Interview with Stewart Brand
Recorded Wednesday 20 January 2010 by Becky Hogge
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Interviewer: Yeah, I'm writing a book. It's interview based and I'm hoping to start, I've interviewed already Rop [Groengrek 00:13] and Julian Asangi who were two guys who, in the '80s, were sort of young hackers, both famous in their respective countries, the Netherlands and Australia. Sort of infamous. And who've since turned towards political activism. And what I'm really interested in finding is, I mean I come with my own perspective which is that I'm 30, I've lived in a kind of age that is almost the heir to the '60s counter-culture as it were and very much defined by that, although when you come into it late you struggle to see …

Respondent: We were heir to the hippies, we were heir to the Bohemians, you know, so it's a long lineage.

Interviewer: Sure. And in hackers and what they were doing I kind of found inspiration at a quite a raw, maybe even childish level, because it seemed very subversive and radical and that was the very little, there wasn't very much else subversive and radical going on. So my goal is to really interrogate those feelings and see if them dying away now, the kind of pessimism about where all that stuff is going is just a natural growing up, not caring so much about subversive, radical stuff or whether it's something else. So that's kind of the whole narrative. And do you know Dr Who, the English TV series, Dr Who?

Respondent: I don't. I see it referred to incessantly.

Interviewer: Right, so reading a couple of books, and you must be bored with how much has been written about you in terms of your involvement, but it does feel like you're almost some kind of time traveller because you pop up at so many what were then to be, what were going to be iconic moments in the history of computers, the Mother of All Demos you filmed. You coined the, well you coined half of an amazing phrase: Information wants to be free. I mean, you coined the whole phrase. Only half of it stuck. Also the way that the Home Brew Computer Club was first founded, the first hacker con and then, of course, the Well. I wondered what, there's been a lot written about that, about you but I wondered what that journey was like from your perspective and if you could talk a little bit about that. I mean, we could be here all day, I guess. But what was it that first inspired you around personal computing and how that was emerging?

Respondent: '60-'61 I was in the army as an infantry officer and I guess the question always is, after military duty, do you go back to where you were or go off somewhere else? I'd been in the Bay area in Stamford and then in North Beach in the hippie period, in the period between graduating form Stamford and going off to New Jersey, primarily for the army. And I got involved with the artists' scene in New York, was a sort of Lower East Side hippie on the weekends and a infantry officer during the week. And,

but there was never a question in my mind that I was going to go back to California when I got out of the army so I did and was even then, in a house boat in South Lido. And somebody, some friend at Stamford took me by the Stamford Computation Centre. This was at a time, '61 or so, when computation, everything computery happened in large mainframes and time sharing was staring to be invented – it's referred to as Space War mode by some of the people playing Space War – and what I saw was the back room of this computation centre a bunch of young computer programmers playing Space War, which was the first what we would call video game, computer game, and remained so for ten years. And they were in a state of ecstasy, as near as I could tell. I mean they were mashing these buttons and operating a, just a toggle that moved their rocket ships around on the PGP11, I guess, screen, which was one of the first of the mini-computers. And five of them playing simultaneously and beyond any out of body enthusiastic experience I'd ever seen. So I just sort of registered at the time: something's going on here and I don't know what it is [unintelligible 05:08]. So later when I had, in the [unintelligible 05:14] catalogue I had sort of expounded that computers were going to be important and I had a, I think I had the only published review in Nicholas Negriponti's Architecture Machine book which was, led the way toward the Media Lab and many other things. And then when I shut down the catalogue in '71 and was looking around for what to do next, Jan Wenner at Rolling Stone was up for having me write about something. I said, ' Well I'd like to write about computers and Space War.' And he said, 'What's Space War?' And so I went off and spent time at the Stamford Artificial Intelligence Lab and the Xerox Park and, based partly on what I'd seen years before in 1969 at SRI with Doug Engelberg and the Mother of All Demos, I sort of had that as, partly as an entrée in and partly as just a way to understand what people were up to. And so I was talking with Alan Kay and all of that and just got a sense that profound things were going on and I've sort of been drumming my fingers ever since because so many of the things that were foreseen at that point took a long time to arrive. So when I did the piece for Rolling Stone, which was called Fanatic Life and Symbolic Death Among the Computer Bones, it was basically about Space War and drawing on Space War as a model of where computation really wanted to go. It was interactive, it was stuff that was uninteresting on the computer but very interesting to people, it was going to be very graphic and all this kind of stuff. And Jan Wenner said at the time, 'Well, you've just set in motion a whole new body of journalism that's going to track down all this stuff.' And in fact, it was ten years later that Steven Leagy did the book Hackers, which sort of told the rest of the story of how things had started and [unintelligible 07:26] in '61, about that time [unintelligible 07:28] and so on. So, you know, if there was an exponential growth going on, the early part of exponential growth looks like a flat line and so I happened to be around for some of that. But basically I was just being in the Bay area paying attention to interesting people, so for the same reason I was paying attention to Ken Keysey, I was paying attention to Doug Engelberg.

Interviewer: So you say you saw profound things. Often we can't see things until we're looking for them. I mean, back in that time what do you think you were looking for that you saw here?

Respondent: Inexplicable enthusiastic behaviour is usually a sign that something's going on. Another sign is that a whole lingo develops and so that there would be such a thing as a hacker's dictionary which came rather early on and has been updated ever since, is a sign of, you know, if people are having to invent new words to describe

something it suggests that what they're describing is itself new and that they have to invent words to do it suggests that there's a fair number of people who are interested in that. So, you know, just concepts of a computer bug which was invented by what's-her-name at Department of Defence? That use of a procedural problem that had to be identified and fixed hadn't existed in engineering in those terms, before that. But is, and this was one of the important revelations that when computer programming was being taught to children by what's-his-name at MITE, the turtles and all of that …

Interviewer: Yeah, the man who wrote …

Respondent: And he had brain damage in traffic [unintelligible 09:42] we'll come around to his name. What he emphasised is that kids who learn programming learned that there are always bugs in programming. And so de-bugging is a normal part of life. And one of the things that kids learn from learning programming in the world of Seymour Babbit, if kids learn that de-bugging is a normal part of what you do in life, that is a really, really fundamental truth and certainly the opposite of what most formal education says, which is: Here's the way to do math. Do it that way and all will be well. Well, if you do programming it will always have mistakes and part of your operation intellectually is to treat those mistakes as normal, not a bad thing that you committed a terrible mistake and your grade is going to be low. Of course there's mistakes, the computer doesn't run yet. It doesn't run yet and then you learn the techniques of modularity and things like that to sort down to the problem and fix it. And even when you fix it, once the code gets to any level of complexity at all there will probably always be bugs in there, or they'll get introduced later and that's normal. Get used to it. Which is a very biological sort of frame of building robustness into systems that you're doing and so I guess being trained as a biologist and studying ecology and evolution, which have very complex processes, result in these remarkably resilient and robust systems. I was looking for that kind of thing.

Interviewer: I suppose, looking back, it's obvious now that the advances in technology and in all areas, particularly biology it's been a shift from formal systems to sort of more network systems that would, and a more network way of understanding but obviously it's tempting, and I'm going to not resist the temptation, to try and map some of these ideas on to what's going on maybe socially at the time. I've read in a couple of passages in your current book a kind of, Regret is too strong a word, it's not the right word, but actually regret is just a, forget I even said that word. But you have spoken about how, beyond the sort of mysticism of the '60s that you saw in Sand Francisco, once you'd sickened yourself with that and once you'd realised that, say, LSD just turned, you know, just invented personality failure in a lot of people who did it a lot of times, that what you were left with were basic societal bugs or bugs in the, you know, just the kind of getting things right gradually. I don't know what passage I'm thinking about but I've actually pulled out a different passage about personality damage for this. But there's another passage I'm trying to get to where you say once you got sick of all the gurus and all the mystics what's left are some fairly persistent, you know, the boring grind, the day to day life.

Respondent: Yeah, and the daily negotiation.

Interviewer: Yeah, that's right.

Respondent: Which has its advantage in that it's full of surprises and I guess it gave that sort of evolution and almost the definition of Evolution is: You don't know what's coming next. You're always being surprised when evolution comes up with a sufficiently complex system dealing with a sufficiently complex world that is going to find pathways that are not clear before it finds them. And are often not clear after it's found them. So …

Interviewer: But was this technology in any way a refuge or a sink for new ideas and new ideals?

Respondent: Which technology?

Interviewer: I guess when you go to Stamford for the first time and you see the enthusiasm and you begin to understand this new frame of thinking. You know, where you're, which is engineering but also it's framing problems in ways engineers have never been able to before. I suppose I've spoken about this project with others who were alive in the 1960s, alive and conscious in the 1960s rather than just kids, and they have said, 'Well, I wouldn't be surprised it, you know, the bunch of people that you've identified, of which you know, I lumber you in a group with, which is probably unfair, but people like John Perry Barlow and others who you later worked with in the '80s, maybe this was the next paradigm after whatever it was you guys were up to in the '60s. That you could go to that was fresh, that didn't have the baggage and maybe the failed kind of …

Respondent: Well, the difference between drugs and computers was that drugs levelled off and computers didn't.

Interviewer: Right.

Respondent: And just kept getting better and better and better and Moore's Law was sort of the, you know, the representation of that. And [unintelligible 14:55] founded the Media Lab basically. He found the realisation that these things were going to get drastically better for a long time. I first heard of the concept from Herman Kahn who wrote it down in a book called The Year 2000 which came out in '69 maybe. And Herman said one of the [unintelligible 15:16] of computer technology is it keeps getting better. That's fine. That happens with a lot of technologies but all level off at some point. Cars get better and better and then they stop getting better and better or they slow down at how much better they get from decade to decade and he said as near as he could tell that was not happening with computer technology. It was just going to keep getting better and better and better and then that came to be expressed later as Moore's Law, which has held up for a horrendously long time. I mean, technology is supposed to come in S-curves. They develop gradually and then they get steep and then they level off and computer technology has not done that yet. And as we get into [unintelligible 16:11] computing we may have a step function up rather than levelling off. So putting that kind of a positive feedback that just keeps going and that enhances capability, and enhances capability, and enhances capability decade after decade at the heart of the human process of communication and calculation and the rest of it, is pretty damn fundamental stuff and it is the kind of revolution that we thought psychedelic drugs was going to be. And so at Stamford I encountered Aldous Huxley and Aldous Huxley did this book called Doors of Perception and while I was in the army or right after I got out

of the army I was taking mescaline with artists in, outside of New York City and having amazing experiences and sort of the line was: No hope without dope. This was going to be the great revelatory breakthrough for humankind etc etc. and it was for a while but then it tapered off pretty badly and I expect it'll occasionally get revived from time to time so, you know, everything from ecstasy to [unintelligible 17:43] offers new intellectual capabilities and college students are taking it [unintelligible 17:50], getting in a sense more affected by [unintelligible 17:54] and seems like right in line with what we were up to in the '60s. But still nowhere near as radical as what computers have done. So I just, you know, shifted my allegiance in a sense from a semi-failed technology to a highly successful technology.

Interviewer: Do you accept the theory that's been put forward that some of the attractive, well attractive to me, elements of computer culture, geek culture: co-operation, everyone having a voice …

Respondent: It's interesting, the popular view at the time was that hackers, nerds were these lone guys in their mother's basement and, you know, they didn't know about Chinese food and guys staying up all night exactly like musicians staying up all night and basically jamming together. They didn't know that hackers were what I call lazy engineers, you know, always looking for the intensely clever short cut. And one of the by-products of the valorisation of the hackers is that the [unintelligible 19:03] engineers, who did a hell of a lot of the real work at the time, have been under-credited and so, Doug Engelberg was never a hacker. Bill English, who ran his operation for the Demo was never a hacker. He was, you know, a very 9 to 5, severe, solid citizen engineer. I married him to his wife actually. So, you know, they did hang out with questionable characters but in terms of SRI they were, you know, good employees. And it was full of variety. Bob Metcalfe developed Ethernet, that's a park, and it's a park and Bob's a Conservative.

Interviewer: Yeah. To which I'm tempted to say, 'Well, John Perry Barlow's a Republican but that's just ideology, that's not …

Respondent: Well, he's trying to give up on Democrats and he keeps failing 'cause the Republicans have gone so far astray. Yeah, he was a Republican and, you know, he's a rural guy who got swept up in urban sensibilities by Grateful Dead and others.

Interviewer: I happened to meet him in Rio once and he seemed very swept up in urban sensibilities that night.

Respondent: He seemed very what?

Interviewer: Swept up in urban sensibilities that night.

Respondent: Yes, that's a fact.

Interviewer: But, so it's a partial myth then? I mean, not a myth but it's only partially true that everyone that developed computers during the '70s and '80s was a secret hippie. Actually there were a lot of straight guys at it as well.

Respondent: A lot of straight guys and a lot, even the fact that Steve Jobs and Steve Wozniak could get going, they could get going because basically they developed, both of them especially Wozniak, in the culture, very open culture of the Hewlett Packard and Wozniak sort of asked Hewlett Packard and was starting to do these mother boards for what became the personal computer, the Apple, he asked Hewlett Packard if they were interested and they said, 'That's marvellous, we think you could probably do that on your own.' And, which was completely the Hewlett Packard approach to life. Both Hewlett and Packard were extremely public-spirited. To a large extent they invented Silicon Valley, unlike the, there's this wonderful book called Regional Advantage by Annalee Saxenian which compares Route 128 around Boston with Silicon Valley and Route 128 would have a platform, like many computers, but then would not progress to the next platform, microcomputers, for example. And the reason they didn't is because there was, if you were working at Dec or at Lane and wanted to go somewhere else you were intellectually crippled before you could leave the building.

Interviewer: Right.

Respondent: And in Silicon Valley, mainly because of the behaviour of Hewlett and Packard back then, and Stamford to its credit, if you wanted to leave Hewlett Packard and do something in the community either as just public service or go found another company or something like that, that was great by those guys. They felt they had a very clear intellectual understanding that their company could only prosper if their industry prospered. Their industry can only prosper if the region prospered. And so they were always incredibly supportive of basically their competition, which was the opposite of the way things were done around Boston and the opposite of the way things are usually done in Europe, frankly. So, and they also developed the business aesthetic that failure is a good thing to have on your resume whereas, in Europe, once you've failed that's it, your career's over. Nice try, too bad. And people don't hide failure they, what you expect to be asked in the interview is, 'Well, this business start-up you were involved in, it went sour. What did you learn?' And so Shell Caplan, for example who was the founding engineer for Amazon.com. I think he was employee number one or probably two after Jess Light, had been part of at least half a dozen mega-failures in the Bay area. I first knew him as a young hacker in Stamford AI Lab playing Space War. He's in some of the photographs of that period and he's been a major supporter of the Long Now Foundation and we're real good friends for years. One of the things, he let me get some founder stock from Amazon back when I was, you know, bad, which I've kept and I've been glad of. But Shell was hireable by Jeff who has a very good eye for who he hires because he has seen so many things go wrong and had been at the heart of financial mistakes, engineering mistakes, business mistakes and could bring his own personal kind of resilience and just sheer knowledge to Amazon which then prospered, based on his very good initial programming. Do you know the book, Regional Advantage?

Interviewer: No, I don't, I don't.

Respondent: I think [unintelligible 24:54] and Annalee has written another book called The New Argonauts which is basically taking a similar, she runs a department at UC Berkeley. New Argonauts is about the Asian, that is Indian and Chinese, entrepreneurs who are totally comfortable in Silicon Valley, often found running companies for major senior positions in companies, start-up and long lasting ones, and doing the same damn

thing in India and in Taiwan and in Hong Kong and Singapore and mainland China. And they are [unintelligible 25:37] across the Pacific. Basically making everybody prosper intellectually and financially at both ends of that trip and they are inventing a lot of the modern world with that capability of having a full range of [unintelligible 26:05], full range of Indian apparatus and sensibilities and a whole range of Californian apparatus and sensibilities and no feeling of contradiction or double life or anything like that. Honoured at both ends of that trip and are rewarded every which way and are rewarding the societies they work in every which way.

Interviewer: I'm guessing that a lot of these philosophies are ones that you've made a lot of hay with working through the Global Business Network with major corporations and trying to spread across, for example, some of the places you've identified like Europe, that don't go well with these working practices.

Respondent: Typically, yeah and Global, I'm going to have lunch after chatting with you with Nick Turner who runs Global Business Network, co-runs it here in London for mostly European clients, and when Peter Schwartz was here in London for five years as Head of Scenario Planning at Royal Dutch Shell, that was a stint he had done at SRI before then and Shell said, ' Well, you know, we'd like to keep you. You're very good at this and you can become a Shell man,' which is typically, you know, a life long thing. You've just got to stick around and have lots to do over the decades. And he declined because he wanted to go back to California. And Global Business Network basically took Scenario Planning which had first been devolved by Herman Kahn and then the was seized on by Royal Dutch Shell and Peter Vark and made more, much more in a sense operational in that it was more toward opening the mind of management to multiple logics of roles that might go forward in the coming decade or so, that they should build robust or resilient or adapt the strategies to manage and never have a crisis because you've always seen, because you're not surprised, is ideal scenario planning. And indeed that often works out. But what Peter wanted to do was to basically Californianise sort of the next stage of that process of things so you have a West Coast, that is Rand Corporation, a Herman Kahn set of ideas in terms of Scenario comes from Hollywood which he purveyed to the world and Pentagon picked up on aspects of it, used considerably at the time. I knew I liked him a lot. And he went around to the various corporations and almost none of them picked up except this weird twin of Dutch and English at Royal Dutch Shell who said, 'This stuff actually works,' and Peter sort of mysticised it a little bit and made it more persuasive and then Peter, this is the only Buddhism of wandering around Asia, Peter then took it back to California [unintelligible 29:07] and we developed it to another level and training, Scenario training. It's one of the few business ideas that has turned out to have very, very long legs so the Turner Scenario which was exotic back in the day is now a normal one that everybody uses and the IPCC talks about the various scenarios of how climate change might go forward and that's all the product of that sequence of events.

Interviewer: I'd like to swerve the conversation a little bit, picking up on that, and then moving on to something that I'd kind of hoped to discuss as well. All of that sounds great and the California ethos of company management and all of that but sometimes it's translated on the ground to, and there's a whole bunch of other stuff among this, you know, people become more autonomous, they become individual, they, or rather as workers they might become more autonomous and they might have portfolio careers and all this kind of stuff, which is great.

Respondent: Portfolio careers? I've never heard that one.

Interviewer: Oh really? Oh, it's a bit of, it's one of those terms where it's a bit like, 'I'm between jobs, oh I have a portfolio career,' which is like, ' I can't quite get tenure anywhere.' But …

Respondent: Right now I'm working on the unemployment part of my portfolio.

Interviewer: Yeah, exactly, exactly. And yeah, and sometimes when you get right down to the ground that doesn't work out for a bunch of people. They prefer job security, they prefer that kind of stability and …

Respondent: The place I loved working best was the military and boy do they have job security. I mean, well they don't. The senior guys, the generals are, you know, always worrying about whether they're going to make it to the next star or not because it's either up or out. And, but they are life long guys, they're not in it for the money, they all have advanced degrees, they've been all over the world, they know everything, they've been through combat, they know how to take things seriously and they are fabulous clients for, you know, futurist work in scenario planning and so on. And it is because they are absolutely not having a portfolio career.

Interviewer: Right, yeah. They're safe and they can make tough decisions, they can take risks. That kind of thing. Yeah, sure, sure. Going back to another passage I pulled out from Whole Life Discipline where you speak about your finding that later generations don't often look back and they certainly don't look back to previous generations and …

Respondent: I'm sorry, who doesn't look back?

Interviewer: Well, can I quote you from your own book or is that terribly gauche? You write: In reality I find the later generations don't look back much. If they do look back, they don't care about it. And then you go on to speak that perhaps you were an exception to that and your experience in Michigan with the deforestation but I'm walking around the world and I'm not the only one, with a massive chip on my shoulder about how the political landscape changed because of the '60s and how, although I'm aware especially of the women, that there were some fantastic outcomes because of that. At the same time we're in a highly, a world that's dominated by global corporations, there's a lot of consumerism about and when I first came across hackers, this was my big tonic. This was like, great, these guys have the power over their own, they're not just consumers, they're creators. This is so fantastic. And it felt new and it felt like mine and then you see how bitter I was when I discovered that actually it was invented by the same, you know, '60s hippies that brought us individualism and rapid consumerism in the first place and it kind of throws my world for an entire week.

Respondent: Well, I didn't realise we were responsible for consumerism.

Interviewer: Well, I don't know. This is the thing. Perhaps you're not to blame.

Respondent: What's wrong with consumerism? I don't get it.

Interviewer: I suppose when you live in a world where you're expected to forge your own identity through, and this has been how maybe the counter-cultural thing has been hijacked by the corporate world, embraced and extended even …

Respondent: What's wrong with the corporate world? I don't get what's wrong with consumerism and I don't get what's wrong with corporations per se.

Interviewer: Well, I have, I guess I have strongly stated views which are loosely held in this arena but, as a citizen, when you're campaigning for civil rights that seems to me you have much more power now over consumer, campaigning for consumer rights. So on the climate change problem where, or the climate change issue, we're encouraged as a society to travel less and do all the things the individual can do and governments almost seem slightly off the hook. I mean, when Copenhagen failed, you see and, I don't know, it just seems like a shift of power. It's a personal feeling which I'm trying to, which isn't probably that interesting to the grand scheme of things 'cause it doesn't make a lot of sense.

Respondent: Well, it's interesting but it's, the problem I have with that one [unintelligible 33:57] climate is it's not enough and so as a card carrying libertarian, I'm forced to say, 'Well, there's no other entity besides governments that can make coal expensive.'

Interviewer: Yeah, sure, sure.

Respondent: Consumers can't do that. Market can't do that. Corporations can't do that. Environmental groups can't do that. United Nations can't do that. But England can make coal expensive.

Interviewer: Right, and yet if you said …

Respondent: England made coal cheap. You guys started it.

Interviewer: I'm sure it was our fault. We're pretty much to blame for every ill of this last century.

Respondent: Never mind blame, it was, hell's bells, you know, we wouldn't have computers without the industrial revolution so something good.

Interviewer: But if you hung around government much then you learn, as have I a little bit, then you know that you can get, especially I guess since my experience has been around copyright and digital rights and that, so you just get this impression and I know Laurence Lessick got it as well 'cause he swung his career as soon as he got there, that the whole thing is captured by corporate interest rather than public interest.

Respondent: I agree. And yeah, copyright issues I'm one with freeing that stuff up since in a way the most important part of information wants to be free, I think. And so Laurence what's-his-name at Stamford …

Interviewer: Lessick.

Respondent: … Lessick, is dead on and going after Microsoft was an important thing to have done and I would love to see [unintelligible 35:37] going after exactly the same way and the same frame. Where they do the most harm, I think, is not with patenting things like Glyphosate is pretty reasonable. That's the round-ups of herbicides, some really good herbicides and ecologically is good and herbicides you can have. You know, it's a very major development and good on [unintelligible 36:09] for doing it and for commercialising it and so on. It had been developed in some university lab somewhere it would have gone nowhere because unfortunately there is not good transition between labs and business. Better than it used to be. Anyway, they did that and when they got into genetic engineering they patented a number of the research techniques, often working with universities and so university people with university money and other [unintelligible 36:44] money would develop something and then would be licensed to and then buy [unintelligible 36:50] and nobody could do that research without asking Monsanto's permission and paying him a fee of whatever. And so it stifled research and that, I think is absolutely intolerable. So that, to me, is much worse than patenting some genes or some seeds to stifle the research process. There's no excuse for that. So I'd love to see him taken to task and there were other issues and the activity of the foundations and the transgenic crops world is quite crucial, especially the Bill and Melinda Gates Foundation.

Interviewer: Do you find that ironic?

Respondent: Yeah. Oh, it's delicious. You know, they picked up on what the Rockefeller Foundation has been doing for years. Rockefeller Foundation invented the green revolution, saved a billion lives, found [unintelligible 37:42], set him loose. He worked his ass off for the peasants in Mexico and developed what became the amazingness of the green revolution. And then was prevented by environmentalists from taking what he had done in South Asia and making it happen in Africa. There's no fucking excuse for that, in my far from humble opinion. So the Rockefeller Foundation has been crucially important in all of that and they've basically handed it on, to a large extent, to the Gates Foundation, which operates on a much larger scale than Rockefeller ever did, frankly. And in places like Africa and South Asia very, very effectively they're working with breeding, with precision breeding, with genetic engineering, with whatever else comes down the pipe to make better food and better crops. And …

Interviewer: But they're also doing that in a framework that's …

Respondent: And to undermine Gordon Conway here in London at Imperial College, was head of Rockefeller Foundation and he basically hammered on Monsanto to free up research patents and other stuff 'cause he basically was able to say, 'Look, here guys, cassava feeds 800 million people but it's an orphan crop as far as Monsanto's concerned. So, you know, let research go forward and [unintelligible 39:15]. Let the research go forward on this amazing [unintelligible39:20] improvement in cassava and [unintelligible 39:22] and that has been done, thanks to …

Interviewer: There are about 70 patents …

Respondent: Thanks to basically working with corporations instead of fighting them. And Gordon Conway also, when I think quite, in some ways, the other, one of the other

big beefs against Monsanto is that they were going to do this whole terminator gene which was going to be sterile corn and which hybrid corn already is. I mean, everybody has to buy hybrid seed for the garden and for everywhere else every year. And, but they were going to sterilise the corn and that was treated as some kind of terrible thing because it was going to enslave was the word that was used quite a lot, the powers who [unintelligible 40:10] I mean, they don't enslave well at all. So that's not happening. But, and every farmer buys seeds from all sorts of sources and they're always comparing and contrasting the seed, the price, the quality and all the rest of it. That one's, I don't think, an issue. But it would have been swell to have sterilised, engineered crops because of the issue of what's called gene flow.

Interviewer: Sure, sure.

Respondent: And so, you know, well actually it's the same with environmentalists, you know, butting heads in the dark against themselves, saying, 'Well, we mustn't have gene flow. We mustn't have sterilised agricultural plants either because that's enslaving these poor farmers.' So it's just absurd. So what one wants to do with Monsanto or any other corporation [unintelligible 41:08] is, they're so big, they're like nations. It's like saying Britain's always wrong. It's not always wrong but it's not always right either and so, you know, what one does as a political activist or a participant in government or whatever is you just try to sort out what's right and what's wrong. Take the wrong stuff, identify it, try to make it better. You know, look carefully at what happened with the Blair administration in Iraq and things like that and lessons learned and don't do that again. Same thing with corporations. So the thing I mainly resist is that all consumerism is bad or all corporations are bad. It's just, nothing useful has been said yet. And in fact, the opposite of something useful has been done because it prevents further thought or further investigation or further pursing of the actual situation and an adjustment at a micro-level, which I guess is sort of the underlying idea that we're talking about here, an adjustment at micro-level is what typically makes things go pretty well in evolution and squalor cities and business and ideally in government.

Interviewer: Sure, sure. OK.

Respondent: Sorry, you got a bit of a rant there.

Interviewer: No, I liked that rant. That was an excellent rant and I suppose, in a way, it's not surprising if corporations are fulfilling the same role as maybe the military industrial complex did in the '60s as something to be scared of, and at the time I guess that wasn't something particularly that you, you didn't succumb then to being blanketly scared of that edifice and, in fact, maybe that helped you see farther in terms of where computers were going to go?

Respondent: Well, certainly the theme of counter-culture to cyber-culture is, I think, more than is actually there but I'm OK with it. I'm OK with the book generally, obviously, but I mean, Marshall McCluhan was inspired by commandos. His idea of management was that he was sort of the Special Forces A Team, that's what he'd be called now, which I got to study when I was working at the Pentagon in 1960 and they got their green berets from Jack Kennedy, Mike Manergee, and I was sent down the photograph [unintelligible 43:49]. They are the ones who basically enabled the end bar awakening in Western Iraq. They are the ones who are, if anything good comes out of

Afghanistan it will be the Special Forces guys and then the Navy Seals and other of the special operations guys who are pretty damn good. The Special Forces guys are these professional nice guys. Their job is to understand at an anthropological level what the local situation is, blend in with it and while keeping all of their muscles, just being very gentle. And it's an amazing accomplishment within, specially given that it's within the military, and the only reason you would have an accomplishment like that is because the military has to deal with this life critical and national security critical set of real undertakings in the real world. And as a small unit commander, which I was, you've got to accomplish a mission, you've got to take care of your people. Those are absolutely contradictory requirements. And hell, for a 21 year old to look up to you being responsible for the lives of 50 people. If you screw up they get dead and you're responsible because as the commander of the unit you're responsible for everything the unit does and fails to do.

Interviewer: I get the impression, actually I don't know if I've got this right, after the late 1980s, early 1990s, after the hacker cons and when the world was nicely running …

Respondent: Yeah, that's '83, '84 they were basically [unintelligible 45:42] taking shape and the hackers conference happened about the same time.

Interviewer: How involved did you say in the way that personal computing developed after that?

Respondent: That's interesting.

Interviewer: Did you stay as closely involved to kind of comment on where the next generation took it or did you …

Respondent: Well, I had a lot of stuff on "personal computers" where they existed in [unintelligible 46:07] section and people like Shell, [unintelligible 46:13].

Interviewer: But say when Tim Burns …

Respondent: And the same when Ted Nelson came along, he was, he did computer-led dream machines sort of as a riff on the whole catalogue, speaking to exactly the same audience in very much the same way, in very much the same language with also an introduction of a whole lot of new language and new ideas. And people found it quite exhilarating.

Interviewer: What kind of new language? What kind of new ideas, do you think? What surprised you?

Respondent: You know, the concept of hypertext was developed to a large extent there, riffing on Engelberg which Ted had studied pretty closely and revered. Describing data when it's properly managed and, you know, everything is inter-twingled. That was definitely a new term. And computer lib, liberation, was an important concept for a lot of people that, you know, because it turned the left of the early '60s [unintelligible 47:38] the idea was that computers were these terrible instruments of control, centralised control. IBM, Big Blue, the enemies etc etc. And Apple was founded in a sense as a riposte to IBM and, much as Google was founded

and someone, you know, don't be evil, with them it's Don't be Microsoft. So each of these things is a response and that's why I keep being impatient with people who bitch about Monsanto. You know, OK so Monsanto was the new Microsoft. Go out and be the new Google. Don't just, I mean it really would be like saying, 'Well, Microsoft is bad, therefore nobody should use personal computers.' Which still may happen because the [unintelligible 48:35] of the global north fell in love with micro-computers very early on, word processing and all the rest of those capabilities basically freed us up to do all kinds of stuff. We were worried about email, we were worried about all these things. If we had been worried that way by genetically modified seeds, same sequence of events would have occurred, that we're not, Monsanto would not have the controlling position he still, to some extent, does. So that's interesting in its own right. So what, here's what I think it will take: I think it will take genetic engineering coming into the garden, garden shed biotech will free this domain from the approbrium that it undeservedly got for an important three years.

Interviewer: So the guy I live with is a bio-informaticist and we were talking about this and particularly about bio-hackers and whether this garden shed, actually that's taking the garden shed metaphor a little differently, but whether this grass roots bio-hacking will take place. And he said, 'Well, of course the difference is that if you start buying the equipment you need to do this stuff you get arrested because someone thinks you're making a super-virus.'

Respondent: Dual purpose and stuff, yeah.

Interviewer: And it kind of makes me think about the fight for hacker freedom.

Respondent: Come on, the IGM, there's two varieties of bio-hackers. One is the IGM crowd which are all school-based, partly because AMIT, Jamboree Crowd, they've sort of said, you know, 'Should we be letting in amateur groups?' And they decided, you know, there's just enough of a legal or liability issue and because we're so concerned in keeping very good bio-safety practices, bio-security awareness going in the bio-hacker community we, as an institution, putting on this institutional jamboree year after year, would prefer to deal only with other institutions where they are overseeing the students that are doing the work and so on and it doesn't need to be colleges. It can be high schools and whatnot. But we want a certain amount of institutional oversight. There's another outfit run by one of my wife's former employees, Jason Boad, called DIY Bio and DIY Bio is taking the same body of ideas and techniques and machines and so on into the amateur realm and meeting online endlessly. They're sending around bio-books, they're conferring relentlessly on the ethics and bio-ethics of what they're doing and basically taking outside the institutional realm from as much of the ground up as they can, the responsibility of treating all of this with great responsibility. Now, the same sequence will occur with bio-hacking as has occurred with hacking, which is at a certain point it becomes organised crime. Now, it took a lot longer than everybody expected back in the day. Back in the day people in the government, US government at least, were very concerned about hacking. Bad things will occur. The internet will be taken down. The hypernet will be, you know, hopelessly compromised etc etc. And those things have occurred but, you know, the various worms and viruses and whatnot would be released into the net and then they'd be detected and antibodies would be developed and on you go. Two years ago GBN happily does a lot of work with the national security people and the intelligence community in the US, who I love working

for ‘cause they’re smart, engaged, serious public servants, and dealing with a world in which open source intelligence as intelligence anybody can get is at least of equal power, and in some cases greater power in some subject areas to what is managed in the espionage secret world. And that’s been a flood that’s been happening throughout government and science and everything else is, you know, once [unintelligible 53:24] came along and you started getting half-baked data in the public domain, which was then baked in public by other scientists or other people you thought were scientists and it turned out they were amateurs, but the work is good and now what, that kind of thing. That is also the case with the kind of intelligence you care about in national security, especially when you don’t have a cold war between two big espionage apparatuses. Al Qaeda really doesn’t care about America’s secrets. And if it did care, you know, it couldn’t do squat to get them and what would it do with them if it had them? So, and China might care and that’s supposed to be interesting. Russia might care and that’s supposed to be interesting. So anyway, we did a study some while back on the cultures of hacking with strictly civilian people who were aware of stuff going on in China, stuff going on in Eastern Europe, Estonia and various places and Bulgaria and Romania, Russia, Taiwan, Korea, South Korea, North Korea maybe. And the weird, there’s enormous money in hacking now. Billions, trillions of dollars being scooped out of the apparatus, you know, and just as we’re really pissed of at the investment bankers for doing great harm to the world economy, hackers are doing great harm to the world economy.

Interviewer: We’re talking about the sort of cyber-attacks that Google has been speaking about …

Respondent: Cyber-attacks and nabbings of stuff from databases and clearing account numbers and the shopping of that around and the many tiered, so there’s the script keys down at the level of running the actual exploits but they are four levels down from the geniuses that are developing the new hacks. And the geniuses who are developing the new hacks go to conferences.

Interviewer: Yeah, yeah, yeah.

Respondent: And, you know, have very well paid, legitimate lives. And very strange relationships which are still largely obscure between national government, like Russia’s national government, China’s national government who tolerate a certain amount of : Sure, go out and rip of those guys, not other guys. And in exchange for the permission to continue to do that we would occasionally like you to do a gig for us. And they do. And so, you know, Russia’s unhappy with one of their former satellite states, shut them down for a week. Bring them in line with a cyber-attack. Who did that? The government did that? Guys, you know, in some basement in Moscow? Probably not. Probably just, you know, some of the regular organised crime guys who were doing a favour for the guys who were doing a favour for them.

Interviewer: And the organised crime guys are hiring the Russian and Chinese equivalents of …

Respondent: I’m sorry?

Interviewer: The organised crime guys are hiring the Russian and Chinese equivalents of the guys I was interviewing at the Kaos Computer Congress in December who go to conferences, like you say. So where does this take us? Does that mean that …

Respondent: So bio-hacking will go in that direction at some point and there will be a, I fear, weaponised thises and thats, biologically and but then you raise the question: Well, can that be stopped? And then I'm persuaded by arguments like Craig Ventriss who says, 'Look, the time when bio-technology was most dangerous to the world was when it was hidden away in bio-weapons labs in Russia and the United States. Because, you know, those Russian bio-weapons labs who generated tons of weaponised smallpox.

Interviewer: Yeah, yeah, yeah.

Respondent: Jesus H. Christ. Weaponised smallpox. You know, the mind boggles. It's so much worse than nuclear weapons 'cause, you know targeting makes no sense with smallpox. If you decide to take down Washington DC with smallpox …

Interviewer: You're going to have to take out Baltimore as well.

Respondent: … on Tuesday, on Thursday Moscow is sick.

Interviewer: OK, but I want to drill down to this because in the '90s people like the EFF spent a lot of time defending hackers from laws that would, for example, outlaw encryption. We've had a lot of fights here in Europe around hacking tools. You know, the kind of stuff script, kiddies pick up. And yet there's kind of a shift, even, I work a couple of days a week for a foundation, the Open Society Institute, their information programme, and they were five years ago funding free speech online campaigns, privacy online campaigns, individual consumer campaigns, copyright reform campaigns. And now even they are realising that a lot of the attention is going to be around these new threats from Russia and China, these cyber-attacks and so are we saying that you can have this period of freedom, maybe even like drug liberalisation in the '60s. LSD is legal and then after a while it becomes illegal. That may not be a good comparison but we're going to have this pocket where we allow the good guys to develop in an open, grass roots, kind of bottom up way because that's kind of helpful in terms of solving some major problems and taking technology on the spot and then we crack down. Or do we never crack down, which is maybe what I heard you saying when you were talking about openness being the safest place for biotech?

Respondent: I think so. I'm trying to think of a crackdown that has really worked over a long period of time. Cracking down on alcohol had every reason to do it. I mean, the suffragette ladies were dead right, the drunk males beating up the wife was intolerable in civilisation. But the crackdown led to basically an invention of organised crime, at least in the US – Chicago and all of that. And the repeal of that and prohibition in the States. I'll tell you about a conversation with my father. He said, 'You're doing all those drugs aren't you?' I said, 'Yeah, marijuana and stuff like that.' He said, 'Those are illegal drugs?' And I said, 'Well, you know, alcohol was illegal, you know, during prohibition and you drank didn't you?' He said, 'No, I didn't. It was against the law.' Well I didn't have any comeback to that, did I ? Wow. OK. Sorry, I'm obviously of looser fabric than the old man. But obviously he was one of the few. Everybody else

just drank illegally and that was that. So [unintelligible 1:00:57] and, in a sense, this is the daily negotiation that is constantly going on in the economy, in politics, in personal interactions. I started using psychedelic drugs earlier than most and I stopped using psychedelic drugs earlier than most people started using them actually. I had my last LSD in 1969, not because somebody shook their finger at me but because I was tired of [unintelligible 1:01:24]. And I saw people trying to cure their personality problems with LSD which was exacerbating their problems, rather than curing them and so I thought, 'Well, OK. There's, something is self-limiting here and I think I'll just not bother with it any more.' That turned out to be the right thing to have done and lots of people went through various forms of that and the others [unintelligible 1:01:58] have, you know, kept on using a certain amount of these drugs from time to time, including some very effective people in business and, I'm sure, government and elsewhere and so what? And California's probably going to have to legalise marijuana 'cause it's the only way we're going to be able to balance our budget. Marijuana's by far the largest agricultural crop in California by a large magnitude.

Interviewer: Really? Really?

Respondent: And the government doesn't get any of that money. And it needs to. So it probably will.

Interviewer: So crackdowns in general, both prohibition on alcohol and prohibition on drugs …

Respondent: Prohibitions probably are counter-productive.

Interviewer: And a prohibition on hacking would be equally counter-productive.

Respondent: And so, you know, the [bill joy 1:02:47] we're just going to have to relinquish some of these technologies. I don't think it actually works that way. I asked Freeman Dyson about this once and he said, 'You know, technological [unintelligible 1:03:02] is not how it actually works in the world.' He said, 'All the scientists in the world talk to each other and when they come across a new set of tools that looks kind of questionable to them they just quietly back off. You don't need to have [unintelligible 1:03:17] conferences.' And indeed the [unintelligible 1:03:21] Conference, in retrospect and some of that is in the book, Jim Watson and others feel like it was all very righteous and self-righteous and all that.

Interviewer: And a bit misguided in the end?

Respondent: A bit overwrought and unnecessary from the scientific standpoint but, as I said, from my own feeling, I think it was politically an astute thing to do because otherwise they were going to be regulated by idiots.

Interviewer: Yeah, yeah, sure.

Respondent: So better to do self-regulation where people actually know what's going on and then back off as needed, as the data comes in and you realise, you know, this stuff's not as dangerous as we thought. Then to, you know, have an embargo on Cuba that goes on for 40-50 years, with nobody able to [unintelligible 1:04:15]. I'm not sure it

was a good idea originally and really not a good idea now. I mean, your politics have a tough time.

Interviewer: I just think, 'cause certainly here in England, that's where the internet service providers have been, I would, I mean if you speak to them they'll say they were, almost their hands were forced into self-regulation because it was otherwise we impose regulation and that led to, for example, some of the content filtering software that we use here in the UK against child pornography, you know, and now they're constantly having to keep the government away from adding more URLs to the blacklist as a filter for them.

Respondent: Interesting, I didn't know that.

Interviewer: So I don't know if government learn a few tricks or what, from that, but it is quite …

Respondent: I think so, yeah. [unintelligible 1:05:03] there is a new generation of civil servants and of elected officials each time that have grown up with these things and are not allergic to them. So, you know, Bill Clinton says they didn't inhale and Barack Obama says, 'Well, what was the point?' You know, and that sequence, Nelson Rockefeller was not allowed to run for President because he'd been divorced. Jack Kennedy was not supposed to run for President 'cause he was a Catholic and he had to sort of apologise for that. So these things move on.

Interviewer: Do you ever indulge in judging the generations that have come after you and, I don't know, either worrying or celebrating what they're going to do with the technologies you've seen develop?

Respondent: I'm inclined usually to celebrate. I mean, I don't use Twitter. I haven't that capability of multi-tasking and attention span management. But I'm enjoying enormously, you know I Google a word for my name and Whole Earth Discipline and so I see a lot of Twitter commentary on this book I just finished and never before in life has an author been able to see that fine-grained a set of response to their writing. And so my online version of Whole Earth Discipline I do not allow commentary. I'm not interested in commentary. Been there, done that, not interested thank you. But to go out and sort of screen for commentary out in the world I think helps me with my online version of the book a little bit better. Or at least more responsive, more than better, is the right word. And I completely buy Clay Sharkey's argument that I want [unintelligible 01:07:04] on Whole Earth Discipline is that the great advantage the young have is they don't have to unlearn a lot of stuff which is no longer of any use. And so they've just got cognitive bandwidth for grabbing new technology, making it their own, running off to their own horizons which is why a [unintelligible 1:07:23] has its own uses for new technologies which are, you know, I have said to commercial audiences, what is done in a pre-commercial way was new technologies, communication technologies being the obvious example, is where your markets will emerge. So, you know, find and follow free. That's also Kevin Kelly's line from New Rules. And that's been very well rewarded from the world. People always find a way to add a value which can be charged for. You know, the manual for some great open source operating system, or whatever, becomes very useful.

Interviewer: Or the service to install it on your computer if you're too busy to do it.

Respondent: I'm sorry?

Interviewer: Or the service to install it on your computer …

Respondent: Yeah, exactly. I don't want to learn all this stuff, can I please rent somebody who has?

Interviewer: I have one last question which I'm surprised that after over an hour, thank you, I'm unable to answer myself. Are you, would you describe yourself as a techno-Utopian?

Respondent: Let's think of a better term 'cause Thomas Moore was amazing to have done Utopia as a kind of set thing, as a book. But Utopias in practice are invariably Distopias. So Utopia tells you that Distopia will happen when you try to plan ahead, so. Probably techno-optimist is accurate. In the sense that I think we are more often surprised in a good way by new technologies than in a bad way 'cause, you know, with all these things if you're looking for trouble you can find plenty of trouble: child pornography online or whatever it might be. But being an optimist rather than a pessimist gives you permission to grab something and run with it. So if environmentalists, for example, had been techno-optimists about genetic engineering it really could have been green from the ground up instead of having to have green sort of painted on it very late in the day. And by being techno-pessimists about that, and environmentalists are often techno-pessimists, sort of understandably but not understandably at all. And we will be that, in the very concept of techno-Utopian would be part of what we trend against, against technology because techno-Utopia says Brave New World, which I'm re-reading now. We, the technoids, know the future and are spelling it out for you. That's what Utopia is. It's there in Plato and it's there in Thomas Moore and my sense is the opposite, and as Kevin Kelly's basic line is that what technology does is open up more options, opens up more freedom, opens up more surprises, opens up more pensive development, opens up resilience in the overall system. All of this seems to be the opposite of the convergence that a Utopian set of ideas might suggest. And my generation is lucky in that we all got to go out and try to make communes work, which pretty much universally failed for various reasons. A lot of them was we thought that our ideas would prevail and ideas don't prevail in social situations, you know. I mean, people sign the contract and then realise it sucks and then they leave.

Interviewer: Is there anything else you'd like to talk about before we conclude the interview that you think I should have asked?

Respondent: No, thank you. That was fun.

Interviewer: Thank you very much, that was great.

[End of recorded material]