

All right.

Quick break to tell you about another podcast that we're interested in right now, HubSpot just launched a Shark Tank rewatch podcast called Another Bite.

Every week, the hosts relive the latest and greatest pitches from Shark Tank, from Squatty Potty to the Mench on a Bench to Ring Doorbell, and they break down why these pitches were winners or losers, and each company's go-to-market strategy, branding, pricing, valuation, everything.

Basically all the things you want to know about how to survive the tank and scale your company on your own.

If you want to give it a listen, you can find another bite on whatever podcast app you listen to, like Apple or Spotify or whatever you're using right now.

All right.

Back to the show.

All right.

So last month, Sam went down to Nashville for the podcast movement conference, and he did a fireside chat with John Lee Dumas.

You might know him as the host of the Entrepreneurs on Fire podcast.

And if you like my first million, you might like the Entrepreneurs on Fire podcast.

It's the same.

It's like inspiration and strategy around your entrepreneurial journey and helps you create the life you've always dreamed of.

That doesn't sound too bad, does it?

All right.

Well, guess what?

It's also part of the HubSpot podcast network.

That's who brings you our show and other great business shows.

So if you want to listen, learn, and grow, go listen to Entrepreneurs on Fire.

It's on the HubSpot podcast network.

You can find it at HubSpot.com slash podcast network.

All right.

We have a special episode by Ben Wilson.

This is a three-part series on Thomas Edison.

We discovered this podcast about two or three months ago and freaking loved it.

It had very small listenership.

Both Sean and I binge listened to all of them.

His name is Ben Wilson.

The podcast is called How to Take Over the World.

Ben has allowed us to air this episode and the next two.

So this is a three-part series on Thomas Edison.

He's allowed us to air it on our feed just because we like it.

So his podcast, it only had a few hundred listeners at the time, but we thought this was so cool, Sean and I, and it's about a similar topic that we talk about.

So we have this segment called Billionaire of the Week.

This one is on Thomas Edison.

[Transcript] My First Million / SPECIAL: Thomas Edison (Part 1)

We loved Ben's podcast so much.

We just said, hey, man, let us just air this on our feed because it's so good.

So it's called How to Take Over the World.

This episode is on Thomas Edison.

He's got a few other episodes or a few other folks on his feed.

He's got Thomas Edison, I believe he has Alexander the Great, the Rothschilds family.

It's really, really cool.

I'm a history buff.

And so I'm happy that he was cool and let us air this.

We're doing it none other than just we think it's good and we want you guys to check it out.

So here it is.

Enjoy the episode.

There's part two and part three on our feed.

Check it out.

I'm going to show you how great I am.

I just want to say from the bottom of my heart, I'd like to take this chance to apologize to absolutely nobody.

Hello, and welcome to How to Take Over the World.

This is Ben Wilson.

It's good to be back.

Today, I'm going to be talking about Thomas Edison, the world-renowned inventor and businessman.

I'm really glad that I chose to do this episode about Edison because honestly, he's underrated.

I learned a lot while doing this one and I think you will learn a lot listening to it.

He was an unbelievably prolific inventor filing 1,093 patents in his lifetime.

Among those are two of the most important inventions of all time, the light bulb and recorded sound.

And Thomas Edison is interesting because he is in many ways the original inventor, entrepreneur, celebrity.

There is sort of a playbook now.

If you think about someone like Bill Gates or Steve Jobs or Elon Musk and that playbook for how to be a famous inventor originated with Thomas Edison.

He was really the first one to do it.

In fact, Edison's celebrity really surpassed any of those guys.

I mean, yeah, Bill Gates and Elon Musk, they are famous nowadays, very famous.

But Edison was literally the predominant celebrity of his day, the most famous man.

And celebrity is almost kind of underselling what he was.

He was viewed in these almost mythic, god-like terms.

After he died in the USA, there was an effort made to extinguish all the electric lights in the entire country for a minute as a tribute to Edison.

Edison seemed to represent progress itself and the idea that man had mastered the elements and could do anything now.

Edison was born in this era of incredible change and he wrote that to levels of celebrities previously only enjoyed by kings and congress.

So what I want to study on this podcast is two things.

One, Edison the businessman and inventor and how he was able to achieve success in those domains to the extent that he did because it was truly remarkable.

And then secondly, Edison the celebrity and how he was able to spin the perception of his success into nearly unparalleled fame and influence.

This first episode will cover Edison's life through the invention of recorded sound.

And then the second part, which should be coming out in just a week or two, will cover his life from the invention of the light bulb to his death.

So let's start at the beginning.

Thomas Alva Edison was born in Milan, Ohio on February 11th, 1847.

He came from a family of very contrarian men.

His grandfather had opposed the American Revolution and been forced to flee to Canada when the US successfully gained independence from Great Britain.

But then his father Samuel made the opposite mistake and backed a failed rebellion in Canada and was forced to flee back to the US.

Thomas was the youngest of seven children, born to a moderately wealthy family.

He was born in Ohio, but mostly grew up in Port Huron, Michigan, a frontier town right on the border with Canada about 50 miles north of Detroit.

It was a major transportation hub located right where the St. Clair River meets Lake Huron and also along a major train line.

Growing up, he actually went by his middle name, so his family called him Alva, and his friends called him Al.

He was of medium height, he stood 5'9 in adulthood, and he was really scrawny as a child, though he eventually filled to a medium build.

But the feature that most frequently drew people's comments and attention were his piercing gray eyes.

As a child, Thomas Edison attended a few months of school, but he was mostly homeschooled by his mother.

And you might think, okay, yeah, frontier town, 1850s, it was normal to be homeschooled, but no, actually most kids went to school, they went somewhat irregularly, things were definitely a little different back then, but Edison was unusual in the fact that he attended very little school and was almost entirely homeschooled.

And that's because Thomas Edison was not like the other boys, he didn't fit in naturally, he was kind of odd.

A schoolmate wrote years later, quote, I often run across him in town with just as dirty nose and face as the other boys, but he seemed to be thinking of something all the time and not playing much.

Another wrote that he was, quote, a child that was always doing funny things different from other children, loved to be by himself.

And this aloofness was taken for stupidity, actually.

His father later said, was he a remarkably smart boy?

Why, no, some folks thought he was a little adult, I believe.

Teacher told us to keep him in the streets because he would never make a scholar.

All he ate went to sport his brain and he was puny.

[Transcript] My First Million / SPECIAL: Thomas Edison (Part 1)

He was forever asking me questions and when I would tell him I don't know, he would say, why don't you know?

And it's difficult to know how much of this aloofness and this kind of weirdness was due to his hearing.

Edison had progressive deafness that got worse throughout his life and we don't have good records of when this first started because Edison didn't really like to talk about it.

All we have is a single statement when he said, I haven't heard a bird sing since I was 12 years old.

So it's clear that he had already started to go deaf as a child.

But that doesn't seem to explain all of his social aloofness.

He was also just different.

He thought different.

He acted different from other boys' age.

He had a very analytical mind, but as a consequence, he looked at the world kind of like an alien the way some really smart people do.

At one point in his childhood, he burned down his father's barn and when his furious father asked him why, he said, I just wanted to see what it would do.

So his deafness combined with his kind of oddness set him apart and isolated him.

The thing that saved him in the midst of this isolation was his mother.

Mrs. Edison was a very strong and literary woman.

She saw the intelligence in her son, nurtured it, believed in him, and told him so.

She homeschooled him by buying textbooks and reading through them with young Al.

Edison would later write, quote, I used never to be able to get along at school.

I don't know now what it was, but I was always at the foot of the class.

My father thought I was stupid, and at last I almost decided I must really be a dunce.

My mother was the making of me.

She was so true, so sure of me, and I felt that I had someone to live for.

Someone I must not disappoint.

But his mother's education could only take him so far, and at age 12, young Edison became an independent man, and his young adulthood from 12 up through his teenage years is the most frontier America Mark Twain sounding story you have ever heard in your entire life.

In fact, if Mark Twain had written it, you might say, yeah, it's good, but it's a little much.

Tone it down a little bit.

It starts, like I said, when Thomas is 12 years old, and the family falls on hard times due to a big economic recession.

So Edison takes a job as a newsboy, eventually selling papers on the train to and from Detroit.

He had an entrepreneurial streak from a young age, and was soon selling other things on the train as well, from candies to fruit and other produce.

As he's doing that, he realizes that the produce is cheaper in the big city of Detroit than it was in his small town.

So he starts buying produce in Detroit and taking it home when selling it at a profit on the streets of Fort Huron.

And pretty soon, he's growing this little business, setting up a couple fruit stands

and hiring out other little boys to man them.

And so it is that at age 13, Edison was running a thriving business with multiple underage employees.

He even bribes the train conductors because technically he's transporting goods on the train without paying, and he bribes them in the best possible way.

He goes to their wives and offers them berries and butter at wholesale prices.

So now even the wives of the train conductors are caught up in this vast net of underage deception.

They're invested in Thomas Edison's succeeding, and so of course the conductors allow him to continue to transport his goods for free.

One of my favorite stories from this stage of Edison's childhood is how he reacts to news about the battle of Shiloh.

This is all happening during the American Civil War, and for those of you who don't know, the battle of Shiloh was one of the biggest battles of the war.

Edison is in Detroit when news starts to come in about the battle, and he can see that it's a huge sensation.

People are following it like it's the Super Bowl.

So he formulates a plan.

He walks into the Detroit Free Press and buys a thousand copies of their paper.

He doesn't actually have the money to do that, so he buys the paper on credit with no collateral.

Essentially they do it because they're charmed by this precocious young kid demanding to buy a thousand papers.

And he then bribes the telegraph operators to send word to all the towns between Detroit and his home of Port Huron that the battle of Shiloh had commenced was underway and there was more news to follow in today's edition of the Detroit Free Press.

Which by the way, will be coming on the evening train.

Well of course Edison takes his normal evening train home, and he gets to the first stop and there is a mob of people at the train station waiting to buy papers.

He had to raise the price from five cents a paper to twenty five cents a paper just to keep from running out right away.

And he ends up making a huge profit on selling all a thousand papers at a markup of twenty five cents, five times its normal price.

And Edison gets up to all sorts of plots and schemes as a young teenager.

At fifteen he decides that rather than sell someone else's paper, he's going to start his own.

He calls it the Weekly Herald.

He brings a printing press onto the train and starts printing in this office that he's made for himself in a little spare room and creates the first ever newspaper printed on a moving train.

The paper does decently well actually, it gets a maximum circulation of four hundred copies a week at its height.

But even this enterprise is not enough for curious young Edison.

He has been experimenting with chemistry sets in his basement and that was becoming his true passion.

In fact he's so passionate about learning science and chemistry and conducting these experiments that he sets up a chemistry lab on the train.

Unfortunately this leads to his Icarus moment when he goes too far, reaches too high and the lab catches fire which not only puts an end to his chemistry experiments but actually gets him kicked off the train with his chemistry set, his printing press, and everything else. He's done on the train between Port Huron and Detroit.

As his career as a budding merchant is put to an end, Edison picks up a new interest. He becomes a telegraph operator, what they call at the time a station agent. And Edison jumps in and immediately becomes obsessed.

He spends 18 hours a day learning Morse code, learning how to send and receive the dots and dashes that make up telegraph messaging.

And in short order he becomes a pretty good station agent.

He apparently became a very good receiver, which is of course when you listen to the Morse code and transcribe the messages, but he was always a relatively so-so sender, which is funny because he was mostly deaf, you'd think that he would have trouble hearing and transcribing the messages, but no that was what he was a good at.

In fact eventually after a few years he becomes the best in the country.

He could receive and transcribe even the fastest messages with few to no errors.

But yeah, never was a great sender.

And this is enough to really make a name for himself in the community of telegraph operators around the country.

In 1863 he leaves Michigan and becomes what was called a traveling tramp operator, because this area was more or less frontier country in America.

The American Midwest, Michigan, Ohio, Indiana, Illinois, Missouri, all those states were very much still developing and settling.

The new towns and cities were popping up all the time and many were growing rapidly, so it was a very fluid and changing scene and the areas where station agents were needed was changing all the time.

So station agents were hopping from city to city as needs cropped up, often sharing room and board with each other as well as tips for where to find good whiskey and pretty girls as they moved from city to city.

Hence, they were called tramp operators.

They actually didn't call themselves that, they called themselves sparkers or lightning slingers, which are both very steampunk and is funny to me because it seems exactly what kids of that age would still call themselves if they were around today.

They were a tight-knit group of intelligent and technically skilled 20-somethings who were well educated in a very frontier sort of way, not a lot of theory and formal university training, but a lot of experimentation and practical knowledge.

They were also dealing on a daily basis with some of the most advanced and sophisticated technology in the world at the time.

And this created a perfect storm for experimentation, for learning, for innovation, and also for hijinks.

I've talked before about the tribe of maniacs phenomenon and it was in full effect here.

In fact, this is sort of a textbook example and it's crazy how much it resembles Silicon

Valley in its heyday.

Both were on the frontiers of America, born a generation or two after it was settled and during a time of really rapid population growth, both had access to the most advanced technology at the time, Silicon Chips in the case of California, Telegraphs in the case of Edison and his contemporaries.

Both scenes were started and run by men in their 20s who were obsessed with tinkering and both scenes were dominated by playful applications of the new technology, especially for the use of practical jokes.

And in the same way that Steve Jobs was kind of the king practical joker in his circle, Thomas Edison was the king practical joker in his.

That's another funny little coincidence that we see.

For whatever reason, great innovators are also very often great practical jokers.

Most of the practical jokes that Edison and his buddies were doing focused on one thing, physically shocking, unsuspecting bystanders.

Remember, this is a world where electricity is essentially a brand new technology.

There was no power grid.

Electricity was only used to send Telegraph messages and your average person had no experience with it whatsoever.

So when people get shocked, they have no idea what is happening to them.

And so the Telegraph operators who did understand it had endless fun with this.

There is a story of Edison putting a wire in some shallow water and flipping the current whenever people walk through it and their arms would fly up over their heads and then he turned it off after a couple seconds.

And these people's arms would fall back down to their sides and they'd look around completely bewildered at what had just happened to them while Edison and his traveling tramp operator buddies are cracking up looking down from a nearby window.

Edison wasn't just innovating with his practical jokes, he's also starting to invent.

The first thing he comes up with is a clever device that records incoming transmissions so that they can be played back slower.

And soon inventing becomes an obsession, like a real obsession, like a borderline unhealthy obsession.

In fact, Edison starts to take on an appearance of a junkie, basically.

He sounds remarkably like a drug addict.

He's well paid, but he's always broke because he's spending all his money on spare parts and extra batteries.

He barely sleeps.

He was notorious his whole career for pulling all-nighters and only sleeping when he absolutely had to.

He would sit at his workbench and invent and tinker and work until he just, you know, passed out or lay down and sleep for an hour or two and they get right back at it.

He always looked disheveled and dirty because whenever he did sleep, it was usually him falling asleep in his work clothes at the workbench.

And so he also rarely changes and almost never buys new clothes.

He also takes on a really gaunt appearance because he's barely ever eating.

And if you listen to this podcast, you know this is one of my hobby horses, that all these great men were light eaters, Caesar, Napoleon, Putin, Steve Jobs, all of them that we have covered so far, at least.

And I tried to let this rest.

I decided that when I started doing this episode that I wasn't going to bring it up anymore. Even if it did turn out that Edison was a light eater because I'm starting to sound like a freak who's weirdly obsessed with this one little thing, which is kind of true.

But then I started reading the Edmund Morris biography, and this is the second paragraph of the entire book, okay?

He said, quote, from earliest youth, he had half starved himself.

Even in early middle age, while earning big money and enabling two successive wives to fatten on oat cuisine, he would eat no more than six ounces of meal, generally only four, and drink nothing except milk and flavored water.

A man can't think clearly when he's tanking up, he would say.

Okay, so rant over, but I do want to make the point that Edison, he was commented by a ton of people by his friends and associates.

This was something really remarkable about him, that he ate hardly anything.

And so with all these things put together, he's becoming sort of an invention junkie.

He's obsessed with it, barely eating, barely sleeping, he loves it, he can't get enough of it.

And then he has, like, an episode.

He has a moment that almost eerily parallels an incident from Julius Caesar's life.

He's studying Michael Faraday's book, Experimental Researches, to try and figure out a solution for one of his telegraphic inventions, and Faraday was a very famous English scientist.

One day Edison comes home at 4 a.m. and rather than go to bed, he starts studying Faraday until he bursts out to his roommate, quote, I am now 21, I may live to be 50.

Can I get as much done as he did?

I have got so much to do and life is so short, I am going to hustle.

And if you remember, Caesar had an incident where he sees a statue of Alexander the Great and bursts into tears because Alexander had already accomplished so much by his age.

So like Caesar, Edison decides he has to hustle.

The next year, in 1868, he moves out to Boston where he drops out from being a station agent and starts a business where he can focus more fully on inventing.

His first invention is an electric boat counter, which totally flops, but then he starts to develop advanced telegraphy technology for the financial sector.

You'll remember from the Ross Child episode that getting information faster than your peers creates enormous financial opportunities.

So he's helping these bankers in Boston and New York by creating the first electric stock ticker machine, but more than anything by creating various techniques for sending more messages faster.

He's getting them prices of commodities like gold and also prices of stocks before anyone else so they can profit off that information.

And so as great as Boston was, if you're going to be working with bankers and financiers, you've got to be in New York City.

[Transcript] My First Million / SPECIAL: Thomas Edison (Part 1)

So he moves down from Boston to Newark, New Jersey, which is just across the river from New York and moves his business down there as well.

In 1874, Tom invents his first mass market product, the Inductarium, which is essentially a machine that shocks you.

This being the 1870s, people are like, oh, awesome, just what I need.

And it actually sells pretty well.

It was marketed as something that should be in every family as a specific cure for rheumatism and as an inexhaustible fount of amusement.

Look, I know some people tend to glamorize the good old days.

I can be guilty of this, but I for one am grateful to live in an age where people are not so bored that they will sit around an induction coil and shock themselves for hours on end just for entertainment.

His other consumer facing invention was the electric pen.

The best way to think about an electric pen is it was like a tattoo pen, except instead of skin, it made perforations in a stencil.

You could then roll ink over the stencil to make hundreds of copies of a handwritten note.

It was actually exactly like a tattoo pen.

The first tattoo pens, even modern tattoo pens, were basically made by simply adapting the Edison electric pen to be used on skin.

But the success of these inventions are modest compared to his invention of the quadruplex, which is a system for sending up to four signals across the same telegraph line, which is a big deal because it increases the bandwidth of communication a lot, right?

Forex is it.

The quadruplex is really successful, both financially and in terms of raising Thomas Edison's profile amongst fellow scientists and fellow inventors.

He gets married in 1871 to a 16 year old by the name of Mary Stillwell, which was not as weird back then.

Being the work addict he is, he works until well after midnight on the day of his wedding.

But regardless of his work addiction, these are good years, he's married and in love, the business is doing well, he's got over 70 employees, and he's having a great time thinking of new inventions all day.

The quadruplex sells so well that he's got some more money and decides he wants to move out to the country where he can have a little more room to experiment, a little more elbow room.

So he moves his laboratory to Menlo Park, New Jersey, and Menlo Park was essentially the middle of nowhere.

The average podcast listener has six shows in their rotation.

So you're most likely not just listening to my first million.

If so, I want to make another suggestion.

I want to share a podcast that I've been listening to.

The show is called the Jordan Harbinger Show.

So Jordan is my homie.

He's a great friend of mine.

Jordan's one of the guys who helped encourage us to launch his podcast.
He's given us a ton of feedback on how to grow, how to make the content amazing.
And his show is awesome.
I became friends with him because I started listening to the show and I reached out and it's very fascinating.
He dives into the minds of some very, very interesting people.
So authors, scientists, CEOs, mobsters.
He's got a gift.
Kind of like Sean does, to be honest.
I'm getting guests to share never heard before stories.
Very cool.
Very fascinating.
A few of my favorite episodes are episode 117 with Robert Green.
I've talked about Robert Green's books all the time in this podcast.
It's one of my favorites.
And then episode 498 with Rob Dierdek, who's coming on our podcast actually a month.
So you can't go wrong with adding Jordan Harbinger Show to your rotation.
Check it out.
Search for the Jordan Harbinger Show.
That's H-A-R-B-I-N-G-E-R on Apple Podcasts, Spotify, wherever you get it.
Check it out.
He's awesome.
I love him.
It's just 20 miles from Manhattan, but it was a part of New Jersey that had been completely undeveloped up to that time.
So that was what he liked about it.
It was close to his clients in New York, but at the same time kind of out in the country.
So Edison moves his operations down to Menlo Park and it's like Disneyland, but for inventors and electricians.
But this paradise is broken in 1876 when Edison hears rumors about an invention that threatens to undo all of his hard-won success that he got with the quadruplex.
Alexander Graham Bell has invented the telephone.
Now the times of homes being wired up with telephone wires was still long in the future.
Neither Edison nor Bell really envisioned this quite yet.
They saw the telephone as the evolutionary next step of the telegraph, and in their minds what the telephone did promise to do was make Edison's quadruplex obsolete.
Even if you're able to send four Morse code messages at the same time, it's still not as efficient as just being able to pick up a phone and simply tell someone a message.
Luckily for Edison, while Bell's telephone was technically capable of carrying sound, it wasn't yet a very practical invention.
It couldn't carry messages very far or very clearly.
The sound was really garbled and it got even more distorted the further the signal had to carry.
So the race was on to create a functional telephone, something that could actually be

used in telegraph stations.

Edison is as ever completely obsessed with the problem and with inventing.

He's working day and night every day to build a new transmitter and his approach is to just try every material possible until something works.

There are essentially two parts to the transmitter, a hard casing and a diaphragm.

For the casing he tries graphite, carbon dust, lead, anything else that seems like it might do the trick.

And the diaphragm got even weirder.

He's testing rubber, leather, cloth, silk, ivory, pigs bladder, fish guts.

I mean, he's just trying any substance he can think of to see if it will work for this diaphragm to help carry sound better on this new transmitter.

But it works.

I mean, eventually he finds a couple substances that work and Edison's carbon transmitter vastly improved the telephone.

Whereas Bell's original telephone barely allowed you to make out the outlines of what the person was saying on the other end, Edison's transmitter more or less sounded like a telephone that were used to.

So it was an enormous improvement.

The question was, would it improve the telephone as much as whatever improvement Alexander Graham

Bell had been working on since he invented the telephone?

He had also been trying to improve it and make it so that you could hear it and it could sound better.

Bell had not been idle.

Western Union, which was the telegraph company that had a near monopoly on all the wires in the United States, decided to stage a competition between Edison's transmitter and Alexander Graham Bell's new transmitter, new telephone.

And when they put them head to head, it turned out to be a blowout.

Edison's phone could pick up a whisper from three feet away and transmit 70 miles, whereas Bell's telephone couldn't even carry a shouted call from New York to Newark.

So with that, essentially Edison had won the first round of the telephone battles.

And I think there's a really important lesson to be drawn from this victory.

One of Edison's greatest weaknesses turned out to be one of his greatest advantages in this instance.

And that weakness was that he was not a particularly good theoretical scientist.

He didn't really know the underlying physics and chemistry all that well.

I'm not trying to say he wasn't ignorant of the science.

He did.

He knew the basic principles of science, but he was self-taught.

He didn't know the theory nearly as well as his peers who were Harvard educated or who had gone to universities in London or Paris.

He was, by comparison, a tinkerer.

And he compensated for that by acting like a tinkerer.

He experimented like crazy.

With the telephone and later with the electric light bulb, he didn't really try to reason it out.
He didn't start with first principles and think his way to his inventions.
He just dove in and started trying stuff.
And he was just unbelievably persistent.
He tried and he tried until he brute-forced his way into a solution, into an answer.
Listen to how he described his own process and the way he viewed genius.
And said, quote, everything on earth depends on will.
I never had an idea in my life.
I've got no imagination.
I never dream.
My so-called inventions already existed in the environment.
I took them out.
I've created nothing.
Nobody does.
There's no such thing as an idea being brain-borne.
Everything comes from the outside.
The industrious one coaxes it from the environment.
The drone lets it lie there while he goes off to the baseball game.
The genius hangs around his laboratory day and night.
If anything, he's there to catch it.
If he wasn't, it might happen just the same, only it would never be his.
It reminds me of an experiment frequently cited and discussed, where different groups of people are put in teams and asked to make a tower as tall as they can out of marshmallows, scotch tape, and some spaghetti sticks.
And they have 18 minutes to make this tower.
And I did this when I was in a consulting firm.
And the famous result from the study is that kindergartners actually regularly outperform business school students, among others, also lawyers and CEOs.
And actually, when I did this experiment with my consulting firm, our tower was shorter than the average tower created by a team of kindergartners.
So why would that be?
Well, usually adults spend the first five to 10 minutes discussing how they're going to build and putting together a plan and debating ideas for the best way to build a structure out of these weird substances.
And kindergartners don't do that.
They just start sticking spaghetti into marshmallows and taping it up and building.
And then when their tower collapses, and it usually does, it's only been a couple minutes, so they just fix it and adapt on the fly, or they try something different.
They try a new way of building the tower.
And so they spend less time planning than adults do, and more time just trial and error.
And they trial and error their way to taller towers.
When we did this experiment at the consulting firm, many of us had these very nice-looking towers that were either pyramids or square-looking structures that you probably imagine.

And the team that actually won, that got the highest tower, didn't look anything like that. It looked like this total freak show of a structure that they had just kind of, they started experimenting from the very beginning, and it was kind of leaning and weird, but it worked.

It was the tallest by far.

So anyway, obviously, there's a takeaway from all this.

I would say that it is plan less, do more.

You have to try and fail and try and fail until you find something that works, whether that's in business, art, sports, writing, whatever it may be, that was the approach that worked for Edison, and I think it's the approach that works for most people.

Most people spend more time planning and thinking than they need to, and less time just getting in reps, trying, experimenting and failing, and figuring out things that do work the hard way.

Okay, back to the story, back to the life of Edison.

So Edison sold the rights to his new transmitter to Western Union for \$100,000, which seemed like a ton of money, but alas, it was kind of short-sighted for Edison.

Telephones obviously became one of the most important technologies in the years to follow, and his receiver was actually widely used for the next 100 years.

If you went and picked up a phone in the 1960s, you would have a carbon-based transmitter based on Edison's patent.

So he lost out on millions and millions of dollars by selling that patent to Western Union.

Unfortunately, this was kind of typical for Edison.

He was a really great inventor, obviously, but he was not a great businessman.

He was okay.

I mean, he wasn't like a dunce, but he wasn't the type of businessman that he was an inventor. It was in the midst of working on this transmitter that Edison made his first truly great world-changing

discovery, and it happened really late at night.

Edison would have these great midnight work parties.

Generally speaking, the environment at Menlo Park was very professional, very buttoned up and workman-like, but being the insane insomniac that he was, he would often make his men work very late with him, and when he did, he would have the night watchmen bring up a midnight dinner.

The men could relax and converse.

It was the one time that they could kind of let their guard down and joke around and have a good time while they were at work.

And then after they did this, after this midnight meal, the hours after midnight were often their most creative and led to some of their most productive experiments and big breakthroughs. And one night, shortly after their midnight dinner, Edison was testing out different materials for the diaphragm of the transmitter.

And since he was hard of hearing, Edison had to hold his finger to the diaphragm to feel how much it was vibrating, to see how well it was transmitting sound, because, again, he couldn't really hear how well it was transmitting sound.

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As Edison was doing this, it kind of dawns on him, like, oh, wait, this is making unique vibrations for each sound he makes.

So he turns to his assistant bachelor and says, batch, if we had a point on this, we could make a record on some material, which we could afterwards pull under the point and it would give us the speech back.

So that's the way that recording works, right?

And he just kind of intuitively this, that, huh, if my voice is making these vibrations, well, then if I could make these vibrations kind of solid, then in whatever way I record them, I could just reverse the process and make the sound again.

And it's kind of like a big realization to have all at once, right?

But he does.

So he calls his master machinist, a German man, by the name of Klusi.

And by the way, this guy and bachelor were geniuses, especially Klusi.

He was an absolute savant at taking Edison's ideas and turning them into machines.

And so Edison tells this machinist that they're going to try to do this, make an indent on some wax paper and then pull it back through to see if the noise will reproduce.

Klusi said, this is absurd, but hey, you know, I'll try it.

There's no way this is going to work, but sure, whatever you say, Mr. Edison.

It's a real statement to their adaptability and ability to move quickly that they have an experiment rigged up and ready to try in just an hour or so.

Bachelor pulled the wax paper along a wheel and Edison spoke loudly into a telephone mouthpiece with a point attached to the back.

And he used the stock phrase that they used for experiments such as this.

He said, Mary had a little lamb.

They pulled out the wax paper and examined it, saw the marks of the vibrations, and then put it back under the needle at the beginning.

And they pulled it along roughly the same speed.

And as they did, they heard Edison's voice saying Mary had a little lamb back to them.

Klusi cried out, Mein Gott in Himmels, or in English, Mein Gott in heaven.

His mind is blown, right?

Butler would later say, it was not fine talking, but the shape of it was there.

There were cheers and congratulations all the way around.

People can't believe it.

They have imagined, for the first time in history, heard recorded human speech.

And it can be difficult to understand just how monumental this was.

When Edison told his attorney, Benjamin Butler, about the invention, the latter's response was, my dear Edison, tell me something more about your wonderful invention in recording the human voice.

It is so remarkable that I do not understand it at all.

His confusion is pretty understandable given that Edison himself struggled to find the words to describe what he had invented.

He wrote, quote, you probably remember our experimentation about printing the human voice.

I have not done that, but I have produced in recording the voice on a paper from which

I can reproduce the same voice at any future time, as you can listen and recognize the

voice of the original speaker.

When speaking to the Philadelphia Record newspaper, Edison's colleague Edward Johnson described it similarly.

He said that Edison had invented an instrument, quote, by which a speech can be recorded while it is being delivered on prepared paper, and that it could be, quote, re-delivered at any time.

I mean, even by today's standards, that kind of sounds like magic.

I can record a voice on paper and then make the paper repeat back the same voice.

And to people at the time, it was like magic.

It was a complete sensation.

It's difficult to put ourselves in their shoes because now we are so used to seeing and experiencing new technologies that we're sort of jaded to it.

I mean, what could be invented now that would truly blow your mind?

What was the last invention that you saw it?

And we're just like, whoa, mouth agape.

You couldn't believe what you were seeing or hearing.

It's really rare these days, right?

I don't even know what could do that now to us, maybe like a teleportation device or something like that.

And that's kind of like what this was to people at the time.

It really, it melted their brains.

There are stories that they test the device with random strangers.

They play it for people and they ask them, what do you hear?

And the people respond, I have no idea what this is.

I don't know what I hear.

And you know, the audio was not as high quality as recorded audio, not as high quality as the audio that you're hearing right now from me, but it was audible, right?

So these people could not decipher the words.

And then the person who was playing the audio for them would say, this is a recorded human voice that you're about to hear.

And they would play it again.

And the person could tell them every word that the person had spoken is when they heard it the first time, their brain could not compute that they were hearing human speech from a machine.

Edison said, quote, they do not expect or imagine that a machine can talk and hence cannot understand its words.

It's just, it's really crazy.

It is, it is, it is crazy how much this invention blew their minds, how incomprehensible it was to them.

In fact, after it was announced, one professor wrote to Edison asking him to repudiate what obviously must be a hoax.

He said, quote, the idea of a talking machine is ridiculous, but the article is so ingeniously constructed that some persons are so ignorant of the first principles of science that they are apt to believe it true unless you deny it.

In other words, this scientist is asking Edison to repudiate reports of this talking machine because obviously that's ridiculous.

That could never happen.

Despite these reactions, Edison doesn't immediately recognize how this might be commercialized. Notice that in his letter to his lawyer, he starts by saying, you remember our experimentation about printing the human voice.

I have not done that.

What Edison was trying to do was print human speech in order to make telegrams easier to send.

Telephones had been invented, obviously, as we've discussed, but these were still being used as more reliable ways to send telegrams.

Rather than having to tap out messages and Morse code, you could call up the station agent and he would just write down the message as you said it and it would later be delivered to the intended recipient in writing.

He was trying to invent a way so that you could speak and the words would simply type themselves out, automated voice transcription, essentially, something that is still not totally reliable in 2020.

If you ever use voice transcription on your phone or something like that, you know it makes lots of mistakes.

So he felt like he had only solved half the problem.

He had invented a way to record sound, but you could only play it back with sound.

You couldn't automatically convert it to writing, which is what he was trying to do.

Edison and his colleagues failed to anticipate the mass market appeal of their achievement. They would really gain that perspective accidentally.

An article in the Scientific American reported breathlessly on the work of some French researchers who were attempting to record human speech, but they were attempting to do so by measuring the movement of the lips, tongue, mouth, larynx, and so on of the speaker.

So they're trying to measure the way that your mouth and your throat is moving as you speak and then they were going to try and use that to create a robot that would do basically the same motions, like artificial lips and stuff with an artificial throat that was like a pipe organ and they would recreate the sounds somewhere else.

So you could speak, they would measure it, then they would send that information across the telegram and essentially a robot would recreate your speech on the other end.

We know that this was not a reliable way to record and reproduce human speech, but at the time it seemed rather promising and impressive to the reporters of the Scientific American.

So they write an article about it saying that it's the B's knees, these French researchers are really on the verge of a remarkable breakthrough, and soon they will be able to record and reproduce sound.

How exciting is that?

Well, Edward Johnson, who was kind of like Edison's chief marketing officer, sees this and it really grinds his gears, right?

It really makes him mad that these guys are getting all this press for claiming to be on the verge of something that Edison had actually already accomplished.

So with Edison's permission, he writes a letter to Scientific American and basically says, hey, we already recorded human speech and we can reproduce it at any time. And he sends a diagram of their as yet unnamed contraption, which would come to be known as the phonograph.

This creates an international sensation.

People's first reaction is essentially, wait, you're telling us that we can hear the voices of dead people?

And that's kind of the first application that people make in their minds is that if we can record people's speech, then we will be able to hear them continue to talk after they are dead, which tells you something about human nature, right?

And that doesn't seem so remarkable to us now, right?

We're used to hearing the voices of past statesmen.

You've heard the voice of John F. Kennedy and Richard Nixon, if you're an American.

You've heard all these actors and actresses from old time movies who are now dead.

And that doesn't seem weird to us.

But this was really remarkable.

And I think one of the reasons why is that for thousands of years across many different places and cultures, soothsayers and magicians, fortune tellers had claimed to be able to speak for the dead via magical or divine powers.

We have, for whatever reason, this internal natural urge to connect with our loved ones who have died, and so that was like kind of a staple of magic.

And now along comes this man who had made that promise real.

We're going to be able to hear the voices of dead people from beyond the grave if they record something before they die.

No wonder he was soon given the nickname the Wizard of Menlo Park.

A few short weeks later on December 7th, 1877, Edison and his colleagues walked into the offices of the Scientific American to display a working model of the phonograph.

Here's what Scientific American wrote about what happened next.

Quote, Mr. Thomas A. Edison recently came into this office, placed a little machine on our desk, turned to crank, and the machine inquired as to our health, asked how we liked the phonograph, informed us that it was very well, and bid us a cordial good night.

These remarks were not only perfectly audible to ourselves, but to a dozen or more persons gathered around, and they were produced by the aid of no other mechanism than the simple little contrivance explained and illustrated below.

The phonograph was obviously then diagrammed below in the article.

It was huge news all over the world, and though he didn't realize it at the time, this marked the beginning of the end of Thomas Edison's life as a private person.

He would be a celebrity for the rest of his life, letters from the adoring public constantly streamed in, and eventually so did interested onlookers who crammed into public viewing areas in the Menlo Park lab to catch a glimpse of the legend at work.

Edison soon discovered that he was a natural showman, he was sort of Steve Jobs-like in his ability to get the press to report breathlessly on any new invention that he had made or even claimed to have made.

In fact, Edison served as a direct inspiration for Steve Jobs.

In 1984, when Jobs pulled the bag off the first Macintosh, its first words mimicked those of the phonograph.

Hello, I am Macintosh, it sure is great to get out of that bag.

So anyway, all this leads to a huge international profile and a big platform, but not huge profits. Edison would struggle to find a profitable use for the phonograph for quite a while, and everybody would.

It would be decades before recorded audio found a use that many people would use in their homes and was widely available.

Part of this was Edison's fault, he was an inveterate tinkerer.

He just couldn't stop trying to perfect the machine and just kind of get something done and ready for release.

But part of it was also just the technical difficulties inherent in creating a useful product.

Edward Johnson wrote, quote, the phonograph is creating an immense stir, but I think it impresses people more as a toy than as a practical machine, which was definitely true.

Around this time, the New York Sun released an article titled, A Marvelous Discovery, a man of 31 revolutionizing the whole world.

And it was really a hagiography, it was the first of many articles that would portray Edison in an almost legendary light.

It hewed closely to an old American stereotype of this wild frontier inventor.

It was first established by Benjamin Franklin about a hundred years earlier.

Edison was portrayed as a plain spoken, approachable, normal-seeming man who nevertheless possessed

an almost godlike ability to create technology that revolutionized human life out of thin air.

He was usually portrayed as dirty and grimy with grease, chewing tobacco, and speaking plain, unaffected language.

And though Edison was definitely trying to portray a certain image, he liked playing up this folksy inventor.

The appearance that was in these reports was, for all intents and purposes, correct.

He did kind of look like that.

He did love to chew tobacco or chomp on a cigar.

He did, in fact, do a lot of the work himself at this time and could often be found at the workbench with dirty shirt and greasy hands, and he was often found in unkempt conditions because he had, once again, slept at the office.

So he is kind of playing up his celebrity, but, you know, it's based on a truth about who he really was.

But this article spurs even more people to come and see him.

Menlo Park started to turn into a zoo where he's the main attraction, and at the same time, pressure is mounting from creditors and business associates to find more profitable uses for the phonograph.

So Edison decides that he just needs to get away for a while and takes a trip to the Western United States.

He starts in Wyoming, where he goes to observe a solar eclipse, and he then proceeds to go

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even further west to California before returning home, making a stop at St. Louis on the way. When he gets back, he tells reporters that the trip was a lot of fun, but he hadn't come back with any ideas for new inventions.

But less than 24 hours after returning, he made three sketches in his notebook, and at the top of the page, he titled them Electric Light.

On the next episode, we'll dive into Edison's invention of the incandescent light bulb as well as the rest of his life.

Until then, thanks for listening.