

YOUR WORLD IN

# 2050

Flying cars, life on Mars, and human  
limbs being grown in jars. Welcome  
to the world of tomorrow

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WHAT'S OUR WORLD GOING TO LOOK LIKE IN 2050? IT'S A BIG QUESTION TO ASK, AND UNLESS YOU'VE KEPT THIS COPY OF *FS* FOR 33 YEARS SO YOU CAN LAUGH AT OUR PREDICTIONS FROM YOUR PENTHOUSE ON THE MOON, CHANCES ARE YOU'RE AS CLUELESS AS WE ARE.

THAT'S WHY WE ROUNDED UP SOME EXPERTS, WHO SPEND A LOT OF TIME THINKING ABOUT THESE KIND OF THINGS, AND GOT THEM TO TELL US WHAT'S AROUND THE CORNER...

## SPACE

**W**e're all off to Mars. Well, maybe not just yet, but the red planet's relative similarity and

proximity to Earth means it's the destination of choice for the first human colony in space.

The Mars One project ([mars-one.com](http://mars-one.com)) aims to establish a working colony on the red planet by 2032. Once the first team of four astronauts has arrived (seven months after leaving Earth), more groups will arrive every two years. Anyone who applies, though, has to be prepared to say goodbye to Earth, because this is the very definition of a one-way ticket.

Hannah Earnshaw is a PhD student at Durham Uni, who is on the shortlist of 100 wannabe astronauts hoping to be among the first settlers. "I think it's inevitable humans will go to Mars," Earnshaw says, "be it for resources, needing more space, or just because it's there and we can. What's important is how we do it.

"If the first people to go are those who want to live there, who will be committed to looking after the planet rather than simply exploiting it for resources, I think that's a good precedent to set."

While the mission has been planned around current tech, there's every chance new science and tech will be incorporated into the mission. "As 3D printing

becomes easier and more mainstream, we may well be taking 3D printers and feedstock ingredients with us to make the construction of spare parts easier," says Earnshaw.

"Developments in space suit technology might mean improved surface exploration suits can be sent over to the crews on Mars further down the line. But since the mission plan as it stands doesn't depend on new tech, we won't be held back if they take longer than expected to develop – they will just make our lives easier as and when they arrive."

So does Earnshaw think there will be any signs of life? "While the surface of the planet is devoid of life (unsurprising, given the limited protection from radiation by the Martian atmosphere), we haven't yet investigated underground, where conditions may well be suitable for microbial life to survive. I think it is very possible that either that sort of life could exist on Mars today, or we could find evidence of such life having existed in the past."

For those with an urge to see space for just a few hours, meanwhile, space tourism will soon offer the opportunity to blast off. Virgin Galactic is developing both suborbital and orbital spaceflight, although a seat on one of its spaceflights will currently set you back \$250,000. ▶

# TRAVEL

**D**riving a car is set to become a nostalgia trip in your lifetime. Only classic car enthusiasts will remember the steering wheel and accelerator pedal with a warm fuzzy glow.

Futurist and author Dr Jack Uldrich predicts car ownership itself will become a thing of the past, as ride hailing apps like Uber, driverless technology and electric cars converge.

“In 40 years’ time, I don’t think you will be allowed to drive yourself in a city because you will be the weak link in an autonomous vehicle chain, and we won’t allow it for safety reasons,” he says.

To look forward, he suggests looking back 100 years to when horses were replaced by cars. “If you were a horse enthusiast, you could still go to a farm outside the city and ride a horse,” he says. “I think that’s what will happen with cars. There will still be old car enthusiasts but we will not let them drive those cars in the city.”

Dr Uldrich even thinks the idea of calling up a car for a ride will become old-fashioned. “Because of exponential advances in artificial intelligence, sensor technology and quantum computing, the autonomous network will get so good, it could anticipate when we need a ride and a vehicle – maybe even a flying

one – will be outside when you need it!

“One knock-on effect from reduced car ownership will be a change in urban planning,” adds Dr Uldrich. “Garages could become gardens, and with fewer parking spaces needed, we could plant more trees and build more parks.”

It’s also been predicted that by 2050, only ten per cent of newly built cars are going to run on petrol alone. Norway has gone even further, pledging to phase out the sale of fossil-fuel based cars by 2025, prompting Tesla founder Elon Musk to tweet, “What an amazingly awesome country. You guys rock!”

Musk has also got the world’s top brains working on the Hyperloop, an underground tunnel that shoots passenger pods through an air vacuum at up to 760mph. Routes around America have been proposed, such as San Francisco to LA – it currently takes six hours but could be done in 35 minutes in the Hyperloop.

Once the science guys master the tech needed for space tourism, too (as mentioned earlier), we could be looking at commercial flights from London to Sydney in under three hours. The planes could orbit the planet at over 4,000mph before re-entering airspace Down Under.



## FOOD

**R**ight now, around 54 per cent of the world's population lives in urban areas, and by 2050, that will rise to 66 per cent.

Architects are already designing skyscraper greenhouses and vertical farms that relocate agriculture from the countryside to the urban garden.

Here's what food futurologist Dr Morgaine Gaye thinks we can expect: "We're going to have such a phenomenal understanding of our nutritional requirements. We'll all have some kind of digital integrated device we breathe into, and it will know exactly what kind of vitamins and minerals and micronutrients we need. We could scan it around our kitchen and it will know exactly what our body should absorb that day."

Production processes will change too. "We're going to have a much better system of growing and food communities within cities," says Dr Gaye. "City blocks and buildings will all be a growing space; the vertical space could be a hydroponic growing wall. The rooftops, any underground spaces, they'll all be integrated into feeding and supporting the population. We'll be doing a lot more rearing, cooking and eating together, and we won't outsource as much production. It will be a lot more local, a lot more seasonal."

The idea of eating insects won't be anything special, either. "It's already normalised," she explains. "I spoke to a big restaurant chain a few years ago and said they should do the first insect burger, and they laughed at me. Then I mentioned the idea in a talk late last year, and someone from the same restaurant chain was there and said they were discussing it."

"There are lots of exciting things happening with companies using food waste, too," says Dr Gaye. "Coffee grounds from takeaway coffee can be used for bricks and biofuel. One company called Piñatex uses pineapple leaves to make a vegan alternative to leather, which is pretty amazing. We're going to see very little waste in the future. We're going to be repurposing it all." ►

# SPORT

**T**he winning time in the 1904 Olympic marathon was one hour 20 minutes slower than in 2016.

Humans are getting fitter, faster and stronger, but surely the body has its limits?

“We’re still at a point where records are being broken and progress is being made,” says Dr Simon Choppin, senior research fellow at the Centre for Sports Engineering Research at Sheffield Hallam University, “but there may be a time where Paralympians are outperforming their able-bodied counterparts because prosthesis technology has surpassed that of the human body.

“Then the question would be ‘to progress sport, do we have to allow some kind of augmentation?’ Top athletes have an advantage over the rest of us in that they’ve got a beneficial genetic code. In the future we might be able to identify exactly where these advantages come from and manipulate the genetic code of our offspring or maybe even existing people, to give us the benefits of increased lung capacity or a different type of muscle build for better sprinting.”

New rules and equipment have been equally responsible for records being broken – the flip turn in swimming and the starting blocks in sprinting were both

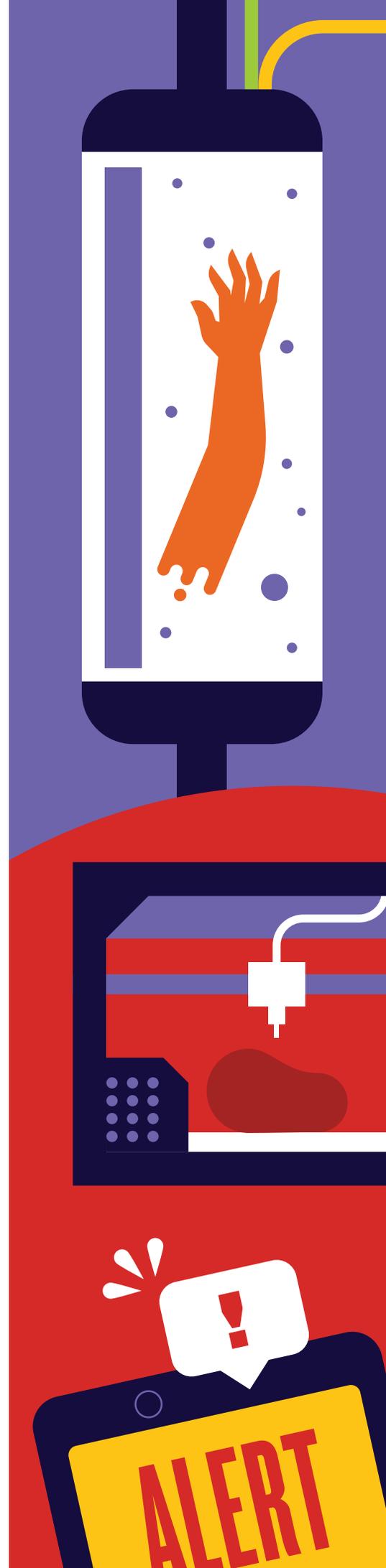
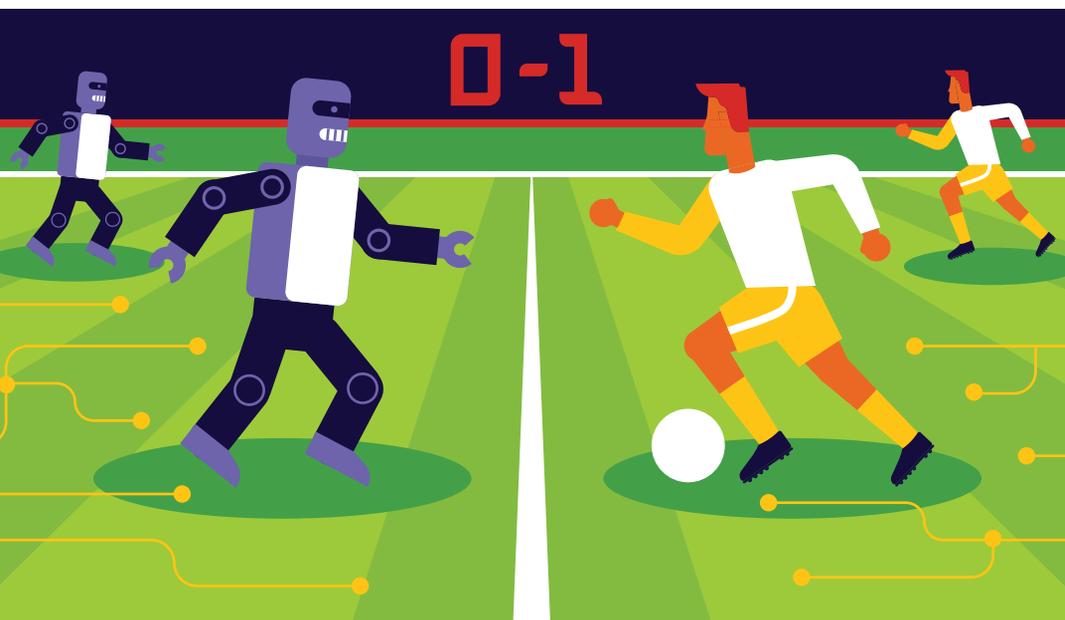
game changers. “Technology allows new rules or rule changes to be possible,” says Dr Choppin.

“In football, FIFA are very keen to keep the game very fluid with no interruptions. So every time they introduce new technology, it has to meet those criteria. Sport lives and dies by the fact that people want to watch it. If no one wants to watch it, no one gets paid for doing it.”

The biggest change could be world sports finding themselves competing with e-sports, suggests Dr Choppin. “Who’s to say the next generation might not prefer something you watch entirely in virtual reality? Suddenly, sports that are over 100 years old will start to look a bit old hat when they’re compared to e-sports, where you could tailor the environment for the viewer, and make it more interactive and stimulating than the real world.

“Sports are an interesting evolutionary environment. Lots of them pop up, some of them evolve and mutate but eventually the strongest ones survive.”

By 2050, we could even see the first robots versus humans football match. At last year’s China World Robot Conference, American robots beat Australian robots 7-3. They weren’t very good and fell over a lot but hey, that never held Titus Bramble back.



## HEALTH

**N**obody should ever have to replace a body part. It sucks. But it would suck less if you had some box-fresh body parts kept in a lab, ready to go. Bioartificial organs grown from our cells are already a reality; according to *National Geographic*, 30 people have received lab-grown bladders, and more organs are on the way.

While ‘hollow’ organs such as the bladder are easier to reproduce than solid ones with lots of blood vessels, scientists have managed to 3D print a working womb for a mouse. While we’re only at the mouse stage right now, it’s exciting science that could in the future have huge implications for women who aren’t able to have children.

Our understanding of drugs and diseases is also going to change dramatically, says Dr Jack Uldrich. “As we sequence the human genome better, we’ll come to a greater understanding of whether a drug will work on you or on me. We’ll start creating personalised pharmaceuticals, 3D printing individual drugs specific to you.”

Huge advances in genetics, and advances in nanotechnology, biotechnology, stem cell research and regenerative medicine are going to make some diseases preventable, and significantly reduce the number of different drugs on the market. Good news for people, but arguably less so for the pharmaceutical companies.

“They’ll try to maximise their profits as long as possible,” says Dr Uldrich, “but if you don’t develop the drug to cure that disease in the UK, we’ll do it in the US, or someone will do it in Singapore or India. Big industries will do everything they can to protect their profits as long as possible, but the end game is not positive for the pharmaceutical industry.”

Wearable technology is going to evolve into technology that becomes part of us, too, like a monitor near the heart that could detect problems before they arise. “Before a heart attack, there are certain proteins released from the heart,” says Dr Uldrich. “If we can put a sensor in the body and detect those proteins, that sensor will connect to your phone and say, ‘hey, it looks like you’re going to have a heart attack in 36 hours, let’s do something about that.’”

“We’re going to do the same with cancers. As soon as that first cancer cell begins to divide, we’re going to get an early warning while it’s still treatable.”

But will everyone want to have chips and sensors inside them? “In 40 or 50 years, society is going to split,” says Dr Uldrich. “One half is going to incorporate tech into themselves. Elon Musk and Mark Zuckerberg are both working on brain-to-machine interface tech – a neural chip to connect our brains to the internet – because they think the only way to stay ahead is to incorporate tech into ourselves.

“That’s a legitimate position. But the other half of society has a legitimate position, too. They will say, ‘I understand we can do that, but I don’t want a neural brain chip or heart sensor’. I think this is going to be an evolutionary test. Is tech like this good or are we, like Icarus, flying too close to the sun and about to get burned?” 