

Demetri Kofinas: 00:00 Few things are as responsible for the making of the modern world as precision engineering, and yet it remains invisible. We live customizable lives, expecting the universe to conform to our expectations and yet beneath this manifold exterior exists a world of exactness so precise that it passes largely unnoticed.

Demetri Kofinas: 00:24 It is this world of increasing perfection, uniformity and repetition that we speak about today in a conversation on the genius brought to bear by humanity in reshaping the world, as well as an homage to the craftsmanship and personal touch that gives our world its meaning. Our endless striving for that which is flawless is most human, yet try as we might, we cannot rid the world of all its imperfections.

Demetri Kofinas: 00:51 Humanity after all is by its very nature hopelessly, beautifully, fatally, flawed. "To err is human," said Alexander Pope. Perfection is divine. This week on Hidden Forces, Simon Winchester, precision and the making of the modern world. So there are bound to be listeners to this show who have read your books. I'm sure of it obviously.

Simon Winchester: 01:33 I hope so.

Demetri Kofinas: 01:33 Like I said, a confession, I've only read the Perfectionists but you have written The Professor in the Madman. Just here let me look here on Amazon, this has got 900 reviews and you have basically five stars, which is ... I have seen a lot of books, I know that's right up there. But you have such a variety of work. The men who ... what is the men who-

Simon Winchester: 01:54 "The Men Who United the States," I think, yes.

Demetri Kofinas: 01:54 The Men Who United the States, The Map That Changed the World, that looks amazing. I feel like I would love that. I heard an interview you did talking about your book on the Pacific, I just thought, "Amazing." You basically, what it seems to me is, looking at your work let's say if I were looking for books, it seems that you take something that doesn't necessarily seem like a topic and you turn it into one, and that's what I felt about The Perfectionists.

Demetri Kofinas: 02:14 When I first saw it I said, "Wow, that's a book I want to read. Like a history of precision engineering, but I never would have imagined to do something like that. How did the idea for this book come together?"

- Simon Winchester:** 02:26 It came from a reader. The only book thus far where a complete stranger sent me an email out of the blue, chap called Colin Povey who lived in Florida, a place called Clearwater and he said, "I've read all your books," which is nice and, "I've liked them," which is even nicer and, "I've often wondered whether someone, and I think it should be you, should write a history of precision, which is integral to all of our lives and yet it's sort of invisible it's like the air we breathe or the language we speak."
- Simon Winchester:** 02:56 So we don't think about it rather like you said, and I put it to my editor Harper Collins, my publishers, and they said, "Yes, it sounds a good idea, but we can't quite see the sort of narrative thrust," the through-line as they call it. In other words, you could write it as a series of sort of episodic essays, but that wouldn't be very satisfactory. So does precision have a beginning, does it have a middle, does it have a conclusion?
- Simon Winchester:** 03:22 In doing some research I was able to find out, and I think without cheating as well that it does have a specific-
- Demetri Kofinas:** 03:29 When you say cheating, what do you mean?
- Simon Winchester:** 03:30 Well, I mean you could fudge these things. In theory you could always invent a through-line, but I came up with a through-line, which was real. What I did was, I looked at the very first thing which one can say legitimately was precise, and that was a cylinder made in 1776 on May the 4th, which people remind me now of course is Star Wars day ... may the 4th be with you.
- Simon Winchester:** 03:56 Not my joke, there's. That was made for James Watt, by an extraordinary eccentric Englishman called John Wilkinson, and he made it with a exactness, a tolerance if you like, between the outer wall of the piston, what one wanted to put in it, and the inner wall of the cylinders he'd invented, of the thickness of an English shilling, which in those days, 1776, was one tenth of an inch.
- Simon Winchester:** 04:24 With that number of 0.1, I thought there's the beginning of a through-line, because that would be chapter one and chapter two would 00.1 and chapter three 000.1. So each chapter would be more precise if you like, it would be more exact in tolerances up to the very present day when the, what I believe are the limits of precision engineering, things are being machined to one to the minus 28 zeros and then a one. So very, very tiny little tolerances.

Simon Winchester: 04:57 So that gave me the narrative thrust of the book, and the editors seemed to think it was a reasonable idea, and mercifully the reviewers have too, so everyone wins.

Demetri Kofinas: 05:07 So to clarify for our audience, when you're talking about tolerances, what do you mean?

Simon Winchester: 05:11 Well, if you like, the easiest way is how well it fits. A shoe, that's got a tolerance of I don't know, but your feet. But let's say an eighth of an inch.

Demetri Kofinas: 05:20 Tolerance of error.

Simon Winchester: 05:21 Tolerance of the amount of allowable error between the size of your foot and the size of your shoe. Obviously with a shoe it's a great deal, but with a tiny piece of let's say a motorcar, the tolerances are tiny. I mean they would be a thousandth of an inch. With a jet engine, they would be thousandths of a millimeter.

Simon Winchester: 05:43 So tolerance is a crucial and critical aspect of precision engineering, and I should perhaps at this point tell your listeners the difference between precision and accuracy, which people often get confused with. So it's boring, but let's get the boring bits out of the way.

Demetri Kofinas: 05:57 No, it's actually not. I didn't know this either and I found it very educational.

Simon Winchester: 06:00 Well, in the English language there are no synonyms, and precision and accuracy are not synonyms. Accuracy, the best way of sort of realizing it is to think of a dartboard. Your intention when you throw arrows or fire bullets at a target is to hit the center, and if you do that, if you have achieved your intention, then that is accuracy.

Simon Winchester: 06:21 If however you fire bullets or arrows or whatever at the target and they all perhaps don't hit the center, but they all hit the same place. let's say at 10 o'clock, and you do it the same time after time after time after time, you've achieved great precision. If you can achieve precision and accuracy, then you're absolutely off to the races, but there is a difference and the crucial ... sort of to take this a little bit forward, aspect of doing the same thing time after time after time, is the making of pieces of whatever, whether it's a carburetor or a piece for a refrigerator or a television or a iPhone, that are exactly the same, are crucially and the word is interchangeable.

Simon Winchester: 07:03 The making of interchangeable parts, such that if a part fails, you just get another one out of the box and it fits perfectly. So those things, tolerance, interchangeable parts, accuracy and precision, lie at the center of this book. The book is about a great deal more than that, but those four concepts are important to know about.

Demetri Kofinas: 07:23 Is it fair to say, the way I think about it also, is that in order to achieve precision you need to have ... I mean it's very much something where you've got tools that allow you to be precise, the accuracy is more a human methodological approach. It's about first of all, you could have very precise tools, but be highly inaccurate because you don't know have the right theory and how to approach let's say-

Simon Winchester: 07:45 Well, I mean a good example is, maybe this will be later on in the discussion, but I mean the making of the Hubble telescope.

Demetri Kofinas: 07:50 Right, exactly.

Simon Winchester: 07:51 And that was the mirror when it was ground, was ground very precisely, but it was inaccurate because it was one fiftieth of the thickness of a human hair flatter than it should have been. In other words your intention was to make it a certain dimension, and what actually came out was incredibly precise, but it was wrong. So it was precisely inaccurate.

Demetri Kofinas: 08:16 What was it, the Mars rover in '98 ... what year was it, or 2001, there was a piece of equipment in outer space that was sent by NASA that costs hundreds of millions of dollars or billions of dollars, and they got one digit off. They rounded in the wrong err.

Simon Winchester: 08:29 Yes.

Demetri Kofinas: 08:29 I think it was because they were translating from the metric system to-

Simon Winchester: 08:33 Well the classic example of that, I mean on earth, is the Air Canada flight that filled up with kerosene flying from, I think it actually was an American rather Canadian plane, flying from, let us say, Chicago to Winnipeg, and it loaded the fuel in gallons whereas what was required was-

Demetri Kofinas: 08:53 Was liters.

Simon Winchester: 08:53 Liters, exactly.

Demetri Kofinas: 08:54 And they overfilled the plan.

Simon Winchester: 08:55 Well, the other way around, they put in liters. I think he was therefore flying from Canada to the United States. He said, "I want 10,000 gallons," and they put in 10,000 liters, and he ran out of fuel.

Demetri Kofinas: 09:05 Ran out of fuel.

Simon Winchester: 09:06 Yeah.

Demetri Kofinas: 09:06 Oh my god.

Simon Winchester: 09:07 He had to make an emergency landing somewhere in South Dakota or somewhere you don't want to be.

Demetri Kofinas: 09:11 That's wild. I have one more question for you before we proceed along with the substance of the book, and that has to do with how you write something like this. At first when I began to read the book, I didn't understand why you put the precision numbers there. I mean I should have understood it as I started reading along.

Demetri Kofinas: 09:27 The structure of the book came together for me as I started to read it. You created this structure within which that was relevant to the material, and I wonder, do you do that with your other books, and how did you have that thought?

Simon Winchester: 09:39 Well I think the three components to write a successful non-fiction book, first of all you've got to have a good idea. So there's no point in writing about your grandmother who collects moths or something. No one's going to be very-

Demetri Kofinas: 09:53 How do you judge a good idea?

Simon Winchester: 09:54 Well, I suppose that comes to-

Demetri Kofinas: 09:57 That's the talent.

Simon Winchester: 09:58 That's something. That's the mystery. You might think that the second component is good writing. I mean good writing is important, but I think it's not the second most important thing. First important thing is the structure of the book. You can write lyrically about an incredible idea, but if you get the structure wrong or inappropriate or clumsy, you'll lose the reader, and that's what you don't want to do.

Simon Winchester: 10:23 You want a sort of on, on, on. The reader is compelled to say, "What next?" And you, I think ... I mean maybe I'm flattering myself, but because you know that the next chapter is going to be about things even more accurate than the one you've just read, you think, "Well, before I go to sleep tonight, I better look at chapter five."

Simon Winchester: 10:41 So with, for instance, a book ... like I did books on the Atlantic and the Pacific, and in the Atlantic, a gigantic subject, well how do you corral all this information into one coherent structure? What I decided to do was to do it sort of chronologically, but base it on the seven ages of man from Shakespeare from As You Like It.

Simon Winchester: 11:04 If you remember from school, it was the infant and then the school boy and then the soldier and then the lover and then the judge and the old man and the return to childhood. It seemed to me that you could look at the ocean from its origins, its childhood, the school child is us getting to know about the ocean. In other words educating ourselves about the ocean.

Simon Winchester: 11:27 The soldier would be about all the wars fought across the ocean, everything from Trafalgar to the Vikings to modern warfare, and so it would go on. Similarly with The Men Who United the States, it obviously has to be in the discussion with your editor, I decided I'd do America looking at it as it were, not necessarily through foreign eyes, although I'm English so they are sort of foreign, although I'm an American now, but through the structure given to me by the Chinese philosophical elements of earth, air, water, fire and metal.

Simon Winchester: 12:03 It worked out very neatly, because you could begin by looking at America in the context of earth, geology, mountains, plains, all the rest of it, and then ending up in metal, which would be things like telegraph wires and the computer age and that sort of thing. So getting the structure-

Demetri Kofinas: 12:20 So the book was about all the people who over the centuries brought the country closer together?

Simon Winchester: 12:25 Yes.

Demetri Kofinas: 12:26 Fascinating.

Simon Winchester: 12:27 It was the physical uniting of the States.

Demetri Kofinas: 12:30 This is what I mean, like your books are so ... what a creative idea. What a creative way to think about things. Not many people do that, and that's a common theme throughout all your books, huh?

Simon Winchester: 12:38 I try to make it. At that moment it's obviously not quite ... when I wrote a book about the Yangtze River, and that's simple travelogue, except that the structure there was that I realized was, I used to live in China, that going upstream from Shanghai towards Tibet where it rises 4,000 miles away, you're actually going back in Chinese time because Shanghai is an ultra-modern city, you get to Nanjing, that's famous or infamous in the '30s and '40s.

Simon Winchester: 13:05 Wuhan, that's famous in 1911, the time of the Chinese Revolution, and then you go up into western China. It becomes really old-fashioned, full of old temples and there's a lot of Buddhism there, a lot of Taoism, and so the structure of the book is not simply a travelogue, but it's looking at the river as a vehicle for exploring Chinese history.

Demetri Kofinas: 13:26 That's interesting. You say as you go up, you go back.

Simon Winchester: 13:29 Exactly.

Demetri Kofinas: 13:30 There's something similar that I experienced while reading your book, which is that as I went into further detail as the chapters moved towards more and more precise, I found that I was moving further and further away, and it felt like there was some level of conscious influence on your part as well, moving further away from what made sense. In a sense the book is both story about precision, but it's also an homage to imprecision.

Simon Winchester: 13:55 I'm so glad you got that. What I did not want the book to be it was a sort of appeal to precision, saying precision is good in all of its manifestations. I wanted to say particularly, and you spotted it so well, thank you, that as you get more and more precise, you want to say, "Wait a minute, is this good for us? Aren't we forgetting things that we were once very good at like craftsmanship and working with wood and working with our hands, and doing things which are imprecise and which nonetheless remind us of our soul?"

Simon Winchester: 14:28 Because I mean we're imprecisely made, and yet we're beautiful. I'm not, but some people are very beautiful. There's no straight lines in landscape, and yet landscapes are very

beautiful, whereas precision is all based with perfect spheres, perfect straight lines, perfect flatness, perfect fit.

- Simon Winchester:** 14:47 Is perfection in the end a bit tedious and robbing us of our humanity? So I didn't want this book to be a scold, I didn't want this to be shrill, but I wanted, particularly in the later stages, when you're looking at really, really precise devices, I wanted to say, "Is this what we really want?"
- Demetri Kofinas:** 15:07 You know what came to me now, your wife is Japanese correct?
- Simon Winchester:** 15:09 Yes.
- Demetri Kofinas:** 15:10 What came to me now when you were speaking, have you seen The Man in the High Tower?
- Simon Winchester:** 15:13 Yes, I have seen The Man in the High Tower.
- Demetri Kofinas:** 15:15 So I'm sort of reminded when you're speaking, that the world of sort of maximum precision is this-
- Simon Winchester:** 15:20 The western side.
- Demetri Kofinas:** 15:21 Well, the Nazi, this future fictitious Nazi regime, and that the imprecise is the Japanese.
- Simon Winchester:** 15:27 Is the Japanese, right. In a funny sort of way, you would think it might be the reverse, but no, the Japanese revere ... and I try and make this point in the later chapters of the book. To this day, although they're known for Nikon and Canon and all these highly precise manufacturing companies, the government awards the title of living national treasure to usually rather elderly people who have spent their lives devoted to craftsmanship, making things of woodwork and lacquerware and flower arranging, and things which are elementally human and have nothing to do with engineering. I think that's wonderful.
- Demetri Kofinas:** 16:08 It's also wonderful that then ... and I do remember that from the book, and I think one of the things that we lack in society is a place for the wise.
- Simon Winchester:** 16:17 Yes.
- Demetri Kofinas:** 16:17 The older people that have come before, who have something to share. In many cases, especially in these busy cities, they

become a burden as opposed to anything else, and that's a case in Japan as well.

- Simon Winchester:** 16:25 Yes.
- Demetri Kofinas:** 16:26 They all have become a burden on to the society.
- Simon Winchester:** 16:28 It's so interesting you'd say that. I've often thought, but I didn't think I'm clever enough to do it, that I should do a book wandering around the world, interviewing elders in societies that have-
- Demetri Kofinas:** 16:38 Wow, that would be amazing.
- Simon Winchester:** 16:38 ... and revere elders. A woman I met in Hawaii who is very much inclined to talk to Hawaiian elders, said that if she ever did such a book, or if I ever do such a book, the title is obvious, it would be called, "The Original Instructions," because these people sort of have the wisdom to know that what the world really should be all about.
- Simon Winchester:** 17:00 I think it'll be too difficult a book to do, and you might find you were going back to what we said earlier about you can sort of fudge things. I think you might end up being tempted to almost put words in people's mouths, because you'd be talking to a lot of shamans in Indonesia and elderly people in the Andaman Islands and things, and you wouldn't quite understand, you wouldn't quite get it, and there would be a temptation to say make him say something that makes my point.
- Demetri Kofinas:** 17:27 That's so interesting that you make that point. Yes, that's a good point. Something else that came to me while you were talking, and it goes back to this distinction between precision and accuracy. In some sense it could be that as our lives become more precise, they become less accurate, that they are less aligned with our intentions, with the type of life that we want to live, that we may-
- Simon Winchester:** 17:47 We are forgotten and overlooked, dismissed.
- Demetri Kofinas:** 17:50 Yeah, I mean it's maybe a stretch-
- Simon Winchester:** 17:51 We don't perhaps know how we want to live anymore.
- Demetri Kofinas:** 17:52 Yes. Yes.

Simon Winchester: 17:53 We're too subsumed in the world of buying new iPhones and televisions and things.

Demetri Kofinas: 17:59 There's less intention.

Simon Winchester: 18:00 There's less intention. There's a sort of Socratic argument to be made of letting life take you along a certain path, rather than necessarily demanding of it things that you think you ought to want, but perhaps deep down you don't.

Demetri Kofinas: 18:18 That was something else that I thought about when I was reading your book, which was ... and I wrote it down somewhere here, I had a few things ... precision, efficiency, optimization and order. This need to order, and I think that the common thread for me was the human's mind desire to bend the world to its will, and I think we've become so expert at that, and living, as you say, in a world, there's certain level of flow we surrender to life to in a sense is difficult. I think it's more difficult than it used to be, because we've gotten so good at putting order around the world the way we want things to be.

Simon Winchester: 18:50 Well, I think that's why I live, or try to live the way I do. I mean I'm far from living a blameless life, but I live a deliberately rural life. Yes, I've got a small apartment here in New York so I can come down and do things like talk to you, but I live on a very remote farm in a very remote village in western Massachusetts, totally non-fashionable. I have chickens and bees and all that sort of thing, and I love old-fashioned things like stamp collecting. I'm a real nerd I'm afraid.

Demetri Kofinas: 19:22 Good, then you're perfect for this.

Simon Winchester: 19:23 I think I mentioned in the book my Sunday morning ritual, and this is being recorded on a Thursday I think, isn't it?

Demetri Kofinas: 19:29 Yes.

Simon Winchester: 19:29 So Sunday I have eight clocks in my house and I've got a barograph that I've been religiously keeping a clock work record of the rises and falls of atmospheric pressure in the village since 2001 I think, and I wind them all up on Sunday morning and set them correctly. So I love the ritual. It takes about an hour and the clocks are different designs, and some of them chime and some of them don't, but by eight o'clock, by breakfast time on Sunday morning, all of them are, as they say, in rate.

- Simon Winchester:** 20:01 They're still in rate on Monday, but by Tuesday they're starting to fall out of rate and by Wednesday and Thursday it's in complete shambles, and then Sunday I have to move the hands forward or backwards. But it reminded me of a lovely line which I quote, I think two or three times in the book, in a novel which I've always liked, a detective story about a woman called Dorothy L. Sayers. It's called Gaudy Nigh, and it's set in Oxford, and she talks about walking through Oxford late on a summer's night and listening to the college clocks chiming midnight. As she put it, "Chiming midnight in friendly disagreement," and I love that.
- Demetri Kofinas:** 20:35 No, that's a beautiful quote, I remember that from your book. There's also another great quote of yours in the book, which I want to say to our audience because it sort of puts a bow in a sense on what we were just discussing, where it speaks to what we were just discussing.
- Demetri Kofinas:** 20:50 "Is such a wish for perfection truly essential to modern health and happiness, a necessary component of our very being?" I thought that was a great quote that-
- Simon Winchester:** 21:00 I think it's a question which increasingly we need to ask for philosophical reasons, for sort of spiritual reasons, if that doesn't sound too pretentious to say so. But also because it seems that we're demanding maybe too much of our devices, both our mechanical devices and our electronic devices. That we're pushing our abilities to machine things to the edge. I mean and dangerously so, and I give an example of a jet engine, a Trent 900, Rolls-Royce Trent.
- Simon Winchester:** 21:30 There were four of them powering a Qantas A380, a big double-decker, fully laden jet going from Singapore to Sydney in 2010. They were at 7,000 feet and the engines were spooled up to full power heading obviously over 35,000 feet, cruising altitude, when suddenly the number two engine, the one closest to the fuselage on the port side, left-hand side of the aircraft exploded.
- Simon Winchester:** 21:56 Well, it ended happily mercifully, except the ruined engine, 50 million dollars' worth, but when they investigated they found that the culprit was a tiny titanium pipe about the size of a drinking straw, which had been miss machined by a fellow in Hucknall in northern England, and passed by the inspectors. The wall of the tube was a fraction of a millimeter too thin and it ruptured and spewed hot oil onto the titanium roto, caught fire, all sorts of mayhem resulted.

Simon Winchester: 22:31 One wonders whether our ability to machine things down to that level of precision is taxing our mechanical abilities and whether we've reached ... we should say, "Okay, our jet engines are powerful enough, they're fast enough. Until we find new materials or something like that, let's just not push things."

Simon Winchester: 22:51 Oddly enough, since the book was written ... I guess I finished it last December, this problem has really gathered momentum, and at the moment as we speak, there is something like 110 jet aircraft waiting for engines in Toulouse in France in Boeing factories in Washington State and down in South Carolina, because no engines can be made that are good enough and free of these kind of mechanical faults, because the technology of building these engines is becoming so difficult. So in a funny sort of world the way the physical world is telling us, "Maybe you've gone far enough. Let's pause for a moment."

Demetri Kofinas: 23:31 Interesting, and that actually, if I remember correctly, that's the middle of the book that chapter right? It's approximately the middle.

Simon Winchester: 23:36 Yes.

Demetri Kofinas: 23:37 Then that's where you, as a reader, you say, "Wow, I've never put that much thought into what goes into these engines on which I relied to fly from here to there," and then we get to the satellite and we get to the microprocessor and the transistors. What was that research like for you?

Demetri Kofinas: 23:55 I mean the last chapter is ... I can't even remember the number off the top of my head. It was ... I mean I couldn't even say it out, the tolerance level. I have it here for the microprocessor, but what did you learn about ... I guess what I'm thinking is, we've experienced this exponential rate of change in society and we attribute it to Moore's law and to the microprocessor, but what the book also does is it shows that this is a trend that started before that really, right?

Demetri Kofinas: 24:20 Because there is an exponential trend that occurs in terms of our level of precise engineering.

Simon Winchester: 24:24 There certainly is, both mechanical and electronic, but it is now getting as I hope ... I've sort of tried to explain in the mechanical world, starting to get out of hand, and in the electronic world it's becoming near absurd the levels we're talking about.

- Simon Winchester:** 24:39 I mean Moore's law, yes, the ever ... the doubling every couple of years, it seems to be going on and within the microprocessor community they insist that it'll continue going on, but the reality is that there are ... my iPhone 8 here has a chip in it, the A11 chip, which is an Apple proprietary chip made in Taiwan, has 4.3 billion transistors in it, in something about as big as the nail on my pinky finger.
- Simon Winchester:** 25:09 But I think the most remarkable statistic that I learned and Intel confirm it, that there are now more transistors in the world ... and bearing in mind the transistor was only invented in 1948 and the first transistor was about the size of my fist, they're now so small that there are more transistors operating in the world today than there are leaves on all the trees in all the world.
- Simon Winchester:** 25:33 Now to get here to the studio today I was driving down the Massachusetts Turnpike and it's just wall-to-wall trees on either side of you, and you think. "There must be unimaginable numbers of leaves, so that statistic must be wrong." But it is right. They're making thirteen trillion transistors a day, and the numbers are such that if you know your Heisenberg, and you probably know far better than I do, but you're operating now down at levels which is subatomic, so things start behaving peculiarly.
- Simon Winchester:** 26:06 I mean it's quantum mechanics basically, which as Richard Feynman famously said no one really understands, and how do materials, how does electric current, how does it all behave at that level? Are we possibly reaching a limit in the world of electronic precision. The engineers say, "No, no, no, no. There's quantum computing, there's optical computing, we can get faster, we can get cleverer."
- Simon Winchester:** 26:32 One wonders, and of course then that leads onto the, in my view ... it's out of the realm of this book and I didn't write about it at all, but artificial intelligence and robotics, and then combining those two things with ever-increasing levels of precision and ever finer tolerances, and the world starts to descend not necessarily into nightmare, but into a world which seems potentially dystopian.
- Demetri Kofinas:** 26:59 Was that near your mind while you were writing this book?
- Simon Winchester:** 27:02 It wasn't at all, but I do have this very clever Japanese wife who kept saying to me, reminding me that the Japanese have it in perspective. In other words as I mentioned earlier, have a love

for the imprecise. They worship bamboo in just the same way that they worship titanium, both are to be revered.

- Simon Winchester:** 27:21 But she would say to me increasingly as I would come back from my study and say, I've made this extraordinary discovery about GPS or about optical glassware or the LIGO observatories, she would say, "Well yes, just hold on a minute. I mean are there limits? Are we going too far? Are we crazily worshipping precision? Are we fetishizing precision?"
- Simon Winchester:** 27:43 So she's kept me on the straight and narrow and saying, "To write this book properly you need to consider and remind people of the joys of the imprecise as well."
- Demetri Kofinas:** 27:54 One of those is the Rolls-Royce.
- Simon Winchester:** 27:55 Yeah.
- Demetri Kofinas:** 27:56 That's what's so interesting. Another point I wouldn't have thought it, if you had asked me I would have said this is a very precise machine, but in fact the contemporary analog would have been Henry Ford and the Ford Motor Company, and you draw that parallel. Can you tell us a little bit about what you write in the book with respect to the Rolls-Royce, the process that went into, and I guess no longer does. I assume they no longer make them by hand, or do they?
- Simon Winchester:** 28:19 No, they don't. What I do quite deliberately, is to compare two iconic motor cars which were built almost exactly the same period of time from 1908 to 1927, and that on the one hand is the Rolls-Royce Silver Ghost, which is reckoned to be the sort of-
- Demetri Kofinas:** 28:36 What a beautiful car.
- Simon Winchester:** 28:37 It's stunning.
- Demetri Kofinas:** 28:38 I had no idea what that car was until I read your book.
- Simon Winchester:** 28:40 They were just wonderful machines.
- Demetri Kofinas:** 28:41 It's so beautiful.
- Simon Winchester:** 28:42 And nearly all of them that were made, 8,000 were made, nearly all still exist and are running today, which is extraordinary.

Demetri Kofinas:	28:50	Incredible.
Simon Winchester:	28:50	115 Years later. So you look at that, which was a machine made by hand, lovingly made by old-
Demetri Kofinas:	28:57	Lovingly made.
Simon Winchester:	28:58	Literally lovingly. I remember the first time ... I have a sort of professional relationship with Rolls-Royce, which came about-
Demetri Kofinas:	29:05	You have to get into this too, this is great. I would love for you to tell our audience, whether now or later, your history as a writer in LA with the LA gangs and your use of the Rolls-Royce.
Simon Winchester:	29:13	Yes. Well, this one, it's probably best to dispose of that now, I mean basically what happened I was a reporter for the London Sunday Times, and back in the mid-'80s when commissioning editors spent money like drunken sailors.
Simon Winchester:	29:27	They came to me one day and said, "Winchester, we'd like you to write a series of articles about Europe, because the English don't like Europe and don't know anything about it and want to know even less, but we think we have a responsibility to tell the English what Europe's all about. So will you please get a photographer and go on six journeys around Europe? Anyway you like and by any form of transportation. Make each one different and write a 5,000 word essay on each of these journeys."
Simon Winchester:	29:56	The first thing I did, I got hold of a yacht and sailed from Stockholm to Helsinki, then I got two, for the photographer and me, BMW motorbikes in Munich and rode them to Turin.
Demetri Kofinas:	30:07	That must've been a lot of fun?
Simon Winchester:	30:08	It was tremendous fun, and Patrick is ... he's still, now 80.
Demetri Kofinas:	30:10	Did you have the goggles?
Simon Winchester:	30:13	I had a full face helmet. No goggles. My lips going crazy, no. Then I got two horses and we rode them through the Black Forest of southwest Germany.
Demetri Kofinas:	30:23	Wow.
Simon Winchester:	30:24	Then we walked, or at least I walked, Patrick took the car. I walked from Cadiz to Gibraltar around the southwestern rim of

Spain. Then I rode on the train from Victoria Station in London to the Victoria Hotel in Brig in Switzerland on the Italian border. Then we went to a club I belonged to in London, to sort of see what we had got in the bag as it were.

- Simon Winchester:** 30:47 Then discussed the journey that was going to be the lead story, which was a motorcar journey from the westernmost point of Europe, which we defined as the cliffs at the edge of Finistère in western France, because this was the Soviet Union time, the easternmost point in Europe would be the city of Astrakhan, which is where the Volga meets the Caspian Sea.
- Simon Winchester:** 31:08 So we had lunch and we obviously dined rather well, because at the end Patrick said, "Do we have to take your old Volvo?" and I said, "No, I tell you what, why don't we see if we can get hold of a Rolls-Royce?"
- Demetri Kofinas:** 31:20 I can't believe you got paid to do this. This is remarkable. What a life.
- Simon Winchester:** 31:22 Well, it was in ... really, I mean you wouldn't get that kind of an assignment today. So I rang up Rolls-Royce PR people and they said, "Call you back in half an hour," and half an hour later they did, true to their word, and said, "We have a Silver Spirit in ocean blue and it's coming off the production line tomorrow. It's a canceled order and if you'd like to come up to Crewe, we'll show you around the factory, and you can take the car for three months."
- Simon Winchester:** 31:47 So I went up to the factory, and talking about the loving assembly of these cars, there was a man there that showed me a crankshaft. Beautifully forged piece of steel, perfectly, perfectly well polished by hand with chamois leathers and he had made it such that no one side of it was even a fraction of a gram heavier than any other, so if you put it between two bearings and started it spinning, it theoretically would never stop.
- Simon Winchester:** 32:14 Obviously friction would do for it in the end, but no one side was heavier than another, so it wouldn't have a tendency to slow down. So I've always remembered that, and anyway, I picked up the Rolls-Royce and the only embarrassing thing was the registration number, which was RRM1 for Rolls-Royce Motors one, but the parking meter people outside the Sunday Times office thought it was Rupert Murdoch's car, so they never gave it a ticket.

Simon Winchester: 32:39 I lived in a little village in Oxfordshire and whenever I drove it home, all the villagers would gather outside the gates because they thought that Roger Moore had come stay.

Demetri Kofinas: 32:47 This was what year again?

Simon Winchester: 32:48 '84.

Demetri Kofinas: 32:48 And they were beautiful cars then. I don't like them now.

Simon Winchester: 32:51 No, I don't like them at all. They have nothing to do with ... well, they're not made-

Demetri Kofinas: 32:54 But those were beautiful.

Simon Winchester: 32:55 They were stunning.

Demetri Kofinas: 32:55 They're still beautiful.

Simon Winchester: 32:55 The Silver Spirit was a lovely car, but the Silver Ghost ... I mean the upshot of that story was they were so pleased with the publicity, they kept giving me a Rolls-Royces or lending obviously, I took them back in the end.

Simon Winchester: 33:07 But so what I decided to do in this chapter was to compare these two cars which sort of represented the way in which the use of precision in the automobile industry had diverged, because the Rolls-Royce, the Silver Ghost, 1908 to 1927, was all made by hand. And so if a piece didn't fit, the man who was making it by hand would simply file it down until it did fit, whereas Henry Ford, the car that I chose that was made from 1908 to 1927 was of course the Model T and instead of there being 8,000 of them, that was the number of Rolls-Royces, 16 million Model T's were made on assembly lines.

Simon Winchester: 33:52 And if the pieces which were meant to be ... and this harks back to the very beginning of our conversation, were meant to be interchangeable, all exactly the same time after time after time after time, if one piece wasn't, then it wouldn't fit in whatever, the carburetor or the brake lining or the transmission or steering gear, and the production line would stop.

Simon Winchester: 34:15 Investigators would fan out trying to find what was the offending part, replace it, all the workers would stand around smoking and being bored. It would cost a lot of money, and so precision turns out to have been much more important for the production, the mass production of inexpensive popular

motorcars than for the hand making of ultra-luxurious cars like Rolls-Royces, and the interesting thing is that during those years from '08 to '27, the price of a Rolls-Royce went up dramatically, but during those same years the price for Model T went down from \$809 1908 to \$217 in 1927.

- Simon Winchester:** 34:58 So everything that Ford wanted when Ford first came up with the idea of, "I want to make motorcars," his whole ethos unlike Henry Royce who said, "I want to make the best car in the world," Henry Ford said, "We live in a beautiful country. I want every American to be able to get on the road and see it. This is a car for the common person." Well, the common people required more precision than did the aristocracy and the rich.
- Demetri Kofinas:** 35:23 What was the name of the Frenchman who did the same thing for muskets?
- Simon Winchester:** 35:27 Yes, he was called Honoré Blanc, and he was ... it's an interesting story really. I mean this is in the years immediately after John Wilkinson had made his cylinders, and after a man called Joseph Bramah had made locks, and after a man called Henry Maudsley had been making what we're called pulley blocks for the Royal Navy, which were the first attempts to mass-produce very precise things.
- Simon Winchester:** 35:51 Over in Paris this man Honoré Blanc said, "Well, a piece of very well used critically important engineering does not take advantage of these methods which Wilkinson and Maudsley and Bramah had pioneered, and that is in the making of muskets, of guns, specifically flintlocks."
- Simon Winchester:** 36:12 And a flintlock has ten parts beginning with the trigger and then the thing that actually strikes the spark on the flint, and there's a spring and there's something called a frizzen pan, and if you were fighting in the heat of battle let's say in 1814, well, let's say 1800 and your trigger broke, then your rifle, your gun was as good as useless, 'cause you'd have to take it back to the armoire and have a completely new gun made.
- Simon Winchester:** 36:39 But Honoré Blanc said, "Why don't we make all the parts of the flintlock mechanism identical so that if you break your trigger you simply go to a box of triggers and get another trigger and slip it in its place?" So he did this using jigs and things, made sure that every part was exactly the same time, after time, after time, and I mean I know I'm sounding rather boring saying this, but this is crucial.

- Simon Winchester:** 37:02 He laid on a demonstration in a basement of a castle, which still exists in Paris, and he invited all the great and the good to come and see how you could have a box of 50 triggers and 50 springs and 50 frizzens and 50 of all the various bits, and you could take any pieces and assemble them together and lo and behold you've got the makings of a gun.
- Simon Winchester:** 37:24 One of the people who this was demonstrated to was the American minister to France and that was Thomas Jefferson, and Jefferson ... and I've always hugely admire Jefferson anyway, but this was an indication of his prescience and his intelligence. He realized this was something that should be told to the gun makers of America, and so he wrote a letter by hand obviously and had it transported across the Atlantic to the Secretary of War in Washington saying, "We have two armories in America, one in Springfield in Massachusetts and one in Harpers Ferry in Virginia, tell them that they must start making these components for our guns interchangeably."
- Simon Winchester:** 38:06 And so the War Department, it took a long time because of bureaucracy, but they got the message and they held a competition. They said, "Who wants to give us a demonstration of the making of flintlock muskets interchangeable parts?" And a man stuck up his hand and that was Eli Whitney, and Eli Whitney was famous because he invented the cotton gin but had never patented it, and so was relatively poor, he needed the money.
- Simon Winchester:** 38:34 So he knew if he successfully engineered this demonstration he would get the contract to make 8,000 guns for the US Army, but he cheated. So he laid on a demonstration ... it would be too boring to give you the details of what he did, but he essentially hoodwinked all the people who came to his demonstration.
- Demetri Kofinas:** 38:52 By the way, having read that, he sounds like a modern-day Silicon Valley entrepreneur sort of pitching investors. Fake it till you make it.
- Simon Winchester:** 39:00 Well, I mean he's the equivalent of Elizabeth Holmes at Theranos.
- Demetri Kofinas:** 39:03 Exactly. It's a great point.
- Simon Winchester:** 39:04 And he hoodwinked them, and they didn't know what they were seeing, much as the people who except for the nice Wall Street Journal reporter who read the book, they said, "Okay Mr. Whitney, you've made a demonstration which certainly has

convinced all of us, so here's your contract for 8,000 guns," and he made them.

- Simon Winchester:** 39:22 They were five years late, none of them worked properly. So to the engineering community, and this was news to me, because I thought in common with nearly all American schoolchildren that Eli Whitney was a great hero. He's not he is a charlatan, he's a villain and he belongs in the same hall of anti-heroes that Elizabeth Holmes belongs in now.
- Demetri Kofinas:** 39:41 I listen to another interview of yours, and I learned that you studied geology in school, correct? And you had gone to Africa originally to practice as a geologist, or you were doing your PhD there?
- Simon Winchester:** 39:54 No, I wasn't clever enough to do a PhD. I got a degree that in England is called a Desmond, because it's a play on words of Desmond Tutu. It was a two, two, meaning second class degree in a second tier of that class, and armed with a Desmond you could certainly never go off and do a PhD.
- Simon Winchester:** 40:11 So I went off to be a geologist in Africa, in Uganda, and an extraordinary story, far too long to tell here, but I was not very good at my job. I mean I it was supposed to be looking for copper in the foothills of the Rwenzori Mountains, which are beautiful on the Congo/ Uganda border, and I didn't find any copper.
- Simon Winchester:** 40:32 I was there living in a tent in a little village called Kyenjojo, and I was obsessed with mountaineering. I would go every two or three weeks to a British Council library in a place called Fort Portal about 30 miles away, and get any books I could about climbing. One day I got a book called Coronation Everest by a man called James Morris. I read it in one go by the campfire late that night and early into the morning.
- Simon Winchester:** 41:03 James Morris had been the London Times correspondent on the expedition to Mount Everest that got to the summit in 1953, 31st of May 1953, and he had never climbed before in his life, but he got up to 26,000 feet and using an elaborate system of codes he got the news of the success of the expedition back to London to be published in his newspaper the London Times on the morning of the Queen's coronation.
- Simon Winchester:** 41:30 I mean I remember that as a little boy, the Queen who's still on the throne today, this was her big day, and to have as an additional piece of news the fact that a British expedition had

got to the summit of the world's highest mountain just sort of added cream and jam to the wonderful cake the coronation was going to be.

- Simon Winchester:** 41:50 So I thought, "My god, this is an amazing story of James's." I wasn't any good at traveling around the world with a hammer and bottle of sulfuric acid in a magnifying glass, but maybe all I had to do was to travel around the world with a pencil and a notebook, and that would be an agreeable way to spend a life. So I wrote to James Morris who I'd never heard of and I said, "Dear Mr. Morris, I've just read your book. I am a 21 year old geologist living in East Africa and my basic question is, can I be you?"
- Simon Winchester:** 42:20 And he wrote back very kindly and he said, "If you're serious then, quite honest, to being a writer you'll never get very rich, but you'll have an extraordinarily valuable, worthwhile and amusing and fun life. So my advice to you is, on the day you receive this letter, not next week, not next month, but the day you receive it, give up your job in Africa, come back to England, get a job on a small local newspaper and write to me again."
- Simon Winchester:** 42:44 Well to cut a very long story short, I did indeed leave Africa, got a job in the far north of England as a reporter on a daily newspaper, and he was amazed and said things like, "Never lose your sense of wonder. Never bother to learn shorthand."
- Demetri Kofinas:** 43:01 He was amazed that you've done it?
- Simon Winchester:** 43:03 That I've actually done-
- Demetri Kofinas:** 43:04 That you have actually done it.
- Simon Winchester:** 43:04 ... taken his advice. "You've done that? My god, I feel sort of in loco parentis now." So, "Never lose your sense of wonder, don't become cynical and jaded, don't bother to learn shorthand. Everyone will tell you must, but it's a waste of time." Then this was the kicker really, "Every month or so, send me the clippings of the stories you've written for your paper down to me," and he lived in a village in North Wales, "And I will annotate them and send them back to you and with any luck turn you into a halfway decent writer."
- Demetri Kofinas:** 43:36 And he did that.
- Simon Winchester:** 43:37 He did. Starting in 1967, and we wrote to each other once a month until 1974-

Demetri Kofinas: 43:44 Wow,

Simon Winchester: 43:44 ... when we met for the first time. Watergate was finished, I had reported on Nixon leaving the White House and I hadn't reported on Ford pardoning him, because on that particular day the 8th of September 1974, I was covering Evel Knievel attempting to jump over the Snake River Canyon in Idaho. Big mistake.

Simon Winchester: 44:06 But anyway, then Washington went quiet, so I decided to take a holiday and I was still a climber, so I went to North Wales with a South African girlfriend of mine, and on the way up to North Wales she said, "Doesn't your friend James Morris live here?" Which everyone knew that James had created the monster that I had turned into. I said "Yes." She said, "Are you going to see him?" I said, "I've never spoken to him. The relationship has entirely been by letter. She said, "This is ridiculous."

Demetri Kofinas: 44:33 Were you nervous to meet him?

Simon Winchester: 44:34 I was, I was terrified. But Jackie, her name was Jackie Leishman, when we got to the little hotel we were staying in, picked up the phone and found his number and dialed his number, and put the receiver to my ear. He said, "Hello," and I said, "Hello, this is Simon Winchester." This person said, "Well, this is James. My god, I mean I read you every morning from Washington. I created you, you're my protégé. Are you calling from America?"

Simon Winchester: 44:59 I said, "No, I'm calling from the Pen y Gwryd hotel down the road." Anyway, a long conversation, he said, "You must come for tea tomorrow." So Jackie and I, the next morning we went climbing and came down from the hills at about 3:00 and motored to this little village called [inaudible 00:45:15]. Found this beautiful house, parked the car, walked across the gravel to the front door.

Simon Winchester: 45:23 You could see sort of the parquet flooring and the carpets and so forth in the living room, and we were filthy dirty. So I suggested we take our climbing boots off and I pressed the doorbell and we were kneeling down on the front doorstep. The door opened and a woman appeared and I said, "Hello, I'm Simon Winchester and this is Jackie Leishman. You must be and Mrs. Morris."

Simon Winchester: 45:44 This person said, "No. I'm James actually." and there was this brief moment of disbelief, but then we stood up and this person said. "I'll get my wife." I thought. "Now this is spiraling out of

control." Because James had climbed to 26,000 feet on Mount Everest, had been a captain in the British Army and the Brigade of Guards, had fathered four children, had walked alone across the Hadhramaut in the southern part of Arabia. So whoever was going to come down the stairs would, I assume, be a bearded person with a Yukon jack shirt.

- Simon Winchester:** 46:15 Not at all, down the stairs comes a middle-aged lady with a little girl in tow, and we all troop off into the drawing room to have tea, with me fairly obviously a man and Jackie, fairly obviously a young woman, and Elizabeth Morris, middle-aged lady and Sookie, a little nine-year-old girl, and my hero, my mentor twinset and pearls, little hanky tucked up her sleeve, a tweed skirt, legs decorously crossed, little court shoes, and all the chesty accoutrements, rather substantial accoutrements I might say, of womanhood.
- Simon Winchester:** 46:49 But being Britain of course nothing was said about this. We just drank our tea and talked about other things and then we left at about 6:00, and Jackie said to me as we passed through the gates, "What the f- was all that about?" I said, "I have not the foggiest idea." The next morning a note was pushed under my door in the hotel, "Dear Simon, I'm sorry to have put you and your friend through a somewhat awkward social situation, but the fact of the matter is that I've decided to change sex and I'm going to Casablanca," which back in the 70s that's when it was all done, the chop and change surgery.
- Simon Winchester:** 47:24 "And if everything's successful, I'm going to return to Britain with the name Jan Morris, and I hope you and I can be friends." Well, Jan and I ... she's now 91, we've written a book together on British architecture in India.
- Demetri Kofinas:** 47:37 That's remarkable.
- Simon Winchester:** 47:39 I suppose it would be idle to say that we're bosom friends, but we're good friends. She now lives with Elizabeth as they used to be sisters-in-law, but they were not allowed to remarry about 10 years ago, and for years afterwards the Guardian if they'd ever got an application from someone to be a reporter, they said, "It's very easy to become a reporter on the Guardian. All you need to do is to go to Oxford and get a bad geology degree, and then make friends with the transsexual."
- Demetri Kofinas:** 48:06 That's so funny. That's remarkable, and that must have been quite a shock? I mean, sure it was the '70s, it was on the heels or on the tail of the counterculture, but still. Today I wouldn't say it's common, but we're becoming more educated about this.

Simon Winchester: 48:21 It's part of the national conversation.

Demetri Kofinas: 48:22 Yeah.

Simon Winchester: 48:22 But Jan wrote a wonderful book called Conundrum, about it, published in '76 I think. Still in print today, and I'd urge anyone that's curious about this to know, because there's an awful lot of gender reassignment surgery going on these days and it's become, I would say tedious, but almost commonplace, whereas in '74 no one knew about it. Her book is a very tender treatment of the whole thing.

Demetri Kofinas: 48:45 I'm always amazed ... amazed isn't even the right word. I don't know how someone finds the courage to do that.

Simon Winchester: 48:51 No. Well, I've never had the urge, but I think ... no, but I mean Jan talks about sitting under the piano as a four-year-old saying, "Why am I dressed like a boy?"

Demetri Kofinas: 49:03 Wow.

Simon Winchester: 49:03 "I'm a girl. I want to be a girl." So although he went through all the accepted rituals of getting married and having children, and he didn't want to do any of those things and had this incredibly sympathetic wife who is still the wife till this day.

Demetri Kofinas: 49:18 Remarkable. That's also remarkable. That's awesome.

Simon Winchester: 49:21 That is the most extraordinary thing. Elizabeth's story is, to me, the more compelling story.

Demetri Kofinas: 49:27 Interesting. Really?

Simon Winchester: 49:28 To me, yes.

Demetri Kofinas: 49:29 Has she considered writing a book about it?

Simon Winchester: 49:31 I don't think so. She's a very diffident woman, she's wonderfully capable, clearly very, very tolerant, and I don't know, it's macabre to think who will go first. I mean they're both in their 90's, Elizabeth is a little bit older. I mean ... and I think gender-reassignment places all sorts of stresses on the body. I imagine it would. So how long the two of them will survive, I don't know, but Jan is still writing. She wrote a book about the battleship Yamato.

Demetri Kofinas: 49:57 Really?

Simon Winchester: 49:57 Japanese super battleship just last year.

Demetri Kofinas: 49:59 You all have a lot in common.

Simon Winchester: 50:01 Well, I think so, except I check myself in the shower each day. We don't have that much in common.

Demetri Kofinas: 50:07 I have another question for you. When you read James's book, so you are a nonfiction writer, you've never written fiction, correct?

Simon Winchester: 50:13 I've written one book of fiction, but it was a complete-

Demetri Kofinas: 50:16 You have? It was a mistake.

Simon Winchester: 50:17 Well, I was asked to write what was called a future history about writing it from the perspective of 2020 or what had happened after Hong Kong passed back to China in 1997.

Demetri Kofinas: 50:29 Interesting.

Simon Winchester: 50:30 It was sort of quite an interesting thesis. There was a war between China and Japan, which could yet happen. But it's not something-

Demetri Kofinas: 50:36 Which book was that?

Simon Winchester: 50:37 It was called A Pacific Nightmare and it was published in I think 1993, or there about.

Demetri Kofinas: 50:41 That was the sequel to the Pacific book?

Simon Winchester: 50:43 Well, but oddly enough, I'd written a book about the Pacific in early '90s, then Pacific Nightmare and then the new Pacific, so I'm all Pacific'd out.

Demetri Kofinas: 50:52 You're Pacific'd out. I'm curious though, so you read James's book, you read the story of a person who piggybacked off the expedition and wrote about it, what was it about that, that you said, "This is what I want to do?"

Simon Winchester: 51:04 Well, it was Jan I supposed, that's the name I'll give her, because I think most of the advice subsequent to my getting to know her really well came when she was a woman. She said, "You've got to write books, because writing for newspapers, yes, it's immediately satisfying, but you have to accept that what you write will be in a newspaper that will three days after you've

written it will be lining the bottom of a parrot's cage or wrapping up fish and chips or something like that, whereas a book at least there's a possibility of some posterity."

- Simon Winchester:** 51:38 Books remain. I mean, yes, you see these big sales of books outside libraries, but most of them are fiction, body stripping fiction which has a very short lifespan, but nonfiction books can last for many years. I mean for instance, I wrote a book about the eruption of the volcano Krakatoa and I think ... I don't want to sound conceited about this, but that'll probably be the definitive book about Krakatoa for many many years.
- Demetri Kofinas:** 52:07 Which volcano is that? Where is that located?
- Simon Winchester:** 52:08 Krakatoa is a big, huge volcano which erupted between Java and Sumatra in 1883, August the 27th, and it was the first event ... it was the beginning of the global village, because of an interesting fact that they had just completed the submarine cable. The news of Lincoln's assassination in 1865 took 12 days to reach London.
- Simon Winchester:** 52:34 The news of Krakatoa eruption, an operator working from Reuters sent a message saying, "Krakatoa erupting," as it was happening as he was on the sender, "Many feared dead," and then the line went dead and he was killed, but the message got to Jakarta.
- Demetri Kofinas:** 52:53 Wow.
- Simon Winchester:** 52:54 Then it went on the cable under the sea to Singapore, from Singapore to Colombo in Ceylon or Sri Lanka, then up to Suez in the Red Sea, then across the Mediterranean to Gibraltar, then through into the Atlantic and up to Biarritz, and then up to Cornwall, then up to London.
- Simon Winchester:** 53:14 That message saying, "Krakatoa erupted. Many dead," was on the desk of the London Times four minutes later, and that meant that it was published with obviously embellishment once research had been done, the next morning in the London Times and people were sitting in their horse-drawn carriages going to work, reading about places in the world that they never heard of Java, Sumatra, Krakatoa.
- Simon Winchester:** 53:41 Things that had happened just hours before, with the same easy familiarity that they might have been talking about Bayswater or Mayfair or Liverpool.

Demetri Kofinas: 53:51 Amazing.

Simon Winchester: 53:52 So I believe ... well, I'm absolutely certain of it, that it was the first major news event in the world that was known about all over the world within minutes of it occurring.

Demetri Kofinas: 54:03 That period in the last quarter of the 1800s of the 19th century and then towards the beginning of the 20th century, there was such a reorganization. I mean I know it from American history of American life, and dealing with the railroads and then the telegraph and the telephone, it was a remarkable time. I mean that's what you're sort of capturing there.

Simon Winchester: 54:23 I mean that's sort of what I was saying in *The Men Who Unites the States*.

Demetri Kofinas: 54:26 Exactly. That what I was thinking about when you were saying that.

Simon Winchester: 54:27 The way that the country suddenly developed quite extraordinary, and of course this is another period when things are changing the paradigm is shifting.

Demetri Kofinas: 54:35 I'd read this book by ... can't remember the name of the author, but I read this book called *The Land of Desire*. I don't know if you're familiar with it, but it's a history, it was written in 1992, it's a history of consumer capitalism from the late 19th century to the early 20th, and I remember this one particular scene when he tied the rise of abstract art to not specifically people riding in rail cars, but the experience of riding in a rail car and seeing the landscape move so quickly by, was an abstract experience of the land. And that stuck out to me when you were talking. Mr. Winchester, I really appreciate you coming on to the program. Thank you so much.

Simon Winchester: 55:13 It's a great pleasure. I've enjoyed it enormously. Thank you.

Demetri Kofinas: 55:13 Thank you very much.

Demetri Kofinas: 55:17 And that was my episode with Simon Winchester. I want to thank Mr. Winchester for being on my program. For more information about today's episode, or if you want easy access to related programming visit our website at hiddenforces.io and subscribe to our free email list.

Demetri Kofinas: 55:34 If you're a regular listener, take a moment to review us on Apple podcasts. Each review helps more people find the show and join

our amazing community. Today's episode was produced by me and edited by Stylianos Nicolaou.

Demetri Kofinas: 55:48 For more episodes you can check out our website at hiddenforces.io. Join the conversation at Facebook, Twitter and Instagram @hiddenforcespod or send me an email.

Demetri Kofinas: 56:02 As always, thanks for listening. We'll see you next week.