

## [Transcript] The Rest Is History / 343: Oppenheimer: The Father of the Atom Bomb

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All of a sudden, the night turned into day, and it was tremendously bright. The chill turned into warmth.

The fireball gradually turned from white to yellow to red as it grew in size and climbed into the sky. After about five seconds, the darkness returned, but with the sky and the air filled with a purple glow, just as though we were surrounded by an aurora borealis.

We stood there in awe as the blast wave picked up chunks of dirt from the desert soil and soon passed us by.

That was Joe Hirschfeld, who was a chemist who'd been assigned to measure the radioactive fallout from the test on the first atom bomb,

dropped on the 16th of July 1945. And Dominic, we are thinking about the birth of the atom bomb, the Manhattan Project, all that malarkey.

Malarkey, very good.

Well, it's such a somber and kind of overwhelming subject, isn't it, that one wants to perhaps introduce, slightly puncture the gravity of it, because otherwise it's so depressing.

And we're doing this, obviously, because there's a new film out about the life of the man often described as the godfather of the atom bomb, Oppenheimer,

who, and I know, say a little bit about Oppenheimer. I didn't even know what his first name is. I just suddenly realised.

His name is Jay Robert Oppenheimer, Tom.

So what's the Jay, though?

It's Julius. So his father was called Julius. Well, come on to his parents a little bit.

And by the way, for those people listening, that's the first test. That's the Trinity test in New Mexico.

And so the bomb wasn't dropped. It was sort of installed. And then they do the detonation there.

Is that in the hut?

Yes, they're exactly. They're all miles away.

That they have in the fourth Indiana Jones film?

Do they?

I think they do.

You've been watching a lot of Indiana Jones, Tom, haven't you? Because you're gearing up for a mighty series.

That's coming next week. So we mustn't get distracted by that. I vaguely remember. Anyway, listen, we don't want to be talking about Indiana Jones.

We don't want to be talking about Julius. So I don't know.

Well, Robert, he was called Robert Oppenheimer.

And Oppenheimer is so the film, the Christopher Nolan film is inspired by a book which on the Pulitzer Prize called American Prometheus by Kai Bird and Martin Jay Sherwin.

And American Prometheus, that will appeal to you, Tom, because of course, Prometheus is the fellow who he steals fire and brings it from Zeus as a gift to mankind, doesn't he?

But then it's punished for it.

So what happens to Prometheus?

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He gets chained to a rock in the Caucasus Mountains and either an eagle or vulture, depending on the myth, comes and rips out his guts.

And then they grow back and then next day, the eagle or straight vulture comes back and does the same.

And so it goes on until finally Heracles comes and shoots the eagle or straight vulture.

But that idea of somebody who has stolen something that is at once exciting, invigorating, liberating, but also utterly terrifying, which is fire,

and taking something that should probably belong to the gods and giving it to human beings and then is punished for it and then becomes a kind of martyr.

That's the core of Oppenheimer's story.

I mean, the ancient myth that Oppenheimer himself famously invokes is from the Mahabharata, the great Indian epic and specifically the Bhagavad Gita.

Yes.

So it's traditionally said that he sees the atom bomb and he says that he quotes the Bhagavad Gita, now I'm become death, the destroyer of worlds.

But didn't he actually, he actually quoted a couple of lines, if the radiance of a thousand suns were to burst at once into the sky, that would be like the splendor of the mighty one.

So in those two quotes, both of which I've seen attributed to him, on the one hand, there's the sense of death and on the other, there's the sense of radiance and light.

Yeah.

And that ambivalence, by the way, is at the center of his relationship with the atom bomb and with the nuclear age and the Cold War and all those kinds of things as we'll go on to discuss.

And actually, the stories that are told about him, the reason we didn't start with that story is I don't think he did say that because he claims later that he said it, but people at the time don't recall him saying it.

But I mean, he studied Sanskrit.

I mean, we are talking about one of the cleverest men who seems ever to have lived.

I mean, this is a guy who turns up to the Netherlands, not speaking Dutch and gives the lecture in Dutch.

He did indeed.

I mean, it's an unbelievably clever guy.

So maybe he muttered it in Sanskrit.

Maybe.

Oh, I think he, I think the truth of it is he said it to him, he says he said it to himself or he thought it.

I wonder whether there's a little bit of the esprit, the scalié there, you know, that sort of.

Possibly.

It would have been great if I had said this, so I'll say that I did.

But no, so the Oppenheimer story is not just the story of, as you say, one of the Titanic intellects of the 20th century and somebody who,

as you also said, was the, is the godfather or indeed the father of the atomic age.

But it's also a kind of thriller, actually, Tom, because Oppenheimer becomes in the 1950s, the supreme martyr,

the sacrificial victim in the McCarthyite, anti-communist, Red Scare Cisteria of the 1950s.

That's what makes his story such an exciting one.

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Because the context for that is, of course, that it's the United States that gets the atom bomb. Yeah.

But the United States is facing a rival superpower that is also after the atom bomb.

And so the knowledge, this Promethean knowledge is something very, very prized.

Well, right from the start of the Manhattan Project, there was a sense of a race.

Initially, that race is against Nazi Germany.

But then as time goes on, that race starts to become a race for the Soviet Union, stay ahead of the Soviet Union.

That becomes, you know, that sort of sense of urgency, that sense of tremendous excitement is there throughout Oppenheimer's story.

So let's kick off by talking about Oppenheimer himself, the man, because he is an extraordinary man. He's born in April 1904.

And he is the child of German Jewish immigrants.

Lots of the people in this story will be of German Jewish immigrant stock, actually.

So they're ethnically and they're culturally Jewish, but they're not observant.

They don't go to the synagogue or anything like that.

As Father Julius was born in Frankfurt, he's a real autodidact.

He spends all his spare time going to art galleries in New York City and reading history books and things.

And he worked as a partner in a clothing firm, which sounds very unglamorous, but he's enormously rich.

Because he has three Van Goghs in a Picasso.

He does. Anna Rembrandt, Anna Renoir, Anna Cezanne.

So that's not bad, is it?

This is very good going.

And they live on the Upper West Side, I think, in New York City.

His wife is Ella Friedman. She's a painter.

She's also from a sort of German Jewish immigrant stock.

And they're very well off.

They have a summer house on Long Island where their little boy, Robert, goes sailing.

So in other words, they're not a sort of your Lower East Side kind of struggling Jewish immigrant family, quite the reverse.

And not surprisingly, given that he's surrounded by very cerebral parents who spend all their time going to art galleries,

Robert, their son, is a very clever little boy.

And his passions, so Kai Bird and Martin Sherwin tell us, were poetry.

An unusual interest for somebody who's sort of, you know, eight, nine, ten years old, reading and writing poetry,

building things with blocks, which is assigned obviously the scientific mentality, I suppose, the sort of patterns and construction and all this sort of stuff.

And minerals, Tom. So he loves collecting minerals. Do you like minerals?

I prefer fossils.

Well, I know you were big on fossils.

I don't know whether fossils and minerals are part of the same world.

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I think, yeah, kind of geological treasures, yeah.  
Wilfred Owen, the war poet, he was a massive mineralogist, if that's the word.  
Was he? Oh, I did not know that. He must have enjoyed his trench.  
Well, and also poetry. So he and Oppenheimer would have gone on famously, Tom.  
Yeah, but Wilfred Owen wasn't great on theoretical physics.  
No, not so good. No. And also, of course, was dead by the time that Oppenheimer entered his prime.  
That would inhibit the flow of conversation.  
It would. So all through his career, there was a sense of political idealism,  
because his parents were into this thing called the ethical culture society,  
which is fascinating, actually. So that was founded in 1876,  
and it's founded out of kind of reformed Judaism in New York City by a guy called Felix Adler.  
And he said, this is the Judaism of the future.  
We won't have any prayers. We won't have any religious rituals.  
It's kind of Jewish Quakerism.  
Jewish Quakerism. It's very social gospel.  
It's very about being kind and all that sort of stuff.  
And you can see where it would appeal, because at a point when there's quite a lot of anti-Semitism,  
for basically rich Jewish businessmen in New York who have a social conscience,  
this is a way, it's a sort of assimilationist creed.  
So they can join in life. They can have clubs. They can do stuff.  
But their Jewishness is kind of downplayed.  
They are all Jewish, but they're not, you know, talking about the Torah and stuff.  
And there's this kind of liberal activist element to it.  
So Oppenheimer goes to this school, and he is by far the kind of top student.  
You know, he's the brain box, top of his class and everything.  
But even at this point, and this will recur throughout his career,  
he's a very awkward kind of lonely person.  
So this is a story that when he's 14, his parents sent him to summer camp.  
You know, obviously, most of our Americans, as we very familiar with the idea of summer camps,  
for non-Americans, you know, this is a huge ritual for American kids.  
And probably not really matched, doesn't have any counterpart in other countries.  
So he goes to summer camp, and it's all sports and games and kind of boy scoutish kind of activities  
in which he doesn't really join in at all.  
He just walks around collecting rocks, and he's also, like most normal 14-year-olds,  
he's completely obsessed with George Elliot, Tom.  
Yes, of course.  
What young lad going off to summer camp doesn't want to curl up with Mil on the floor.  
He's really into middlemen.  
So people are saying, you know...  
Even longer novel.  
How do you think the Yankees are going to get on this season?  
He says, well, you know, I'm just thinking about Dorothea or whatever it is.  
Anyway, he writes down to his parents.  
He says, well, it's not actually going that badly because one good thing about going is my

campmates

have taught me all about the facts of life.

And his parents are outraged.

They write to the camp sort of top brass who give the boys a massive roll of king.

The boys then, do you know what they do to Oppenheimer?

At what?

It's not good, Tom.

They strip him.

They paint his buttocks and genitals a green paint, and they lock him overnight in an ice house.

But I'm afraid, Dominic, that if you are the kind of child who goes around reading Middlemarch, that's what you've got to expect.

Tom, that is harsh.

I speak from personal experience.

That is...

What?

Has that ever happened to you?

I'm not going to say.

Crikey.

Well, that is very harsh.

I didn't expect such ruthlessness on the rest of this history, to be honest.

Anyway...

You just got a man up.

Well, so Oppenheimer, this will also disappoint you, Tom.

He graduated in 1921, and you had a place at Harvard, not surprisingly.

But then he went off with his family on a little trip to holiday to Germany before going to Harvard.

And he fell ill.

He fell ill while prospecting for minerals.

Do you know?

I love him.

His parents said, oh, you've fallen ill.

You'll have to defer at Harvard for a year.

Well, you stay at home and have improving broths, and we look after you.

But actually, one thing that does happen, which is related to the nuclear issue, go on.

I'm intrigued to know where this is leading.

As part of his convalescence, they arranged one of his teachers, a man called Herbert Smith, from this sort of improving ethical reform, whatever it is, ethical culture society school, to take him to New Mexico riding.

He falls in love with riding.

And one day, he's riding near Santa Fe, and he sees this valley.

And in the valley, or the top of the valley, there is a boy's school, a boarding school.

And it's this school, by any chance, called Los Alamos.

It is.

It is, Tom.

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It is called Los Alamos.

What an extraordinary moment.

Yeah.

So he sees this, and he thinks, brilliant place for a nuclear test.

And then he comes back.

I'll be back.

Yeah, I'll be back, exactly.

He does go to Harvard.

His biographers describe him as a studious, socially inept, and immature young man, which is very nice.

He's very austere, so he's a complete boffin.

He's here for dinner every night.

He has chocolate, beer, and artichokes.

And he already has for lunch something he calls blackened tan, which is toast covered with peanut butter and chocolate syrup.

Ew.

So he's not a man for a healthy diet, it's fair to say.

But he's very thin, isn't he?

Incredibly thin.

Incredibly thin.

He's a chain smoker.

He's very melancholy.

He's very moody.

And Tom, one of the great highlights of doing the rest of his issues, we get to read wonderful works of poetry.

And I thought you'd enjoy it if I read some of J. Robert Oppenheimer, father of the nuclear bombs, poems, his erotic poems.

Would you like to hear that?

Yes, yes, please.

Okay.

This is informed by the facts of life that he's been taught at his summer camp.

Precisely.

He's never had any dealings as far as I can tell at this point.

I don't think he's even spoken to a girl or a woman.

So he says, I'm going to find this quite hard to read because they're ludicrous.

Tonight she wears a seal skin cape glistening black diamonds where the water sways her thighs and noxious glints conspire to surprise a pulse condoning eagerness with rape.

Goodness.

That's unexpected, isn't it?

You didn't expect that final word.

I did not expect that.

This is inspired by Spinoza, an erotic poem inspired by Spinoza, the great Dutch who will be featuring very soon in our episode on Amsterdam.

No.

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I know that there have been others who have read Spinoza, even I, others who have crossed their white arms across the umber pages.

That's too pure to glance, even a second beyond the sacred sphincter of the erudition.

Yeah.

That is unexpected.

Well, yeah.

How old was he when he was writing this?

He was about 21 or something.

Yeah.

Maybe not even.

No, he's probably a little bit younger.

I mean, harsh.

He's probably about 18.

Okay.

I think that's fair enough.

Yeah.

They are.

You didn't expect that?

No, I didn't expect that.

Probably science more his thing then.

Well, yes, it is.

He does very well.

He's actually studying chemistry, but he falls in love with physics.

And after this, he goes off to England to study at the Cavendish lab in Cambridge, which is the great place for quantum physics.

But he's very clumsy, isn't he?

Well, he's clumsy and very unpopular.

And so Ernest Rutherford refuses to have him on his team because he keeps knocking over test tubes.

Exactly.

So quantum physics, for those people who don't know, it's the laws that govern basically atoms, molecules, electrons.

There's going to be a lot of science in this time, and I have really jammed up on it.

So he's very miserable in Cambridge.

He doesn't really like England.

He behaves in a series of ludicrous ways.

So the erotic stuff, there's clearly a lot going on there.

There's a story that he was once in a third-class railway carriage, and there were two people opposite him, a man and a woman who were kissing, and they were obviously boyfriend and girlfriend

or husband and wife.

The man went out, probably by some cigarettes or something, and at that point Oppenheimer threw himself on the woman and kissed her.

She pushed him off, and then he fell to the ground sobbing in a sort of terrible heap.

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And the fact that he then went around telling people this story suggests that he wasn't, you know...

So he's a faintly rapey nerd.

Correct.

He tried to kill his tutor, a man called scientists called Patrick Blackett, by poisoning an apple and leaving it in the laboratory for him to eat.

Wow.

It's very snow white.

And then the other thing...

Presumably, was snow white coming out at that time?

Maybe he was inspired by it.

I don't think so, Tom.

I think snow white is a little bit later, about 10 years later.

He had a friend called Francis Ferguson, who was a Rhodes Scholar, and Francis Ferguson said to him one day, great news, I've got engaged to my girlfriend, and Oppenheimer sort of smiled weakly, and then when Francis Ferguson turned his back, Oppenheimer leapt on him with the strap from a trunk and tried to strangle him, tried to grope him, and then when Ferguson fought him off a bit like on the train, Oppenheimer then fell to the floor and floods of tears.

He sounds quite creepy.

Yeah.

He is quite creepy.

So he then went to Germany to Göttingen, which is the great centre of theoretical physics.

So as you said, Cambridge, you need to be good with test tubes, because it's experimental.

In Göttingen, it's all kind of more mathematical, but there he was so unpopular, interrupting in the class the whole time, that the other students boycotted the course unless he was removed.

And was he?

I think he was, or they found a way around it.

But didn't he became friends with Werner Heisenberg?

Well, he's not really friends with Heisenberg, no, but it's true that this is the point at which Werner Heisenberg-

They dominate.

Tell people who Werner Heisenberg.

So Werner Heisenberg is Oppenheimer's kind of rival, to some degree.

He is one of the absolute meteoric figures of the golden age of breakthroughs in quantum physics, the high points at which is between 1925 and 1927.

And all these theoretical physics offends are studying the movement of electrons around the nucleus of an atom, Tom, something I know you're very familiar with.

And of course, Heisenberg, Tom, you all know this.

Yeah, his uncertainty principle.

Yeah, his uncertainty principle, so more precisely, the more exactly you know the position of a particle, Tom, the less, of course, you can predict its momentum.

You know that, don't you?

Yes, I did know that.



Good.

And it's an incredibly exciting field.

It's very much a young man's field.

So Einstein is kind of yesterday's man, really.

And all these young, thrusting young fellows are studying electrons and talking about waves and all this kind of business.

And Oppenheimer, he published 16 papers in three years.

So he's a great kind of, you know, people know that he's an absolute star of this stuff.

Before coming on to do this, I did some research in the Bodleian.

Yeah.

Where I read that his achievements in physics include the Born Oppenheimer approximation for molecular wave functions, Dominic.

The wave functions is one of his things.

And field emissions, Tom, did you read it, but did Wikipedia tell you about his work on field emissions?

No, it didn't.

But I was just wondering, I mean, what exactly is, so tell the listeners what the approximation for molecular wave functions are.

I'll be very happy to do so.

But we'll be doing that, Tom, for members of the Restless History Club.

You can sign up at [RestlessHistory.com](http://RestlessHistory.com) Restless Particle Physicians.

I don't want to waste it on the ordinary listeners.

Okay.

No, that's fair enough.

So he gets a job, anyway, in the long run at the University of California at Berkeley.

And it's his seat.

So Heisenberg is very much Germany's top boffin.

Yeah.

Is Oppenheimer already been groomed to be America's top boffin?

I don't think he's been groomed as the top boffin because there are lots of top boffins in America.

But he's a top boffin.

He is a top boffin, exactly.

In the American Prometheus book, the Bird and Sherwin book, they call him the Pied Piper of Theoretical Physics.

So if you are clever and you are 18, you might well want to go and study with Oppenheimer. You'd go to what's called...

So it's the Berkeley Radiation Lab, but it's actually nicknamed the Rad Lab.

And as we will see, that has another dimension, the Rad Lab.

But just on Oppenheimer, before we get back to the Rad element of the Rad Lab, he's still a quite an awkward, lonely cerebral man.

The key question, Dominic.

How has he actually managed to speak to a woman at this point?

I don't think so, really.

He will do soon.

And a very important woman at that.

I heard, like, do you like electrons?

Yeah.

Is that how he speaks?

I imagine that's exactly how he speaks.

Well, as you said, he taught himself...

He does things like teaching himself Dutch.

He spends all his time reading Sanskrit, reading sort of sacred texts, Hindu texts and things.

And then in the holidays, he goes off and he rides in New Mexico with his brother, Frank.

They will ride a thousand miles in the summer, you know, across the kind of the plateaus and the valleys of...

So he's not just a nerd?

No.

But he's also not a man who would spend his summer lounging on a sofa with a gin and tonic.

Yeah.

Okay.

So he wouldn't go to New Yorker.

He would not.

He's a very driven man.

Now, I said it was the Rad Lab.

And when he gets to Berkeley, so we're sort of late 20s into the early and mid 1930s.

It's a real hotbed of radical politics.

So the Rad Lab is kind of double edged.

And he goes to parties with other academics where they all talk about kind of Roosevelt's New Deal, about trade unions, about the rights of migrant farm workers, all this sort of stuff that is absolutely in the air on the West Coast in the 30s.

I also read in the Bodleian that he claimed only to have heard about the Wall Street crash six months after it happened.

But that's very plausible.

Yeah.

So that seems to contradict the sense of him as someone who's very interested in radical politics.

Well, first of all, the Wall Street crash happens at the beginning of his time.

So do you think he becomes increasingly interested in politics?

He does absolutely.

He becomes, at first, I think he's very, he's idealistic, but unworldly.

And then he becomes worldlier.

I think there are a couple of people.

One is a very important person in his story, who is a professor of French called Hawken Chevalier.

And Chevalier has these kind of parties and salons such as how so people get together and they talk about left-wing ideas.

This is kind of standard stuff in the academic world in the 1930s.

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But as we will see, this will have absolutely tumultuous consequences for Oppenheimer's career and his reputation.

And the other person, he meets a medical student called Jean Tatlok.

She's played in the film by Florence Pugh, Tom.

That gives you some sense of her.

Oh, I love Florence Pugh.

Yeah.

Well, there you go.

A restaurant in Oxford.

He's always moaning about chairs.

He's not allowed to put chairs outside his restaurant.

But and also very furious about traffic calming measures in Oxford, which apparently have depressed demand for his business.

This is not a line I'm expecting us to be taking in this episode.

Yeah.

Right.

She is the daughter, Florence Pugh, aka Jean Tatlok.

She is the daughter of a notable Chaucer scholar, Tom, which would appeal to you.

So the English lit at Vassa, the great college for sort of rich posh girls.

And she had been a very keen member since her teens, late teens of the Communist Party, Tom.

Right.

So she went to two Communist Party meetings religiously every week and she wrote to a friend, I am a complete red.

And she and Oppenheimer basically strike up this great romance.

So he now definitely has spoken to a girl.

Is this his first real experience of relating to women in a way that doesn't involve strangling people or crying?

Basically, basically a relationship with a woman that is, I mean, must be overwhelming for him because he's obviously got very, very intense, sexual feelings.

Yeah.

But at the same time, it hasn't had any way of expressing them.

Yeah.

I think that's right.

And he meets someone who presumably is, you know, intellectually empowering and full of new ideas.

So do you think is that a she must be a huge influence on it?

She is massive influence.

She's the great love of his life, I would say.

They don't end up marrying.

She's a little bit, she's troubled.

She suffers very badly from depression.

Indeed, she ends up taking her own life much later on after they're no longer an item.

But she is a great, great influence on him.

But again, I mean, he seems depressive.

Yes.

Oh yeah, absolutely.

He was, I mean, when he was at, I think in England, people sort of said, you know, you need to seek treatment.

You are a very troubled, a very troubled man.

But in the same year that he met her, he started reading Desk Capital.

His father, his father gives him a copy of Sydney and Beatrice Webb's book, Soviet Communism and New Civilization, which is always the sort of book that people bash the British left with when they say they were soft on communism in the 1930s.

I mean, it seems quite odd behavior for a New York plutocrat.

Yeah, but he's an idealistic plutocrat, Tom.

And it's not only plutocrats.

He's a sort of trouser, magnate or whatever, you know, people selling his shirts.

I mean, can you be a plutocrat if you're...

No, I suppose not.

He's doing well.

He's doing very well.

He's got a Rembrandt.

I mean...

That's true.

That's true.

Okay, fair enough.

Semi-plutocrat.

So, Oppenheimer and Jean, they spend all their time going to these weekly kind of political parties where people sit around and they talk about Jewish refugees from Nazi Germany, the pleiter farm workers in Roosevelt's America.

They have fundraisers for the Republicans in Spain, during the Spanish Civil War.

And these things, a lot of these things are kind of their genuine causes, but they're also communist front organizations.

Now, a lot of the people at these meetings are paid up card-carrying members of the Communist Party, including Oppenheimer's brother, Frank.

Oppenheimer himself seems never to have joined, probably, because he's just not very clubbable.

He's not a joiner.

Because the communists in this period in, say, California, they're kind of left-wing masons.

It's a sense of that.

It's a club.

It's something where you...

I think it's a very complicated picture, because the American Communist Party was one of the most Stalinist parties in the world, the CP USA.

But at the same time, as you say, communism is attractive to a whole part of the kind of radical, academic, intellectual elite, but also communist appeals to people in the unions.

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So, the 1930s is a great age of union unrest in America.

In California, California has always been this kind of seedbed for radical ideas.

There's all kinds of motives that would draw people into the party.

We did a podcast series about Ronald Reagan, didn't we?

And we were talking about him in Hollywood, and then 1930s, 1940s, and the appeal of this kind of radical stuff in Hollywood.

This is actually pretty similar.

People will be drawn into communism because their mates are all in it.

As you say, some of them are Stalinists.

Some of them are idealists.

Some of them, it's a clubbable thing to do.

All the people you know are doing it, and it's a good cause, and all this sort of stuff.

He is clearly, he's giving cash.

He's not paying membership dues, but he's giving cash donations to communist organizations.

And the FBI, even at this point, are aware of all this.

So in March 1941, this is before the United States has entered the Second World War, one of their guys is making a note of all the license plates of the people who've been to what this guy Hawkins Chevalier's part is.

And Oppenheimer, this is one of them, and they opened a file on Oppenheimer that month. Not because they think he's, you know, it's not because of the bomb or because of physics or something, it's because he's just part of that world and they have files on all of these people.

And because they have a sense war is coming, so that is a theme that we will pursue in the second half.

Yes.

And of course, there'll be more physics.

So we'll be back in a few minutes with Dominic explaining the laws of the universe.

Goodbye.

Hello, welcome back to the rest of this history.

We're talking Oppenheimer and Dominic.

You are, I mean, an astonishing development to all who know you're much vaunted hatred of science.

You are now all over the development of the atom bomb.

Well, Tom, I never said I wasn't good at science.

I said I had no interest in it, which is different.

So, so I, if I can effortlessly get my way through quantum physics, despite not being interested in it, I should be very proud of myself.

And that is an unusual thing, Tom, because, you know, I do suffer from colossal, colossally low self-esteem.

So 1939, Europe is at war.

The big development for Oppenheimer is he spits up with Jean Tatlok, Florence Pugh, and he marries a woman called Kitty Harrison.

Now, she's from a rich Pittsburgh family, but interestingly, she's on her second husband already.

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Her first husband, believe it or not, was a Communist Party organiser in the steel town of Youngstown, Ohio.  
So it's all stacking up.  
And it even run for mayor, Tom, on the Communist ticket.  
How did he do?  
Didn't do well, he won about two votes.  
And he was then killed as a volunteer in the Republican Army in Spain.  
Well, credit to him putting, you know, I mean, yeah, he put his money where his mouth was.  
But yeah, yeah.  
So she then, Kitty then married again.  
She married a British doctor.  
Then she had an affair with Oppenheimer.  
Oppenheimer and the doctor kind of got their heads together.  
It was all very sort of gentlemanly.  
And she left the doctor and married Oppenheimer.  
She gets a terrible press in all the books about Oppenheimer.  
People say she's, I mean, the Kai Bird and Martin Sherman book is full of people saying Kitty was a genuinely wicked woman.  
Oh goodness.  
Why?  
Well, she drank a lot.  
She was very abrasive.  
I think there is always an element, though, in these sort of biographies of  
In a Verticom's great men, that sometimes the women or the wives, if they're,  
if they're spirited people, independent people, they come off very badly.  
Basically, all the hero of the book's friends say, oh, Kitty was a terrible person.  
She was always moaning when we went out on the, you know, on the lash, on the lash.  
Exactly.  
Was Oppenheimer going out on the lash?  
She doesn't seem the kind of person for that.  
No, but he was, they had a very, they clearly had quite a volatile relationship.  
And she was a volatile person.  
Well, she is Spitfire.  
That's what, that's what inscrutable comedies.  
Yeah.  
I think what should be played by Catherine Hepburn?  
That's what you're saying.  
Yeah.  
She might be played by Catherine Hepburn, I suppose.  
Yeah.  
I think her enemies would regard that as very generous, generous casting.  
I think she's Emily Blunt in the Christopher Nolan film.  
So, you know, draw your own conclusions, Tom.  
Emily Blunt was Mary Poppins, wasn't she?

Yeah, I don't have any strong, I don't think I've ever seen Emily Blunt in anything, so I have no strong views on Emily Blunt, one way or the other. I mean, I have to say Mary Poppins sounds exactly what Oppenheimer needs. Yeah, I guess so.

Well, he didn't, you know, stop being strangle people, poisoning people with apples, all that stuff.

Let's get to, let us cut to the chase now, Tom.

So, in January 1939, news broke on the West Coast that two German physicists, Otto Hahn and Fritz Strassmann, had demonstrated that you could split the nucleus of uranium, which is one of the heaviest elements in the periodic table.

If you bombarded it with neutrons, with subatomic particles, their resulting fission will see a gigantic release of energy.

And right away, people around the world see that this could produce a bomb, the like of which humanity had never seen.

A bomb that may come to threaten the very survival of humanity itself.

Very good, Tom.

That's your Channel 5 documentary voiceover, yeah, sorted.

Just so everyone understands, you know, what's the state?

So that autumn, President Roosevelt set up what he called the Uranium Committee to research this.

He said, you know, we have to be on top of it.

So he got his top off ends onto the case.

But actually, it took a year before the Rad Lab at Berkeley began working on this, and Oppenheimer himself became involved.

I mean, of course, they are well known for being very left wing.

So you can understand why the government was so to be fair as Roosevelt.

Well, Roosevelt's not as left-wing as they are, but certainly by October 1941.

So this is a few months before the United States enters the Second World War.

They have a secret meeting at the General Electric headquarters in New York, upstate New York.

Is Reagan there?

No, it's not. I knew.

Oh, hello.

What happens if I press this? Oh, shit.

I knew you.

As soon as I said General Electric, you would think of Ronald Reagan, who for those people who don't know, you know, Reagan series, we talked about Reagan's work in the 1950s as a kind of frontman for General Electric.

So he might have been there a bit later.

He would have been there if it was 20 years later.

At this point, he was he was dressing up as a soldier was he was a soldier, wasn't he? He was an appearing with monkeys.

So at that meeting, they talk about how basically they will need loads of this particular isotope of uranium, which is called U-235, which is the only isotope

Tom that can sustain a chain reaction.

And they will need this for a nuclear bomb.

And Oppenheimer is all over this stuff.

And even at this point, they have a real sense that they are on a race against time with Nazi scientists.

So I know you've been watching a lot of Indiana Jones films and obviously Nazi scientists and people about ilk play a large part in these things.

So there's an element of a sort of thriller about this.

Now, they know that the Nazis, it's the equivalent of the race of the Ark of the Covenant.

Exactly. Exactly.

And Dominic, where is Britain in this?

Britain is off doing its own thing.

Britain has a project called Tube Alloys, which will end up being kind of folded into the Manhattan Project.

But at this stage, the American project is its own thing.

But are they ahead of Britain and Germany?

No, they have a sense.

I was going to come to this, but they have quite a strong sense of being behind their senses that partly because of it was that Han Strasman, who made the great theoretical breakthrough and partly, you know, the Germans have Werner Heisenberg, who's the most famous young physicist on the planet. And of course, they think, well, the Germans have probably been because they've been in the war for two years already.

They have probably been throwing tons of, you know, resources at this.

The Germans sort of have heavy water at telemark or something.

I know nothing of heavy water, Tom.

That's where my scientific knowledge runs out.

I don't even know if it's relevant.

OK, there's something to do with Norway and there's heavy water there or something.

I don't know. My brother would know about that.

Let's draw a veil over that.

Let's get back to Oppenheimer.

So May 1942, he has made the director of the fast neutron research for a new secret committee, which is called S1.

And he's absolutely, you know, passionate about doing this.

So he believes, as most of the scientists do, there are lots of Jewish scientists among them, and they at this point, there is no sense whatsoever that this will be directed, even though they're fighting Japan, this will be used against Japan.

All their senses, this is what this is will be used against the Germans.

In fact, Oppenheimer tells one of his colleagues,

Edward Teller, a man who will feature more heavily in this story in the summer of 1942, explicitly says to him, only a nuclear bomb



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can dislodge Hitler from his conquered territories in Europe.  
And I mean, is the intention that they will use it or that they will say,  
we will use it unless you unconditionally surrender?  
Or what's the what's the military planning?  
I think at that point, they have no clear plan  
because they don't know how devastating it will be.  
No, because they don't know when what the situation will be,  
when they finally got there.  
They don't know how long it will take.  
Of course, it's going to take them another three years.  
They don't have a sort of a finely worked out strategy for how to use this.  
Now, Oppenheimer is aware, even at this stage,  
that there is a big problem and that is the communist problem.  
So he says to his friends that summer in 1942,  
I'm cutting all my contacts with people who were in the Communist Party.  
I know that the government will not want me unless I do this,  
that I have this past, basically.  
And in fact, in August, 1942, the War Department said  
they were very unhappy about using Oppenheimer.  
They didn't really want to give him security clearance.  
They said, listen, he's been hobnobbing with these people who have security risks for years.  
It's not like a one-off.  
And who are Stalinists?  
And who are Stalinists?  
But he gets an absolutely crucial ally,  
who is one of the big figures in the story of the Manhattan Project,  
who is a guy called Colonel Leslie R. Groves.  
So Colonel Groves had graduated fourth in his class at West Point.  
He's in his late forties.  
He is an immensely dedicated, ruthless organiser.  
And that's what he is. He's an organiser.  
One of his aides, one of his closest aides said to him, said of him,  
he was the biggest son of a bitch I've ever worked for.  
I hated his guts, but he then said he got things done.  
And that was he was the person you brought him to get stuff done,  
to run projects and things.  
So Groves, in the autumn of 1942, he takes over what was then called  
the Manhattan Engineer District, ends up being called  
the Department of Substitute Materials.  
But we know as the Manhattan Project.  
And why is it Manhattan?  
Oh, because it was it was there was some office in Manhattan.  
Because I always wondered that because Manhattan is a long way from Los Alamos.  
But she's not Salamos is not even on their radar at this point.

Oh, OK. Oh, because I always thought that they were working in Los Alamos. They do end up working in Los Alamos, but that's because of Oppenheimer. So they haven't even got there yet. So Groves and Oppenheimer have lunch and Oppenheimer and they're so different. But they what they have in common is this sort of single minded obsessiveness about the project. And Oppenheimer and Groves have lunch and Groves says, you are the man. I don't care about the security clearance issue. You are my man that I want to run a single laboratory which will gather all these great brains and that we will dedicate it to this weapon. And I want one person to run it and that person is you. And why have they fixed on Oppenheimer because he's the best scientist or because they sense that he has the personal qualities that when you say they it's really only he. It's only Groves. Lots of other people say he's spotted. Well, that's the fascinating thing because lots of Groves is superiors and colleagues say, why Oppenheimer? What, you know, he's risky. And Groves just says, I see something in him. This may I think it's the obsessiveness, actually. OK, so it's the obsessiveness rather than his evident pedigree as a scientist. The pedigree is a scientist is part of it. But what he's actually getting him to do is to run the thing, to manage it, to manage hundreds of other scientists, which is not something Oppenheimer has ever done. And I wouldn't say that his track record necessarily suggests you'd be very good at it with his whole strangling people and poisoned apples and things. I agree with you, but he has cleaned up his actions and there's been very few strangling related incidents. So Oppenheimer is going to be the man. But but and this is everyone should, you know, stop what you're doing and listen to this bit of the podcast. Oppenheimer has a terrible conversation about this point a few weeks later, the autumn of 1942, or perhaps the early weeks of 1943. He has his old friend, Hawkins Chevalier, the French literature guy round for dinner back in California. And at that dinner party, Chevalier says to him, I have a friend called George who he's he's asked me to pass on a message to you. He, you know, it seems very unfair that we are now talking to the British and sharing secrets with them. But our gallant allies in the east who are doing so much of the fighting and dying against the Nazis, we're not sharing anything with them.

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And, you know, there are people at the Soviet consulate in San Francisco who would just love for you to help them out in the interests of allied unity and actually winning the war against the Nazis and for you to pass on a few, you know, what you know.

And Oppenheimer does one very good thing and one very foolish thing. The very good thing is he says, no, I'm not interested.

You know, this is not for me.

There's no doubt about that.

He he didn't pass on secrets to the Soviets.

But the thing that's very foolish is he doesn't report the conversation.

He doesn't tell anybody about it.

Is it but is it just them in the room?

Just the two just the two of them.

Yeah, I think they're their wives around and they're in the kitchen or something.

And it's just a quiet word.

So very deniable, very deniable.

But well, as we will see, even for his own self-protection, he absolutely should have mentioned it in his failure to do so.

Though you might say laudable because he's protecting a friend.

This will really come back to bite him.

OK. But of course, he doesn't know this at the time.

At the time he is planning for what becomes Los Alamos.

So in November, 1942, he goes to the small group, including Groves, to New Mexico.

They go to a place called Heme's Springs near Santa Fe, a canyon.

And they say Oppenheimer says it's too small.

We won't be able to build a little town down here.

Why don't we go up to the end of the canyon and keep going?

I've I've I've you know, I used to ride around here.

There's a boys school.

They go up there.

They go to the boys school and Groves says, brilliant, this is the place.

I mean, that's literally what he says.

He says, this is the place.

Two days later, the US Army buys the boys school that Oppenheimer had visited all those years ago.

And they just transform it.

They bring in loads of machines.

They bring in generators and cyclotrons and lab things.

And what's the cyclotron?

It's an important lab thing.

And they at first, they open in March and they have only 100 people.

But by the time they're really running in mid 1945, they have 6,000 people.

And Oppenheimer is basically running the show.

It's amazing.

I mean, considering how unsuited to running 6,000 people,

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everything that you said about him, yeah, seems to mark it.  
I mean, but he's good at it, Tom.  
Yeah, well, I mean, as we know, they did it.  
I don't he's very good at it because of this sort of demented single mindedness,  
I suppose he drives them really hard.  
They they believe that the Germans at this point,  
they believe the Germans are two years ahead of them.  
But is he and the other boffins?  
Are they actually in the army or are they just linked to the army?  
Well, most of the people in Los Alamos are not in the army.  
So there are 4,000 people who are not in the army and 2,000 who are.  
Oppenheimer himself, he has the specially commissioned uniform which he wears all the time  
to show, you know, to I suppose to show that he's an authority figure.  
That he's not just a scientist.  
He was commissioned to Lieutenant Colonel, even though he failed the medical.  
So he was medically complete, you know, partly  
because he's just been eating arthochokes and chocolate for 30 years.  
And he can't move in a chemistry lab without knocking over a.  
Exactly. I mean, he would be good in the cavalry, Tom, with all his riding.  
Yeah, that's true.  
And he'd be good as a sort of as an assassin with his strangling, his grotting apples.  
Right. But not as but not as a conventional  
as a conventional infantryman or something.  
Now, so he's running them.  
You know, they're doing all this stuff to kind of prepare for the bomb.  
But all through this, there are doubts about him.  
So for one thing, he started seeing Jean Tatlock again.  
OK, she's still a communist.  
Florence Pugh, she's still a communist.  
Now, whether they're having an affair or whether they're just seeing each other's  
friends, who knows?  
We know we don't know.  
But he is certainly seeing her.  
Secondly, the FBI and army intelligence.  
Both are very concerned about him.  
So all through this period, they are tapping his phone.  
They read his letters.  
They wiretap his office.  
Even his chauffeur, his driver is an agent for army counterintelligence.  
They are so worried and they actually say to him,  
if you ever, whenever you leave Los Alamos, if you drive into Albuquerque  
or Santa Fe or somewhere, we will be tailing you.  
We will be watching you.  
So from this point onwards, he's actually always under scrutiny.

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I mean, this is I didn't realize this.  
I thought that the communist issue kind of as it were, you know, came out of nowhere in the 1950s.  
I mean, it's less toxic for him at this point, because as you said, the Soviets are still American allies.  
That's right. That's right.  
So he can sort of it's not such it's not so toxic.  
That said, in the late summer of 1943, he has his second great disastrous conversation.  
And this is he hears that they are worried about communist influence at Berkeley, the radiation laboratory.  
And so this point that he reports a very late months late that he decides he will report the conversation with Chevalier about possibly possibly being an agent for the Soviets.  
And he's interviewed by a man with a slightly peculiar name of Boris Pash. Who's an ex kind of white Russian or something who works for Army Intelligence.  
And he gives a very, very poor performance.  
He's very vague about the conversation.  
And he's also inaccurate.  
He says, I don't think it's just me.  
They approached he was approaching through the scientists as well, which is a kind of detail that he's made up.  
That's not true.  
And it's not clear whether he's made that up so that it's not just him and that he doesn't look so bad.  
Or he's made it up because he wants it to look bigger than it is.  
It's a sort of bit, you know, he himself said, I don't know why I said that. It just wasn't really true.  
But the fact is he's given this very rambling, shambolic performance.  
And whenever the FBI, when they later interrogate him, he's always a bit vague and evasive.  
And I think because he feels guilty, you know, because as we all would, he feels under pressure and a bit shifty and anxious.  
So he's a very bad and that, unfortunately, does not put it to bed.  
It means that among the FBI and among US Army intelligence, there are people who think he's hiding something, you know, there's something fishy about Oppenheimer, something not quite right.  
And actually, even at this point, Groves is still having to kind of stick up for him and saying, no, he's my man, you know, we'll get him to do it.  
One other thing before we move on to the very end of the story, this part of the story anyway.  
At the end of 1943, a chap called Niels Bohr arrives at Los Alamos, great Danish physicist.  
Now, he had gone on this amazing journey.

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He had been smuggled out of Denmark into Sweden.  
And then in Sweden, he was kind of bundled into the kind of bomb bit of an unmarked British bomber and then flown to England.  
They had an oxygen mask for him to wear because he could he would probably pass out, possibly die on the flight if he didn't have oxygen.  
But he misheard the instructions and didn't put it on.  
So he did pass out, but he didn't die, which is just as well.  
He joins the British nuclear project, which was called Tube Alloys.  
And the British agree that they will send Bohr as they end up sending lots of their scientists to Los Alamos to collaborate on the Manhattan Project.  
And it's when Bohr gets to Los Alamos that he says, I know for a fact because I had a conversation with him that Werner Heisenberg in Germany is working on a Nazi bomb.  
So the pressure is really on.  
But Bohr also does something else.  
He says to Oppenheimer, you know, once we've done this, we should share this with the world.  
We shouldn't.  
It shouldn't just be an American or British thing.  
We should share it with everybody because in this new age, we have to be completely open and there can't be any secrecy.  
And we have to have to build a new, more idealistic, more international world and sharing the benefits of atomic energy is a massive part of this.  
Now Bohr went around saying this in the final years of the war.  
He said it to Churchill and Churchill said to afterwards to his men, you know, that bloke should be locked up like this is a very bad idea.  
But Oppenheimer, because of his kind of ethical culture stuff and his kind of social gospel, Judaism and all this business, he's into that.  
He loves it. He thinks this is great.  
This is a great step towards a world government and all this great fun.  
So this is very this again is going to be is a sort of little ticking time bomb in Oppenheimer's career.  
So let's fast forward since we're reaching the end of this episode.  
We're into 1945. Roosevelt died in the middle of April.  
Hitler killed himself on the 30th of April.  
It's clear at this point, the bomb is not going to be used against Nazi Germany.  
They're not going to need to.  
The Nazis have lost the race.  
So the Nazis never did build a nuclear bomb.  
And as when Germany crashed out of the war in May 1945, obviously, the next target is Japan.  
And at this point, to put the what the decision that will be made in the next episode into context at this point, the American bombing raids on Japan have reached such a peak

that in the most famous one on the 9th of March, 1945, the fire bombing of Tokyo, they destroyed 16 square miles of the Japanese capital and killed 100,000 people.

But also, Dominic, just to put that into context, they are also fighting an incredibly brutal war in the Pacific and the projections of military strategists is that millions of people on both sides will die if there is a land invasion of Japan.

That's right. That's absolutely right.

I mean, there are ferocious arguments about the decision to

I mean, among historians, I mean, about the decision to drop the first atom bomb on Hiroshima and then the second on Nagasaki.

And maybe we'll come to this a little bit in the second episode.

I think there's never there was never any doubt that the Truman administration were going to do it.

And Oppenheimer, at this point, he has he seems to have had a few private doubts, but by and large, he's happy to go along with.

I mean, the context is that Germany has been defeated.

Yeah. And certainly, the British are exhausted and America is desperate not to lose millions of people.

And so presumably this is weighing on what's happening at Los Alamos.

There's a kind of they're thinking this could be a cutting of the Gordian knot. It's not just that.

He thinks it's the weapon to end all wars.

Oppenheimer does. Yes.

But presumably the US military and Truman don't think that.

No, the US. Well, the US military and Truman, I think, in purely,

I think they've got two things in their minds.

One is winning the war against Japan and the other is the Soviet Union, Stalin, and this is a massive historiographical.

This is one of the hottest, most hotly contested debates in all American historiographies.

So we don't really have time.

Of course, the key thing, though, Tom, is they have to make sure it works.

So that summer, they choose the place, the place is called.

I mean, you could hardly you couldn't make this up.

It's called the Juanada del Muerto, the journey of death, the place is the sort of that's literally its name.

Yeah, that's the Spanish name.

Nominated determinism.

Nominated determinism.

Indeed, it's about 120 miles southeast of Albuquerque, New Mexico.

It's Oppenheimer who says we'll call it Trinity.

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I don't know why he no one knows why he chose that title.  
He just said apparently from a John Dunn poem.  
Yeah, there are some people who say because he loved the poet John Dunn,  
which he'd been introduced to by Florence Pugh.  
Is that right? Apparently, yeah.  
I mean, thank God he didn't name himself to George Elliot.  
Reawakening memories of that disastrous spell at summer camp.  
And so that quote that you read at the beginning of the episode,  
that's what happens at 5 30 a.m.  
on the morning of the 16th of July, 1945.  
And this is an extraordinary moment in world history.  
You know, it is the beginning of the atomic age.  
It's the moment at which if you're going to use that Promethean device,  
it's the moment at which humankind gets its hands on fire.  
Well, I mean, it's more than just human history.  
I mean, the whole history of the planet.  
Yeah. And so as you said afterwards, many years later,  
Oppenheimer said that he thought about that line from the Bhagavad Gita.  
Now I am become death, the destroyer of worlds.  
But actually, at the time, he said something quite different.  
So the New York Times, this guy from the New York Times,  
who has been chosen is basically embedded.  
He's been chosen by Groves to report the event.  
And Oppenheimer says to him that the blast was terrifying,  
but not entirely under pressing.  
And then he pauses and he says, lots of boys who are not yet grown up  
will owe their lives to this, which is a counterintuitive note on which to win.  
On that, we will take a break and finish today's episode.  
And we will be back with the second half of this story.  
So the way the atom bomb is used in Japan,  
Oppenheimer's views on that, all the kind of historiographical complexities  
around it, and then the story of Oppenheimer's downfall.  
And ultimately, his he gets kind of rehabilitated.  
Yeah. So we will see you for part two very soon, unless, of course,  
you are a member of the Restless History Club, in which case we can see you  
immediately because you can go and listen to it right now.  
So we will either see you, well, you know, in a few minutes or in a few days.  
Either way, bye bye. Bye bye.  
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