#012

the long good read

#guardiancoffee

Articles algorithmically picked by readers, writers & robots

Introduction

Welcome to the Long Good Read. This is an experimental, almost entirely automated newspaper that uses an algorithm to pick the week's best long-form journalism from the Guardian. The idea was started by developer Dan Catt, print-your own newspaper service Newspaper Club, the design team at Mohawk and the technology editorial team at the Guardian. We've put this together for you to read with your coffee. Enjoy! And please do tell us what you think - what else should we include in our experimental, automatic newspaper?
@thelonggoodread or
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Spend time listening to anyone in the media industry, you might think newspapers are dead. In fact it's just pulse of the big media businesses around the newspapers that is growing weaker, with readership and advertising revenues falling and increased competition from new technology just a part of that.

But newspapers themselves are a delightful, tactile, luxurious technology in their own right. The success of Newspaper Club, which lets anyone cheaply print their own newspaper, shows that newspapers have been reclaimed in a way.

Its success is partly down to our curiosity about being able to professionally print in a format that used to be hard for an individual to access, but it is also part of a wider craving for tangible, physical products to compensate for our digital dependency. Our screen lives make much of our life feel overwhelming, yet at the same time we have nothing physical to show for it. And there's a real human pleasure in being able to make and hold something in your hands.

Editorially, we get enormous satisfaction in exploring and playing with new projects. It's not about finding a future for paper, but a future for the stories that deserve telling. Where shall we go next?

Jemima Kiss
Head of technology - editorial
The Guardian
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This newspaper is in beta. It's an experiment in combining the Guardian's readers, writers and robots with Newspaper Club's short-run printing tools, to produce a newspaper that's completely unlike the daily Guardian.

We're only printing 500 copies, and it's just for #guardiancoffee, so it needed to be quick and easy to produce. 'One person, one hour' was the goal, and achieving that required automating as much as possible, while still retaining an editorial eye.

First, the team at the Guardian wrote a small tool to sift through the most popular and interesting long form content, as driven by website analytics, comments and social media.

A selection of these are then imported into Newspaper Club's browser based tool, ARTHR, and they're quickly laid out into templates designed just for this project.

Then, it's onto one of Newspaper Club's printing presses, where it's printed, packed, and delivered straight to #guardiancoffee and into your hands.

Of course, this isn't designed to replace the daily Guardian paper. It's an experiment to see what's possible at the other end of the spectrum, using new technology and techniques to produce a newspaper as quickly as a webpage.

And if you like it, wait a little while and maybe we'll be able to generate one tailored just for you.

Tom Taylor
Co-founder and head of engineering
Newspaper Club
newspaperclub.com/longgoodread

Here we are, the end of season 2 of The Long Good Read, another six weeks gone in the blink of an eye. Have to say, it's been a bit weird and also fun putting together a weekly paper, can't say I envy people who do it every day though :)

Anyway we've had two seasons, each one racing by quickly with an odd tweak to the tools behind the scenes here & there and a whole bunch of notes added to my to-do lists. The question now is what next, more stories, more often, more personalised, more sources, more serendipity and more betterer?

One thing's for certain though, if and when we're back, between those times I'll get to spend a bit more time figuring out the code that creates the covers. To do handy things like, you know, add legends and labels and other stuff that generally explains what's going on, or even make them slightly useful.

This week colourful "splats", each one the colour of a section with each line representing an article and the length of each line representing, well, the length. The dot at the end indicates if the article had comments turned on or off. In theory adding labels would maybe make it more readable, but we're totally going for the shiny. A weeks worth of articles in the form of dots and lines, if only paper could support animated gifs.

And with that, over-and-out 'till next time.

Dan Catt
Developer
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Jon Ronson is ready for blast-off. Is Richard Branson?

After a 10-year wait, Richard Branson says Virgin Galactic will have lift-off this year: he and his children will be on the first (live televised) flight. What took them so long? Jon Ronson meets him and the 'future astronauts' as they prepare for the ride of their lives

By Jon Ronson

It's dawn at the Mojave Air & Space Port, a cluster of weather-beaten hangars in the desert north of Los Angeles. It looks quite forlorn, in part an elephant's graveyard for half-finished prototype jets designed by visionaries who ran out of money. But it's also a gathering place for freewheeling, maverick space engineers to try out new ideas in the desert: the rocket world's wild west.

A fleet of coaches pulls up outside a hangar. The passengers, coiffured and rich-looking, climb out. The men wear shirts with logos for places such as the Monte-Carlo Polo Club. The women wear the kind of leopard print blouses you see in fashion boutiques in five-star hotels. They are led inside the hangar and take their seats.

"Welcome to the world's largest ever gathering of future astronauts," says the man on the stage, Sir Richard Branson. "As part of our wonderful, pioneering future astronaut community, your place in history is assured."

So far, nearly 700 people have paid either $200,000 or $250,000 (£125,000 or £155,000) for a two-hour trip into space inside the Virgin Galactic SpaceShipTwo, a trip that includes five minutes of weightlessness. (Virgin raised the price by $50,000 in May 2013 to adjust for inflation: some future astronauts paid their $200,000 as long ago as 2004, when tickets first went on sale and Branson predicted a 2007 launch. Tom Hanks has booked, along with Angelina Jolie and Princess Eugenie.) Four hundred of them are in Mojave today, for speeches, a cocktail party and to witness a test flight. This, unfortunately, has just been cancelled due to high winds. (It doesn't feel that windy.)

I'm here because the pronouncement Branson just made from the stage is probably not an exaggeration. These men and women are standing on the edge of history - pioneers in the sort-of-democratisation of space travel. Only 530 humans have been into outer space, which is defined as 100km (62 miles) above sea level. Branson is talking about putting that many people up there in his first year of operation. And it's about to happen, he says. It has been 23 years since he registered the name Virgin Galactic Airways, and 10 since they started building the spaceship - an enterprise stricken by delays and tragedy. Now they're only months away. Branson says the first unmanned test flight will take place "soon"; he and his children will take the first commercial space flight later this year.

I am at a table towards the back of the hangar, listening to the speeches with future astronaut Trevor Beattie. He's the working-class Birmingham boy who made his millions as an ad man - famous for Wonderbra's Hello Boys posters, and French Connection's FCUK campaign, as well as the 2001 and 2005 New Labour election campaigns for his friend Peter Mandelson.

"Some say Nasa sent the wrong people into space," Trevor tells me quietly. "Nasa sent scientists and engineers. When they came back, they either got God or became poets. So what happens this time, when you send creative people? Do we come back as engineers and scientists? What will it do to the other side of our brains?"

"Maybe it'll fuck you up," I whisper back.

"I talked to someone who went on the Zero G," Trevor replies. "He said that after he came back down, he found gravity a real drag."

The Zero G is a specially modified plane that, for $4,950 per passenger, creates weightlessness by performing aerobatic manoeuvres known as parabolas. Branson has been recommending that all future astronauts take a flight on it in preparation for the real thing. Trevor will take his tomorrow, 30,000ft above Burbank, California. He promises to let me know if weightlessness is all it's cracked up to be.

Now Virgin Galactic's CEO, George Whitesides, is on the stage. He surveys the room. "You are truly," he says, "the first in a new class of citizen explorer."

In the mid-80s, the then Soviet president Mikhail Gorbachev invited Branson to be the first civilian in space. He asked Gorbachev's people how much it would cost - $50m, they said, "plus I'd need to spend two years training in Russia, which was too much of my time," Branson tells me. "And I thought it wouldn't look quite right somehow. Then I thought, wouldn't it be better to spend that $50m building a spaceship company instead?"

We're sitting in a small meeting room behind the Virgin hangar at the Mojave Air & Space Port. All this is a first for Branson. He's never created an industry from scratch before. His other endeavours have been about sprucing up existing worlds: credit cards, record labels. Not many people go from putting out the Sex Pistols to creating a new dawn for humanity. As Whitesides will later tell me, "This is the start of something really big - humanity going into the cosmos. Nasa's gone. The Russians have gone. But this is the start of the rest of us going. I really think there is a power in this moment in time in history."

So how did Branson persuade himself he could do it? "At the time we put out the Sex Pistols, people thought we were taking a giant risk," he says. "Then the train network. Each of these was a building block that gave me the confidence to dream even bigger. When I started Virgin Atlantic, I knew nothing about running airlines. I just felt somebody should be able to do it better than British Airways. By then I'd learned what a company is. A company is, you go and find the best people. We got the chief technical officer from British Caledonian, so we knew it was going to be safe, then we got a lot of creative people who weren't from the airline world to go and shake up the business. Starting a spaceship company is not that dissimilar."

The first 10 years were, he says, a fruitless trek around the world, visiting garages in the middle of nowhere to hear crazy pitches from father-and-son rocket design teams. "It was surprising how few of them really had credible, serious ideas," he says. "The biggest worry I had was re-entry. Nasa has lost about 3% of everyone who's gone into space, and re-entry has been their biggest problem. For a government-owned company, you can just about get away with losing 3% of your clients. For a private company you can't really lose anybody. Nobody we met had anything but the conventional risky re-entry mechanism that Nasa had. We were waiting for someone to come up with one that was foolproof."

He says those 10 years were frustrating, but when I ask if he ever lost his temper, he says, "Oh, I would find that very counterproductive. I was brought up

by parents who, if I ever said a bad word about somebody, would send me to the mirror and make me look in it and tell me how badly it reflected on myself." He pauses. "Anyway. Finally we met Burt Rutan."

Burt Rutan is the reason for all this. If, in the coming months and years, we are all shooting up and down to outer space, we'll have Rutan to thank. In photographs, he looks rugged and outdoorsy, with country-singer hair and big sideburns. He's a legend in aerospace circles. In 1986, he built the first plane to fly around the world on a single tank of fuel. In the mid-90s, he set about trying to solve the re-entry problem.

Rutan, who is now 70, had an advantage over Nasa. If you're coming back from Mars, you re-enter the Earth's atmosphere at 12km a second. The heat and the friction at that speed can tear a machine apart. But coming back from a suborbital flight - which was the puzzle Rutan was trying to solve - the spaceship would be going a lot slower. But it would still need something to slow it down.

"Burt Rutan's idea was to turn a spaceship into a giant shuttlecock," Branson says. "And so the pilot could be sound asleep on re-entry and it didn't matter what angle it hit coming back into the Earth's atmosphere."

Rutan didn't go to Branson for funding. He went to Paul Allen, the co-founder of Microsoft. Allen was famous for lavishing money on space projects, such as the $30m he gave the Seti Institute (Search for Extraterrestrial Intelligence) to build an array of receivers to constantly listen out for signals from other planets, so far in vain. Allen gave Rutan $20m. Their aspiration, Branson says, was never more than academic. They would build a prototype - SpaceShipOne - fly it into space twice, and win the X Prize. This was a 2004 competition with a $10m prize for the first privately funded company to fly a reusable space ship into space twice. Then they'd retire SpaceShipOne to the Smithsonian, where it would end its days hanging from the ceiling. All of this did, indeed, happen. SpaceShipOne now hangs next to the Spirit of St Louis in the Smithsonian's Milestones of Flight gallery in Washington DC.

"And that was to be the end of it," Branson says. "Paul Allen is someone who loves to see what's possible, but he's not that interested in running a commercial business. So I went to see him at his house in Holland Park. I told him I thought he was missing a trick, and we would love to take it forward. So we bought the technology off him. We managed to get a group of engineers together and we started to build SpaceShipTwo."

SpaceShipOne had been filled with "single point failures". "If one bolt falls off and you die, that's a single point of failure," the Virgin Galactic engineer, Matt Stinemetze, told Wired magazine in March 2013. "There were things that you probably would've done differently if you're going to carry Angelina Jolie."

For SpaceShipTwo, Rutan's engineers had to turn the prototype into something that could go to space "100 times, maybe 1,000 times", Branson tells me. Developing the rocket motor has been the hardest challenge, followed by modifying the electric actuator - the mechanism that enables the pilot to move the stabiliser, the big part of the tail. SpaceShipOne had one. For SpaceShipTwo they built two in series, so one can fail and it will still work.

Every addition to the prototype needed to be as light as possible - any superfluous weight will eat into the already meagre weightless minutes. Within this constraint, they had to decide how many passengers to take. They settled on six and two pilots, and built a ship 1.6 times bigger than the original.

In 2004, even though they were still - they thought - three years from launching people into space, Virgin opened a reservations website. It crashed under the weight of interest. The first people to pay their deposits included George Whitesides, who back then was chief of staff for Nasa, Trevor Beattie and the Dallas actor Victoria Principal. The Virgin Galactic designers polled these early future astronauts. What did they want out of the experience? They wanted to see Earth from space. They wanted a really good view. So Virgin put in lots of windows. For the interior design they appointed Adam Wells, the man who invented the Virgin Atlantic flat bed and the purple mood-lit Virgin America cabin. He went for white and silver - colours that would "not draw attention to themselves and instead get out of the way of the incredible things happening outside the window".

Wells is telling me this by phone a few weeks later. He doesn't sound too happy about the white and the silver. "Longer term, I have ideas about how that might evolve," he says. "But we need to get up to space to see how those colours perform, what sort of behaviours people have with them."

There won't be much fabric on board, Wells adds, fabric being an unnecessary weight, and definitely no leather. "Leather would be a temptation for a high-end product, but it would be an odd thing to line the interior of your state-of-the-art spacecraft with a fellow earthling's skin." He pauses. "We think about this stuff a lot - about what's right and wrong."

Then he adds that everything he's telling me is "all under wraps".

"These are scoops?" I ask.

"Yeah," he says. "This is good info."

SpaceShipTwo won't have a flight attendant - there will be no drinks service or anything like that - and no toilet. Every passenger will be invited to wear a special astronaut nappy, or maximum absorbency garment, under his or her flight suit, which hasn't yet been designed.

"I met your sister Vanessa once," I tell Branson. "She told me you're psychologically different in

Jon Ronson in zero gravity - Photograph: guardian.co.uk

some way. Like you have a restlessness - an itch that constantly needs scratching. Are you psychologically different in some way?"

He shifts in his chair. "I think that's possible," he replies. "I will feel guilty if I'm not trying to achieve something."

"So if a day passes when nothing's been achieved, do you see that as a bad day?" I ask.

"Definitely," he says. "Yeah. We weren't allowed to watch television as kids. We were told we had to be climbing trees or creating things. I'm sure that if I found myself watching television, I'd feel slightly uncomfortable."

"How long do you have to not achieve something before you start feeling guilty?" I ask. "An hour?"

"Oh, it's not very long," he says.

He glances at a painting on the wall of SpaceShipTwo in an attempt, I suspect, psychically to will me to remember what I'm supposed to be interviewing him about.

"Well, your psychological distress is for the benefit of others," I finish, "because you've really made my life better, especially with Virgin Atlantic and Virgin America."

"Fantastic," he whistles. "For a Guardian journalist to say that, particularly, thank you."

When our interview is over, I drive out of the Mojave Space Port towards Los Angeles. I pass the spot where, on a boiling hot afternoon - 26 July 2007 - Rutan's team was testing rocket propellant for Virgin Galactic when a tank of nitrous oxide exploded. There had been 17 people watching the test out here in the desert, this place for maverick engineers to push the boundaries. Shards of carbon fibre shot into them. Three of Rutan's engineers were killed, and three others seriously injured.

"It turned Burt Rutan from a young man into an old man overnight," Branson told me. "He'd never lost anybody in his life."

Rutan's company was found liable and fined $25,870. As the science writer Jeff Hecht wrote in New Scientist, "The company has an enviable reputation for creativity, but the report suggests it did not have an obsession with training, rules and written procedures... a dangerous combination when working with rocket fuels."

Rutan quit the business in 2011. He retired to the lakes of Coeur d'Alene, Idaho, a climate about as far from Mojave as is possible to find. He didn't respond to my emails asking for an interview.

When I asked Branson how personally connected he felt to the three deaths, he said, "Well..." Then he stopped. "If they were working directly for me, I would feel very responsible. Obviously, if we hadn't decided to do the programme in the first place, they would be alive today. So you realise that. But talking to relatives and survivors - I think every one of the survivors came back to work with the rocket company afterwards. Everybody had to pick themselves up and move forwards, and everybody did."

Paris Hilton is a future astronaut. So are Justin Bieber and Lady Gaga. Of course, regular aviation began this way, too, with the elite putting down the big money first. Ashton Kutcher is another future astronaut, as isVasily Klyukin. He's a 37-year-old property developer and skyscraper designer from Russia. His ticket cost him just over £1m. He outbid everyone at an auction in support of Aids research at last year's Cannes film festival. The prize was a trip into space with a mystery companion, who turned out to be Leonardo DiCaprio.

"My desire was to win!" Klyukin emails me. "I am a man, and men had to win. Space is the Olympic gold medal in the 'Adventures' nomination and cannot be conquered by everyone." He adds that he was swept up in the glamour of the night, too - the auction was full of Victoria's Secret angels. But he has no regrets, no buyer's remorse. In fact, as a surprise for Branson, he's designed a Virgin Galactic-shaped skyscraper. He emails me a mock-up of how it would look next to the Gherkin in central London.

Then he unexpectedly invites me on a two-week transatlantic voyage on board his friend's 228ft super-yacht, the Sherakhan: "Very rare invitation! It would be two incredible weeks. Usually it costs a lot, about €1m [£850,000]." I consider his offer for a long time, but eventually decline, because frankly two weeks is a long time to be in the middle of the Atlantic with a Russian billionaire I don't know, and I think it would get awkward.

A week passes. I telephone Trevor Beattie to ask how his zero-gravity flight went.

"Um..." he replies. "OK. Where do I start? So. Being on the Zero G is like being flown in a hollowed-out Boeing over a hump. You float around uncontrollably for 30 seconds. Everyone does their swimming action, but it does no good. Then they shout an order: 'FEET DOWN! FEET DOWN!' That tells you you've got three seconds before the gravity comes back on and you splat back to the floor again. You try and get in a vertical position, so when the gravity comes on, you hit the deck ready for the next parabola. Which I very sensibly did." Trevor coughs. "Except, when I looked up, there was a bloke about two and a half times my bodyweight who was still floating 10ft above me at zero gravity. Then I realised I was in some kind of Wile E Coyote cartoon. There wasn't much I could do about it. The gravity came on and he came down like a fucking ton of bricks."

"Oh my God," I say.

"I tried to pull everything out of the way," Trevor says. "The only thing I couldn't extract was the end of my left foot, so I ended up with a fractured toe."

"Bloody hell," I say.

Ad man Trevor Beattie is in line to be one of the first space tourists. Photograph: Winni Wintermeyer for the Guardian

"Anyway," Trevor continues, "I didn't want to abort the flight, so I lumbered on. We did a few

more parabolas. Then we came back. I had to get a taxi straight across town to LAX, so by the time the adrenaline wore off and I was on a 10-hour flight to London, I was a bit of a mess."

"This is hilarious," I say.

"The doctors thought so, too," Trevor says.

It's two weeks later. I'm sitting with Richard Branson in a hotel room in Washington DC. He is in town for a conference about the war on drugs. I'm here because my time with him in Mojave was short and there were many things I didn't have time to ask. Particularly, what will space travel on Virgin Galactic actually feel like? I can't picture it.

"Well, it's all in our imagination at the moment," Branson says.

Then he tries to explain.

It will all begin in the deserts of New Mexico, inside a spaceport,Spaceport America, designed by Norman Foster. The building is already finished (although the interiors are still to be done). The photographs make it look incredible - vast but almost invisible, as if it's growing out of the horizon, the same rust colour as the sand around it and the mountains beyond. It cost $212m - paid for by New Mexico taxpayers - and was built so far out in the middle of nowhere that they had to construct 16km of road just to connect it to the nearest tarmac.

Later, Virgin Galactic's Whitesides will describe the spaceport to me over the phone as "a welcoming cradle for this band of explorers, something sleek in the sense of 2001: A Space Odyssey, but friendly in the sense of the Virgin Heathrow lounge. People will see it and think, 'Yes, this is the place I should be flying to space from. This is appropriate.'"

Future astronauts will spend three days at the Spaceport for safety training and to pre-acclimatise themselves to the "sights and sounds" of space travel. "So you're not going to be doing everything for the first time on the flight," Adam Wells says. There'll be a simulator to reproduce the various thumps and bangs, "so when you hear some sort of clunking sound, you'll know it's because the landing gear has just gone up or down." Without all this, Wells says, there'll be "a real risk of sensory overload on the flight. You'll be bombarded with so much that's new to you, your memory won't be able to log it and fix it in place." And you'll come back to Earth remembering nothing much.

Also, during those three days, Wells's people will take your measurements, because "we're effectively rebuilding the seat for each customer". This is for the G-force part of the trip. It's much less unpleasant if the Gs are concentrated in your chest, so the personalised seat configuration will help with that. And then, on day three, you'll climb into SpaceShipTwo.

You will begin its flight attached to a plane with two fuselages - WhiteKnightTwo. It will feel like a normal takeoff and a normal flight until you reach 50,000ft. "At 50,000ft the sky is a much deeper blue," Whitesides tells me. "The vast majority of humanity hasn't been to 50,000ft. Anyway, you get up to 50,000ft and then you have the release and you'll feel a sense of instantaneous weightlessness as the vehicle drops away. That'll last a couple of seconds. And then the pilot turns the vehicle upwards and launches the rocket motor."

"Suddenly, then," Branson says, "you're going from zero to 2,500mph in eight seconds. That's going to be a rush you'll never experience again in your life. You'll go from tremendous noise, you'll feel it through your body, and then the absolute beauty comes when the motor cuts and it's just this total... silence."

"The instant that the rocket motor shuts off, literally everything inside the cabin becomes weightless," Whitesides says. "You're still going up at a tremendous velocity, but once that motor is off, the pilot will initiate the space phase of the mission. He'll tell people that they're able to get out of their seats and float around the cabin."

"The seating system reconfigures itself," Wells says, "so you don't have to think about putting the seat in the right position. It's going to do it itself. The customers' time is incredibly valuable while on this flight, and the last thing we want to do is burden you with responsibilities to move things around or to remember something or to handle something that would be tricky in any way. We want it to be completely intuitive."

"There are plenty of windows and plenty of room," Branson says, "and you just levitate out of your seat and float around and look back on Earth and you'll be one of only 500 people who have ever been into space."

"You'll reach the point of maximum altitude and start to come back down," Whitesides says, "like a ball being thrown up with one hand and caught with the other hand. Once you get closer - perhaps 30 seconds from atmospheric re-entry - you'll get above your seat and gently sink back down and put your seatbelt back on. And you'll get ready for re-entry." And then, as the Virgin Galactic website promises: "Later that evening, sitting with your astronaut wings, you know that life will never quite be the same again."

"So Trevor Beattie went on the Zero G flight the other day and a man was floating above him and then the gravity came back on and he fell on him," I tell Branson.

"A man fell on Trevor Beattie?" he says.

"He broke his foot," I say.

"Trevor did?" Branson says.

I nod.

"Oh dear," Branson says.

"Doesn't Trevor Beattie's broken toe show the dangers of what happens when the gravity comes back on?" I say.

He frowns at me. "We'll give you warning and make sure you don't get a broken toe," he replies. "Buzz Aldrin told me, 'Just enjoy space. Don't do the Zero G. With the Zero G, they put you through 15 parabolas. In space, you've just got one beautiful parabola.'"

One month later, I am about to become weightless in a hollowed-out Zero G plane in the air above Fort Lauderdale, Florida. There are no Virgin Galactic future astronauts on this flight. Instead, there are 20 or so honeymooners, retirees, vacationers. We lie on padded mats on the plane's floor, waiting for the weightlessness to start. When it does, it is at first bewildering. You suddenly levitate, as if you're in a magic trick. You're Sandra Bullock in Gravity, except instead of debris crashing into you, it's tourists from New Zealand and Brazil. There is chaos and injury potential. At the back are rows of airline seats. If you don't quickly learn to control your movements while you're weightless, you might drift over them and plummet when the gravity comes back on. We land on the mat with a very big splat.

Each parabola lasts 30 seconds. There are 15 in all - apparently the optimum number before people start to vomit (Nasa puts its trainee astronauts through something like 60 parabolas and violent retching is the norm). By the third parabola, you realise you are no longer bewildered. You can handle it. And that's when you become magnificent.

As I somersault, I remember something a Virgin Galactic future astronaut told me over the telephone last week. His name is Yanik Silver and his company, Maverick Business Adventures, organises adrenaline holidays for "exclusive" clients. The introductory video on its website makes it clear that you probably shouldn't put your name forward for one of Yanik's trips because he's very selective and you're "probably not right". It's solely for "entrepreneurs or CEOs or business owners who live life to the fullest and want to create incredible breakthroughs in their business... If you're a top-gun entrepreneur, there's not that many people who will understand you, and who better to go on those incredible adventures where success and high-achieving is the norm, instead of people secretly wishing you would fail?"

I think Yanik is in some ways a quintessential Virgin Galactic future astronaut. Back in Mojave, another CEO had told me that he considered being a space adventurer and being an entrepreneur to be much the same thing - with both, you need to leap fearlessly into the unknown, demonstrating a courage that others lack (although when I repeated that to Beattie, he laughed and said, "How self-important!"). Yanik takes his specially selected CEOs scuba diving between the tectonic plates in Iceland, and high-speed evasive driving, and on Zero G flights. He told me something miraculous happens to a business brain during those pumped moments: "You get new ideas, new pathways in your thinking." I asked him at what point the new ideas present themselves. Is it while you're plummeting to the ground before the parachute opens? He said no, it's usually back in the hotel bar later that night. Perhaps Yanik is right. Maybe I will get a new idea at some point later today. I am, after all, lost in the moment, which is rare for me. But then something unfortunate happens.

The Zero G on-board photographer beckons me to float towards him and the instant I concentrate on the manoeuvre the nausea begins. It is a cold, wet, overwhelming, hellish nausea. And it only gets worse with each subsequent parabola. The Zero G people would call this a successful flight, because no actual vomiting occurs. But I don't consider myself a Zero G success story. As I float in a clammy sweat and watch my fellow weightless people joyfully catch droplets of water in their mouths, I suddenly remember how - many years ago - a man had told me he'd taken part in group sex.

"What was it *like*?" I'd asked him.

He frowned. "Honestly," he said, "it's better to watch than to actually do." There are a lot of awkward physical realities involved, he explained. It's best to spare yourself and just spectate.

Will commercial space travel really be as safe and awesome as Branson says? Who'd have the experience to answer these questions without any of the vested interests? An astronaut. A non-aligned astronaut. So I telephone Chris Hadfield.

Hadfield is the Canadian astronaut who became famous for posting a video of himself singing Space Oddity during his five weightless months on board the International Space Station. I describe my Zero G experience to him. Is that what real space is like?

"Oh no," he says. "On the Zero G, you're weightless and then squished, and weightless and then squished. It's nauseating because it's cyclic. You said yourself that the first few parabolas were fine." Prolonged weightlessness, he says, "is just magic. You had it for 30 seconds and it's not very good weightlessness. The pilots do their best, but you still occasionally bang people off the ceiling, and it's still very short. To have it last for ever is so much fun. It's such a joy. So delight-filled. And then you look out the window and the whole world is pouring by at eight kilometers a second. So you've got the grace of weightlessness and the gorgeousness and richness of looking at the world. I loved every second of it."

"And the splatting?" I say. "Will there be lots of future astronauts with broken toes?"

"Oh, it'll be nothing like that," he says. "It'll be much more gradual. The upper edges of the atmosphere are very wispy. You will have seen the worst case on the Zero G from a nausea and a transition point of view."

I tell him how Branson had described Rutan's shuttlecock mechanism as "foolproof", and said

that the pilot could be "sound asleep on re-entry and it didn't matter".

There's a short silence. "Hmm," he says, sounding doubtful. "He's right - it *is* a simple, rugged mechanism that is reusable. It's a nice, elegant solution. It's a good design. But it's not risk-free, and it's complex. They're working very hard - they've got experienced engineers and pilots to make it as safe as possible. But to come into any programme with any vehicle and think you're somehow immune from what everybody else has always experienced with every machine in history is unrealistic. They don't know everything yet. They still have a lot to learn. If they fly it 100 times, maybe they can be careful and judicious enough to avoid a crash. If they fly it forever, eventually one of them will crash. That's just statistics. It could well be something that nobody anticipated. That's normally how it happens with complex machines." He pauses. "I'm just being realistic."

I ask if he thinks the future astronauts will enjoy their experience.

"They'll go very, very fast," he replies. "That'll be really thrilling. They'll see directly with their own eyes something that very few human beings have seen: what the world looks like from above the atmosphere. But if they think they're going to see the stars whipping by, or they'll be going around the world several times, then they're incorrect. And they're going to be disappointed." He pauses. "I went around the world something like 2,500 times. I saw thousands of sunrises and sunsets and all of the continents. Whereas this vehicle will go straight up and straight down again. That doesn't belittle anything. They'll get some of the same views. But it's a different experience."

I think Hadfield is concerned he is maybe sounding too sniffy, because now he says, "Richard Branson and his team are being very brave. Both financially and from an exploration point of view, they're trying to do something nobody has done before. This is brand new." He says that as long as the future astronauts manage their expectations, as long as they "plan for it, ask themselves, 'What am I going to do with my minutes of weightlessness?' so they don't come down and say, 'Huh. That's not what I was expecting', they're going to love what's happening."

Two weeks later I receive an email I hadn't expected at all: "I am in Buenos Aires on vacation. I will be at home in Idaho on Saturday and happy to talk to you after that."

It is Burt Rutan.

I call him the day his cruise docks - this semi-reclusive engineering genius. I say that future generations might regard him as the Brunel of democratised space travel; does he think about things like that?

"Only since my retirement..." he says. He's got a rich, deep American-South voice. Then he tells me why all this began for him.

"In the mid-60s, a friend of mine, Mike Adams, got killed during a re-entry." They had been stationed together at the Edwards Air Force basein Lancaster, California, when Adams, test flying an experimental suborbital plane called the X-15, "didn't line the angles up. He was killed because the requirement to do a precision re-entry had not been met."

Adams's death stayed with Burt, he says, even when he left the air force and set up business in a hangar at the Mojave airport, designing prototype planes. "It was just a deserted old second world war training airport in a crummy little desert town. I had a family, which I lost mainly because I was a workaholic." He says most aerospace engineers work on an average of two-and-a-half planes during their whole careers. He was building one every year, "without ever injuring a test pilot. You can't have more fun than a first flight when you find out if your friend lives or dies flying it. And I flew six first flights myself. With a tiny crew of three dozen people who worked their asses off."

He says you won't find his inventions in the big airliners - the Boeings and Airbuses. They're overly risk-averse and conservative, which is why their planes look identical. But the private jet companies have embraced his creations - planes such as the Beech Starship. And throughout it all he brooded over the death of Mike Adams and wondered how he might invent "carefree re-entry".

He says there was no great Eureka moment with his shuttlecock idea. But one day he felt confident enough to approach Paul Allen and say, " 'I would now put my own money into it if I had the money.' And he put out his hand and we had a handshake. That was the extent of the begging for money I did for SpaceShipOne. He gave me several million dollars and said, 'Here. Get going.'"

"What's Paul Allen like?" I ask.

"Opposite of Sir Richard," Burt replies. "I could call Sir Richard while he's sleeping at home in Necker island and chat with him. We debate global warming fraud all the time."

"Hang on," I say. "Which of you thinks it's a fraud?"

"He thinks it exists; I think it stopped 17 years ago," Rutan replies. "Anyway. Paul Allen's own people can't just walk into his office. They schedule a meeting a couple of weeks in advance. On the few occasions I was alone with Paul, his own people would rush up to me and go, 'What did he *say*?' But if he says something, everybody listens, because it's an important thing to be said."

Between 2001 and 2003, SpaceShipOne was a covert endeavour. Nobody outside Burt's weather-beaten hangar knew they were "developing all the elements of an entire manned space programme. We developed the launch airplane, the White Knight. We developed our own rocket engine, and a rocket test facility, and the navigation system that the pilot looks at to steer it into space. We built a simulator. And, of course, we built SpaceShipOne and trained the astronauts. In 2004, we flew three of the entire world's five space flights - funded not by a government but by a billionaire who made software. This private little thing. Later, people said I must have had help from Nasa. I didn't want Nasa to know. And they didn't."

Since then, Rutan says, history has proved his shuttlecock mechanism to be foolproof. "People told me it would go into an unrecoverable flat spin, but I knew in my gut it would work. And it worked perfectly the first time and every time. It has never had to be tweaked or modified. Which is crazy, because it's so bizarre."

Any delays these past 10 years, he says, have been due to the complexity of the rocket motor design and the fact that Virgin Galactic is full of "smart people" - by which he means committees: interior design committees, PR committees, safety committees. He sounds a bit rueful about this, like if they had listened to him, it could all have gone a lot faster.

He doesn't mention the accident. I'm not relishing asking him about it, because I'm sure it was the worst day of his life, but when I do, he immediately says, "Sure, I'll talk about that."

He won't go into its cause much - only that it was a "very routine" test that fell victim to "a combination of some very unusual things". He pauses. "All of us would be bolt upright at two in the morning for a while after that." And even though he was 220 miles from the explosion, the shock almost killed him, too. "My health deteriorated to where I could almost not walk. I just seemed to get weaker and weaker every day." He says that if I saw pictures from the unveiling of SpaceShipTwo at the Museum of Natural History in New York that following January, I'd see a man "incapable of walking up three or four steps". (I do see those pictures later and he does looks terrible.) Eventually his condition was diagnosed as constrictive pericarditis - a hardening of the sac around the heart. He says that as an engineer he can't bring himself to believe that the stress of the accident hardened a membrane: "That wouldn't make sense." But his wife is convinced of it.

At the end of our conversation, Rutan suddenly says, "If there's an industrial accident at a corporation and three people are killed and three people are seriously injured, how often is there a lawsuit where the families sue the company?"

"Almost every time," I say.

"There was none," he says. "There was none. We wrapped ourselves in the families. We told them the truth from the start. None of them sued us. Each of those families is a friend of the company. And that has a lot to say about something that I'm most proud of in my career, and that is how to run a business from an ethical standpoint."

Later, I look at the memorial website for one of the men who died, Eric Dean Blackwell. It is maintained by his wife, Kim. At the bottom there's a link to Virgin Galactic, so people can read updates on how the programme is progressing.

Back in Mojave, I'd mentioned to Branson that 10 years earlier I'd read the critical Tom Bower biography, Branson, and that when I later asked Bower if he had anything good to say about Branson, he replied, "No."

"Oh, he's forecast our financial demise," Branson replied. "The thing is, he got a bit lucky with Robert Maxwell and everyone he's done since then he thinks is in Robert Maxwell's clothing."

Last month, there was a flurry of Tom Bower activity. He's written a new book, Branson: Behind The Mask, in which he claims that Virgin Galactic is a "white elephant" with no licence to fly into space and no rocket powerful enough to take passengers anyway. I email Branson's people. They reply with a statement that the rocket motor has "burned for full duration and thrust multiple times" during tests, and that they expect to receive the full licence "well in advance of commercial service. Richard," they say, "remains extremely confident of a 2014 launch."

Branson hopes that his future astronauts' five weightless minutes will be only the beginning, and that "suborbital point-to-point travel" is next. This means a journey on SpaceShipTwo that will actually go somewhere, and not just up and down. They could fly from London to Australia in two-and-a-half hours, Branson tells me. And then there are the satellites. "We can put up 15,000 satellites over a six-month period," he said, "which is more than there are up in the air today. For the three billion people who are in the poverty trap, they're likely to get access to mobiles and internet for a fraction of what it now costs."

And this, Branson insists, is imminent. A test flight into space - empty of passengers - will happen in the next few months (Virgin are vague on the details). And the first six astronauts, including Branson and his children, Sam and Holly, should be up later this year. The inaugural flight will be televised live by NBC. The TV company has put out a press statement about it: "Without a doubt, Sir Richard and his children taking the first commercial flight into space will go down in history as one of the most memorable events on television."

Branson told me back in Mojave that his "eyes are open" about making his family the guinea pigs. "Everybody who signs up knows this is the birth of a new space programme and understands the risks that go with that," he said. Then he paused. "But every person wants to go on the first flight."

Are the robots about to rise? Google's new director of engineering thinks so...

Ray Kurzweil popularised the Teminator-like moment he called the 'singularity', when artificial intelligence overtakes human thinking. But now the man who hopes to be immortal is involved in the very same quest – on behalf of the tech behemoth
By Carole Cadwalladr

It's hard to know where to start with Ray Kurzweil. With the fact that he takes 150 pills a day and is intravenously injected on a weekly basis with a dizzying list of vitamins, dietary supplements, and substances that sound about as scientifically effective as face cream: coenzyme Q10, phosphatidycholine, glutathione?

With the fact that he believes that he has a good chance of living for ever? He just has to stay alive "long enough" to be around for when the great life-extending technologies kick in (he's 66 and he believes that "some of the baby-boomers will make it through"). Or with the fact that he's predicted that in 15 years' time, computers are going to trump people. That they will be smarter than we are. Not just better at doing sums than us and knowing what the best route is to Basildon. They already do that. But that they will be able to understand what we say, learn from experience, crack jokes, tell stories, flirt. Ray Kurzweil believes that, by 2029, computers will be able to do all the things that humans do. Only better.

But then everyone's allowed their theories. It's just that Kurzweil's theories have a habit of coming true. And, while he's been a successful technologist and entrepreneur and invented devices that have changed our world – the first flatbed scanner, the first computer program that could recognise a typeface, the first text-to-speech synthesizer and dozens more – and has been an important and influential advocate of artificial intelligence and what it will mean, he has also always been a lone voice in, if not quite a wilderness, then in something other than the mainstream.

And now? Now, he works at Google. Ray Kurzweil who believes that we can live for ever and that computers will gain what looks like a lot like consciousness in a little over a decade is now Google's director of engineering. The announcement of this, last year, was extraordinary enough. To people who work with tech or who are interested in tech and who are familiar with the idea that Kurzweil has popularised of "the singularity" – the moment in the future when men and machines will supposedly converge – and know him as either a brilliant maverick and visionary futurist, or a narcissistic crackpot obsessed with longevity, this was headline news in itself.

But it's what came next that puts this into context. It's since been revealed that Google has gone on an unprecedented shopping spree and is in the throes of assembling what looks like the greatest artificial intelligence laboratory on Earth; a laboratory designed to feast upon a resource of a kind that the world has never seen before: truly massive data. Our data. From the minutiae of our lives.

Google has bought almost every machine-learning and robotics company it can find, or at least, rates. It made headlines two months ago, when it bought Boston Dynamics, the firm that produces spectacular, terrifyingly life-like military robots, for an "undisclosed" but undoubtedly massive sum. It spent $3.2bn (£1.9bn) on smart thermostat maker Nest Labs. And this month, it bought the secretive and cutting-edge British artificial intelligence start-up DeepMind for £242m.

And those are just the big deals. It also bought Bot & Dolly, Meka Robotics, Holomni, Redwood Robotics and Schaft, and another AI startup, DNNresearch. It hired Geoff Hinton, a British computer scientist who's probably the world's leading expert on neural networks. And it has embarked upon what one DeepMind investor told the technology publication *Re/code* two weeks ago was "a Manhattan project of AI". If artificial intelligence was really possible, and if anybody could do it, he said, "this will be the team". The future, in ways we can't even begin to imagine, will be Google's.

There are no "ifs" in Ray Kurzweil's vocabulary, however, when I meet him in his new home – a high-rise luxury apartment block in downtown San Francisco that's become an emblem for the city in this, its latest incarnation, the Age of Google. Kurzweil does not do ifs, or doubt, and he most especially doesn't do self-doubt. Though he's bemused about the fact that "for the first time in my life I have a job" and has moved from the east coast where his wife, Sonya, still lives, to take it.

Bill Gates calls him "the best person I know at predicting the future of artificial intelligence". He's received 19 honorary doctorates, and he's been widely recognised as a genius. But he's the sort of genius, it turns out, who's not very good at boiling a kettle. He offers me a cup of coffee and when I accept he heads into the kitchen to make it, filling a kettle with water, putting a teaspoon of instant coffee into a cup, and then moments later, pouring the unboiled water on top of it. He stirs the undissolving lumps and I wonder whether to say anything but instead let him add almond milk – not eating dairy is just one of his multiple dietary rules – and politely say thank you as he hands it to me. It is, by quite some way, the worst cup of coffee I have ever tasted.

But then, he has other things on his mind. The future, for starters. And what it will look like. He's been making predictions about the future for years, ever since he realised that one of the key things about inventing successful new products was inventing them at the right moment, and "so, as an engineer, I collected a lot of data". In 1990, he predicted that a computer would defeat a world chess champion by 1998. In 1997, IBM's Deep Blue defeated Garry Kasparov. He predicted the explosion of

Ray Kurzweil, inventor, futurist, and director of engineering at Google. Photograph: Zackary Canepari/Panos Pictures

the world wide web at a time it was only being used by a few academics and he predicted dozens and dozens of other things that have largely come true, or that will soon, such as that by the year 2000, robotic leg prostheses would allow paraplegics to walk (the US military is currently trialling an "*Iron Man*" suit) and "cybernetic chauffeurs" would be able to drive cars (which Google has more or less cracked).

His critics point out that not all his predictions have exactly panned out (no US company has reached a market capitalisation of more than $1 trillion; "bioengineered treatments" have yet to cure cancer). But in any case, the predictions aren't the meat of his work, just a byproduct. They're based on his belief that technology progresses exponentially (as is also the case in Moore's law, which sees computers' performance doubling every two years). But then you just have to dig out an old mobile phone to understand that. The problem, he says, is that humans don't think about the future that way. "Our intuition is linear."

When Kurzweil first started talking about the "singularity", a conceit he borrowed from the science-fiction writer Vernor Vinge, he was dismissed as a fantasist. He has been saying for years that he believes that the Turing test - the moment at which a computer will exhibit intelligent behaviour equivalent to, or indistinguishable from, that of a human - will be passed in 2029. The difference is that when he began saying it, the fax machine hadn't been invented. But now, well... it's another story.

"My book *The Age of Spiritual Machines* came out in 1999 and that we had a conference of AI experts at Stanford and we took a poll by hand about when you think the Turing test would be passed. The consensus was hundreds of years. And a pretty good contingent thought that it would never be done.

"And today, I'm pretty much at the median of what AI experts think and the public is kind of with them. Because the public has seen things like Siri [the iPhone's voice-recognition technology] where you talk to a computer, they've seen the Google self-driving cars. My views are not radical any more. I've actually stayed consistent. It's the rest of the world that's changing its view."

And yet, we still haven't quite managed to get to grips with what that means. The Spike Jonze film, *Her*, which is set in the near future and has Joaquin Phoenix falling in love with a computer operating system, is not so much fantasy, according to Kurzweil, as a slightly underambitious rendering of the brave new world we are about to enter. "A lot of the dramatic tension is provided by the fact that Theodore's love interest does not have a body," Kurzweil writes in a recent review of it. "But this is an unrealistic notion. It would be technically trivial in the future to provide her with a virtual visual presence to match her virtual auditory presence."

But then he predicts that by 2045 computers will be a billion times more powerful than all of the human brains on Earth. And the characters' creation of an avatar of a dead person based on their writings, in Jonze's film, is an idea that he's been banging on about for years. He's gathered all of his father's writings and ephemera in an archive and believes it will be possible to retro-engineer him at some point in the future.

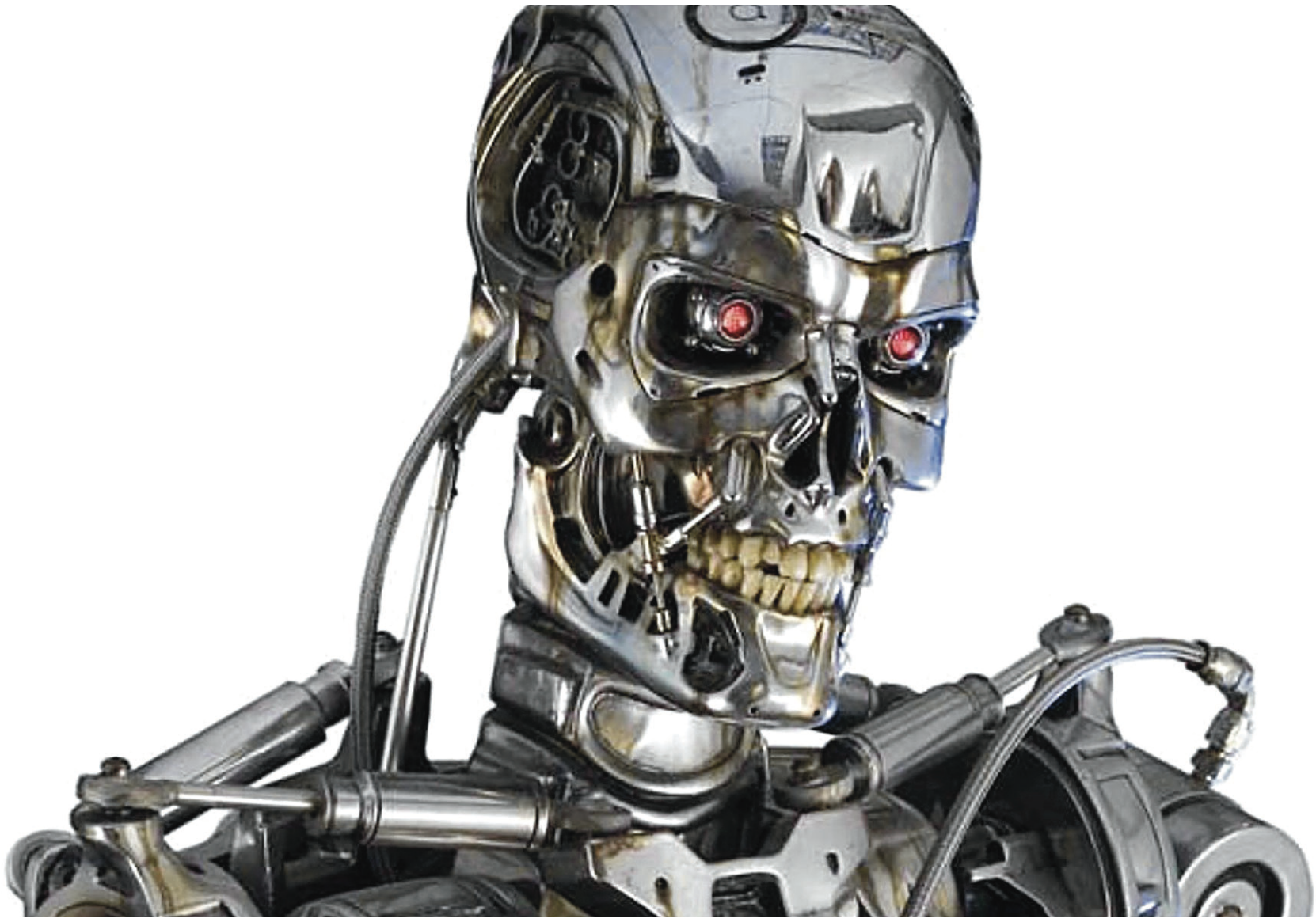
So far, so sci-fi. Except that Kurzweil's new home isn't some futuristic MegaCorp intent on world domination. It's not Skynet. Or, maybe it is, but we largely still think of it as that helpful search engine with the cool design. Kurzweil has worked with Google's co-founder Larry Page on special projects over several years. "And I'd been having ongoing conversations with him about artificial intelligence and what Google is doing and what I was trying to do. And basically he said, 'Do it here. We'll give you the independence you've had with your own company, but you'll have these Google-scale resources.'"

And it's the Google-scale resources that are beyond anything the world has seen before. Such as the huge data sets that result from 1 billion people using Google ever single day. And the Google knowledge graph, which consists of 800m concepts and the billions of relationships between them. This is already a neural network, a massive, distributed global "brain". Can it learn? Can it think? It's what some of the smartest people on the planet are working on next.

Peter Norvig, Google's research director, said recently that the company employs "less than 50% but certainly more than 5%" of the world's leading experts on machine learning. And that was before it bought DeepMind which, it should be noted, agreed to the deal with the proviso that Google set up an ethics board to look at the question of what machine learning will actually mean when it's in the hands of what has become the most powerful company on the planet. Of what machine learning might look like when the machines have learned to make their own decisions. Or gained, what we humans call, "consciousness".

I first saw Boston Dynamics' robots in action at a presentation at theSingularity University, the university that Ray Kurzweil co-founded and that Google helped fund and which is devoted to exploring exponential technologies. And it was the Singularity University's own robotics faculty member Dan Barry who sounded a note of alarm about what the technology might mean: "I don't see any end point here," he said when talking about the use of military robots. "At some point humans aren't going to be fast enough. So what you do is that you make them autonomous. And where does that end? *Terminator*?"

And the woman who headed the Defence Advanced Research Projects Agency (Darpa), the secretive US military agency that funded the develop-



The Terminator films envisage a future in which robots have become sentient and are at war with humankind. Ray Kurzweil thinks that machines could become 'conscious' by 2029, but believes they will augment us. Photograph: Solent News/Rex

ment of BigDog? Regina Dugan. Guess where she works now?

Kurzweil's job description consists of a one-line brief. "I don't have a 20-page packet of instructions," he says. "I have a one-sentence spec. Which is to help bring natural language understanding to Google. And how they do that is up to me."

Language, he believes, is the key to everything. "And my project is ultimately to base search on really understanding what the language means. When you write an article you're not creating an interesting collection of words. You have something to say and Google is devoted to intelligently organising and processing the world's information. The message in your article is information, and the computers are not picking up on that. So we would like to actually have the computers read. We want them to read everything on the web and every page of every book, then be able to engage an intelligent dialogue with the user to be able to answer their questions."

Google will know the answer to your question before you have asked it, he says. It will have read every email you've ever written, every document, every idle thought you've ever tapped into a search-engine box. It will know you better than your intimate partner does. Better, perhaps, than even yourself.

The most successful example of natural-language processing so far is IBM's computer Watson, which in 2011 went on the US quiz show*Jeopardy* and won. "And *Jeopardy* is a pretty broad task. It involves similes and jokes and riddles. For example, it was given "a long tiresome speech delivered by a frothy pie topping" in the rhyme category and quickly responded: "A meringue harangue." Which is pretty clever: the humans didn't get it. And what's not generally appreciated is that Watson's knowledge was not hand-coded by engineers. Watson got it by reading. Wikipedia - all of it.

Kurzweil says: "Computers are on the threshold of reading and understanding the semantic content of a language, but not quite at human levels. But since they can read a million times more material than humans they can make up for that with quantity. So IBM's Watson is a pretty weak reader on each page, but it read the 200m pages of Wikipedia. And basically what I'm doing at Google is to try to go beyond what Watson could do. To do it at Google scale. Which is to say to have the computer read tens of billions of pages. Watson doesn't understand the implications of what it's reading. It's doing a sort of pattern matching. It doesn't understand that if John sold his red Volvo to Mary that involves a transaction or possession and ownership being transferred. It doesn't understand that kind of information and so we are going to actually encode that, really try to teach it to understand the meaning of what these documents are saying."

And once the computers can read their own instructions, well... gaining domination over the rest of the universe will surely be easy pickings. Though Kurzweil, being a techno-optimist, doesn't worry about the prospect of being enslaved by a master race of newly liberated iPhones with ideas above their station. He believes technology will augment us. Make us better, smarter, fitter. That just as we've already outsourced our ability to remember telephone numbers to their electronic embrace, so we will welcome nanotechnologies that thin our blood and boost our brain cells. His mind-reading search engine will be a "cybernetic friend". He is unimpressed by Google Glass because he doesn't want any technological filter between us and reality. He just wants reality to be that much better.

"I thought about if I had all the money in the world, what would I want to do?" he says. "And I would want to do this. This project. This is not a new interest for me. This idea goes back 50 years. I've been thinking about artificial intelligence and how the brain works for 50 years."

The evidence of those 50 years is dotted all around the apartment. He shows me a cartoon he came up with in the 60s which shows a brain in a vat. And there's a still from a TV quiz show that he entered aged 17 with his first invention: he'd programmed a computer to compose original music. On his walls are paintings that were produced by a computer programmed to create its own original artworks. And scrapbooks that detail the histories of various relatives, the aunts and uncles who escaped from Nazi Germany on the Kindertransport, his great grandmother who set up what he says was Europe's first school to provide higher education for girls.

Kurzweil suggests that language is the key to teaching machines to think. He says his job is to 'base search on really understanding what the language means'.The most successful example of natural-language processing to date is IBM's computer Watson, which in 2011 went on the US quiz show Jeopardy and won.

His home is nothing if not eclectic. It's a shiny apartment in a shiny apartment block with big glass windows and modern furnishings but it's imbued with the sort of meaning and memories and resonances that, as yet, no machine can understand. His relatives escaped the Holocaust "because they used their minds. That's actually the philosophy of my family. The power of human ideas. I remember my grandfather coming back from his first return visit to Europe. I was seven and he told me he'd been given the opportunity to handle - with his own hands - original documents by Leonardo da Vinci. He talked about it in very reverential terms, like these were sacred documents. But they weren't handed down to us by God. They were created by a guy, a person. A single human had been very influential and had changed the world. The message was that human ideas changed the world. And that is the only thing that could change the world."

On his fingers are two rings, one from the Massachusetts Institute of Technology, where he studied, and another that was created by a 3D printer, and on his wrist is a 30-year-old Mickey Mouse watch. ”It’s very important to hold on to our whimsy,” he says when I ask him about it. Why? ”I think it’s the highest level of our neocortex. Whimsy, humour…”

Even more engagingly, tapping away on a computer in the study next door I find Amy, his daughter. She’s a writer and a teacher and warm and open, and while Kurzweil goes off to have his photo taken, she tells me that her childhood was like ”growing up in the future”.

Is that what it felt like? ”I do feel little bit like the ideas I grew up hearing about are now ubiquitous… Everything is changing so quickly and it’s not something that people realise. When we were kids people used to talk about what they going to do when they were older, and they didn’t necessarily consider how many changes would happen, and how the world would be different, but that was at the back of my head.”

And what about her father’s idea of living for ever? What did she make of that? ”What I think is interesting is that all kids think they are going to live for ever so actually it wasn’t that much of a disconnect for me. I think it made perfect sense. Now it makes less sense.”

Well, yes. But there’s not a scintilla of doubt in Kurzweil’s mind about this. My arguments slide off what looks like his carefully moisturised skin. ”My health regime is a wake-up call to my baby-boomer peers,” he says. ”Most of whom are accepting the normal cycle of life and accepting they are getting to the end of their productive years. That’s not my view. Now that health and medicine is in information technology it is going to expand exponentially. We will see very dramatic changes ahead. According to my model it’s only 10-15 years away from where we’ll be adding more than a year every year to life expectancy because of progress. It’s kind of a tipping point in longevity.”

He does, at moments like these, have something of a mad glint in his eye. Or at least the profound certitude of a fundamentalist cleric.*Newsweek*, a few years back, quoted an anonymous colleague claiming that, ”Ray is going through the single most public midlife crisis that any male has ever gone through.” His evangelism (and commercial endorsement) of a whole lot of dietary supplements has more than a touch of the ”Dr Gillian McKeith (PhD)” to it. And it’s hard not to ascribe a psychological aspect to this. He lost his adored father, a brilliant man, he says, a composer who had been largely unsuccessful and unrecognised in his lifetime, at the age of 22 to a massive heart attack. And a diagnosis of diabetes at the age of 35 led him to overhaul his diet.

But isn’t he simply refusing to accept, on an emotional level, that everyone gets older, everybody dies?

”I think that’s a great rationalisation because our immediate reaction to hearing someone has died is that it’s not a good thing. We’re sad. We consider it a tragedy. So for thousands of years, we did the next best thing which is to rationalise. ’Oh that tragic thing? That’s really a good thing.’ One of the major goals of religion is to come up with some story that says death is really a good thing. It’s not. It’s a tragedy. And people think we’re talking about a 95-year-old living for hundreds of years. But that’s not what we’re talking about. We’re talking radical life extension, radical life enhancement.

”We are talking about making ourselves millions of times more intelligent and being able to have virtually reality environments which are as fantastic as our imagination.”

Although possibly this is what Kurzweil’s critics, such as the biologist PZ Myers, mean when they say that the problem with Kurzweil’s theories is that ”it’s a very bizarre mixture of ideas that are solid and good with ideas that are crazy. It’s as if you took a lot of very good food and some dog excrement and blended it all up so that you can’t possibly figure out what’s good or bad.” Or Jaron Lanier, who calls him ”a genius” but ”a product of a narcissistic age”.

But then, it’s Kurzweil’s single-mindedness that’s been the foundation of his success, that made him his first fortune when he was still a teenager, and that shows no sign of letting up. Do you think he’ll live for ever, I ask Amy. ”I hope so,” she says, which seems like a reasonable thing for an affectionate daughter to wish for. Still, I hope he does too. Because the future is almost here. And it looks like it’s going to be quite a ride.

Roy Carroll: 'I nearly lost my family. I was drinking too much'

Roy Carroll talks about a dramatic career that has included Manchester United, West Ham, rehab and now Olympiakos

By Sid Lowe

'No," says Roy Carroll, "it was 25." And with that a huge grin engulfs his face. OK, then, let's try again: Roy Carroll's trial for Sheffield United against Barnsley was a bit of a disaster. It was early spring 2011, the game was only 25 minutes old - 25, not 10 - and he'd already let in two goals when he gave away a penalty and was sent off. Any hope he had of a contract left the pitch with him.

He laughs now; it was not so funny then. Carroll had once signed for Manchester United for £2.5m, among the most promising goalkeepers of his generation, but a decade on he was largely forgotten. He had been in rehab in London under a false name, suffering from alcoholism, and few would touch him. It was two months since he had left the Danish club Odense. He went to Barnet to do some goalkeeper coaching and temporarily took over, winning a trophy - the Hertfordshire Senior Challenge Cup - in his only ever match as a manager, but it was brief. Then he went on trial with Preston, only for the deal to collapse at the last minute.

He had been unemployed for eight months, "waiting, hoping". But he was losing hope. Then, unexpectedly, Carroll got the call that changed his life. As he stretches big, powerful arms across a sofa at Olympiakos's Rentis training ground, straight off the pitch, face flushed from training, there's an ease about him. The air is warm, his manager admires him, and he is popular with fans. He won't play against his former club on Tuesday night but that doesn't trouble him greatly. He did not expect to make it this far; for some time, he didn't expect to make it at all.

"I got my first chance in 1995 with Hull City. It's 2014 and I'm still here ..." he says. "You get a lot of knock-backs in football, you get the high life and the low life and I've had a lot of low lifes. But now I'm back up playing with Olympiakos and it's fantastic. I wake up in the morning and I love coming here, training every day. Seven or 10 years ago it was different.

"I came back from Denmark [at the end of January] 2011 and went to Sheffield United, where I had that nightmare. Then I was due to sign a one-year deal at Preston but I got a call from Phil Brown who said: 'I'm sorry, we've got another keeper.' It was very hard because he'd promised me; it was very upsetting but it wasn't the first time and it probably won't be the last. So I ended up getting a call from a Greek agent, talking about OFI in Crete. I don't even know how he got my number ..."

The temptation must have been to tell him where to go. "Nah," Carroll laughs, "not when you're getting a free holiday. And your family comes out to Crete. So I signed there and it was good because things had happened to me in England that I had to move on from. I had to get out. Not many people in England were taking my calls."

Why? "Everybody knows my behaviour, what I was like at West Ham. You get a bad name and it sticks. People try to give players a chance and they keep ruining it and ruining it. I had two or three really bad years. I hope people understand: they think footballers have a great life but there can be depression and drink. Players get dragged into things, there are so-called friends. If you're young, you don't play and you're getting £20,000 a week, do you sit in the house? I was concentrating on going out, not on my football, but now my life in Greece is completely different."

"People need help and guidance. A lot of players hold things back until it's too late. Before I would've probably said: 'It would have been nice if some people had helped me', but it's up to you. You can say 'no' but I wasn't strong enough. I then had a back injury and thought my career could be over. I got into a very depressed mood, very low, and I couldn't get out of it for a long time.

"I didn't help myself by not talking about it until four or five years later. I kept things to myself: 'I'm a man, a tough Irishman.' But no man is strong enough when you get depressed and you go down the wrong road. When I went for rehab, it didn't work. Some people say: 'I'll do some rehab, I'll be OK' and they do two weeks but come out and start all over again because they think, 'That's not me'. But you wake up [one day] and you think 'that *is* me'.

"I nearly lost my family because I was drinking too much and I said: 'Right, what am I going to do? Keep on doing what I'm doing and kill myself in two or three years or be with my family?' And that pulled me out of it. And I thought: 'Let's move to Greece, make a fresh start and get away from all the bad habits.' It changed my life completely. I went to OFI in Crete. It was August, 35 degrees, healthy, people were good to us. I played well and then Olympiakos bought me five months later."

With his first touch for Olympiakos, Carroll saved a penalty. His new side won 1-0 at Rubin Kazan in the Europa League and Carroll, who had replaced the Hungarian keeper Balzázs Megueri, sent off for conceding the penalty, became an instant hero. He grins again. "I didn't expect to go on. It was minus 13 and I was concentrating on keeping warm. It took me five minutes just to get all my layers of clothes off. It's a dream. You're still in shock. It was my first game: you can drop it in your own net and the fans hate you. Or the fans can love you."

In the second leg Carroll picked up an injury but continued. He was, he recalls, "hopping about", unable to walk properly but he made a string of saves, including one in the final minute. An Athenian newspaper called him the one-legged hero. "The fans sang my name and after the game I didn't really want to leave the pitch. I was like a young boy again.

"Since I've been here, I have played Europa League and Champions League. I have felt strong, powerful. I feel I've come on more than in the previous six years. As an older keeper you think more, because your back doesn't hold out any longer," he laughs. "When you're younger you're more raw, you make stupid decisions. This goalkeeping coach [Alekos Rantos] is probably the best I've had: I'm still learning, at 36. I love football and want to keep going as long as I can. Then I'll probably do my coaching badges next summer."

He is back in the Northern Ireland squad and he wants to play in the Euro 2016 qualifiers, which probably means playing for his club. Opportunities have been few, though. His immediate future remains uncertain but his family is happy, living on the coast south of the city, and he has no complaints. Roberto [Jiménez Gago, the Olympiakos goalkeeper] is playing well: "In the game against Benfica, I've never seen anything like it," he admits. "We won 1-0 because he made about 15 top saves."

Talk turns to another Spanish goalkeeper, David de Gea. Between them, Peter Schmeichel and Edwin van der Saar occupied United's goal for 14 years. In the six years between the Dane's departure and the Dutchman's arrival 10 men had a go, Carroll among them. None succeeded entirely. De Gea must break that run. "Peter Schmeichel was the greatest keeper in the world. Others come in and are under pressure already: 'We want another Schmeichel,'" Carroll explains. "A couple of bad games and it's 'get him out'. That happens at big clubs, not just United.

"De Gea has made mistakes, everybody does: we're not robots. Schmeichel made mistakes. How old is David? 20, 21? [He is 23].He cost £18m. And he has to adapt: you watch Spanish football and, OK, there are crosses, but no one attacks the ball. But De Gea is doing a good job and I don't think you can try to improve someone quickly because you just push them. You put your arm around him and say: 'Take your time' … 'get used to the players' … 'learn the language.'"

"Anyway, that list is a bit long," Carroll says. "I knew I was going there to be No2 to Fabien Barthez. I went because I'd get goalkeeping coaching, which we didn't have at Wigan, and I'd face David Beckham's shots every day. But when I left it was the right decision. I enjoyed my time at Man U but I was 27 and I don't want to look back and say I won loads of trophies but played 200 games. I want to say I played 600 games, 700 games. You can sit on the bench and win but that's not the person I am."

Tuesday will be "special", Carroll says; the return leg at Old Trafford even more so. John O'Shea and Wes Brown have gone but he says he is delighted to see Darren Fletcher back. Rio Ferdinand and Ryan Giggs are still playing, Phil Neville's coaching. And there's Albert the kitman. "Hopefully I'll get a few shirts off of him," Carroll grins. "He's a good guy and a real character." He calls Sir Alex Ferguson a "father figure to everyone, not just the players, someone who when he talked you listened", and has watched United struggle this season, conceding late goals. "Man U in the past would never have done that," he says. "I hope United can turn things around. Just not against us."

Is this a good time to play them, then? And how will Olympiakos play? It's time for an insider's guide. Carroll protests: "I can't tell you that! I'm trying to get another contract here! I'm not going to give anything away. Ask the manager." Right on cue, the fitness trainer José Vallejo strolls past. "José, help! They're trying to get information out of me!" Carroll pleads. Vallejo grins and makes a backhander gesture. "Half for me," he says. "OK," Carroll says, "tell them we play six up front." And then that grin engulfs his face once more.

Roy Carroll is enjoying a new life with his family in Greece and has become a fans' favourite at Olympiakos. Photograph: Andreas Papakonstantino/Demotix

Twitch Plays Pokémon: live gaming's latest big hit

Internet phenomenon Twitch Plays Pokémon has had over 20m views. Alex Hern explains why

An infinite number of monkeys with an infinite number of typewriters would rapidly type the works of Shakespeare. How would they do at videogames?

Currently, 56,312 people are attempting to play Pokémon Red at the same time. At times, that has been as high as 150,000. That is: there is one game of Pokémon Red, and all 150,000 people are controlling it at once.

It is going strangely well.

"Twitch Plays Pokémon" is half art project and half reality show for the 21st century. The idea is relatively simple. Pokémon Red, the 1996 Game Boy hit that kickstarted the Pokémon franchise, is running on an emulator hooked up to Twitch, a website which lets gamers broadcast video games live.

Viewers can enter button commands in the chat window, and they get passed onto the emulator, which enters them in order.

In theory, it harnesses the wisdom of the crowds to find the best way through the game, with playing 24 hours a day, seven days a week. (The game has currently been running for just over eight and a half days)

With tens of thousands of players all entering commands at once, coordinated action is nearly impossible. Worse still, the footage is delayed by around 20 seconds, leaving players voting on actions they haven't actually seen. And even when the decision is obvious, just enough viewers set out to deliberately disrupt events that nothing quite goes to plan.

Take the Ledge (an event which earned its capital L). In Pokémon, ledges are one-way barriers, which the player can jump off but not climb up. One particular ledge, encountered three days after the stream began, was just below a wall. To get past, all the players had to do was press right for a few seconds to walk twelve paces east, then up. Pressing down at any point would send them back to the start.

It took them seven hours to walk those twelve paces.

History

Twitch Plays Pokémon's creator has mostly taken a back seat in the whole thing. Speaking to the Guardian under conditions of strict anonymity, they expressed surprise at the stream's popularity.

"I wasn't expecting it to get very popular at all. When I put it up I was thinking it would peak around 300 concurrent viewers at most, I wasn't expecting over 100,000!

"I'm sitting at a computer all day and frequently dealing with servers anyway. The biggest change [since the stream began] has been the amount and nature of messages I receive. I have TPP opened on a secondary monitor all day so I can keep an eye on it."

But while the game mostly plays itself, there have been times a hand from above has been required. The biggest change since the stream began was the introduction of "democracy mode" on Wednesday, which replaced the original "anarchy mode" with a system of votes on which button should be pushed next.

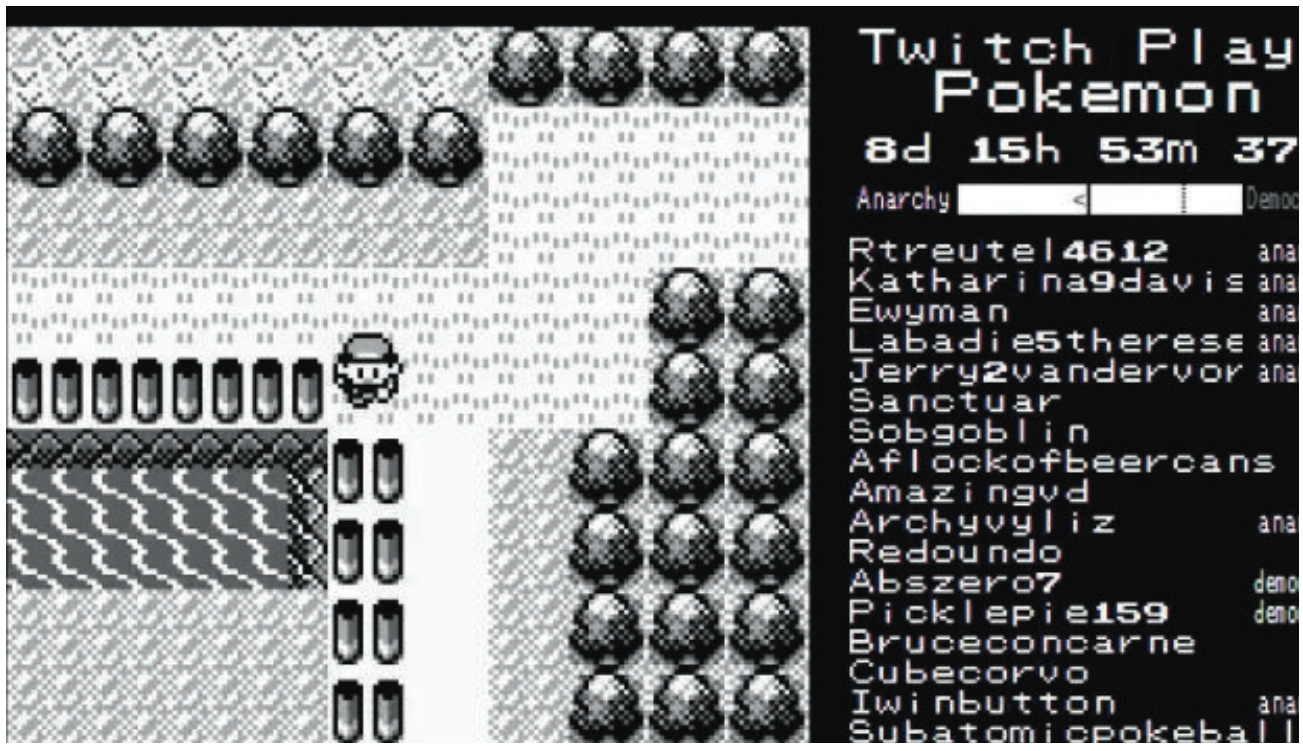
"It was made to make otherwise impossible sections possible," explains the creator. "I knew when this thing got very popular and the inputs became chaotic that I'd eventually have to make a change that wouldn't go over well with everyone...

"The problem was that some sections of the game are impossible without some amount of precision with the inputs, precision that just wasn't going to be possible with the existing input mode."

Initially, democracy mode was mandatory. But after the backlash, a system was introduced to let players vote on whether or not to vote.

"I made a change to the way inputs are determined but it didn't go over well so I put in a toggle to switch between the original mode and the new mode. The viewers had already named these modes anarchy and democracy and I thought they were cool and descriptive names and used them.

"I think the community has responded much better than I was fearing: I was expecting viewer [numbers] to drop by a lot more, and to receive a lot more abusive messages."



Twitch Plays Pokémon. Photograph: Twitch

Community

TPP has generated a fanatical community, which has taken its devotion to almost-religious levels.

Typically, that would be hyperbole, but in this case it's accurate. On the second day of the game, players received the Helix Fossil, an item with no practical use. But because it was at the top of the item list, it ended up being selected - often repeatedly - in the heat of battle. The community interpreted this as "turning to the Helix Fossil for guidance", and so the meme of the blessed Helix Fossil was born.

Other legends were born along the way. Eevee is a low-level doglike Pokémon that can evolve into three different forms depending on which elemental rock is used. The water form, Vaporeon, is tremendously useful because it can use Surf to travel on water, which is crucial for finishing the game. Unfortunately, the players bought and used the Fire Stone instead, turning Eevee into Flareon. The fire dog became known as the "False Prophet", before being released into the wild a few days later.

It goes on: a high-level Pidgeot is known as "Bird Jesus" for winning so many battles; a Rattata with dig, a move that can escape dungeons, is damned for digging the player out of Team Rocket's HQ after hours spent navigating a maze; a Drowzee is the "Keeper" of Flareon after the two were placed in storage next to each other.

The whole thing has a tongue-in-cheek element, a self-aware attempt to find method in the madness. Even without the community, TPP is frequently gripping. Watching the community attempt to name a pokémon (party members have included "x(araggbaj", "AAJST(????" and "aaabaaajss"), or feeling dread as the cursor hovers over a command which will destroy hours of work, is strangely compelling, even if it's bookended with hours of dull repetition.

It's provoked essays on the nature of anarchy and democracy, fan art detailing the history of the faith, a mention in XKCD and a lot of faintly terrible memes. There are even spin-offs, such as Twitch Plays Pokémon Plays Tetris, which takes the same commands and puts them into a hacked version of Tetris.

As I was writing this, the players had reached the most risky section yet, an area called the Safari Zone. It's one of the few places it's possible to render the game unfinishable, by running out of money entirely, and it relies on near-perfect commands to be entered 270 times in a row. But then they did it anyway, coming together and producing detailed maps to help with co-ordination.

The players are well over half way through the game, now, with three gym badges to go before they can fight the elite four, and finish the game.

It can't be long, and the creator is already planning what comes next. "I've received a lot of requests to continue with the Pokémon franchise after the Elite Four and the Pokémon Champion get defeated, so I'm going to do that. I'm still deciding which of the generation 2 Pokémon games to go with."

It's tempting to draw wider conclusions about the success of Twitch Plays Pokémon. As tech blogger Andy Baio writes, it is "to me, the most wonderful thing online right now, a microcosm of the internet at large."

Village butcher's window display with pheasant hanging outside. Photograph: Alamy

Should meat be displayed in butcher shop windows?

A family butchers in Suffolk has been forced to remove the carcasses hanging in its window display after a petition. So what do others in the trade make of the decision?
By Rachel Smith

Over the weekend, a Suffolk petition triumphed, as JBS Family Butchers removed the meat hanging in its window display. The shop, in Sudbury's Borehamgate precinct, followed the centuries-old tradition of displaying its wares in the window until it became the target of a letter campaign in the Suffolk Free Press.

"I, too, have been disgusted at the needless display of multiple mutilated carcasses on display," wrote Ben Mowles from Great Cornard, who claimed he had been forced to suspend trips with his 12-year-old daughter to the nearby sweet shop because he would "rather not look at bloody severed pigs' heads when buying sweets."

It is a stark image. The father shielding his daughter's eyes as he rushes her past the "mutilated carcasses" – which show the signs of provenance, the story of where the meat came from. He protects her from the reality of the chicken that goes into chicken nuggets, the beef that goes into beef burgers, the pork that goes into sausages. And he rushes her to Marimba sweet shop to find solace in a bar of chocolate instead.

Roger Kelsey, chief executive of the National Federation of Meat & Food Traders, explains that butchers' windows have been the subject of investigation in the past. There are regulations surrounding the hygiene of hanging fur and feather alongside pre-prepared meat. "But this is different," Kelsey says. "This is public opinion, branding butchers' windows too gruesome."

At butchers M Feller Son & Daughter in Oxford, it is quite a different story. Far from hiding his produce behind the counter, Michael Feller hangs it outside the shop to attract custom. There are often woodcock, pheasants, wild boar and even whole Père David's deer on display. "We do have complaints," says Feller, "but the reaction is an overwhelmingly good one – particularly at Christmas, where the window is a real draw. It is important people remember where their meat comes from," says Feller, whose grandchildren recently joined the family business.

"The problem is that supermarkets tell us what cuts we're allowed to eat. They wrap it and package it, and people forget that pork loin ever even came from a pig. My customers often come here for sweetbreads or testicles and other interesting cuts, but as soon as you start to target independent butchers, all this will disappear."

Richard Balson, manager of Dorset butchers RJ Balson & Sons, expresses dismay at the petition. "The people kicking up a fuss about this man have gone soft. They've lost touch with reality," he says. "When our family business was founded in 1515, the animals would have been walked into the middle of the towns, where they'd be slaughtered in front of everyone," he says. "I appreciate that it's a completely different world that we live in now. But this is over the top – it's the minority kicking up a fuss, and the minority have too much power."

Danny Lidgate, from Holland Park butchers, agrees that the petition is based on a minority opinion, but it's one he is willing to listen to. "There's always going to be 5-10% of the people who take offence. They're going to be the ones who are most vocal about it," he says. Lidgate has decided not to hang carcasses in his window. Instead, he displays cuts of meat, alongside roses hand-carved out of animal fat and seasonal vegetables.

"I want people to think 'look at those lovely lamb chops' – not 'oh my goodness, there's a whole pig dangling in the window'. Lots of art galleries purposefully display shocking work to generate a reaction. Sometimes it's a good reaction, sometimes it's bad. But either way, it provokes some sort of reaction – and that's what lots of people choose to do in butchers' windows."

In Framlingham, 30 miles north-east of the Borehamgate precinct, butcher John Hutton shares Lidgate's opinion. Hutton is proud of his window display – but admits that he would draw the line at a whole pig's head. "A good old rib of beef is a lovely thing to look at," he says. "But a pig's head … I don't know, it might offend more than please."

His reasoning is based purely on aesthetics, and is certainly not through any attempt to obscure the reality of where the meat comes from. In fact, his meat delivery arrives in a van from the abattoir round the time that children are walking back from school, past the butchers. "They're not squeamish at all," he says. "The whole pig carcasses come off the back of the lorry, and it doesn't seem to bother them in the slightest. If anything, they're intrigued, and their parents like it, because they know they're buying meat cut from the whole carcass."

Back in the Borehamgate precinct, Richard Nicholson, the assistant manager at JBS Family Butchers, is overwhelmed by the public support. The butcher's window was a topic of debate on both Radio Suffolk and Radio Norfolk. The butchers has since been inundated with phone calls from people encouraging the owners to put the meat back in the windows.

"Ultimately we're just a small shop. Our priority is to do what's right for the business," Nicholson says. "We're leaving it down to the public to decide – if they think that's how a butcher's window should look, then we'll put the display back. If not, then we'll keep it down."

Musician Zoe Keating reveals iTunes, Spotify and YouTube payouts for 2013

Cellist's latest publicly-shared numbers reveal 92% of her income still comes from sales rather than streams

By Stuart Dredge

Want to know how much a musician really makes from digital services like iTunes, Spotify and YouTube? Zoë Keating is one of the more reliable sources.

The cellist, who self-releases her music rather than work with a label, has made a habit of sharing details of how her earnings break down between different sources, for the benefit of her peers and the wider debate around digital music payouts.

Over the weekend, Keating published her latest set of figures as a public document on Google Drive, splitting her recorded-music earnings from 2013 into sales and streams. In short, 92% of her income last year came from sales - $75,341 - with a further $6,380 coming from streaming services.

Keating's biggest source of income last year was Apple's iTunes Store, where sales of 32,170 single tracks and 3,862 albums netted her just over $38,195.

Meanwhile, 185 tracks and 2,899 albums sold through her profile on direct-to-fan site Bandcamp earned a further $25,575, while a mixture of physical and MP3 sales on Amazon earned her a further $11,571.

403,035 Spotify streams earned Keating $1,764, while more than 1.9m views of videos on YouTube - mostly those uploaded by other people featuring her music - earned her $1,248. US personal radio service Pandora generated $3,258 of royalties - but from an undisclosed number of streams.

Keating also notched up 266,331 streams on SoundCloud and 222,226 streams on her Bandcamp site, neither of which generated royalties for her.

She tweeted a link out to the spreadsheet on Friday (21 February) without passing comment on any of the services listed. "2013 music sales & streaming numbers for a middle-aged mom in a non-album cycle," she tweeted, while noting that Apple keeps 30% of iTunes sales, while Bandcamp takes a 10% cut of sales through its website.

Zoë Keating has shared details of her income streams regularly.

Keating's per-stream payout for Spotify was thus $0.0044 in 2013. The streaming service said in December 2013 that its average per-stream payout to music rightsholders is between $0.006 and $0.0084 - a figure that includes payouts to publishers as well as labels (or in Keating's case, self-releasing artists).

Her Spotify payouts were still a long way ahead of YouTube's $0.00064 per stream: a single Spotify stream was worth nearly seven YouTube streams in 2013. However, it would take 160 Spotify streams to generate the same income for Keating as a single track sale on iTunes.

Keating has spoken publicly in the past of seeing streaming services as a positive tool for her music, while warning that the companies running them must work harder to help artists forge sustainable careers.

"I don't feel like streaming is the evil enemy. I think it's a good positive thing to get music out there," she said during a music industry debate in October 2013, while calling for streaming services to do more for independent musicians. "All I'm asking is make a direct deal with me, let me choose my terms."

In a previous Google Doc sharing details of her income between October 2011 and March 2012, Keating provided more detail on her views on streaming.

"The income of a non-mainstream artist like me is a patchwork quilt and streaming is currently one tiny square in that quilt. Streaming is not yet a replacement for digital sales, and to conflate the two is a mistake," she wrote at the time.

"I do not see streaming as a threat to my income, just like I've never regarded file-sharing as a threat but as a convenient way to hear music. If people really like my music, I still believe they'll support it somewhere, somehow. Casual listeners won't, but they never did anyway."

Keating has also been one of the most prominent musicians calling on streaming services to share more listening data with artists. "I wish I could make this demand: stream my music, but in exchange give me my listener data," she wrote in 2012.

This constructive feedback played no small part in leading to Spotify's announcement in December 2013 that it was making its analytics available to musicians through a partnership with digital music firm Next Big Sound.

How to volunteer at a music festival

Volunteering at a music, film or art festival can mean getting free tickets, discounts or 'crew' perks, as well as gaining an insight into how major events are put together
By Will Coldwell

How does it work?

There may be moments when you're dancing - in the mud, to an obscure post-grunge rock band with a man who looks distinctly like the Labour politician Tom Watson - when you begin to believe that festivals come together by magic. But you'd be mistaken. In fact, the great summer parties are a feat of hard work and meticulous planning, with hundreds (sometimes thousands) of people coming together to set them up and ensure they run smoothly. However, turning a profit can be tough and many festivals - both arts and music - depend on volunteers to ensure they go ahead. As a result lots of organisers offer fans free tickets, benefits or discounts in exchange for helping out. It's a great way to get into the often pricey events on the cheap and the perfect opportunity to plan out a summer of partying or travelling in both the UK and abroad.

Do I need experience?

In most cases no experience is necessary but training will sometimes be provided.

What will I do?

Most festivals get their volunteers to help out with tasks such as giving out wristbands, car parking, monitoring gates, litter picking or just keeping an eye on things. If you already have experience in things like first aid or stewarding you could end up taking on a role with more responsibility, such as managing a team of stewards. Depending on the role you take on you will be expected to work a series of shifts over the course of the festival. Oxfam, which manages the stewards for all of the UK's biggest festivals, usually requires volunteers to do three eight-hour shifts and you receive a food token for each, as well as plenty of free tea and biscuits.

Will I miss my favourite band?

Well, you will almost certainly miss some of the fun, although you should be able to swap shifts with your fellow stewards if your hours end up clashing with your dream performer. If you agree to do early and late shifts - such as helping set up prior to the festival and/or helping with the clean-up operation afterwards - you could find yourself free to enjoy the entire festival without working. And many people find festival volunteering a fun experience in itself; you get to make new friends and help bleary-eyed ravers find their missing glowsticks.

How much does it cost?

It's free. Though in most cases you will be expected to pay a deposit to make sure you turn up to your shifts rather than disappearing in a flurry of cocktails and fancy dress after five minutes. Of course, while you save money on the event itself (and many organisations offer volunteers food vouchers) you should still budget for your food and drink.

Where can I do it?

Lots of places! Countless music and arts festivals around the world rely on volunteers so it's worth checking websites or contacting organisers directly if there's a particular festival you want to get involved with. See examples below.

Advice for a first-timer

"I would do it with a friend as you can usually get paired up with them," says Natalie Ward, who volunteered to steward at Glastonbury festival in 2009. "And bring lots of snacks and a waterproof as you may end up standing in the rain for hours. But it's really fun; you get to meet lots of new people and you usually get to stay in your own campsite with showers and more space. And with tickets costing £180 now it's great to have a free ticket; it takes a lot of the pressure off to have fun and you can just enjoy yourself."

Where do I sign up?

Oxfam stewards
If you want to get yourself to any of the big-hitting British festivals (think Glastonbury, Bestival, Womad, Reading and Leeds), as well as a bunch of great smaller ones, such as Shambala and Boomtown, then you need to apply through Oxfam. The money Oxfam generates by running the service goes back into its charity work and it raises £1m each summer through festival work. Applications to steward open in spring but you should register your interest now in order to get a reminder. You will need to provide details of a referee and pay a deposit in order to apply. For 2013 the deposit was up to £205, depending on the festivals you chose, but you only need to pay one deposit even if you plan to volunteer at several festivals.
● *For information and to register your interest visit oxfam.org.uk/stewarding or contact the Oxfam festival team on 0300 200 1266 or email stewards@oxfam.org.uk*

Work Exchange Team
In the States, the Work Exchange Team does a similar job to Oxfam, organising festival volunteering opportunities for music fans across a large number of American festivals, including the Californian music and arts festival Coachella and magical dance rave-up Electric Forest in Michigan. Again, you earn your ticket through shifts and the roles you take on will vary from festival to festival.
● *For more information and to sign up visit workexchangeteam.com*

Festivals abroad

SXSW festival
The week long "music, film and interactive" festival and conference in Austin, Texas, has become the darling of the hip, tech-savvy, entrepreneurial start-up world. It's a huge event that runs each year thanks to 3,000 volunteers. The festival welcomes out-of-town volunteers, making it a great way for a newcomer to dive into one of America's great modern cultural events. Out-of-town volunteers need to work a minimum of 30 hours throughout the festival as part of the conference crew or complete a minimum number of shifts with the production teams, with roles involving everything from technical support to registering visitors. Depending on the hours you work, you will earn wristbands giving you access to various parts of the festival. Limited hotel discounts are also available for volunteers.
● *For information and to register visit volunteer.sxsw.com*

Outlook festival
If you want to combine amazing music with a beach holiday, electronic bass-fest Outlook - this year featuring Lauryn Hill and Busta Rhymes - is one of several in Croatia that takes volunteers. Roles include everything from box office to decor, and applications open in the spring.
● *Visit outlookfestival.com/get-involved or contact volunteers@outlookfestival.com for more details*

Electric Picnic
A leftfield festival in Ireland, which combines top musical acts (last year the line up boasted Fatboy Slim and Björk) with art, performance and comedy. Volunteers need to pay a deposit equal to the value of a weekend ticket, shifts last six-to-eight hours and volunteers need to clock up 24 hours over the course of the festival. Registration for this year's event is not open yet but visit electricpicnic.ie/volunteers12 for updates or contact volunteers@electricpicnic.ie

Sundance
It is one of the world's most-respected independent film festivals and every year more than 1,800 volunteers help make it happen. Sundance, which takes place in Utah each January, requires volunteers to help run everything from shuttle stops to theatre entrances. Volunteers from around the world are welcome to apply and will get the chance to see world premieres of new indie flicks in return for their hard work, as well as getting food vouchers and a golden ticket to the staff and volunteer opening night party. Applications open in August.
● *For more information visit sundance.org/festival/volunteer or contact volunteers@sundance.org*

Melt!
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Jim Jarmusch: how the film world's maverick stayed true to his roots

While the rest of his cohort have fallen by the wayside or been absorbed into the Hollywood system, the film-maker has stayed weird, as his new movie of erudite vampire love reveals
By Jonathan Romney

The word "hipster" invariably crops up in discussions about American film-maker Jim Jarmusch, not least because he looks the part. He is tall, lean, often wears shades and has a famous shock of hair that started turning silvery grey in his teens; his basso drawl completes the uncanny resemblance to a certain Hollywood great, which inspired Jarmusch to found a jokey secret society, The Sons of Lee Marvin.

Jarmusch is without a doubt the most rock'n'roll of film-makers - although he obliges you to define the term. He has worked with a lot of musicians, either as composers or as actors - Neil Young, Tom Waits, Screamin' Jay Hawkins, hip-hop producer RZA. But if you look at the breadth of Jarmusch's references, and the enthusiasm with which he showcases them on screen - William Blake, native American mythology, lute music, Tesla's physics - then it all becomes rock'n'roll after a fashion, all glamorous grist to his intensely idiosyncratic cinema.

Jarmusch's new film, *Only Lovers Left Alive,* offers his most eclectic brew of such allusions. It's a vampire romance about a centuries-old couple (played by Tilda Swinton and Tom Hiddleston) who have had ample time to accrue all the erudition in the world, from the music of 17th-century English composer William Lawes to the different timbers that a wooden bullet might be fashioned from.

What fascinates Jarmusch in the vampire myth is less the usual blood-guzzling, though there's plenty of that, than the educational opportunities afforded by supernaturally extended life.

The couple might come across as a little superior in their knowingness, but Jarmusch has said: "If you'd lived for a thousand years and saw humanity devolving, you might feel a little snobbish as well." The result is a singular dark comedy that will charm some and raise the hackles of others - the *Guardian*'s Peter Bradshaw, reviewing it in Cannes last May, found its name-dropping arch-romanticism "studenty". But Jarmusch's unabashed literacy and curiosity about the world are rare in contemporary American cinema, and marks of a defiantly individual worldview.

Jarmusch has been writing and directing for more than 30 years - starting in 1980 with his mini-feature *Permanent Vacation* (certainly distinctive, if today barely watchable), followed by a much surer feature debut, the wry bohemian road movie, *Stranger Than Paradise* (1984).

Of his generation of US independents, Jarmusch has stayed the course, and stayed weird, while others fell by the wayside (Hal Hartley) or learned to work with the mainstream (Spike Lee, the Coens). Jarmusch has sometimes worked with Hollywood names (Johnny Depp in *Dead Man*, Cate Blanchett in the shorts anthology *Coffee and Cigarettes*) but has generally stuck to modest budgets. He also reaps modest rewards: the relatively conventional *Broken Flowers* (2005), starring Bill Murray, grossed nearly $14m in the US, but that exceeded the American box-office total of his other eight features combined (not including *Only Lovers*).

His films consistently flout the conventions of American screen storytelling. For one thing, their subjects are not always primarily American, and Jarmusch often shows the US from the perspective of foreign visitors: Italian, Hungarian, Japanese. He likes to blend American and world cinema traditions: *Ghost Dog: The Way of the Samurai* (1999) is a hip-hop gangster movie infused with Japanese warrior lore and filtered through the French existential thrillers of Jean-Pierre Melville.

In *Only Lovers*, Tom Hiddleston's character has a wall of portraits apparently representing Jarmusch's own pantheon of heroes: among them, Mark Twain, Buster Keaton, Thelonious Monk, Joe Strummer.

The director's seriousness is often underestimated, says New York critic and festival director Kent Jones: "There's been an overemphasis on the hipness factor - and a lack of emphasis on his incredible attachment to the idea of celebrating poetry and culture. You can complain about the preciousness of a lot of his movies, [but] they are unapologetically standing up for poetry. [His attitude is] 'if you want to call me an elitist, go ahead, I don't care'."

Another thing that makes Jarmusch distinctive is his genuine independence: he is extremely rare in that he has made a policy of keeping control of his own negatives. But his refusal to play the industry game has not made things easy for him. When Harvey Weinstein pressed Jarmusch to cut his 1995 western *Dead Man*, the director stuck to his guns - later claiming that his refusal had resulted in the film being half-heartedly promoted on release.

Jarmusch's unique sensibility doesn't always appeal to the market. It took seven years to finance *Only Lovers Left Alive*, with the film finding no takers in the US. In the end, the project was adopted by European producers, Reinhard Brundig in Germany and British veteran Jeremy Thomas. Thomas sees individualists like Jarmusch as an endangered species. "He's one of the great American independent film-makers - he's the last of the line. People are not coming through like that any more," he said.

Jarmusch was raised in Akron, Ohio, which is partly why his new film muses on the decline of Detroit; he grew up seeing the nearby city as "a mystical, magical place - the Paris of the midwest". In the early 70s, he briefly studied journalism, then moved to Columbia, New York, to study literature, absorbing the influences of poets such as John Ashbery and Frank O'Hara. As a student he spent 10 months in Paris, soaking up screen history at the Cinémathèque, then studied film at New York's Tisch School of the Arts, where he met his lifelong partner, Sara Driver, herself a notable independent director. He also worked as assistant to the Hollywood maverick auteur Nicholas Ray - another prominent face on the wall in *Only Lovers*.

Then there's the musical side of Jarmusch's career. In the late 70s and early 80s, he was a face in New York's downtown underground, singing and playing keyboards in post-punk band the Del-Byzanteens; two musicians from that scene, saxophonist John Lurie and Richard Edson, one-time drummer in Sonic Youth, starred in *Stranger Than Paradise*. In his soundtrack choices, Jarmusch is deeply eclectic: *Coffee and Cigarettes* includes Iggy Pop, the Modern Jazz Quartet and a Mahler *Lied* performed by Janet Baker, while *Broken Flowers* was immensely influential in popularising Ethiopian jazz. In this respect, Jarmusch is on a mission. "One thing about commercial films," he once remarked, "is - doesn't the music almost always really suck?"

Today, the director plays in rock trio SQÜRL and collaborates with Dutch lute player Jozef van Wissem - the two fields of activity combining magically in the eerie *Only Lover*s score. Van Wissem says: "I think Jim likes to be creative in a way that involves just a few people, as opposed to directing. He likes the gang idea of being in a band." All the new film's cultural references, Van Wissem says, are authentically close to Jarmusch's heart. "It's a very personal film, maybe even autobiographical. Jim is a cultural sponge, he absorbs everything."

Jarmusch's critical stock has fluctuated - *Dead Man* was considered a bore by some, hailed as a modern classic by others, while the glacial meta-thriller *The Limits of Control* in 2009 mystified quite a few diehard admirers. Meanwhile, for all his erudite thoughtfulness, the director has claimed that, for him, film-making is less about intellect than instinct. "I feel like I have to listen to the film and let it tell me what it wants. Sometimes it mumbles and it isn't very clear," he said.

Jarmusch can't be easily pinned down to any cinematic wave or category. "I don't know where I fit in. I don't feel tied to my time."

He is certainly not on the same time scheme as the rest of cinema, or indeed, the rest of humanity - which is perhaps why *Only Lovers Left Alive* is one of several of his films, including *Night on Earth* and *Mystery Train*, to take place after dark.

Tilda Swinton has said: "Jim is pretty much nocturnal, so the nightscape is pretty much his palette. There's something about things glowing in the darkness that feels to me really Jim Jarmusch. He's a rock star."

Moon Photograph: Corbis

Meteorite smashes into moon in largest lunar impact ever recorded

Rock travelling at 61,000 km/h punched a crater 40 metres wide and produced a flash that could be seen from Earth

By Ian Sample, science correspondent

Astronomers have captured the moment a lump of rock slammed into the moon with so much force that the bright flash could be seen from Earth with the naked eye.

The 400kg (63st) meteorite, travelling at 61,000 km/h (40,000 mph), punched a fresh crater on the moon's surface some 40 metres wide in what is thought to be the largest lunar impact ever recorded.

The rock, which was about a metre in diameter, ploughed into an ancient lava-filled basin called the Mare Nubium, producing a flash almost as intense as the Pole Star that took more than eight seconds to fade.

The impact energy was equivalent to 15 tonnes of TNT - at least three times as great as that from the previous record-holding lunar impact, observed by Nasa in March last year.

The event was recorded by Spanish telescopes that monitor the moon under a project called Midas (Moon Impacts Detection and Analysis System). The flash was picked up at 8.07pm GMT by two telescopes in Seville, southern Spain. Both were peering at the unlit side of the moon where the bright flickers from impacts are easier to spot.

Unlike Earth, the moon has no atmosphere to protect it from incoming meteorites, so the surface is pocked with craters. The rock would have swiftly burned up in the Earth's atmosphere long before it reached the ground.

Details are published in the latest Monthly Notices of the Royal Astronomical Society.

Astronomer Jose Madiedo, who leads the Midas project at the University of Huelva, saw footage of the strike soon after the telescopes' software had processed the impact on 11 September 2013. "When I saw it on the screen I realised I had witnessed a rare and unusual event. It was really huge. I couldn't imagine such a bright event," he said. "We image a lot of impacts on the moon, but they're caused by very small rocks. They can be the size of a nut, and just a few grammes, and go up to 1kg. But this event was really impressive and very rare," he said.

The telescopes capture scores of much smaller lunar impacts every day. The smallest rocks the telescopes can see weigh only a few grammes and hit the lunar surface every three hours or so.

The telescopes spot impacts from the tiny flashes of light produced as the rocks are vaporised in the intense temperature of the collision. The flashes usually last just a fraction of a second, but the flash from the 11 September impact lasted longer than any seen before.

By observing the moon, Madiedo hopes to learn more about threats to Earth. "We are very close neighbours.

What happens on the moon can also happen on the Earth," he said. "This impact ... shows that the rate of impacts on our planet for rocks of this size, around one metre in diameter, is about 10 times greater than we thought."

Few rocks this size would be a danger to people on Earth, because most would be completely destroyed as they burned up in the atmosphere. Though parts of very resistant rock might survive the intense heat of entry and reach the ground as small meteorites, they would not pose a serious threat, Madiedo said.

Dominique Ansel: 'I don't want the cronut to kill our creativity'

The chef behind New York's most craved pastry talks about growing up poor, staying creative and running a business
By Jana Kasperkevic

Dominique Ansel is part pastry chef, part cult leader. He describes a soufflé with unflinching eye contact and drool-inducing detail. His marble-tiled bakery, in Manhattan's Soho neighborhood, resembles a temple to airy, flaky, crusty idols of pastry.

Yet the world of food blogs, the name Dominique Ansel is almost synonymous with one word: cronut.

This causes Ansel no small amount of pain. The cronut, equal parts donut and croissant, inspired numerous knockoffs and lines of salivating foodies after Ansel introduced the world to it last May. Ansel, by all accounts a serious chef who was nominated this year for a prestigious James Beard Foundation award, has been backed into acting as a stage manager for the flaky, creamy little usurper.

"If you are the first in line, you'll see me," says Ansel, who unlocks the door every morning at 8am to dozens of expectant faces. He's known for urging patrons not to buy cronuts on Craigslist, a corner of which has become a black market for the pastry. Blinding sun, pouring rain, sleet and snow have done little to dissuade fanatics from surrounding the Dominique Ansel Bakery. Staff are known to issue detailed, friendly cronut explainers to the odd tourist who expects to get a cronut any time after 8.30am.

No one is allowed to jump the line, Ansel's own family included. The only loosened rule in the cronut's short history: a man, first in line at 4am, carrying an airline boarding pass. His goal: proving he needed a cronut before the bakery opened so he could use it to propose to his girlfriend. Ansel's team sold him a cronut at 7am, and the man rushed off to his 8.30am flight and, possibly, wedded bliss.

You can guess what it's like to deal with this kind of thing most days. Though Ansel seems both amused and flattered, his expertise as a chef and business owner doesn't extend to hijinks like panicky suitors.

Ansel, who spent six years working as an executive pastry chef at Daniel Boulud's Daniel and helped expand French gourmet food companyFauchon, says "the world of pastries is ripe for exploring. There are millions of things that can be done, hundreds of recipes". The cronut threatens to overtake his reputation, and Ansel, whipping out airy madeleines and salted caramel eclairs, is determined to not be known just as the guy who came up with it.

"I don't want the creation" - he calls the cronut "the creation," as a wry Dr Frankeinstein might have referred to his monster - "to kill our creativity", Ansel says. "We are actually more known for our creativity than the cronut. And people come because they know we do things that are unusual."

Thus the burning eyes he lends to his latest invention: the magic soufflé. It never deflates, and the recipe is a secret. Then listen to Ansel's spontaneous treatise on his latest, frozen s'mores - a confection made of ice cream wrapped in a light wafer inside a marshmallow that is set aflame in front of you - and your mind may wander from hunger.

To find out more about the life after the cronut, we sat down with Ansel in his bakery and spoke about the differences between being a chef and a business owner, growing up poor in France and the importance of giving back. An edited transcript of our conversation follows.

Why did you decide to start your own bakery?

When I first started the bakery, a lot of people were telling me: 'Do not only do pastries. It's not going to work. A pastry shop in New York is not going to work. People don't go for just pastries. You have to have a big lunch menu and ton of sandwiches.' And I did not really want to listen to anyone.

I had my idea of how I wanted to make pastries and where I wanted to take the pastry world. And I found a way to really give people different perception of what pastries are - it's not always this really big tall cake that is rich with buttercream and is sweet and spongy. That's not it. Pastries can be really refined, can be very delicate and creative, artistic. That's something that's very important for me.

You grew up in a poor neighborhood in France, and now devote some of your profits in giving back to similar neighborhoods here in the US. Why is that an important part of your business?

I never forgot where I was from. When I was younger, there were days when I was really hungry, when my parents couldn't afford to buy much food.

Sometimes, we had just bread and we didn't really have much money to buy food. And nowadays, in a big city like New York, people kind of forget because there's a lot of food, a lot of restaurants, but there is still a lot of people who are hungry in the city. It's something I don't forget and will never forget.

When I have a chance to use the passion that people have for my product and I can use it towards something that's going to do a lot of good for other people, it's a chance for me to do something good. When I saw that I could help and do something like auctioning cronuts, for example, at a charity auction, I happily did it. It's a little bit of extra work, but you just donate some of your time and energy to do something. With all the money we raised last year, we fed hundreds of thousands of people between the Food Bank for New York and God's Love We Deliver auction against hunger. There was one auction where we sold 12 cronuts for over $14,000.

Do you feel that more businesses should have social missions?

Absolutely, especially when it comes to your city and your neighborhood, you should just look around and see that people have needs and sometimes it just takes for you to be willing to do this extra work to help them. People tend to forget, because you have a decent situation, you always have food, you always have meal with your family, but you forget that people need your help sometimes.

What's different now that you are a business owner in addition to being a chef?

You constantly have to make decisions and keep improving, training your staff, building a team. I think the biggest difference is that when you are a chef, you mostly focus on working in the kitchen. When you are a business owner, you are more focused on growing your business and the demands of your clients, and especially building a culture of your business. When you are a chef in the kitchen, people always look up to you and they always follow your lead. When you are a business owner, you have more things that you don't deal with when you are a chef. So building a culture is really having a philosophy on how to deal with things.

For example, when we first had the line outside the bakery, it was very important for me to decide to sell to them and to acknowledge that they were here. So in the morning right now, we pass [out] hot chocolate, fresh baked mini-madeleines, hand-warmers. It's very important for me to keep focusing on my customers as soon as they get to us, not just when they walk into the shop. It's not something that a chef would necessarily think about. But as a business owner, you have to take that into consideration.

I saw that on Valentine's day you passed out roses to people waiting in line.

That's another example. I like to be close to my customers. They thought of coming early on the cold day [and] I want to make sure they have at least something nice, something sweet from us, just to let them know that we know they are there. It's cold and I really want to take good care of them.

I also saw you tweet some wishes from your wishing tree. Were you flattered by some of those?

Yea. We did a wishing tree for valentine's day that we left here inside the bakery and we invited people to just write a wish and put it on the tree. Actually, a lot of people played along and we had some sweet ones.

Many of them wished for a cronut, a product that you recently trademarked. Was that an important decision for you to make?

This is one of those decisions that you make as a business owner, not as a chef. The trademark of the cronut was a very important decision for us. [The trademark application] was a suggestions from a lawyer that cares for us and she suggested this to protect us. As a chef, you don't really know if you need to do this. We really quickly realized that a lot of small business owners are just bullied by [bigger companies]. If you don't protect your trademark, they will try to register the name before you do and they will stop you from using your creation.

Kind of like patent trolls.

Exactly. It's really important for me as a small business owner to stand up and say 'I am going to protect my trademark.' This is my creation and I am going to protect it so that I can ensure I can continue making it.

I found it very interesting that when people ask you why don't you just make more cronuts, you've said "You don't go to a doctor and tell him to make more surgeries." You emphasize quality over quantity. Is that part of your philosophy?

It's the same reason that you don't ask writer to write four times more articles. I want to control the quality of the product. I want to sell people a good quality product for a fair price. A lot of people also ask me, why don't you sell out to a big factory and make tons of money? But this isn't about money.

This is what we believe in. It's not about making tons and trying to sell as many as you can. It's about making a very good, very high-end quality product and giving people the best experience. It's not about raising the price for cronuts or selling it for twice more. Would they still sell out? Probably yes. But I don't want to treat my customers like that. I want them to have a fair price for a fair product. This is what I believe in.

Some people say "Well, what else can you do with a pastry business?" You've proven that there is room for innovation and creativity. And you have previously mentioned that you have many more ideas. Why is it so important to stay creative?

I think it's the same for every field. Knowing that you did something well, it's not enough for this world. For example, if Van Gogh had only painted one painting and stopped there, no one would know about him. You start a new trend, you really explore your field and you go beyond what you know and what can be done. Beyond what people think can be done. There's no limit if you are creative, flexible and have imagination. It's just a matter of really understanding your customer and understanding what they are looking for.

We see it here at the bakery a lot. For example, in the beginning, I made a point to change the menu every six to eight weeks, which is very unusual for a bakery. People would change a menu once, twice a year. We change it very often, as often as a restaurant. In the beginning, people were coming back and were sad not to find the pastries that they saw a month or so ago. But now people come back and they are excited about new items and they are excited about change.

They bring new friends, they bring family here. There is this energy, this willingness to stay open minded and learn about new things that New York has. It's really an exciting place for a chef to be.

In our earlier email correspondence, you told me "Never get lazy and let your creation kill your creativity." Do you also encourage your staff to be creative?

Totally. Yeah. It's very important for me. It's part of our culture. I always say I don't want the creation to kill the creativity. A creation - one of them was a cronut - I don't want us to stop yet and kill our creativity. We can do a lot more. We can do so many more things and it's very important for me to have my staff involved in this aspect so I always push them to think out of the box, to think differently. Because they also have ideas. Because they also have different experience and sharing and seeing my staff growing with me, it's something that is very unique and amazing for me.

You previously helped expand Fauchon into places like Russia, Egypt ...

... Kuwait ...

What have you learned from that? Was it different than setting up your own business?

I learned a lot. I've learned all the things you should and shouldn't do. Fauchon's concept overseas was really copy-and-paste, it was a replica of what it was in Paris, which [in] some places works very well, and [in] some others, not at all. I think for me, it's very important for business to have a mindful growth but to also understand the market. If I were to open a place, a bakery a block away, it would have to be different. It would have to fit to the neighborhood, to have its own identity and personality. As a business owner you really adapt your concept, your ideas, your product, your service based on the location and your customers.

This is one of the most important things I have learned with Fauchon.

When you first came up with the cronut – there was a lot of attention. How did you feel about all of that attention?

At first, it was a little bit overwhelming. You know it's not something that we were expecting. The first day that we launched cronut, someone from Grub Streeet came here and took a photo of it and posted it. It was a small article, just like a write-up of something new that we were doing because we always do something new. The same night, they called us and they told us they had increase of traffic of 300%. They technically told us they had never seen anything like this and that we should be ready to get busy.

The first day I made maybe like 35? The second day, I decided to make 50. The first day we sold out in about 15 minutes. The second day in 10. And by the third day, we had a line of about 100 people waiting outside before work by the doors. And that's how the crazy began. I was really shocked. And we were not ready [laughs] to have a line of people outside the shop. We had very busy lines in the morning before the cronut, but not that amount of people coming for one product. It was something really unexpected.

This was all word-of-mouth advertising.

People often ask, 'Was it a PR strategy?' And we are like 'No, not at all'. There is no PR strategy, there is no PR team, there's nothing that's planned. We do things naturally.

I do things that are genuine, with my heart and when I decide to buy few dozen roses to give to our first few customers in line, it's because I believe that it's a special day for them. And if I can make it a little more special for them and happier for them, I will do it.

[In the morning], the most exciting part is really being at the register and see people leave the shop, saying goodbye to each other after standing on the line together. They spend time together. They exchange emails. They exchange phone numbers.

You could start a cronut match-making service.

[Laughs] They really become friends. It doesn't matter where they are from, which part of the world, what part of the city they are from. They talk and befriend each other.

Do you have friends and family ask you for a cronut?

Not all of them, because they know I don't make exceptions.

They would have to get on the line.

Most of them, friends and family, have actually never tried a cronut. I've made rules since the very beginning and I have to stand by them. Everyone, all of my close friends and family, knows that they shouldn't ask me. My answer would be the same as for everyone: they should wait in the line. That's something I believe in, fairness for everyone. Good quality product for a fair price and everyone being treated equally.

You had a special Valentine's Day menu. How did it go?

It was amazing. That was our busiest day so far. And it was also last year. This year we have done everything in pink and we had - and this is very funny - most of our clients are actually gentlemen.

Really?

Yes, for Valentine's Day. For that day, we would see a good 80% of customers that are men. And when they walk into the shop with the hearts, and the cases are all pink, and we're playing love songs, and there are rose petals all over the floor, it's all very feminine. It's not a place where you would expect men to be, but they are all very smiley, and a little bit shy and they ask about recommendations.

Well, I guess they have figured out what women have known all along: that the way to the heart is through the stomach.

You got it.

Do you feel that French have different relationship with food than Americans?

Completely. Yes. [laughs]

How different would you say they were?

There's a lot more tradition and roots and history [in France]. France is a little bit more conservative when it comes to food. They know what they like and they like what they know. They don't like change too much. They like the things they have tasted before. They like French food.

New Yorkers, Americans are completely different. They are a lot more open-minded. They travel a lot more. They are willing to discover new flavors, new textures and just new things from all over the world. That's why I think New York is one of the most exciting food scenes in the world today. And I firmly believe this, because I've had some of my best meals ever in New York.

So what's next for your bakery?

Well, right now I am writing a book, a cookbook with Simon & Schuster to come out in October of this year. So that's what's right now.

And then when it comes to expansion - any healthy and safe business should expand. It should be a mindful growth and it should take into consideration, as I said earlier, the place, the location, the customers, the concept. To me, it's not just opening something. There should be something really unique and special about it, something that has a heart, something that people believe in.

According to Dominique Ansel, New York is an exciting place for a chef to be. Photograph: Thomas Schauer/Courtesy of Dominique Ansel Bakery

Sidestep rising house prices – get a house on Fanny Hands Lane

Reduced property prices on streets with rude names could be the answer for a younger generation struggling to buy homes
By Holly Baxter

Every now and then some rowdy, tasteless English-speaking so-and-so decides to disturb the peace in the quaint Austrian town of Fucking. I know this because one of my long-suffering Austrian friends told me such a tale as evidence of Britain's shameful inability to control its citizens' binge-drinking, sign-stealing and excessively puerile behaviour while abroad. But if you're not lucky enough to have an unamused Austrian to hand, you can always search Google Images for "Austrian town of Fucking" (the words "Austrian town" being key here) and see for yourself the number of people who have contorted themselves into various positions in order to creatively interpret the name of the town. It turns out that there is nothing we love more than a double entendre.

Considering this, it seems a shame that a recent survey has found house prices tumbling on streets with naughty names. Around £84,000 could be the difference between a perfectly lovely cottage on Rectory Road in Upton-upon-Severn and an identical one on its adjoining street, Minge Lane – and that's no laughing matter. No, seriously, it isn't.

Who would have guessed that the same people who probably stole a Fucking sign in their youth with all the joy in the world would grow up into prudes so paralysed by the fear of Crotch Crescent and Fanny Hands Lane that they would refuse to buy a property there? Is it the thought of having to stammer your address down the phone to a snickering pizza delivery man that makes people avoid these streets like the plague? Or the notion that, like naming your child something wistful and cutesy like Rainbow or Sunshine, you will fail to be taken seriously once you've revealed that part of yourself to the professional world? Or perhaps it's merely the old British fear of standing out too much in a crowd? After all, the Mirror reported one resident of Fanny Hands Lane in Lincolnshire as saying, "If you're ever ordering anything and tell people your address, as soon as you say 'Fanny' they know exactly where you mean."

Perhaps, however, there is an upside to this strange and disappointing news. Our youth – a dubious category that I still see myself as belonging to considering I live in jam-packed rented accommodation and have zero savings – have suffered the most under an ongoing housing crisis. The generation before us bought up a hefty proportion of British property and are now either sitting on it or leasing it to us for astronomical monthly fees. So far, so depressingly well known.

But the youth are also the most enthusiastic advocates of innuendo. I haven't exactly conducted a scientific survey on that intuitive fact myself, but what friend of mine hasn't stopped on their way back from visiting my house and sent me a triumphant photo of Cumming Street, a mere mile down the road? Which twentysomething can hold up their hands and honestly say they haven't had a private giggle after passing by Bell End in the West Midlands?

Now the cat's out of the bag, I predict that those who once spent their days doubled over with hilarity at the unfortunate moniker of Cock Lane in London's Farringdon will seriously consider the advantages of living there; teens will descend en masse toward Cockshoot Close in Oxfordshire; the estate agents in Lancashire will be overrun with young professionals waiting to get their hands on a slice of Slag Lane. Wonderful things sometimes come in the ugliest packages, and so Britain's rudest street names could signal a new era for the disillusioned youth of the 21st century. As their mothers and fathers stand around blushing at the thought of a cheap detached home on Cock-A-Dobby in Berkshire, those whose age allows them to revel in a silly name will be laughing all the way to the bank.

Fanny Hands Lane in Ludford, Lincolnshire Photograph: Betty Finney/Alamy