

University of Illinois Student Life and Culture Archives

Interviewee: David Eisenman (Part 4)

Interviewer: Katie Nichols

Date: January 14, 2020

Length: 00:54:58

David Eisenman: All right.

Katie Nichols: All right. It is January 14, 1:30ish PM. We're at the Archives Research Center in the conference room with David Eisenman, and we're continuing our oral history interview.

DE: And that's the year 2020.

KN: Yeah. [Crosstalk.]

DE: Which another year has begun. [Nichols laughs.] Well, I thought today we'll probably not have a longish session, but today, I thought we should spend a little more time on what some of us called the Educational Reform Movement, which was going on parallel to the centennial year and to, of course, the increasing turmoil in Vietnam in the late '60s. I've just gotten off the phone from Paul Schroeder, and you have elsewhere in archive--Paul has left a lot of materials, which, at the moment are over at the NCSA with Anita Chan, right, and eventually they're going to come to you. But Paul is a saver, and he has tons of actual printed material, including a draft and maybe even the final draft of what he said at the centennial convocation in March of 1968, the final event of the centennial year. So why don't I deal--I'm going to work a little backwards in this one. Let's start with the centennial convocation.

A few weeks before the final event of the centennial year, which would be attended by the Governor of Illinois and, of course, the president of the university and the Chancellor, was held in the assembly hall, a great big event at which, by the way, the original plan was John Cage's *HPSCHD* would have been the music. But by then, *HPSCHD* had become a much bigger project, and Cage may have provided some electronic music for the event, but something much shorter than what *HPSCHD* turned out to be. *HPSCHD* was played more than a year later. But anyway, it was going to be this great, big event. All the classes were canceled. Students were invited, of course, to come, and large numbers of them did. The assembly hall was—

KN: All right. Okay, go ahead.

DE: All right. Have we missed anything, do you think or, uh?

KN: I don't think so.

DE: Okay, well, then we'll just pick up from there. Heinz noticed that there were no students scheduled to speak at the centennial convocation, and he thought that was a little odd. After all, students kind of outnumber everybody else on campus. So he began to lobby the centennial committee for a student speaker. And David Pines had nothing against that, but there were enough student radicals in the mix in those days that I think there was some concern that it would just turn into some sort of antiwar speech, and therefore there was a little bit of reluctance on the part of the President and the Chancellor, thinking that this might be disruptive. And indeed, they were not wrong to be concerned. But in any case, some process of selection of a person then began, and I'm not sure what the official roles of the Undergraduate Student Association and the Graduate Student Association were. There had been student councils associated with colleges, but I think that the creation of the Graduate Student Association was a relatively fresh thing. It couldn't have been more than a couple of years old at that point. Whether there had been an independent Undergraduate Student Association, some kind of student—unofficial Student Government, I'm not sure. Somebody else will have to fill that history in. But in any case, there may—we definitely, we of the centennial planning group, had absolutely worked very extensively with the Undergraduate Student Association and the Graduate Student Association. The fraternities and sororities kind of ran the campus until the mid '60s, when other students became a little more active and involved and began to feel that the place shouldn't be entirely run by sororities and fraternities in their organized governments. So I can't tell you exactly who it was, who was supposed to be selecting a student to speak at the centennial convocation, but some kind of complicated process led to Paul Schroeder's being tapped to give the speech.

Now the minute that happened, Paul came under enormous pressure from antiwar people to turn it into an antiwar rant, which of course, exactly was the fear of the President and the Chancellor, who are hoping that we could be celebrating 100 years of land grant university experience, which they were trying to take the long view. So Paul has talked to me over the years about how tortured he felt in this period, because he really also wanted to talk about the nature of higher education. His own career at the University of Illinois had begun, begun as an accounting student, but by the time he was a senior, his vision of the world had broadened substantially, and he ended up being a librarian in the end, but he went off to Stanford as a political scientist graduate student. He didn't stay at Stanford, but clearly his view of his role in the world had changed drastically during the four years at the University of Illinois. And so Paul wanted to talk about educational reform, but he, in the end, was under enormous pressure to also acknowledge the Vietnam conflict, and he, he was supposed to give a signal to students to walk out of the centennial convocation at, at the point of his speech, as a protest against business as usual when the world was struggling with Vietnam.

Well, he, he did that, but his speech did still contain what he had hoped it to contain, which was a bit of a complaint about the, the, should we say, stiffness, the rigidity, there's the right word I want, of the curriculum and the approach to education that was still pretty much *de rigueur* at the University of Illinois. You couldn't get a new course approved. No faculty member could propose and succeed in getting a new course approved, new subject matter or a new approach to a subject, unless a courses and curriculum committee within the college agreed. First, you started in your department, then your department's approval had to be approved at the college level, and then the college's recommendation had to be approved at the campus level, and, God knows, maybe even the university level. We had just in that year, gone to a chancellor system. President Henry used to be president of all the campuses and Chief Executive Officer of the whole place. So everything used to come to his office. But we became a bit decentralized just as the centennial year began, '67-'68.

So here we were in March of '68 and Paul speaking at the centennial convocation. So he, he was near the end of the program. There were a few remarks after. I remember he, he said, 'My education here was disappointing,' and said some other negative things. And Jack Peltason, the chancellor, took the microphone when Paul was done, said, 'Well, I think there's another side to this story, but this isn't the time for it,' which was very polite and sensible of him. He kept the program going, and it ended, I think, soon after Paul's speech. But don't hold me to that. In any case, Paul had said, 'Don't go home after this convocation. We have rooms reserved at the Illini Union.' And my memory was that it was the YMCA, but maybe they were both the YMCA and the Illini Union, or maybe I ended up in a room at the Illini Union.

But anyway, my room, the topic, which had attracted some faculty members and some students, the topic was, how could we be a little faster on our feet to respond to changes in the world with changes in the curriculum, so that students could actually take a course, for example, in Vietnamese history, or the history of the conflict between communism and capitalism, something that would help people understand current events and the background to them. So we began the discussion, and now I guess I want to come back to that event. Charlie Wert, who, at the time, was head of metallurgy and mining. We had, believe it or not, a department entitled metallurgy and mining, and Charlie was the head of that department. Charlie Wert was a faculty member who had been on many committees, was keenly interested in not only his own little discipline, but in the whole thing, the whole education, whole, the whole question of, how do we educate young people. I'm going to tell about that session, but I think we need some background, and Paul's chat with me a few minutes ago has given me, I think, a framework here.

I came here in 1965, and I started teaching physics. Many other graduate students, of course, had come from very different undergraduate institutions than a huge Midwestern public land grant university. So to us, this was a different kind of education. I've mentioned in previous sessions that I was lucky enough to have been a Harvard undergraduate and coming out of a small town in

Pennsylvania that had been an eye-opening experience for me. So, and I think I've mentioned in connection with Regent Gregory housing, which was probably the project that brought me to the attention of the graduate college committee for the centennial year, I had wanted to create some kind of living learning experience at the University of Illinois that would match what I'd seen at Harvard, living in Harvard houses for four years with other students, in dining halls that encouraged us to sit and talk to each other and not just race through a meal and run off. My assessment—I'm repeating myself from a previous tape, but we need this. My assessment was that I was at a place that was like a high school with a hotel attached. I didn't feel that we were treating U of I undergraduates as adults. We were treating them more like middle school students. There was a rigid formula, for example, for determining your grade in shall we say, physics, 101. We kept track of, we graduate students, kept track of how your homework looked and how you had done on our exams and how you had participated in labs and and discussion sessions, and then, of course, there was your final exam. But if you had screwed up all semester, screwed up in our terms, which meant you didn't turn your homework in, didn't attend labs and so forth, there was no way you could get an A, even if you answered every question on the final exam brilliantly. And the Harvard experience was exactly the opposite. If you knew the content of the course, at the end of the course, nobody asked how you'd gotten there. The path was up to you, but if you were able to demonstrate that you had learned what you were supposed to learn, nobody held against you. Now, of course, if a particular course required long papers all through the course, and you hadn't turned them in, it probably would have been hard to come out well. You would have to make that work up. But even there, you were given a little rope, you could turn it in late, perhaps. We were allowed to become obsessed with something, work on it exclusively for weeks on end, and then get caught up in other courses. Nobody regimented us. There were certain expectations. You couldn't let down a lab partner, obviously, things like that, but generally speaking, we were treated like people.

And I thought the University of Illinois was, in general, not confident that its students would do the work unless we were cracking a whip above them at all times. So there was an attitude towards students in the classroom. And then there was the fact that everybody was just housed in what I really called hotels. The dining rooms were very brightly lit. They were able to accommodate only a tiny fraction of the people living in the dorm. So if everyone lingered over dinner, there wouldn't have been enough tables. In a Harvard house, I'd say at least half of the people living in the house could have occupied the tables if just half of the people got up and left. There was plenty of room for everybody else. There was no pressure on us to race through a meal. So I think other graduate students had the same reaction I did, which is we were meeting students all the time who weren't getting the support from their fellow students, through where they lived, through outside of classroom moments, such as when you're eating a meal, when you're just sitting at the Illini Union at a table studying. We didn't see the opportunities on this campus for people to talk to each other about what was on their minds. Or study together or learn about other people's disciplines by living with them. In fact, the—it almost was the case that

engineering students gravitated towards certain dorms which were near the engineering campus, and fine and applied art students gravitated towards certain dorms which were closer to their side of campus. So a number of us, I think, felt that something could be done here, and that the students here were no less able to see the world more broadly than their narrow major than people at the elite Eastern or Western schools, Stanford, Harvard, name it.

So there was, I think, a ferment among some of the people already on the campus. No one could miss the fact that at Berkeley and other California campuses in particular, there were educational reform movements going on, students demanding that the curriculum be loosened up a bit, more rep—more representative of the world's current problems. Berkeley was famous for student sit-ins and complaining about the way grades were assigned and all sorts of things. So there was—Harvard also, by the way, had a independent student newspaper, *The Harvard Crimson*, which also published *The Confidential Guide*, which was an annual publication that came out in September that rated faculty based on surveys that the students themselves designed and that were voluntarily turned in by Harvard undergraduates. So there was no such thing at the University of Illinois. If you had a complaint about a faculty member or you really thought the guy was an idiot, you had no way of telling anybody that other than by word of mouth. So we, here, we had the Illini Publishing Company. The name may be slightly different, but it published *The Daily Illini*. It also published *The Illio*, the university—what do you call those things? Yearbooks. Harvard had an interesting thing called the freshman register, which had pictures and names and home addresses, at least it had the hometown of every freshman. So you could buy this book when you showed up on campus, and you could see the other 1200, the other 1100 and 99 of your classmates. And I still have my freshman register, and it still has marks in it as I met people during my freshman year. It was never a surprise to me that Facebook was invented at Harvard because Harvard had paid attention to helping students get to know each other, and the whole point of the campus was to get students to talk to each other.

There is a famous book, and I bet I mentioned it here already, by John Henry Cardinal Newman, the famous Anglican minister who converted to Catholicism in roughly 1845 and then became a light of the Catholic Church. Newman wrote a book called *The Idea of a University*, and in that book, he says, 'If you had to throw out every element of a university but one, the one you would want to retain would be the student body, because young people talking to each other is the most wonderful design for education that man has ever come up with.' Minds are still active and flexible, and people are not yet burdened with adult responsibilities. The old model of English education was indeed rather elitist. It was people who didn't have any money worries, mostly, with a handful of extremely bright people from the lower elements of society. But that idea was incorporated into the undergraduate experience of a lot of us graduate students, and we didn't see it here. So I think that the Graduate Student Association, and I can't remember what my own involvement with GSA was, but it may have begun because of the centennial year. Maybe it began when I started working on Gregory housing, which was a year or more earlier, but

somehow I got to know Bruce Morrison, who by then was very active at the Graduate Student Association, ended up being a US congressman from New Haven after he went to Yale. But Bruce and others were very active in demanding that graduate students be taken more seriously, that they not just be employees, but have some say in how the teaching was to be done, how grading was to be done. And, maybe, I think we're more focused on what we did than what we were paid. But there may have been issues of workloads. I don't remember so much of that as I do just dissatisfaction with being treated as lackeys, as opposed to co-equals, or at least colleagues of the faculty in teaching.

But there was a feeling on campus that we could be doing this better, and it was shared by members of the graduate college committee on the centennial year, namely David Pines, the chairman of the committee, who, as a physicist, was always interested in interdisciplinary work, even within physics, which by then, was highly specialized. There were high energy physicists and there were general relativists who would have had almost nothing in common. There were, especially here at the University of Illinois, solid state scientists. Solid state was a new, a new field, really. After all, it was John Bardeen who invented the transistor and showed that we could avoid huge energy consumption in the old-fashioned vacuum tube by building modern electronics that used almost no power, because the rectification of signals could be done on little chips of solid material. So David, at David's 60th birthday party, which came considerably after the centennial year, John Bardeen and others commented that David had collaborated with more different people from different branches of physics than any other physicist they knew. So David already had a view of the world that was expansive, that rather than becoming more and more and more specialized, David felt that the interdisciplinary um hybrid vigor, as it were, that you got by talking to people whose work was very different from your own—other people's mental frameworks very often gave you a clue as to how to re-approach your own work. So David was already focused on alternative ways of doing education, and David's own educational experience had been diverse. He, because he was Jewish, was—he ran into in the late '30s, early '40s, when he was coming of age, he ran into quotas at the eastern schools and did not get into Princeton, wherever he was applying to, so he ended up going to Black Mountain College, which also was the place where John Cage taught and Buckminster Fuller and a number of other just remarkable 20th century figures. In North Carolina, they built their own campus. The students had to do carpentry as well as philosophy and physics. And David had no interest in physics before he got to Black Mountain. But his tutor—in fact, he said the high school physics teacher was, in fact, also the football coach and basically just read from the book, didn't understand physics at all. So David had been turned off from physics. But Nathaniel Rosen, who had worked with Einstein—and there's a famous Rosen Einstein Podolsky paper that still is considered one of the great landmark papers in physics—he ended up at Black Mountain and taught physics to David and said, 'David, you ought to become a physicist,' which Pines did, and ended up collaborating with something like a half dozen or a dozen Nobel Laureates. David was a very bright and accomplished man.

In any case, he took on the job of the centennial year and really saw it as a time for the university to reconsider its posture in the world. We, after all, started out as the Illinois industrial and agricultural university. We only became the University of Illinois later. We were a land grant university, meaning that the government gave the institution a chunk of land that was federal land, and we could sell it or use it to fund the university. It happened that the honorary chairman of the centennial year was Fred, oh, dear, I'm going to have—Turner. Fred Turner, who was our Dean of Students. And Fred Turner was a grandson or grandnephew of Jonathan, there was Jonathan Archibald Turner, I've got his name a little bit wrong, but the guy who invented the land grant concept that the new states that were filling in with people after the Civil War, as people moved west, ought to have higher educational institutions that would teach Farmers scientific farming. People were beginning to realize that you could take primitive land, break it, the plow that broke the plain, the invention of John Deere, of a plow that was self-cleaning, that would go through clay soil and not get clogged, but just cause the soil to flow across the plow had to do with the shape of the plow. We were breaking the plain. But we were also discovering that after you plant certain crops, the same crop, several years in a row, the plants started growing shorter and shorter. And you can go today to the Morrow Plot next to the University of Illinois Undergraduate Library. You can see one corner of it that has been in continuous corn since 1870 or something like that, and the corn grows to about a foot and a half high. It's terrible. The soil was hopelessly depleted. Now, crop rotation was something that we were talking about when I was a kid. Farmers were alternating corn with something like clover or soybeans that have roots that have microorganisms in them that take nitrogen out of the air, fix it, and put nitrates back into the soil. But by the time I was in college, artificial fertilizers were the new secret, and now we're discovering, of course, that the enormous amount of energy that it takes to make artificial fertilizers is changing our climate by pumping so much CO₂ up into the air that maybe we'll have to go back to other methods of fertilizing soil, but frankly, there's no way you can fertilize Illinois soil enough to grow 200 bushels of corn to the acre. If you don't pour on artificial nitrogen fertilizer, you cannot get that kind of yield. So the reality that we're facing in 2020 is that the world—the number of acres per person available for growing crops peaked back in 1969 or '79. Every year, population grows faster than we replace destroyed farmland. Even cutting down forests, which is in itself, a disaster. We're going to run out of land. Therefore we have to get a higher yield per acre if we're going to hope to feed the 10 billion people on earth.

Well, it was looking ahead to problems like that, which were beginning to be defined in '68. People were talking about population explosions. I just yesterday, gave the graph of world population to students I was teaching. At the time of Jesus, there were 190 million people on the whole earth. And by 1600 we had made it up to, I think, less than a billion, and now we're adding a billion every 10 years. The graph is an almost perfect exponential. It goes along very close to the x-axis, from minus 10,000 years to about 1800 and then it goes almost vertical. So we knew about Malthus, who predicted that we would starve ourselves to death. We knew that modern

agriculture techniques had allowed us to keep up with population, but in the '60s, there was real fear that famine was coming, and of course, Norman Borlaug got the Nobel Prize for the Green Revolution. Agriculture has done a number of amazing things since the centennial year, but nobody doubted in '68 that we were running into a population problem. We were beginning to be aware of the CO₂ levels just as the centennial year took place, so problems that are now very well defined were still inchoate, but enough people at the university could see the future that we were trying to get the university to position itself for the 21st century. And that was one of the titles of a centennial document. Education in the 21st Century. Let's look ahead 50 years and ask ourselves, what should this university be doing?

So David took the assignment. Let's not just celebrate that we're happy to be 100 years old. Let's face the fact that the world is changing very rapidly, and that the way we've been doing things may not be the optimum way to do things. But you can see how his vision and the vision of other really smart faculty members who are looking ahead matched the perception of some of the younger ones among us that we're not, we're not comfortable with the way we are teaching and the way these kids that we are teaching are trying to learn. So you can see why some pressure would be on. And it went beyond the immediate pressures of the draft and the war that was beginning to look pointless in Vietnam.

So there are a lot of strings hanging into this mix, but now I want to return to that meeting after the centennial convocation, an educational reform meeting, the one I participated in, in the Illini Union. So there's Charlie Wert and me and a group of undergraduates, and we're saying, why should it take years to get a course approved? If the world's changing faster than that, surely we should be able to study molecular genetics. If new information is becoming available and people really want to know about the cutting edge of science, why should we have to wait years for a course to be designed and approved as good enough to get credit for graduation in, shall we say, biochem, or whatever your major might be. So Charlie just tried to explain to everybody what the bureaucracy was, what the rules were as the university was then constructed, about how you got a new course approved, and why it was important that courses not be frivolous and that a student end up after four years really having learned at least the basics of the field in which he or she was getting a degree. But I interrupted and I said, 'Charlie, okay, fine. For credit to graduation, if I want to say I have an undergraduate degree in physics, let's agree that I should have taken a certain core curriculum of physics courses. I should know mechanics, and I should know electromagnetics, and I probably should know something about relativity and who knows, maybe even solid state. But there are also distribution courses. We encourage students to take things far from their majors so they have some idea of what's going on in the rest of the world. Because this is a democracy. Well, it's a republic, technically, but aren't we supposed to know what other people are doing? Aren't we supposed to be generally educated so we can be good citizens and vote intelligently.' I know this sounds silly in 2020 with Donald Trump as president, but nevertheless, one still had a sense in the '60s that maybe education was for citizenship, not

just for occupation. And some of us felt that education was for the the, what should we say, the enlargement of your own soul for figuring out who you were and how you wanted to spend your limited number of years on earth. I don't think many of us thought about how our years were going to be extended. I mean, Paul said he was remembering one of the centennial symposiums. Said Gerald Holton. Wasn't that his name? I said, not only was it his name in '68 but the man is still alive in 2020 in his late 90s, still teaching. I mean, we have, I think, added several months to our lives every year that I've been alive. The median age at death has increased by something like 15 years during my lifetime. I might have to be around another 25 years, not sure I could put up with it. Actually, I'm having a great time, as must be obvious, but anyway.

So I said to Charlie, 'Look, okay, fine. If a course has to be approved for official credit towards your major or toward distribution, you know you have to take a certain number of hours in the humanities, a certain number of hours in the social sciences, if you're a physics major. Okay, fine. But how about the free courses? There are free distribution courses. A student could take anything after he's met these specific requirements for graduation. Why not make it extremely easy to create a course that doesn't count, except for the hours. If you need 120 hours to graduate, I don't know what the number is. I think it is 120 as an undergraduate. If 90 of them are specified in your major definite distribution courses that are approved for that purpose, there still are free choices that are out there. Why not let faculty members teach anything they want, as long as it only counts for hours and it doesn't count towards either your major or a specified distribution requirement?' And Charlie said, 'Well, then there's one other issue, which is that faculty workloads have to be determined within the department, and if a man teaches—' We keep using this male language. I'm going to come back around to another, remind me, if I don't get back to it, that while we were on the phone this morning, Paul was looking over a list of people who participated in a symposium, and he said, 'There are no women on this whole thing!' He said, 'Wait a minute. Wait a minute. Oh, there's Mary Ann Ferber.' And I said, yeah, 'Let me tell you what Mary Ann said to me in 1969.' But he's completely right. The world was male in those days. There were females on the faculty, of course, but not many. Just as there were almost no Black teachers. I think there were six Black faculty members, something like that, in 1968 on this entire campus. But that's a side point.

He said, 'Faculty members have to have a workload that's reasonable. And if a guy teaches an additional course, well, our normal approach is that he gets additional pay, or he's relieved from some other teaching obligation or some other research obligation.' I said, 'Well, okay, fine, I see where that would be a problem. But what if a guy just volunteers to teach a course, if he doesn't ask for relief in the form of additional pay or relief from other obligations. If a guy—' Or, we used the word guy, I'm probably being honest to the way the conversation actually went. Said, 'If a guy's willing to teach the course and students are willing to take it, maybe there shouldn't be any approval necessary from the—why don't we trust our faculty enough to, if they're passionate enough about teaching something and people want to take it, why don't we let them do it? Assign

hours to it, according to the workload that the faculty member claims the students are being burdened with. But you know, within reason, nobody should be able to teach a 20-hour course just to give football players some way to graduate. I can see the potential for abuse, but unless there's an obvious abuse, why don't we make it really, really easy?' Charlie said, 'Do you think people would really teach courses for free?' And I said, 'Yes, I do. And if nobody does, then where's the harm?' You know. And so Charlie, by God, took that idea from the day of the centennial convocation, and between us, we invented the 199 courses. And I have no idea if there's still a 199 rubric out there, but suddenly, any faculty member on the campus who wanted to teach anything that was reasonably within the range of whatever department he was in, I'm continuing to use male pronouns here, was free to do it, and students were free to take the courses. So that was one success that came out of the day of the centennial convocation.

But it was, there was—Paul reminded me, students in the student government. There were, there were count student councils in every college, there was a student government, the UGSA, Undergraduate Student Association, I think, was a relatively recent invention. Everything had been kind of college level up until shortly before the centennial year, or maybe even during the centennial year. But Paul had gotten involved with student government and with Illini Publishing Company, that was it, IPC. He had been one of the student members of the IPC board and had gotten to know *Daily Illini* editors who included, by the way, Dan Balz, who is one of our more famous alums at this point, because he's frequently on public television on Friday nights on *Washington Week*, and he's senior editor at *The Washington Post*. He was scheduled to retire after the 2016 election, but the election of Trump has kept Dan in the saddle, and he will be sure, I'm sure, he is writing a book about that election year and will certainly be covering the current one. So Dan has extended his career as a journalist, to his wife Nancy's irritation, all because of Donald Trump. Anyway, Dan was editor of *The Daily Illini* the centennial year, and so I got to know Dan very well, and Paul too. Dan, we've all kept in touch over the years since, but *The Daily Illini*, was an extremely fine newspaper in those days. Dan was a very serious editor. Every issue was posted on the bulletin board outside his office as editor-in-chief, with red marks all over it on how it could have been improved. He took the job of being editor extremely seriously, and there were real reporters in those days who went on to major jobs in American journalism. And I could name some of them. Roger Simon was very active that year and still writes for *The National Journal*, one of the better Washington publications. Other names will occur to me, but they're not terribly important. However, there was, there were students in the news, people interested in being being editors and writers at *The Daily Illini* certainly were critical of what they saw on the campus, even though it was the only campus they'd known. We graduate students who came from other places had suggestions. You know, was, was a pretty lively place.

And I don't want the impression of the late '60s to be that it was entirely that everybody's focus was just on Vietnam and international affairs. There really was a ferment, a feeling that the world was changing at a very high speed. Alvin Toffler's *Future Shock* came out at about that time,

pointing out how very rapidly the world was changing. And just let me remind ourselves, as we're thinking about that era. Between 1948 and 1968 I discovered at about that time, as my own interest moved over to how we finance higher education, I discovered that the American income distribution had changed in an extremely interesting way between '48 and '68. Incomes—real incomes after inflation—had doubled at every decile in the American income distribution. Poor people, if you had looked at the bottom 10% of Americans in 1948 and you took a look at the new bottom 10% in '68, the average buying power of that bottom 10% had doubled. If you could afford two dozen eggs a week for your family in '48 you could afford four dozen eggs a week in '68. your buying power in real terms had doubled. Of course, it was still low, but you weren't shivering at night. You didn't have no radio, even, you might even have a TV set by '68. You were still in a two-room apartment, but it was warmer. You were probably eating a little more meat. Things had gotten better. But of course, this was true at every decile. So let's go to the median. The median income had doubled. People who saw the occasional neighbor with an automobile now lived in a neighborhood where everyone had a car. Indeed, by '68, well, it was in the late '50s, I think, that *Life Magazine* ran a front-page feature about the two-car family. Imagine two cars. Why that only used to be millionaires. Well, heaven's sake, by '68 there were probably four car families. So the fact is, everything would seem to be getting better, but when you stopped to think about it, the gaps between people also doubled. After all, if, when you had a \$1,000 income, I had a \$5,000 income, which, by the way, 5000 was the median household income in 1960. Okay, so 5000 would have been in 1950 that would have been, oh, that would be the 70th or 80th percentile, at least. Doctors were lucky to earn 12 or \$14,000 a year in 1950. And indeed, associate professors at the University of Illinois were paid \$14,000 a year in 1968 and Jack Peltason, the chancellor, was earning 44,000. I think we now pay our Chancellor more than 600,000, something like that. Now today's dollars are about in terms of household income, a dollar today is worth a dime back in my era. The typical Illinois household now is at something like 58,000 but they were at 10,000 in 1970 so there's been a six-fold increase since the time we're talking about in median household income. But the gaps between people in different deciles also have grown enormously.

And of course, now we're finally talking about the 1% and the top 10%. There was almost no awareness of the American income distribution in '68. People like Heinz von Foerster, who was mentioned earlier as a mentor of both Paul Schroeder and myself, and a guy very interested in educational reform. A man who lived through the Nazi era, knew what roles universities could have played, but didn't, in the opposition to fascist leaders. I mean, the universities were taken over by the Nazis. They replaced anybody who was vaguely left with party member, party line leaders, they controlled the intelligentsia, and having seen something like that, Heinz was, it was—from his own life experience, quite interested in universities as a place where dissent and questioning of current leadership should always be possible. So Heinz and others saw what was happening to America. Was happening to the world. Heinz published a famous paper right about the time of the centennial, showing, claiming that the world population would go infinite on

March 29, 2021. And indeed, the graph is practically vertical right now. We are adding people at an astonishing rate. I'm living in the first generation of humans on Earth who have seen the world's population triple in their lifetimes. It used to take 100 years, as recently as the 19th century, for the population to barely double. Now it has tripled already, and I'm not dead yet. It could easily quadruple. It was 2.5 billion people when I was born, and we're up past seven and a half billion now. We could hit 10 billion before I die. We shall see.

In any case, as I'm trying to say here, the challenges facing the world were becoming visible in the late '60s. It was only months after the centennial year was over that the first Earth Day took place. People were beginning to talk about ecology. We had seen the Great Lakes in America become so polluted that the fish died and the lake started stinking and you couldn't swim anymore on beaches. People were becoming keenly aware that big as the oceans are, the solution to pollution was not dilution. You didn't just wash your crap into the ocean and hope that it would disappear and the fish would somehow or other eat it. Now we know that the fish are filling up with micro particles of plastic. I keep telling my students today that we were sailing along—we meaning the general population—we were sailing along in the late '60s in a triumphalist mode. We'd beaten Hitler, we'd beaten Tojo. We'd seen our incomes double. We had color television. We had automobiles with automatic transmissions. Computers were still on the horizon, that's to say, home computers, but we just weren't paying attention to what the problems were that were building up.

And my—I became very gloomy 20 years ago. I thought, I have nothing to say to young people. I don't know what to say to them. And I now think I do know what to say to them, and what I say is, the problems are defined. They were inchoate. They were vague. When I was your age, I say to them, but now we can tell what they are. There's a lot of meaningful work to be done in the next 50 years, and we have tools to do it that we just couldn't imagine. When, as a physics graduate student, I was shown a Marchant calculator that would allow me to multiply seven-digit numbers by each other, which sometimes you have to do in quantum mechanics to come up with a very precise answer to a problem. I punched in my first problem and pushed the button, and the machine started chugging and bumping all over the table. And I was sure it was going to break itself, and I unplugged it from the wall. But it was a mechanical calculator that actually ran gears in order to multiply large numbers by each other, and that was what we had. Slide rules and Marchant calculators. I show my students one of the first handheld calculators that multiplied and divided and took square roots. In today's money, it cost over \$1,000. It was 200 in 1970. A handheld calculator today, you go and buy them for a buck and a half, and they have little solar panels that run them, and you can multiply numbers and take square roots and so forth. But you can't imagine how primitive—we had no way to do simulations on computers of how you set an orbit up of a planet around the sun. By the late '80s, at least physics students could go and see how indeed, complicated it is for something like a planetary system to set up around a sun. You could actually run a simulation on a desktop Apple by the late '80s that students could sit and

look at and say, oh! And they were, they were seeing on a screen, things that would have taken us days to calculate and manage to draw out on graph paper. The world has changed in wonderful ways, and we have tools in 2020 that we just couldn't have imagined in '68.

So I think, I think there's a lot of very useful work to be done in the next 50 years. And if Freud was right, and I'm sure I've said this before here too, that if what makes us happy is love and meaningful work, there's a lot of meaningful work to be done. We anticipated that. David Pines and the other faculty members, I think, saw more clearly how drastically the university would have to change. How computers, how new tools, would become available, and we had to show students how to use them well. We're at a weird moment now, when everybody is walking around with his face in a handheld smartphone looking at stupid online stuff, which is being manipulated by the Russians and radical left and right and crazy people. We all spend way too much time with this new tool, using it in terrible ways, just as people thought in the '50s that television was going to rot our minds. It is true that when your radio was running, you could still walk around your house and get things done, but once you had plunked down in front of a television set and watch it, you became a couch potato and started gravitating towards 400 pounds. Also, food was getting ridiculously cheap compared to income. So we've watched people become obese in my lifetime, and television has played a role in that. But I've also seen, believe it or not, when television first hit my very rural Pennsylvania town, people literally did sit down front of their TV sets all day, every day, when they weren't working or doing housework. But by the time their grandchildren were born, people were rebelling against television and getting out and doing things again. I think we'll fight our way through the fascination with instant connection with other phantom people through the damn handheld calculators of today, and we'll start using these tools. People are already doing it, obviously, but more of us will use these tools in useful ways.

But looking back on it, I just can't get over how prescient Pines and others were in trying to get the university to think ahead 50 years. And since that 50 years is now up, plus two, it's a nice time to reflect back that when the 150th anniversary of the University of Illinois came by, the only thing the administration of this university could think of doing was raising money from alums. We really spent a year talking to kids about their lives, the lives of their nation, the future of the world. And there was no such vision this last year and a half, two years, when we supposedly were celebrating the 150th anniversary of this university. We have become even more rigidly captive of occupational preparation, not preparation for life, not preparation for citizenship, but just preparation for earning money. And I think we are greatly overcompensating the leadership of this university. We have way too much bureaucracy, not enough focus on what students ought to be asking, which is, I have a limited number of years on this earth—what do I owe to my fellow man? What's going to make me, on my deathbed, happy that I was here? And we were asking those questions and they're not being asked. And that's all I have to say today.

KN: All right. Well, thank you very much.