REUBEN MARGOLIN AND DAN TOROP

DAN: So I understand you've made a mechanical wave?

REUBEN: You're sitting underneath it, what do you mean? Uh, yeah. I suppose it's a mechanical wave. It's an installation. It's eighteen feet by eighteen feet by eighteen feet. And right now it's installed in my studio here in Emeryville. Basically it's got this grid of wooden dowels that are hanging down—there are 144 pieces of dowels, hanging by eighty-one cables. It's a total of about half a mile of steel cable and there are maybe five hundred roller bearings in the matrix above it and two perpendicular variable cam shafts. And the whole wooden surface undulates in two different directions perpendicularly at the same time as well as rises and falls.

DAN: There's a level where it's like a dream, right, to see *The Wave*? To be in a room with this . . . ?

REUBEN: A dream in what sense?

DAN: I don't know, it's like a dream reality, you know, where you could actually suspend . . . Maybe just because it's so impractical, you know? You don't normally see this. Like . . . And then you see a wave suspended in midair, sort of moving . . .

REUBEN: Something dreamlike about it?

DAN: Yeah.

REUBEN: Hmm . . . Cool, that's a great response. Um. Yeah, I thought you meant it's a little bit like a dream for me, too, just because it's been something in my head for so long, and I've been working on it, and to finally pull it all together. I mean it's been around so long as part of my imagination, that to have it completely outside of my imagination, and something that I can walk around, and show other people, is a bit like a dream. My friends were getting seriously sick of me during the time I was building it, because they would be, "So Reuben how's it going?" and I'd be like, "Oh fine, I've just been working on *The Wave*." And then the conversation would pretty much end. Because there was really very little way to communicate that I was trying to figure out how to run that bunch of wires over to there, and I was worried about the friction of one particular pulley, and I'd spent all day trying to fix that. It doesn't make for great conversation.

DAN: Do you think there are terrible ways to talk about it, which kill it, then?

REUBEN: Well, if you can think of them, I'd rather you didn't bring them up right now.

DAN: Yeah. No one's come and said, "This is nonsense, this is crazy, what are you doing building a mechanical wave?"

REUBEN: Uh. Not yet.

DAN: No?

REUBEN: But I interview people before I allow them in the door.

DAN: Really?

REUBEN: To make sure they're going to say nice things.

DAN: Really. Hmm . . . Yeah, it seems . . .

REUBEN: No, so far it's been very well received.

DAN: I remember the UPS driver was really impressed.

REUBEN: The UPS driver liked it, too.

DAN: Yeah, everyone's . . . But he didn't come to the opening.

REUBEN: I don't think he came to the opening. If he did, I didn't see him.

DAN: Yeah, I didn't see him either, yeah . . .

REUBEN: I thought the opening party for it was really successful.

DAN: Oh, yeah.

REUBEN: That was really fun.

DAN: Yeah, a lot of people.

REUBEN: There was a bunch of people, and a bunch of friends brought food, and drinks, and *The Wave* ran great except for one time when I dropped it all the way down to the ground by mistake. I was drinking a beer and talking to somebody, and it hit the ground and derailed, and I had to climb up and get it back going again, but since that worked out I felt like quite a hero.

DAN: Oh yeah. Nothing like saving the . . .

REUBEN: Saving the wave.

DAN: Yeah. I remember at the opening someone was like, "Oh it would be great just to lie down under this and fall asleep and watch it moving," and I thought that was a nice response to . . .

REUBEN: I think so. It's surprising how calm it is.

DAN: When I look at this, I think about mechanical looms and the people who built the first mechanical looms—in England, right? In the seventeenth century or something? And the Luddites who tried to tear them apart?

REUBEN: Why were the Luddites tearing apart the mechanical looms? They didn't like the technology?

DAN: I think that they were taking away jobs from the people by replacing the people with machines . . . I don't know if they all came from the town of Ludd or what, but that was, I think that was the original story.

REUBEN: Well, I don't think this wave is going to take away anyone's job . . . I'm really happy to say it's completely useless.

DAN: Really? Not going to take away jobs . . .

REUBEN: And it can't be used for anything practical.

DAN: Hmm.

REUBEN: And yet, and yet it's really satisfying to watch.

DAN: Are there many useless machines in existence?

REUBEN: No . . . . I can't really think of any. I think that art is often useless. In that it doesn't— If it serves some sort of purpose, like it can blend your smoothie, then it's been a, then it has a practical purpose and it's probably not going to be called art . . .

DAN: Yeah.

REUBEN: But I would say that most art . . . I mean, I don't mean useless in that it doesn't have any value, it has incredible value, but it just doesn't have a practical purpose, and this wave doesn't have a big, I don't think it can be used for any sort of uh . . . mechanical help or something.

DAN: Well when Calder was building his mobiles do you think he was like, "Ah, these are totally useless?" I wonder if that was even an issue for him at that point. Or whether he thought of them as ornamental in some way?

REUBEN: I'm sure he thought of them as ornamental. They're so beautiful. I somehow don't think he was worried about whether they were useful or not.

DAN: Hmmm.

REUBEN: But I'm sure he knew they had value and that they were going to be loved, and inspirational. But occasionally when you're running up against contraptions that do things, you have to, you have to wonder whether it's going to have some sort of use and whether you're going to be able to sell it, or something.

DAN: So a rickshaw, for example, is useful?

REUBEN: A rickshaw is *super* useful.

DAN: Yeah.

REUBEN: Yeah. There should be thousands of them.

DAN: Yeah.

REUBEN: I'm gonna make one next.

DAN: Really? Oh yeah, the rickshaw. But you can still make that be beautiful and well crafted?

REUBEN: Oh yeah, I hope so. And hopefully functional too.

DAN: Yeah, I was thinking, cause . . . I went to the Museum of Modern Art last week, and there were these sculptures from the '80s, these Jeff Koons sculptures, and it was like this, these two vacuum cleaners in a big transparent plastic box lit by neon tubes, and it's like totally clean and like . . . And I guess it's supposed to be something about industrial design, that these vacuum cleaners are beautiful. I think it's supposed to be something about . . .

there's that '70s artist who made things out of neon tubes, that guy at Dia Beacon who had that long hallway. Who's that, I can't remember his name?

REUBEN: Yeah, I dunno.

DAN: It seemed like Jeff Koons was playing off of them . . . Like, "I'm not just going to take neon tubes, take something industrial, and make it beautiful, but I'm going to take something . . . " And I don't know what the whole process was, but I think that was like . . . super clever, like? All about positioning . . . Like sort of clever and stupid at the same time, because he didn't just . . . He went to the store, and he probably just spent a thousand dollars on vacuum cleaners and made some nice clean Plexiglas boxes . . . And it's a totally different strategy, right . . . Like it probably took him a lot less time to make that, than this, right?

REUBEN: Uh, probably. Although he had to earn all the money to buy the vacuum cleaners, so . . .

DAN: That's true.

REUBEN: But I'm not sure. Wait, what's your question?

DAN: Oh, I dunno, I'm trying to figure out . . . Something about the strategies of making things, or like people, dealing with machines, in, like, an art context or . . .

REUBEN: Yeah.

DAN: I don't know that . . .

REUBEN: Hmm. Yeah, I'm not sure. But I would like to take, I'd like to amend something I just said. That this, *The Wave* is extremely useful.

DAN: Oh, really? Oh, good. What's it used for?

REUBEN: Well, I think it . . . It's . . . No, I take it back, it's not useful. But it does have . . . If you sit around and look at it, I think you do learn a ton about how things work.

DAN: Hmm.

REUBEN: And about, um, geometry. And I think also you get a, and I think also by spending time with The Wave itself it . . . pulls forward a huge amount of just memories and ideas and it's . . . And it's just . . . And that by hanging out with it and watching it . . . I think it's . . . Yeah, well shit nevermind.

DAN: No, that makes sense.

REUBEN: Yeah.

DAN: And partially because everything is sort of exposed in it so you can . . .

REUBEN: Yeah.

DAN: It's sort of like a metaphor for knowledge or something like that.

REUBEN: Oh yeah, that sounds good.

DAN: Yeah, OK, metaphor for knowledge . . .

REUBEN: But in terms of making . . . In terms of vacuum cleaners, I don't have a vacuum cleaner actually. I find the noise of a vacuum cleaner really distressful.

DAN: Hmm.

REUBEN: So I have a broom. I prefer a broom. And in terms of buying stuff, most of the stuff I made. There's a lot of stuff in *The Wave* I made that I could have boughten.

DAN: Like the pulleys?

REUBEN: Like the pulleys, yeah. And it's partly that it's cheaper to make 'em myself. And it's partly that it's hard to get a pulley the right size that's the right strength. I mean, virtually all of it is made here in the studio. Except things like the motors, you know, or the mechanical chain, or the cable, obviously. It's all put together from pretty raw material. And I had to think about all that.

DAN: Yeah . . . And so was it an expensive project to make?

REUBEN: Yeah, I think it has about, I put about six thousand dollars of material costs into it, plus renting the studio for the seven months. Which has left me completely overextended, right now. But, yeah, that will end, and I have this in the studio for now until I figure out where to put it.

DAN: And that's why you can build a rickshaw now to . . .

REUBEN: Right, I'm building a rickshaw to sell. And doing a little decorative painting. And I'm building a fence.

DAN: That's good.

REUBEN: Three jobs in the next three weeks.

DAN: That's exciting.

REUBEN: Yeah, it should put me back on back on my feet.

DAN: Who is the fence for?

REUBEN: For the Yeti.

DAN: Oh, really? That's great.

REUBEN: Yeah.

DAN: I feel like people spend six thousand dollars for a sofa and a television nowadays. This is probably better than a sofa and a television, right?

REUBEN: Well you can't sit on it, but it's probably more fun to watch.

DAN: Yeah, that's true . . .

REUBEN: Takes up a lot more space, though.

DAN: That's true. Hmm . . . Do you ever watch movies with elaborate special effects that are, you know . . . Like there was that movie this summer with fake waves hitting New York?

REUBEN: No, I didn't see it. I barely ever see movies.

DAN: So not a big fan of the movies?

REUBEN: I love seeing movies, I just barely ever . . . First of all it's really expensive to go to the theater, and second of all, I've been obsessed with this thing for the last seven months. And so if I have any time, I've just been in here working away at it. And it's just been so much fun to figure it out and get it all hanging from the beams and get everything put together that it's been more interesting than going to see a movie. Although I am kind of now about ready for a vacation, and wouldn't mind seeing a couple of movies. What was the name of that movie?

DAN: I think it's called *The Day After Tomorrow*. I didn't see it either. But I saw the posters, and there's a large wave generated by the computer, but, I mean, in the super-realistic way, you know. It engulfs New York Harbor, like floods the city, or something like that. And, I guess in the computer it would have looked like a wire frame and maybe could have been rendered like this, as a wooden grid. It would have been an interesting version of the movie if people were swept away by a wooden grid . . .

REUBEN: Yeah, no, I think that yeah . . . I mean for sure. Computers are amazing. And I've tried to make things digitally before and I'm working on a collaboration with Perrin Meyer on a new *Caterpillar*—he's going to be doing some computer programming. And the waves that you made are super-beautiful and impressive—the ocean animation thing.

DAN: Thanks.

REUBEN: But this is, I don't feel like this is competing with . . . I mean, even though it's extremely complex, I don't feel like this is competing with digital technology. It could be done. Somebody with more of a computer sensibility could make this thing out of computers, and servomotors. And I think it probably would have been beautiful, but I think something else would have been lost. I mean, there, this is all made up of big cams that are circles. It's all made up of bits of geometry that you can look around and see, and the installation is, you know, partly the wave, which is very slow and sensual, and it's partly the mechanics above it, which are visible and can be figured out and looked at, and are just made up of all these pulleys and chains and levers and cams.

DAN: In what moment could someone have built this? In the nineteenth century? Like at what moment would industrial . . . Like, so, it's made out of wood, chains, wire . . .

REUBEN: Motors . . .

DAN: Large motors, right?

REUBEN: Yeah.

DAN: Um, voltage controllers . . .

REUBEN: Yeah.

DAN: Toggles, what, like four toggle switches?

REUBEN: Yeah.

DAN: Do you think someone could have built this in 1870?

REUBEN: Yeah, I do. I think in fact it probably could have built it a lot before then if you were going to power it by . . .

DAN: Cranking it?

REUBEN: Yeah, by oxen.

DAN: You could have built it in the fifteenth century?

REUBEN: Yeah. In fact for all I know it has been built somewhere else.

DAN: Maybe the Pope had his private mechanical wave?

REUBEN: Right.

DAN: Hired . . . Yeah, or maybe in the golden age of the Roman Empire?

REUBEN: Right. They would've had one in every living room.

DAN: Yeah, that's perfectly possible.

REUBEN: [LAUGHS] Right, I guess in some ways it's not very modern. I guess it could have been made aeons ago in the past. It doesn't really read as a high-tech modern gadget, despite its complexity.

DAN: Part of it, you did use power tools.

REUBEN: Oh, yeah.

DAN: To make things a particular width. And you're relying on the pulleys being, you know, smooth.

REUBEN: Ball bearings.

DAN: Exactly. And you're relying on modern materials.

REUBEN: Oh, for sure. I mean that I could get five hundred ball bearings surplus, and not have to pay that much money. And that I have an end mill and a lathe, and other big tools that are affordable. And there's electricity that abounds. And a lot of other salvaged material. I mean, yeah, It would be very hard to make this in a different time, where those materials weren't readily available. And where I wasn't fortunate to have so much time to spend working on one project.

DAN: Yeah.

REUBEN: The technology isn't, for sure, new. It's putting together a lot of bits of interesting mechanical ideas that I don't think . . . any of the ideas in themselves are, are really that new. I mean it's just . . . It's just really basic ideas of cams and levers and pulleys. But it's just *magnified* to a rather dizzying scale of complexity, where every wire has to go to . . . There's eighty-one cables, and every cable has to go through six pulleys before it reaches the wave, and all the pulleys have to be bearing, and everything has to slide, and there's tons of moving parts. So it's not really I don't think that it's new, but that it's sort of complicated. And the *miracle* to me is that it actually works.

DAN: So maybe that's a sort of digital idea, that there's not just one set of cams, but everything's repeated: nine in one direction, nine in another direction. And there's a grid—that's a modern idea too.

REUBEN: That sounds right: a repetition of small parts. And seeing a whole as a repetition of small parts very well might be digitally influenced. That makes sense. And a lot of making this is about, I mean it's usually the more success I have has to do with the more I make jigs. And make patterns. And the more I think that it's OK to throw out stuff that I've already done. And start again. The more time I spend before I start making, figuring out how to make it in the simplest way. It's something that comes from having to make so many repetitive parts. You know, there are five hundred pulleys up there. Not all of them are handmade but a lot of them I made. And when you have to drill so many holes into different pieces of wood, you sort of figure out the easiest way to make it. And the easiest way to make it always has to do with making the right kind of fixture and jig. And that's fun, satisfying work. And also the success of it sort of depends on being willing to scrap ideas and scrap notions that I had from the beginning that didn't really work out. And being flexible that way has been a really important part of the process of making *The Wave*.

DAN: Hm . . . Because when you were having problems, when you redesigned the grid, it could have been like, "Oh no there's no good design," right?

REUBEN: Yeah, right. Halfway through I'd built one whole version of the matrix, and it took ten days and five or six hundred dollars. And it didn't work at all. There was way too much friction, and I had to throw it out. And then there were another few days before I came up with a new plan, and during those few days I was once again, you know, five months into a project, and there was no clear way to finish it.

DAN: But this design is much more elegant with the shuttles going back and forth.

REUBEN: Yeah, this design turned out great. It kind of changed the whole aesthetic of everything. Before it was going to be these bits of PVC pipe and housing and zip ties, and it was going to have a bit more of a modern aesthetic I guess. And then I started using the oak, and the next thing it was all oak and fir and nineteenth-century aesthetics.

DAN: Yeah, makes sense.

REUBEN: And I had no idea if *The Wave* was going to work or not until it was completely finished. There was no way to try it out. I made the models of various small parts of it. But I had to actually have it completed before there was tension on all the cables, before I knew if it would work. And I just finished climbing around connecting the last of the cables, and came back down and turned it on, and ran it for about thirty seconds, and it was just so overwhelming. And I had to leave right away, and I took a walk around the block, and then I came back, and I ran it for another thirty seconds, and once again I was like, "Oh my god, this is incredible," and I had to walk around the block again. But I'm developing some immunity to it, and now I can stare at it for hours without having to leave.

DAN: I remember when you were talking about it as a mechanical marionette.

REUBEN: Yeah, for sure, it definitely reminds me of puppets in that it's suspended and it's manipulated by an incredibly complex mathematical set of hands. It would be impossible to control eighty-one strings with my own fingers. And having it be a puppet but run by a set of mathematical hands makes it really smooth, really kind of graceful, kind of abstract and fairly modern-feeling.

DAN: What does it mean to be abstract?

REUBEN: Well, abstract in that to me *The Wave* itself doesn't represent anything specific. It's not necessarily water. It's not necessarily wind. It's not necessarily math. It's not necessarily forces. It's a surface that I think can be read as a lot of different entities. And at times when it's descending it reminds me of a leaf falling, at times when it's on the ground sort of rippling it reminds me of a manta ray or a flatworm. At times it looks like a stormy sea. At times it just feels like it's responding to this presence of energy that's underneath it. And it's being manipulated not so much by the strings but by some sort of force that's rolling around inside of the studio. So, abstract in that it doesn't correspond to one specific thing.

DAN: That makes sense. For some reason it reminds me of when I was reading these Bernard Berenson essays about the landscape and he talks about conceptual landscape painters and they're the ones who paint a tree not by what they see when they paint the tree but by what they know is there. Or by some sort of formal agreement of what a tree is, so if you look at twelfth-century manuscripts a tree might be represented by a stump with like three leaves coming off of it, and that's sort of their agreed-on conception of what a tree is and it works and you have these weird, beautiful landscapes with trees that don't really look like any trees we'd ever see.

REUBEN: I think that's true. I think that what we're seeing is a really complex set of memories and imaginations, and it's that sort of imaginary world that we live in for the most part. When you see something and you're aware of so much more about it than you're actually seeing right at that moment, I think that is what gives the world a lot of life, and what allows art to have a life of its own.

DAN: Hmm. So, does it make sense to talk about the *Caterpillars*?

REUBEN: Oh, for sure!

DAN: Because this came out of the *Caterpillars*, right?

REUBEN: Yeah, for sure. Right, so the *Caterpillars* I've been working on for probably for three years. Starting in '99 or something? I can't remember. I built three of them.

DAN: Why did you get into caterpillars?

REUBEN: Well I . . . The first, I first got inspired by a caterpillar in maybe '96 or so in Utah. Where I was camping with, uh, the Yeti, who's a geologist. And um . . . Yeah, we were . . . whatever . . . cruising around the desert, and, uh, I was hiking along, and I had a part . . . , we were some uh . . . particularly hallucinogenic moment, and I saw a caterpillar that was um, that was completely transparent.

DAN: Really?

REUBEN: Yeah. I could see all the way through the caterpillar right out to the other side.

DAN: Hm.

REUBEN: And I could see exactly how it worked.

DAN: I see.

REUBEN: And I probably stared it for, I don't know, a couple hours. And thought, "Man, that thing's *amazing*." And the main thing about that caterpillar that amazed me was that it didn't, it didn't . . . The length of it never changed. The next time you see a caterpillar, just pay close attention to it, the length of it is constant. And as the wave picks up in the back it comes out of the front.

DAN: Hm.

REUBEN: So the overall length never changes, and this wave just keeps moving through it, and it keeps on walking forward. And it was just in the back of my mind for *years*, and I went off to painting school, and Italy, and Russia, and then I was in this artist residency thing in Scotland. And I'd been doing all this painting which was starting to get a little bit, like kind of heavy, and almost started to feel like it was religious in nature. I'm not religious, but it sort of started to feel that way. It's probably just like . . . maybe . . . Yeah, I don't know what I was painting. I still like the paintings, but they were . . . I really wanted to be exercising another part of my head which was more rational. And more mechanical. And so, I started working on the *Caterpillar* right then, and, yeah, worked on that for a few years.

DAN: Different *Caterpillars*?

REUBEN: Three different ones. They're mechanical caterpillars that undulate and they walk forward. One of them, the first one, was made out of windshield wiper motors. It was analog, and had a 120-way switch that was made out of bits of tape measure.

DAN: I remember that. It was really elaborate.

REUBEN: Yeah . . . And that kind of worked, it went two feet in seventeen minutes.

DAN: And that was really pretty homemade, that one?

REUBEN: That was really homemade. I had an electric drill and a handsaw. Then the next one I made back in Oakland. It actually had a digital circuit that I wire-wrapped, a 50 IC digital circuit. It was made out of steam-bent oak. That one still works, it works great. The next one was cam-driven, which led rather directly into this project. And I'm not done with *Caterpillars*. They're going to come back. But I'm not done with the *Waves* either. At the moment I'm really enchanted by the lightness, and by the fluidity, of this particular design, and would like to build more that are either bigger in scale, or different in complexity, or use different materials.

DAN: How did the *Caterpillars* lead to *The Wave*?

REUBEN: The *Caterpillars* are like segments of waves that are being driven from inside. Whereas this thing is a wave that is being driven from the outside. And the *Caterpillars* were really fun to make. All three of them worked, to some extent. Sometime during that process I was trying to make one out of cams. And I realized that if you had a circle that was off-centered, that would create a sine wave. And from there I realized that if you had a *bunch* of circles that were off-centered and they were all staggered along a shaft, that was another way to create a sine wave. And then several years later, I thought about having two of them perpendicular. This thing has been sitting in the back of my mind for probably two years. I first wrote a proposal for it a couple years ago, and didn't get anywhere. And then moving into this new studio in March, with big high ceilings, and lots of space, I kind of revisited it and figured I would . . . make a run for it. Right before I was working on this I was actually working on another *Caterpillar* that ended disastrously. I worked on it for two months, maybe three, pretty straight. It was just completely frustrating; it didn't work at all.

DAN: That was the solar-powered one?

REUBEN: Right, the *Solar-Powered Caterpillar*. But it had this horrific mechanical idea in it, that just was way too complicated to make, and the whole time I was making it, it was just this *small*, *tight*, *mean* thing to work on. The whole time I was really wanting to make something that was *loftier* and lighter and more airy. And I really wanted to make something that was beautiful. It was really important. I was in this new studio. I really wanted to try to make something beautiful. And the *Caterpillar* I was working on just wasn't cutting it. And so, basically I decided to hang it up. Stuck it up, high up on the wall. And the next day, I started working on this, and didn't stop until seven months later when it was done.

DAN: Is that *Caterpillar* around somewhere?

REUBEN: It's that thing over there that looks like it's part of an old wringer washing machine.

DAN: Oh, I always wondered what that was!

REUBEN: Yeah.

DAN: Oh, that's really, um . . . Yeah, it's very . . . very different.

REUBEN: Yeah, it's really horrific.

DAN: How does it work?

REUBEN: It doesn't work.

DAN: What was it supposed to do?

REUBEN: Those rollers are supposed to pull a belt. That's one of nine segments. And those rollers are powered, and they pull through a belt that has variable width. And then there were these big arms—they're off of it right now—with wheels that read the width of the belt, and articulate each of the segments as the belt passed through.

DAN: I see. Yeah, it makes . . . Yeah, it's pretty, like, tightly . . . built and convoluted.

REUBEN: Yeah.

DAN: Yeah, it's totally the opposite of, uh . . .

REUBEN: Yeah. Look at it—it's heavy, it's got duct tape on it, it just looks particularly bad.

DAN: Hmm. And this, just, like, everything spread out . . . in the right way.

REUBEN: Yeah. I mean, I've been making stuff, you know, since I was little and one of the reasons I feel so good about this is that I've made a lot of things that haven't worked out, and so . . . I can say that this piece is a success. And the reason why I have the confidence to say that is that I've made a ton of things that have definitely not been successful and haven't worked, or haven't worked so well, or have been ugly, or . . .

DAN: Like what?

REUBEN: Like *The Basmati*.

DAN: What was *The Basmati*?

REUBEN: Oh, *The Basmati* was this nightmare wooden thing that had a motor on it, and you could drive around like a scooter. And it was just really horrific. I have it stored underneath a back porch, and hopefully it's getting rained on and destroyed.

DAN: Hmmm.

REUBEN: But anyway, I don't want to talk about *The Basmati*. I've just made other things that haven't particularly worked. I made a hand-cranked blender that didn't really blend anything that well.

DAN: I think I saw that.

REUBEN: It looked good.

DAN: Yeah.

REUBEN: It didn't actually, you couldn't actually make a smoothie with it.

DAN: And that's like . . .

REUBEN: It kind of defeated the purpose of it.

DAN: Yeah, that's the important part. When you built the first *Caterpillar*, I remember seeing a little bit of a video—was it the first time you ran it? With the people in the room?

REUBEN: No, it wasn't the first time.

DAN: Everyone seemed very nervous about whether it would work or not.

REUBEN: I know. I do have a history of making things that don't work right.

DAN: Hmm. But there's something built in . . . totally impractical about it, right? In the sense, that . . . Like, when the Wright brothers were working on the airplane, do you think they were doing it because it was practical and we needed to fly, or because they thought it was glorious, the idea of flying?

REUBEN: I assume they were driven by the adventure, and the challenge, and, you know, the thrilling nature of flight, rather than by a practical sense of the airplane being a useful form of transportation. I could be wrong. But for sure this is driven not by a sense of practicality but by the possibility that it is gonna . . . become a beautiful . . . something beautiful.

DAN: And how do you know when something is beautiful?

REUBEN: It's partly that I've made so many things that haven't been beautiful that when I was done with this one . . . Yeah, I felt it was right. And it probably has to do with that it's just, it's fairly . . . I think it's pretty well-balanced. There are things that grab your attention, and other things don't detract but are there for closer examination, and it all reads really consistently as a whole.

DAN: Yeah . . . [PAUSE]**. Do you have any desire to integrate yourself with whatever the East Coast art establishment is? And follow whatever the conventions are that would make a project like this easily digestible?**

REUBEN: Huh. Yeah, I would like to be . . . recognized as an artist, I suppose in a conventional sense. But I'm not really sure how to do that, and it's not really strictly that important. I mean really, the important thing for me has not been trying to fit into the . . . the artist establishment. The important thing has been fun to make . . . to make stuff.

DAN: Because in theory you could keep working this way indefinitely. Doing carpentry jobs to finance these projects.

REUBEN: Yeah.

DAN: And existing within the community here . . .

REUBEN: It's a good way to work. It's a great way to work. It provides a lot of freedom. It means that I can make whatever I want. I'm sort of excited about making stuff that's more public and that has a different sense of scale, and I think that could all be helped if there was a . . . more involvement in a larger artistic community. And it's a small one here. But I'm very bad at self-promoting. So I haven't really figured out how to do that yet.

DAN: If this was not in your studio here but in a white box gallery do you think it would be ruined in some way?

REUBEN: Nah, I think it would look great.

DAN: 'Cause it's clean?

REUBEN: Oh yeah. I'd sell out in a minute.

DAN: Really?

REUBEN: Absolutely.

DAN: Great.

REUBEN: I've been trying to sell out ever since I was ten.

DAN: Really? How's it been going?

REUBEN: Not very well.

DAN: Why not?

REUBEN: I think because I'd just rather hole myself up in my studio and cut some more pieces of wood, and make something up. [PAUSE].

DAN: So a long time ago you made a car that was a table that you could drive?

REUBEN: Yeah, that sounds familiar.

DAN: Yeah, what was that about?

REUBEN: *The Traveling Commons*. I built it right after college. I think I started building it in '93. It was a round table but instead of table legs it had wheels, and it had a windshield that popped up, and then when you stopped it folded down and it became a flat tabletop, and it had chairs instead of bumpers. And my plan was to drive around the world in search of conversation. It was sort of the first big—I mean now I think of it as an art piece, but back then I didn't consider myself an artist whatsoever and it was just a way of life or something. A social experiment. But looking back on it, it was the beginning of trying mechanically minded stuff.

DAN: And did it work in the sense of finding conversation?

REUBEN: No. It worked absurdly well in terms of being able to drive around. It never broke down.

DAN: That's good.

REUBEN: No, it was really annoying. I was really hoping it would break down and I'd have an excuse to leave it. It never broke. And it worked in terms of finding conversations—it worked all too well in that I met tons of people. But people continually wanted to ask about the table, and I really wanted to have conversations about what utopia meant, and how to make the world a better place, and what the meaning of life was, and instead I had to deal with conversations about what the table was, and where it came from, and where I was going, and what I was going

to do when it rained. And I didn't know how to steer the conversation to a more interesting place and so it just got completely frustrating and I finally abandoned it.

DAN: And with this, is there the equivalent question of "What do you do when it rains"? Or have you found a way, an end-run, around that, at this point?

REUBEN: A little bit. I think I'm getting a little better than that. For one thing I wrote a little pamphlet so if it's a question that I've heard, and I don't particularly want to answer . . .

DAN: You can say . . .

REUBEN: Yeah, "it's in the pamphlet."

DAN: Ten bucks.

REUBEN: Yeah, and I'll sell you the pamphlet for ten bucks. So it works out great. Other than that, no. It's been a little bit different. I think it's been different because the table was supposed to be a vehicle for something else, for conversation, and this is really a piece in itself. I never meant the table to be something you just sat around and stared at, and was fascinating as its own thing. Whereas the function of this is—let me see—somehow to express a sublime and poetic material nature of things and, so, it's OK with me that it becomes a focus.

DAN: Hmm . . . I was looking at the motorcycle there. I didn't know motorcycles had such thin tires. They're smaller than car tires.

REUBEN: They have to be round, like the way a bicycle tire is round. Whereas car tires are kind of flat on the bottom.

DAN: Why do they have to be round?

REUBEN: Because when you're going around the corners, the whole motorcycle's leaning.

DAN: Oh, I see . . .

REUBEN: You don't want to go up on that edge.

DAN: I see... Interesting . . . I guess that's the beauty of engineering is that things naturally make sense, and there's one good design . . .

REUBEN: I definitely believe that if you find the cleanest solution engineering-wise, the simplest solution, it's going to be beautiful, and if it's not beautiful, then you haven't found the right solution.

DAN: Wasn't one of the big tenets of mid-20th century modern art that some sort of economy of means or, I don't know, clarity of form, or something like that . . .

REUBEN: Hmm. Like who?

DAN: I don't know. I guess not de Kooning, right? He was all over the place. Like Barnett Newman, he'd make these paintings and they're just like a big red painting with a streak of white through it, and it would be the simplest possible huge painting to get a feeling of something. I think maybe the critics wrote more about that. It mattered less for the painters. But...

REUBEN: Hmm.

DAN: Yeah . . . Hmm. [PAUSE].

REUBEN: Yeah, pretty much I started it—I mean I *knew* overall where I was going—but I basically started at the beginning. I started at the cams, started working, and figured stuff out as I went along. I never had a drawing for everything. And so I'd just cruise along for a while and make something, then I'd get to the next step and be like, "OK, now's the time to figure out *how* to put that motor in that is going to change the amplitude." And then I'd think about that for a few days, and come up with something, make that, and move on to the next thing. And be like, "Now I've got to work on the matrix, so let's try *that*." Which made it kind of fun, that I was figuring out as I went along.

DAN: That makes sense. So in a way you could modularize in your head, and know that there have to be these cam modules and . . . What happened with the matrix? Originally you imagined eighty-one discreet components in the matrix, and then you brought it down to nine shuttles by nine wires, in a way?

REUBEN: No . . . You're right that I definitely thought of it as components. There's a cam shaft component, and a matrix component, and a wave component, and a platform component. And I was thinking about all those separately. But the basic idea behind the original matrix was similar to this. It was just that it didn't work because there was too much friction inside of the housing. But it was really a matter of changing that into bearing pulleys. And I was just kind of scared to make something that had 243 pulleys, because if a cable came off, it would be catastrophic. So

I was reluctant to do that. But as it turned out, it wasn't a problem. The cables aren't coming off. [PAUSE].

Yeah, for sure I thought about the . . . I thought there were going to be so many pounds of force on this pulley, and so it needs to be roughly that big. But I don't have any mechanical engineering background, so it's kind of from the seat of my pants. As well as I asked some friends, like Frank Bletsch and Bruce Douglas, who have been making stuff for years and are really good and creative. So I'd call them up and be like, "Wait a minute, Frank. There's going to be 300 pounds of load here, and this is a quarter inch aluminum by eighth inch—is that going to be strong enough?" and then he'd go, "Well, err . . . Maybe, yeah, probably, I don't know, yeah, probably," and I'd go "Cool, that sounds good" and I'll go with that. And he was right, of course. [PAUSE].

There are *so* many moving parts, and if any one of them fails, the whole thing doesn't work. So it all has to be slightly overbuilt.

DAN: What's going to happen with it next?

REUBEN: I don't know.

DAN: Really? It's a mystery.

REUBEN: It's a mystery. I *do* know that it's possible to get it out of here. Which I'm kind of looking forward to.

DAN: Hm.

REUBEN: By hauling the matrix up, and then sliding it across the beam then down the other side into a big triangular cart and out the rollup door and forklift it onto a truck, so it's possible to move it all. Which would be sort of fun to do. But I don't know where it will be installed next.

DAN: So you need a room, with, what, thirty-foot ceilings?

REUBEN: Yeah. And a couple places to suspend it from, and a couple things to bolt to the floor for the platforms, but it doesn't need much.

DAN: Maybe it makes sense to turn it on and look at it running?

REUBEN: Sure.

[THEY GET UP AND WALK TO THE CONTROL PANEL].

[SOUND OF SOFT MACHINERY].

[A FEW CLICKS].

[MACHINERY AND A COUPLE OF CLICKS].

[THEY WATCH *THE WAVE*].

Yeah. Basically I'm really happy with it.

DAN: It looks great. It's nice seeing it go that slowly.

REUBEN: Yeah, it's nice having the option of changing speed and changing amplitude and changing height. It looks fine just running right now without any changes, but you can always stir it up a bit, and make it more dramatic, or more aggressive, or calmer, or freeze it.

[THEY WATCH *THE WAVE*].

DAN: It sounds sort of like ice cracking in the spring.

REUBEN: Yeah, or occasionally it sounds like rain or occasionally like fire.

DAN: Hmm.

REUBEN: When I was finished, I was really surprised at a lot of things about it. One was how quiet it was. And I was really surprised at how organic it was and how much life it had. I somehow always thought of it as being much more of a mechanical contraption, whereas it read very much like a living organic thing. And . . . yeah.

[THEY WATCH *THE WAVE*].

I've gotten used to all those creaks and know that those are all OK. So far I haven't heard a really . . . I'm dreading the big bad crack.

DAN: Oh yeah.

REUBEN: The big crunch. Where everything falls to the ground . . . But it hasn't happened yet.

DAN: It looks pretty solid.

[REUBEN INCREASES THE SPEED OF *THE WAVE*].

[THEY WATCH *THE WAVE* FOR A WHILE].

DAN: There really is a weird feeling where it seems to be falling, where the swells seem to be engulfing me, when I'm looking at this.

[THEY WATCH *THE WAVE*].

DAN: It's weird that there's nothing human about it, there's nothing anthropomorphic.

REUBEN: Right, usually it seems like art has to have a real human element for it to be captivating.

DAN: **Yeah, yeah.**

REUBEN: And which is sort of surprising that, yeah . . . that this is . . . really so abstract, and so mathematical, and yet retains so much interest.

DAN: **Yeah. It's not sinister, right? Like there's sort of this whole history of sinister clockwork automatons and . . .**

REUBEN: Hmmm . . . Right, yeah, I don't think it is sinister. No . . .

DAN: **You don't have nightmares about it?**

REUBEN: No, when I was in the middle of making it, I'd be dreaming about it all the time, but it was more just like random useless dreams about cams not connecting in the right place . . . But they certainly weren't nightmares.

DAN: **Yeah. Good.**

REUBEN: Yeah.

DAN: **I mean the only thing at all anthropomorphic is the levers going off the cams remind me a little of *Fantasia*, in *The Sorceror's Apprentice* where there's a dancing broomsticks scene. The apprentice enchants the broomsticks, and they start dancing . . .**

[THEY WATCH *THE WAVE*].

REUBEN: Depending upon the light sometimes the cables disappear. And when the cables disappear it's just this floating, curvaceous entity. But the cables themselves, I find really interesting and attractive, because they're all lined up, these long columns of perfectly straight lines . . .

DAN: **So, it's rational but sensual . . .**

REUBEN: Yeah, I think so.

[THEY WATCH *THE WAVE*].

DAN: **And do you think this is, you know, going to be good for picking up chicks and getting dates? "Come over and see my—"**

REUBEN: "My wave"?

DAN: **Yeah.**

REUBEN: Uh, I hope so.

DAN: **You'd think.**

REUBEN: You'd think. Yeah, I mean if this isn't, what is?

DAN: **A motorcycle or . . . ? I mean this or a motorcycle—which do you think you're better off having?**

REUBEN: Well, maybe if the motorcycle ran you'd be doing all right. Between this and a broken motorcycle, I would say this might win out.

DAN: **Probably. How long would it have taken to fix that motorcycle?**

REUBEN: That broken one over there?

DAN: **Yeah.**

REUBEN: Ah, I could probably fix it in a week or two.

DAN: **So, less than seven months.**

REUBEN: Yeah, but . . . Yeah.

DAN: **It's impractical, is what you're saying. You could have saved six and a half months and thousands of dollars by just fixing the motorcycle.**

REUBEN: Yeah. I wanted to use the motorcycle for a while as a counterweight for the wave but it turned out not to need the counterweight. I was going to hang the motorcycle in the corner and have it go down when the wave went up. But that idea got scrapped. Along with many other ideas . . .

DAN: **So that was a little less elegant?**

REUBEN: Really stupid.

DAN: **How much does a motorcycle weigh?**

REUBEN: That one weighs 375 pounds.

DAN: **Oh, it's a perfect weight.**

REUBEN: Yeah, it would have . . . It turned out to be way too much and completely unnecessary, but . . .

DAN: **Yeah.**

[THEY WATCH *THE WAVE*]. ‼