

Hi everyone and welcome to this week's episode of No Such Thing As A Fish, which is one of my favourite episodes that we did in the Soho Theatre in our summer run. No offence to our other guests who are all amazing as well, but I really really love this episode with Hannah Frye. Now you'll probably remember Hannah, she was on No Such Thing As A Fish earlier this year. She's a mathematician, she's written a load of books that are definitely worth getting if you're even slightly into, in fact, whether you're interested in maths or not, she makes the subject comma life, but the very important thing I also had to tell you is that Hannah has a new podcast, it's called Uncharted and would you believe it, it is a podcast about graphs. You know those famously visual things in a very unvisual medium, but like everything that Hannah is involved in, of course it's absolutely brilliant, it's not just her reading out numbers or saying a p-line, downy line, curly line, all that kind of stuff, it's actually stories about human behaviour, it's about discovery, it's just an absolutely brilliant podcast, I very very highly recommend you tune into that. Like I say, called Uncharted and it's wherever you get your podcasts. Anyway, very much hope you enjoy this show as much as we enjoyed making it. All there is to say is on with the podcast!

Hello and welcome to another episode of No Such Thing as a Fish, a weekly podcast this week coming to you live from the Soho Theatre! My name is Dan Schreiber, I'm sitting here with James Harkin, Andrew Hunter Murray and Hannah Frye and once again we have gathered around the microphones with our four favourite facts from the last seven days and in no particular order here we go. Starting with fact number one and that is Andy. My fact is that if this conversation had one extra person it would be substantially less funny. And which extra person are you thinking of? Well, anyone, that's the thing. Any extra person, even if it was Alan Carr, even someone as funny as that, even Alan Carr, wouldn't make this conversation much funny. The original chatty man? Yeah, that's interesting, you said just think of someone funny and he was a funny guy. Well he wouldn't be if he was here. Or he would but we wouldn't. Basically this is a theory about the maximum number of people who can have a good conversation. So it's about when you're out, you're with friends or family or whoever and it's a theory by Robin Dunbar who's an anthropologist and he's an evolutionary psychologist. He's best known for the idea of Dunbar's number which is that most people have a social circle of about 150 people and he has been working on this idea and he says if five people are in a conversation or if there are four people and a fifth joins the amount of laughter drops dramatically. And obviously this is a slightly artificial, it's very quiet when no one laughs, isn't it? But basically it's, what if there's 200 people in a conversation? Yeah, if a fifth person joins a group, either it becomes two conversations almost immediately or you get this one person starts monologuing a bit like now and that also doesn't lead to laughter. It's really interesting because he said that like four is the right number but if you have a dinner party then it's kind of okay to have eight people. You kind of want to stay in those four, eight, twelve and that made me think the last supper, thirteen. Is that what was happening? Judas was just sat there, couldn't make any conversation. He's like fuck this, I'm going. Oh do you think he made like a real killer joke and no one laughed? Okay fuck this, I'm killing that guy. Does that mean so six is wrong, right? You don't want six people. Not funny for six. Less good. How many are in Monty Python again? Uh oh, yeah, true. Yeah, I just have strong opinions

about Dunbar. Oh okay. Oh okay, here we go. Maybe strong is too strongly stated but I'm raising an internal eyebrow about this, I think. Make it an external eyebrow. Wait, wait, tell us more about your internal eyebrows. It's just outwardly I look calm, inwardly. I'm quizzical. But yeah, go on. Okay, the 150 number that he's famous for, so the way that they got that was that they looked at the social groups of primates and then they looked at the size of brains, measured the size of brains of the average human and the size of brains of primates and then they just had loads of dots on a graph and they just drew a line through it and were like 150. Okay. Which is, I would say not how you do science. No, no. So is he, but is he respected in the field or is he someone that's sort of, it's like, okay, you've called it a bit too early here. So I don't know that much about this four, four, five laughter thing. Yeah. Tell me more about their research methods. Oh wow, that was so bloody hell. That was incredible. Oh God. I think it was, I think they were observing people in the fields. They would observe groups of conversations happening. Yeah. I can't remember if they recruited them or if they were. No, they did it just, they had like a party happening and they were kind of just scientists with a clip. Maybe that's why people weren't laughing because there was some creepy action. The other thing they did is that they looked at lots of movies and lots of different things to see when you've got a movie, how many people are in those conversations. So they looked at Sex and the City, Love Actually, Pride and Prejudice, League of their Own, which apparently is a movie. I thought it was a sports paddle show they were talking about, but apparently it's a movie. Tom Hanks, Gina Davis. Sure. Yeah. Freddie Fenton, which is David People. But they noticed that in those lots of people, it was like just groups of four that were chatting all the time. And they looked at Shakespeare as well. And they found that in Shakespeare, it was never usually more than four. And one thing that they also found is if you're gossiping about someone, then actually it's better to be in a group of three. And the reason being that you only have the brain space to be in a group of four people. But if you're gossiping, then that person is the fourth person. That's cool. Again, that's what the study says, whether that's true or not. I like that. The idea was that if you, all the four of us, we're talking and we're also trying to imagine what the other three are hearing. But we're also, if we're listening, we're also trying to understand what the other person's saying. And it's harder to do that with five people than with four. So for instance, if you had the sentence, James knew that Andy thought that Dan wanted ice cream. That's kind of a sentence that's relatively easy to understand. But if you were to say that Hannah believed that James knew that Andy thought that Dan wanted ice cream, it suddenly becomes way more difficult to understand. Oh my God. Do you think you did though? I could just ask that without, I didn't understand that at all. Any of it? No. And the other thing I suggested was that, and I think this is where the research may be a bit stretched, is that SAS patrols and surgical teams do best when there are four members of the team because that makes the communications easier. Although that's separate to the laughter thing as in, I don't know that SAS patrols laugh a lot. That would be me as an SAS guy heading into a building full of terrorists. Do you know what? There's actually four of you already, so I'm just going to sit this one out, guys. It'll go better, trust me. I was reading a bit about conversations, generally. And there's this amazing book, Watching the English by Kate Fox, which she sort of walked around all over the UK, just

eavesdropping in on conversations. And one of the bits of research that she discovered was that 94% of British respondents admit to having conversed about the weather in the past six hours, while 38% said that they've had talked about it in the past 60 minutes. So she worked out that that means that almost any moment in this country, at least a third of the population, is either talking about the weather or has already done so, or is about to. I know what you mean, but it depends when she did her study, because if it was just after it had snowed, for instance, and everyone's going to be talking about the weather, if it's in the middle of the night. I know there's weather in the night, but there is less. I think we can't say that. But she makes that point that in places like Finland, they just never talk about the weather. If it's wintertime and you're snowed in so much that tunnels are actually dug to get you to the shops, what you actually do is just sit with someone just in silence, because you're like, we don't need to talk about the weather. We know what the fucking weather is like. The rules, according to Kate Fox, there are rules about talking about the weather. The first rule is you always have to introduce the topic as a question, like, raining again. Yeah, yeah, yeah. That's a very Aussie way of talking as well. It is, yeah. The inflection just kind of gives you an opportunity for it to either be a question or a statement, and the respondent can decide what it was. Yeah, yeah. Raining? She's in it cricket again, for instance. But the other thing is that when people say that to you, you're not supposed to ever disagree. So if someone ever does a question about the weather to you, it's really rude to say, no, it's not raining. I do that all the time. Or if someone says... I genuinely do that all the time. I'll say, oh, it's drizzling. It's spitting. Yeah, it's not raining. I do that constantly. That's so weird, because you are the most English person I know as well. Well, I have a strict categorisation system in my head, but also I pride myself on not, you know, not giving up in the face of rain. So I will say, sort of, yeah. There was one really amazing study where they, you know, if you're looking at the weather forecast and it says, oh, tomorrow there's a 40% chance of rain, they went and actually asked people what they thought that meant. Oh, yeah. And actually, so for me, it seems like, OK, well, you know, you replay the day 10 times and four times it will rain and six times it won't rain. That sort of seems quite obvious. But when they did the survey, loads of people were like, OK, it means that 40% of the land is, you know, so if it's like London, 40% of London will be covered in rain. Oh, yeah. As an alternative. But then the most common response was that, like, it would be 40% rain. So it's in, like, if 100 is maximum rain. I feel like it's more like 25% rain. That's amazing. There is this thing about when conversations end and whether you want them to or not. Oh, yeah. So there's a psychologist. I think he's a researcher called Adam Mastroyani. And he was at a black tie party and he looked around the room and he thought, I wonder how many of these people are in conversations. They just don't want to be in any more because it's hard to judge, isn't it? The end of a conversation, you know, you'll have a conversation and one person will try to disengage. You're still talking, Andy. Oh, God, it's happening. So he and his colleagues, they surveyed hundreds of people, they put them on a room with each other, they got to talk and said,

when the conversation ends, you can leave. But they didn't say, I don't think they said, this is when the conversation will end. The conversation lengths were 50% longer than most people wanted them to be in general. And although 10% of people ended the conversations, even though they wanted to keep talking, but they were worried about being boring.

Everyone was having a nice time and they just thought, I'd better. So basically,

98% of people don't think the conversations are the right length. Okay.

Does that mean if I'm chatting to someone in a party, I should stop early or I should carry on going?

It depends what they're doing. There are signals out there.

Are they looking at you? Are they sitting down? Are they slowly backing away?

Yawning. Do you hear, Hannah, you've written books and you've written about famous characters from history who we do know some of the voices of and some of that we don't say like,

I don't know, an old scientist like Robert Boyle or something like that.

Do you hear their voices in your head when you're writing the dialogue you're copying out on the book? Not for Boyle, but there is one person who I do do this for. I'm not sure it's that

appropriate, but I'm going to do it anyway. So it's a guy called Francis Galton. Oh yeah, Galton. Francis Galton. He was like, I mean, an amazing statistician, like loads of the

work that we use now for stats comes from his thing, regression to the mean, that was his idea, loads of stuff about population stuff. The thing is that Francis Galton was so

intent on collecting statistics about the human body and about humans because he was a massive eugenicist and like total white supremacist, like really just a not nice guy.

The thing about him though is that he was from Birmingham.

You have to imagine, he's talking about white supremacy and a bromie accent,

you know what I mean? That's the one I do. We've mentioned him a few times, so one of the eugenicist

things he did was he did a beauty map of Britain, didn't he, where he went round sort of with a little clicker going, oh, hot, hot, hot. Oh, she's really nice. Yeah, yeah, she's really fit.

The word he has, though, for like ugly is horrible. I can't remember these, it's like repugnant. Oh, really? That's the category that he had. Oh my god. Yeah, I can't remember exactly

what the word was, but it's something like that. And he had a hat that he designed that had a flap on it because he thought he was so clever, his head was overheating, so he was like,

better let some air in. Yeah, that was great. Yeah, interesting guy. You haven't persuaded me about Dunbar's number, by the way. The 150 one? Neither of them. Not even the four? No. But aren't

you enjoying, so that means you're not enjoying this conversation, basically. You really wish Alan Carr was here to learn things a bit. Well, you know, I think there's room for a fifth person.

There are some really nice things about friendships, though, about connections. So, especially when you look at the network that's created, so there was like a lot of work in this

in the 90s, something called the friendship paradox, especially, and it really came into being when social networks came about, and you could actually test this out empirically.

So, the friendship paradox basically says that your friends are more popular than you.

Okay, and that maybe... Don't worry, I've heard it before, I hear it again.

But this actually, this works for everyone. It does. It works for like 98% of people,

is that their friends are more popular than them. How is that possible? So, it's possible in the

same way that almost everybody on earth has an above average number of arms.

Yes. Yeah, yeah, yeah. Right. But not by much. Not by much, exactly, not by much. But the thing about... So, if you look at like Twitter networks, for example, you get some people who have like, I don't know, 100 million followers, right? Whereas the vast majority of us have like, you know, very few. And so, when you kind of look at the mean, like the average number of friends across everybody, almost everyone is below that threshold because there are some people who really dwarf the numbers. But there's some really interesting things that happen when you look at how this plays out kind of in person. So, not on a social network. There's a brilliant story about this company in Hungary. And this company were having all of these problems. They had these

three different offices and they were having to downsize. They were like, going to make loads of people redundant. So, all these like horrible rumors flying around, like vicious stuff about how many people are going to lose their jobs. And so, the company decided to try and map out the friendship networks inside the company to see what was going on with these rumors. So, they asked everybody, oh, give me the name of one person who you go to. But if you want advice or information, give me the name of one person. And then they're like, map the network. And so, in the same way as with social networks, there was like, most people had hardly any friends, right? Like one or two. But there was one person who had like a huge number of connections.

And it turned out this person was the safety officer for the company. So, people were like, he's got to be the CEO, surely. The directors and managers, no one cared what they had to say, basically. But this safety officer, so he was like, going around to all of these different places, training people on the rules, and just bringing all the juicy gossip with him as he went. So, do they sack him? So, that was the option, right? You can get rid of him and then cure the problem. Also, no more safety in the company. Yeah, no more safety in the downside. What they actually did, which I think is much more clever, is they gave him a pay rise and then used him to spread out the secrets that they wanted. Oh. That's a starry way of doing it, isn't it?

Climbing. Oh, my God. Very cool. We need to move on, by the way, to our next fact, very simple.

Okay, just a quick thing on going back to conversations. So, there was some research done at the University of Rocklöv in Poland. And they looked at loads of different people from different countries. And they saw them in conversation. And they worked out the distance where people felt they were comfortable talking to someone. So, how far away you are from someone when you're talking? Oh, yeah. They found that in the UK, the preferred distance if you're talking to a stranger is 99 centimetres, which is about the wingspan of a tourney owl. Oh. I was struggling to envisage 99 centimetres, but now you put it in owl terminology.

So, if you're from Argentina or Norway, they're the closest. They like to hang out more close to each other when they're talking. Okay. They like to be about 40 centimetres between them. That's the wingspan of an arctic turn. And if you're in Romania, then they're the furthest away. If you're speaking to someone in Romania, they want to be 140 centimetres between you. And that's the same as a wingspan of a great skewer. Ah. It's just facts. It's just facts.

Like, if you want to know. The skewer, the bird, not the skewer, the skewer.

Because that would be a great skewer. Imagine the kebab. You can fit on that.

Okay. No, no, no, no, no. What? Can I very quickly tell you one last thing?

Well, you can start it and I'll let you know when I want it to finish.

Oh, no, no, no, no, no. Okay, okay, okay.

Very recently, this thing happened last year also. There was a guy on Reddit who was, you know, on Reddit, you write to each other and you answer each other's questions. And it's like, it's a very community-based. And he was having a really hard time interacting with people. He spent about a year writing responses to other people's messages and he got nothing back. You know, you get sort of points and scores and things like that. He got absolutely nothing back. Anyway, it turned out he discovered after a year that he had mistakenly been blocked and nobody else on Reddit could see anything he had written for a year. And he'd been answering incredibly specific questions. He answered someone's cry for help and he got absolutely no responses

to it. He thought, wow, okay.

I was like that thing with the Horniman Museum in South London.

They weren't getting emails from ages. They had no idea why and it turned out that a new system had put on their computer system and it was to filter out any rude words. And the...

Mistakened it for Horny Man and went, no, that's not coming through.

We need to move on to fact number two and that is Hannah.

Oh, that's me. Okay. Fake diamond rings are better than real ones. Fact.

Well, my wife is in tonight and there's something... Fake diamond rings are better than real diamond rings. I think they're better. I think they're better.

Oh, Hannah, I think they're better. Oh, no, sorry. A dangerous, subjective note.

Rubber dumbbells on the phone.

That's something to say about this. Objectively. Objectively. Okay, so here's the thing, right?

You want diamonds, right? Why do people like diamonds? They're sparkly, sure.

They're rare, sure. They're expensive. They've got great thermal conductivity.

And that last one, I accept. They do have the highest thermal conductivity in the middle.

I agree. But the thing is, on every metric, there's something else that does better, right?

So, sparkliness. There's another sort of substitute diamond called mossomite, right?

Much sparklier. Interesting. You get like a greater display of the spectral colours.

Expensive, right? There is other things that are more expensive. Also, they artificially inflate the prices. Bitcoin. Exactly. And then sort of big, you can grow them in the lab. That makes it better, right? You know, big ones. But the thing is, right, so the real reason why I think that the other ones, the fake ones, are better is because there's this sort of diamond substitute called zircon, right? And there's like a lab-grown version of it called cubic zirconia that you get in, like, Elizabeth Duke. And the thing about zircon... Sorry, that's the shop.

Oh, yeah. Sorry, that's... Did you not buy your jewelry in Argos?

Darling, you're probably wondering why I've brought you here today. Well, great news. Open the catalogue.

No, a cheaper page, please. Elizabeth Duke, go on. Sorry.

Okay. All right, so I want you to imagine a sort of 1999 Elizabeth Duke ring, okay?

I think it's better. So zircon is naturally occurring. And the way that it naturally occurs is when it forms, it makes, like, this jail. So the crystal structure is like the almost perfect cubes that are sort of stretched in one direction. And they're formed in such a way that they can trap atoms of uranium inside them, okay, like literally uranium inside a jail.

And the thing about uranium is that it decays, okay, it decays into lead, but it does it at a very

predictable rate. So if you find a lump of zircon in the ground and you open it up and you see that there's a certain number of uranium and a certain number of lead inside, you know how old that zircon

is, right? Cool. So there was some zircon that was created at the beginning of the earth, right, 4.4 billion years ago. And that is how we know how old the earth is, is because they found this really, really old zircon in these hills in Australia, and then went through, counted up how many lead atoms there were, how many uranium, and that's how we know how old the earth is. And that I think is much better than a sparkly rock. Can you get that one in August?

So I think you can get them in some joy shots, they both contain zirconium, cubic zirconium and zircon. But the other thing is like the gold band, so you can't make gold on earth, there's no way to like make gold. We just have what we have. We just have what we have, it was forged in stars when they were colliding together. So I just, I love the idea that you go in that 1999 ring, it's like. And that's why your engagement ring came in at 20 quid.

No, you're right. You've got, you've got a ring that is the birth of the solar system, and so cool. The origins of earth, which is extraordinary. When did diamonds come about then? Later. Slow down professor. Like zircon is zircon is the, so hang on zircon is the mineral, right? And the metal is zirconium. And zirconium is not well known. It's used in the nuclear industry and for a few other things. And braces for your teeth and tennis rackets.

Interestingly, some tennis rackets have a bit. Anyway, but zircon's almost the indestructible, aren't they? And that's why they're finding these incredibly ancient ones. So they can be washed down a whole river and they won't chip and they can be heated to 1600 degrees Celsius and nothing happens to them. And so that's why they're the sort of pieces of evidence for 4.4 billion years ago. It's just, we know they still exist in exactly the same form. That is cool. They don't really change. Yeah. There are some diamonds. So most diamonds are made in the earth, in the middle

of the earth, right? In these things called kimberlite pipes. It's due to the pressure of the earth and they're created. But there are some diamonds, like the largest one ever found, which is called Sergio. It was found in Brazil, named after a guy called Sergio Borges de Carvalho who found it. It's basically not like the diamonds you have, like on your rings and stuff like that. It's what's called a carbonado. But it is a diamond and we're not sure how it came about. You find them in only two places, really, on earth in Brazil and the Central African Republic. Weird. They're not near each other. The thing is they used to be near each other before all of the continents came about. So we think they might have landed on earth in this area before the continent split. And if that is true, then they might have been made in supernovas, which they're pretty cool, but they're not very shiny. You can use them in like drill bits and stuff like that, but you can't really put them onto rings. It's no good. A lot of diameters use for drill parts, right? Most of it is found in construction sites. It's a demo conductivity. Yeah, is that what it is? Well, partly, yeah, because you want to like wick away the heat if you're drilling. So it gets hot as you're drilling and then it's... Yeah, but it like conducts it away. And it conducts it away. Wow. Because Robert Boyle, we mentioned him before, didn't he do a thing where he used to, he attempted to basically turn diamonds into hot water bottles? At least that was one experiment that he'd don't raise your internal eyebrows at me. Would they not be... This is a real thing. Would they not be more like cold water bottles if they're conducting heat away from you?

So, yeah, maybe it's a cold water bottle because he was trying to... Okay, excellently raised eyebrows. He tried to, yeah, cool down a warm bit of his body and bed at night. He thought that that would be a way of... With time. Yeah, yeah. Expensive way to do it, isn't it? It is, yeah.

You can get a cheaper hot water bottle or a cold water bottle at Argos, I suppose.

So this is just, this is not a funny thing at all. It's just, I find it interesting, is that the reason Earth is able to support life is partly because of plate tectonics, which no other planet we've observed has. That's because we haven't got very good details on many other planets, partly. But basically, Earth has plates which move and they fracture and they collide. And it means that bits of the inside can get to the outside in the form of magma or whatever it is.

And that means that you have oxygen forming or it means you have carbon dioxide in the atmosphere. You know, it's the relationship that makes it all possible for Frost to all be here thinking about that. Wow. That is very cool. Yeah. Have the three of you heard of Lil Uzi Vert? The Rapper? Yeah. Is it really a Rapper? Yeah. Oh. Why is he a musician? Yeah, yeah, yeah. So he has

a diamond, which supposedly is worth \$24 million. So worried about it being burgled from him, that he had it implanted into his forehead. What? Yeah. And if you look at photos online, it's there. No. No, honestly, it's there. The thing is about Lil Uzi Vert is he thinks his brain is so big that this just cools it down. How big is it? If you see a photo, it's quite large and it's quite embedded as well in his forehead. Is it how? I want to know the mechanics of it. I don't know because it was almost stolen from him at a gig when he went crowd surfing. Oh, really? It's because he made it a massive target in the middle of his forehead.

Put it in your, it's so, just, okay, just a brief tangent about diamond theft because, okay, right, the biggest diamond ever found was called the Cullinan II, Cullinan II. It was dug up in 1905 in South Africa and it was given to the royal family, the British royal family. When you say given, we're talking about theft here, right? Hello. It ended up in the hands of the British royal family and it was huge, right? It was 3,000 carats. It's a biggie and it's, it was so huge, basically. They had to find a way of getting it to the royal family. So what they did was, They could have just left it. Well, they could have dismantled the monarchy. I know, they didn't do any of these things. They could have, yeah, they could all be leaving a more sensible life now, but we are where we are. So they got arm guards and they had a huge, great escort for it and they put it, you know, they put in a big old sealed casket, put the casket on a train to Cape Town, loaded onto a Royal Navy ship in a massive safe, huge security everywhere, ship sails back to the UK. That was a decoy and the real journey of the diamond was put in... It was in Princess Anne's head.

Philip had to smuggle it in up his ass.

The real thing is amazing. It was put in a normal box and just put by Registered Post.

No. Really? I know. Doesn't that say a lot about the postal system?

They just put a three shilling stamp on this diamond and just put it in a box and posted it.

Wow. They always ask you if there's anything worth anything in there.

Oh, yeah, right. Yeah, yeah, yeah. This one, yeah.

Are they fibbed? Isn't that an incredible decoy? That's really amazing.

If only your friend had done that, Dan. Well, yeah, and they took it out of his head during the crowdsurf and he managed to recover it. Imagine if Charles had to have that put in his as part of the coronation. Would have livened up an otherwise dull ceremony.

And now the Surgeon General approaches.

Penny Mordant is using the sword to gently incise.

One way that you can make diamonds, these are nano diamonds and a guy called Wuzhong Zhou from St Andrews University has noticed that if you burn a candle, then the carbon which is burning there makes these nano diamonds. About 1.5 million of them every second are made. And obviously, they're really, really tiny. There's not much you could do about it. He wonders that maybe in the future we might be able to somehow get them to coalesce and make new diamonds, whether we will or not. I don't know. But I was reading about nano diamonds and there's an amazing thing that they've just done. They've made tiny thermometers using nano diamonds and they use quantum mechanics

to be able to tell the temperature of something. And they managed to work out that a nematode worm

had a fever. Wow! Using one of these tiny diamonds, isn't that amazing? And then did they give it another tiny diamond as a hot water bottle and said, go to bed, take the day off. It's just incredible.

It's like so amazing. The opposite though, I think it was Loisier, but it's around,

and maybe it was like it's around the boil time where they were just obsessed with burning stuff.

Right. So I think this is like the whole kind of turning gold and you know all the alchemy stuff.

And then they decided to burn a diamond to see what would happen and they successfully managed to make it disappear into thin air because basically it just went to carbon dioxide, nothing else. Sort of kind of destroyed it. But I had the idea that you would do that,

burn a diamond, next to a tree, the tree takes in all the carbon and then basically you've got yourself a diamond tree, same carbon. So you know swallowing diamonds, is that a thing?

Well, yes. Is it to smuggle them? It's, well, there are a few different reasons that people have swallowed them over the years, basically. Sometimes it's to steal them. There was a rash of cases in the last few years of people just doing a quick switcheroo in a diamond shop and then swallowing the diamond and running away. Oh, wow. They've all been caught and you know,

they very rarely get away with it, basically. But one thing happened to an American woman called Jenna Evans in 2019. She had just got engaged, very exciting, had a diamond ring, very exciting. Then in her sleep, she took the ring off and swallowed it

because she was having a bad dream about, she said she was on a train and there were some bad guys

on the train and she had to keep the ring safe. Oh, no. So in her sleep, she took the ring off and swallowed it. Wow. And did they retrieve it? They retrieved it. Yeah. They went to hospital, they x-rayed her. It's a very clear x-ray of a diamond ring and they said it would be unwise to let this proceed. And did she excrete it? No, I think they went in and... Oh, did they? I think they went in and got it because they said it would be unwise to, it would be unsafe to let that...

My dam is the ring. My dam is the ring. Yeah, yeah.

It is time for fact number three and that is James. Okay, my fact this week is that in 16th century Italy, duels often took place where the chosen weapon was very hard maths questions.

That is so good. Isn't that amazing? Yeah. And it's totally true. So this was quite often,

it was people who were university professors, professional mathematicians, you might say, wasn't much job security in those days. You kind of had to kind of, you know, get jobs where you could. If you were in a job, you might not stay there for long. So one way to get your name out

there was to publicly challenge a more famous mathematician to a duel and you would go to a church or to a town hall square or something like that and you'd have like 30 maths problems and they'd have 30 maths problems and there might be a crowd, might be a load of people there and then you just sit there like the countdown numbers around just trying to answer as many as you can. And 30 is such a big number. It's like an exam. They knew even bigger numbers than that.

It sounds incredible. It is incredible. And you couldn't set something that you couldn't answer yourself. Precisely, yeah, because you wouldn't know if they got it right or wrong. So they challenge you, they say this can't be done and you have to prove it. And so quite often it would happen if a new person had worked out a new bit of maths, you would challenge someone knowing that there's no way

they could work this out because you just worked it out yourself and it would prove that you'd worked out a new bit of maths. But hang on. So you're only allowed to challenge someone a question which you know the answer to yourself. Precisely. That means that when you turn up at the duel you've

basically already won. No, because you've got their 30 questions. So you've sent each other 30 questions.

So dual, so is two people. I thought both of you were sitting on the same exam paper and you'd have to work out all the answers. But also though, there's no algebra at this point. There's no sort of like nice neat equations. So they're set in words. So like you know those horrendous maths problems which is like Jim and Joe have three, it's like the worst version of that. It's like Mattrain leaves Leo's station at this side. Did they ever use examples where the answer unfortunately

had to be like, your mama is a, you know, like, yeah, the answer is my son is a dick. Like, you know, that kind of thing. If that if those existed, then they haven't been kept in history. I'm sorry. Did they start with a few easy ones at the beginning just to get the crowd going like, what is six times nine and then have to build up from there? You know, I bet they did. I don't know. Hannah, you might know my way. I think they were vicious. I think that I went to town on each

other. But there was it was it was cubics a lot like say an equation where you have like a number cubed, which were really valuable because I mean, there's no calculators right at this point. And so if you wanted to calculate interest rates, then you need these the solutions to these equations.

But there was there was a few like very particularly famous characters. So there's a guy called Cardano, who had a like long standing feud with another returning guy called Tataglia. And Tataglia got very annoyed with Cardano because he accused him of publishing an equation that Tataglia had known the answer to. And so challenged him to a duel. And I think Cardano refused, didn't he? Well, I think Cardano, he kind of refused, but he had a second like one of his students and said, well, one of my students could do it because Cardano was really famous at the time. He was a famous astrologer. A bit later, he actually got put in prison for doing a horoscope of Jesus Christ. So he was like, he was really, really famous. And he thought it wasn't really worth him. Sorry, I really reacted like that was a crazily controversial thing to do now.

In the time it was pretty amazing. The other thing as well is it was high stakes for these things, because if you lost your reputation was damaged, you were you were seen as someone who was not capable of doing great math and it kind of just ruined you. If you won, there might be a monetary prize or alternatively, the loser had to buy you dinner 30 times for every every single one that

you got right. Yeah, in a local tavern, they'd have to foot the bill no matter what you ordered. Tad Taglia actually was famous at the time for he'd done a few of these challenges and won them all and he'd turned down the dinners. Like they'd offered him these 30 banquets and he said, no, I don't need that. I just I'm happy to show that I'm an amazing mathematician. That's pretty, it's pretty cocky. It's pretty amazing. Cardano's second though, Ferrara, isn't it? He was like, fine, okay, you know what, I'll see you. I'll do I'll do your 30 questions. But by this time, he'd worked out how to solve any equation to the power of four, right? Which is like, whoa, hang on, level up. So he just set all 30 questions as to the power of four. And Tad Taglia had no idea how to solve them. So he got beaten. So it must, we're talking about it like it's kind of been very exciting to watch. But actually, the idea of a duel where you have you like your opponent might have invented a new kind of gun. Yeah, it's like that. You have invented a new kind of gun and it's tomorrow. And you know, I think we should bring it back. I think the next two potential Prime Minister candidates, they should give them a blackboard each one end of danishy. I would love to see Liz Truss tried to solve a cubic equation. That's not the best maths duel, though. The best story about a maths duel is about Galois. Do you know about Galois? Of the vetted cigarettes. Yeah. Yeah. Okay, so he's this really young French mathematician. And he was absolutely amazing. He was what he was looking at Quintic. So equations to the power of five level up. Anyway, he was absolutely amazing. But he was also a proper flirt. So he was having an affair with this soldier's fiance. And in like the soldier came in and was like, how dare you? So Galois was like, fine, I'll challenge you to a duel. But he really wanted to finish his theory, like his math theory. So he went home that night, he's like 19, 20 years old, went home that night, and he stayed up all night trying to finish Galois theory. And like writing on this piece of paper, and we still have the piece of paper. And all the way through, it's like this unbelievable mathematics that kind of still stands today is like the father of group theory. And he finished, right? He finished the theory, right? And he keeps going, oh, the like the mafem, mafem, right? And it's like, oh, in the morning, I will die. And then he goes off and he loses in the duel. Oh, yeah. And honestly, the math is like really good. It's also he wasn't he wasn't bluffing, we'll fill this bit in later after duel. I promise it works. Okay. The sad thing was with Galois, he was part of the revolution, right? And he thought that if he died in the duel, there would be a big funeral. And all of his mates would use that funeral as chance to kind of rise up against the government. So sure enough, he did die in the duel and everyone kind of got to the funeral and everyone was very sad. And I'm like, when are we going to do it? When are we going to do it? And then halfway through, news was passed around that one of Napoleon's marshals had just died. And so next week, there was going to be an even bigger funeral. And so they went, oh, fuck it. Let's do it then. Oh, did they do it? Did the French Revolution happen? Yeah. It's quite an interesting question, isn't it? Really wouldn't think about it. Did it happen? Yeah. Just on duels. Yeah. So the last duel to happen in France happened after the first seven Beatles albums were released. Really? Yeah. The guys who fought it, two French politicians. There was a mayor of Marseille and another politician who was called René Ribierre. It was in 1967. It was filmed. They fought with swords in a private house. Wow. And they could have heard Revolver by that point. How stunning. Not Sergeant Pepper, which was out later that year. So who's at the eighth album, Sergeant Pepper? Okay, good. Was it legal, though, for them to do it? Like if one of them had killed the other, would they have gone to jail? I think they were, because

1967, I think the reason, I think they were fighting in a private house, because it was probably a bit legally iffy by that point. Yeah. I think actually a bit earlier than that, they outlawed Jules and probably, yeah. Speaking of the Beatles, there was, you know, so Patti Boyd, Patti Boyd, she was married to George Harrison. Thank you. And then she left George Harrison to be married to Eric Clapton. And they had an affair and it was a big, it was a big thing. And he wrote, George Harrison wrote something about Patti Boyd, that song, something. Oh, yeah. And Layla was written about Patti Boyd as well by Eric Clapton. So she is part of two major songs as the muse, the inspiration. And if you're going to, if you're going to say they didn't, if you're going to say they had a duel, I'm so excited, where they had to turn up with a new chord each. Yeah. Completely. So one night, George Harrison's at home and Eric Clapton turns up drunk

and they have a duel. No. A guitar duel. Stop it. Nothing is said. A guitar is handed to Eric Clapton. And according to Patti Boyd, for two hours, they sat silently just riffing at each other back and forth, said nothing, and Clapton, even though he's drunk as hell, still just absolutely wiped the floor with Harrison. Wow. Is that cool? There was a guitar off between Harrison and Clapton.

It's less cool than it sounds, I think, if you had to be there, just watching these two drunk blokes play the guitar at each other. I think it would have been amazing. In the 19th century in Germany, it became quite cool to have been in duels, to such an extent that if you were a man with a scar on your face, you were considered to be good marriageable material. The idea was, you've been in a duel, so you had honor. You managed to, someone had cut you, but you still managed to get through it, so you must be hardcore kind of person. And it was to such an extent that men would deliberately nick their faces with razors and then bathe the cut in wine so that it didn't heal properly. So they made them look like they'd been in a duel. It's kind of interesting because there was a 2009 study that found that women favor men with facial scars for short-term relationships today. Oh, really? Short-term relationships. As in a bad boy, he's got a scar. Don't know if it's true. There was also a study saying... Just to say, I got a head injury in my first week of university, which led to some superficial scarring, and I can assure you it's not true. It doesn't say how short-term the relationships were. Doesn't matter.

I've got great countervailing data. Okay, well, here's another study which counteracts it. There was a study done where they looked at people with scars and people without scars, and they found that

if you have a scar, people are more likely to stand about a foot further away from you, and that's about a wingspan and a thrush.

Of what? A thrush. A thrush. A thrush. A thrush. A thrush has got a one-foot wingspan. Yeah, approximately. I'm more impressed by that than anything else you've said. That's massive. Just 30 to 32 centimetres. You look at a thrush, you think that's nothing. Yeah. Yeah, but you think it's a wing on both sides. Yeah, that's true. I think I've not... In fact, all the way through you earlier, but I didn't understand what a wingspan was. All the way through you've been standing half the distance and people are comfortable. I've been saying, let me tell you about these scars. Yeah, yeah. Gosh. I was reading about jewels and I found a cool thing that was almost a weird little nugget. So I'm going to do it as a quiz question. Oh, lovely. So there was a jewel that happened in July 1806 between two people, Mr. Hoeworth and Lord Barrymore. Hoeworth,

just before doing the jewel, this was with pistols, takes his clothes off entirely except for his underpants for the jewel. Why? Okay. Is it the same reason why the IRA make you take your trousers off before they kneecap you? Sorry? Oh. Interesting. That's true. I thought you limped as you arrived here tonight. I'm doubly confused now. I've got a theory. Yeah. So his skin was like a woodland coloured. Like he looked like a jungle. And so it was camouflaged for the jewel.

Yes. And so the other guy in the jewel could only see a pair of underpants floating around.

Yes. No. No, I'll just say no. But like, yes, what an idea. Right. But not that. No, of course not.

Can we go back to Hannah's IRA thing? Maybe his clothes were big because of the era when this was,

whenever it was, and it would make him a smaller target to take his clothes off. That's good.

No. So what it was? I don't think we finished guessing that. Oh, sorry. Sorry. Sorry. No, what it was is that this is according to the theories of the time. It might actually be true. I'm not sure. But if you were shot with clothes, the clothing might go into the bullet wound. It's the same as the IRA. Is it? Oh. So what is it? Okay. I mean. Yeah. Yeah. But so the wound will be infected with whatever disease is sitting on the clothing that you have, dirty bacteria, whatever. And so therefore it could get stuck into the wound. Exactly. So he stood more of a chance if he was hit by the bullet naked or surviving it than he did if he had the clothes on. So he should always strip. I think that did happen relatively, not all the time, but it did happen from time to time. There was, in the 1890s, there was a movement by women saying that it's not fair that whenever people bespurred my reputation, I have to get a man involved to do the dueling for me. And so they decided they wanted to do the dueling themselves. And in Lichtenstein, Princess Pauline von Matanik fought a duel with Countess Anastasia Kilmanseg. And it was over a disagreement

over a flower arrangement. Right. And again, they were topless. And the reason they were topless is because they didn't want their clothing to be infected. And you're saying the IRA did that?

Yeah, well, so it's like maybe I made this up. No, I think it's nice. You don't hear many people these days willing to speak up for the IRA and say, well, in that defence. I think that's really good. And I think it's brave. Yeah, yeah. I regret it. I regret it.

It is time for our final fact of the show. And that is my fact. My fact this week is that boxer Chris Eubank once lobbied to cancel a championship match just hours before it began because he believed his opponent had been hypnotised to feel no pain and also so that he could see punches coming at him three times slower than normal. I mean, this is Chris Eubank, he's the champion of boxing at this point. Yeah, he was he was in a match against Steve Collins. Basically, use mind games against Eubank to make him believe that he had superpowers through the benefit of hypnosis. So he said the hypnosis meant that no matter how much you hit me, it's just not going to register. But the other thing that he said was, if you throw a punch at me, I'm going to be like Spider-Man in that scene in the canteen, where it just comes super slow. And I'm going to be able to just dodge everything. And it freaked Chris Eubank out so much that literally hours before he was desperately trying to get out, despite being the absolute dominant boxer in the match. Did they end up having the match? Yeah, they did. And Eubank lost. Yeah, he lost. It worked basically. He was and he talks about it years later, saying that when they had their first weigh in and this was first said to him. And there were other things that were said. But he said, that's when I lost the match all the way back then. Psychologically, I was done. I just couldn't match it. He tried to do everything that he could when he got to the

actual event itself. This guy, Collins, came out. He had a hoodie on. He had headphones in, and he was listening to the Rocky theme tune the whole time. Eubank comes in on a motorcycle, trying to look all cool. He's got Tina Turner, simply the best playing out loud. The whole time, this guy, he's got his eyes closed, sat in the corner of the ring. He's giving him nothing. All the intimidation tactics are not working. And that throws Eubank as well. He just thinks, I can't do this. Wow. That's amazing. Thank you very much, James.

It's amazing that it could make such a big difference. The one thing that came to mind immediately for me is the Korshnoi versus Karpov chess game. Yeah, one of them had defected away from the Soviet Union. The other one hadn't. It was a big thing about who was the best, the West or the East. And Korshnoi thought that Karpov's assistant was hypnotizing him to such an extent that this guy who was called Zuka, he thought he was hypnotizing him by staring at him the whole way through. Obviously, everyone was staring at him the whole way through

because they were watching the game. But he said that he wasn't allowed to sit on the first two rows and they made him sit at the back of the room because he was sure it was going to happen.

He still thinks to this day that he was being hypnotized and couldn't play chess.

But it was for good reason as well, because this guy, that was supposedly his job, he would come in and he would mentally get inside your head.

But the truth was, he did get inside his head, didn't he? But he just didn't do it in the way that he was suggesting. Oh, the player that was worried about the hypnosis, he had dark sunglasses on because he thought that might deflect it. He had his partner sit next to him and he was tickling him and kicking him the whole time. Yeah, trying to break the gaze.

And then it was crazy. He brought in three monks to come. Sorry, it was two monks.

Two monks. Yeah, yeah, yeah. Three would be overkill. We'll stick to the two.

And four, no laughs to be seen anywhere. And they meditated and that helped him to regain a, it was something like a 4-1 deficit in the games because it was six games in total.

The monks helped him. Yeah, yeah, yeah. It was, it was mad that match.

And Coach and I lost, but he still today thinks it happened because he thinks that Magnus Carlson, who's the greatest chess player who ever lived, he thinks that he must be hypnotizing people because he's the only reason he can beat so many people because people blunder against him and stuff like that. But that idea of in chess of like it being, psyching out your opponent,

being a big part of it. I mean, Kasparov used to do that as well, right? Like Gary Kasparov, the really amazing guy. So he would do this thing where he would take his watch off and he would put it down on the table while he was playing it. And then he would just sort of play along. And then at the point where he was like, I'm done toying with you now, he would pick his watch off and he would put it, return it to his wrist. And that would be like your cue to say, like, you're done. But then when he played against the computer, obviously, none of those tricks worked. But IBM, they deliberately put in a bit, they put in an extra bit of the code.

So Kasparov knew that the computer was like calculating the number of potential options there were. And he knew that like calculations took time. So the longer time it took, the harder the calculation was working. But IBM deliberately put in a random amount of extra time before the computer would give its response. So Kasparov was sitting there trying to think about what the computer knew. And it completely psyched him out. And he says now, I mean, I think all the grandmasters

say that he was still at that moment still better than the machine, but he lost it because he allowed the machine to psych him out. Yeah, right. That is incredible. The mind games of sport.

Yeah, are fascinating. Hypnosis, though, I always thought it was a bit of a dubious territory. And it sounds like there is a bit more science behind it than we possibly give it credit for. I don't know. It's kind of a bit that you're doing it to yourself. Yes. And some people are more and less susceptible to hypnotism, but some people are really susceptible to it. People at home can't see that Andy's moving his hands quite a lot in my direction when he's saying this, which I think you might be trying something. But you know that it is illegal to do any hypnosis on television or radio in the UK. Ofcom will stop you from doing that. Really? The reason is you can hypnotize people over television and radio. And one of the ways that they see how suggestible someone is, is by playing them tapes and seeing if it affects them. But Ofcom does not regulate podcasts. Close the doors. You are feeling you will buy 20 copies of Andy's book.

You're about to say you were feeling very sleepy and worried. What if people are?

No, they banned it in the 40s because this is a report from the New York Times about hypnosis being banned. I'm quoting here. The BBC experimented with a television program featuring a British hypnotist today, but dropped the idea quickly when four of the six judges went into a trance. And it was when you had to audition for TV shows, basically. And apparently the judge, like this hypnotist, was so good that the judges fell asleep, a random studio employee fell asleep, the TV announcer fell asleep, everyone fell asleep. And when they were woken up, they said, well, he's too good. We can't put him on TV. We can't do it. Wow, really?

He would hypnotize the whole country. It would be a nightmare. So yeah, yeah.

But why didn't he just hypnotize them into thinking he'd been a bit of shit, but basically fine?

And then the power he could have had. It's amazing. You do wonder, because like, when you hear people like Darren Brown, who can do it, and Paul McKenna, do they have the power to do it within their day to day life? And is that ethical? And it turns out Paul McKenna did use it once. He's admitted to it and he says, I felt very bad. I'm never going to do it again.

What did he do? Well, he used his power to make his girlfriend at the time like curry.

She's so fair. She didn't like curry. Oh, that's his book. It's his badly selling fifth book, isn't it? I can make you like curry.

Wow. So what? That is unethical. It is unethical. He said he never would do that again. He felt really bad for it, but he just really liked curry and she didn't. And it was really getting in the way of the relationship. If that's the worst misuse of his powers he's ever made, I'm a Dutchman. I can't believe that someone could be back on a hypnotizing. Because you just would get on the bus, wouldn't you, and say, I've paid. And that would be it, you know.

It's not that quick. I try that every day. It's not Jediism. It takes minutes, doesn't it? It takes like seven minutes. Well, yeah, the bus will wait, won't it?

You just pretend you're looking for your change all the time. Yeah, all the time swinging that watch. The bus crashed today because the driver, for some reason, thought he was a chicken.

Have any of you guys ever been hypnotized? I never have. No. Yeah, I did. What happened?

Yeah, so it was me and my co-host, and they tried to hypnotize us both, and it didn't work on me at all. But it did work on him. And I just, there was a little bit of me that just thought he was faking.

Oh, really? Yeah, well, I sort of, maybe I just don't believe people. I just sort of do think it's a bit faking. Yeah, no. Well, you have to persuade yourself, I think. You're definitely part of the equation, aren't you? Because that's how they say it works, right? Is that you are actually doing it

yourself, but you're just allowing yourself to do it. They're helping you along the way. And you didn't believe? You didn't believe enough. Internal raised eyebrow. But they supposedly used it during the Civil War and other battles. Civil War? Yeah, yeah. English or American? American, I believe. Sorry. Sorry. I don't think they had any English. Sorry, I was so aggressive there. I just think we should be specific when we say the Civil War. Yeah, yeah. There are so many countries. I think I, yeah. I'm sorry. I just think every time, every time we use the words, the Civil War, to mean the American one. Yeah, yeah. A little bit of that. I run at the end that you're not being very civil. Oh, God, I'm sorry. Oh, you're right, being very aggressive. No, so, you know, remember, Naysby is all I'm saying. Yeah. Yeah, yeah. We could have got rid of them. We did get rid of them. They came back. Sorry, go on. Oh, no, I was just checking. I'm sorry, sorry, sorry. So yeah, during the Civil War, the Civil War, hypnosis was used on patients because it's been found in, I mean, maybe it is a bit dubious, but it is also a bit psychosomatic. If you were hypnotized prior to surgery when they didn't have the proper meds, they could hypnotize you into thinking that you could be in a less painful place. And they found that surgery works way better when people believe that it's going to be better for them in recovery periods and so on, if hypnosis is used beforehand. Well, they do it in childbirth as well, don't they? There's like the whole sort of hypnopurthing. Yeah. But what a particularly famous case in the 1800s, I think, Dr. Ellison, who had two sisters, 15 and 17, who had epilepsy, and he was trying to hypnotize them into being better, but then was like so impressed with how well he was able to mesmerize them. He like started sticking needles in their necks and then turned it into a show. Do you say they were his sisters? No, they were just two sisters. Oh, they were sisters, sorry. Okay, I was about to say brothers. No, wow. Was that around mid-19th century? I think so, yeah. Because that was a big, there was this like hinge moment before they discovered proper anesthesia, like real chemical stuff, where hypnotism seemed to work. And there was a doctor called James Esdale who worked in British India. He was a Scottish doctor. He was in India at the time. And there were a lot of men at the time who had hydroceals of the scrotum. So if you're not familiar with this, it's where your scrotum, it's really painful and it's like a slight, it's kind of tumour. It's full of bodily fluids and they can grow and it can be really uncomfortable for ages. And but it was a painful operation to deal with it. And patients would just put up with the discomfort for years rather than have the pain of the operation. One man was using his testicle as a writing desk because it was that big. Oh, wow. I know. Like it was serious. When life gives you lemons, eh? I'm just like, yeah. That's just weird. Yeah. So, but what I'm sorry, what I'm trying to say is that, you know, he used mesmerism to operate on and rob this guy of his writing desk. But it was, it was a big success because he was using mesmerism and the post-operation death rate plummeted and you know, so yeah. That's incredible. I know. The weirdest wee work situation. Dear Maria, I'll write you again from my usual place. My name is Wright Nut. You know, Peter Jackson of Lord of the Rings. Yeah. Can you guess why he consulted about getting himself put it through a deep hypnotic treatment? Okay. So sometimes people do it if they're scared of something. Was he scared of hobbits? He was. Deep hobophobia. No, it's not that. It's related to Lord of the Rings though. Oh, is it related to rings? Yeah, he swallowed the ring of true power and he needed, yeah. No, I love this. He said this a couple of years ago, right? He wanted to be hypnotised into forgetting that he had made the Lord of the Rings films so that he could watch

them like a normal person. Because they're so good.

He said that. That's wonderful. Wow. Can you believe that? He said it was such a loss for me not to be able to experience them like everyone else was. Oh my God. Wow. I watched them. I was feeling sleepy. Stephen Fry did it once. He needed it for a work reason. So he was doing his a bit of frying lorry with Hugh Laurie and there was a sketch that they wrote where he needed to sing. He wrote about this in his autobiography Moab is my wash pot and he has a pathological fear of singing out loud to anyone. Could be one person in a room. He just can't do it. But he felt he needed to do it for the sketch and so he went to a hypnotist and so he writes that basically it was quite embarrassing for him because in order to get it to the point where he could be triggered into being hypnotized he needed a key word and the key word was the lead in line but the lead in line was hit it bitch and so he had multiple sessions with a therapist. So he went when you hear the words hit it bitch you will sing and yeah and I think he was worried for a while that like anytime he heard that you know. Oh yeah because Stephen Fry hears that phrase a lot. I don't know what his personal life is like but I'm just oh my god.

Okay I need to wrap us up guys that is it. That is all of our facts. Thank you so much for listening. If you'd like to get in contact with any of us about the things that we have said over the course of this podcast we can all be found on our Twitter accounts. I'm on at Shriverland, James. At James Harkin. Andy. At Civil War Lover.

And Hannah. Right on square. Yeah or you could go to our group account which is and no such thing or you can go to our website. No such thing as a fish.com.

All the previous apps are up there so do check them out. Soho thank you so much for having us once again. Hannah thank you so much for being here. We'll see you all again next week with another episode. Goodbye.