

# MONTAG



MONTAG

MAGAZINE

ISSUE 2 - BETTER BODIES

ED



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MONTAG

MAGAZINE

## Grover

## MONTAG

Launched by Grover in March 2017, MONTAG is a magazine that explores, on a deeper level, where new technology is taking us as a society. MONTAG reports from the fuzzy edge between new tech and everyday life and asks: when technology evolves in exponential leaps, what will we do next, and what does that change mean on a human level? Grover started MONTAG to encourage the reader to find out for themselves. **Read more at [www.montag.wtf](http://www.montag.wtf)**

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## MONTAG ISSUE 2: BETTER BODIES

Issue 2 of MONTAG deals with a future where we, increasingly intertwined with our machines, start to become cyborgs. Today, machines are already extensions of our bodies. If you wear a fitness tracker day and night, then it would just be the matter of making the clasp permanent to take your first steps as a cyborg. With that small leap in mind, the features and short fiction in this issue look at body technology that is comfortably close, yet more than

a little unnerving. If you could take drugs to make you smarter, would you do it? Would you enjoy a brain-implant that gave you a better memory - and what if it got hacked? Would you grow new body parts that are bigger, stronger or faster than ones you have now? And if you do all of this, at what point would you stop being "human"? Explore Issue 2 of MONTAG and decide what part of you you'd replace first...

### CONTENTS

## 04/05

### RAY AGAINST THE MACHINE: TRANSHUMANISM'S SAVANT-PRINCE HAS CALLED TIME ON HUMANITY

In 2040, we'll spend most of our time in "full-immersion virtual reality." At least, that's what the Transhumanist followers of Ray Kurzweil think.

## 06/07

### TODAY'S DYSTOPIA: BLADE RUNNER

Sci-fi classic Blade Runner is a movie whose stature continues to grow as the years pass - and whose characters wrestle with the utter fragility of life...

## 08/09

### MONTAG FICTION: LOVELY WEATHER WE'RE HAVING

The year is 2200. You check your phone before getting out of bed to prepare yourself for the day. Choose your own adventure.

## 10/11

### BOOST YOUR BRAINPOWER

What if you could take a pill and harness the power of your mind at its maximum potential? Welcome to the world of nootropics.

## 12/13

### ORGAN DONOR TO ORGAN CLONER: GROW YOUR OWN BODY PARTS

Astonishing technology to grow new human organs exists right now - so it's time to add a few new body parts to your shopping list...

## 14/19

### SELL YOURSELF!

Everything has a price - including your body. Kathryn Lawrence investigates whether we'll soon profit off the invisible data stream we produce (as well as the more tangible human byproducts...)

## 20/21

### BIOHACKING: YOU ARE WHAT YOU EAT

Biohacking can bear life-changing results: long-term illnesses eradicated, mental health restored. Sounds great - it's just that you might need to consume someone else's poop...

## 22/23

### THE WILD WORLD OF HUMAN AUGMENTATION

Some people add technology to their body in extreme ways. What do they insert and why did they insert it? Peel back the skin and find out...

## 24/25

### YOU CAN'T TAKE IT WITH YOU: FUTURE FUNERAL PRACTICES

Our traditional "burn or bury" options seem a little dated when you could be freeze-dried and turned into plant food, compressed into a diamond, or shot into space.

## 26/27

### MONTAG FICTION: RANSOMWEAR

When our email is hacked, we feel violated. When our wearables are hacked, we might feel something closer to terror...

## 28/29

### THIS DIDN'T WRITE ITSELF: AUTOMATION IS COMING FOR YOUR CREATIVE JOB TOO

AI will soon eat up the creative jobs you might think can't be automated. An eager Joe Sparrow tries to find an AI that'll write this article for him...

## 30/31

### CONSUME YOUNG BLOOD, LIVE LONGER: IT'S TIME TO EMBRACE YOUR INNER VAMPIRE

In the search for youth, researchers may have found a magic potion: young people's blood - and rich people are thirsty...

### THE MONTAGE PODCAST

THE MONTAGE is the companion podcast to MONTAG, where the MONTAG team of Joe, Kathryn and Thom get under the skin of the topics explored in the magazine, and expand on some of the bigger questions. It's lovingly recorded in the Grover recording studios (OK, a very warm cupboard) in Berlin, and is the perfect accompaniment to your morning commute, a luxurious bath, or a long dark sleepless night worrying about the future of humankind.

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# Ray Against The Machine: Transhumanism's savant-prince has called time on humanity

*Disclaimer: this is going to get very weird, very fast.*

*Maybe you've already tried VR in the guise of an Oculus Rift or an HTC Vive. If not, it's worth getting practice in now, because by 2040, we'll probably be spending most of our time in "full-immersion Virtual Reality." Or at least, that's what Transhumanists think.*

*But don't fret. Being able to keep ourselves occupied in VR will be useful, because five years later - in 2045 - the Singularity will happen, and suddenly we won't be the smartest thing on the planet any more.*

*Oh, and we're going to live forever too. Told you it was going to get weird.*

## Transhumanists are Very Serious People.

Yes, they laugh and joke like you and me, but fundamentally, they're dealing with Big Ideas that are So Big, they might not care about the newest Donald Trump gif from your WhatsApp chatroom.

Put it this way: Transhumanists would happily come to the pub with you, but conversation would drift pretty quickly from football to the concept of, you know, living forever.

That's why they're so serious. Life itself is at stake. Not just their lives - all of humanity's. Transhumanists have realised that maybe - just maybe - they've been born in time to merge as beings with technology that's around the corner.

So maybe we should put the jokes aside for a moment too. Transhumanism is based around one very simple idea, that we can all get on board with immediately: hey, what if we just didn't die?

## Blood is thicker than tech

Transhumanism is, at its core, the idea of taking technology and using it to create Humanity+.

Or to put it another way, becoming post-human. Transhumanists' aim of meshing dumb brains, weak flesh and smart technology is partly driven by an enthusiasm for making humans live longer, and partly resignation: it's going to happen anyway, so we may as well get on with it.

Humanity+ might not be the better you that you want (I'd be happy to stop at having blonder hair or a less enormous nose) but it's going to be the one that you'll get.

*If you replace all of your brain matter with nanite technology - and you're still aware of being you, just smarter - would you really care?*

And the benefits will be more than mere tech marvels. Are you struggling to learn German? Some microscopic machines in your brain will just re-wire those synapses for you - it's *unglaublich einfach!*

The Transhumanism timeline goes big, fast. The assumption is that the leaps in tech evolution are going to become a series of ever-faster blurs, and in the end you won't understand them.

Take those brainy nanobots, *Deutsch sprechen für dich in deinem kopf*: those machine-neurons are better than the fleshy ones ones you grew up with - so why keep the stupid ones?

If you replace all of your brain matter with nanite technology - and you're still aware of being you, just smarter - would you really care?

And with big ideas like that at its core, Transhumanism philosophy follows a similar exponential curve to the technology it predicts.

One moment, you're marveling over a computer beating a human at Go, and the next, the world's turning into a giant computer, human beings are turning into pure intelligence, and

the concept of intelligence itself is colonising the universe at light speed.

## Unashamed About Ray

One name that crops up time and time again when you reach into the world of Transhumanism is Ray Kurzweil. If Transhumanists are essentially becoming Human+ - their own gods - then Ray is God+. Transhumanist-in-chief. The man they'll follow into infinity.

Scientist, inventor, innovator, thinker, author, futurist: most mere mortals struggle to relate to Ray.

His more prosaic work has involved changing the world. He's created machines that copy human skills: looking, reading and speaking. He invented the charge-coupled device flatbed scanner, the omni-font optical character recognition technology, the first print-to-speech reading machine for blind people, and the first commercial text-to-speech synthesizer.

He's been peppered with awards from Presidents, has scooped up 21 honorary doctorates and is generally recognised as a living, breathing genius.

And remarkably, for Transhumanists, this work is not the reason he's worshipped.

Because Ray's also written a series of best-selling books that bridge technology and flesh, with provocative titles like *The Singularity Is Near: When Humans Transcend Biology* and *Fantastic Voyage: Live Long Enough to Live Forever*.







Transhumanists love Ray because his message is: hey, chill – we’re gonna live forever, whether you want to or not.

**Here’s an idea.** If you do want to live forever, you’re going to need a lot of cash. So Transhumanists could do worse than dropping Ray an email and asking him what next week’s lottery numbers are.

Why? Because since the early 1990s, he’s made a series of rational, measured predictions that have eerily come to pass almost exactly how and when he described.

He’s made so many correct predictions that the Wikipedia page devoted to them is longer than that of Nostradamus. (Although it’s still not as long as the Wikipedia entry for the TV remake of *Hawaii Five-0*, because Wikipedia.)

**In 1990, in a single book, he correctly predicted:** the fall of the USSR, and the liberating, educating role technology would play in its demise; that by 2000, a computer would beat a chess grandmaster (IBM’s Deep Blue beat Garry Kasparov in 1997); and that, by the early 21st Century, we’d all be hooked up to the internet via wireless connections.

Aware of his gift, and a master of publicity, Ray’s kept a running total of his successes: in 2009, by his count, 102 out of 108 of his predictions had come true.

So when Ray Kurzweil says that by 2039, we’ll be able to upload our brains to a computer and humans will be able to become “software-based”, we should probably take a moment to digest the news as a likely outcome.

### A singular prediction

**If it feels like, say, the Qatar World Cup is a long way away,** maybe it’s time to readdress your interpretation of time, the

universe, and everything. Here’s where the weird things start to get really weird. And there’ll be no going back to how it was before.

The Singularity is an idea that Ray, and Transhumanists, toy with a lot, for good reason. It’s the point when technology takes over; when our technology gets smarter than us, and then starts making smart changes we’re not smart enough to understand.

BTW, it’s pencilled in for 2045. Better bring the washing in before the end of the world starts.

Oh, right – that’s because the Singularity essentially means the end of humanity. In the “plus” column, it might also spell the end for some other trivial ideas like “death”, “time”, “perception”, and “space” too.

Your question now is: what does “humanity” mean when being human isn’t confined to that boring and limiting born-live-die one-way curve?

What if you and your conscious mind could be copied from that meat-bag you’re in now and pasted into a shiny new device? The battery life would be better, at least.

**Here’s some more predictions that Ray has made that you should probably pop into your phone’s calendar right now, as a fun way to mark off the days to the big jump to Humanity 2.0.**

### 2018

**Let’s start with a blooper:** Ray predicted that in 2018 ten terabytes of computer memory – about the same size as the human brain’s capacity – should cost a thousand dollars.

Hey, we’re ahead of ourselves – you can pick up a 10TB drive online for

\$400 right now. Durr, Ray!

### 2020s

**Don’t get too smug at Ray’s previous swing and a miss,** because in the next decade, we’ll be able to buy a computer as smart as a human brain for that same \$1000.

And once computers start getting clever, it’s curtains for humanity as we know it: after that, they’re smarter than us, building better versions of themselves – and then they’re in control. But for a thousand bucks, that’s a bargain!

### 2030–2050

**Ray’s pretty sure that a thousand dollars is going to get more meaningful in what it can buy.** At this point, it’ll buy a computer a billion times smarter than all of us put together.

Other trifling changes in this period include the prediction that humans stop being flesh, and start being a “fog” of tiny devices. Quick reminder: we’re also living forever at this point.

All those people who told you it was great to be alive in the swingin’ Sixties sound a bit silly now, don’t they?

### Into the future

**Fog-bodies, everlasting life (except you won’t recognise it as such) and Matrix-like VR compliancy.** In conclusion: it’s all rather terrifying. Or exhilarating. Or maybe it’s just that we’re too dumb to understand it all.

So it’s probably worth getting acquainted with VR right now, and you can work your way up to replacing your body with smart fog later. But for now, at the very least, make sure you keep your phone OS up-to-date.

## TODAY'S DYSTOPIA: Blade Runner

*In MONTAG's Today's Dystopia series, our writers explore the dystopian worlds of classic fiction, and see if our world has slipped any closer to the fictional one since it was published. Is our cool new technology bringing us closer to a future we're afraid of - or is it already here?*

*Blade Runner is an eerily prescient movie, and yet so much of it feels so far away. In 2017 we have technology that Harrison Ford's hard-boiled ex-cop Deckard would recognise, but what about the far-fetched stuff, like the cloning and genetic tweaking of humans?*

*We're now just two years from when Blade Runner is supposed to take place - 2019 - and it turns out we're closer than you might think...*

Blade Runner is a movie whose stature continues to grow as it ages, and the fallibility of the human body is the bones upon which the movie's murky meat rests.

Based on Philip K. Dick's book, *Do Androids Dream of Electric Sheep?* (an undoubtedly less rock 'n' roll name than *Blade Runner*) the movie was a famous failure that - fittingly - only found acclaim once it was reborn as a Director's Cut.

It wouldn't be too much of a stretch to describe *Blade Runner* as a Body Horror movie of sorts. Whilst it's not quite as flaps-of-flesh and gore-tastic as David Cronenbourg's definitive work in this genre, it does have a similar focus to, say, *The Fly*.

*Blade Runner* depicts characters dealing with the absolute fragility of their physical life, and from this, the viewer feels the deep thrum of humanity's endless wrestling match with death, and what it means to be alive.

Harrison Ford is Rick Deckard, "Blade Runner": a cop who tracks down and "retires" artificially-created humanoids known as Replicants. The retirement parties Deckard throws involve him killing the humanoids, and the movie pivots around this complication: if a Replicant looks and behaves like a human, should we not treat them like humans?

In a nod to the *is-he-or-isn't-he?* innuendo around Deckard's own humanity (or otherwise), we'll mark the similarity between the elements of the movie and 2017 out of Replicants.

**Spoilers ahoy...**

### Implanting false memories - 4 Replicants out of 5

Rachael - the object of Harrison Ford's desires - is a replicant who does not know she is a replicant, which makes it all the more awkward when Deckard's probing causes her to realise the truth. Unlike other Replicants, Rachael thinks she's human: her manufacturers have carefully seeded memories so visceral that not only do other people believe them, but so does she.

On the surface, the likelihood of this happening before 2019 appears to be a long shot. Even if Neuralink - the brain-computer company launched by everyone's favourite gazillionaire, Elon Musk - is online by then, it's hard to imagine that he'll be dropping memories into users' minds like Apple dumped copies of U2's LP into everyone's iTunes. (Although it's safe to say that Bono has considered something along those lines.)

But what if we're implanting the false memories into ourselves, without realising it? As social media and technology allow us to focus more tightly into our own communities and reinforce (possibly latent) beliefs, it's unsurprising to learn that plenty of people have flawed recollections.

Today's equivalent of Rachael wouldn't be a conspiracy theorist, wilfully rewriting history: she'd simply be a normal human being, as susceptible to Fake News on Facebook as anyone else. As humans, we respond strongly to gut feeling - and if a story from a group of people we trust, in a space we feel safe in, smells true - we're likely

to believe it.

The problem is that in an era of Fake News, the story is bullshit, the friends are anything but, and the safe space is social media - which is precisely designed to make us keep responding to things we are likely to believe.

Think you're safe? Forget it. When even the statements of the leader of the free world are false, it becomes statistically difficult to differentiate falsehoods from reality. Maybe you need to try the Voight-Kampf test on yourself.

### Genetically adapting human life - 3 Replicants out of 5

*Blade Runner's terrifying but eerily likeable bad guys - Roy Batty and Pris* - have only been allotted four years of life. This countdown timer is programmed into the humanoid off-world workers, who, not thrilled with this arrangement, have headed to earth to find someone who can extend their lives.

They find J.F. Sebastian, a human who alters living beings to look completely different to the point of absurdity. (A crueller writer than this one would point to a before-and-after photo of Sylvester Stallone, tap their noses, award this section a full Five Replicants and move on.)

But the more fascinating reality of today is that genetic engineering of humans has already begun. There are already women happily walking around with lab-grown vaginas, and the possibility of implants to make you half-human, half-machine is already here. And yet the really weird stuff is only just starting to happen.



In China, where restrictions around genetic modification appear to be as loose as their famously roomy Intellectual Property laws, doctors are already experimenting with genetically modifying children before conception.

Soon, choosing eye and hair colour, as well as genetically proofing children against disease, could be a normal – if morally quagmire-like – part of conception.

So while this tech could be used to ensure a person can live as long as possible, it stands to reason it could also be used to limit lifespan, like our poor anti-heroes Pris and Roy – so we're close enough to award a conservative three and a half Replicants.

#### Animal cloning - 5 Replicants out of 5

The presence of animals in *Blade Runner* is not as emphasised as much as in *Do Androids Dream of Electric Sheep?*, but animals are still considered a luxury of the hyper-rich. Mass extinction of animals is hinted at, presumably a result of the dense, sickening clouds of pollution that envelop LA in 2019.

In 2017, cloning animals is old news. Dolly the Sheep was born nearly 20 years ago, grandaaaad.

There are now plenty of companies, including the amusingly heartstring-tugging *myfriendagain.com*, who offer to create a clone of your pup, presumably for an eye-watering fee in the tens of thousands of dollars.

If a dog's expensive, just imagine how much it'll cost to clone a human. But it's possible – and would you baulk at the price to bring someone back?

#### Dense, sickening clouds of pollution enveloping major cities - 4 Replicants out of 5

*Blade Runner's* world is a murky soup, the result of an ecological

with incredible electronic goods at suspiciously low prices, has really been knocking it out of the park in this regard.

One Chinese city in particular, Shijiazhuang, has gone above and beyond to do its bit. In late 2016, levels of fine airborne particulate matter reached 1,000 micrograms per cubic meter – 100 times the World Health Organisation's guidelines.

According to the National Environmental Analysis released by Tsinghua University and The Asian Development Bank in January 2013, seven of the ten most air-polluted cities in the world are in China.

So while we're not at apocalyptic levels of pollution yet – and China is quickly making huge positive steps towards green energy production – we can still nail this prediction to a firm four Replicants out of five.

**In conclusion: uh-oh, we're actually pretty close, with an average score of 4 Replicants out of 5.**

And yet, 2017 doesn't feel like *Blade Runner*, right? Where are the violent battles between the police and desperate people deprived of the care they need to survive?

Where are all the people

unquestioningly absorbing half-truths via individually-tailored data streams? Where are the narcissists having their bodies transformed into new weird shapes with cosmetic surgery?

I guess the next 18 months has a lot left up its sleeves...



disaster that has rendered life itself a weird balance between continual ill-health and selective immortality.

We've got less than two years to hit this target, but China, in rush to industrialise whilst providing the rest of the world



# MONTAG FICTION: Lovely Weather We're Having

*This story was inspired by a tweet:*

*\*realistic vision of the future\* screens everywhere but they all just show bad weather predictions  
...and is a Choose Your Own Adventure.*

The year is 2200.

You check your phone before getting out of bed to prepare yourself for the day.  
Your home screen contains a widget with the day's weather prediction.

*TODAY: Your Location: 20°c in the morning, rising to 35° by mid-day, and a 50% chance of rain.*

The widget is always wrong.  
What do you do?

- A.** You prepare for a colder day, and take an umbrella – go to **A2** \_\_\_\_\_
- B.** You prepare for a colder day, and do not take an umbrella – go to **B2** \_\_\_\_\_
- C.** You prepare for a warm day, and take an umbrella – go to **C2** \_\_\_\_\_
- D.** You prepare for a warm day, and do not take an umbrella – go to **D2** \_\_\_\_\_

**A2.** \_\_\_\_\_

If you prepare for a colder day, put on a scarf and take an umbrella, it ends up being too hot (of course). You want to shed layers walking around all day, and find the umbrella cumbersome. You end up fashionably wrapping your scarf around your head and tucking the umbrella under your arm as you enjoy the surprisingly warm weather.

A police robot commands you to halt as you round the corner. You scramble for your identification card as it attempts to scan your face and match it to the citizen recognition database. You are still fumbling in your pockets as it scans your body and incorrectly categorizes your umbrella as a potentially lethal weapon.

Electricity arcs through the air between you and every muscle in your body seizes, leaving you twitching on the ground. After you are delivered to the detainment center in a daze, you are released by a human officer who recognizes the robot's mistake but shrugs, "Better to be safe than sorry." Your umbrella is confiscated, "For your own protection," and it rains for the entire next week. "Lovely weather we're having," you grumble, as you fork over the cash for a new one.

**B2.** \_\_\_\_\_

If you prepare for a colder day, put on a scarf and do not take an umbrella, noxious sulfur-scented clouds roll in around mid-afternoon and you get stuck inside the library. You sit glumly waiting for the rain to stop so that you can walk to the bus stop down the block, watching viscous yellowish raindrops pitting the concrete outside. The rain doesn't let up for hours, and you want to go home. What do you do?

If you risk running to the bus stop with your scarf over your head, go to **B3**

If you're not an idiot who wants to be blinded by acid rain, go to **B4**

**B3.**

What are you, an idiot? That rain would eat through your scarf in seconds. Go to **B4**

**B4.**

You know it will hurt your wallet to do it, but you have to call an autocab if you're going to get home before dark. You open the app on your phone and see them zipping around the map; looks like no one counted on rain today.

Your autocab pulls up to the library entrance and extends a weather-proofed awning over the door. Climbing in, you are greeted by several other miffed passengers. "Lovely weather we're having," says one, rolling her eyes towards the menacing sky.

**C2.** \_\_\_\_\_

If you prepare for a warm day, and take an umbrella, you also slather yourself in 3000 SPF sunscreen – by the year 2200, the ozone layer just ain't what she used to be. And boy, does it turn out to be a scorcher. You end up using the umbrella as an extra layer of sun protection as you run your errands, and even then, it feels like the soles of your shoes are melting into the concrete if you stand in one spot for too long. It's way hotter than 35° by mid-day.

You buy two bottles of electrolyte drink from a vending machine to replenish yourself from sweating so much, and go to sit on a bench in the shopping plaza. The mall is overrun with chloro-kids on skateboards, acting up like they're getting energy from the sun. Injecting chlorophyll into your skin doesn't actually make you able to photosynthesize, but the kids think it looks cool to turn themselves green and use the weather as an excuse to menace the general public.

A green kid with bleached eyebrows and short, spiky hair rolls up to you on his skateboard and sneers at your umbrella. "Lovely weather we're having, eh?" Before you realize you're being harassed, the kid grabs the plastic drink bottle in your hand and squeezes, so that it squirts into your face, and rides off cackling.

**D2.** \_\_\_\_\_

This morning you have awoken with a sense of purpose and trust in the universe. You feel optimistic, and figure a 50% chance of rain is also a 50% chance of not-rain. You head out without a scarf or umbrella, and for once, the widget is correct: the weather is lovely all day.





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## Boost your brainpower

**We all know this feeling: you already have so much to do, but you know you have the potential to do more, and while the tasks in front of you are absolutely doable, you just can't seem to get it all done.**

Maybe it hits you at 3 PM at work, or the night before a big deadline, but no matter when it strikes, it's the most inconvenient time.

Most of us have found our own ways to cope with this feeling: healthy methods include taking a walk, doing some light stretching, or just relaxing until you can turn your mind back to the task you should be focused on.

Less healthy methods include beating your head against your wall, desk, or keyboard, until you actually get around to doing the damn thing.

Now what if I told you that you didn't have to experience this feeling, that you could take a pill and be able to harness the power of your own mind at its maximum potential?

Welcome to the world of nootropics.

*There is a pervasive myth about the human brain that we only use 10% of it*

### Change Your Mind

The word "nootropic" was coined by Romanian psychologist and chemist Corneliu E. Giurgea, from the Greek word for mind (*nous*) and the verb to turn or change (*tropikos*). It's used to describe a category of drugs called cognitive enhancers, also known as smart drugs, which include stimulants (like the amphetamines found in Adderall, the #1 study buddy), cholinergic drugs (which act on chemical reactions between neurotransmitters), and a host of other natural and unnatural dietary supplements (such as ginseng and ginkgo biloba).

There is a pervasive myth about the human brain that we only use 10% of it, which has been soundly debunked by modern brain imaging technology, but serves as a great jumping-off point for science fiction and fantasies of what we could do with increased brainpower.

The nootropic market got a big boost after the release of the 2011 thriller "Limitless," in which a writer played by Bradley Cooper starts taking a mysterious nootropic substance called "NZT-48" which supposedly unlocks the remaining 90% of his brain functions and allows

him to become fantastically wealthy off of the stock market. The film ends (spoilers!) with the implication that he has figured out how to retain his superhuman intelligence without the drug (after much drama involved in acquiring and synthesizing it to maintain a supply) and that he will become president of the United States. If only being superintelligent were actually a prerequisite for that position...

"Lucy," a very similar film from 2014, finds a drug mule played by Scarlett Johansson accidentally absorbing a large quantity of a nootropic with the same purported ability to unlock the unused parts of the brain, and she ends up (spoilers again!) transforming and transcending human form to become a space-and-time-defying supercomputer. And, having also been the star of AI-love-story "Her" this isn't the first time Scarlett Johansson has been featured in a Transhumanist narrative... is there something we don't know about ScarJo?

While most people are simply entertained by the hyperbolic nature of these outcomes, others may have walked out of the theater thinking "Where can I get my hands on some of this stuff?"

### Get Limitless Here

Enter "Limitless Life," found at literally "get limitless here" dot com. They sell "experience enhancing supplements," including Katy: "a brand NEW, legal, all-natural, organically grown, plant-based nootropic supplement that will bliss you out." Marketed towards both health-conscious ravers and performance-enhancement-seeking biohackers, it's supposed to make you feel good while it makes you smarter, but it seems that most people who would try this instead of your average festival drugs are already pretty smart.

Supplement-peddling startups like Nootrobox (now known as "HVMN") market directly to the Silicon Valley crowd claiming to increase energy, focus, and creativity.

*"The human drive to self-improve is timeless, but modern technologies now allow us to enhance in precise and measurable ways like never before."*

Different supplement blends like RISE, SPRINT, and YAWN are optimized for different parts of your day. These mixtures of nootropics are commonly called "stacks."



Stacking supplements is where some of the actual biochemistry comes in. We know that choline is important for helping neurotransmitters work, so a choline supplement will usually form the base of the stack along with a "racetam," like piracetam. The mechanism that makes racetams grease your thinking gears isn't really understood, but they can sometimes act as stimulants as well. And speaking of stimulants, there's almost always a nice big dose of caffeine in a nootropic stack so you can really feel the brain juices flowing.

Many of the other chemical compounds used in nootropic stacks are supposed to improve working memory, or increase your general health and well-being like fish oil, omega-3 fatty acids, and vitamins like B12, which are mood-boosting and often featured in energy drinks. It turns out dopamine has a lot to do with productivity, so feeling good is half the battle.

### But Do They Really Work?

Everyone knows drinking a cup of coffee or smoking a cigarette (even though it seems relaxing, nicotine is a stimulant!) can help you reset your mindframe and get into work mode. But all those other fancy chemicals, do they actually do anything?

Because of the increasing popularity of nootropics, anecdotal evidence for their effectiveness continues to spread – check out /r/nootropics on Reddit if you want to read stories from hundreds of willing guinea pig-turned-amateur-neuroscientists, but their use as performance enhancers in healthy adults has yet to be scientifically proven.

Most nootropics have been shown to be effective in treating memory disorders such as Alzheimer's, Parkinson's, and Huntington's diseases. The majority of research into memory-increasing drugs and chemical supplements is geared towards people who are losing their memories, not towards healthy brains that wish they could be better.

It could be that the simple distraction of taking that coffee or smoke break is what actually works, and not the stimulants themselves (though most likely it's both). The same goes with taking the time to optimize your health with supplements – if you have time to performance enhance, then you probably have time to give your brain a natural boost through exercise, relaxation, or other proven ways.

### Or it could be the effect of another well-documented neurobiological phenomenon.

The placebo effect can actually trick your brain into releasing some of that dopamine that you wanted in the first place, even if the drugs don't do it.

According to research from the journal *Thinking and Reasoning*, summarized by *The Science of Us*, there is a real neurological phenomenon happening where most people find that they are most creative, or able to come up with unorthodox solutions to problems, when their mind is wandering in the shower.

So while there's nothing that really exists to give you that "Limitless" effect, everyone is at their best after getting squeaky clean, and there's no reason not to take vitamins if you want to. Between pills and powders, placebos and showers, anything is better than applying your head directly to your keyboard.

MAGAZINE

MONTAG



# Organ donor to organ cloner: Grow your own body parts

*Tailored, lab-grown body parts will make an enormous difference to necessary – and not-so-necessary – surgery. How long would you want to live if you knew heart attacks were no longer a threat? How far would you go to get the body you want?*

## A living beefburger

Growing a beef burger is, apparently, a tough enough challenge. The cost of producing a single palatable lab-grown burger was hovering around the \$300,000 mark until a couple of years ago, yet investment in the cultured edible meat industry has been in the hundreds of millions. (You can now buy a tasty lab-grown burger for about \$15.)

The reason these astronomical sums are involved is because we humans are playing catch-up, and time is money, baby: nature's had a few billion years head-start and it's still much easier to grow real meat the old fashioned way.

*Most people are eager to accept meat grown in giant petri dishes. But what about living, twitching, bleeding body parts?*

We're getting there, though – expect your sausages to be cruelty-free and just as delicious within a decade or so. Maybe they'll be genetically altered to be good for you too.

The advantage of humans playing god, the argument goes, is that we can have our beefcake and eat it: all the advantages of meat (taste, nutrition), with none of the disadvantages (mass slaughter of animals, clogged arteries). Most people are eager to accept meat grown in giant petri dishes.

But what about living, twitching, bleeding body parts?

## Be Your Own Butcher

If it's incredibly complex and staggeringly expensive to produce a quarter of a pound of minced cow, you'd be forgiven for thinking

we must be a lifetime away from growing living body parts. But you'd be very wrong, because people are already walking around with real, living body parts that they weren't born with.

By the end of this article you might not be so sure how long your "lifetime" is going to be any more, either. We're entering a world where now-standard operations will seem like butchery, where disease is cured with 3D-printed organs, and where a trip to the operating theatre is more akin to a mechanic changing the tyres on your car.

This writer remembers with puce-tinged vividness a junior school trip to a museum whose guide took great delight in explaining exactly how barbarous operations were in early Victorian times.

And one day soon, schoolchildren will gather around a museum exhibit demonstrating the early 21st century hospital and laugh at how archaic it seems: Amputation! Rushed organ transplants from dead people – or "donors" as they were called! Skin grafts! "Cures" for cancer that involved radiation poisoning! No wonder no-one even reached 100 in those days...

The reason it won't make any sense to them is they will be right: all these operations and treatments are

barbarous, when compared to what's about to happen.

Get ready to enter a time when your diseased or damaged or worn body parts are simply re-grown and swapped out.

## Bring Your Own Bodyparts

Maybe the immediate image of "grown" human body parts is the

famous ear-on-a-mouse which was such a striking image – it's an ear... on a mouse! – that it became early internet meme.

But while the sight of a mouse with a human ear attached fuelled some precious, precious Internet Outrage over the perils of genetic engineering (despite the ear-on-a-mouse not being genetically engineered at all) today's technology has moved a long way since then.

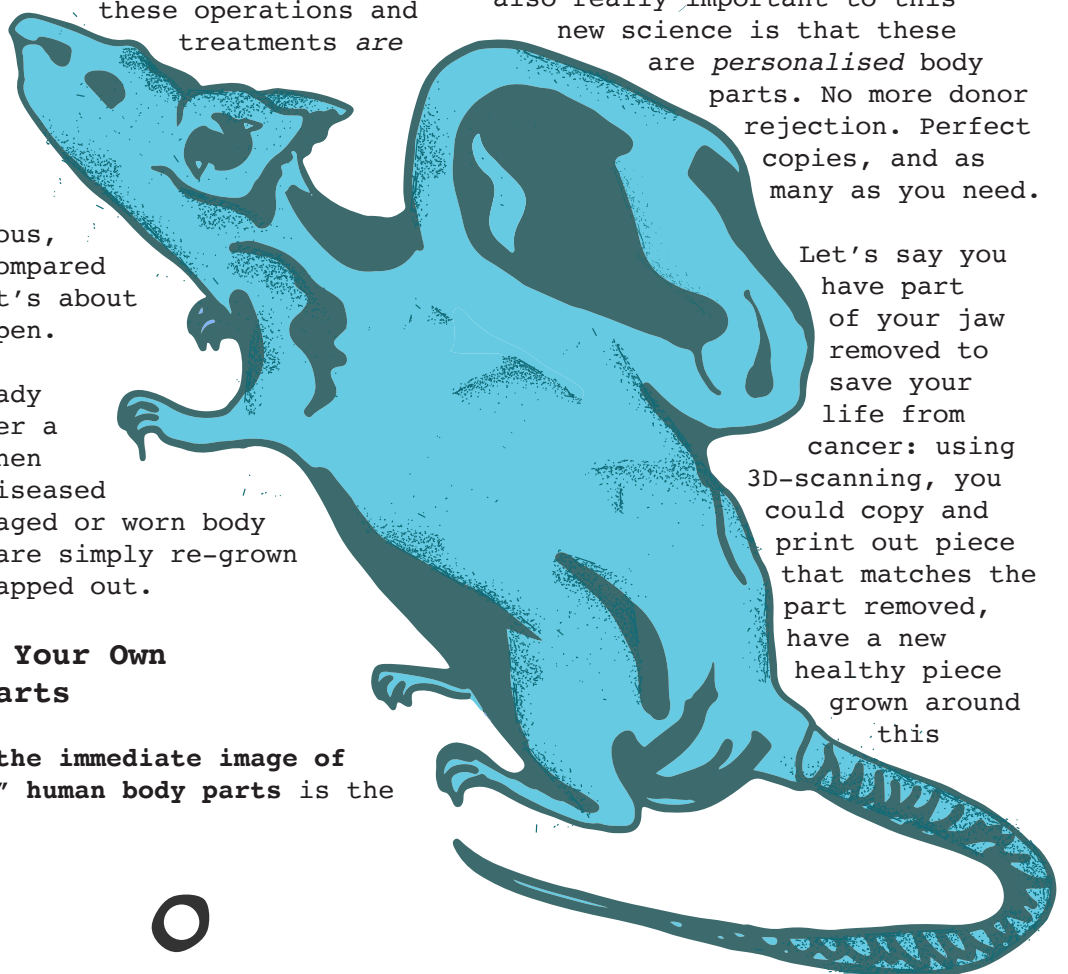
As is often the case with step-changes in technology, it's actually a number of technologies maturing at once that has made the idea of growing duplicate organs possible.

*No more donor rejection. Perfect copies, and as many as you need.*

3D scanning, computer modelling, 3D printing, biodegradable plastics, advances in micro-engineering, and tissue-growth tech: all these individual areas of expertise must be corralled and made to fulfil very specific roles in very specific laboratory conditions. And then out pops a kidney, or something.

While the idea of creating new organs from scratch is perhaps mind-boggling enough, what's also really important to this new science is that these are personalised body parts. No more donor rejection. Perfect copies, and as many as you need.

Let's say you have part of your jaw removed to save your life from cancer: using 3D-scanning, you could copy and print out piece that matches the part removed, have a new healthy piece grown around this



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scaffolding and implanted later. It'd be an exact fit - genetically and physiologically - so your face would look exactly the same as before the operation.

Then one day, you'll be able to have the jaw grown quickly in advance, so surgeons would just cut the old one out, and pop in the new. And one day behind that, the new jawbone will be 3D-printed right into your face during the operation.

And that's when the huge compromises of the present that accompany these operations - being forced to choose pain and disfigurement over health - will vanish.

### **Start saving now: lab-grown organs are here**

**If you're wondering about a reasonable time-frame to when we can expect this to start changing our lives - how about right now?**

Because there are already a number of women with lab-grown vaginas. It sounds like the set-up to a misogynistic joke (and, let's face it, it most likely is), but this pioneering operation has transformed the lives of a number of women born without fully-formed vulvas.

The new vaginas were grown in a method that is pretty much a template for creating all lab-grown organs. Cells are removed from the subject, which are then cultured and grown around an artificial scaffolding created from a scan of the patient.

Once grown, it's then implanted into the women - and remarkably, it seems to just... work. The women report that their lives are much improved, that they can enjoy sex as "normal", and can quite possibly have children as normal, too.

If anything, it's remarkable that we're not forming disorderly queues to be next in line to have a new body part grown and slotted into place.

### **Beat, your greens**

**What's interesting is that, as this technology develops,** it becomes clear that we humans aren't simply tricking nature or finding loopholes: we're actually becoming more in tune with it, in really remarkable ways.

While 3D printing frameworks for organs to grow on seems to solve most problems - it's great for growing cartilage onto, for instance - it doesn't solve them all. Creating replacement hearts has proven especially difficult (like, duh!), due to the nature of the network of blood-delivering arteries in developing heart organs.

So when, over a healthy lunch, scientists noticed that the spinach in their salad looked a bit familiar, so they stripped away the green matter and grew flesh over what was left. And it worked. Blood flowed down the passageways that were used in the leaf's structure, and was delivered to the developing heart tissue in exactly the way it needed.

We've entered a world where idle, fleshy, shower-thoughts can be made to work.

### **Be still, my beating hearts**

**When you can grow anything in a lab, lots of established medical practices change very fast.** These new body parts won't just save lives on an individual scale - it'll super-charge medicinal research and change our approach to what our bodies do.

*When you can make whatever replacement lump of flesh you want, the future feels like a much less scary place.*

If you can grow an unlimited number of kidneys to run tests on, you can develop medicine faster, better and more cheaply.

When you can make whatever replacement lump of flesh you want, the future feels like a much less scary place. In other ways, it

also feels a much less certain one, especially when you raise the question of morality and what it means to be human.

It's fairly clear that when you need a new liver, you'll have a new one created. Fine. But how many times do you grow and replace the liver of an alcohol addict who keeps on drinking after replacement? What if you could genetically modify the addict's liver so that it would process alcohol five times more effectively than his old liver? Would he just drink more?

And that's before you consider vanity use of this technology.

### **Vanity and everlasting life**

*What if you replaced all the parts of your body - are you still "you"? How would you know?*

**Consider just two of men's most obvious hang-ups:** would men with thinning rugs even hesitate to invest in a brand new scalp, bristling with a thick, luxurious and virile thatch of hair? Is it a depressing certainty that they'd enter a pathetic arms-race with their peers, having ever-larger genitals transplanted until they look like comical fleshy tripods?

Beyond vanity is the concept of, well, life itself. No more heart attacks - you just have a new one put in pre-emptively. No more cancerous organs - switch that out for one that's DNA-tweaked so that cancer won't touch it. So when do you stop?

Assuming you can grow as many new hearts as you like, at what point would you consider no longer replacing them? When you are well into old age and have replaced more than 50% of your organs, are you now a new person by majority rule? What if you replaced all the parts of your body - are you still "you"? How would you know?

Much longer, more personalised lives await us. We now just have to decide at what point we're no longer who we think we are.

# Sell yourself!

***In a "sharing economy" where we share our vehicles and homes in exchange for cash, will we also be able to profit off our own invisible - and more tangible - human by-products?***

## **What is your personal data and how do you sell it?**

**In order to understand how much your data is worth, you first have to figure out what that data is.**

Data brokers pay for three types of data: volunteered data (such as social media profiles), observed data (such as location data from cell phones), and inferred data (the combination of volunteered and observed data that can supposedly predict your future behavior as a consumer).

But they can also find plenty of your personal data out for free, from public records, governmental databases, and other publicly available sources:

- Identification data (such as your name, address, email address)
- Sensitive data (such as birthdays and social security numbers)
- Court and public record data (such as criminal records and marriage licenses)
- Home and neighborhood data (such as real estate listings)
- Vehicle data (such as vehicle registrations and insurance)
- General interest data (such as charitable donations)
- Financial data (such as credit reports)
- Travel data (such as frequent flyer information)
- Purchase behavior data (such as what you buy and how you pay for it)
- Health data (such as over-the-counter drug purchases and "ailment and prescription online search propensity")

So the next time you end up on WebMD after Googling the symptoms of a common cold and managing to convince yourself it's actually brain cancer, remember that a data

broker somewhere is also laughing at your hypochondria.

And what are they using it for? "People search products," which can be used to locate individuals for various reasons, are the least profitable (about a \$52 million dollar industry as of 2012).

Then there are "risk mitigation products," which use personal data for fraud detection and credit information – this industry is worth over \$177 million.

And finally, marketing products, the largest industry trading our personal data (worth \$196 million) which everyone should be familiar with – they need to know who you are, where you live, and what you like, to make effective advertisements and get you to buy more stuff!

## **What is your data worth?**

*An individual's age, gender, and location is worth only approximately \$0.0005 per person*

**This dense cloud of personal data that we generate over our lifetimes is worth surprisingly little.** According to a 2015 study by Western Digital, a data storage company, 5,000 consumers valued their data on average at \$3,241 (that's \$4,165.33 today).

Those 5,000 consumers would be crushed to know that all together their personal data would be worth about \$2.50. According to a Financial Times report in 2013, 1,000 people's personal data collectively costs \$0.50, and an individual's age, gender, and location is worth only approximately \$0.0005 per person.

For more specific information, such as the names of people who suffer from a particular disease, an individual name could cost up to \$0.30.

Of course wherever a legitimate market exists, there is also a black market, and the value of data such as health records,

identification, and credit card info on the dark web is much higher.

Login and password data for premium content services, such as Netflix, is worth about as much as a whole person's personal data on the open market: \$0.55 (and who hasn't given away that information for free at least once?)

Stolen credit or debit card numbers fetch \$20-35, which seems small for the amount of havoc one could wreak with that information. Health records on the dark web can go for \$50 apiece and online banking login information depends on how much money is in your account, but can retail between \$190-\$1,000.00.

## **Can you sell your data yourself?**

**Obviously most people won't ruin their own lives by selling their own credit card or banking info on the dark web,** but a service does already exist to allow you to personally profit off of legal data sales.

Datacoup is the "world's first personal data marketplace," which will help you collect and sell your data for cash.

According to several sources, you can earn about \$8 per month selling your personal data via Datacoup, and currently the service is only available in the US. You must install certain applications to allow Datacoup to monitor and collect this data, which people who are already trying to gain control over their personal data may be averse to.

There are also two notable examples of individuals who have taken a more radical approach to selling their own personal data: a Dutch student named Shawn Buckles, and a Brooklyn-based engineer named Federico Zannier.

From May 6th to June 5th of 2013, Zannier opened a Kickstarter called "A bite of Me" with a goal of \$500, to sell a painstakingly collected arrangement of personal data.



He states on the Kickstarter's campaign page:

"Since February, I have been recording all of my online activity (the HTML pages I have visited, the position of the mouse pointer, a screenshot of what I was looking at, a webcam image of me looking at my computer, my GPS location and a log of the apps that I was using)... I'm selling this data for \$2 a day. If more people do the same, I'm thinking marketers could just pay us directly for our data. It might sound crazy, but so is giving all our data away for free."

For \$2, backers would receive one day's worth of this data; \$25 for a week of his data and access to his custom tools to collect and analyze their own data – and for a pledge of \$200 or more, access to the entire data archive, 7GB of information including:

"50,000 files, which include some 2,800 websites I visited; 20,500 screen shots; 17,000 webcam images; a recording of my mouse pointer movements; my GPS location; an application log of 23,000 lines of text; an iPhone app and a Chrome Extension for tracking your own activity; a suite of tools for analyzing the data (which includes 50 bash, python and R scripts)."

He got 213 backers who pledged \$2,733 in total, and has not supplied any further updates on his personal website federicozannier.com (which now belongs to a Japanese SIM card marketing company) or myprivacy.info – a now-defunct site that previously hosted visualizations of his personal data.

**Over \$2,000 is not a bad take compared to Shawn Buckles' profit:** he set up a "Data for sale" website with an online auctioning system to sell his personal data in April of 2014.

Tech publication The Next Web was the highest bidder and paid him €350 for his personal profile, location records, train records, personal calendar,

email conversations, online conversations, thoughts, consumer preferences, and browsing history. The Next Web planned to use his data to illustrate the issue of privacy at their 2014 The Next Web Conference, and Buckles donated the profit for "selling his data soul" to Bits For Freedom, a Dutch digital rights association. All of it seems like a noble demonstration, but since he included information such as email and online conversations with others, he has admitted the project lost him some friendships.

Buckles also released a pamphlet on digital privacy containing some food for thought, as we contemplate what it means to create, monetize, and define ourselves by our data:

"Privacy is the right to live unobserved and undisturbed, and to decide for oneself what information one shares and with whom. Privacy is based upon a personal environment [sic] in which we can seclude ourselves. Privacy is essential in shaping one's identity.

"But privacy is gone. We gave it up, for no other reason but the thought that it's useless. Why don't we protect our rights? Our ancestors fought fiercely for them –because they were oppressed.

"'I've got nothing to hide'

"This is a fallacy. What will happen if a Hitler takes power tomorrow? Nobody'd be safe. He wouldn't only know our location, networks and believes, also he could pretty accurately predict our behavioural patterns and our patterns of resistance. To flee or hide would be impossible. We'd be powerless. Whether we have something to hide is defined by the context in which we live.

Their [sic] will come a day we need the right to privacy. Maybe that day's today. Are we free? Do we live in peace?

That depends on who you regard as your friend. And more importantly [sic]: how your friends regard you."

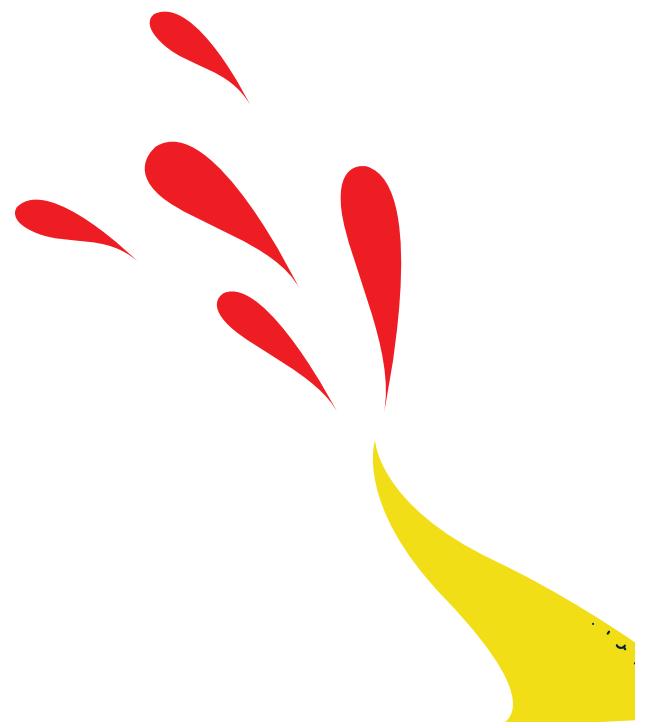
**While we live in a society where we are constantly interconnected by technology, our personal data choices also impact those around us.**

It seems ironic that part of Buckles' privacy manifesto warns against the imprisonment of technology and links to Edward Snowden's TED talk on "How we take back the internet", while espousing the dangers of governmental control of our personal data – but through this project he has not only participated in his own self-commodification, but involved unwilling participants as well.

Where the personal meets the political in the monetization of data seems to be an always shifting line, and the old adage of "if you can't beat 'em, join 'em" rings hollow but true in both Buckles and Zannier's examples.

As people gain more awareness of what data is being constantly collected about them, hopefully we move towards a future in which people are more empowered and enriched (in knowledge and capital) by their personal data than enslaved by the combination of technology and global capitalism that produces this increasingly profitable market.

*So what else can we hawk for cash? Turn past the centrefold to explore the other human byproducts that you can sell in the future: from bodily fluids to more dangerous, and lucrative, wares...*









### **Sell your body... but not how you think**

**Some say you may be worth more dead than alive but that's a pretty bleak way to think about your future.** To put it more precisely, your organs are worth much more monetarily outside of your body than in you.

Until we perfect the science of cloning and figure out the ethics of slaughtering your clone for spare parts, or simply grow organs in labs, we are going to have to do things the old-fashioned way: organ transplants from corpses or live donors.

But it's not just organs being traded on the open or the black market; there are many, many parts of your body you can sell, several of which you can part with painlessly (and live!) ...and did you ever wonder who's buying?

*Your organs are worth much more monetarily outside of your body than in you.*

### **Your Personal Inventory**

**What would you give an arm and a leg for?** While voluntary limb amputation isn't very common (they're pretty stubborn to re-install) there are a lot of things you can live without if you're really strapped for cash.

First let's go through the human products you throw away all the time - money down the drain in a literal way. Then we'll get to the slightly more risky (and more profitable) items before we hit the big ticket items that may cost you your life to sell.

#### **No Sweat**

**You can't sell your sweat** (that we know of) but selling these waste products are about as easy. And while you can buy tears for \$500.00 per mL, Lee Biosolutions does not list how much they paid the "Single Human Donor."

Donating blood saves lives, and can net you \$120 per year if you donate every 56 days and get a \$20 gift card every time. And plasma isn't much more lucrative than blood:

depending where you are, you can get paid \$20-50.

There's a legitimate medical use for your #1 biggest waste product (or should we say number 2?) All gross puns aside, you can make \$40 per donation off of selling your *scheiße* to a stool bank called OpenBiome if you have the right cocktail of bacteria in your gut to participate in fecal transplants for people afflicted with *C. difficile*.

The most innocuous fluid, that famously sterile (it's not, actually) golden stream, supposedly can bring in up to \$200 per serving. According to the basics of supply and demand, one would think this prolific, nutritious (it's not, actually - doctors now say you shouldn't even drink it in the wilderness) liquid would be cheap, because it's so plentiful.

But it's the demand that matters: if you manage to break into the market to sell drug-free urine to people who can afford both lots of drugs and lots of clean piss, rumor has it it's incredibly lucrative.

The most painless and lucrative disposable human product you can sell by far is hair. Virgin hair, as in never chemically styled or dyed, depending on its purity, length, and color, can go for \$250-\$3,000. HairSellon has a nifty online calculator to help you figure out how much your hair is worth: red hair in particular is more valuable than other colors.

### **Sex-specific Human Products**

**That other bank of bodily fluids (the sperm bank) seems like a much more profitable option** for those who can produce sperm: between \$35 and \$100 per donation or up to \$125. Becoming a sperm donor also requires a screening process, which sources say very few actually qualify for - but it won't hurt to try.

Only the Breast, "a community for moms," is the open market for breast milk. They provide information about breast milk donor screening, collecting, handling, and storing milk for sale, as well as shipping with or without dry ice.

By the ounce, and depending on various factors such as special diets, human breast milk costs

\$0.90 - \$2.00, but considering that the average baby needs 25-35 oz per day, those numbers could really add up.

That's also assuming that the Only the Breast buyers are intending to feed it to babies, but there was a trend in the last few years for adults to drink it (which the Journal for the Royal Society of Medicine advises against).

If you produce eggs and are between the ages of 21 and 34 you can apply to undergo a series of tests and, after a several-week process including injections of fertility drugs and hormonally-induced ovulation for the maximum harvest, walk away with up to \$14,000 depending on how many eggs are produced. This includes an \$8,000 compensation for all the appointments and medications. You could gather quite a nest egg, providing one for someone else!

Working as a surrogate and carrying someone else's baby to term in your own womb (more like a body rental than a sale) can also pay \$39,000 - \$52,000 "depending on factors including the type of pregnancy and the number of previous pregnancies (surrogate mother experience)" - but that is seriously a full-time job.

Placentas are also highly valued for both cosmetic and nutritional purposes. If you can keep yours (some hospitals do not let their parents take them home) and don't want to eat it yourself (as one source mentions stir frying it with onions and another recommends powdering it and mixing with something like a Bloody Mary, consider selling it to someone who will make it into a hair mask. This one is a little tricky (and illegal in many places) to sell, so most sources won't cite a price.

### **Illegal (For Now) & Risky (But Bankable)**

**Due to the National Organ Transplant Act of 1984**, it's mostly illegal to sell organs and internal tissues (even with a willing, live donor). However, in a 2011 legal case a U.S. court ruled that bone marrow should no longer be included on that list. They also set the price at up to \$3,000, but because it's so hard to match bone marrow donors with those in need of marrow, it's still very hard to get paid for a donation.



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And finally, we've arrived at those bloody beans: your kidneys! Because of the aforementioned organ sale prohibition, it is definitely illegal to sell your own kidney in the US but somehow in 1999 someone managed to get bidding up to 5.7 million dollars for a kidney on eBay before they were delisted.

You didn't hear it from me but after the organ harvesters and brokers take their cut, you can still get between one and ten thousand dollars a pop. Want more reliable (and legal!) compensation? Consider a holiday in Iran.

### Do It Yourself

**eBay's policy on human remains and body parts states:** "We don't allow humans, the human body, or any human body parts or products to be listed on eBay, with the exception of items containing human scalp hair."

While another popular online marketplace, the handcraft and vintage shop Etsy, has a slightly looser animal products and human remains policy, prohibiting all items made from human remains, "except for teeth and hair."

It's more likely you will find a crocheted organ like Theo the Thymus or Stanley the Spleen if your shopping proclivities include buying organs.

Scouring eBay for any human products that may have slipped through the cracks of this policy, we struck gold on a listing for a "Human soul great condition slightly used free of sin". The seller notes that its quality is "weighted by several minor bad deeds, but all have been repented."

The price has been set at \$500.00 with over 30 people watching the item at the time of writing, and yes, according to the description, they are extremely serious:

"A human soul extracted with the full consent of the previous owner. Any information regarding the previous owner is strictly confidential and may NEVER be revealed to the buyer or any third party.

Preferred use with a female vessel but WILL NOT in any way HARM a male vessel. In rare cases, may cause mild sexual confusion if used with a male vessel but WILL NOT cause homosexuality.

The presence of the soul is felt by a true believer but is not visible by eye or detectable by any known apparatus.

Jar not included.

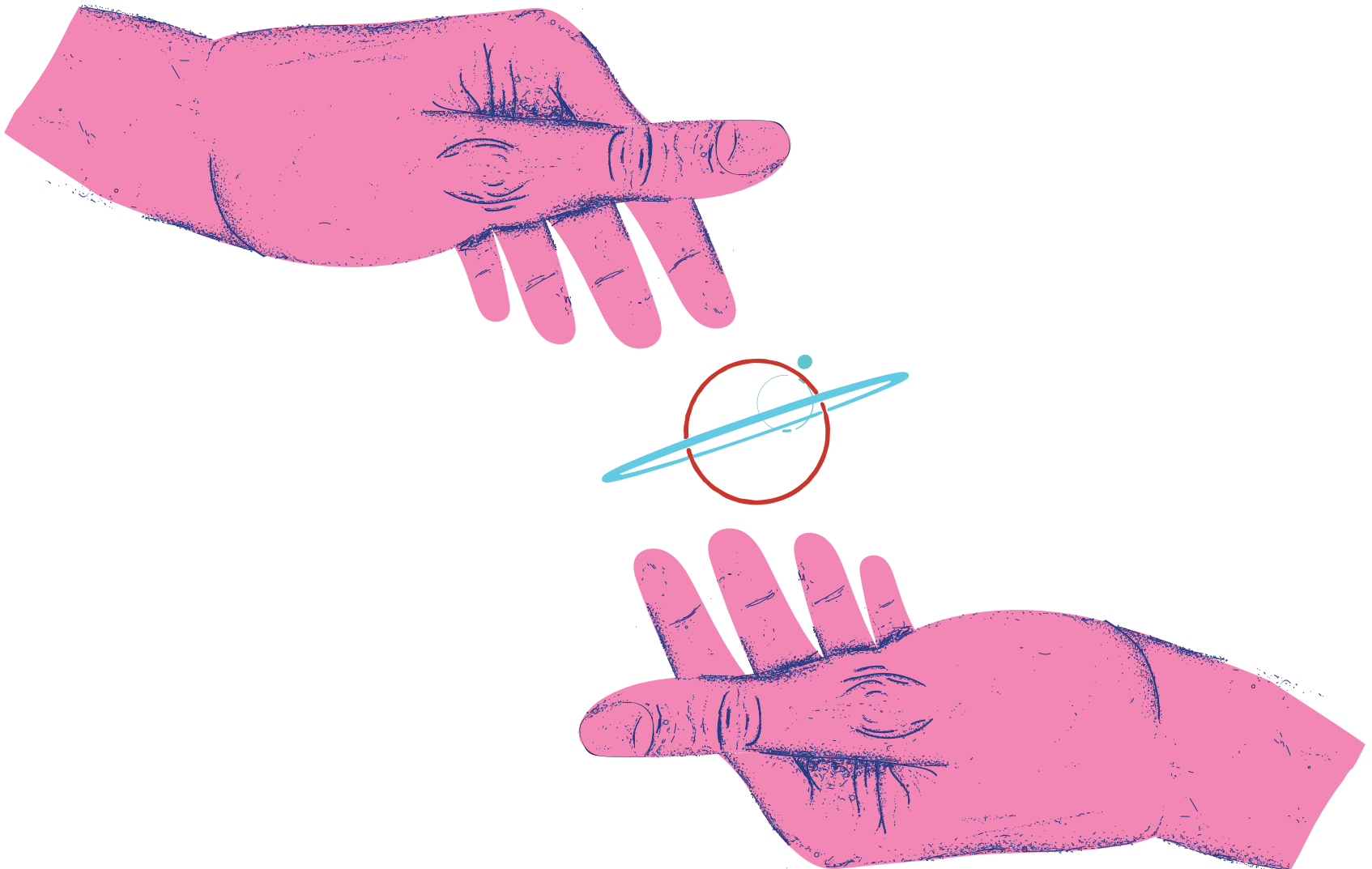
Please make sure you're a true believer before purchasing the item. If you do not feel the presence of the soul, there is nothing we can do to help.

If not inserted into a vessel, the soul will expire in autumn 2036. Unfortunately, a precise date can not be calculated.

**IMPORTANT:** Use with technology (software, robots) has not been tested and is NOT ADVISED. There is no way to predict the outcome or the possible effects on the soul."

Unfortunately it is not within the MONTAG budget to purchase this item in order to test its compatibility with technology and see exactly what would happen if one attempted to transfer this soul to a robot or a MacBook.

But if you, dear reader, want to buy it and let us know, please email your findings to [montag@getgrover.com](mailto:montag@getgrover.com).



# Biohacking: You are what you eat

*Biohacking can be intensely risky, but can also bring life-changing results: long-term illness eradicated, mental health restored. MONTAG's Sean Fleming learns how physical self-experimentation can begin with drugs, and reach as far as, erm, consuming someone else's poop...*

*“Most modern medical techniques don't work, so you just expect me to deal with my symptoms for the rest of my life? That sounds wacko.”*

*– Josiah Zayner, biohacker extraordinaire*

*“Politics is politics and science is science and there's a bit of a tension between them sometimes.”*

*– Professor David Nutt, former UK Gov Chief Drug Advisor*

## Do It Yourself

To some, Biohacking is more than working out that when you exercise you sleep better, or taking Modafinil makes you more productive. To these people, Biohacking means serious self-experimentation, and solving real world health problems that modern medicine has been unable to do so.

One of these serious dudes is Josiah Zayner. If the name rings a bell it might be for one of two reasons:

**The first** is his crowdfund aimed at providing people with CRISPR kits to alter bacterial DNA.

**The second** is the DIY faecal transplant he performed. On himself. And yes, a faecal transplant is pretty much what you're hoping it isn't.

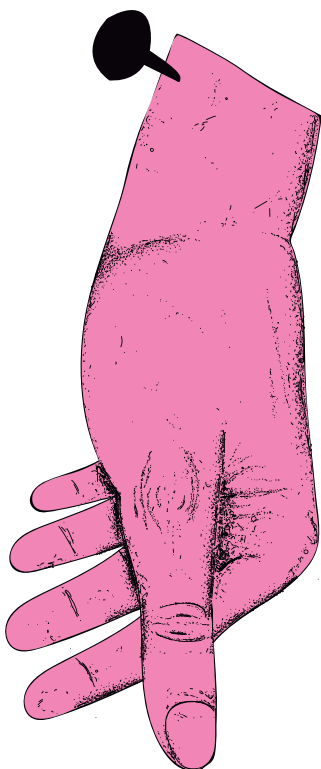
Josiah has suffered from severe gastrointestinal issues for his entire life. His gut bacteria works against him on a daily basis.

Gut flora is a funny old thing. The microbial life in your belly dictates your gastrointestinal health, your weight, and even - potentially - your mental health. This mass of microbiotic genetic material - the microbiome - is so important to human life, it is considered a partner to our own personal genetic material.

Having tried and failed to alleviate his symptoms with conventional medicine, Josiah grew tired of his gut fucking with his life. He decided to give himself a new microbiome.

## You are what you eat

**The rationale behind Josiah's experiment was quite sound.** If gut bacteria is responsible for your chronic pain, and transplanting your biome is a risky - yet within the realms of possibility - well, why not give it a go?





For all its intrigue, the experiment was fraught with hazards.

One is a very real biological danger: replacing his biome with a donor's means purging his body of all his existing bacteria so that the donor bacteria can 'occupy' Josiah's body, effectively neutering his bacterial response.

The other is, simply put, gross: the experiment involved ingesting capsules of a donor's shit.

Ickiness aside, this was an incredibly risky move. Experts almost unanimously condemned Josiah's experiment as dangerous and irresponsible. Less than 3% of faecal transplant donors are approved, and as a rule patients about to undergo transplants are told not to take antibiotics.

Of course Josiah went ahead and did it anyway. I guess if you feel you've spent your whole life being let down by doctors and health professionals, a few more negative opinions just lose their potency.

To cut a long and fascinating story short, Josiah's experiment worked. His gastrointestinal issues are gone and he's a lot happier for it.

I'd be pleased too if an incredibly risky procedure was successful and benefitted both myself and the wider scientific community. I'd be pleased if I had been vindicated after putting my life at risk to hack my health. I'm not sure how widely I'd share the news that I'd been eating poop, but that's just me.

### **Microdose this!**

**You'll be cheered to learn** that not all biohacking involves rooting around in your friends poop and then swallowing capsules of it.

If you're at all interested in how Silicon Valley tech mavens get shit done, you've probably heard the term microdosing before. Microdosing is taking very small quantities of drugs such as LSD, or Psilocybin (aka Magic Mushrooms), to boost productivity and creativity, lower stress, and stay happy.

The practice has attracted satire, obviously, but its roots go deep in the valley's mythology, with both Steve Jobs and Bill Gates going on record saying they've taken and

benefitted from tripping balls.

Furthermore, a cursory Google search will flag up endless personal accounts from entrepreneurs, programmers, creatives, and journalists who've all given it a go, to see if they can bottle lightning via some good old fashioned drug experimentation.

Dosing acid for creativity is nothing new. Albert Hofmann, the first person to synthesise LSD, believed that microdosing could be a valuable alternative to other more addictive drugs that contained amphetamines, and that it could increase focus and productivity.

Considering that LSD was created with these values in mind, it's unsurprising that people are discovering that acid isn't just the plaything of Psy-trance festival-goers, and that it may have a place within the working environment.

### **The tripping point**

**Research into psychedelics was short-lived**, but prior to its restriction James Fadiman was leading the charge and his research into psychedelics remains pioneering.

Fadiman's something of a legend within the psychedelic research community - and as a lifetime advocate of the wonders of microdosing his is an opinion that carries weight in this field, so if you're planning on riding the rainbow road to a better you let me share James Fadiman's guide to microdosing.

There are some important but simple parameters. Simply take a small amount of acid, or psilocybin, regularly for about three days. "Small" means 1/5 to 1/10 of a normal dose. (Let's save those bigger ones for Glastonbury, yeah?)

Fadiman reckons that taking LSD in the morning yields the best results, so after you've had a shower, put the kettle on, make yourself a cup of tea, and dose yourself over your cornflakes.

I would wash my hands prior to making breakfast but Fadiman's position is unclear on this.

Like most biohacking, this is very much an at-your-own-risk experiment. Expect elevated moods,

enhanced focus and productivity, and in some cases microdosers have reported it helping with depression and cluster headaches. Others have reported melting into the sofa and listening to Aphex Twin for 14 hours. You've been warned.

### **Look at me. I am the Doctor now.**

**Dismissing Biohacking, smart drugs, and life-logging as niche play** of the super-weird would be incredibly reductive.

For me, the early adopters who offer up their bodies to push this guerrilla science further are the true innovators of our time.

Society views single-subject research as the domain of the strange and the mad. Our literature reflects that fear: Dr Jekyll, The Invisible Man, The Lizard.

Self-destruction and villainy are nearly always thematically linked with the concept of self-experimentation, and yes, the ethics are wobbly and the risks are great - but playing it safe and pushing boundaries is an oxymoron.

Biohacking is moving us toward some of the most exciting preventative medicine and early warning systems.

Look at today's biohackers and think about the future: those people inserting LEDs under their skin to mimic bioluminescence, placing magnets in their fingertips and speakers in their ears are just a few degrees of separation from us all inserting heart implants that warn of impending heart attacks.

**As population age increases, health care services become strained**, and greater emphasis is placed on individual responsibility for your own healthcare and wellness, it's today's hobbyists that become tomorrow's industry.

Make no mistake, these pioneers of personal healthcare are paving the way for a new type of healthcare. Homebrewed, personal, and totally yours.

Now if you'll excuse me, WedMD is telling me that this lump on my arm is Smallpox. I think I'll figure out my own second opinion.

# The Wild World Of Human Augmentation

*We've been augmenting our bodies with technology for, well, ever, if you count clothing as technology. When you use your Apple Watch to make a voice call, it's a big step towards our bodies being the starting point we add useful equipment too. So what does it take to become a real cyborg?*

## Extra Sensory Cyborgs

In the future, technology will give us extra senses that we can only dream of today. As it stands, our natural human senses are far inferior to those of other animals. Of course, what we lack in raw sense data, we can usually make up for with our much higher brain power, but that still doesn't mean that we'll ever smell as well as a dog, or see as many colors as a mantis shrimp.

Or maybe we can. With technology, anything is possible. These artists and scientists have hacked their own bodies to become cyborgs that have more senses than the average human being. Some of them are making up for deficiencies they were born with, and others simply want to see how far they can push the limits of what it means to be human.

## Technologically Induced Synesthesia & Cyborg Art

If you aren't familiar with synesthesia, it's a rare psycho-physiological phenomenon that causes the senses to work in strange ways. Synesthetes automatically associate sounds with tastes, colors with numbers and words, smells with shapes, or any other pairing of sensory information. This involuntary cross-firing of the brain affects one in every 2000 people, with some experts suggesting that some mild forms affect one in 300.

Neil Harbisson has a form of technologically induced synesthesia. He was born with achromoplasia, and saw the world only in black and white until he was 21 years old. In 2004, he had an antenna implanted in his skull that vibrates corresponding

to colors. He then feels these vibrations as sound frequencies inside of his head, including colors that human eye can't normally perceive in the infrared and ultraviolet spectrum. These extra senses inform his art practice, and he talks extensively about the potential for this kind of technologically mediated synesthesia to revolutionize fashion, food, music, and other creative pursuits.

But is he the "first cyborg artist" as some sources have claimed? Definitely not.

Stelios Arcadiou, also known as Stelarc, a performance artist born in 1946, has been augmenting his body with technology for much longer. Many of his performances have been extremely graphic in the way that he introduces technology to his body. For example, after two surgeries, he has had a third ear implanted on his arm with an embedded wi-fi enabled microphone inside, so that the ear can not only listen, but transmit sounds. He has also made performances with other, more conventional, cyborg apparatus such as a robotic arm and a massive exoskeleton.

## Extra Sensory Perspectives

Moon Ribas, who is also a cyborg artist, has an augmentation that allows her to feel when there is an earthquake anywhere on the planet in real time. The implant under the skin of the inside of one of her elbows gets information from a custom iPhone app that aggregates data on seismic activity, and the strength of the vibration adjusts to translate the magnitude. She has described the sensation as "akin to having a phone vibrate in your pocket," and has had this extra sense for more than three years now.

She uses her seismic sense in her dance performances. In one piece called Waiting for Earthquakes, she remained still until prompted by the vibrations of the device to move. Very small earthquakes, much too minor to register for those of us without a constant stream of seismic sense data, happen approximately every 10 minutes.

Moon Ribas and Neil Harbisson are the co-founders of the Cyborg Foundation which advocates for the advancement of sense-enhancing technologies with the slogan "Design Yourself." Along with the Cyborg Nest, which Moon is also a co-founder of, they promote technological augmentations and provide information and inspiration to aspiring cyborgs.

Cyborg Nest has developed the North Sense: a \$425.00 device which allows the wearer to sense magnetic north - a skill that many flying creatures such as birds and bats, already have.

The sensor must be attached to the chest with two small titanium rods stuck under the skin, like a typical barbell piercing, and it vibrates gently when the wearer is facing magnetic north. It was designed to be an "entry level" cyborg device, as it doesn't require surgery, and in fact can be installed by any licensed piercing studio.

## Common Senses

The most accessible and common cyborg augmentation today is undoubtedly a magnet inserted in one of the fingertips. When the nerve endings in the finger heal from this minor surgery, they become sensitive to electromagnetic waves. Neodymium magnets are most commonly used, and must be coated with a body-safe material such as silicon so that metals don't leach into the blood system.

Biohackers Grindhouse Wetware have created a more advanced version that uses the magnet to transmit more complex data, such as sonar or other fields of energy. Being able to sense electromagnetic fields alone, however, can be quite useful for people who work with electronics or electricity. And there are now hundreds of biohackers who have had this procedure.

Online retailers such as Dangerous Things and Digiwell sell body-safe magnets and implantable devices such as RFID transponders, which can be programmed to send all kind of information from inside of the body.





One Swedish workplace is already using implanted RFIDs to let its employees open doors and use office equipment.

**In the future, many have speculated we'll be using implanted chips in the body instead of credit cards**

or IDs. An implanted chip could be used to store all of your medical records, for example. Market forces like using implanted technology for medical or financial purchases will most likely be what pushes this tech into the mainstream.

There will have to be a social function that necessitates having technology in the body for most people to accept it, and not just be an interesting – but ultimately personal and subjective – extra sensory perception.





compression into a diamond after cremation. Several companies such as Cremation Solutions, LifeGem, Heart in Diamond, and Algordanza offer this service.

*The human body is 18% carbon. 2% of this carbon remains after cremation, and it is this carbon that Algordanza uses to make their diamonds*

Cremation Solutions' website explains the process:

- Step 1: Place several ounces of the ashes in a crucible that can withstand massive heat.
- Step 2: Bring the temperature to just over 5,000 degrees Fahrenheit, and allow all of the elements except the carbon to oxidize.
- Step 3: Continue to heat until the carbon has turned to graphite. The entire heating process will take a few weeks.
- Step 4: Place the graphite in a core with a metal catalyst and a diamond seed crystal.
- Step 5: Place the core in a diamond press.
- Step 6: Bring the temperature to about 2,500 degrees Fahrenheit and the pressure to about 800,000 pounds per square inch. Allow several weeks for the graphite to turn into a rough crystal.
- Step 7: Remove the crystal and use faceting tools to cut it to your specifications.

Both Cremation Solutions and Heart in Diamond emphasize that while these synthetic diamonds have all the natural properties of a girl's best friend, they are more kind to the earth and lack the exploitative labor practices of diamond mining to produce.

Depending on color, cut, clarity, and carat size, individual diamonds go from \$750 to \$24,999, and that's only for the diamond, not including the setting or jewelry.

While some synthetic diamond creation processes allow for the addition of chemicals to color the diamond, Algordanza's process uses the natural beauty of the boron content of the deceased's ashes to bring out the color, which can range from white to dark blue.

And is this process also available for pets? You bet.

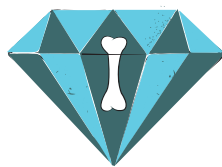
*"LifeGem for Pets? Of course.' At LifeGem, we understand that pets are cherished companions and unconditionally loving family members.*

*Since introducing the LifeGem to the world, we have received thousands of requests to memorialize pets as LifeGems. The answer is YES, we absolutely can and will create a LifeGem memorial of your precious pet." - LifeGem*

### Something's Gonna Steal Your Carbon

Can't decide between cremation and giving your body back to the Earth the old fashioned way? A Swedish process called Promession offers an eco-friendly alternative.

Invented by biologist and avid gardener Susanne Wiigh-Mäsak,



the promession process involves freezing the body using liquid nitrogen to a temperature of -196° C, and then using powerful vibrations to break it into a fine powder. The powder is then freeze-dried again and processed to remove any metals that are remaining in the mixture from prosthetics, tooth fillings, or other bits that could harm the soil.

This powdered and reduced substance is then placed in a biodegradable container and buried shallowly so that the remaining minerals are in contact with the topsoil and are readily available for plant life. Between six to eighteen months later, the container and all of the materials it contains will have been recycled.

Wired reported on the process back in 2013, and uncovered conflicting information as to its effectiveness: while it was tested extensively on pigs, its use for humans has yet to be proven since human testing is still illegal, and a source from the Federation of Cemeteries and Crematoria of Sweden claimed that some deceased people who intended to use the process have had their bodies frozen for 10 years and are still waiting to be promessed.

In the mean time, people are still coming up with interesting, eco-friendly ways to use the human body to nourish the Earth. The "Capsula Mundi", created by Italian designers Anna Citelli and Raoul Bretzel looks like an egg, and envisions a future where cemeteries would consist of hundreds of trees being nourished by seed pods containing human remains.

**Of course there's no cure for death that we know of (yet)** but who knows what the future may hold?

Those people who are currently frozen and waiting to be involved in a more eco-friendly burial process, could be on the first step to cryogenics, which would make the Jameson Project a reality without spaceflight: reviving the terminally ill from a frozen state of stasis when a cure has been found for their disease.

Until then, becoming a shooting star, a shiny rock, or plant food are all pretty cool options as something to do with what you leave behind. You can't take it with you, but giving is always better than taking, anyway.

## MONTAG FICTION: Ransomwear

*When our laptops are hacked, we feel violated. In Ransomwear, we find out that when our wearables are hacked, we might feel something closer to terror...*

**Bounding up to her apartment building after a sweaty several-kilometer run in the early evening,** Victoria stopped and tapped her WristLit. The tiny LED screen lit up, displaying the number of calories she just burned. *Not bad,* she thought, entering the lobby of her building. She swiped her wrist to get on the elevator and into her apartment on the ninth floor.

The lights came on as she entered and sat down on the floor of the apartment, stretching her hamstrings and swiping through some evening news headlines. *More missile testing from North Korea... ransomware of unknown origin spreading all over the world... ooh! and a video of a cute dog that was trained to stand up and wear little pants.*

She marked the dog video "watch later."

She took her running shoes off and walked to the kitchen to heat up a microwave meal for dinner. Her WristLit buzzed to remind her that she had a meeting tomorrow at 9 AM, and suggested an optimized bedtime. It would wake her up after the appropriate number of REM cycles for maximum refreshment, based on what time she managed to get to sleep.

After showering and eating quickly, and chuckling at the little dog wearing human pants, she got into bed. Checking the time on her wrist, she noticed the WristLit needed a software update, so she tapped "Update overnight" and fell asleep.

The next morning, her arm felt warm when the WristLit woke her up. The band, a woven metal mesh made of tiny plates that rearranged themselves to accommodate wrist movement, was definitely at its tightest setting. *I must have been really tossing and turning,* she thought, *...but I slept fine.*

Turning off the alarm, an alert popped up to remind her of the morning's meeting. She got out of bed to get ready. Dressed and armed with a smoothie for the road, she grabbed her purse and headed for the door.

But it wouldn't open. She swiped her WristLit several times, and it stayed locked. *That's strange,* she thought. She inspected the door frame, nothing seemed to be blocking the sensor. She inspected her wrist.

There was a bright red screen overlaid on the main display.

**"OOOPS, UR WRISTLIT HAS BEEN ENCRYPTED! NOTHING WORKS UNTIL U PAY. U HAVE 2 DAYS AND 16 HOURS LEFT. TO PAY, CLICK 'PAY NOW.'"**

The message scrolled across, followed by a big green button marked "PAY NOW" and a countdown marked 02:16:58:28, ticking off seconds.

*This has to be some kind of joke,* she thought, stunned. *Then, I can't miss this meeting!* She panicked, putting down her smoothie to rummage through her purse for her smartphone. *I have to call them and let them know I'm running late.*

*Shit,* she thought. *I can't unlock it, it's paired with the WristLit.*

She wouldn't be able to communicate with anyone or leave her house until she paid to get all of the functions of the WristLit back. She put the phone down and looked back at the glaring red screen on her wrist.

She tapped "PAY NOW."

The next screen already had all of her banking information, which was also conveniently stored on the WristLit for mobile payments. Next to it was the bitcoin equivalent of what they wanted her to pay, and another button that said "PAY NOW."

The number made her eyes feel like they were going to bug out of her head.

*That's more than my college tuition and I'm still going to be paying that loan back for the rest of my life! This can't be real. There's no way people are paying that.*

She could feel blood rushing to her face, and her pulse quickening as she started to really freak out. She could feel her heartbeat against the wrist band, which was becoming increasingly irritating. She tried scratching underneath it to lessen the pressure a little, but could barely fit a fingernail beneath it. And it seemed like the more she tried to pry it up, the tighter it got.

A red mark was already forming where it dug into her flesh.

*There's no way this is happening.*

She tapped the WristLit's screen to decline the payment and swiped to go back to the first message. But a different message appeared on the screen next to the countdown timer.

**"IF U DO NOT PAY U LOSE UR HAND."**







# This didn't write itself: Automation is coming for your creative job too

*Science-fiction promised us amazing technology that would mean by now we'd all be working, at most, a 20-hour week. Well, we have the amazing technology, but we're working longer than ever.*

*So should we be grateful, not fearful, for the advent of automation? It's already replacing the most repetitive of human jobs – and is coming for the ones you might not think can be automated...*

**Working more than 55 hours a week raises your chance of a stroke by 33%.** In Japan, overwork kills 10,000 people per year.

Conclusion: Work is bad for you. We should not work if possible.

## Stop working, now.

**So, let's not work.** While some rage at the likelihood of automation killing 38% of jobs within 10 years – and who doesn't feel a pang of vicarious anxiety for the truck drivers and shop assistants whose jobs will be initially gobbled up – I long for the day when all our jobs are obsolete.

Lounging around on beaches, idling in green idylls, punching the air in nightclubs, or whatever you'd do instead of working, sounds *great*.

*It's easy to visualise whose jobs will vanish first, and even what the cause will be. Or is it?*

Some worry that this wave of automation is the effect of a brutal, end-capitalist society who are cutting the legs off from under the poorest people. Or maybe these people are being liberated from monotony, suddenly wallowing in free time in which they can simply... *live*.

What's more right-on and left-wing than freeing the workers first of all?

And no, don't sweat about something as simple as money, silly! Once the robots have taken our jobs, we'll shift to a cashless society or a bitcoin-like micro-payment/barter system. Or maybe we'll all be able to get fat off the profit of the robots, and lounge around on a Universal Basic Income while our robot servants do the work we don't need to any more.

Actually, that's the key point about automation and work: there are certain jobs that will be automated faster than others. It's easy to visualise whose jobs will vanish first, and even what the cause will be. Or is it?

## Book, line and sinker

**Imagine, you want a new book. One made of paper and ink.** Something trashy, to take on holiday and guzzle next to the pool. Well, in the automated future, if you go to a shop, the salespeople will be largely gone, replaced by automated salespoints and robotic shelf-replenishers.

*Sorry, pesky humans, but robots can do manual work faster, longer and better than you.*

If you order online, you bypass the shop anyway – and in the warehouse, your order is processed automatically, relayed to an automated picker which plucks the book from the shelf, automatically sends it to a dispatch-bot which packs it and stacks it in an automated truck which eventually, automatically brings it to your door.

And then you hop on a plane which is auto-piloted to the Costa del Sol, where your self-driving car takes you to the hotel, and so on. And when you get to the hotel, hopefully, all the pickers, packers, dispatchers and drivers that are now out of work will be resting by the pool too.

Sorry, pesky humans, but robots can do manual work faster, longer and better than you.

These are the *obvious* job-scraping robots. The only people who are safe in this whole process are the *creatives*, right? The book's

author, the cover designer, the curators at the publishing company – whose exquisite taste enables books like "Rebels: City of Indra" by Kylie and Kendall Jenner to exist – and the hard-working scribes who write the reviews: they're safe.

Robots can't replace us... can they?

Oh, puh-lease. The robots are coming for the "creatives" too.

## Read all about it

**The first "creative" job to go might be the news journalist.**

After all, reckon automators, what is "news reporting" other than a replicable series of processes? Just sniff out a breaking story, gather evidence, quotes and pictures, sift out the red herrings, collate into a news article framework, and distribute out to the masses as fast as possible.

In a world of reasonably-believable Twitter bots, it doesn't sound too much like science fiction to assume that this could be automated.

Maybe it's time for journalists to start drinking heavily and worrying where their next paid job is coming from. Oh wait...

And speaking of drinking, tools like Reuters' News Tracer already gulps straight from the firehose: analysing all of Twitter and picking out the tweets that might be the start of a news story.

It is taught phrases that might be associated with a sudden event – people are inclined to tweet a warning to avoid an area if they think a bomb has gone off, for instance – and it can then alert a



journalist of its findings.

The Washington Post already uses a similar tool: Heliograf creates the basis of a story from pre-defined parameters and a flesh-and-blood journo fills in the gaps. On US election day, nearly 500 articles were created this way.

Wordsmith, a "Natural Language Generation Engine" will turn a spreadsheet of data - let's say, today's New York Stock Exchange listings - and make them into news stories, reporting on the ebb and flow of the stocks and what it means.

From here, the next steps are easy to imagine: you teach AI to take its initial findings, build an article to our liking, share it and then continually iterate it as the story develops. (Journalists will continue to tweet furiously.)

**>10 CREATE "CLICKBAIT"**  
**>20 GOTO 10**  
**>RUN**

**As a Clickbait Content Generation Professional (or writer, as we used to be called),** I for one welcome our robot overlords, and look forward to the day when I can finally let the robots do this stuff.

Also: how can I even think about resisting?

After all, for the last year or so, I have been using Speechmatics' brilliant AI-and-Neural-network-driven voice-to-text system to write up transcripts of interviews, which I then edit into something readable.

Why not bypass that step and let AI do it all? I can still put my name on it - and get paid for the AI's work! C.R.E.A.M, baby.

Excited by the idea of letting a robot do the graft, I cleared my workweek diary of the pesky work part, pencilled in five solid days of loafing, video gaming, and drinking, and sat back to Google publicly available AI-writing services.

First up was AI-Writer and it immediately seemed like a big piece of automatically-crafted cake. The home page boasts, "Just feed our AI Author a headline, and it will do all the research and writing work for you. Yes, it's really that simple!"

I tapped in a headline for an article I was planning on writing for MONTAG - but which now seemed like a much worse use of my time - added my email address, and hit enter.

"Usually," the confirmation window chirruped, "you will receive the requested text within minutes, but sometimes it takes hours, depending on the workload!"

After not receiving my requested 1500 words on "3D Printed Human Organs," I let out a long sigh, scrubbed "Go to the zoo all day!" From my calendar, and wrote the damn article for myself.

I then tried a more simple request: 300 words on "Virtual Reality." To spread my bets, I also put in a request for 200 words on "Sausages."

Workload must be overwhelming for the neural networks tippity-tapping at the keyboards over at AI Writer HQ, because, dear reader, I received nothing all - except the sneaking suspicion that I was just dumb enough to put my email address into an unknown database.

Discouraged, I started gloomily writing this very article.

**Months later, I learnt that my snark was unfounded when the AI-written articles quietly dropped into my inbox.** The results were wildly impressive, although not in the straightforward way you'd expect.

Instead, AI-writer appears to have stumbled on - and I mean this sincerely - a way to create brilliant, free-association-type articles on anything you desire.

Here's an excerpt from the full AI-scribed article on "Virtual Reality." It's an article that zips between Spanish and English at will, and is full of wonderful almost-non-sequiturs like:

**"A virtual world is considered plausible if the interaction in it is logical and coherent. In no other country are transgender genders as accepted as in Thailand, nowhere else are there as many gender equalizations as here."**

My joke request for an article on "Sausages" was treated with the contempt it deserved, which suggests that, while AI may not

be a great writer, it's definitely aware of how to troll its users:

**"Snagsby are retouched with a damp cloth, the best tea service is put out, and there is an excellent arrangement made of delicate new bread, crispy twists, fresh fresh fresh fresh fresh butter, thin slices of ham, German tongue and sausage, and delicate rows of delicate anchovies that nestle in the parsley."**

However, there is undeniable promise in this tech.

My initial request, with the much more focused subject of "3D-printed organs" convinced me that AI-writer's tech is actually going to be a useful tool.

The copy it provides doesn't quite pass as human, but only because the article doesn't flow from one sentence to the next. Yet it's a very useful collection of material sourced from all over the web. It's easy to see how an editor could request an AI article, and then tidy it up into something that's readable and workable - just like editors do with junior writers' work today.

Until then, I've resigned myself to the cycle of waiting until the last minute to write thousands of words for frustrated clients, and put my dream of life without keyboard-calloused fingertips back on the shelf.

## Post-creativity

**For now, you'll just have to gulp nervously and imagine the horror of a post-creative world - one where BuzzFeed listicle writers, advertising executives, Instagram spokesmodels, and Vloggers are callously tossed onto the scrapheap, their vital work instead executed by machines without souls, humanity, morals or self-awareness.**

But make no mistake, the machines are coming for your job. And the least-likely career to be subsumed by automation? Therapists.

Which is good news, 'cos when your job vanishes, you'll need someone to talk to.



# Consume young blood, live longer: It's time to embrace your inner vampire

## The bleeding edge

Modern-day billionaires don't come much more interesting than Peter Thiel.

He co-founded one internet monolith (Paypal), spotted the early investment potential in another (Facebook - you may have heard if it), created a data company that nosey government agencies love (Palantir - even if you've not heard of it, they've probably heard of you), and, as a consequence, is filthy stinking rich.

Money brings you a lot in life, but if home-spun wisdom has taught us anything, it's that "you can't take it with you." Peter Thiel, according to some tasty media stories, is eager to push that final destination as far away as possible.

And to make what he wants in life to happen, Peter Thiel is thirsty: thirsty for what he sees as justice (he paid to defend Hulk Hogan's case in court against Gawker Media, which eventually was crushed to smithereens) but also, allegedly, thirsty for young people's blood.

It's all resulted in some... intriguing headlines.

["Peter Thiel Is Interested in Harvesting the Blood of the Young" - Gawker.com](#)

Or he's not, according to which outlet you read:

["No, Peter Thiel is not harvesting the blood of the young" - Techcrunch.com](#)

Hey, hang about a minute...

["Peter Thiel Is Very, Very Interested in Young People's Blood" - Inc.com](#)

Hmm. I guess the story you believe depends upon whether, in your opinion, a Trump-supporting Libertarian billionaire would consider harvesting youthful human blood a prudent investment.

Either way, whether he really does, as Gawker reported, "spend \$40,000 per quarter to get an infusion of blood from an 18-year-old based on research conducted at Stanford on extending the lives of mice," or not, Thiel is, as usual, onto something.

If you're being mocked by the hit TV show Silicon Valley, you may or may not be crazy, but at the very least you are definitely on the bleeding edge.

Either way, in the centre of the Venn diagram between cutting edge technology, billionaires' eagerness to tweak their bodies, and the sticky red stuff, something bloody interesting is definitely going on.

So what will the future hold for BloodTech? And what does it mean for us non-billionaire normies?

## First Blood, Part II

**So why the focus on blood?** Surely the possibilities offered by re-growing and replacing human organs or simply living forever offers greater impact - after all, we'll all need a new liver or heart or kidney at some point.

But it turns out that blood is sloshing with a huge number of enzymes and molecules that do miraculous things - the consequences of which we are only just getting to grips with.

Blood isn't just endlessly replaced red gloop - it gets old too. And as it gets old it gets less useful. And when blood stops being useful,

you stop being alive. And that's, you know, a problem.

"Young Blood" may sound like the name of an identikit SoundCloud rapper (actually, Young Blood really is a hip-hop artist on SoundCloud, and is worth a listen) but the idea of squeezing in a quart of someone else's plasma is worthy of your attention.

On a very basic but important level, young blood = young body parts. Scientists thought that as bones get older, they get worse at healing themselves - but it turned out that the bones could heal just fine: it was the blood that wasn't doing its job.

And while the likes of Peter Thiel may (LAWYER'S NOTE: or may not) be getting transfusions from their Blood Boy, the most interesting part of this research - for the rest of us - is that the difference between old and new blood is just a molecule or two.

Find a way to reintroduce that molecule into the bloodstream and bones can heal themselves again, and we'll all be youthful forever.

## Young, at heart

**None of this should be too shocking:** the rejuvenating effect of young blood in old bodies was spotted in some lucky mice who were made young again in the 1950s.

But now there's a dawning realisation that young blood's eagerness to return organs to a similar state of youthfulness extends a bit further than giving aching muscles and bones a bit of pep: it might have beneficial effects on the brain.

This has enormous implications for people with brain-based conditions



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like Alzheimer's and Parkinson's disease - two conditions that are notoriously difficult to treat.

Because if the secret sauce hidden in our most precious ketchup can bring withering brain cells back to vitality, millions of lives will be changed - and human trials are underway to see if young blood has an impact on muscle motor function.

And just think: if a regular blood infusion could keep the body, the organs and the mind youthful, the more ambitious some post-human tech aims, like the computer-AI-brain interface proposed by Neuralink start to sound.

Neuralink is a pet project of yet another billionaire live-forever enthusiast - Elon Musk, the real-life Tony Stark and old buddy of Peter Thiel (spotting a theme yet?) - and the combination of constant bodily rejuvenation coupled with augmented intelligence could be too tempting to let slip by.

Not only will we live longer, but we'll live smarter. It's the startup dream, made flesh.

### *Sit tight and wait, bloodsuckers*

#### **Thicker than water**

**For now, mysterious companies like Ambrosia are pushing ahead with pumping the good stuff into humans.** Ambrosia is, according to Quartz, claiming some remarkable breakthroughs: "a month after receiving a transfusion of young plasma... participants had fewer chemical biomarkers indicative of heart disease, Alzheimer's, and certain types of cancers."

It sounds too good to be true (and indeed, has been called "fake news" by one Stanford immunologist) but right now, to a billionaire nearly the wrong side of 50, it is surely worth a punt.

So what does it all mean for the rest of us? Those other humans, who also have five litres of blood and an eagerness not to die yet, but very little in the bank? Essentially: sit tight and wait, bloodsuckers.

Much like how advanced health tech is finding ways to turn the body's existing defences against cancer, we are discovering that the secret to a healthier future is right under our bleeding noses.

And where there's an eagerness to keep living, there's cash, so any useful developments here will happen quickly - hopefully within our puny lifespan.

In the meantime, there is reasonable cash to be made from selling blood, and in these troubling economic times, maybe it's as certain a business as a young person could hope for.



Rethink *things.*

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