
Ep Freedom

Guest: Matt Ridley

**WOODS:** What a wonderful idea for a book, *How Innovation Works: And Why It Flourishes in Freedom*. Boy, that second part — because I saw the main title, and I thought, *If I know Matt Ridley, I know what that subtitle has to be*. Sure enough, it is. So let's start off with the important distinction that you make in this forthcoming book on the difference between invention and innovation, because I think some people may use them more or less interchangeably.

**RIDLEY:** Yes, and I think it's quite important to make a distinction, and I don't know what sort of the formal definition of invention versus innovation would be, but the way I use the two words is that, whereas *invention* is the coming up of a new idea or a new device, *innovation* is making that new device sufficiently affordable, reliable, and ubiquitous that we can all use it. So someone like Steve Jobs or Jeff Bezos is an innovator, but I don't think it would be probably right to call him an inventor.

And indeed, if you go back, I look into the origins of vaccination, which was a terribly important process, and dig out the people in the very early 18th century who came back from the Ottoman Empire saying, *Hang on, there's this really important process that people do to prevent their kids getting sick. We ought to try it here*, and they went around proselytizing this and spreading the idea and getting people to do it for smallpox, made themselves very unpopular in the process. But they did not claim to have invented the process, and we don't know who the inventor was in that case.

So our policies tend to assume that what we really need to do is make sure lots of invention happens, lots of people have bright ideas in universities and places like that. And a big theme of my book is that no, we need to make sure a lot of innovation happens. A lot of people take ideas and turn them into something that can be really practical and useful to ordinary people. And Thomas Edison said it's 1% inspiration, 99% perspiration, and it's the perspiration that I think we underestimate.

**WOODS:** And you're illustrating this through a series of, well, stories about actual examples of innovation. And good heavens, there are great, great many of them. In fact, I scarcely know where to begin in talking about them. In fact, I'm going to turn it a little bit on you. Of all the stories that you tell — because I don't know about you, but when I write a book, I don't necessarily know all the information in the book the moment I started. I discover things as I'm working on it. And I wonder what would be the story that was the most fascinating for you, with the most surprises?

**RIDLEY:** I think one of the ones that really intrigued me most was I decided to look into the origin of the insecticide-treated bed net, which is a mosquito net that you put over your bed, mainly in Africa these days, to try to avoid getting malaria, which I think has transformed the world much more than any of us realize. Because if you look at the graph of malaria mortality, it was going up till 2003 and it's been going down since. And that's roughly when the Gates Foundation and others began to push this technology as hard as they could. And technology is a weird word to use for a sort of piece of cloth, but I said, well, okay, who had this idea, that you put a bit of insecticide on bed nets? Was it very obvious? Were lots of people trying it?

And I traced it back to an experiment in Burkina Faso in Western Africa in the mid 1980s by two Frenchmen and a Burkina Fasan at a mosquito research station really, which had a series of huts. And they literally set about making people sleep in these huts, covering them with mosquito nets or not, covering the mosquito nets with insecticide or not, and then the clever thing, the fourth thing: making tears in the mosquito nets or not. And what they were doing there was saying: let's face it, most mosquito nets are going to end up with holes in them most of the time. Does that make them completely useless, or are they still quite useful? And what they discovered was, if it had insecticide on it, it was still extremely useful, because it had highly repellent qualities.

So I tracked down one of the Frenchmen who'd done this experiment. He didn't speak much English. I don't speak much French. But what was amazing to me was that nobody else seemed to have tracked him down. This hasn't been written about. So I had great fun digging into this beautiful little experiment that somebody picked up on, that somebody in particularly the Gates Foundation began to realize was much more important than anti-malarial drugs or the search for vaccines, has really transformed the world. So that was a nice example of an innovation that I don't think anyone had really done the proper research on, and I was delighted to be able to do it.

**WOODS:** That is wonderful. That is wonderful. Now, these days, when people think innovation, a lot of times they think electronics or artificial intelligence, things like that. But oftentimes, innovation deals in areas that are rather more mundane. And in this list of items that I'm seeing here, you even have toilets, the most mundane thing of all, but yet in a way not mundane, because they, in a way, separate us from the animals.

**RIDLEY:** Yeah, well, I have a chapter on what I call low-tech innovation. And the S-bend, the U-bend, the bend in the pipe under a toilet is an incredible invention, just beautiful, terribly important, because it stops the smell coming back up. So having a toilet in your house with a pipe leading to the outside might seem like an obvious thing to do, but actually, it's not much good, because the pipe just brings the smell back up — until somebody in the 18th century said, *Well, hang on. What if we put a little bend in the pipe? Then the water will get trapped there, and that will stop the smell coming back up.*

And I walk around London a lot. It's a big city. It's 10 million people maybe, having a daily — what's the polite word? —deposit. And yet you never smell sewage. How is that achieved? What an incredible thing, that in our modern cities — it's not true of every city in the world, but most modern Western cities, you can't smell sewage. It's extraordinary. It's an amazing achievement. And again, this is a very nice example of where the first guy to do it didn't really manage to make it catch on. It was later people, a guy called Bramah, who was a more of an innovator than inventor in this case, comes along and makes it a sufficiently practical, reliable thing, that it doesn't freeze up in winter or it doesn't leak or it doesn't smell or whatever, and just starts rolling it out. And by the early 19th century, suddenly an English gentleman in London or a French gentleman in Paris wants to have this in his household. And it transforms the world. So yeah, if you had to give up the S-bend in your toilet, you'd be a lot worse off than you would be if you had to give up your iPhone, arguably.

**WOODS:** See, there's an excellent point. It's not so mundane after all. Well, let me ask you about, I noticed in the description, I think because it's a nice almost alliteration, "steam engines, jet engines and search engines." Let's talk about search engines, because I think people for various reasons, some justified more than others, are unhappy about Google, whether it's for perceived bias or whether it's privacy concerns or whatever, that we overlook the sheer amazement we should have at the very phenomenon of a search engine, something none of us could have dreamed of 30 years ago, because there was nothing to search. We wouldn't have known about the world wide web. So what kind of stories can you tell us there?

**RIDLEY:** It's a really interesting technology, because I think it's probably the most useful innovation of my lifetime. I use it I think every day. Very rare that a day goes by when I don't

do some kind of search for something on the internet, whether it's a destination or a ticket price or a piece of information or whatever it might be. And yet, if you go back to the 1980s and you look at people starting to speculate about network computers and what they can achieve, almost nobody zeroes in on the importance of search, on how search is going to be not just something we do all the time once we've got the internet, but that it's going to be the main way to make money out of the internet. Nobody spots that.

And in fact, the people who invent search engines don't spot that either. So Sergey Brin and Larry Page didn't set out to create a search engine; they set out to catalog the internet. And they suddenly discovered along the way that what they'd come up with was a rather neat device that would enable people to find anything they want, and that this was monetizable. And they weren't the first to do it, of course. There were about 10 or 20 search engine companies out there already. They came up with a better one, and they scooped the pool with Google.

But here's a really interesting thing about that. You rerun the tape of the 1990s, and you have Sergey Brin not meet Larry Page because of some accidental change in the world. Do we end up with no search engines? Of course not. Somebody else would have done it. Somebody else did do it. Lots of other people did it, and they just happened to do it best and quickest. So there's something completely inevitable about the search engine. It would have been impossible not to invent it, just as it would have been impossible to get through the 1870s without inventing the light bulb, because 21 different people came up with the idea independently. Thomas Edison was the best of them.

So these technologies like that are completely unpredictable in advance and unbelievably obvious in retrospect. I find that asymmetry really interesting, and I can't fully explain it. I don't understand why it's so hard to see these things coming when they become so obvious later on. But it's a really important technology and a really simple one and a ubiquitous one. And you know what? There are circumstances in which it's not there for me, and I wish it was. I was trying to find a book on my shelves the other day, and I thought, *Oh, I know. I'll just search for it*. What? No, you can't do that in real life, and of course, we never did it before 1990.

**WOODS:** Folks who have listened to *The Tom Woods Show* for a while know that there's a sponsor who, I'm sorry to say, did not renew for 2020, but it's rare for a sponsor to be with any podcast as long as this particular suitcase company was. And I used to say that the 360-degree spinner wheels they had on these suitcases made me feel like the king of the airport. And that expression, "the king of the airport," just took off. People referred to me as that. People did memes of me with a crown and a suitcase. I don't know where that all came from, but naturally, there'd be something wrong with me if I didn't ask you about the innovation involved with the wheeled suitcase, which by the way, is another example of something that in retrospect seems incredibly obvious. There were people whose job it was to carry your suitcases because they were so bulky and unwieldy. All you need to do is put wheels on the doggone things.

**RIDLEY:** I know. Why didn't we do it in the 1940s, 1920s, 1850s, 1200s? And so I asked the question: were wheeled suitcases late? Are they a good example of an innovation that could have happened much earlier? And superficially, the answer must be yes. Of course it's possible to have invented them at an earlier stage. But then I began to look into the history of it, and I discovered that actually, people were inventing them in the 1920s and 1940s, and they weren't catching on. And people would try and get suitcase companies interested in mass manufacturing them or marketing them, and they just wouldn't catch on.

Was this because people were being obtuse? I didn't think it was. I think it was because with the weight of wheels before plastic and aluminum, with heavy iron wheels, with the small size of airports and railway stations, with the large number of relatively available porters to help you, actually, adding extra wheels to a suitcase that's taking up space and adding weight

was probably not a good idea. It's not until the '70s and '80s that we're tracking our own baggage around and we're going long distances on airport concourses that suddenly it becomes obvious.

And a guy called Bernard Sadow in 1970 on his way back from a holiday, he saw an airline employee rolling bags on a cart, and he suddenly thought about it, and he went home and he put some wheels on a cart. And he had real trouble in getting the suitcase manufacturers to catch on. I mean, he eventually got a patent on it in 1972, but the retailers weren't that interested in his prototype. Eventually he did, and then a little bit later, eventually, they did start selling it. And a little bit later, an airline pilot had the idea of the so-called roll-aboard, the one where the wheels are on the sort of narrow end of the suitcase and you tip it and roll it behind you with a telescopic handle. And that then catches on.

So, yes, it probably could have been done sooner, but I suspect not an awful lot sooner. And it's an evolutionary thing. It starts kind of simple, just some wheels on the long side, and then it gets changed. And then finally, we get these wonderful wheels that spin around 360 degrees and go any direction, and you can push it or pull it in front of you. It's a very nice example of an innovation that changes gradually over time and improves in our lifetime. But I don't think it was as late in coming as we think.

**WOODS:** Well, fair enough. Because, as you say, it sure seemed obvious that it ought to have come sooner, but now I actually have more sympathy for people who came before me, and I don't just think of them as belligerent and obtuse fools. Fair enough. So now, with a few examples out there —

**RIDLEY:** And I find it very hard to think of anything that we could have invented much earlier than we did. It's pretty hard to come up with examples of things that we should have — you know, we obviously couldn't admit the search engine until we've invented the internet, for example. So most things come along about when they're ready to come along in a surprisingly predictable way.

**WOODS:** And to some degree, you need to have a wealthy enough society that can spare the research and development money and so on and on. You need an extended division of labor. There are some institutional and, frankly, wealth preconditions for at least some of the advanced forms of innovation. I mean, perhaps we could have had some of the impressive technology of today 30 years ago, but at a huge cost in terms of foregone opportunities and sacrifices we would have had to make, so there's a natural kind of market rationing of innovation, we might say, in that respect. I'm just speculating.

**RIDLEY:** That's right, and you have to make the preliminary technologies before you can make the next stage of them and things like that. But yeah, no, the point that innovation comes out of wealth is actually quite an important one and a point that a lot of people don't get. They assume that necessity is the mother of invention, and they assume that it's because we're desperate, because something is going wrong in the world that we invent our way out of trouble. And actually, the evidence for that is very poor, because if you think about it, if that were true, then Zimbabwe would be better software than California. The need is greater, if you like, in a poor country than in a rich country. In fact, it's the prosperous parts of the world, it's California in recent times, it's Renaissance Italy in the Middle Ages, or whatever, it's Victorian Britain — it's the wealthiest parts of the world that drive the innovation engine. And it's often a surprisingly small part of the world that matters at any one time.

**WOODS:** All right, now having evaluated all these examples, presumably, and I think this is what you're trying to in your book, you walk away with some common features of all these. And I think in order for us to understand the circumstances in which innovation flourishes, well, it would be nice to see what are the common features of these main and significant innovations that you've chronicled here. So what would those be?

**RIDLEY:** Well, I run through some of the lessons that I've learned from the stories that I've told. I think it's important to understand that innovation is gradual. The idea of sudden breakthroughs, in which people jump out of baths and run down the street shouting "Eureka!" or have an apple fall on their head is actually usually nonsense, and it's made up after the event. And if you look at something like Moore's Law, there is a steady improvement in the efficiency of transistors on chips. And even though we know it's steadily improving, we can't cheat it. We can't jump ahead very much.

It's important to realize that there's a huge amount of serendipity here, that people set out to invent one thing and end up inventing another, that we can't see in advance what's going to change our world nearly to the extent that we think we can. The ability to start reading DNA sequences was thought to be an entirely medical development. In fact, its first application to human life was forensics and identity testing, a hugely important part of criminology, suddenly came out of DNA. Nobody saw that coming.

It's a recombinant phenomenon, innovation. You tend to need things from different strands of human life to make new things. Often the ingredients are there already in society; you just mix them in different ways. It involves a huge amount of trial and error. And again and again, what I found great innovators saying, people like Jeff Bezos, people like the guy who invented the Post-It note at 3M, saying you just have to do the hard work of trying lots and lots of different things. Thomas Edison tried 6,000 different plants before he settled on bamboo for the filament of a light bulb. It's much more of a team sport than people think. The myth of the lonely inventor who's brilliant tends to be a myth, unfortunately.

There's a really interesting phenomenon whereby we underestimate the impact of an innovation in the long run, but we overestimate it in the short run, and I call this a Amara's hype cycle, because a guy called Roy Amara first came up with this observation. And I think it's really true that, for example, there's a lot of articles around the turn of the current century saying this internet thing is overrated. Online commerce is not going to take off. People were sort of saying, actually, this technology is a bit disappointing. It's not doing what we thought it would. And then 20 years later, of course, that's not true. So in the short run, we overestimate how much we're going to change the world through inventing something, but in the long run, we do the opposite.

It tends to like fragmented governance. So it's quite important for innovators to be able to swap one country for another or one regime for another or one tax system for another in order to find a congenial place to do their work. That's Europe's great secret from the 1500s onwards, and that was China's downfall, is that it became too unified. It had one set of rules. And of course, that's America's great advantage, is that the states being different, you were effectively running sort of laboratories.

And big monopolistic organizations are really bad at it, and they get in the way ,and they stop it happening. There's a huge resistance to innovation these days, and a lot of it can be traced back to big companies or big government agencies who don't want it to happen. Kodak could have invented — in fact, it did invent digital photography, but it didn't want to disrupt its own business model. Nokia could have invented data smartphones. They did in a way, but the voice division of Nokia was too powerful and said, no, no, no phones are all about voice. And so that left space for the iPhone to come in. So it's vital in our innovation policies that we make room for the external disruptors to come into these industries to do it.

And I end up a little bit pessimistically saying, are we in an innovation famine? You look at the turnover of startups, look at what's happening with big companies sitting on cash piles that they don't know what to do with. Are we capable of innovating in digital bits, but not in atoms much anymore, which is a point that Peter Thiel has been making. So I'm an optimist, but I don't think all is well with the ecosystem that we're creating around innovation.

**WOODS:** Let me add something that comes out of some work I did on military spending and the wartime and peacetime economies of the United States, because even the peacetime economy has a very substantial military aspect to it in terms of government spending.

**RIDLEY:** Correct.

**WOODS:** And what we hear a lot is that, sure, there could very well be cases of market-driven innovation, but a lot of innovation is crossover from, let's say, military innovation. They'll say, look, we have the internet, or we have the iPhone, and these things rely so heavily — or let's say the GPS — they rely so heavily on work done in the public sector that it's not right to give the credit to the private sector about this. And they will argue that crossover of this kind is very substantial, maybe 30%. But other people say it's only 5%. And even there, the issue would be, wouldn't we have invented these things anyway? I mean, wouldn't we've come up with GPS devices anyway? Would we really have needed government involvement? Do you have an opinion on that?

**RIDLEY:** Yes, I do, and I tend to come down on the latter side, that I think we would have invented a lot of this stuff anyway. And here are some of the points that I like to make about this. People say without the Second World War in the 1940s, we'd never have developed computers or jet engines or radar, all these things. And that's just not the case.

If you look at what was happening, the annus mirabilis, the miracle year for the computer is 1937. That's the year in which lots of different people have lots of breakthroughs that actually look in retrospect to be really important in the development of computers. And then computers go into sort of a secret mode where they can't talk to each other. There's a brilliant German working on it. There's some brilliant Brits and some brilliant Americans. And then they don't know about each other. They can't cross-fertilize their ideas. They're calculating the trajectories of artillery shells and things like that. Imagine what would have happened in the 1940s if there'd been peacetime and international collaboration on these things. It would have gone much faster, I'm convinced. And the same is true of the jet, which, the breakthroughs are in the 1920s. It takes a long time to get it going, and of course the military picks it up. So that's one reason why I think we exaggerate the degree of importance.

Now, don't get me wrong. If the government is taking 40% of our national income, I do hope it spends some of it on innovation, because it'd be a pity if it didn't. But on the whole, if you look at what happens in government, it's not a very innovative process. It mostly gets innovations in from outside back from the private sector. It's quite good at inventing, because it pays for a lot of science and a lot of very high-tech technology. But it's not so good at turning those things into innovations.

And the internet comes out of DARPA, yes, but DARPA kind of sits on it and doesn't develop it. And it's only really when it gets into the private sector that it starts flourishing in the way that it does. And a lot of these things like even GPS, but certainly some of the ingredients of the iPhone, yes, you can trace it back to a publicly funded invention of a crucial kind somewhere along the line, but that tends to underestimate the importance of the perspiration I talked about, the hard work of turning this into an affordable, reliable thing that tat anyone could use. It's not good enough just to come up with the idea of a plasma screen or something; you've then got to make it something that you can manufacture cheaply and do well with. I think GPS might be an exception to the arguments I've just made. I suspect the public sector involvement was very large in getting us to GPS.

But the cell phone is a really good example of the opposite happening, of the government preventing the development of the cell phone. In the 1940s, you got people talking about how, you know what? If we had radio using cells and dropping from one cell to another so that you could actually have multiple people using it, you could usually increase the number of people that could use a system, we could actually roll this out. But the television wanted the spectrum, and the spectrum wasn't allocated in any country until way too late. And

eventually, when it was, we were able to press ahead rapidly with cell phones. So the idea was there, and the incumbents stopped it happening without the government.

**WOODS:** Part of your response reminds me of something that I've said when people bring up Scandinavia as an example of what countries with a large public sector can accomplish. And they'll point to this statistic or that statistic. Or even countries with more draconian public sectors will say, *Well, look, at least they accomplish this or that*. I mean, remember Bernie Sanders reminding us of the literacy program in Cuba. And my way of processing that is, well, I would hope if they're seizing that many resources from the private sector, that they would have something to show for themselves. I mean, it can't all go into sinecures, right? Something has to come out of it. I will concede that yes, you have that much money, you are going to almost by accident do something good with it.

Well, the book we've been discussing, *How Innovation Works: And Why It Flourishes in Freedom*, will be available May 19th, 2020. So this is actually, as I said at the beginning, a sneak preview, but we will, Matt, I hope to get you back on the day of release and we'll continue this conversation. But until then, I will direct people to preorders at TomWoods.com/1611, our episode number for today. And then is there a website of your own I can tell people about?

**RIDLEY:** Yes, it's MattRidley.co.uk, and there you can find all my books. There's also — it's the same website, it's called RationalOptimist.com, so that's from my previous book,

**WOODS:** Right, okay, so I will link to those also at TomWoods.com/1611. Well, best of luck with this, and I look forward to the official release.

**RIDLEY:** Thank you very much, Tom. It's great to have been on your show.