

You're listening to Imaginary Worlds, a show about how we create them and why we suspend our disbelief. I'm Eric Molinsky.

In the last few months, the media has come to realize something that economists have been saying for a while. Automation is the real culprit for job losses and flat wages – not globalization and certainly not immigration.

<MONTAGE OF NEWS REPORTS>

And in fact, besides working on this podcast, I also work for The New Yorker Radio Hour where I help their staff writers adapt print pieces to radio. And I've been spending the last few months working on a story about how automation is about to take a big leap forward soon, which means a whole sector of jobs from warehouse workers to truck drivers are going to disappear. And it's not just blue-collar jobs – a lot of white-collar jobs are being replaced with algorithms or some other kind of artificial intelligence. I read an article the other day about software engineers that are worried they might be designing their own replacements.

Thinking about robots and seeing them up close got me thinking about sci-fi because sci-fi has been imagining this future for a long time – all the way back to Kurt Vonnegut's first novel *Player Piano* from 1952.

READING: "Hell, everybody used to have some personal skill or willingness to work or something he could trade for what he wanted. Now that the machines have taken over, it's quite somebody who has anything to offer. All most people can do is hope to be given something."

"If someone has brains," said Anita firmly, "he can still get to the top. That's the American way, Paul, and it hasn't changed." She looked at him appraisingly. "Brains and nerve, Paul."

"And blinders."

Now that genre didn't take off because for much of the 20th century, it seemed like the worst case scenario was not coming true. Automation may have wiped out jobs, but it was creating new jobs at the same time – jobs that paid better – jobs that had less physical strain.

But now we have reached a turning point. We are manufacturing products than ever before without the need of human beings. Think about the money companies are saving with robots that never take breaks --- they don't need

heat or air conditioning – they don't even need the lights on. Forget health insurance – you don't even need a human resources department.

I actually talked with Roy Bahat, who is a venture capitalist in the Bay Area. And he says there's a parlor game that some of his colleagues in Silicon Valley like to play called The Last Job.

RB: When tech people sit around saying I think last job will require empathy people caring for children, or require you to have skill job to work with hands – or whatever it is.

Roy started to feel a little guilty about this because his company Bloomberg Beta invests in artificial intelligence companies that are specially geared towards the future of work.

RB: And I realized at one point if we're going to automate all these things, we better have a point of view into what our society is going to look like.

That's why an organizations that he works with called The Economic Security Project teamed up with the sci-fi website iO9 to sponsor a huge fiction writing contest where they ask writers to imagine the future of work – or lack there of. The only big rule is that the writers have to imagine in their stories Universal Basic Income or UBI -- where every American gets a stipend from the government to pay for their basic needs. Now UBI is kind of a hot term right now because a lot of economists and tech moguls have been going around saying this is the future.

RB: One reasons that group explored fiction we needed evidence of the imagination to picture how whole society might fit together in part because fiction may be best way come up with consistent set of rules that might work in reality to understand what might happen but if your puzzle where do I go paint picture instruction manual post work what things are going to look like – I don't think we've hit on it yet.

The contest is closed now but the winning story will be published on iO9 in January.

There is a series of novels that explore what that future would be like -- The Expanse novels by and Ty Franck and Daniel Abraham.

The books take place around 200 years in the future. Automation has led to mass unemployment. Most people get a universal basic income – which is a huge political and humanitarian victory. But a lot of people who are on “basic,” as it’s called in the novels, still yearn to have jobs and careers – or just to make a lot of money. So – since this is the future – they fly off to Mars and the asteroid belt to live a more rugged, pull yourself up by your bootstraps kind of life mining for raw materials in space. Eventually the Martian colonies become independent from the Earth and create this Ayn Randian propaganda about how Mars is a nation of makers while Earth is a society of takers.

READING: And if Martian propaganda was right, most of the people she could see right now didn’t have jobs.

In the second book, one of my favorite characters, a Martian Marine named Bobbi Draper thinks about this situation when she comes to Earth for the first time.

She tried to imagine that, not having any particular place you had to be on any given day....A world no longer of the halves and the have-nots, but of the engaged and the apathetic. Bobbie wondered if Mars would become like this after the terraforming. If Martians didn’t have to fight every day to make enough resources to survive, would they turn into this? A culture where you could actually chose if you wanted to contribute? The work hours and collective intelligence of 15 billion humans just tossed away as acceptable losses for the system?

Ty Franck says the inspiration for that part of the story came from an article he read about how parents with higher educations and dual incomes tend to have smaller families.

TF: What I took from that is that’s really interesting, what if we’re in a future where half the population doesn’t have jobs? What happens to population growth then?

In other words, he thinks automation could lead to overpopulation.

TF: What we’re positing is that when most of the people don’t have jobs, they have kids instead because they have nothing else going on.

But that's all backstory. The Expanse is really focused on space exploration, intergalactic politics, contact with aliens – and we're going to hear a lot more from Ty and Daniel in my next episode which will be all about The Expanse, the books and the TV series.

But going back to automation – I wanted to know who is really focused on this idea? And can *those* stories help us navigate the future?

We'll find out in a moment.

BREAK

Earlier this year, I tackled a similar subject – how sci-fi has imagined the Internet and what we can learn from those stories. And once again, I wanted to turn to Ed Finn, who runs The Center for Science and imagination at Arizona State University.

EF: It's interesting because SF in so many ways is this tool for escapism, and yet we keep talking about work. And I think that's because work has come to shape us so profoundly we identify ourselves by what we do. If you think about a truly idyllic utopia where there's no work of any kind some people might find that horrible and awful – that would be a terrible place to live.

Actually, utopias fall under his job description. Ed works with sci-fi writers to publish an anthology called Hieroglyph, where the writers are encouraged to create worlds that are more constructive than dystopian. I asked him, what was the best story he read about automation?

EF: There's great SF story by my friend Lee Konstantinou that we published in an anthology, the story is called Johnny Appledrone vs. the FAA.

Lee Konstantinou says the character at the center of his story, Jonny Appledrone, as a mysterious radical that advocates for the workingman, but gets caught up in his own hype.

LK: But I needed a narrator, I needed someone to meet him, to be affected by him, to learn about him and his cause, and eventually I came up with character who becomes an intern of this legendary figure.

That intern is the main character. His name is Arun and he is one of the few people left working at an automated pit stop called Big Machine.

READING: Everything at Big Machine was automatic. Well, almost everything. Occasionally, a hose tangled up, an unusually big rat would die in the bathroom, a trucker would collapse drunk on a snooker table with a mighty thud, or a stray drone jammed up with bird poop would drop from the sky. I did what little the robots couldn't, a poorly paid ghost in the machine Mostly, I was an eyewitness to the end of the age of the truckers. They told me that their days were numbered now that their rigs were mostly automatic. In the beginning, because robot trucks increased total trucking volume, truckers actually got more work. More trucks meant more legally mandated drivers, manning machines in case of trouble. But robo-trucks became more reliable, and corporate lobbyists gathered in Washington. The law couldn't last. Truckers would eventually have to be sacrificed on the economy's automating altar.

As millions of truckers lose their jobs, that resentment builds until a character named Gallagher drives a truck bomb into the Department of Transportation.

READING: The Cheyenne massacre changed BigMachine. The truckers weren't sure how to respond. Everyone hated Gallagher, yes. At the same time, he'd taken action, while they, for all their whining and complaining, sat on their hands, waiting for the end, the day they'd finally be fired. The sympathetic chatter — cloaked beneath tortured disclaimers ("I don't like what he done, but....") — made me sick. So many died at that monster's hands. How could anyone say a kind word, offer a single qualification or explanation for his actions?

LK: And then you can also imagine an ambivalence on the part of the truckers, they don't like what he did, they hate what he did, it speeds up automation of trucking industry not slowing it down but it wasn't that hard to imagine someone might go there.

Lee is expanding that short story into a novel where he's going to delve more deeply into ideas like Universal Basic Income, and how that would play out politically.

LK: What happens to immigrants and refugees? Do you extend this benefit to all people living in society, or do you only extend it to citizens?

Which is a pretty realistic, near-future scenario. But the other story that Ed Finn recommended was way out there. He is fascinated by the new novel *Autonomous* by Annalee Newitz. In her future, robots and humans work alongside each other to the point where they start to take on aspects of each other.

EF: I think my single favorite part of the novel is the robots find ways to have recreational drug like experiences, they deliberately run bad code that's going to cause them to glitch and have crashes and that's like getting high.

Yes, even robots need a break from the monotony of work.

I've had Annalee on the show before because I'm a huge fan of her journalistic work. She's best known for co-creating the website iO9. *Autonomous* is her first novel.

AN: And when you're writing journalism there are a lot of stories that you have to leave out and often times an editor will say like if you're talking about something that's happening more than five years in the future that's really not journalism. So I got to hope I held in for years and years and years all these feelings about science and then just kind of poured them into this book.

The initial spark of inspiration happened when she was researching an article about a seismology lab at Berkeley. She was looking at these robotic "actuators" that simulated an earthquake by crushing a model house.

AC: And because I'm a bit of a dork I kept thinking oh you know actuators are just arms. Like how does it feel to have an actuator instead of an arm? That moment I had the image the sort of first image in the novel where we meet Paladin the robot character who is climbing a sand dune and he's getting sand in his actuators and it's causing him pain.

READING: Sand had worked its way under Paladin's carapace, and his actuators ached. It was the first training exercise, or maybe the fortieth. During the formatting period, it was hard to maintain linear time; memories sometimes doubled or tripled before settling down into the straight line that he hoped would one day stretch out behind him like the crisp, four-toed footprints that followed his course through the dunes. Paladin used millions of lines of code to keep his balance as he slid-walked up a slope of fine grains molded into ripples by wind.

So how do humans compete with artificial intelligence in this future? That's the plot. Paladin and a human are paired up to find the designer of an illegal drug called Zacuity, which makes humans smarter and more productive at work – like the way people abuse Ritalin or Adderall today.

READING: After taking Zacuity, work gave you a kind of visceral satisfaction that nothing else could. Which was perfect for a corp like Quick Build where new products had tight ship dates, and consultants sometimes had to hack a piece of hardware top-to-bottom in a week. Completion rewards were so intense that it made you writhe right in your plush desk chair, clutching the foam desktop, breathing hard for a minute or so. It was easy to see why the shit sold like crazy.

AN: One of the kind of evil things that I did with the drugs Zacuity was that I made a drug that was not only making people more productive in the sense they were gonna get kind of speedy and they're able to get more stuff done. And so one of the kind of evil things that I did with the drugs Zacuity was that I made a drug that was not only making people more productive in the sense they were gonna get kind of speedy and they're able to get more stuff done but it also made them feel like getting a work project done was genuinely good and that it felt good to accomplish something or to meet a deadline. If a company could give you a drug that not only made you get your work done fast but that when you completed that work you were like wow I did something awesome. That would be the perfect worker drug.

I've had jobs before where I could've used a little Zacuity. The only problem is it kills you in the end. That's why Paladin and his human partner are trying to shut down the drug entirely.

Now Annalee wanted to avoid the cliché that robots would be inscrutably different than us. She thinks if we design them, they'll be reflections of us.

AN: I think what we're really looking at is a future of fragile intelligence because all of these machine learning algorithms we are training them on human data sets data that's created by people and the minds that emerged from that are going to be just as flawed and neurotic as human minds. They're going to be full of prejudices we've already seen multiple scholarly papers at this point showing that algorithms make racist assumptions.

Right

AN: And those are prejudices that they learn from humans. And that's again because they're working with human data.

A few years ago, I did an episode about how robot narratives borrow from slavery narratives. Annalee does not sidestep that issue. She imagines if robots are self-aware, they are slaves. But the robots are allowed to work towards their freedom, which in this case means they get an autonomy key that contains all of their memories – which were owned by the corporation that created them.

Paladin does win his freedom, but he also switches genders to please a human lover. And now she's feeling a little out-of-sorts.

READING: She wanted to ask Fang a dozen questions but settled on one. How long have you been indentured?"

By way of reply, Fang transmitted a tiny video file, which was nothing more than seven still images arranged in a sequential slide show. Viewed together, they said: seven years. Viewed separately, they appeared to represent four different bots. Seven years ago, he was a middleweight insect drone used for mapping. He had become a snake, then a tank, and for the past three years had retained his current mantis shape.

Fang's antennas swept lazily towards Paladin. "You'll see. Don't get too attached to that body – sooner or later, they'll change it."

But here's the twist. If robots are self-aware slaves, then human slavery can be legalized again. A lot of readers were surprised to see slavery and indentured servitude in this future – at least for humans -- but Annalee says it really shouldn't be a surprise.

AN: If you have a form of slavery anywhere in your culture -- that never exists in isolation you can't have slavery in one part of your culture or in one part of your history and expect it not to infect the entire culture

Which brings us back to an idea I often wrestle with. Should we take sci-fi at face value – maybe not as prediction but least, a dress rehearsal of the future?

Annalee looks at this way. What she loves about sci-fi is that it can show us how humans of all eras – past, present and future – wrestle with the same fundamental questions. They just do it in slightly different ways.

AN: That's what's kind of cool is if you look at old science fiction and you say oh they predicted you know the tricorder predicted the mobile phone. That's because it's an ongoing human fantasy to have a little voice in your pocket giving you information. You know that's not a new fantasy. You know we've always had that idea going back to I don't know like a voice in a burning bush giving you special information right. Like that's just the Biblical mobile device. I got to bring a fire with you everywhere! Um, don't do that.

Well, I'm going to make one prediction about the future. We're going to see more sci-fi about automation because this issue gets to questions of how to feel a sense of purpose and dignity, and what is the value of life when it's not highly valued by society. And if those issues aren't in the wheelhouse of sci-fi, I don't know what is.

That's it for this week, thank you for listening. Special thanks to Erik Bergmann who did the readings, Roy Bahat, Ty Franck, Daniel Abraham, Ed Finn, Lee Konstantinou and Annalee Newitz, who is already preparing for our automated future by conversing with bots on Twitter – or she at least *thinks* they're bots.

AN: If we think about it in the future if we think about it in a science fictional mode is a world where you can never be sure if you're talking to a person who is a bot or a bot who's a person and you have to decide how to respond to that.

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