earth, Expanding Human Presence into the Solar System, Why We Explore," online: <www.nasa.gov/exploration/whyweexplore/why_we_explore_-main.html#.V4fH7BKgYmg>.

[35] See Planetary Collective, online: <www.weareplanetary.com/>.

[36] Angela Watercutter, "Planetary Clip: How Important Is Space Travel to Humanity?", *Wired*, (21 April 2015), online: <www.wired.com/2015/04/planetary-clip-premiere/>.

[37] *Ibid.*

[38] Plato, *The Republic of Plato*, ed. & trans. by John L Davies & David Vaughan (New York: A.L. Burt Company Publishers, 1902) at 278.

anything we can call infinite because humanity cannot have an image of infinite magnitude nor conceive infinite time or infinite power.[39] Hobbes would explain that human beings' notions of the infinite are tied to the recognition that we are not able to conceive the ends and bounds of outer space.[40]

II. THE MODERN GORDIAN KNOT

War is the province of chance.
In no other sphere of human activity must such a margin be left for this intruder.
It increases the uncertainty of every circumstance and deranges the course of events.
—Carl von Clausewitz[41]

After years of observations and study, astronomers have offered us newly discovered exoplanets that, in the fullness of time, no doubt will become destinations into the unknown. However, these destinations will be in jeopardy if information and the access to that information becomes a feature of the past. From the beginning, it has been a struggle to analyze the conflict between access, openness and security, which is clearly reflected in the agenda of the United Nations Internet Governance Forum (IGF).[42] The 2006 transcripts from the first Openness Session in Athens, Greece, showed the intricate connection between the actions of governments, businesses, and the equally important impact of those decisions on the regular internet user.[43] During the 2006 IGF preparatory meetings, participants listed the 10 most frequently discussed public policy issues. There were four issues noted that, to this day, continue to resonate with the challenges associated with cyberspace and the delivery of information:[44]

- cybersecurity;
- privacy and data protection;

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[39] *See*, Thomas Hobbes, *Leviathan*, ed. by Richard Tuck (Cambridge, Mass: Cambridge University Press) at 23.

[40] *Ibid.*

[41] Carl von Clausewitz, *The Essential Clausewitz: Selections From On War*, ed. by Joseph I Green (Mineola, NY: Dover Publications, 2003) at 7.

[42] United Nations, Internet Governance Forum (IGF), http://www.intgovforum.org/cms/. [The author participated as a member of civil society in the United Nations "Second Internet Governance Forum Meeting" in Rio de Janeiro, Brazil, 12-15 November 2007. The author also participated in the "Fifth Internet Governance Forum Meeting" in Vilnius, Lithuania, 14-17 September 2010.]

[43] United Nations, IGF, "First IGF Meeting: Athens, Greece: Openness Session" (31October 2006), transcript online: <www.intgovforum.org/cms/IGF-Panel2-311006am.txt> [Openness Session].

[44] For a short synthesis of written contributions and discussions see UN, IGF, online: <www.intgovforum.org/brief.htm.>.

- freedom of expression and human rights;
- rules for e-commerce, e-business and consumer protection.

Although threats in cyberspace cannot be denied, there are also equally disturbing threats to human rights online. The transcript of this Session included a discussion about human rights, with a dialogue about companies that had allegedly cooperated with repressive countries and in the process, violated principles of human dignity.[45] For these reasons, future developments in technology require that both governments and businesses consider present and future practices that either directly or indirectly infringe on human rights.

It is both fascinating and troublesome at the same time that there are cases in which peace is supposed to be guaranteed and secured by war, or at least the steps necessary to set the stage for peace. For Jean-Jacques Rousseau, war would be born of peace, "or at least of the precautions men have taken to assure themselves a lasting peace."[46] Equally relevant, and more important, he noted that "there is no general war between man and man; and the human species was not formed merely for mutual self-destruction."[47] But, the threat of destruction is a constant in human history. What would happen, if in the early morning hours of a regular day, a regular month, and a regular year, an entire civilization's existence was threatened by an astronomical event? Would the entire population be caught off guard? The origin of this threat would be revealed eventually and hopefully with time to avert a catastrophe — a massive explosion in outer space that creates a powerful discharge of x-rays and, in reaching the planet, causes massive extinction. There was no chance for the inhabitants. This hypothetical event is partly true. The Cygnus X-1 high-energy event did occur and originated at the center of a black hole, in the constellation Cygnus.[48] This stellar-mass black hole was discovered in 1964 by the Uhuru satellite, and became one of the most powerful x-ray sources to be detected in outer space.[49] The energy discharge began with a collapsed star that turned into a black hole, and, in the process, pulled material into itself from its blue star companion.[50] Fortunately, x-rays are not a threat to our civilization because these waves of high energy cannot pass the Earth's natural shield: our atmosphere.[51] But, the Uhuru probe did more

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45 Openness Session, *ibid* note 44.

46 Jean-Jacques Rousseau, *The Basic Political Writings*, 2nd ed. & trans. by Donald A. Cress (Indianapolis, IN: Hackett Publishing Company, 2011) at 256 [Rousseau, *Basic Political Writings*].

47 *Ibid* at 257.

48 NASA, "Missions: Chandra: Exploring the Invisible Universe," online: < www.nasa.-gov/mission_pages/chandra/multimedia/cygnusx1.html > [Mission: Chandra].

49 Walter Lewin & Michiel van der Klis, *Compact Stellar X-ray Sources*, (Cambridge, Mass: Cambridge University Press, 2006) at 159; see also *ibid*.

50 NASA, "Chandra X-Ray Observatory," online: ; see also, *ibid*.

51 See NASA, "Mission Science: X-Rays: Earth's Aurora in X-Rays," online: < science.hq.nasa.gov/kids/imagers/ems/xrays.html > .

than offer future generations a look at this unusual event.[52] Uhuru observations and data gathering added to the archive of human knowledge. Cygnus X-1 is located near a star formation in the Milky Way that spans approximately 700 light years across, and the event began millions of years ago.[53]

While an astronomical event may be more difficult to manifest in our lives, one created by humanity for war may have a more sinister effect. In 2015, Frank A. Rose, U.S. Assistant Secretary of State for the Bureau of Arms Control, Verification and Compliance, and formerly the Deputy Assistant Secretary of State for Space and Defense Policy, noted that China was developing and testing a debris generating anti-satellite missile (ASAT).[54] Its purpose was to destroy satellites in low Earth orbit.[55] He noted that in 2007, China had already conducted a destructive test that "created thousands of pieces of debris, which continue to present an ongoing danger to the space systems — as well as astronauts — of all nations, including China."[56] He also noted that these activities threatened "the long-term security and sustainability of the outer space environment," including threats to the civil, commercial, military, and scientific space endeavors of all nations, and the integrity of individual satellites, along with their strategic and tactical information.[57] These facts are troublesome, and remind one of the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies* (*Outer Space Treaty*), which entered into force in October 1967.[58] The *Outer Space Treaty* continues to represent the guideposts of international law in space, and in relevant parts it states:[59]

- that outer space exploration should be peaceful (Moon and other celestial bodies), carried out for benefit of all nations;
- nuclear weapons or other weapons of mass destruction are prohibited in outer space;
- states are responsible for their activities whether carried out by governmental or non-governmental entities.

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52 California Science Center, "Uhuru," online: < californiasciencecenter.org/exhibits/air-space/stars-telescopes/uhuru > .

53 Mission: Chandra, *supra* note 49; see also Ramesh Narayan & Jeffrey E McClintock, "Observational Evidence for Black Holes" (Source: Cornell University Library, 2013).

54 Frank A Rose, "Commentary | Strategic Stability in U.S.-China Relations," *SpaceNews*, 29 January 2015, online: < www.spacenews.com/commentary-strategic-stability-in-u-s-china-relations/ > .

55 *Ibid.*

56 *Ibid.*

57 *Ibid.*

58 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, 27 January 1967, Res. 2222 (XXI), (entered into force 10 October 1967, United Nations Office of Outer Space Affairs) (abridged) [*Outer Space Treaty*].

59 *Ibid.*

What it is in the best interest of humanity? International law and space law were drafted to bring order and allow for a peaceful existence. Yet, these legal guideposts are being ignored, require updating, and are still expected to keep the public trust safe. How do we face the painful state of the present legal systems that humanity has relied on for so long? In 1514, Copernicus discovered the correct position of the Earth in relation to the universe, and later Johannes Kepler uncovered facts regarding the movements of the planets around the sun.[60] These astronomers would have been horrified to know that the old terrestrial wars are now threatening the perfect harmony of outer space and unfortunately have invaded cyberspace. The social contract is present in these considerations and Rousseau would have noted that "we have to consider the private persons who comprise it, and whose life and liberty are naturally independent of it."[61]

This complicated situation evokes the story of the Gordian knot. According to legend, Gordius, a farmer, received a sign that was interpreted by his soon to be wife as a message from the gods.[62] Years later they traveled together with their ox cart to a town, where an oracle had prophesized to the people that their new king would be a man arriving in a cart.[63] When the town people saw them arrive, they immediately declared him as their king.[64] The people dedicated the ox cart to Zeus, and Gordius tied the pole to the yolk of the cart with a highly intricate knot — this became known as the Gordian knot.[65] The oracle would later foretell that whoever could untie that knot would rule Asia. The story goes that later Alexander the Great entered into this legend, for it was he who resolved the riddle of the knot. His approach was not just simple, but an example of bold thinking. After examining the knot carefully, it is said that he cut it to pieces with his sword.[66] This action in the face of an unsurmountable challenge shines a light into the present dilemma of warfare in cyberspace and outer space. How should we untie this modern knot?

Remarkably, this challenge can be further considered with the help of Thomas Hobbes, who stated that *all men have a relentless desire for power*.[67] This phrase prompts the reader to consider the state of the global community as it faces issues and duties that require best practices to manage cyberspace and by extension, take these lessons into outer space.[68] For Hobbes, there was no end to

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60 Sagan, *supra* note 6 at 64.

61 Rousseau, *Basic Political Writings supra* note 47 at 174.

62 Jacob Abbott, *Alexander the Great* (Akron, OH: New Warner Co., n.d.) at 41.

63 *Ibid.*

64 *Ibid.*

65 *Ibid.*

66 *Ibid* at 42. See also, Lance Kurke, The Wisdom of Alexander the Great (New York: AMACOM, 2004) at 123.

67 Thomas Hobbes, *Of Man, Being the First Part of Leviathan*, vol. XXXIV, Part 5, ed. by Charles W Eliot (New York: P.F. Collier & Son, 1909-1914) at chapter XI.

68 *Ibid.*

the desire for power unless that end came by death.[69] The desire for power, according to Hobbes, was a more selfish and particular desire to gain control purely to attain a more expanded control.[70] Thus, human dignity will require an observation on how every society behaves at all times, especially in times of emergency. It is easy to curtail human rights at those moments when the perceived need arises. For this reason, the words of Lord Acton serve as a reminder of the pitfalls to avoid in future plans.[71]

> *Power tends to corrupt, and absolute power corrupts absolutely. Great men are almost always bad men, even when they exercise influence and not authority, still more when you superadd the tendency or the certainty of corruption by authority. There is no worse heresy than that the office sanctifies the holder of it.*

Jon Postel's writings also noted that those in power over the internet were meant "to carry out the necessary responsibilities."[72] These words remind of service to the community by decision-makers who should act in good faith, while not forgetting that concerns about ownership are a reflection of control. As noted earlier, "[i]t is appropriate to be concerned about 'responsibilities' and 'service' to the community."[73] The management of cyberspace, its security, and the accessibility of its resources require action for the "public good" that will not betray the public trust. It is that trust that will be needed for the exploration of outer space.[74]

Even within the Internet Corporation for Assigned Names and Numbers (ICANN) the seeds of human rights can be found within its inner-workings. The 2014 report titled, *ICANN's Procedures and Policies in the Light of Human Rights, Fundamental Freedoms and Democratic Values*, noted the elements necessary for a better functioning of internet governance.[75] Online communications and internet-related issues were recognized as a subject to be analyzed by the European Court of Human Rights, noting cyberspace as one of the "principal means for individuals to exercise their right to freedom of expression", including offering tools for participation in activities of public

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69 *Ibid.*

70 *Ibid.*

71 John Emerich Edward Dalberg, Lord Acton, *Historical Essays and Studies*, ed. by John N Figgis & Reginald V Laurence (London: Macmillan, 1907) at 504, online: < www.oll.libertyfund.org/titles/acton-historical-essays-and-studies > [emphasis added].

72 Postel, *supra* note 31.

73 *Ibid.*

74 See Roy Balleste, "Interstellar Travel and the Mission for Outer Space: A Human Rights Perspective," (2015) 18:3 SMU Science & Technology L Rev 219.

75 See Monika Zalnieriute & Thomas Schneider, *ICANN's Procedures and Policies in the Light of Human Rights, Fundamental Freedoms and Democratic Values*, Council of Europe, 8 October 2014, DGI(2014)12 at para. 33.

interest.[76] Recently, the *Human Development Report 2015* further noted that access to the digital revolution continued to be uneven across the world, and this was notable across regions (urban and rural), between sexes, and age groups.[77] In particular, the report noted that "81 percent of households in developed countries had Internet access, compared with only 34 percent in developing country regions and 7 percent in the least developed countries."[78] The report made a very important observation: "even though the digital revolution has contributed substantially to human development and revolutionized the world of work . . . access to the digital revolution remains uneven, constraining the effects it could have on human lives."[79]

There is a newer and more significant challenge that now links considerations of outer space law with cyberspace law. Both are interconnected because each are required for worldwide communication. This new challenge requires that humanity develop while averting the use of cyberspace and outer space to do harm. This harm can materialize in the continuation of hybrid wars where kinetic attacks by one nation are combined with cyber-attacks.

III. THE EDGE OF THE COSMOS

When the Sun shrinks to a dull red dwarf, it will not be dying.
It will just be starting to live — *and everything that has gone before will merely be a fleeting prelude to its real history*.[80]
—Arthur C. Clarke

The challenges for outer space and cyberspace are symptomatic representations of historical developments that tied them to notions of power and the nature of warfare. While some nations are taking steps to expand activities into outer space, the global community in general remains oblivious to this change in circumstance. This Gordian knot will be difficult to untie and more challenging to cut if new rules are unavailable to prepare humanity for this new age in history. War should be avoided and peace should be safeguarded. Even in the Roman world, the law of war required it to be declared within a specified procedure and provided that there was a just cause.[81] Cicero noted that

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[76] *Ibid* at para. 34.

[77] United Nations Development Programme (UNDP), *Human Development Report 2015: Work for Human Development*, (New York: UNDP, 2015) at 7.

[78] *Ibid*.

[79] *Ibid* at 59.

[80] See Arthur C Clarke, "That All-But-Eternal Crimson Twilight" in Dennis R Danielson, ed., *The Book of the Cosmos: Imagining the Universe from Heraclitus to Hawking* (Cambridge, MA: Perseus Publishing, 2002) 423 at 424 [emphasis in original]. (The author's discussion of astronomy includes Clarke's analysis of the life of the sun.)

[81] Wolfgang Preiser, "History of International Law, Ancient Times to 1648" in *Max Planck Encyclopedia of Public International Law* (Oxford: Oxford University Press, 2008 last updated) at para. 21.

these conditions were "only satisfied if the war was waged to avenge a wrong suffered at the hands of the enemy or in self-defense."[82] However, the extent of war to reach into outer space remains unclear. It has been suggested that while Article IV of the *Outer Space Treaty* designated the use of the moon and other celestial bodies for peaceful purposes (with a prohibition of nuclear weapons), on the other hand, areas beyond those described are uncertain with regards to peaceful undertakings.[83] There is also the consideration about missiles that could be "fired from earth to another point on earth through outer space."[84] Perhaps the best approach would be to put the importance of international humanitarian law at the centre of such future considerations, while remembering the potential need to delineate the territorial jurisdiction for a future criminal tribunal designated to adjudicate breaches of international humanitarian law.[85] This consideration is also necessary when bearing in mind that neutral states may not prohibit the deployment of conventional weapons and suborbital missile systems in the outer space above their airspace.[86]

There is no doubt that satellite communications may also play a key role in these types of conflicts that cyberspace is now part of in world communications.[87] Could this threat be that real? Indeed, the threat is very real, and it is one that has the potential to combine the real world with cyberspace, and by extension, to move into outer space. This is exemplified by the development of a variety of space weapons. In March, 1983, President Ronald Reagan introduced the *Strategic Defense Initiative* as a project designed to defend the U.S. from an attack by nuclear ballistic missiles.[88] An interesting consideration is that a "space-based weapons system would require . . . 'land and space-based precision sensors, involving complex computer and software technologies, for surveillance, target acquisition and discrimination, tracking and pointing.'"[89] These weapons can be deployed in low orbit to interfere with

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82 *Ibid.*

83 Julia Breslin, "Region of War" in *Max Planck Encyclopedia of Public International Law* (Oxford: Oxford University Press, 2010 last updated) at para. 9. See also *Outer Space Treaty*, *supra* note 61 at art. IV.

84 *Ibid.*

85 *Ibid* at para. 14.

86 Bruno Demeyere, "Missile Warfare" in *Max Planck Encyclopedia of Public International Law* (Oxford: Oxford University Press, 2011 last updated) at para. 16.

87 Mark Fidelman, "This High Speed Satellite Company Is Defying The Naysayers And Changing Everything," *Forbes* (30 October 2013), online: <www.forbes.com/sites/markfidelman/2013/10/30/this-high-speed-satellite-company-is-defying-the-naysayers-and-changing-everything/#1b45ca375669>.

88 John E Parkerson, "International Legal Implications of the Strategic Defence Initiative" (1987) 116 Mil. L. Rev. 67, as cited in Ali M El-Haj, "Strategic Defense Initiative," *Max Planck Encyclopedia of Public International Law* (Oxford: Oxford University Press, 2015 last updated) at para. 1 [El-Haj].

89 El-Haj, *ibid* at para. 3.

satellite telecommunications, which challenges traditional notions about the protection of the human person.[90] It is unfortunate that technology needs to be designated by the "means of destruction as its distinguishing feature," including electromagnetic weapons, lasers, and particle beams.[91] For instance, electromagnetic weapons include nuclear bombs that may, on detonation, discharge an electromagnetic pulse (EMP), which is triggered by a cascade of gamma rays that collide in the upper atmosphere.[92] Other weapons that threaten the peaceful order of outer space include lasers (a concentrated beam at the speed of light and capable of disabling satellites), and particle beams (also a directed energy at the speed of light, transferring thermal energy similar to a lightning bolt).[93] There may also be something much more traditional, in the form of a deployed missile armed with explosives set to detonate in close proximity to a satellite.[94] It has been speculated that this kind of weapon could be utilized in the development of space mines.[95] Thus, the future of outer space exploration cannot belong entirely to the parochial hegemon, benevolent or not, or to the undefined ideals of the private sector unless rigorous conditions are met. The goal should be international stewardship, while simultaneously promoting human dignity.

Currently, only a few countries regulate space activities performed by their nationals or originating from their territory.[96] While the Peace of Westphalia treaties of 1648 introduced the nation-state concept, individuals traveling through cyberspace continue to interact in a virtual world that goes beyond the control of nation states.[97] This world is connected to a future in outer space now being driven by the private sector. In that manner, information has become a precious commodity that flows across borders and beyond our planet. In 2005, the U.S. Air Force included cyberspace as a new area for military operations in its mission statement.[98] The world of cyberspace began to change militarily with the events in Estonia, in 2007, and in Georgia, in 2008, which exposed the utilization of distributed denial of service attacks (DDoS).[99] Then, in 2010, it

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90 Robert A Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space" (2000) 48 A.F.L. Rev. 1 at 19 [Ramey].

91 Ramey, *ibid.*

92 John M Collins, Military Space Forces: The Next 50 Years (Washington, DC: Pergamon-Bassey's International Defence Publishers, 1989) at 29, as cited in *ibid* at 20.

93 Ramey, *ibid* at 23-26.

94 Blair Stephenson Kuplic, "The Weaponization of Outer Space: Preventing an Extraterrestrial Arms Race" (2014) 39 NCJ Intl. L. & Com. Reg. 1123 at 1139.

95 *Ibid.*

96 Ram Jakhu & Kuan-Wei Chen, eds., *Regulation of Emerging Modes of Aerospace Transportation* (Montréal: Centre for Research in Air & Space Law, McGill University, 2014).

97 Strobe Talbott, The Great Experiment: The Story of Ancient Empires, Modern States, and the Quest for a Global Nation (New York: Simon & Schuster, 2009) at 87 & 208.

98 Johann-Christoph Woltag, "Cyber Warfare" in *Max Planck Encyclopedia of Public International Law* (Oxford: Oxford University Press, 2015 last updated) at para. 1.

escalated with the deployment of malicious software known as Stuxnet.[100] These incidences prompted national policies that established special cyber units within armed forces.[101] Yet, when considering this new communications medium, it is important to realize how much cyberspace has transformed the social fabric of society. For this reason, the drafting in 2008 of the North Atlantic Treaty Organization's (NATO) *Tallinn Manual on the International Law Applicable to Cyber Warfare* became the highlight of military operations in cyberspace with humanitarian law considerations.[102] Now, it has been noted that "cyber warfare encompasses military activity that primarily makes use of computer systems and networks in order to attack those of the adversary."[103] The *Tallinn Manual* was written to examine how international law applies to cyberwarfare, while also considering *jus ad bellum*, the use of force by nation-states, and the *jus in bello*.[104] Given that cyberspace is now another theatre of military operations, and one in which the Stuxnet cyber-weapon was deployed, the world community must assess what this means for our future.[105]

IV. THE GUIDING LIGHT: FINAL THOUGHTS

Looking at these stars suddenly dwarfed my own troubles and all the gravities of terrestrial life.
I thought of their unfathomable distance, and the slow inevitable drift of their movements out of the unknown past into the unknown future.

— H. G. Wells[106]

The quote from Fred Schaaf at the beginning of this article denotes both disappointment and hope: "The future space traveler who has not first made the simple walk of wonder will find his journey beyond our solar system ultimately a disappointment."[107] His words indicate the importance of understanding our backyards and neighborhoods. It invites humanity to simply wonder and search

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99 *Ibid.*

100 *Ibid.*

101 *Ibid.*

102 *Ibid.*

103 *Ibid* at para. 2. See Michael N Schmitt, ed., *The Tallinn Manual on the International Law Applicable to Cyber Warfare*, NATO Cooperative Cyber Defence Centre of Excellence (Cambridge: Cambridge University Press, 2013).

104 NATO, Cooperative Cyber Defence Centre of Excellence, "Tallinn Manual: Research," online: < ccdcoe.org/research.html > .

105 Dancho Danchev "Coordinated Russia vs Georgia cyber attacks in progress" *Zdnet*, (11 August 2008), online: < www.zdnet.com/article/coordinated-russia-vs-georgia-cyber-attack-in-progress/ > .

106 H G Wells, *The Time Machine* (Auckland, NZ: The Floating Press, 2008, 1898 original) at 98–99.

107 Schaaf, *supra* note 1 at 251—252.

into the unknown. In years to come, humanity will play a key role in ensuring a new age in space exploration, and one in which global society will lay claim to information accessibility. The world is better because of satellite commutations making information available in real time. This commodity that now resides in cyberspace is a necessary ingredient for human development. Because of this fact, information should always be accessible and open for the betterment of our world society. There are still challenges to be resolved before humanity can move forward. A hybrid conflict is still present between the Russian Federation and Ukraine.[108] The threats of cyber-attacks worldwide are very real.

While in the past, nation-states had the top position, the present belongs to those stakeholders equipped with an appropriate technological outlook, and one that either directly or indirectly will create a process of decisions that will revolutionize our lives. The legal power of the individual and the private sector, supported by new technologies, will create new opportunities for meaningful participation in key events of international significance. Today, our information society reflects on a new reality of technological innovation, which requires of all stakeholders to face a tall order. Ultimately it is in the workable social contract that humanity will discover a sustainable outer space program for the benefit of those who want to engage in it to service the community.

> Many years ago the great British explorer George Mallory, who was to die on Mount Everest, was asked why did he want to climb it. He said, "Because it is there." Well, space is there, and we're going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. And, therefore, as we set sail we ask God's blessing on the most hazardous and dangerous and greatest adventure on which man has ever embarked.[109]

Tackling this future challenge will not be easy, but in doing so, humanity will influence how information is shared and made available. Information has always been the power of our civilization. How information is shared has become vital to humanity's existence. Today, humanity is searching for something. Humanity is returning to the stars. This is our moment in time. What could be a perfect moment in time? It is to conquer the challenges of time found in outer space travel while envisioning goals that benefit humanity. Humanity will discover that it will first need to work together. And above all, it will need to recognize that there are no ordinary moments, especially for those that work in good faith and in trust for the global community.

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[108] Andreas Umland, "Russia's Pernicious Hybrid War Against Ukraine" (22 February 2016), The Atlantic Council, *New Atlanticist* (blog), online: < www.atlanticcouncil.org/blogs/new-atlanticist/russia-s-pernicious-hybrid-war-against-ukraine > .

[109] JFK, "Moon Speech," *supra* note 33.

Has the Era of Privacy Come to an End?

Avner Levin*

Abstract

This keynote address to the 2016 McGill Law Graduate Conference provides a brief history of privacy before discussing contemporary challenges in the form of increasing technological ability to create, store and process personal information, and powerful advocacy against privacy from both government and the private sector. In order for privacy to survive, a new set of personal information protection principles is required and new ways of enforcing these principles must be developed, which will leverage the power of technology to develop hybrid regulatory/technological solutions, such as Google's content removal tool.

INTRODUCTION

A talk such as this is always an opportunity to stand back and reflect on the state of the field, so to speak. As I set about doing that, I was struck by how pessimistic I was about the future of privacy. In fact, and that is the reason for the title of this essay, I believe that unless we take collectively, as a society, and not only in Canada but internationally, urgent steps to protect, or salvage, our privacy, the era of privacy and personal information protection will soon come to an end.

What I hope to take you through in this essay is a (brief) history of privacy, focusing more on the modern era and then a look at the technological and political developments that have been plaguing privacy for a few years now. I will end with a few hopeful suggestions as to how we could counterbalance these developments with a mix of legal, regulatory and technological responses.

I. A (BRIEF) HISTORY OF PRIVACY

We do not often think about it, but privacy is, of course, a very culturally dependent idea. For example, privacy in Japan is based on a societal-normative foundation of customs and traditions[1] (and then of course they have legislative data protection layers as well[2]). So, I apologize, but my "history" of privacy is really a history of a common-law, and to some extent, a civil-law idea of privacy. It certainly is not a comprehensive or comparative review.

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1 Makoto Nakada & Takanori Tamura, "Japanese Conceptions of Privacy: An Intercultural Perspective" (2005) 7:1 Ethics & Information Technology 27.

2 Hiroshi Miyashita, "The Evolving Concept of Data Privacy in Japanese Law" (2011) 1:4 Intl Data Privacy L 229.

Most legal scholars begin their discussion of privacy with the American paper by Samuel Warren and Louis Brandeis about the right to be "let alone."[3] The paper, written in the late 19th century, was the first attempt by celebrities of that era (the upper class) to limit access to information about them, and to retain for themselves the ability to manage and control their reputation, their image in the eyes of others, their dignity, and their brand. Of course, the paper was not written *exactly* like that, but as a general right to be let alone, and it has been adopted and cited endlessly by privacy scholars in the field.

Interestingly, and we will return to this point later, the Warren and Brandeis article was not concerned about the contemporary American preoccupation with government surveillance. It was about (anti)social interactions. The more significant immediate point I would like to make about the Warren and Brandeis article, vis-à-vis a history of privacy, was that it established a private legal action framework for privacy in the United States (U.S.), or in other words, a tort. That was a very typical "common-law" solution to the issue of privacy as the authors understood it, but the rapid adoption of their article meant that Americans did not really pause to consider other legal solutions, such as legislation and government regulation.

Indeed, the next big development in the U.S. was the paper by Dean William Prosser in 1960 at the University of California, Berkeley School of Law. Prosser, a tort expert, established four privacy torts in his paper "Privacy".[4] That second influential paper cemented the perception in America that private legal action is the preferred mechanism to deal with private sector disputes. Since then, legislation in the U.S. has been a patchwork quilt of special interest accommodations,[5] such as video store records.[6]

But let us leave the private sector for a moment and go back to those concerns about governments. In Europe, post-World War II, and generally in the West throughout and after the Cold War, recognition grew that government surveillance was just as big of a concern, if not more so, because of the state's coercive powers, than any form of private sector invasion of privacy.

In both Europe and in the U.S. we therefore see legislation that aims to curb government power to collect sensitive information about individuals, and to subject it to well-defined protective principles. These are known in the U.S. as Fair Information Practice Principles (FIPPs). The Americans identified five original principles in 1973, which were: notice, choice, access, security, and enforcement.[7] The Europeans and the Organisation for Economic Co-operation

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3 Samuel D Warren & Louis D Brandeis, "Right to Privacy" (1890) 4:5 Harv L Rev 193.

4 William L Prosser, "Privacy" (1960) 48 Cal L Rev 383.

5 Avner Levin & Mary Jo Nicholson, "Privacy Law in the United States, the EU and Canada: The Allure of the Middle Ground" (2005) 2 University Ottawa L & Technology J 357, s. 2.1.1.

6 *Ibid* at 366.

7 Robert Gellman, *Fair Information Practices: A Basic History*, SSRN Scholarly Paper ID 2415020 (Rochester, NY: Social Science Research Network, 2016).

and Development (OECD) then added more principles in the 1980s and expanded these five principles into eight.[8] Since 2001, in Canada there are now ten principles enshrined in Canada's private sector privacy legislation, the *Personal Information Protection and Electronic Documents Act*.[9]

These principles, and equally important, the regulatory framework that developed around their enforcement in the form of independent information and privacy commissions, data protection authorities, or privacy enforcement authorities that now make government departments, agencies and ministries as well as the private sector in Europe and Canada accountable, ushered in the "Golden Age" of privacy. This Golden Age started in the mid-1970s and, I fear, it has just about ended or is in the process of ending. So, let us now talk about this Golden Age, how it came to be, and why it is coming to an end.

II. THE MODERN ERA GOLDEN AGE OF PRIVACY

The Golden Age of privacy came about because these privacy principles (I will refer to them collectively as such for the sake of consistency) had real meaning at the time — following them literally changed information management and provided individuals with real control over their information and who else had it. Control became the essence of personal information protection, and the language of these privacy principles also captured principles of choice, consent and, to a lesser degree, notice. The Germans developed the idea of "informational self-determination" — the ideology that control over your information allowed you to determine and shape your identity, your sense of self, and that this should be an individual right, rather than a government dictate.[10] It is sadly obvious to see how the Germans, learning the lessons from the Second World War, would want to wrest control over the identification of individuals out of the hands of government for good.

Technologically, what allowed members of society to exercise control over their personal information, was the feeble (in modern terms) processing and storage powers of computers at that time. For example, the hard drives sold in the 1970s and 1980s only had between 500MB to 1GB of storage. Manufactured by International Business Machines (IBM), they were the size of a washing machine and weighed over 500lbs. And they cost $35,000.[11]

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[8] OECD ,"OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data", online: <www.oecd.org/sti/ieconomy/oecdguidelinesontheprotectionofprivacyandtransborderflowsofpersonaldata.htm>.

[9] SC 2000, c 5, Schedule 1.

[10] Paul Schwartz, "The Computer in German and American Constitutional Law: Towards an American Right of Informational Self-Determination" (1989) 37:4 Am J Comp Law 675, s. II.

[11] IBM, "IBM Archives: IBM 3370 direct access storage device", online: <www-03.ibm.com/ibm/history/exhibits/storage/storage_3370.html>.

Furthermore, personal information was not collected continuously by governments or by the private sector. Instead, it was collected in a series of discrete interactions. We were able to make separate decisions about whether we wanted to provide information and what information we would provide on a variety of issues, such as when we filled out our income tax returns, or our government census, or applied for a passport or a driver's licence, or, when we shopped, whether we would provide the store with our postal code or telephone number. All of these interactions largely depended exclusively on us to be the source of information about us, and so, we were able to decide whether we wanted to interact, what information we would share in the interaction, and under what conditions. We had, in the language of modern-day principles, a meaningful opportunity both to consent to the collection of our information and to understand the purposes (as in the examples I just mentioned) for which this information would be put to use. Finally, the information collected about us and processed about us was stored in discrete stand-alone proprietary databases both in the private sector as well as in governments. Special effort was required in order to share and transfer (i.e., disclose) information about us between government departments.

The combination of all of these created the Golden Age of privacy. We felt, largely correctly, that we were in control. We felt that if we decided not to provide information to the government or to a business about us then the government or that business would not know or have access to that personal information. We felt that the purposes for which our information was used were well-defined and limited; we felt that we knew, or could know if we wanted to, what information was stored about us. In other words, we felt that the privacy principles were meaningful and real. Then slowly, gradually, incrementally, everything changed. And today, we may well be witnessing the end of the privacy era.

III. THE END OF PRIVACY

There are various estimates on the internet as to how much data is processed in this day and age in order to enable our data-rich lifestyle. Let us pick one estimate, by a company called Domo, which is a snapshot as of 2016.[12] The statistics boggle the mind, demonstrating how far we have come in 35 years in terms of storage and processing power. Almost a million Tinder swipes. *Every minute*. That is pretty personal. Close to two-and-a-half million posts liked on Instagram. *Every minute*. This is a tremendous amount of personal information. And just about seven million Snapchats, again, every minute. All of this personal information created, stored and processed *every minute of every day* in 2016.

You can see, therefore, why privacy protection is collapsing. The principles are no longer up to the task. Let us not forget, as well, that these statistics are

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[12] Josh James, "Data Never Sleeps 4.0", (28 June 2016) *Domosphere* (blog), online: < www.domo.com/blog/data-never-sleeps-4-0/ > [Domo].

about private sector information processing. Governments around the world have seen a similar rise in their capacity. Most recently, and infamously, that was demonstrated by Edward Snowden through his revelations about the capacity of the National Security Agency (NSA) in the U.S. The NSA's Utah Data Center holds by some estimates 12EB of information.[13] That is *twelve billion* times more information than the IBM 1980 hard drive capacity referenced above. In Canada, we are slowly learning about the capacity of our own Communications Security Establishment, a governmental cryptologic agency, and about the cooperation between like-minded nations such as the Anglo Five Eyes (United States, United Kingdom, Canada, Australia and New Zealand). This form of information sharing is a far distance from those old IBM mainframe databases, those good old-fashioned silos of information.

Our control over information has loosened not only because of the increase in our technological capabilities, but just as much because of the change we have undergone in the way we socialize. Social media is (unfortunately) here to stay which proves that we may be increasingly interested in controlling our information, but also, that we are just as interested in other people's business and lives, in gossip and in information sharing. We are human beings and we do as humans would, whether offline or online. Among the many implications for privacy is this — personal information about us no longer originates exclusively with us. Others can be a rich source of information about us through their activities, and both governments and the private sector can deduce, generate if you will, personal information about us through analysis of so-called meta-data, and by other means.

So, we are now in an era where there is increasing technological ability to process information, and more personal information that is created and available for processing by individuals. This information is proliferated by sensors and devices known as the "internet of things," by other individuals "socializing" online, and by the analyses of this information. Now, to add to this privacy horror story, we must not forget about the advocacy from both governments and the private sector to bring about normative change to diminish the value of privacy, whether in the name of national security or in the name of profit (as Zuckerberg and many others did and will do).[14] All of these erode privacy and erode our control over our personal information and our ability to decide what happens with it. All of this offers clear evidence that the privacy principles of yesteryear are no longer powerful, meaningful or relevant. As a result, I argue

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[13] Kashmir Hill, "Blueprints of NSA's Ridiculously Expensive Data Center In Utah Suggest It Holds Less Info Than Thought", *Forbes* (24 July 2013), online: < www.forbes.com/sites/kashmirhill/2013/07/24/blueprints-of-nsa-data-center-in-utah-suggest-its-storage-capacity-is-less-impressive-than-thought/ > .

[14] Bobbie Johnson, "Privacy no longer a social norm, says Facebook founder", *The Guardian* (11 January 2010), online: < www.theguardian.com/technology/2010/jan/11/facebook-privacy > .

that in the absence of corrective action our privacy will soon come, if it has not already, to an end.

IV. A NEW HOPE

So, what if at all can be done? The legal and regulatory answer is clear — we need a new set of personal information protection principles and we can discuss some proposals in this regard. What is perhaps not as clear is that we need new ways of enforcing our privacy principles. The regulatory frameworks within agencies and commissions that once worked for us may perhaps need to evolve and take on new roles.

First, let me talk a bit about the shape that such new principles could take. There have been many initiatives in recent years that could be characterized as either conservative or radical, from the revised OECD principles,[15] to the new European Union's *General Data Protection Regulation* with its intriguing inclusion of new principles such as article 25, "data protection by design and by default" and article 17, the "right to be forgotten."[16] All of these are worthy of their own devoted talks, but I want to focus today on a rogue group of academic and industry leaders that came together a few years ago through collaboration mainly between Microsoft and the University of Oxford's "Oxford's Internet Institute".[17] Their radical proposal was to suggest that it is perhaps time to abandon the principles of notice and consent and to move towards principles that restrict and limit the use and processing of information.[18]

If you go back to the information presented by Domo[19] you will perhaps understand why the Oxford-Microsoft group believes that notifying and asking people to consent to the processing of their data — in the manner it is currently done — does not offer individuals meaningful protection and control over their information. Instead, it offers corporations a fig leaf of legality (also known as a privacy policy, or "terms of use") to cover their continuous data processing activities. Put differently, the act of consent is a discrete, singular act, whereas the processing of data is continuous. What the Oxford-Microsoft group suggests is that meaningful protection in the era of our privacy and personal information will only be found by tightening the constraints over the uses and purposes for

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[15] OECD, "2013 OECD Privacy Guidelines", online: < www.oecd.org/internet/ieconomy/privacy-guidelines.htm > .

[16] EC, *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)*, [2016] O.J., L. 119 [*General Data Protection Regulation*].

[17] Fred H Cate, Peter Cullen & Viktor Mayer-Schonberger, *Data Protection Principles for the 21st Century,* (Redmond, WA, Microsoft Publisher, 2013), online: < www.repository.law.indiana.edu/cgi/viewcontent.cgi?article = 1022&context = facbooks > [Cate, Cullen & Mayer-Schonberger].

[18] *Ibid* at 6–7.

[19] *Supra*, note 12.

which information can be processed, and by focusing on processing that has significant implications for individuals. These include admission decisions to a university, insurance coverage, employment, hiring and disciplinary decisions and healthcare provisions.[20] Many, many other commercial purposes and processing — for example, for advertising and marketing — would be subject to a risk/benefit analysis,[21] which critics have understood to mean that such uses would not be restricted at all.[22]

It is easy to see why the Oxford-Microsoft proposal is both attractive and horrifying at the same time. Does it offer us a brave new hope? Or does it simply surrender the battle over privacy? I think it offers us some hope, but only if we change the way that we currently enforce our principles of privacy protection, which brings me to my second point.

So, second — how do we provide meaningful privacy protection in this day and age, and perhaps, even for tomorrow? We need to find a way to *continuously* offer individuals control, choice and all those other Golden Era privacy principles. And it is no surprise that we will need technology to do that. In fact, we will need to combine regulatory and technological responses and we will need regulatory and legal decisions to directly determine and dictate technological privacy protective measures. In other words, we will need more *Google Spain* decisions,[23] or perhaps, if we cast our net a bit more broadly and earlier in time, we need more *DMCA*s (which is, if you forget, the U.S. *Digital Millennium Copyright Act*).[24]

What the *DMCA* did legally was to establish legal liability for corporations that could be seen to facilitate intellectual property (IP) infringements, unless they could demonstrate their IP protective actions.[25] What the *DMCA* achieved technologically was the creation of an interface, largely automated, through which IP rights could be pursued and protected.[26] As a result, when I look for the latest episode of a popular television show, such as Mr. Robot on YouTube or Google, I cannot easily find it. Note that I did not say I cannot find it at all — but I think it is a fair assumption that most non-tech-savvy folks would conclude that if they cannot find it easily on YouTube or Google then it is nowhere to be found on the internet. And that of course is of vital importance to privacy and is

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[20] Cate, Cullen & Mayer-Schonberger, *supra* note 17 at 18–19.

[21] *Ibid* at 17—18.

[22] Ann Cavoukian, "So Glad You Didn't Say That! A Response to Viktor Mayer-Sch—nberger" (16 January 2014) *Privacy Perspectives* (blog), online: <iapp.org/news/a/so-glad-you-didnt-say-that-a-response-to-viktor-mayer-schoenberger/>.

[23] *Google Spain v AEPD*, 2014, ECLI:EU:C:2014:317, Case C-131/12 (C.J.E.U.) [*Google Spain*].

[24] *Digital Millennium Copyright Act*, Pub. L. No. 105-304, 112 Stat. 2860 (1998).

[25] *Ibid*, Title II.

[26] See e.g., Google, "Legal Removal Requests", Legal Help, online: <www.support.google.com/legal/answer/3110420?visit_id=1-636191549595465825-3132166967&rd=1>.

the beauty of the *Google Spain* decision as well. For the significance of that decision is not only in its confirmation of a right to be forgotten, but also in Google's decision in its aftermath to create a technological interface, similar to the IP interface, that would allow individuals to submit privacy requests easily and efficiently. It is not a perfect process, and there is much to improve, but it is a start.[27]

I can think of a couple other examples, very quickly, in which a regulatory decision could leverage technology, and which could push back against the collection of personal information through the proliferation of sensors and the Internet of Things. Police body-camera video feeds, for example, could be encrypted by default with judicial approval required in order to decrypt the images. Drone manufacturers could be legally required to geo-fence[28] their devices so they could only be flown in open spaces. Manufacturers that do not comply will face legal liability for the resulting illegal processing of personal information. No doubt many more similar examples can come to mind.

We need many more such legal and regulatory decisions, and we need to provide private and public sectors with the right incentives, both positive and punitive that would encourage them, nudge them, and, if necessary, force them to come up with more such solutions. Inescapably, in the Canadian context, this leads to the continued call for greater enforcement and order-making powers for the Privacy Commissioner of Canada that would place the Office of the Privacy Commissioner of Canada (OPCC) on a level plain with other data protection and privacy enforcement authorities worldwide. Such mechanisms should ensure that the private sector views the OPCC as a significant regulator.

V. CONCLUSION

We may be witnessing the end of an era, the era of privacy and personal information protection. Hastened along toward its demise by rapid technological development and new social and political paradigms of information sharing, personal information protection can still be salvaged through a new regulatory approach. This approach should focus on the retention of consent in meaningful instances which have significant implications for individuals — such as in healthcare, employment, and education contexts. In Canada, the Privacy Commissioner of Canada must be equipped with enforcement and order-making powers comparable to other jurisdictions. Globally and locally, further legislation and regulation must protect privacy by leveraging the power of technology to develop hybrid regulatory/technological solutions along the lines of the *Google Spain* decision and the *DMCA*. If we could find a way to protect IP

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[27] Google, "Search removal request under data protection law in Europe" Legal Help, online: < https://support.google.com/legal/contact/lr_eudpa?product = websearch&-vid = 0-674717288659-1483559549447 > .

[28] Create a virtual "fence" through software around a real-world restricted area.

for strong commercial interests despite technological developments surely we can find a way to do the same for privacy.