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Facebook v. Jefferson: How Our Emerging, Networked Society Undermines Ideas of Security and Privacy

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2016 SYMPOSIUM KEYNOTE ADDRESS

Roy Wyman*

Are you excited? All right; you should be! For a couple of reasons; one, this sounds like a fantastic topic, and I'm really excited to be a part of it. I really have no time to be here tomorrow but I will be anyway because I just really wanted to participate, and with the faculty and guests who are going to be here; this Symposium is going to be phenomenal. I'm very excited about it. I'm particularly excited though because of what we're here about, which is cyber security. And I know cyber security, generally doesn't make people really excited. You don't ask a nine-year-old, "What do you want to be when you grow up,"—I want to be a cyber security attorney or I want to deal with that on the technical side. But think about why this is an issue. It's an issue because we have taken all the data in the world and we are taking it piece by piece and making it so that we can access it. So that we can use it, and so that we can analyze it. And what are we doing with that? We are trying to cure cancer. We are making your life better. And the price of that is diligence. We have to be aware all the time of what is going on. And so that is what makes this exciting. We are making available cures. We are making available information. And information that will save lives, that will make life better.

So what I wanted to talk about tonight is where this is heading, where we are at now. I called it Facebook v. Jefferson because I see this as a fundamental root level tension between the law, how we see the world and where technology is taking us. And I think most of the time we get so busy with the day to day of life, the day to day ones and zeroes and figuring out how we are going to implement solutions, that we do not take a step back and look at the bigger situation. And that is what I really want to do today. So let us take a look at the bigger situation. From a legal perspective, and it is intimidating as heck to be here with a bunch of law professors because you're all going to nail me because this is based on my constitutional law from the early '90s, so be gentle with me. But before I jump in too far let me also say that no one's been here before. So I'm taking a lot of theory, I'm throwing things out there because we don't know what the answer is. Future historians are going to be writing about this time and how we dealt with these issues. So we are guessing now. And so I am taking whatever is out there, and I am doing my best to pull it together to figure out

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here's a scheme that we can apply this to and see how it works, how we are all doing the best we can.

So here is where we are at now. I call it the theory of liberal democracy. Not in the sense that you hear the politicians talking about, the liberal without the "E" or conservative or any of those things; it's not about that, it is liberal democracy; it is what we are all born into in this country. It is the broader view. Jeffersonian, Madison, those sorts of theories of what governance is about, what people are about.[1] And whether we realize it or not, that is the milieu we live in. Forgive that French pronunciation. That is a Venn diagram. Can you all see that? So, we are all onboard—you know what that does. You can put anything in there. On the left are burgers and on the right is cheese and in the middle are cheeseburgers. On the left are attractive people and on the right are smart people, and in the middle are those you want to date or marry. You know, we have all seen these. So let us put in some of these. What we have got on the left, the blue side is the individual. And on the right is the state. U.S. government, whatever government you are born into. Anybody here who is familiar with constitutional law, you know that in our country, in our society, that was the basic issue. Person versus state; that is what liberties are about. But cyber security is about keeping information secure, which protects the privacy of that data. So that when I give my data to my bank, to my church, to my hospital, I want to know that it is being kept private. So privacy and security are two sides of the same coin. And when we talk about rights, when we talk about the person and the state, the primary concern of liberal democracy is where the state ends and I begin.[2] My associations, my individual choices, my sense of who I am, that is all on the blue side and in that green part in the middle, that is where we get tension. That is where I do not want the state invading my church.

Now if you do not think that this is the basic way we think about life, look at it this way. Let us add a couple other terms; trusted system, your IT system at work, and the Internet. It's the same thing. You want a barrier, a firewall between our system and what's out there and the hackers. Cyber security is just how we think of it in day to day life is a Venn diagram with those two sides.

So how do we think about politics, how we think about society? It is about people. The person is the atom in sort of an Aristotelian sense. It is the basic unit. You are the basic unit that we think of in a liberal democratic way of thinking. And the person minds the state. It keeps it off your church. That is the idea of what we're going with here.

So when we are thinking about the state and the person, we think about that right to privacy and where does it come from. And you would think that the right to privacy is something that was in the Constitution. I will ask are there

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1. *See* JUDITH N. SHKLAR, *Redeeming American Political Theory*, 85 AM POL. SCI. REV., Mar. 1999, at 5.

2. *See* William A. Galston, *Expressive Liberty and Constitutional Democracy: The Case of Freedom of Conscience*, 48 AM. J. JURIS. 149, 177 (2003) (discussing the roles of the individual and the state in a liberal democracy).

any Con law professors here—how many times does the word "privacy" appear in the Constitution. Zero.[3] The idea of a right to privacy was first stated in a Supreme Court decision in *Griswold*[4] in what year? Anybody know? 1965. So that precedent is younger than I am. Just to give you some perspective. Yeah, I'm old; I admit it. Where does that idea of privacy come from though? It does not start with there. It starts way back in a case called *Pope v. Curl*, or at least that old.[5] Interesting case. Curl was—well, Pope was Alexander Pope, which you may have heard of, and he and Jonathan Swift exchanged some letters.[6] And Mr. Curl got those letters and published them.[7] And Pope sought an injunction to get those back off the market and to keep him from being published anymore.[8] And the court, based on the very first copyright law ever written, said Mr. Pope, you win.[9] Because you have a right to your thoughts and your words, they're your property.[10]

A hundred and fifty years later, a couple guys, Brandeis and Warren wrote about the idea of privacy.[11] And they based it on that case but also—a little detail—"It certain every man has a right to keep his own sentiments, if he pleases . . . the manuscript is, in every sense, his peculiar property; and no man can take it from him, or make any use of it which he has not authorized. . . ."[12] The right to privacy is based in a property right.[13] That is its origins. We do not think of it that way, but it is grounded in the tangible.[14] And from that we can come up with what I call the Privacy Syllogism, which is something I made up, but I think it works. We have rights in our own property; our thoughts and our words are our property and therefore privacy in thought and word is a property right. That is where we get to—that is how we think of things. So, with that background, let us talk about networks. Some of you may have seen a diagram like this before. What I want you to do is look at that one. And this is how a computer network might look in a diagram form, a very simple one I admit. On the left-hand side you will notice is the Internet and a router and a firewall. If you want to, put a little circle there like we had in our Venn diagram. That is the Internet; that is the outside. That is the scary stuff. On the right side is you as an individual, your privacy, you and your association from work. So how we think of networks, we can project directly on the idea of the state and liberal

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3. U.S. CONST.
4. Griswold v. Connecticut, 381, U.S. 479, 483 (1965).
5. Pope v. Curl (1741) 26 Eng. Rep. 608 (Ch.).
6. *Id.*
7. *Id.*
8. *Id.*
9. *Id.*
10. *Id.*
11. *See* SAMUEL D. WARREN & LOUIS D. BRANDEIS, *The Right to Privacy*, 4 Harv. L. J. 193 (1890).
12. Millar v. Taylor (1769) 98 Eng. Rep. 201 (K.B.).
13. *Id.*
14. *See id.*

democracy and it lines up. But like I said, that is very simple. Now I want to show you a different idea of a network. And that is my image of a network in its natural surroundings. You will notice a bunch of bubbles and lines between them going every which way so that every bubble is connected to every other bubble. And each bubble reflects all the other bubbles in it. It's more complex, it's elegant, it's beautiful. If anybody here is a chief information security officer, a CISO, you're a little bit nauseous right now. What is not in there? Firewalls. What else is not in there? Defense. Everything is open. This is the nature of information. And if you do not believe me, think about it this way: what is cheaper to put on the Internet? What is called a honeypot, a computer server that has no defenses connected to the Internet, or one that has a firewall, internal defenses, IPS, IDS, all of those defenses that you would like. It is cheaper to put a honeypot out there. Of course it will last you about—what—five minutes before it is taken over, so the nature of information is that it flows and we spend all this time and energy stopping it because we are really going against nature. Now, that does not make it bad. We go against nature every day. A river flows. We can go down and we can pull buckets of water out of it but it's a lot better to put the work in to create an irrigation system so that we can have a farm. Civilization requires that we go against nature. And so we go against nature all the time. So anyway, I wanted to—I went back and I found the earliest description I could find of a network that suited this. "There's a wonderful net . . . [and] the artificer has hung a single glittering jewel in each 'eye' of the net. . . . If we now arbitrarily select one of the jewels . . . in its polished surface there are reflected *all* the other jewels in the net, infinite in number. Not only that, but each of the jewels reflected in this one jewel is also reflecting all the other jewels, so that there is an infinite reflecting process occurring."[15] It's elegant, it's beautiful, it's scary. So it's from the Avatamsaka Sutra[16], if anybody actually knows how it's pronounced, my apologies, from the third century. There's nothing new. The nature of information has always been out there.

So here is my Network Syllogism. The inverse of what we had before. Information by its nature is shared and open, information about a thing is not separate from the thing itself, and therefore things of themselves by nature are shared and open. So here is the difference—remember when we were talking about the liberal democracy—what was the relevant level of concern: the individual and that individual's relationship to the state. But now we are talking about a system, we are talking about the level of concern being at the network level. At the higher level of the system. Let us go back to my syllogism. Because some of you may have found something that maybe did not make sense to you. Look at the one in blue. Information about a thing is not separate from

15. THOMAS CLEARY, THE FLOWER ORNAMENT SCRIPTURE: A TRANSLATION OF THE AVATAMSAKA SUTRA (1993).

16. *See id.*

the thing itself. Does that make any sense? Well, it's a little bit confusing but if you'll let me explain it is actually very obvious. And that is by looking at the system itself. And to do that we look at systems theory.

Systems theory talks about feedback loops.[17] And every computer network, everything we work with, works by feedback loops in a system.[18] So for example, this room is heated or cooled based on a system that if you simplify it, it is simply this: you get a sensor with a switch and a heating component. The sensor senses that, hey, it is cold, and it flips a switch, it gets information. It is cold, flips a switch, and sends a signal to the heater that says heat it up. The heater heats up the room, that information is then conveyed to the switch, the switch says hey, it is warm, I am going to flip it off now and it flips off and then the heater gets the information that the switch has been turned and it turns off until it gets cold and then the sensor gets that information back. It's a feedback loop of information. And note here, something important. That the actions of the switch turn into information to the heat element and the actions of the heat element turning on or off changes the temperature of the room which becomes information to the switch. In other words, actions and information are inherently the same thing depending on the viewpoint of who's looking at them.[19]

Systems adapt via these feedback loops. And the more technology pushes forward, the more that those feedback loops become relevant and elementary. So for example, artificial intelligence is all about feedback loops.[20] If, Watson, or any one of the other ones, they do something and they get told yes that was good or no that was bad. Or you could do better. And so Watson's response to that, well, I got a good response, I got a bad response, and it teaches itself. We are feedback loops. This is evolution, this is adaptation. It is a type of information flow. Not the only type, but an important one.

So we had our little democracy and our Venn diagram. Well systems theory has something similar but you will notice that what I have got here is Thing 1 and Thing 2 and those are just things, and are not the centerpiece. In the same way that our Venn diagrams are. One is not necessarily invading the other. And you have got information and actions on both sides. So this is just a generalization of that circuit that I was just talking about for the HVAC unit. And actions are one thing. Say the action on Thing 1 is on the left, becomes information to Thing 2. Thing 2 takes that information and turns it into an action. Which then becomes information to Thing 1 and the cycle goes around. So you think okay, I got it. But the system theory says what you look at is the

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17. *See* Philip Anderson, *Complexity Theory and Organization Science*, Vol. 10 No. 3 ORG. SCI., no. 3 1999, at 217 (discussing the manner in which complex systems interact using a web of feedback loops).

18. *See id.*

19. *See id.* at 220.

20. *See* RANDALL D. BEER, *A Dynamical Systems Perspective on Agent-Environment Interaction*, 72 Artificial Intelligence, 173, 181–82 (1995) (stating that feedback loops play a fundamental role in allowing autonomous agents to learn from interaction with its environment).

entirety. So the network does not care about the atomistic thing in there. It is looking at what Thing 1 does with Thing 2. It is a different approach fundamentally than what you are dealing with in liberal democracy. And to be honest it is a different way of viewing reality, for good or bad.

Here is a quote you may have heard before. Mr. McNealy, who was with Sun Microsystems, said, "You have zero privacy anyway, get over it."[21] Now, as you can imagine, when he said that, some folks got a little bit upset. And they have a right to get upset, because under a system of liberal democracy, it's invading my barrier but from a systems theory this is just a truism. The nature of information is to flow, the nature of reality is privacy is something you have to invent or create. It isn't there by nature. Okay? Now I may be giving him too much credit but there is a sense in which what he said is true.

What did Thomas Jefferson say about information? Just to contrast a little bit more. Information is the currency of democracy.[22] Interesting way to talk about information, as currency. Now, when you think of currency you think of money. Right? I had a law professor who told me it is called currency because it is like water. It flows in a current. The point of money is to make it flow. That is why cash is called currency. You do not call real estate currency, you call cash currency. In his models, you have a democracy that was built on competing ideas and the best idea won. Right? And ideas were the money that they spent and collected. And like money, you want it to flow but you cannot force it to flow. So the nature of it is not necessarily flowing, you have that option. It does not acknowledge, like as the systems type theory that it is naturally flowing all the time.

So there is a growing tension here. Now let us talk about that tension. There is four areas that I want to talk about having a tension. Information and our ability to process information is growing at a phenomenal rate, and it is putting more pressure on us.[23] Technology is also invading our private space and I do not have to tell you this. Anybody who has a smartphone anybody here have a smartphone? Anybody here not have their smartphone on them—how many of you left your smartphone at home? It is our companion; it is with us all the time. It is creating a tension. Third, private actors; the government is no longer the issue. And fourth, the increase in breaches. Because obviously that is the heart of what we are talking about here.

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21. POLLY SPRENGER, *Sun on Privacy: 'Get Over It'*, WIRED (Jan. 26, 1999), http://archive.wired.com/politics/law/ news/ 1999/01/17538.

22. This quote is often misattributed to Thomas Jefferson. In fact, this quote was first said by Ralph Nader, who attributed it to Thomas Jefferson. Nonetheless the quote still reflects the author's main point that our societal ideals of personal rights regarding privacy are shifting. THOMAS JEFFERSON FOUNDATION, INC., https://www.monticello.org/site/jefferson/information-currency-democracy-quotation (last visited June 6, 2016).

23. *See* NICHOLAS CARR, *Is Google Making Us Stupid?*, THE ATLANTIC, July/August 2008, at 56 (discussing the difficulties that society may face as a result of increasing access to information).

And I hope you will excuse me; I want to take a really broad approach to this; to put this all in context. So the structures are quickening. This is the growth rate and a lot of you will be very familiar with Moore's Law, and Moore's law is often cited—Moore's law does not say that computers are getting twice as good every two years.[24] That is how people interpret it. Actually what it says is that the number of transistors on a chip will double about every two years.[25] Well at some point in Moore's law, you just run out of space. Transistors can only get so small, to the point that it is molecule sized. Moore's law will slow down and it actually is already slowing down.[26] But Moore's law is just a thin slice of history. It is just a broader rule. I do not think anybody's named it yet. If anybody wants to name it Wyman's law, go for it; I am with you. But it is a rule that says that actually if you go back before transistors and you look at the future, that actually that will continue to grow exponentially. Because there was information and there was processing before we had computers. We had the abacus, which was a major development, so this is sort of where we are going along that pattern of exponential growth.

In 1960, we had the computing power of a bacterium if you calculated that, the number of calculations per second for one thousand dollars of investment. By 1990, we'd gotten up to nematode worm. Thirty years to go from bacterium to nematode. Not bad. 2000, ten years later, we are at lizard. 2015, we are at mouse. Today we are about at a mouse. So for a thousand dollars you can buy a computer that will make calculations the same as a mouse. In five years, so folks who are seniors in high school right now, when they graduate from college, for a thousand dollars will be able to buy a machine that can calculate the same rate as somewhere between a monkey and a student. A human being. That is where we are projected.[27] Let that sink in for a second. In five years, you will be able to put down a thousand dollars plus inflation and buy a computer that is as smart as you are.

What does cyber security look like in that environment? What does school look like in that environment? What does your work look like in that environment? Are you going to be asking your computer whether your brief looks any good? And what are you going to do when your computer is smarter than you are? This is bringing enormous tension on our concept of privacy and security. When you have got computers that are able to do this in the hands of states, in the hands of major corporations, and if you think that it is slowing down—what is really important here is not the number of calculations. What is

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24. COMPUTER HARDWARE, https://web.stanford.edu/class/cs101/hardware-1.html (last visited Apr. 1, 2016).

25. *Id.*

26. *After Moore's Law*, THE ECONOMIST: TECHNOLOGY QUARTERLY (Mar. 12, 2016), http://www.economist.com/search/gcs?ss=after%20moore%27s%20law#masthead&gsc.tab=0&gsc.q=after%20moore's%20law&gsc.page=1.

27. RAY KURZWEIL, THE SINGULARITY IS NEAR: WHEN HUMANS TRANSCEND BIOLOGY 67 (2006).

important is what we do with that. Are we able to use that? So as an example, Moore's law is actually getting left in the dust, this is what it costs to sequence a human genome. In 2008, it cost a million dollars to sequence your genome. In 2011, three years later, it did not cost a million, it cost a hundred thousand. Three years after that, it cost ten thousand dollars. In 2014, it cost a thousand dollars. Today it cost two hundred dollars. The green line is Moore's law; the blue line is the cost of sequencing a genome.[28] This is crazy. So that is where we are headed.

In the meantime, all the smartphones, as we have determined, they are becoming our colleagues, they are becoming everything and it has become so invasive, technology is so much a part of our life, that it is impacting how we interact with each other. If you do not believe me, think about how often you texted ten years ago. Now, I cannot go twenty minutes without texting somebody. And I do not know if any of you are college football fans—do they have a college team down here? Actually, I graduated from Michigan so I have great memories of Jadeveon Clowney; actually still wake up at night with cold sweats. Well, to give you an idea of a quirk of mine, I tend to like college football, University of Michigan, and on Twitter I actually started following a couple of coaches. And one of them is Jay Harbaugh, son of a guy you may have heard of, Jim Harbaugh. Jay is the University of Michigan tight ends and assistant special teams coach, and he does a lot of recruiting. And he is dealing with seventeen and eighteen year old kids all the time. One of his tweets was this: "Would it be rude for answering machine to say 'Thx for calling—please hang up and just text/DM me, thanks'? #JustSayin."[29] In other words, I do not want to talk to you, I do not even want you to leave a voicemail, I just want you to text me. Because after all, voicemail is way too personal and a disembodied voice; Heaven forbid. It is changing the view that we have of ourselves and our associations. We are networked societally. The Venn diagram of me versus state and my associations is breaking down and disintegrating. It is eroding. The government is no longer the issue. Yes, the government is interested in your data. It sought by warrant from Google in a six-month period, information on 31,343 people.[30] For Microsoft, it sent in 5,940 requests on 13,570 individuals.[31] So the government is looking for information; sometimes with a warrant and sometimes without. But it is often losing.[32] *Warshak*, determined that the

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28. K.A. Wetterstrand, *DNA Sequencing Costs: Data from the NHGRI Genome Sequencing Program (GSP)*, NATIONAL HUMAN GENOME RESEARCH INSTITUTE, www.genome.gov/sequencingcosts (last visited Apr. 2, 2016).

29. Jay Harbaugh (@JayHarbaugh), TWITTER (Jan. 8, 2016, 10:02 AM), https://twitter.com/jayharbaugh/status/685521899644792832.

30. Sarah Menendez, *How the U.S. Requests User Data from Google*, MARKETPLACE (Dec. 23, 2015, 2:25 PM), http://www.marketplace.org/2015/12/23/tech/google-data-requests.

31. Ashley Carman, *Microsoft Creates New Transparency Website and Releases Fresh Report*, SC MAGAZINE (Oct. 19, 2015), http://www.scmagazine.com/microsoft-details-content-removal-requests-and-user-data-requests/article/448010/.

32. *See, e.g.*, United States v. Warshak, 631 F.3d 266 (6th Cir. 2010).

government trying to get information without a warrant was violating the Fourth Amendment.[33] In *Microsoft*, it wanted every Hotmail account in Ireland,[34] and that's being fought.[35] The Government was already given the metadata for everything in the United States, and wanted every search on Google for a week.[36] Every search you made for a week on Google. They wanted it. Google said, go away.[37] Here is five thousand random searches, you can have that.[38] And the government said thank you, we'll take it.

When it comes to data, the government has already lost. I am sure your professors have taught you, when you are arguing when you are in court, the person who lays the field of battle wins. If the other side is telling your story but arguing against your arguments, you have already won. And courts have already determined Google, Apple, they have your data, they own it. The government does not. The government is not the point of concern anymore. Let us talk about cyber security now.

I think the quickest measure of whether there is an issue or not is you look at insurance. This is the amount paid total in premiums in billions of dollars for cyber security insurance. In 1990, it basically didn't exist. In 2012 it was one billion dollars in total premiums.[39] By 2019 it will be eight billion dollars.[40] That is eight-fold increase in eight years. And they do not know what they are doing. Insurance companies themselves say it is an immature market.[41] It is a three billion dollar immature market. So it is out there. And I can tell you from personal experience, they do not know how to price it out, they do not know how many records you have because the people with the information do not know how many records they have. They do not know what they are insuring. It is immature. And at some point when you do not know what you are doing, something breaks. And we are waiting for that day. And by the way, back when the government—it just occurred to me—you know, we're going to talk in a

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33. United States v. Warshak, 631 F.3d 266, 288 (6th Cir. 2010).

34. *In re* Warrant to Search a Certain Email Account Controlled & Maintained by Microsoft Corp., 15 F. Supp. 3d 466 (S.D.N.Y. 2014).

35. *See* Brief for United States, *In re* Warrant to Search a Certain Email Account Controlled & Maintained by Microsoft Corp., 15 F. Supp. 3d 466 (S.D.N.Y. 2014), *appeal docketed*, No. 14-2985 (Mar. 9, 2015).

36. *Google Rebuffs Feds Over Access to Search Data*, ASSOCIATED PRESS, http://www.nbcnews.com/id/10925344/ns/technology_and_science-tech_and_gadgets/t/google-rebuffs-feds-over-access-search-data/#.VwAhQWPy2xo (last updated Jan. 19, 2006, 8:24 PM).

37. *Id.*

38. *Id.*

39. Elizabeth A Harris and Nicole Perlroth, *Cyberattack Insurance a Challenge for Business*, N.Y. TIMES (June 8, 2014), http://www.nytimes.com/2014/06/09/business/cyberattack-insurance-a-challenge-for-business.html?_r=0.

40. *See* Robert P. hartwig & Claire Wilkinson, Insurance Information Institute, Cyber Risk: Threat and Opportunity 2 (Oct. 2015), http://www.iii.org/sites/default/files/docs/pdf/cyber_risk_wp_final_102015.pdf.

41. Clint Boulton, *Need for Cyber-Insurance Heats Up, But the Market Remains Immature*, CIO (Nov. 9, 2015, 6:54 AM), http://www.cio.com/article/3003114/security/need-for-cyber-insurance-heats-up-but-the-market-remains-immature.html.

second about the moon shot regarding cancer that the government is supporting. And I can't remember—it's either one or four billion dollars—and that is what they are putting into cancer research. And we've got here about eight billion dollars. Do you know what CVS Caremarks' gross income is in a year? 120 billion dollars.[42] The government is putting in a billion? CVS could do that tomorrow. They do bond rounds of four billion dollars like it's nothing. So if you think the government is the main issue, the government is trying to ride this tiger just like the rest of us are. That's our wonderful catastrophe. It's wonderful because it's valuable, it's precious; it's a catastrophe because it creates so many issues for us. So what do we do with this? What do we do with this wonderful catastrophe? Well, I have no perfect theory. Like I said before, the theories are going to be written after we've already done this stuff.

So I'm going to steal from Thomas Kuhn and the nature of scientific revolution and some of you who are much smarter than I am are going to say, yeah Kuhn, that does not work; that is scientific stuff. Yes. I have got no better theory; if anybody else does, please come on up and you can do this part because I do not. So this is what I grabbed. Kuhn has four stages, sort of like four stages of grief, the four stages of a scientific revolution is what I am going to steal here.

First stage: ignore or tolerate.[43] What am I talking about? This is the good old days when the Internet first started out. I have heard, from a couple of security experts, there was a time when if you went on the Internet and you were a big company, what you did was you put up a server and you put in a firewall but you would leave part of your memory outside the firewall, and then you would connect to the Internet. Why on Earth would you do that? That unsecured part is just a honeypot like I described before. That was your tribute to the hackers. What you were saying was, "Hey hackers, this memory is yours; do with it as you please, just don't touch the rest of my systems." That is ignoring or tolerating the hackers. That was back in the good old days. That is the stage that we went through. Now we are here.

Anomalies build to a crisis. We're at crisis stage. By 2019, we're going to have twenty-seven billion things connected to the Internet.[44] Not people, things. Your car, your refrigerator, your heating system all will be connected to the Internet. Remember what I said, in five years you are going to have computers as smart as you. What do you think that is going to do for facial recognition? I lived, when I was at CVS, in Chicago for a while. Anytime you are in the city of Chicago, there is a camera looking at you. There is nowhere you can go in the city of Chicago where there is not a camera looking at you. Which means that, in five years' time, if somebody wanted to, they could know everywhere you are at all times in the city of Chicago.

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42. *See CVS Health Corporation Income Statement*, YAHOO! FINANCE, https://finance.yahoo.com/q/is?s=CVS&annual (last visited Apr. 2, 2016, 4:33 PM).

43. *See* THOMAS KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 37 (2nd ed. 1970).

44. *See* DAVE EVANS, THE INTERNET OF THINGS: HOW THE NEXT EVOLUTION OF THE INTERNET IS CHANGING EVERYTHING 3 (2011).

Even at home, your refrigerator, your heating system, both are going to know where you are in your own house. And if you had any sense of privacy in your own house, you gladly gave it away to Facebook anyway because all your friends know what you are doing there. So even those areas that we thought were private, we are gladly giving away, and, really, what is our choice? You can turn off your cell phone, take out the battery and cover it up in aluminum foil. Not do the click-throughs. But we are not going to do that.

Step three: try new ideas. What new ideas? I do not know; they are new. Do not ask me; they are going to be future ideas. A lot of them are going to be good, a lot of them are going to get pushback, some of them are going to be bad. That is the nature of this stuff. New generations are going to be much more willing to try new ideas. My granddaughter is two, and she will occasionally grab my daughter's phone. When she does, it never fails, within five minutes, she has somehow got a video of Shakira up. I do not know how she does that. I could not find a video of Shakira in fifty minutes if you asked me to. Her generation is living this stuff. This is their day in/day out. They are going to understand new ways of thinking much better than we do because that is going to be their culture. But you will get pushback.

I mentioned before the moon shot for cancer. The idea that the Vice President floated out there is that we would spend money to get computers talking to each other so that cancer researchers were communicating, working together to cure cancer. Exciting and great stuff! It took about a week and there was an op-ed in the New England Journal of Medicine saying, yeah, sharing data is good and all that but—and if any of you are married or in a serious relationship you know the word "but" means ignore what I just said and I'm going to tick you off now—but, we spent decades putting this data together. We are going to have what some people call research parasites. Taking our data and using it for their own good and not giving us credit.[45] That is serious pushback. New England Journal of Medicine, a fairly well-known journal. Fairly-well respected.[46] People do not want to give up their data so there is going to be pushback to new ideas.

Fourth step: revolution.[47] Although like I said, I'm not going to be a slave to Kuhn. I think when you are talking about these sorts of cultural issues, a lot of times you can layer one solution on top of the other. So do not think that I am suggesting that liberal democracy is going to go away. I think we are just going to have another way of looking at things, another way of living that is going to adapt our traditional way of looking at it. I think we will always have a core concept of privacy or something like privacy that is going to be a check or a

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45. Dan L. Longo & Jeffery M. Drazen, Data Sharing, 374:3 N Engl J Med 276–77 (Jan. 21, 2016).

46. This was stated tongue-in-cheek. The speaker acknowledges that the New England Journal of Medicine is a very well-known and respected journal.

47. *See* THOMAS KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 92 (2nd ed. 1970).

backstop. This is my best guess of what we're going to be and I want to talk about this on a legal, a political and a societal level. Add salt to taste.

We have got to do something about the constant liability here. Because like I said, the insurers do not know what to do with this. Right now we are having a tough time knowing where breaches are, who is responsible for them, and apportioning out liability. I think we are going to end up with a different system of figuring it out. Would it be something like workers' comp? Would it be something that is more like a no-fault kind of system? I do not know, but I think we are going to have to figure out a new way of apportioning liability when you have got a network in which everybody is reflecting everybody else's network. I also think our concept of data is going to be different. Right now we think of data as property. Remember under a liberal democracy, that is where we draw the line between us and the state. I think we are going to go to a place where—and forgive me, I am going to talk about an area of law that I know nothing about but it is going to be more like water rights. From what I understand about that, I may have a right to go down to my river and take a bucket of water out, but that does not mean I get to build a dam. And so we are going to have a different view of data, a different view of ownership. Some of this is going to be by law, by regulation, some by society changing and moving along with it. We will be a networked society. Your sense of self has already started to fundamentally change. Facebook and all the other social media and the technology have already done that whether you realize it or not. Kudos to you for leaving your phone at home but the rest of us did not. We are connected all the time.

In the political sphere, I think that there is going to be areas that are definitely protected. Financial, the property side, are the cornerstone of our society. That is going to be protected and that is going to be at the core. Health information, there is going to be a strong effort. There already is a strong effort with things like HIPAA, but I think that that is getting eroded by the interoperability of machines and more particularly by decentralization. Anybody have an Apple watch? Anybody have a Fitbit? Anybody have a phone? They are all tracking your steps. They are all collecting that information and they have now or soon will have more information about your health than your doctor and your hospital and every pharmacy and every other provider of health care to you. According to the Government's understanding, ninety percent of the relevant health information about you is outside of your health care record with your hospital or your provider. It wants to collect that. Which means that who is going to have your health information? It is not St. Elmo's down the road, it is not MDPC, or your physician. It is not CVS or Walgreens. It is going to be Fitbit and Apple, and that changes things, because your information is going to be all over. So our sense of privacy, our sense of security pertaining to our personal medical information is going to change. We are going to have to make a choice. Do we want to be healthy or do we want to have privacy? And I think for the most part we are going to choose health.

Another one, employment and education; those are already getting undercut. People are much more likely than they used to be not to have a single employer but to be freelancing. I think when you have got a connected world; it is much easier to work for many companies rather than one. There will not be the same privacy expectation as there once was. I'm sorry; this is the wrong place to say this, but education is already getting undercut. You have an Internet where anybody can learn anything from anybody at any time. The traditional institutions will have to play a different role. Our concern about privacy in education is going to have to change. Finally, we have your personal life. You are choosing to give that one up all the time.

So finally, a metaphor that I am just going to beat the heck out of. I am pushing this metaphor until it breaks. But I think it is somewhat apt. For years our approach to security was to create a firewall. And we realized that does not work, because ultimately somebody is going to break through that firewall. It is just the nature of it. Nobody is secure anymore. So what did we do, what are we doing, what are smart companies doing? They're putting security behind the firewall so that even though you can break through the firewall, not everything is there open to be had.

And there are three broad categories, or what I think of as three; there's probably more. The first is virtual perimeters. In other words, we put our information into little packets so that we do not have literally just a hundred million records in just one place for everything to get to. We put walls behind the walls. And I think we are going to be doing the same thing. We are going to be creating a culture of sub-cultures. Where we connect meaningfully by choice and we are not just going to put everything out there for everybody.

Second, we have integrity checks. We make sure what we put on the system is still there the next time we go back to it. We are going to use things like concepts of liberal democracy and basic moral codes in different places, as a surrogate as kind of an integrity check to make sure that what we are doing is okay, but it is not going to be the first line of defense anymore. Demilitarized zones (DMZs), the green area in the middle, where it used to be you had a firewall and nothing got in that you didn't allow in; now we create a sort of safe space behind our firewall, where you can come in and I can come in and we can meet and greet. We can do our things there, like North Korea and South Korea and then you go back and I go back and it's within the firewall but not all the way. What we are speaking to here is a world that is much more open to complexity. Forgive me for this, but Nisbett would say, it's East versus West.[48] This is a world where we do not always have to have a winner and a loser where you see the world in flavors and you realize what is right and wrong is a bit more contextualized even in something as concrete as your information. In one context you may want to share it, but in another, not. We are headed towards a

48. *See* Richard E. Nisbett, The Geography of Thought: How Asians and Westerners Think Differently . . . and Why (2003).

much more interesting and complex world. Whether we like it or not, it will be a networked world. So let me ask you: are you excited? Are you nauseous? Are you both? Anybody have any questions? There must be some.