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The Non-Revolution in Digital Payments

with Eric Hughes

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C. AUSTIN FITTS: I first met Eric Hughes in the early '90s. I used to go to Esther Dyson's PC Forum. I'd run into him there. I'd run into him out in San Francisco. He was at the time a brilliant mathematician from Berkeley and one of the founders of Cypherpunks and an entrepreneur and I think to me one of the most knowledgeable people about financial payment systems and their relation to sort of new digital technology and also just a very powerful intellect and a lion-hearted person.

So I got to know Eric back then and hadn't seen him for quite some time, and when I decided we really needed to do a *Solari Report* on the digital systems, I called Eric in Utah and said, "Okay, can I get you on the *Solari Report*?" and he said, "Yes." So with no further ado, Eric, thank you so much for joining us on the *Solari Report*.

ERIC HUGHES: Well, thank you. Hi, Catherine.

C. AUSTIN FITTS: Hi. So how in the world did you get interested in payment systems?

ERIC HUGHES: From privacy issues when Tim May and I dreamed up Cypherpunks in the summer of '92 before we had our first meeting, we were focused principally on two technologies at the time for anonymous communications and anonymous payments. I ended up focusing on payments for a lot of my Cypherpunk activism. It ended up being mostly research, not a lot of fielded systems, because as I dug into it, it just kept getting deeper and deeper and deeper in terms of what you had to know in order to actually pull something off.

It wasn't simply a case of being able to write code and put out code and

make something happen. That's now what payment systems are, is what I learned.

C. AUSTIN FITTS: Tell us about Cypherpunks – what it was. Tell us a little bit about the history.

ERIC HUGHES: Cypherpunks was really the first large Internet activist movement. It got started in 1992. The Clipper chip came out in 1993, which did us endless amount of benefit in terms of promoting the cause. It was quite large, and it was prior – just prior to the World Wide Web, which got really going in '94 and '95, and before the Internet had become a consumer commodity. So we got specialty attention, for the most part, in technical and business press, not so much in the overall popular press except for some of the cryptography policy issues like Clipper.

But we were focused on privacy and autonomy and all the good things about decentralized power.

C. AUSTIN FITTS: Well, it's funny. I remember at the time how excited I was. If I had to define the stupidest thing I've ever said in my life, I remember turning to a very important Washington attorney after working with the technology – I think this was in '95 – and I said to him, "Look, we just don't need the banks anymore. There are ways of doing all this without the banks. The power's going to shift to Silicon Valley, and things are going to really change." Famous last words.

ERIC HUGHES: Yes, that was the same year, '95, I wrote an issues of Esther Dyson's newsletter for her on digital payments. And one of the first things I said in that episode was "banking as a human activity is about a thousand years old, and the computer industry is only a few decades old, so which of those do you think is going to take over the other's business over time?"

C. AUSTIN FITTS: So you were betting on the banks.

ERIC HUGHES: It was foolhardy to believe that you could simply just write a

little technology and replace banking. Of course, you have to know what banking is about before you can say that, and basically very few people in the technology world had any inkling of what it was really about at the time.

"Bring us from that time when you were smarter and I was naïve, and bring us up to date on where we are now. What's happened, and why do you call it a "non-revolution"?"

C. AUSTIN FITTS: Well, we called tonight "The Non-Revolution in Digital Payments," so why don't you talk a little bit about the development of the Internet, and then what has happened in terms of the payment systems integrating in with the Internet, and sort of just give us a history. Bring us from that time when you were smarter and I was naïve, and bring us up to date on where we are now. What's happened, and why do you call it a "non-revolution"?

ERIC HUGHES: Okay, so there are two forms – there are two ways of calling it a non-revolution. The weak form, which is not very interesting, is to say that we really don't have any new payment systems on the Internet that weren't extensions of existing financial products, principally payment cards like Visa and the automated clearinghouse system which moves checks around. Those two mechanisms undergird pretty much all the payment systems that are out on the Internet, predominantly PayPal.

And there really hasn't been any – there was no fundamental novelty in the way that those transactions were gained. What did happen was that they were simply extended out so that they could be transacted on the Internet. So that's not really a revolution. It's more of an organic, incremental change to a long phenomenon of the extension of the payment systems out into smaller and smaller areas, into greater – smaller volumes – I'm sorry – smaller average transaction sizes and larger and larger volumes. So it's been going on for decades.

The more interesting way in which there was no revolution is that there were – I mean, so digital cash technology was invented originally by a fellow named David Chaum, who is a true seminal figure in terms of thinking about such things. The non-revolution that didn't happen is

that those transaction systems not only – well, they were tried in terms of – there was a DigiCash INC startup, but they were never fully fielded. So no one really knows how well they would have worked in practice, because in many ways they just never got off the ground.

And so one non-revolution was the kind of simple non-revolution of extension of existing things. But the other one was things that might have been done that never grew – that never scaled – that were never really known on whether they would work in practice by being able to get large. And that happened largely because there was timing, there was accidents, there were personalities involved, but largely it's because it was cheaper overall to not have the revolution, simply to extend the incumbents outward rather than to mount all the effort to do something fundamentally different.

C. AUSTIN FITTS: Well, it's funny. In the developed world, the system – the incumbents, if you will, move deeper, as you said, to do more transactions at smaller and smaller amounts and smaller transaction costs. But the other thing that happens is they also moved into parts of the world where they weren't. So for example – and I put this up on the blog – one of the books you recommended I read for tonight, which I found was very useful, was *The Payment System Design Management and Supervision*.

The link will be up on the blog – from the – Bruce Summers wrote it for the International Monetary Fund. It reminded me again of all the effort they were doing at that time to go into places like Russia and build out their – so their stock exchange, their mortgage markets, and put them on the international payment systems. And in fact, it made it much easier to harvest those systems and harvest the assets in those places because you did. So you're taking the incumbent system, and you're using it to drive outward globally and then deeper within the developed world.

ERIC HUGHES: Right. That book is quite good in terms of just knowing what the payment system is really all about. It's much more than about adding and subtracting numbers. But the thing you're talking about is the increased fungibility that happens as the result of taking an incumbent

system and bringing the other local systems, national systems up to snuff so that they can interoperate. Because it's not a mere matter of moving the numbers across the network from Europe to Russia, from the U.S. to Russia; it was a matter of creating a stable system in Russia that you could trust the numbers moving back that they would be – that you would get your money when the numbers moved back.

And that issue of trust and how you structure trust in terms of the payment system is really the core of things, and that's not a technology issue.

C. AUSTIN FITTS: Correct. Another crosscut to all of this is privacy, some of which relates to the integrity of the system, but some of it relates to what it means to us as a user. If you look at 20 years ago, a lot more of my transactions were done with cash, and a lot more were private. And now we're talking about operating through systems where – I don't know about you, but I believe the data is transparent to a variety of parties, and the system is organized that way.

ERIC HUGHES: Oh, it's certainly transparent by law to a number of parties, principally the Treasury Department. Your listeners probably know about the Financial Crimes Enforcement Network – it's abbreviated FinCEN – the piece of the Treasury Department that focuses on looking at transaction records and looking for patterns and it had just started when I started doing Cypherpunks. It was fairly new then, and the things they were focused on at the time were detecting things like smurfing money through the U.S. payment systems for drug deals – so where you had a $10,000.00 reporting limit, and they were looking for not just those payments going out directly, but ones that were adding up and getting aggregated and pointing out to it.

These were the kinds of transactions that they were analyzing 20 years ago, and we had 20 years in the middle – in the interim of increased data collection and increased analytical capacity.

C. AUSTIN FITTS: Right. I remember, I told you this story, I'll never forget when I was in Washington, I had a friend who was a reporter who was

lunching with one of the senior guys at the Drug Enforcement Agency. And he said to her, "Let's face it, honey; you know, all the wires are batched and go through the New York Fed for the whole country, so you know they know where everything is."

ERIC HUGHES: Yes, it's true. There was the change that happened around that same time period that – in '94 – '95. Quite significant, is that they changed the federal wire transfer system from – it had – used to have been the case that each of the – the federal reserve banks individually had run their own clearing and settlement system, and they integrated them into a single system – single technical system called Fedwire – from Fedwire to FedNet – I'm sorry. And they consolidated even that transaction system. Evidently having 12 centers of power was too many; they needed just one.

C. AUSTIN FITTS: Oh, my! That is centralized!

ERIC HUGHES: There was one live machine room and one hot backup that they did when they did the technology changeover.

C. AUSTIN FITTS: At one point, I got very interested in who the corporate contractors were who were running the payment systems and the databases for a variety of parties, including the government. And what I discovered was that if you mapped out not just the payment system, but who the information technology company was that was running the system or providing the system or doing a variety of tasks, the world looked very different if you mapped it out from the backend.

So for example, I wrote a story once about the – that one of the most important lead investors and guys on the board at Enron was also the chairman and lead investor in an IT contractor who was doing very high level IT work for the Department of Justice and the SEC as well as the New York Stock Exchange. And at one point, I said, "You know, the Department of Justice may not have asserted control of Enron's documents, but the Enron board had asserted control of the Department of Justice's documents."

And so when you map out the backend of these systems, you see some pretty funny relationships. Now, that information is very hard to get. I once called the heads of the 12 New York Fed banks, and I said, "What private IT companies manage, monitor or are involved in your systems?" and they said, "That's confidential information you're not allowed to know." But I did try.

"Let's just stipulate there are legitimate and illegitimate ways of gathering the data. But in any case, we know that the data gathering – the watching itself before analysis is extensive."

ERIC HUGHES: Yes. Let's just stipulate there are legitimate and illegitimate ways of gathering the data. But in any case, we know that the data gathering – the watching itself before analysis is extensive.

C. AUSTIN FITTS: Right. Well, what these systems do is it allows you to aggregate and watch a great deal of information not just on individuals, but on patterns. So the intelligence that can come from these systems is quite extraordinary, I think. You know, that can be both positive and negative. One of the things we saw during this period, Eric, was a tremendous effort by Treasury to get every individual in the banking system. You see certain populations that are very resistant to coming into the banking system, but of course to make everything digital, you need that population in.

So you can see a real pressure to try and get everyone to the point where they can transact digitally. And I think that's one of the reasons why I think the movement to Smartphones is such an important one, because Smartphones make it possible to finally succeed at that so that you can literally get everyone in a position where you can transact digitally, which means you can go all digital on all sorts of things, particularly those governed or managed by government.

ERIC HUGHES: And this isn't a U.S. phenomenon. In fact, in Japan, they've been doing payments by Smartphones for 15-odd years now.

C. AUSTIN FITTS: Really?

ERIC HUGHES: Oh, yes, and in many other jurisdictions. Not Smartphones – like just like SMS messaging previously.

C. AUSTIN FITTS: Right – well, Europe is very, very much ahead. I was in Holland in November, and they're very much, much more Smartphoned in terms of their payment transactions than we are.

ERIC HUGHES: The only reason that I think we didn't have phone payments much earlier in the U.S. is that we had the legacy of the AT&T divestiture and all of the warning camps that sprung up along there. You ended up with a kind of – split the spoils between major players mentality in the Tell-Co market, which meant that they were constantly foisting incompatible technologies down their own silos. And unlike Europe, where you had a single GSM standard, you had all sorts of different technical standards in the U.S., and it delayed the onset of Smartphone – you know, telephone payments.

So that's ending basically because phones are going on the Internet, which is a common area, and you'll be able to just avoid that gratuitous incompatibility in the U.S. phone market. But the point is is that the overall thrust to move the extent of the payment systems out to the very edges of retail margin is going on everywhere, not just the U.S.

C. AUSTIN FITTS: Right.

ERIC HUGHES: And it is in many ways a kind of – I wouldn't say inevitable, but inexorable, certainly, kind of overall trend in the business environment.

C. AUSTIN FITTS: Well, on one hand, the economics very much argue for it to happen. On the other hand, what's interesting is if you look at the economics of doing everything digital, on one hand, the transaction costs have dropped enormously. If you look at my costs as a business owner dealing with security problems and issues – you know, sort of fraudulent charges on credit cards and all the different sort of integrity issues, the expense is enormous. So that's why every time they talk about driverless cars, I think, "How are we going to – how are you going to deal with the

cost of the integrity issues?"

The transactions are getting much more efficient. But the sort of blowback issues – the expense is skyrocketing from just looking at me and the entrepreneurs and businesses I know.

ERIC HUGHES: Yes – there were always costs of handling cash as well. I mean, cash expenses – just paying people to go to the – drive to the bank, direct labor costs, shrinkage costs from the employee and other kinds of theft. I mean, overall it's been kind of a – I mean, there are still expenses in dealing with payment systems; they're just different expenses now. But what I should point out – what you're saying is that the bulk of the benefit of the digitization of transaction systems has not been reflected in a lower cost of operation by the end users.

There's been a large amount of actual wealth created in higher efficiencies, and it has not been distributed down to the customer level.

C. AUSTIN FITTS: But it has made choice and convenience greater for the customer, I would say.

ERIC HUGHES: Oh, that's true. No, that's certainly true. And in fact, convenience is the best coin to buy privacy with. It's been – that's been very clear for quite a number of years.

C. AUSTIN FITTS: Right.

ERIC HUGHES: Is that simply making something easy to do, people will gladly give up their privacy. I made a remark – again, this is another 20-year-old remark – but that the cost of privacy was not greater than three percent of the transaction volume of whatever you were buying. People were willing to pay a little extra – this is back before they disallowed this, but people were willing to pay a little extra to pay with their credit card and willing to give up their privacy in return. So you know that whatever the effective interchange costs for people – people's perceived privacy, it's not very high.

Now, admittedly, we haven't had the kind of major privacy disaster that would cause that perceived value to change. But buying people's personal data by offering them convenience is Google's business model in so many ways.

C. AUSTIN FITTS: One of the things I thought that was most interesting that I heard you say recently when we were talking is that if you study money histories – and I also want to mention – because I put this up on a link; you also had recommended *A History of Money from AD 800* – if you look at the questions, you can have all the new technology in the world, but everything comes back to the basic questions of how humans are going to relate to each other and what constitute trust between people when it comes to transactions.

And technology doesn't change any of that; it always brings us back to the basics. We have to go back to the basics, particularly if we're going to try and do something new.

ERIC HUGHES: Well, let's go back to 800 AD, because that was the invention of the pound sterling by Charlemagne, right. And one of the great inventions of Charlemagne was standardized coinage. And this is not a technol – issues of technology, of minting coins in a more precise way than they had done before. And the trust issue is that you are trusting the person operating the mint to make sure that there's the same amount of silver in that coin for every coin so that the coin has good value. So even something as seemingly intuitive as using precious metals for money still have these issues of trust.

You just can't get away with it. And as soon as you intermediate anything over physical possession of minted coins, be it paper money or an electronic records book – record system – you just have all that many more issues of trust. I mean, it really is foundational.

C. AUSTIN FITTS: Right. Well, if you were listening to this *Solari Report*, and you wanted to learn more to understand the digital systems in your life, how would you go about doing it? What would you do?

ERIC HUGHES: Oh, well, I can tell you what I did.

C. AUSTIN FITTS: Okay!

ERIC HUGHES: I hit the books. I was living in Berkeley, California, at the time, where I'd gone to school. And I headed off to campus, and I found the business library, and I sat in the business library and read. And I was – you know, then as now, I did contract software for a living. And so I would simply take off a couple afternoons a week and head over to the library and spend the afternoon there.

"I was living in Berkeley, California, at the time, where I'd gone to school. And I headed off to campus, and I found the business library, and I sat in the business library and read."

And so I was reading things like *American Banker*, the trade publication of the American Banking Association, and I was reading books on – technical books on clearing and settlement systems and mostly money, some amount of commodities and stock clearing and settlement. I was reading law books on – in fact, I bought a thick copy of a law book called *The Law of Electronic Payment Systems* to understand what was going on underneath the hood there.

And this was all in order to understand how the technology actually worked, because the technology works by behaving – but it's people's interpretation of what the technology is doing is where the action is in terms of my – so you need to understand – to get a full sense of all this stuff, you need to understand what it is. Now, I can't recommend that to everybody simply because I had some very highly technical issues that I was trying to figure out in terms of the nitty-gritty of building a payment system from scratch. In terms of what people can go do to learn, I will recommend that anybody that really wants to understand what the payment system is all about is to obtain a copy – it's not all that expensive – of that book on the payment systems that was done by the IMS – that I recommended to you – you'd already mentioned.

C. AUSTIN FITTS: Yes – it's up on the blog.

ERIC HUGHES: It's an excellent book that really describes what's going on, and that's the payment systems for just money transfers between banks. There are other kinds of payment systems like the Visa clearing system that moves credit card payments around. It's different in details, but all of the principles that are true for cash payments between banks are true about Visa as well. You have some slightly different issues on who takes consumer credit risk and where the different failures are allocated. But those are differences at the margins really.

The basics are still all the same. There's always a club at the center of large players that band together to cooperate, and they always sell their services to their customers and act as a group intermediary. That's the overall structure of how any of these work. And you have to understand what the trust relationships are amongst the club members to really know what's happening.

C. AUSTIN FITTS: Right. And to me, I think some of the most dangerous moments in the financial system is when there's a real seize up in problem and a breakdown in trust, you know, in or between some of those systems.

ERIC HUGHES: Oh, absolutely! That's – that was the fall of 2008.

C. AUSTIN FITTS: Right.

ERIC HUGHES: I mean, basically, anytime there's a credit crisis – credit crisis says, "Well, I don't trust you pay me again like I did yesterday." That's the down-to-earth translation of what that highfalutin term actually means. It says, "I don't think you're going to give me my money back, so I'm not dealing with you anymore."

C. AUSTIN FITTS: Right. Now, let's talk a little bit about wallets. What are wallets, and what do you think is going to happen in terms of movement of the system down into the Smartphone and the use of wallets?

ERIC HUGHES: You mean – you're not talking about leather billfolds that I carry my actual cash in?

C. AUSTIN FITTS: No! I'm talking about digital wallets.

ERIC HUGHES: It's a piece of the technology. It's just a place you store stuff. They're almost all virtual pieces of software. You know, they only time that – the only successful wallets I know have been telephone-based wallets – I mean, in terms of – when I say "successful," I'm talking about large, double-digit penetration into the consumer market, not experimental systems that we can make function. But the wallets that have worked in the past have all been based on telephones. And the reason for that has been largely that it's a captive platform that hasn't really been easy to hack.

So I suspect that the rollout of wallets is not going to proceed as rapidly as people would like because of security issues with the platforms they are running on, and they will probably end up not even – the wallet will actually probably not end up being on anything you actually own, but will be a record in some hosted software in some machinery that you gain access to with your technology device. So they'll use the phone only to authenticate you, and they won't even use it at all to store anything actually. The actual storage will be up in the cloud.

C. AUSTIN FITTS: Right.

ERIC HUGHES: So mostly wallet is going to turn out to be a misnomer, because there's nothing actually in there.

C. AUSTIN FITTS: Right – it's not going to be a wallet; it's going to be a deposit.

ERIC HUGHES: It's going to be a demand deposit account at something that's de facto – a bank – whether or not it's regulated exactly like a bank or not.

So I guess the very shortest version of my answer to that question is wallets don't really exist, and they won't – and – and they're unlikely to behave that way.

C. AUSTIN FITTS: Right. You sent me a very interesting article that is also up on the blog. You populated the blog this week, Eric, about Internet activism, and they Cypherpunks are still at it. So bring us up to date on what's happening in terms of the debate about how the Internet's going to be governed and what that means to payment systems.

ERIC HUGHES: Well, let me just first make a disclaimer – is that I'm not really up to speed on everything that's happening with Internet activism anymore because I don't really do it in the same way I did before. Having said that, what's very clear in all the Internet activism there is, and there's a goodly amount of it still, none of it has to do with the payment system, which one exception, which is Bitcoin, which we can talk about later. I will just give you my summary version: Bitcoin is not the answer. We'll just do it later.

C. AUSTIN FITTS: Okay.

ERIC HUGHES: The places where I'm hearing talk about the governance of the Internet having – are really in some sense back to foundational issues – things that we thought we had won back in the '90s – things like your Internet connection may not be cut off for random and arbitrary reasons. So like the SOPA and PIPA bills that were killed, both had that property. But, you know, there's a non-legislative version of this coming out now about Comcast and some of the major people that are dually embedded in both content and distribution are going to start sending out warnings to their users when they think they're doing something wrong.

So we're in a situation where there might be private action with no judicial review or no prior judicial review for people being just disconnected from the Internet for undesirable behavior. So that's a worse situation than we were facing in the '90s. I mean, feel free to be wary about government power all you want, but arbitrary private action by service providers is a worse threat. It's harder to argue a public policy issue when you've got private players, at least in the American mindset. It's easier in Europe.

C. AUSTIN FITTS: Right.

ERIC HUGHES: So like this last week, there was a thing called the "Freedom to Connect" conference that I was listening to the coverage about, which is on that topic. So you know, you're – in some sense, we're getting to a – you know, what seems to be is that there were these initial battles that were fought in the '90s over many of these issues, and now the money is really on the table, and a lot of stuff is going to get figured out that will be persistent for decades to come in terms of policy.

C. AUSTIN FITTS: Right. Well, I think to me, a lot of it comes down – in the financial area, a lot of it comes down to privacy. Am I allowed to communicate through the Internet, or am I allowed to transact with another party in a manner which is private? And so a lot of the activism revolves around privacy, but privacy turns around and impacts everything, not just transactions or payment systems. There's a lot that people can do to organize to engage in payments or engage in transactions.

"A lot of the activism revolves around privacy, but privacy turns around and impacts everything, not just transactions or payment systems."

If they have privacy, they can proceed to do that organization which fundamentally changes the way that they can interact and shift economic power to them, you know, if they can organize in those ways. But it takes privacy.

ERIC HUGHES: And technically speaking, privacy is not under direct restriction. Privacy itself is not under direct attack like it was back when. Like, for example, the Clipper chip, which was wiretap-enabled cryptography, was a direct attack on privacy. And they – the strategy they had was to make sure that that was the kind of encryption that everyone used so that there would be no possibility for privacy. That's not really where the threats to privacy come from anymore. So in terms of privacy, I'm going to make one brag about how good Cypherpunks is.

C. AUSTIN FITTS: Go for it.

ERIC HUGHES: When the Patriot Act was drafted, there were no cryptography restrictions in place. They didn't have to be argued out; they were just never written down to begin with. And it was pretty much the only thing that did not lose in privacy to the Patriot Act in some way.

And we did that by arguing the case broadly from a number of political things, by enrolling allies and doing a bunch of ground-type politics to change the policy perception about the value of cryptography in terms of preservation of privacy – that it wasn't even conceivable to try to squish it when the Patriot Act came along.

And I should remind people that only four and five years earlier was the last gasps of the Clipper chip. There was Clipper in '93, and then there was five years of like weaker and weaker legislative attempts to try to get something on that order passed. So like '97 was the last of them, and just four years later the Patriot Act passed, but we had won so completely, it was inconceivable to do otherwise. And so that's the level of success you can have if you make your case in a principled fashion and do your homework and actually put the effort in.

So I want to inspire people at least with that success story – that this is not utterly hopeless, but we did have one major victory that makes the possibility of privacy yet retained. Now, switching to the other side of things, the main threats to privacy now are coming from roughly Facebook and Google and their ilk.

C. AUSTIN FITTS: Right.

ERIC HUGHES: Which is to say software that you don't buy –

C. AUSTIN FITTS: Not government – right.

ERIC HUGHES: Software that you don't buy with cash; you pay for with your privacy, and your privacy is eliminated. It is sent through the blender and sold to commercial interests trying to sell you things in the most beneficent interpretation of how that data issues. We don't know the

many ways the data is actually being used.

C. AUSTIN FITTS: I'd say it's fair to say you don't have a Facebook page, and I don't have a Facebook page. Is that correct?

ERIC HUGHES: I do not have a Facebook page. That is correct.

C. AUSTIN FITTS: Neither do I.

ERIC HUGHES: I do not even have a pseudonymous Facebook page for trolling people on Facebook. So I completely refuse to participate. What happened in the mid '90s is that the action basically went out of personal computer software and moved into Internet software. And so you could mark that transition as roughly '95 – '96. So for 17-odd years, we've been living in the neo-mainframe world, where we have hosted applications on other people's machines with no control over our own data.

We are granted access to our data because it's commercially useful for people to keep giving us our data. But all these service agreements say that your data could disappear at any time.

They have no obligation to return it to you. So it's not just privacy that's been diminished. It's autonomy, more generally.

C. AUSTIN FITTS: Right.

ERIC HUGHES: You become subjects to the machines in the cloud who are doing things and the ability to do things for yourself and, therefore, have autonomy over the devices that you own is greatly diminished as a commercial reality. One of the technical possibilities – it's still possible to build those things. It's just that the disparity and the number of people who want to use one model over the other has created a huge economic disincentive for people to innovate in terms of economy and privacy and freedom for end-user devices.

C. AUSTIN FITTS: So if I'm listening to this, and I want to support groups

that are trying to protect individual rights on the Internet – if I want to support some Internet activists, what do I do? How do I do that?

ERIC HUGHES: Well, unfortunately, I can't just give you the address of the foundation that's supporting that kind of software that you can donate to. To my knowledge, no such organization exists just yet.

C. AUSTIN FITTS: Okay.

ERIC HUGHES: The EFF is a good place to start looking for people involved because the EFF still ends up being the cluster around which a lot of these things orbit. But the EFF – it was not always this way, but it has become a lawsuit machine in the same way that the ACLU is a lawsuit machine. They do decent work working the judicial system to make sure that the worst things are turned back. But they don't actually move things forward a lot. Now, there is one thing that I can recommend that is promising in this regard.

I've forgotten the name – the name has slipped my tongue, but there's a recent effort that I just heard about on Democracy Now this week about an organization that sprung up to do proxy donations for wikiLeaks and other Internet activists.

C. AUSTIN FITTS: Wow! That's wonderful!

ERIC HUGHES: We'll get it on your blog.

C. AUSTIN FITTS: Okay.

ERIC HUGHES: But, you know, the people – they're endorsing good people who are doing good work. And the easiest way to do something good now is just to go learn about those people and to tell your friends about them. I mean, simply put, the – we're back in the – having been to school at Berkeley, I kind of cringe at this phrase, but it's true: we need consciousness raising in the public about the value of privacy and autonomy on the Internet. And it's not that people are ill-equipped to understand this.

I mean, SOPA and PIPA got stopped dead by a mass movement once people understood. One of the very next things to do is there needs to be larger interest in it that will eventually be able to turn into a kind of nonprofit donation stream to fund good projects. I mean, software needs to get written, and the people who write the software have to live while they're doing it. So the shortest path to improving things at the end of the day is going to end up being foundation-funded software development. But there's not much of that happening right now.

"Software needs to get written, and the people who write the software have to live while they're doing it."

A lot of it – most of it's still – most of the open-source world is still running on volunteers.

C. AUSTIN FITTS: I must admit, what's been accomplished by volunteers is extraordinary.

ERIC HUGHES: It is, but it has also been insufficient to turn back Google and Facebook.

C. AUSTIN FITTS: Sure – trillions of dollars can buy a lot.

ERIC HUGHES: Well, that's absolutely true, and –

C. AUSTIN FITTS: Before we close, we have to talk about Bitcoin.

ERIC HUGHES: Oh, we do have to talk about Bitcoin.

C. AUSTIN FITTS: We have to – why don't you just briefly describe what Bitcoin is, and then I'll rant about why I strongly recommend against anybody using Bitcoin.

ERIC HUGHES: Okay. So Bitcoin is described as a currency, which it is not. It is most accurately described as a synthetic commodity, meaning that there is a set number – set amount of Bitcoins in the world at any given time. There is an algorithm for increasing their number over time, and

there's an allocation of who has power to control the resource at any given time. So there's a transaction system attached to the commodity. But to use it as money is saying too much. People have to accept it as money in order for it to be money. So there's still the issue of the trust in the system to do all over again.

Now, Bitcoin is, it should be said, still – it's been used, so it's basically out of its purely experimental phase. There haven't been any obvious attacks on it yet, so it's survived its child crib death phase of deployment, but it's still very young. And if you were going to try to take down a system that you know its weaknesses for, you're going to – you want to wait until it's a little larger so that people get the message. Now, having looked at the technology a bit, and I can't say I'm a Bitcoin technical expert, it appears to me that there are several kinds of not purely technological attacks on Bitcoin that could be mounted that would cause it to go through a panic.

C. AUSTIN FITTS: Now, the prices vary tremendously. As you said, it's a commodity. So we see the price, for example, recently skyrocketing. This is something you could lose a great deal of money on.

ERIC HUGHES: Well, unlike unlike a physical commodity, Bitcoin has additional risks. At some point, the cryptography will break. It uses a – they might figure out a way of doing technological upgrades on it, but right now the underlying things have a limited lifetime, versus Moore's Law, like all cryptography does. And the theory behind cryptography is not so solid that you don't know about attack a theoretical attack coming out of left field, there's a number of ways in which the system could just crash all at once.

And what happens in this crash is that you are left with your Bitcoins, but you're not left with anybody that's willing to trust their value to accept them as payment. So just like Wildcat bank notes that were prevalent in the period of bank panics in the U.S. history from the Civil War to World War I, the same thing is kind of scheduled for Bitcoin almost.

C. AUSTIN FITTS: Right – it's kind of like a sovereign credit that has no military to back it up.

ERIC HUGHES: Yes, that's exactly right. That's a perfect analogy, actually.

C. AUSTIN FITTS: Okay – ladies and gentlemen, please do not use Bitcoin. It first strikes a lot of people as sort of an independent, out-of-control, freedom-fighting alternative, but for something to be that it's got to have the ability to go the distance, and I don't think Bitcoin does. I couldn't agree with you more. So thank you, Eric. Okay – well, before we close, we do have one question, and I wanted to – it came in on the webinar. "I found the TED Talk by" – and this is someone I don't know – "Mikko Hyponnen." Is that someone you know?

ERIC HUGHES: Yes, I've heard the name.

C. AUSTIN FITTS: "To be a good primer as to the actors and motives as to the types of online activities that threaten privacy and deter online commerce or present certain key concepts in non-overly technical way with valid current examples." Any comment?

ERIC HUGHES: Sounds like a good reference.

C. AUSTIN FITTS: Okay.

ERIC HUGHES: I mean, the – some of the best – just FYI, some of the strongest privacy-oriented people in the world were Finnish. That fellow is Finnish. I do remember that.

C. AUSTIN FITTS: Why doesn't – that doesn't – if you had to live next to the Russians in a very cold country –

ERIC HUGHES: They fought the Winter War in '42. I mean, don't discount the Fins wanting their autonomy.

C. AUSTIN FITTS: Oh, they're amazing people – amazing and very, very intelligent.

ERIC HUGHES: But there is quite a cryptography and privacy community in Finland, and it actually doesn't surprise me that that kind of talk is coming from Finland.

C. AUSTIN FITTS: Ah – okay. Well, Eric, I can't thank you enough. Is there's anything else you'd like to say before we close?

ERIC HUGHES: Let's talk about one last thing I think which is important when we're talking about the payment systems, which we kind of touched on earlier, because you're asking about what to do next. So at risk of going over too long, I want to raise the issue of fungibility. So one of the – fungibility means that you can move something from one part of the economy to another part of the economy easily with minimal transaction costs. That's kind of what the definition is. It's basically fluid assets.

So one of the general principles of fighting this kind of regime is to get rid of fungibility – get rid of the kind of fungibility that's globalizing and universalizing. That doesn't mean that you don't have the ability to transact. It just means that your transactions with people close to you, say, are going to be different than the transactions far away from you, like your mail-order company or – and your telephone providers, which are large, faceless corporations.

So organizing at the local level to figure out what you might do in terms of creating local economies and to create the trust in local economies seems to be one of the things that I keep coming across over and over as a generic part of an actual solution to come. So we don't have time to go into that. Perhaps another night.

C. AUSTIN FITTS: Well, I agree, because what you see when you look at both currency transactions and credit and equity at a local level is there is a real need for vehicles that optimize within a place-based context that are different than what you need to optimize globally. And so if you want to optimize, you need a relational optimization, both local and global, and it calls for local systems. And the struggle – I mean, if you look at what I was working on in the '90s and what you were working on was

something that would allow those kind of things to happen.

And the struggle has been a real tussle between the people who have wanted to consolidate and create efficiency centrally versus those who'd like to sort of allow the financial system to optimize with the environmental ecosystem and do place-based things that are more or less independent so that the local system can optimize with privacy relative to the global system. And that's been a major political struggle.

ERIC HUGHES: Yes, absolutely.

C. AUSTIN FITTS: And we didn't talk about it because it's not a payment system, but at the heart of that struggle in the U.S. is the MERS system, which is a way of trying to make all the local real estate something that can be globalized and made non-transparent to the local system so they can't see their own real estate fly around. It's quite remarkable. It's kind of like the reverse of what we're proposing.

"At the heart of that struggle in the U.S. is the MERS system, which is a way of trying to make all the local real estate something that can be globalized and made non-transparent to the local system so they can't see their own real estate fly around."

ERIC HUGHES: Yes, I had a – I'll share one last anecdote, because it's very telling. But I had a conversation in I think '99 – calendar year '99 with a senior technologist at Fannie Mae, was bragging about how good their real estate database was getting, and he was saying – just – I want people to know how long this was in coming. This was '98, ten years before the big crash. He said that, "You know, we're getting so good that soon we're going to be able to just start backing loans without doing appraisals at all."

C. AUSTIN FITTS: He was right. It was very soon.

ERIC HUGHES: It was extraordinarily soon.

C. AUSTIN FITTS: It was very soon.

ERIC HUGHES: So local knowledge is going to be key. Now – and one last thing on locality – all the lessons in that payment systems book that I recommended are also true at the local level.

C. AUSTIN FITTS: Yes.

ERIC HUGHES: You are still going to need a club, and you're still going to need to develop mutual trust in that same way. The difference is not in the mechanisms that you use to move the value around; the difference is going to be what the political and social goals are of those local organizations, vis-à-vis multinational finance industries.

C. AUSTIN FITTS: Right. How do you hold – how do you create and then hold trust through time? And that's a human question. It's not a financial question. It's not a technological question.

ERIC HUGHES: Trust is the foundation of money, more than any other thing. It exists in human emotion, primarily, and you're going to get an argument – I get an immediate argument about people who will say, "Well, gold is money." And I'll say, "No, gold is not always money," and I have an example finally. I didn't have this back when, but I knew that the value of gold was a social construct. There's a book whose author I've forgotten, but whose title is *The Red Gold of Africa*, which is about the Gold Coast region of Africa.

And the reason it's called the Gold Coast is that the natives – the native Africans there didn't value gold as money, and so it was still sitting in the hills waiting to be mined. Their fine metal was copper. Their whole economy was based on copper. Copper jewelry was the high copper – copper bangles were the socially visible form of wealth accumulation. It was an entire economy running on copper and not on gold. So even there, you have to have trust in the social convention of what other people are going to find valuable.

You can't get away from it, even for something as seemingly transparent as precious metals.

C. AUSTIN FITTS: Well, I would say that gold is money, but it's because you have such a large critical mass of people who believe it is money.

ERIC HUGHES: That is the only reason it's money. Let's be clear: that's the only reason it's money.

C. AUSTIN FITTS: Right, but there are two reasons something is money. One is there's a Navy who can make you agree to it: force. And the other is a consensus, and it's always fascinating to me to see what can create a very significant consensus – something that can take something from the status of a Bitcoin to something that really is money.

ERIC HUGHES: Mm-hmm – and this was the third book – this is the – we're into the topic of the third book I recommended for these kind of issues, which is a book called *The Refiner's Fire*, which is on the magical history of Mormonism, but it particularly pays attention to these kind of magical creation of value in people's minds from a religious point of view.

C. AUSTIN FITTS: We will add that to the blog.

ERIC HUGHES: Yes, it's not specifically on money. But it's very informative as to the interior emotional life of how money is actually created. And after it's created – at the moment of creation, it's somehow pulsating and glowing still, and then it becomes routinized, and it becomes something mundane. But money is never that way at the beginning.

C. AUSTIN FITTS: Yes, it's part of a sacred covenant.

ERIC HUGHES: That's absolutely right.

C. AUSTIN FITTS: Right – it has to be.

ERIC HUGHES: I mean, you're talking about economic value could be considered a fraction of someone's life. And in that sense, to take their money is stealing a piece of their life and giving them nothing in return.

C. AUSTIN FITTS: You're converting your time and your energy into something and then hoping you can convert it back. So you're right: it's your life energy.

ERIC HUGHES: So it's a miniature form of death – miniature form of killing to economically abuse someone in that way.

C. AUSTIN FITTS: Well, if you use it to harvest, but if you use it to transfer your energy for time –

ERIC HUGHES: It changes its valence utterly, and it becomes something affirmative and convivial.

C. AUSTIN FITTS: Right. See, I always think of it as something wonderful. It's taken me my whole life to keep mastering the fraudulent and ugly sides of it, but it doesn't have to be that way. Anyway, Eric, you know I'm going to have to have you back on the *Solari Report*. So that's the last thing I have to do is get a commitment from you that I can get you back.

ERIC HUGHES: Okay!

C. AUSTIN FITTS: Anyway, thank you for joining us on the *Solari Report*. It is always a pleasure to speak with you. Thank you so much.

ERIC HUGHES: Thank you for having me, Catherine.