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Interview with Steve Wozniak

By Brian Riley
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BRIAN RILEY: Do you have any particular topic that you wanted to bring up when you get to UC Davis for the October 29th event?

STEVE WOZNIAK: I don't know how it's structured. I have to look. Sometimes the event's structured, so I don't have that much choice on the topic and sometimes I do, so I couldn't tell you. I mean, I'd probably just bring up a lot of topics relating to–I don't know–creativity, innovation, how we're often kind of dissuading people. How we define intelligence almost as being *non*-creative in ways. I might bring that subject up or I might get into issues of the Internet, the Cloud, what it means, some right and wrongs, some problems that are coming in the future. Maybe evolution of devices as I see them. You know, how they're going to be more and more relating to humans, like on a human level, then all of our personal traits, you know, our history of computers in my lifetime, it's almost always a move in input-output directions toward working better with humans and then working more like a human. So it could be a lot of different things that I like to talk about, but I'd have to look at what the specific topics of the day are.

RILEY: Could you expand upon what you just mentioned about creativity?

WOZ: Well, that gets more into the educational system, but it also involves home, it involves the culture of the country, but basically intelligence is very much defined as having a lot of right answers on a test, and the right answers tend to be the same answers as everyone else, especially in the younger years where it matters the most, because by third grade kids decide whether school's important or not. You know a whole bunch of them have kind of just dropped out, not trying to be as great as they could. It's just the nature of the competitive system. But we try to teach everybody that's the right answer, there's one answer, same as everyone else, and it's not *your* answer. It's out of some book. It's a lot of memorized information and the person who has the most handle on the memorized information is the most intelligent, rather than the one that sticks his hand up and says: "Why isn't it something else?" or "What about this?" Or, I know how to calculate how when two canoes meet in our river, but no river's going to go the perfect speed, or even, am I ever going to be disliked or called "disruptive." So education you get for personal reasons and (from) other places is often a lot more important as far as how the mind works in ways that get you through life. You really don't learn those in class.

WOZ (cont.): So there's different techniques–So our intelligence of intelligence is just basically faulty and wrong and it's just made up the only way we can think of doing it.

RILEY: How would you recommend that elementary, grade school teachers teach differently or not teach?

WOZ: It always boils down to money. One teacher, one student does not fail. If the teacher cares, whatever problems the student has they go back, they get the understanding all the way along. You're not allowed to pass through, sort of half understanding some stuff, then everything's going to be built on the last thing and that's going to build on the next thing, and if you miss out on some steps, it doesn't show up and you have trouble from then on and you're just called: "Oh, you're having difficulty learning." Well, you missed some of the earlier steps, but a one-on-one teacher never fails at that, and in a class of 30 you can't go back for each kid having 30 different problems and go back and try to fix the one little problem. It's just efficiency. Efficiency boils down to money.

WOZ (cont.): For one thing schools don't have as much money as nature would have given them, because money for schools–Education's considered a right. It's been considered a right for hundreds of years and that means that not just the kings and the wealthy get it, but anyone gets it. Because of defining it as a right, it has to come from governments. Only governments can supply it to everybody, you know, and handle that equality and fairness thing? And when money comes from a government, it only comes in accordance in our system and all the hundreds of countries that have democracy. It just comes from votes. If you have more votes in a certain direction, you're going to get more money in that direction, and the votes for schools are deprived, because children don't get to vote. A family of five that wants good schools gets no more voting power than a family of two that doesn't want to pay for schools, and so we got a problem right there.

WOZ (cont.): Secondly, I do–I hope to God that someday my work contributes to having one real humanlike teacher, a computer that's really humanlike that is really your best friend that knows your soul and your inside thinking better than any person does and knows how to back up and how to say things to you differently than to other people. Once we have that, one low cost computer, one low cost teacher per student, maybe we can have the students all going at different paces. There are a few good school projects, but they're very rare as you go around the world. You see some schools that have these kind of mixed curricula where different kids at the same age are going in different directions on different subjects at different paces, and I want to see a system where everybody comes out with the equivalent of straight A's. You go to school, you come out as educated as everyone else, and it might have taken you longer, or you might have gone in a different directions. Not only that, I'd like to give the kids the chance to say–You know what? If you want to get through this course, you could take 100 hours of instruction online on this little computer, or you could sit down over a couple weekends and whack out the whole course in one month and go take vacation and have free time to move on to something else. Think of how many people would love to just dig in when they're young and work really hard just to get done sooner–if they're fast. So I see a lot of different things that I bring up in that whole area that really it's going to boil down to, you have one teacher per student, you'll never fail with making them very educated and thinking, too. You know, that's a problem. You can't really give people a chance to think independently in a class, because you have 30 different directions to handle every minute of the day. And if your kids in class–By the way, if your kids in class don't understand something, a teacher doesn't have the freedom to go back and re-do it. They're responsible to the administration. The teachers are being judged on what page of the

book they're on–Monday, Tuesday, Wednesday, Thursday, Friday. They don't have a chance to go back and make up for something that maybe the kids were excited about something one day–a field trip–and didn't really pay attention as well as they should have. No, teachers can't go back at all. And secondly, right now we got teachers' unions, and they'd rather teach 30 kids poorly than 20 kids well, because they get paid more money.

WOZ (cont.): Some cities have ways to pass tax overrides–property tax overrides in California, which is the worst in the county in class size–50th in the nation. Mississippi at 49th is way behind, 47th in money per student, 43rd in computers for students–Those sort of numbers. California's way behind. You can have tax overrides for cities like Cupertino and Los Gatos that believe in good schools, but you need two-thirds of the vote and only one-third of the people have kids in school, and it's very difficult to pass those things. There are other kinds of elections that pass bonds to get more money for school districts, but those bonds never go into better education. They go into nicer buildings, better buildings, stadiums in the school, nice indoor track-and-field things. It goes into all those areas. Those aren't education, really.

RILEY: Do you think we should fund the school districts equally over the whole state or allow them to be funded locally?

WOZ: I think that individual treatment involves looking at individual situations and deciding where the most need is. People in a city can always vote to pay more money. So, if there's a wealthy community or a community that believes in schools a lot, Cupertino and Los Gatos have done this for 20 years now, and a few other cities, throwing in with the property (tax), but it's so hard to pass it. You need 67 percent of the vote and you don't have 60 percent of the people with kids in school. It's tough to find the communities where people think that education is deprived, meaning should have more money, should be better than it is now.

WOZ (cont.): And besides this, we're in a real bad situation to determine how to run education anyway. It's always a matter of money and we just take a side. We're a side-taking community. Nobody does a calculation that says: Here is the percentage of the GNP that should go to education. Nobody does that. They just say: "I'm for schools" or "I'm against schools." "I'm against the wasteful amount of spending," or "I'm for kids' learning," and they take one side or the other without saying: Is the number that's being spent on schools above or below the number that I would calculate as being the right number?

WOZ (cont.): So we don't take the intelligent approach of saying: What is the right number? Are we over or under it now? That's too much thinking. I'm sorry, people are not going to think. They just wanna quickly take a side because that's a lot easier. It's just like a football game, and that's what we're taught in schools: My school right or wrong. My team right or wrong. That's drilled into us from the time we're in school and you'll always support your school without ever questioning who's better. You know: What's really good?-even if it's sports. It's just sort of a bad thing. Go to any professional sports game, everybody boos the referees when they call a foul against *their* team, and it's just which side you're taking. It's not that you really, really logically see things that way. So we're just a community that doesn't want to think, just wants to take sides and that really just goes with our two-party election system.

RILEY: So what you just said about K through 12, a lot of that also you would apply to the higher education level, public universities, too?

WOZ: Yes, but less. Less of it. You still have to get through a (inaudible) and follow the maze carefully, and there are differences in people by that age. There's a lot more room for independent, free thinking. To me, I really see that the free thinking comes more on your own time. Take the class. You know what? School is a wonderful place to be in, it's like, oh my gosh, you're the family pet. You're being taken care of, your expenses are paid. Well, a lot of people have school debt, but you can work, you can work and pay for your school as you go, and then on your own you have your own little things that interest *you* in life. Personal things are going to motivate you so much more than a grade from a school. That grade from a school doesn't mean anything compared to–oh my gosh, achieving maybe just getting a certain speed on a crossword puzzle and that's my *thing* in life, and my pastimes, my hobbies, the things I do on my own time. Those are the things I really love. Well, you have a lot of time to do that in school, I mean, you got bookstores that are full of books on some subjects that you might think you're interested in, even if it doesn't pertain to your major, even if you're not taking the course. Especially in the university, if you don't want to go out and party all the time with everybody, you've got a lot of time for doing some great learning of whatever you wanted.

RILEY: Are you glad that you went back to finish your bachelor's degree?

WOZ: I'm quite proud of it. As a matter of fact the proudest day of my life was actually getting that degree, because it was the most important work I've done in my life, but see I didn't really drop out of school, saying school's worthless or something. I had three good years, and I was so skilled at the engineering work that I did that I could get hired anywhere, so unfortunately my career took off and I didn't have a chance to get back for a long time. So I was just going back to finish something I long started and worked many years on already. So in that sense, by then I did not have to go back. My résumé was the work I had done for Apple and things like that, so I didn't need a degree, but then I did think in my head. My parents talk about their colleges and somehow it meant something to me when I was young, and I wanted to be able to talk about my college to *my* kids.

RILEY: Did you want to comment on the funding crisis in public universities today?

WOZ: I don't know what it is in public universities. It's sort of like everything is squeezed these days and everything that can be seen as, hmm, skippable, as not essential is going to be pained, I think, for a long time. I don't know–So I don't know what it is in public education. I know I see a lot of articles about (how) students are protesting the raise in tuition and whatnot. It is what it is. You know, state colleges, when you're in your own State of California, the tuition is so subsidized already by the citizens of California–the voters of California. I went my first year of college *out* of state. I paid out-of-state tuition. It was an ungodly amount. I couldn't even translate it to today's dollars. You'd probably jump with a little heart (pumping). So in-state was *so* much less expensive.

WOZ (cont.): And, you know, you have a lot of options. You also have a lot of options (in state). Go to a community college for two years and live at home for two more years. Yeah, you miss

out on the greatest time in your life, getting out with other people all on your own, but you're gonna get there by your third year anyway. I don't recommend it, but money-wise there are good trade-offs.

RILEY: Trade-offs to what?

WOZ: Trade-offs to going right to a four-year college. I think going right to a four-year college is the best time you'll ever have in a life–the best four years, the most important four years, and you'll want to be around people who think like you. Which school you choose matters very, very little. You'll get the academic material one way or the other, the same levels at any school. But you wanna be around that and you wanna have that fun time in life. You want to have that growing time. You want to find out what your values are, your ideals, your ethics, what's right, what's wrong, and that's around the time that it's solidifying–your whole personality, and you're going to be that way forever. That's an important time in life. My first recommendation is try to get to a four-year school, and it's expensive, and go away from home. It's expensive and not everyone can afford it. That's just one of the aspects of life. Probably always will be.

RILEY: I read that when you and Steve Jobs went to K through 12 in California we had a better system and people attribute a lot of California's–your success, California's success to that better system then, and also today to higher education–*public* higher education, today that's helping people succeed in Silicon Valley.

WOZ: I don't now how to judge today compared with then in higher education. I do have a feeling–And this is just something you sort of remember in life–I have a feeling that the school programs are very limited today. A lot of the ones that I remember that were really great, and even elementary school all the way through high school were so important a part of my life and so good and they just sort of get thrown out for, you know, you gotta teach the same standard basic things that have been taught for 200 years, and everybody's gotta be taught the exact same things, and there isn't that much room for all these little extra programs in the schools that there used to be, and I really strongly feel that whenever I visit schools and look at them and talk to teachers. There's a *little* bit in optional programs, and there's still some arts and music gets in, but not to the extent that we had when I was young. It just seems like things did change. Maybe it's economically based.

WOZ (cont.): As far as universities, I think there's an awful lot of courses now in universities for entrepreneurship. And Steve Jobs, really, was very much against the schools even when he grew up. He just basically thought oh, the teachers are dumb, and didn't really–He cared about, like all of us, one or two teachers are important in our life, and that never goes away. Teachers are very important and should be liked and much more supported than they are. There's categories in life–I blame it–a good teacher does as much as any doctor or lawyer and the pay doesn't reflect it.

RILEY: How about current UC Davis students like myself. I'm a graduate student, but undergrads, too. We're trying to figure out ways to be more creative and be more successful in our education? Do you have any advice?

WOZ: One thing is to try to come up with personal projects for yourself. And at first in your life, the little projects you come up with, you know, it might be just to learn a certain thing. It might be to get good at a certain game. They have no money value. They couldn't start a company. You shouldn't start thinking at the top right away. It's like: Well, for a while I'll get a job, even if I'm kind of good at something on my own and I'll just work on it until I've really developed what I think will go. Getting taught that, oh, you come right out, you've got the tools to make presentations and put things on paper, defining a little business for yourself–entrepreneurship. I don't–I don't believe in that strongly, because it often leaves out knowing a few sharp technical guys that can do something other people couldn't do that will come up with ideas that are more outrageous than anyone else. You gotta kind of scout the creative people. You know, by the time you're out of college, the level of creativity in people varies and you can tend to spot it. And that doesn't mean, you know, you need good managers, too. You need people that are non-creative along with the creative types, but you've really got to trust a lot of the creative types for ideas and visions and the willingness to believe that something's possible even when the normal thing for what you've learned in school says this probably isn't possible.

RILEY: Could there be–I don't want to focus necessarily on Apple, but just to use it as an example–Could there be such a thing as Apple being too big of a corporation, such that it stifles creativity?

WOZ: You know that's always been the case, and it's always been said, and just because we've heard it doesn't make it a reality, but I see–There are companies (that are) very huge, like Google, that actually approach kind of sharing with the world a little bit more than Apple does. Apple says anything that'll run on our product will have to be sold through our stores, have to be, you know, built on–like they want tight control, and that's sort of like the old Communist thinking that we were brought up with being told was really bad, the people who control all your thoughts and your options and your pricing and all that. You want to have the room as a young–See, I was a young scientific-technical guy when I was in college. I could think of ideas and I could write programs and run them on any computer, and now, now I really can't write a program. I couldn't sell it to anybody on a computer. I could write it and run it on an iPhone if I get a developer license, which isn't too bad, but it's like, I don't like the world closed off to me as to what I can think of and do just because the big company wants to hold onto that territory for their own profit reasons. Yeah, you know, I feel bad. I'm always for the little guy. I'm always for the little entrepreneur over any of the big ones, but, you know, it's not just Apple, it's every big, established company.

RILEY: So wouldn't you say that, just like HP turned you down when you proposed the micro-computer, that's a drawback of big corporations, right?

WOZ: Yes and no. HP didn't turn it down for big-corporation reasons. HP was a company that had a company culture. Every company does, and it's very hard to move outside of your company culture. HP's company culture back in those days was not what it is now. It was: We make some products that engineers use. We make tools that engineers use. We understood engineers very well. So an engineer at HP at the bottom of your chart could be the chief marketing guy, too, because he knew the market. He *was* an engineer. He was *part of* the market. Now, HP would have built the Apple][computer not as a fun, nice, colorful machine for the

home. They would have built it as a boring, you know, black and white, lousy keyboard, professional tape drives, machine for engineers with a much higher cost and much lower features. They would have built the wrong machine. And they couldn't really–and the machine I was describing didn't fit their culture enough, and they turned it down for some pretty good HP reasons, and looking back I'm always glad that they did. I wanted them to do it so badly at the time. I wanted to be kind of like a hero within HP then. I loved that company, but if the machine had come out so different that it didn't inspire the whole world of personal computers, then I would have felt bad.

RILEY: Do you think we might have to revamp our general political system in California and the US to improve some of these things that you're talking about? Like funding for–

WOZ: I don't see any way to revamp it, so saying "we should"–It's not just a matter of we make a decision. I think if you ask people: "Would you want the political system to be really revamped, and here's few categories and ways," I bet you could get 90 percent of the people to say yeah, they want (that), but it's just not gonna happen. I mean, the powers that control what can happen–You can't move–People actually, believe it or not, as much as they say they want change, they don't like the way it is, they don't want very much change at all, ever. They prefer the status quo, the trusted guidelines of life and how it works and what we have and how decisions are made and what we do in life. They really are pretty scared. They don't want to admit it, but it's part of that not being as smart as we think we are...

WOZ: (cont.) We've got a lot of flaws in our system. We just–We talk like: "We have freedom and democracy." What a joke. What a joke that is... This country was never founded on equality and freedom. We're just taught that in school. We're not the only democracy in the world. There's tons of other democracies and most of them are *more* democratic. We've got so much, you know, control over our lives in this country–So, we believe all these lies, and then we stick with it, because it's "my country right or wrong"...

WOZ (cont.): A company says: Here's something we can do for our company, our employees and for the world, and here's how much it's going to cost, and here's the benefits. Ooo, this one's not worth doing. Here's one where the benefits way outweigh the costs. Let's go and–Let's go after it. Well, a country never works that way. It's just infinite money, nobody, you know, politics, make decisions, look good, and never ask how much does a war really cost people. You just, no, "You have to go do it," because it's one of the things we do. You know we got a–We have a–It's a big joke and we just fool ourselves. Freedom? Our country wasn't formed as an equal country. We had slavery to have cheap labor. Like we have in China now (that) we complain about? We had cheap slave labor and that made our country really big. Now, none of the countries in Europe had that. Mexico didn't have slaves. That's why Texas broke away from Mexico. That was one of the reasons, and became a country of its own for a while.

RILEY: So are you saying there's a lack of *authentic* democracy?

WOZ: Exactly. It's very easy to play with us and we don't have an awful lot of choice, and as far as this part of, "We stand for the good of the world," I just–I'm sorry, I don't buy it.

RILEY: So what's the–

WOZ: You get to the top and you have corruption. It comes with money and it comes with power. And you have corruption, you'll just try and get more and more and we have the greed. We have way too unfavorable a distribution of resources in this country compared to countries like Australia, New Zealand. Canada is so much more even-distributed, as far as education and income and things like that. So we have all these inequalities. And we'll always think, "Oh my gosh, we're the most fair and equal of all"–It's just a lie.

RILEY: So it seems like you're in tune with some of the themes of the current Occupy Movement?

WOZ: I understand them as–they're–where it's all coming from, and yes and I would agree philosophically and logically that they are right, yes. When I was young, I was taught that if we learn and we go out and create new things as engineers, we're going to make all these devices that do things for us and make life easier so we don't have to work as hard. And my dad, I remember him telling me when I was young: "And so someday we'll get to have more entertainment and more movies and we'll have maybe a four-day work week." Well, you know what happened in Silicon Valley? Now it takes two people working full time, stressfully, just to have a house in Silicon Valley. That's not a four-day work week. That's *both* people having to work now and it's very–It's much more difficult and it doesn't seem like: "Oh my gosh, like it's a whole new–the whole world is ours. Life is easy and everybody's kind of taken care of." No, it seems that we've gone way backwards. And yet we're successful. We've created this incredible wealth. But where did it go, because it didn't go into our own entertainment and our own lifestyle and make things easier for us and give us a four-day work week. Where did that money go? The wealth? It all went to the top. You know, yeah, that's wrong.

RILEY: And so how can we remedy that?

WOZ: Well, we can't. I don't see any way to remedy it, because the powers of money really control all the workings of the government, and we can't change how our government works about that. They're never, ever gonna get taxed the same as us. You know, nobody–In my life, I've never heard one politician propose–what do you call it, a "flat tax rate"? Never once. They propose flat taxes on earned income. But never once do they propose that capital gains–another method of gaining–the greater method of gaining wealth for the 1 percent–capital gains should be taxed the same as ordinary income. Why, why are all these tax laws gonna favor, 1–you know, the rich people? Is that right? No, I don't believe it's right. So, but there's no way to overturn it, because we don't have the money and the power.

RILEY: How about the new–the coming Information Age and the kind of democratization of information sharing and open source collaboration and open research. Could that make a difference?

WOZ: As far as open source, open collaboration–hard for me to comment on it. Just, it's such an open area. There are so many aspects to it. As far as the Internet and the Information Age–the Internet came about in my lifetime; I was right on top of it from the early days–and at first it *was*

a source of democratization. Everybody had an equal access to it. Everybody could publish. Everybody could send things to anyone anywhere in the world, and now all the barriers are popping up as to what you can and can't send on electrons and who you can send them to, and the fact that it's all monitored. There were laws against mail, in my life, being monitored without court orders and all. All the Internet stuff is, I just assume, is (inaudible). So it's really gone the opposite of the way that it seemed it was going to go at first.

RILEY: It sounds almost like you're saying we need a drastic change.

WOZ: I would be for a drastic change, but I just–See, the trouble is, change only comes from the people, and if you run around and poll all the people in this country–phht–that I don't think a lot of them really feel the way I do. I really think the masses just want things the way they are. They want tight control. We gotta protect against "terrorism" and things like that. You know, they'll call any terrorist act a war and–phht–There's so few people that really want to sit down and say: How can we really, really–What is the right system, and how can we get there? We're never gonna get there. It's in our culture.

WOZ (cont.): You go to countries like New Zealand, you're going to find a whole different world of the way people just talk and think and, you know, the freedoms of life.

RILEY: Would you consider sponsoring some big concerts again like you did before in the '80s?

WOZ: (laughing) Probably not sponsor them, because I did my fair share of sponsoring them, but we almost put on another US Festival in 2009 and 2010, but the guy involved who was really behind it and financing it, died of pancreatic cancer, so, bummer.

RILEY: Do you think perhaps something like that could excite people and get people–

WOZ: Yes, yeah. I actually think that concerts appeal to an awful lot of young people and thinking people who get messages about life in words of songs, and music affects their feelings and their thinking. I think that it can reach an awful lot of people, and if you combine that, like what I did, with a technology fair, or fairs with speakers speaking out about, you know, maybe younger, different types of movement. You'd have a chance. You'd get a large number of young people behind it. It's only going to start from the university-aged people, just like it did in the Viet Nam days.

RILEY: If Apple came to you and said: "We'd like to hire you to be CEO," would you accept?

WOZ: I would question it very deeply. I'd only accept if I felt that in the end it would be good for Apple and I could really help Apple. Because I love the company, just like Steve Jobs, but you know, then again, not being a–not being a, I don't know–Not wanting to do a lot of things that leaders have to do. I don't ever want to be a lie. I don't want to go out and say these statements that mislead people and just say the good words and phrase things. I don't like to work with press people writing what I'm saying. It's just a question of honesty, so that would be an–one issue I'd have personally, but also, would my being there be better for Apple than the people who are there? And it's only going to be measured by the people that own Apple, the

shareholders. They want the stock to go up. That's just the modern world, you know, that's the most important thing. As far as great products, if I thought that, oh yes, my thinking–I've got a lot of different ideas than Apple about products and the direction they should go, and yeah, I would love to put that in place, so I would consider it.

RILEY: How about the pepper spray incident at UC Davis. Did you follow that?

WOZ: I followed it, and I was abhorred by the–what was shown in the press. Then I saw like a full video, and the full video to me looked pretty much like, you know, you have to have normal control. It's your property. You know, if you try to go into my house, I can prevent you from it. And it was like there was so much, you know, the way it was set up, you know, the students versus the police and then the police giving them a lot of warning. That was never shown to the major public, and I'm thinking, why wasn't the whole story shown? Let everybody judge based on the real whole story, rather than just seeing the incident.

RILEY: Did you read the Reynoso Report's conclusion that the police didn't really have a policy rationale for evicting the protesters?

WOZ: No, I didn't read that.

RILEY: OK. Is there anything else you'd like to add?

WOZ: I will tell you, you know. I'll tell you, I went back. I took my share of tear gas at Berkeley, you know, in the Viet Nam War days, and I actually am–I'm *for* peaceful protests. The question of can it turn violent, I don't know.

RILEY: What did you think about the Free Speech Movement in 1964, Mario Savio and all that?

WOZ: Well, of course. Free speech and the–See, I was brought up by my dad. He was so much into our Bill of Rights and what they meant, and that's what it *stood* for. But then in later years I went back. I have to be honest. I went back and I read the story, and it wasn't one of free speech. Mario Savio could take a microphone on the streets, in public, in parks, anywhere, and get permits for marches even, but to come onto private property, even a campus at Berkeley in the middle of where people are studying, and to just say: I'm going to just be disruptive and take it over with my speech. That was the issue. It was trespassing. It wasn't whether free speech was allowed or not. It was trespassing. You can't come into my house and bring in twenty of your friends and have a big free speech (event) and say: "We're just speakin' our thoughts." No, my house is my house. People that own things, they own things, and there are enough public areas and ways to express your views and your thoughts and you should do them. In the Viet Nam War days we had a lot of totally authorized, you know, peaceful protests.

RILEY: I think one of the main issues (as it was stated) in that day was that the University did not allow political advocacy on campus, even though they allowed free speech, and he wanted them to allow political advocacy.

WOZ: I don't think that's what it was, but it's hard–You'd have to go back and study real closely the people who were right there. Did the University have a right to that? Well, if it was disruptive, yeah. I mean, you could go just a little bit off campus. I mean, I'm sure that you could pass around leaflets and you wouldn't be disturbing the campus. You could post leaflets. There were always leaflets posted about the Viet Nam War and things like that at Berkeley. It was just wide open to any kind of political protest and activism, and there were speeches on campus, but they were the ones that were approved, you know, a certain amount of time in a certain space with a certain amount of microphone. And I saw many of those and attended many of those, and even ones promoting boycotts of classes and stuff. So Berkeley wasn't–didn't seem shut off from that. Of course, I went in a later year. But I really don't think that was the issue. I think it was you're not allowed to do a certain thing on campus, you gotta do it somewhere else. It's not *your* property.

RILEY: Um–

WOZ: And there are people who are being disruptive. In other words, I don't believe in a right that, you know, you got free speech and you gotta speak out your mind, but you have the right to harass somebody by getting thousands of your friends to send them e-mails about something they're doing. I don't believe in harassment. I don't believe in bullying. That sort of bullying: you gotta go along or we're going to be, you know, yelling at you. No, there's like good, easy, peaceful ways to do these things that I believe in a lot more.

RILEY: Do you think that's–

WOZ: And I changed my view on Mario Savio, because I didn't really know the real issues when I was young. Just, like on free speech, he wanted to speak some negative thoughts, and I believe you should always be allowed to speak anything negative you want about the government, about the president, about any of these things, and nowadays you might be put in jail and called a "terrorist" on occasion and that frightens me more than anything. But you don't have to trespass to have your–to speak. It's what you're allowed to speak about nowadays that's gotten a lot worse. But Mario Savio could have said everything he wanted to, like to a newspaper, out in some other public park with the proper permit, at the right times on the Berkeley campus even. But, you know, then there still is a limit to free speech, too. You know, you can't really say everything. You can't say things that are gonna get, you know, people incited to attack somebody. You know, killing an abortion doctor is not free speech.

RILEY: What about Anonymous? Do you support some of the apparent goals of Anonymous?

WOZ: I didn't actually pay good enough attention to tell you for sure. I guess they were going after greedy, bad, corporate culprits–Am I right?–to expose some of their secrets. So I think we're talking about websites.

RILEY: A lot of it has to do with retaliating against abuses of police power.

WOZ: In what way?

RILEY: Well, if the police are abusing the law and going beyond their lawful duties and prerogatives–

WOZ: Oh, yeah. Oh my God. I'll never ever trust a policeman in my life with the truth, and that's all the time. They shoot so many people that are unarmed that they didn't have to shoot, over and over, city after city after city you read about it. Um, uh, uh, no. The police are no friend of mine. And there are some good police, and maybe even most of them are good, and I've known some good ones, but no, I'd never ever trust it when I read these stories about police abuse and all that. So I'm against that, and I would join in with Anonymous. I don't know what they're doing, if they're destroying websites and stuff like that, you know, ah, I could smile on it. I don't think they–it really hurts somebody, like financially. But, like I said, you know, bullying and trying to get, you know, harassing somebody to death is not really maybe the right approach. But then again, like I said, I don't really know what Anonymous is.

RILEY: How about Wikileaks?

WOZ: Wikileaks? Yeah, I think society always kind of comes and sort of winds up, like Congresses and all, they always seem to support police, which I don't like, and military, which I don't like, and we have way too much abuse there. Wikileaks exposed a bunch of stuff from the government that wasn't meant–the government didn't mean to release it. Well, it got released. You know, who paid for that stuff? We taxpayers paid for it, and if we see something, we paid for it, here is the truth. Why is the truth hidden from us?–Why is the truth hidden from us for way, way, way too long, you know, a hundred years, forever, we'll never see it. If it gets exposed, I don't think that's a bad crime at all. In some ways it's almost honorable. Daniel Ellsberg's Pentagon Papers changed my life quite a bit when I was young, attending Berkeley, and he went through the court system and was actually let off by the Supreme Court, not because he was in the right with free speech, but because the government wouldn't turn over a bunch of documents. But still, still, I think that leakers should be protected, and yet they're treated–you know this Wikileaks guy might be treated like some kind of terrorist criminal and thrown away and disappeared and executed, all these bad things we used to hear about Russia. That's wrong. I'm so glad that Ecuador offered him asylum. I actually have an honorary degree from an Ecuador university.

RILEY: Great. How many honorary degrees do you have? Did you count them?

WOZ: I don't know. It's probably about nine. Some are foreign. But I'm very proud of the one from Ecuador, very nice people, good people over there and I like the way they think.

RILEY: How about the Stop Online Piracy Act?

WOZ: I didn't study it closely enough. I hate to see the Internet shut off in any way to become less than perfectly free to the end users. The small people that use the Internet should be Number One, and not some people who have enough power to control it, either politically, or security-wise, or companies, or countries. And it's so sad how it's–everything's been pretty much usurped from us the people. At first it was kind of like outer space. "Nobody owns outer space," or "nobody owns the moon." Well, that's only because there's nobody there able to own it. You

know, as soon as somebody's able to own something they want it, and control also turns into wealth, but it turns into power.

RILEY: So do you think–

WOZ: –everybody else–the internet everywhere, country to country to country. I like it. I prefer to think of myself as a citizen of Planet Earth. And you know what? I don't look at myself as being superior, because I'm in California I'm superior to people in Utah or Oklahoma or New Hampshire. No, we all think of ourselves equally, right? Well, why don't we think of every country that way? Why is it state to state is one thing, but oh, country to country we have to be, they're not as good as us, we're they're enemies, we're against them. I don't think that way. I pretty much am like the Eastern religious-type thinking. We're (inaudible) of the same world.

RILEY: Steve Jobs went to India, right?

WOZ: He went to India and he was around a bunch of people. He was living with no money, largely because he wanted to escape his family and he had no money, and part of that got him into people who talk about certain things, and he heard all these people that bathed in the Ganges River, and he went over there. He was trying to search–You know, when you're young, a lot of people go out and they start traveling around by foot, hitchhiking, friends, get here to there, with no money, and they do it for a period in their life, and it's a way of reaching the phase (where) you're finally capable and you might end up being–a lot of them wind up being CEOs of companies, kind of like that book *Into Thin Air*, what that guy was really doing, by the conclusion of the author. So Steve didn't really–He was talking about Eastern religious thoughts a lot, but I don't think it really got into him that deeply.

RILEY: Do you have a nostalgic view of the political activism or the social movements of the '60s and early '70s?

WOZ: I have to think, because I was not an activist. I was not going to be an activist, but I would hang around and watch and see these groups of people, what they were doing, and of course, philosophically I agreed with their intent. I also agreed with their thinking, that they were right and the authorities, from the government on down were wrong, and "a", wrong in terms of lying, and ("b") just wrong in terms of misleading people's thoughts on what was really going on. So I'm nostalgic sometimes. It's just that I (inaudible) nostalgic, but it affected my life forever in how I would think about things, how I would visualize authority, you know, I'm very anti-authority. I visualize police, military, government, and I'm for the good when I see it, but I'm really opposed to the bad, and unfortunately the bad usually gets covered up with lies.

RILEY: Is it possible for activists to kind of get stuck in a philosophical rut?

WOZ: (Laughing) I'm not sure what a philosophical rut is. Yes, I think so. You should always be willing to look at new facts, just like I did with Mario Savio. Look at new facts and re-judge things. That doesn't mean you change your values. Your personality and your values don't change throughout life. It takes major, major events to cause a change after you're twenty-some years old, young twenties. You're gonna be pretty much that person forever, but you should be

still open to even to changing your views. Maybe even as far as becoming (for example), instead of a liberal, a conservative, but studying and you should go with the truth as you see it. Not only that. You don't have to prove anything to anybody. Just, if you believe it in your head, whatever you believe, that's good and right and that's going to make you happy, and happiness is the measure of life.

RILEY: So would you say that you're not religious in the conventional sense?

WOZ: Exactly. However, I'm kind of spiritual inside. I have a lot of philosophies of how to be a good person, how to treat people, and I've worked them out, thinking over and over, reflecting inside my mind the way shy people do, and I was very shy, and coming up with my own little keys and rules for life, and they stayed with me, very, very deep core–[recording stops]

RILEY: Can we have morality without religion?

WOZ: I was never in a church. Actually, I'd never go to church. It actually came to play a great deal in my life, because I was in college and the Viet Nam War was going on and you had to prove you were a college student, so instead of filing form number 1049, or whatever, I filed my report cards. San Jose draft board votes 5 to 3 to make me "1A," eligible for the draft for one year. Oh God, and to fight it, you know, I don't mind being shot at, but I would never shoot at someone else. So I was a conscientious objector, but you weren't allowed off unless you were in an official church. Well, to me going to an official church means saying the same words, singing the same song, saying everything the same time as everyone else. That's following, that's not leading. I wasn't going to just go and be one more follower, you know, I want to be a thinker. So I didn't have a church, and eventually the draft lottery came out and I got number 325 out of 365, so I was going to be safe for my year. The next week the draft board sends me a notice saying they're granting my student deferment, and that meant they could make me "1A" in a later year. So I just lost all faith in the government being for the people at that point.

RILEY: Well, what would it take for you to regain faith in the government?

WOZ: Well, seeing a lot different things than I've seen my whole life (half-laugh). You could say oh, maybe I'm biased and saw it in certain ways, but no, I look for government going out to be helping people who need help. Starting with the poor, starting with the desperate, but not just giving them temporary money or something. Finding ways to really bring them up. Maybe you can't bring the poor people up to where they will be working and be contributing to society like wealthier people today, but the young poor children, having ways that they come up, really getting full, as well educated as anyone else. If the government were doing that–and also when people have bad times. Somebody has a bad medical situation. The government helping those people that need the help. The government helping people who have car crashes, who lose their house, lose a job. I believe in all these things, and I think that a lot of people will say: "Oh my gosh, that's socialism. Governments do things horribly. Governments are so horribly inefficient. The private sector does things well and uses money well." Oh my God. Look at health care. Health care in this country. We're the *most* privatized of all the modern nations. All the rest are more socialized with more things like universal health care than we have, and in our country it

costs twice as much for half the benefits of all those other countries. We're way off the list, off the line. So we've done horribly in the private sector. It's not efficient for money.

RILEY: Do you have an opinion on economic theories, like Milton Friedman's, or things like what is called "market fundamentalism," or neoliberalism, or (concepts like) "corporatocracy."

WOZ: I don't–I never studied them, so I don't have an opinion. I'd have to really do a lot of reading to be able to–I've just decided in my life, I didn't want to become corrupted by money, so I never read financial papers. I don't do buying and selling of stocks. I don't want to be super-wealthy. I'm not super-wealthy. It's just part of my life that I just want to rule out, because I don't admire the people who get up to the top. They're just thinking of becoming more and more wealthy, instead of helping other people at the bottom have good lives.

RILEY: Do you ever invest in start-ups? If students come to you with ideas for a start-up, would you possibly invest in it?

WOZ: In the past I did some of that. I don't have that much money anymore. So I would do that all over the place in the past. I'd just give them, even if it's maybe to go to college or give them computers. Even a college, I might give them a lab of Macintoshes. That's just what I believed in. But now what I do is I give my them time. I talk to them. I give them any advice I can think of how they should proceed towards their goals, and I try to inspire them and share stories. So, sort of mentorship stuff, all the time, because I believe in young people, like Steve and I when we were in our college days, that's what we were developing into doing the great things we were going to do, and when I see other people like that, doing that, that is so important to society as well as to those people themselves.

RILEY: How about the movie *Facebook.* Did you see that movie?

WOZ: *The Social Network*?

RILEY: Yeah, about Facebook, Mark Zuckerberg...

WOZ: Yes, right. *The Social Network* was, I think it won movie of the year. But you know what? *Pirates of Silicon Valley*, the TV series, was a lot more entertaining and interesting and it would have been movie of the year, but it was never a movie, and they're going to make these movies about Jobs now, so they have the potential to get there, too. I saw that movie and kind of walked out very saddened by a picture of Mark Zuckerberg not being totally honest with some people. And to me, honesty is the apex of all good. You have to be honest, and if you're doing something, and not quite telling these other financers that–You're not working on their products and you're going off and doing your own, you're not–If you're hiding stuff from them, that's when you know that what you're doing is wrong. When you believe in what you're doing's right, you talk about it. You don't hide it. So I did feel a little bit of bad will when I walked out of the movie towards how Zuckerberg had left some people behind, but I think from what I read he made a–(inaudible) quite a bit in later years, because they got very wealthy from amounts of stock they got, or whatever.

RILEY: How about Ron Wayne. Are you still in touch with Ron Wayne?

WOZ: Yes, I am, now and then. Ron was a very honorable person and he always will be, and he's very, like some people have very dedicated, absolute true to their core. I'm one of those people, and Ron is that way. He has no money. He's kind of just living barely on some Social Security or something, but the sort of person he is, I admire. He just stuck to his goals all his life. They were very arch-right-wing conservative, you should only hold gold at home and a lot of these other principles, there should be no welfare, probably, but when I met him that absolutism talk sounded very intelligent to me. Here's a guy that knows stuff and Steve and I are just young. Here's a guy who could solve disputes. He knows how business works. But yeah, he sold out pretty cheaply. He might have made–on the average he might have made the right decision selling out, because it was a point where Steve and I had no money or savings accounts or relatives or friends that could loan us money, and we were getting thousands of thousands of dollars of parts–tens of thousands of dollars of parts, (inaudible) his credit, and then we had to build up computers real fast, sell the computers for cash to pay off the parts. You see the risk? If we didn't get paid and we owed like let's say twenty, thirty thousand dollars, they wouldn't be able to get any from Steve or from me, and Ron Wayne, being an adult at the time, and he had his gold in his mattress, you know, or a safe, as he says. I mean, they'd get the money from him. So maybe that was one of the reasons that he just didn't feel like he, you know. I don't know. He had enough of the company. He had all hundred percent of the risk and (inaudible) percent ownership of the company, and it was only a partnership then. If (inaudible) had stayed, he would have accompanied us with that same percentage, as we moved our partnership into a corporation.

RILEY: I read about how you created that intercom system with the other teenagers in the neighborhood.

WOZ: Yep, great memories of life.

RILEY: What about teenagers today? Do you see anything like brand new on the horizon that teenagers today might be getting into?

WOZ: Oh, my God. Everything on the Internet from Facebook to other little things. Everything they discover and share with their friends and get on and send some messages and learn how to pull some little stunt here and there. Yeah, I think there's an awful lot of room for playing around the way we did with our wires. It depends on how you make it, how you make your Facebook page look. You know, it's one element of creativity that they've got access to. The amount of creativity is in your brain and it wants to find its way out, and it finds it out in the patterns of the day. In our day we did have a lot of electrical parts that we could connect together and get things to happen, and nowadays it's just different ways.

RILEY: Do you have a sense of something brand new on the horizon that may be something that we can't predict, maybe something like nanotechnology or something along those lines?

WOZ: The things that you can't predict, because if you could predict it, a million people already would have already predicted it with all their financial resources and the big companies and their

research, and they're being paid to predict. So a lot of surprises like Apple and Facebook and Google, they come about without any expectations, and it's usually young people, because young people aren't hung up by the way things have been done in the past. Here's something possible, and this one makes sense to me, even though it didn't exist before. So–I forgot what the question was.

RILEY: Well, I mean, do you have a *sense*, you know, just a sense that there's something new on the horizon?

WOZ: Yeah, I do. So you can't know what it is, but there's always–there's so much new on the horizon. Think about all the things that are real major. That's what you're going to notice. There are little niches, like is there a new way to make a lampshade, but things that every single person does. They all have homes. They all have cars. They all have television. They all listen to–go to concerts. Any of these areas, somebody could think of ideas that would totally disrupt things, shut down the old businesses eventually, over time, and replace them with something new, you know, the way RIM and Nokia kind of are being shut down with all the smartphones. So there's always something new possible, and there's so many categories of life open. The mobile world really makes it possible, mobile electronics? Because in the old days you could think of: What could I do with a computer? But you only thought of what can I do with a computer in one location, and you never thought: What can I do with computers on everybody, all the time, everywhere they are? And we're re-thinking out every little aspect of life, how we live it, because of that, and everything is coming out different, and at first, it's just, how can the mobile app give access to all these big things in fixed locations? But eventually everything's going to be much, much more mobile and the ideas of how to implement every little idea that has to do with buying things you want in life or real estate, having things, communicating with people. And on the Internet you can also combine a lot of things. If you're Internet-based on these mobile devices, the mobile device is in contact with a server in a data center. The server is actually doing most of the information processing. It's got all the storage of information, and the entire Internet is in the hugest storage ever. And it has the processing, and then it sends back the results that you would want to see. The biggest (inaudible) of all that's real obvious is not to learn how to program an iPhone. Learn how to program the iPhone *and* create the website that is the other half of the formula, and then every company in the world wants to bring these mobile devices into how it operates its business. Every school, every university. A lot of universities now are passing out iPads and iPhones to every single student, just realizing that, if it's a part of their life, this technology, they know how to live in it, we'd better become connected to it as well.

WOZ (cont.): As far as other technology that nobody would expect, I would love to see chips, like we have chips today doing all our electronics work, chips that work on photons instead of electrons, but that's been a 35-year goal of mine, and I just keep hoping that this research breaks through and it becomes possible. It's hard to say, because making chips is such a huge operation that has evolved over decades. The number of steps to get a little more performance, a little more density of parts on a chip has gone on for so many, so many stages. It's hard to say when you can apply that same thinking to a whole new technology like photon chips, but photon chips would be much faster and use much less power, and that'll take us further in life.

RILEY: Do you think the time is ripe–Is the time ripe to create like another Apple][computer, like an open computer, but using modern components?

WOZ: It's a little more difficult now, because I think you've gotta think out complete solutions, and there are, of course, a lot of hobbyist little computers, Raspberry Pi and Arduino that a lot of it, the do-it-yourself builder guys are going with? And that's where it's going to start with those guys that build it themselves, but I think you gotta almost have a team of young people that, you know, come up with a new great operating system, and they're based around visual displays, the sorts of things that are going to be common even in the future. Voice is so very, very important. So often, I'd much rather speak into–speak messages into my phone than type them out on a keyboard. I'm so inefficient at that. Voice operation and just saying things the natural human way, and I used to say, in the Siri I would speak: What are the five largest lakes in California? And I'd get the answer, but then after Apple bought Siri I would get all these lake-front properties, sales places and crap? Well, why doesn't it see a phrase, like: What are the five *largest*. "Five largest" is a relationship. Wolfram Alpha is the search engine that deals with relationships. Why didn't it know to go to Wolfram Alpha for the answer? Why did it go out there and try to do Google-ish type answers? So I think there's a lot of room to just understanding natural text, and still, even just on a keyword level, the simple little keywords and phrases like "five largest" that very young programmers could sit out and, you know, write a large program on today's modern, fast (inaudible) computers, that really understands sentences and what the person really wants for answers, better than is being done today. I think that's a huge area to get into.

RILEY: Is that like the Semantic Web?

WOZ: It probably is. I don't know what "Semantic Web" means (half-laugh). You know, I've heard the phrase so many times and I just don't know. The Web–you gotta look at it–the Web is–the Internet really is–the number of nodes is roughly equivalent to the number of neurons in a brain, and the number of Internet connections–network connections, is roughly the number of synapses in a brain, so it's no surprise that the first time we replace the brain was with the Internet. We've replaced part of the brain, where you used to ask difficult questions to a smart person. Now you ask them, difficult questions, to Google and you get tons more answers back, if it's about things, and so the Internet sort of replaced part of the brain anyway.

RILEY: Do you think we'll be having major breakthroughs in artificial intelligence?

WOZ: I absolutely do, because I think that's very important and human beings want to speak naturally the way they speak to a human, and computers don't understand it yet. Artificial intelligence hasn't made but the smallest steps, looking for some keywords and I think there's a lot of room to improve that. I think we're gonna get there, and you know, Raymond Kurzweil predicts a singularity in 40 years, and I never want to go out thinking that far ahead, but I'm kind of, actually that's one case where I'm kind of convinced he's on the right track and in 40 years our computers are going to be conscious.

RILEY: What about the merging of man and machine, cybernetics, do you think there's something we should be careful about, or jump into more quickly?

WOZ: Cybernetics?

RILEY: You know, like hooking a computer up to your brain and stuff like that.

WOZ: Oh, no (half-laugh), I'm not into that. Although, it's probably going to happen when it's an adaptable. But, you know, thank God I don't have to worry about that. Like, could you put chips in your eye that can see better than any human? And I'd probably say: I'll stick with my human (capability), I just want to be natural, but if all the kids in school are going to do it, your kid's going to do it, too. So you know, there're going to be some devices that make our bodies work better. Obviously we have certain medical devices that let us live longer now, and we have crutches that help us walk if we need them, so we'll take any technology that helps us to be a little stronger, be a little more super-human. Somebody's running in the Olympics with artificial legs. Someday they'll win it. Are we going to transfer the content of our brain, our knowledge, into a machine? That one (half-laugh), that one I don't want to even think about. I don't think it's going to ever be possible. I don't think we're actually going to want to be able to look at a brain and see the wired pattern and duplicate it, because it just doesn't follow the rules of things that we can explore. In other words, our memories change over time, and our brain abilities change over time, so that means that you're going to find some weak, weak, weak links and connections, and I don't think we're going to transfer our intelligence to a machine.

RILEY: Do you think we'll make big breakthroughs in parallel processing?

WOZ: Yes, I do, although parallel processing even is one of those things that just grows incrementally... and it doesn't scale out exponentially. So, new breakthroughs in programming, like everything? I think it might be, and it might come partly from thinking about: how do we build machines that are like the brain? And psychologists will be involved. They'll say the brain does so much multitasking. We'll have each little processor simultaneously doing different tasks, and that's more like a real brain, a lot of different tasks going on at once add up to the total. But nobody knows the formula of the brain yet. That's what we've got to solve and I think we're going to stumble onto it by accident. Like the Internet was not designed to be part of the brain. It turned out to be part of the brain by giving answers to important questions, but it wasn't ever designed to be that from the beginning. It was just an accidental outcome we got.

RILEY: In the mid-Eighties there was talk about Japan becoming a world leader in super-computing, but it never turned out. They didn't succeed. Do you know why?

WOZ: Well it was at a time when Japan was doing very well economically, because they owned the world economics due to the technology of the VCR. All the VCRs were designed and actually built in Japan and they kind of owned the world. This was before South Korea sort of took over those categories of things. And then the United States came back with personal computers and operating systems and *we* were the economic power of technology, so *we* had the biggest super-computers, and now who knows where it's going to go, but it's probably going to wind up with China.

RILEY: Do you have a general opinion about the economy in China?

WOZ: That it's growing very rapidly. It's the healthiest economy in the world for growth, same–them and South Korea, and just in terms of the number of people, I expect them to be sort of setting the spotlight of even scientific research and things in the future.

RILEY: How about Steve Jobs. Do you think that if he would have had surgery that he would still be alive today?

WOZ: I don't ever think about that. I don't think about that. I don't know what the odds are of the approach he took. I don't know much about the approach he took. I don't know of the odds of the surgery. It's not something you want to go back and think about. He's just as alive today in my mind as ever.

RILEY: Can you elaborate?

WOZ: Well, his–basically his principles and ways of running a company, Apple, and setting up a great company and what he stood for will be his legacy forever.

RILEY: How about the way he joined forces with Bill Gates when he came back?

WOZ: I knew a little more inside, but I don't want to talk about that now.

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Brian Riley can be reached at info@brianriley.us

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CLICK HERE to see Woz on the Merv Griffin show (1984).

CLICK HERE to read Woz's interview in *Creative Computing* (November 1984, pp. 285-286, 290-291). (PDF version)

CLICK HERE to watch Woz's TEDx talk (November 2012).

Worldcat.org: Woz's autobiography, Woz biography by Doug Garr (1984).

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