

biomedifuturism

SCIFI PROTOTYPES OF THE FUTURE OF BIOMEDICINE

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2083

BIOMEDICINE

From autonomous robots, via chip implants to deep brain stimulation – the boundaries between human and machine seem to fade. It confronts us with all kinds of challenges and questions, about current as well as future issues.

In this publication biomedical Master students of Radboud umc examine the frontiers of medical biology and explore the ethical, social and cultural issues that arise from the fading boundaries between human (alive and conscious) and machine (non-living and unconscious). Using the method scifi prototyping, they created fictional futures based on scientific fact for the specific purpose of creatively exploring and iterating how technology and social developments can shape and be shaped by the people who use it and explore its implications on the everyday lives of people. They were asked to write from a first-person perspective and situate the story in the year 2083. The result is a mosaic of utopian and dystopian stories, of diseases cured forever and technology misused for financial gain. Be inspired by the carefully crafted stories of these students and ask yourself this question: would you want to live in this future?

COLOFON

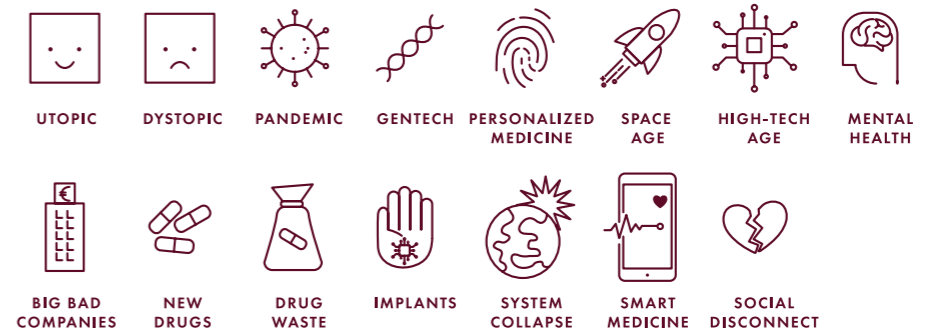
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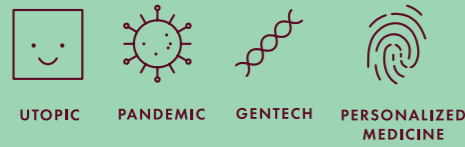
The authors are Master students of biomedical sciences at Radboudumc

Future visualizations have been generated by the students using the AI text-to-image tool Midjourney

January 2023

THEMES





A Tiny, Invisible Molecule with the Power to Save the World

FLEUR SEMMEKROT + ANNA PUMPE

Today, Jan 24th, is my 90th birthday. My family is visiting me to celebrate. Everyone is there, my daughter with her husband and son, and my son with his boyfriend and their twins. My wife was with us in our hearts as she passed away 42 years ago during the Hantavirus-2 pandemic. After having coffee and cake we gathered around the fireplace and my grandchildren started asking questions about my past and how our lives have been back then. So, I started telling...

When I was young, life was quite different from today. The technology was not as much advanced especially in healthcare and science progressed immensely during the last decades. But already at that time we were fighting global warming - unsuccessfully as we see today. We did not reach the 2-degree temperature goal, which had severe consequences. But let me start at the beginning. 60 years ago, in 2020, I was a young, enthusiastic scientist starting my PhD in virology - I was doing experiments with viruses that can cause nasty diseases. You know that we have lived through many pandemics and endemics over the last years, which is the reason why we must go to our monthly health checks to prevent a new disease from spreading among us. But when I started working, I was experiencing the first big pandemic that would change our lives. Before that I was living in a free country, being able to do everything I want, I had all the freedom you could imagine. But

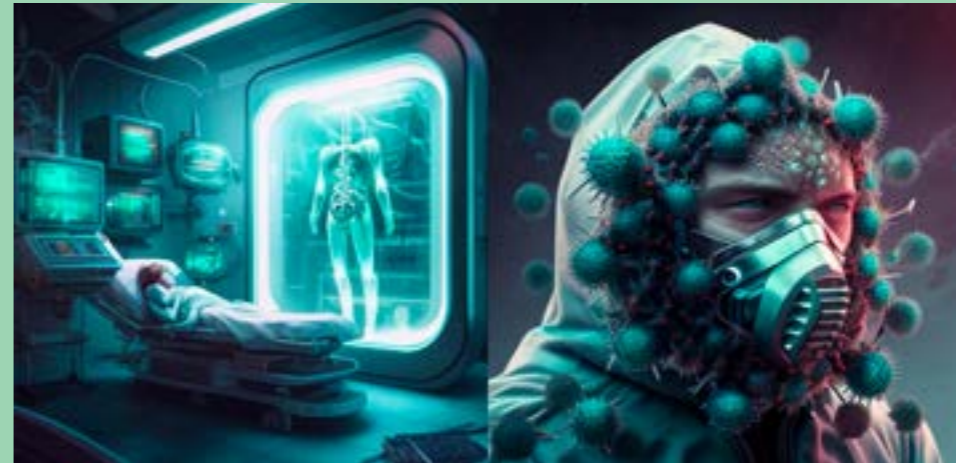
from one day to the next, all that changed because of the Covid-19 pandemic. Suddenly, nothing was allowed. No going out. No meeting friends. No sports. No nothing. We were only allowed to do our groceries and stay inside. Luckily, I was allowed to go to work because I was working on a treatment for exactly this virus.

I was interrupted by Charles, my youngest grandson; "How is that even possible? How did you survive?"

"Well, we had to. We did not have another choice." And we did. But the pandemic has left its marks. Many people died, others suffered for years from the consequences of an infection.

A couple of years within the covid pandemic a new treatment approach evolved. Which you also know now: XNAzymes. But back then, we were not able to use them to cure people yet. We needed to do a lot of research to make them better. But that took us a while...

Unfortunately, many years later in 2041 the Hantavirus-2 pandemic came over us. This virus was an evolved version of the original Hantavirus but more severe and as you know it took my beloved wife and your grandmother from us. This disease was even worse than the Covid pandemic. Many more people died. The healthcare system was overloaded. People could not be buried in a way they deserved. People working in healthcare, nurses and doctors worked to their limits and they often died because of the



Hantavirus-2 as well. Myself included, I worked all day and barely had the time to sleep or even eat. I lost many co-workers during this time, and I had to keep the research running with the little people that were left.

As I was describing the situation back then, Olivia started to shed some tears. "That must have been terrible for you. Losing your wife, being restricted in every way. How did you get through this?"

It was the darkest time of my life. But I could keep myself busy with work. We were still working on these XNAzymes, because you can adapt them to other viral diseases as well. And as the pandemic progressed even more, we worked even harder. And finally, the hard work paid off. We were able to generate an XNAzyme killing the Hantavirus-2 that was able to be effective over a long period of time, easy to produce and safe for the patients. As we discovered these essential modifications, we knew that we had a breakthrough! With this development we were able to adapt this technology to other viral diseases, and thereby prevented the spreading of the monkeypox virus variant 3B which otherwise was estimated to cause a detrimental epidemic that possibly could have developed into another pandemic in 2073.

"Wow, that really is a genius thing you did! You literally saved the world." Shouted William, Olivia's twin.

I am proud of this discovery. Other researchers all over the world are working on this technology to make it even better and make it work with other diseases as well which arise from damaging RNA. With the technologies we have today, it is also so much easier to produce adapted XNAzymes and treat people more individually with this. You know that this is how it works today. When you go to the doctor, they have all your specific data, they know your DNA and they have all other kinds of data to monitor your health. But that was still the future when I was your age.

Our conversation was then interrupted by my daughter Mary who came into the room with a platter full of drinks and snacks, ready to play a few family games.

My Breakthrough

Killing the



Mite



UTOPIA



PANDEMIC



HIGH-TECH
AGE



SPACE
AGE

IRIS EBBEN + CATO LOEFF

12:47 p.m. The TV hologram pops up in the kitchen, where I was just eating my lunch.

NEWS FLASH: "After 50 years being eradicated, two new cases of scabies infection are found in the Netherlands. Might this lead to another pandemic? We asked Professor Lim in an interview this morning."

I sigh. How does this keep happening? Every time we think the pandemic is over, another one starts.

Two months later...

Scabies spread over the Netherlands incredibly fast, so everyone has to follow strict regulations. I need to go to work, but luckily that is not a problem. I get in my self-driving car and head to the office. Before I want to enter, the guard's hologram tells me to roll up my sleeves so my hands, wrists, and elbows are clearly visible. I walk through the gate that screens my whole body, takes a small sample of some upper skin cells, and immediately shows me the result of the PCR test: no scabies. I quickly de-roll my sleeves again and hurry to my working place, hoping to avoid other people in the building. Debbie just finished cleaning my place thoroughly and hands over my protection suit. Her always friendly automated voice is a nice company during the lonely office day.

On my way back to my apartment, I get a message on my smartwatch: groceries will be delivered in 13 minutes. The drone brings me exactly what I ordered, so I don't unnecessarily have to get in contact with other people. One of the products I received I did not order: the scabicides ointment. Since the scabies pandemic, everyone who orders anything gets this delivered with it. You should apply the ointment all over your body and leave it on for at least 12 hours. After all, the rules have already changed; 8 hours used to be enough. It has such an impact on my day layout. For weeks I rubbed myself with the ointment at least once a week. As a result, I couldn't work on my research or participate in the online quiz with my friends in the evenings. For some time now, I know better about the ointment. As a biomedical scientist, I now know that using the cream as so-called "protection" is not a good idea. This makes the scabies mite resistant, which actually caused this huge pandemic in the first place!

I turn on the TV hologram and watch the news. Another 5,000 people have committed suicide today because they can no longer bear the itch. I decide I need to do something as a biomedical

scientist and put my PhD on the history of the 60-year-old COVID-19 on hold. I begin to focus on finding a treatment against the scabies mite. I am assigned 20 robots by my boss Professor Lim, which I put to work in the lab. On week 25, I am working in my apartment when a hologram of robot number 9 appears. It tells me to come to the lab immediately. Five minutes later I arrive there. There is a breakthrough with one of the developed sprays: the light of all the fireflies is extinguished. This means that these test animals have all responded to the treatment and no longer have scabies. I call my boss who is just on the verge of her 100th application of the cream. We decide we have one chance and speed up the production of the spray. Three weeks later we have enough spray to treat the whole world at once. On the same day, we schedule a meeting with all the world leaders. When even Queen Amalia finally logs in fifteen minutes late, it is decided that this spray can save the world.

Exactly 23 hours later, NASA sprays five rockets from Mars toward Earth. Upon passing through the vapor ring, they explode and the treatment spray is released. This treatment is repeated exactly 25 hours later. The scabies mite is killed, the world is redeemed and a working treatment is found. That night I slept well and the next day I can resume my PhD on the history of COVID-19.



Neural Synchrony

A tale of AI-powered ADHD treatment

BART BOLIER + SARA VAN KAAM



It is January 20th, 2083. Me and my grandson Hans have an appointment at the genome sequencing centre.

“Are you nervous?” I asked Hans, while we were sitting in the waiting room of the genome sequencing centre. “A little” he said. The day finally came that we were called in for whole genome sequencing to determine which treatment or combination of treatments would be best for his ADHD.

The path up to this point has not been easy for the both of us. Oh, how have the times changed. I have struggled with ADHD my

whole life, but luckily, I belong to the generation in which ADHD was finally recognized as a real disorder. Still, when I was young, I had to try multiple types of therapy and drugs to determine which treatment worked for me personally. This process took me several years, but fortunately I was able to receive the right medication and counselling.

However, not everybody has been this lucky unfortunately. My daughter was diagnosed with ADHD as well. Her search for the right treatment was exceedingly difficult, way more difficult than mine. In her case, the ADHD led to depression. She could not cope

With all the knowledge and integrated AI protocols into modern medicine, ADHD is now a perfectly treatable disorder.

with her symptoms and had trouble with fitting in at school. The medication methylphenidate did not help and made her feel even worse.

When my grandson, Hans, was diagnosed with ADHD as well it did not come as a surprise to me. ADHD tends to run in families and the heritability of ADHD is approximately 80%. Fortunately, everything has changed.

“... Can Hans come to treatment room four?” I heard softly in the background. Look at me, reminiscing about the olden days. Although I have been using medication my whole life, my thoughts just take over sometimes. It just happens without me noticing.

Before I could get up from my chair we were called again. So, I quickly stood up and we went inside. In about five minutes his blood was collected by the assistant and we were back in the waiting area. Only one hour and then we have the results, said the assistant that collected the blood sample. Isn't that incredible. It amazes me that only a small amount of blood and a short amount of time is necessary to achieve such a life-changing result as receiving a life-long personalized treatment for ADHD.

Using whole-genome sequencing, the unique gene variant combination is identified. Machine learning, based on the sequence data, will then provide the best treatment options for individual patients.

I remember when I was learning about machine learning and whole-genome sequencing during my time as a biomedical sciences student. At that time, the combination of these techniques was seen as an interesting line for future research and a pivotal step towards personalized medicine. Therefore, it is truly amazing to see that this line of future research came true.

With all the knowledge and integrated AI protocols into modern medicine, ADHD is now a perfectly treatable disorder. Hans will not have to experience the tedious process his mother and I had to go through to find peace of mind. Furthermore, I am incredibly happy that he does not have to handle all the nasty side effects that treatments can have.

“Grandpa? What are you thinking about” said Hans. “Oh Hans, I was just remembering how much has changed since your mother and I were diagnosed with ADHD. It has been so long and everything has improved a lot. You do not have to worry about your ADHD diagnosis anymore. On the way back home, I'll buy you an ice cream!”



The Smell of Betrayal

LILIANE SANCHEZ ROCHA
+ LINDA GODDING

Lately, it's been getting harder and harder to stand on my feet, probably I should not complain since I am ninety-eight years old, almost a hundred. In fact, it is incredible that I can still walk and have some independence at this stage, but I cannot deny that my body is giving up on me. There are some moments in which it seems as if I travel to the past, my brain just shuts down and takes me to an old distant memory. From time to time, I am unsure of which reality do I live in, at times I am still living in the early 2000s, when life was easy and beautiful, when the air was cleaner and when I was young... so young. Somehow a nurse brings me back to my current life, although I can still move, I need help with a few things. Anyways, she acts as if I need to go somewhere, but for the love of me, I seem to not be able to remember where or why, and yet I still do not want to ask, I refuse to let see that my mind is fading away. I walk from my room to the living room downstairs, and when I turn left, I see my "wall of pride". The objects that hang in there are the ones that for the longest gave me the greatest joy, nowadays they just remind me of whom I used to be. The first that catches my eye is my title of master in biomedical sciences. When I graduated, life seemed to be so promising, I had a purpose! finding cures to

diseases, and making life worth living for those who once lived in pain and hopelessness, that was my drive.

In the year 2025, I got involved in a very innovative research. It was about a device called "electronic nose". At the time the little machine could recognize multiple patterns of different odors, and the goal was to identify the odor patterns of the deadliest diseases. Not only that but we aimed to go to the next level and identify those odors produced even before symptoms stroke.

In those years, a lot of research was being done to identify Parkinson's disease, right before patients would show the most common symptoms. At that point, the damage was already irreparable. So this area became our primary focus... and lo and behold, somewhere in 2037 We did it!! We discover the smell of disease! And not just Parkinson's disease, we found the odor patterns that predicted multiple diseases, such as Alzheimer's, various cancer types, and multiple sclerosis. It was like inventing a machine that could look into the future, undoubtedly it was one of the most revolutionary findings of the century. We gain medals and awards. It seemed as if we had been able to change the world.

And sure we did... nothing would ever be the same since that 25

November 2037.

In those days the treatment of diseases was already very advanced, and with the electric nose, we could finally beat diseases. This thought was exciting but somewhat scary. Would we become an undefeatable ... specie? Would we be able to live indefinite time?

In the first year, the e-nose started to be used in hospitals, but its cost was still very elevated, since the devices could predict a wide range of diseases they required refined technology and materials. But it was achieving our dream, it was changing medicine and Biomedical sciences for the better. With time we designed more "simple e-noses", these could predict more common diseases, like the flu or COVID. Its production was cheaper and could be sold to the general public. This too generated excitement and controversy, some people fear that society was not ready to handle well this technology, doctors accused us to try to replace them, but, to us, it seemed a fantastic idea. Finally, people could be in charge of their own health. What could possibly go wrong?

"We have to go Liliana, it is time" I heard while I was staring at my title, "sure" I responded, even though I am still clueless about what is happening. "Does my hair look fine?" I asked... I feel like I need to break the silence since my mind has been wandering in the past for so long. She looks at me with a soft smile and says "you look great, don't worry, we will be with you at all times, you don't have to fear" I sense kindness in her voice but her eyes, they seem worried and they reflect sorrow. I feel divided, do I really want to know where am I going to? Some part of me is telling me to just forget and go back to a happy memory, a safe memory. Although I doubt that it is safe, I decided to keep thinking about the time when I changed the world...

As time progressed the pressure of the pharmaceutical companies became stronger and more difficult to handle. They not only

wanted to work in a partnership with us, but instead, they wanted to buy our technology. We knew that their end goal was just to make profit, and our biggest fear was that our products would not reach our target group. We did our best to resist the pressure, but the demand for the devices became unbearable for a small company like ours. We needed to partner with an experienced pharmaceutical company, at least partnering was better than selling. So did we. In 2042 we sealed the deal with LebensFreude AG, with the conviction of merging our goals. Now that I think about it, I wished I could really go back in time, I wished we had never signed that contract, but I am not sure why.

It was 2045, and by that time the basic electric nose was everywhere, but somehow, they were not entirely being used for the purpose they had been created for. It all started when many places used them at their entrances, people were being scanned to find out their diseases.

Stores, restaurants, and public places became more selective. Just those in perfect health were welcome in society, and those unable to pay for treatments were relegated. Companies started to use the Basic e-nose while hiring employees, and soon job opportunities were not the same for everybody. This started to build a bigger gap between society, and the world of the "healthy and wealthy" became stronger as never before.

Many times we argued with LebensFreude, but their power grew more than ours. Nonetheless, we reached an agreement. We had engineered an affordable "advanced e-nose", one that could predict deadly diseases. Thus, we agreed that treatment costs would significantly decrease, in exchange of releasing this new device to the general public. Finally, the entire population could benefit, and maybe then the social mess that had been created could be solved.



Even though the e-nose used in wealthy countries was not being purposely pre-programmed, the quality was declining.

When the advanced e-nose hit the market it seemed we were achieving our goal, but a couple of years after, somehow the population was getting sicker than ever! How did this happen? people were being diagnosed on time, treatments were widely available and new medicine was being produced. And still, the diagnostics and treatment were not improving life. Why?

I feel like waking up when I hear the sound of a gavel banging on a table, once again my mind has blacked out. But.. what am I doing in a courtroom? It is a huge room and is completely full of people, lawyers, and reporters. the flashes of cameras are overwhelming and I am getting headaches. I look around me and... IT'S ME! I realize I AM the one being judged! WHAT DID I DO? I try to focus and stay in the now. My heart is pumping so fast, I feel I can't breathe, my arms and legs are numb, I feel a sinking feeling in my stomach, I feel nauseous. But I keep repeating to myself "stay in the now, stay in the now... keep focus, remember... remember..." and suddenly the story starts to unravel:

The advantages of the e-nose and early treatment did not help to solve society's division, if anything it made it stronger. The flu and covid were not a problem anymore. But knowing that someone was developing Alzheimer's prevented them from getting jobs, even if they were following a successful treatment. Society didn't know how to really react or do with so much information, even though "we were so advanced in technology, we were still not prepared to have so much power in our hands. Gradually those who find out that were developing cancer suffered from anxiety, panic attacks, and depression, dramatically increasing the suicide rate. All of this happened in developed countries, but what happened with the rest of the world was preposterous.

At some point, another line of the advanced e-nose had been produced, this line was a more affordable one, it had been created for the poorer countries, for those who had limited access to medical services. These devices were connected to a shared network that was located in the building of LebensFreude, technology had advanced so much that they did not require internet to keep the connection to the network. We had been told that through it, they could calibrate the devices, and the data could be retrieved to offer the medicine matching the predominant future diseases. As a result, the company was making astronomical amounts of money. What we didn't know was that the higher ranks in LebensFreude had ordered to hack our system and they were feeding the devices with the wrong data. People were told to be developing diseases that they were not, and treated with medicine they didn't need. Some used it for enough time to damage their liver and kidneys, increasing impairments and diseases among the population. But the most deplorable outcome of the misused of this technology turned out to be: human trafficking.

Even though the e-nose used in wealthy countries was not being purposely pre-programmed, the quality was declining. LebensFreude was becoming greedier and tried to make the devices at even lower costs, hence, the 100% accuracy with which it started, decreased and false diagnoses raised. But nobody knew! I promise I didn't know! our research team was been pushed out of the development process and we became powerless, LebensFreude was talking over through legal and political manipulation.

Fast forward, people ended up developing liver and kidney failure. Although science was getting closer to developing functional and safe "In vitro organs" we were not there yet, but the demand was

increasing and the offer was sparse.

The social psychosis was getting unmanageable, people who needed an organ were trying to obtain one at all costs... and this unleashed despicable practices.

People from poor countries, who had been falsely diagnosed as developing deadly diseases, and had no means to follow the suggested treatment, were desperate to ensure their family's future. Some of these were large and the loss of a member would mean a tragedy in all aspects. This though pushed the "sick" relatives to their limit, and to do anything to spare their relatives from an uncertain future.

At least they knew they were "dying" and they were on time to do something with their still healthy bodies. And that was: sacrificing themselves to sell their organs. They thought they were about to get sick, they thought they would eventually die in a matter of months, they trusted in the e-nose, I trusted it too! But It failed, I failed...

All of a sudden my mind is clear now, I am aware of life again. Now I can remember the moment I realized of the tragedy that was happening behind my back, of the betrayal of LebensFreude. Back then I entered in a state of shock and disbelief, my coping mechanism was disconnecting from reality, it was too excruciating to face. All I ever wanted was to improve life, all I wanted was to make this world better but we made it worse.

While I am embedded in my thoughts, I hear the word "guilty" being pronounced. They found me guilty of innumerable charges. I am still in the dark about what happened to all my colleagues, to those who shared my same dream, what happened to Linda? and what happened to LebensFreude? Will they ever pay? It is too late

for me now. Do I deserve this punishment?

Although I have been dead inside since this scandal was released, I hope my body follows soon and then my only regret would be having signed that contract in 2042.

The end?

The Depressing Happiness of Life

MAREIKE PFAFFERNOSCHKE +
ANOUCK VAN DER VLIST



UTOPIC



DYSTOPIC



HIGH-TECH
AGE



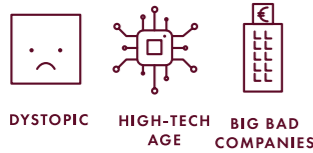
MENTAL
HEALTH



NEW
DRUGS

As my life and communication device (which is commonly known as LCD) woke me up after my REM sleep was finished, I was dragged back into reality knowing I had another unpleasant day, the 17th of January 2083, in front of me. When I walked downstairs, I could already smell the coffee. "Ah, thank you, Dobby!" Dobby replied to me in his automated voice with "Good morning Scarlex, you are welcome." I have always liked Dobby, even though he is only my house robot. He always gives me the feeling I am okay the way I am, unlike everyone else in my life who tell me I am being to dramatic and just want attention. After breakfast, I take my anti-depressant probiotic pills, that Dobby reminded me of. This is where the 'pretending to be fine at university' began again. As I stepped into my self-flying car, I felt even worse about myself because I saw everyone smiling and enjoying their day. This even got worse as I walked into the university. Luckily, my best and only friend Claire was already waiting for me at our meeting spot. She is the only person I ever told that I suffer from depression, which makes me probably the only person in the world as science has created a cure in the form of a pill for every mental health issue there is. This has even replaced all jobs like psychologists and psychiatrists, that were really common in the past. This is when I notice that Claire waves at me, saying "Hellooooo, can you get out of your head and to me please." I smile at her, and we walk to class together. For the rest of the day, I try to concentrate on our classes, which is really hard when you have a hologram in front of you instead of an actual person teaching. After school, I get back to my question why my anti-depressant probiotic pills do not work for me. I have looked at all entries in our digital achieves, tried consulting with our doctor, and I am currently searching for people that practiced psychiatry when they were younger. So far, I have not figured out what is wrong with me because everything I have figured out tells me I should not have these depressive symptoms. My doctor has even prescribed me the double recommended dose for my depression pills. I do not know how to continue like this, because every day is torture for me which is made even worse by the people around me who live in this fairytale happiness. As I am crying in my room, struggling with my assignment, I get a message from Dobby on my LCD around my wrist. He pops up as a small hologram asking when I want to eat dinner. I just click him away as I want to be alone, but he keeps popping up. After a few minutes

Dobby enters my room, wanting a clear answer. At the same moment, another hologram pops up of Dr. Kaeleen, who I reached out several times asking for help for my depression as she used to work as a psychiatrist. "Stop bothering me and leave problems of the past in the past! You are probably just imagining this." At this point, all my hopes have been shattered as she was the only human left who had work in this field previously. Unfortunately, all other prior mental health workers are not around anymore, meaning that there is no one else left who I can reach out to. I do not know what to do anymore, because I have searched all archives and contacted everyone who I could find. "Please Dobby, help me!" "Okay Scarlex, I will prepare dinner", Dobby replies. I break out crying thinking my life could not possibly get worse. After I had two bites of my dinner, thinking it would make me feel a bit better, Dobby sends a reminder to my LCD that I need to leave in 20 minutes for my monthly anti-depressant probiotic pill compatibility check. I really do not want to go, but I know if do not go, then I will not get a new package of pills. Without my pills, I will get aggressive outbursts which leads me to be angry at everyone and everything, unable to stop myself from yelling. This makes me scared to interact with people around me, so I lock myself in at home. I leave my dinner and make my way to the doctor for my check. I walk into the office of Dr. Cedro. "Hey Scarlex, I looked at your last test results", he started. "We found something in your microbiome we still cannot explain. We think it might be a new bacterial species. This might also explain your dissatisfaction with the effect of the anti-depressive probiotic pills." Not knowing whether this would be good or bad news, I nodded. Dr. Cedro continued, "Knowing this information, we looked at your old test records, showing an increase of this species over time. We previously thought this was measurement error, but due to its increased number we looked into it in more detail. This might also explain your mood state like you used to describe it." "But what can we do now?", I replied. "Well, there are several options. We can either remove the bacteria from your gut or we develop a new probiotic pill, trying to get rid of this bacterial species. It is up to you." I could not believe what I was hearing. This means I was right after all, and I really suffered from depression despite everyone telling me this was not possible.



A Futuristic Scandal within the Meat Culture Industry

MARTIJN MOERS +
CHARIYA VAN DOLDER



I'm stuck. Stuck at work. Stuck at this desk and there is nothing I can change about it. Well, next to finishing the leftover work of a colleague. There were multiple rumors in the hallway but since I don't talk to anybody, I don't know any of these rumors. Which is fine, because I like it that way. No nonsense to bother me.

"Good afternoon my fellow colleague, still here to work?" is what Freek says to me, interrupting my self-pity. He approaches me and by experiencing a change in the height of the desk I assume he leans on it. "Hello there, yes, just finishing what Liv left, before she was fired by the company" I say to him. Freek is one of the few people who likes to talk to me, or at least I think he does. He never stopped talking to me, unlike the others.

"Wow, HMP really likes to work you to the bone, huh?" I stare out the

window as he talks to me. The sky is already dark and empty due to the pollution, leaving the stars invisible.

"I suppose so, I'm the one who has the highest valued education and the most experience on this subject so they clearly had a preference."

"Don't you sound all high and mighty. Oh well, care for some coffee? To keep the melatonin effect canceled?" He shifts his gravity back to his legs and waits for an answer. We exchange our first eye contact during this conversation as I turn my chair to him.

"I told you this before, I don't drink coffee."

"I know, I know, just checking." He says as he walks off. As he is almost out of sight, I said: "But tea would be nice, sucralose instead of glucose please!" he puts his hand up, confirming the order and he walks off to

the canteen.

I focus my attention back to work and read the new preparation of the meat product of HMP. HMP is one of the biggest players in providing cultured meat to the common consumers and the company I work for. The name is an abbreviation for Humane Methods for People and is well-known for its unbelievably tasty cultured meats. Within this building of HMP, the one I'm sitting in, are the culturing labs where billions of petri dish steaks are made. The next step of this company is to make such a culture lab in the size of a microwave, so the consumer can culture their own kind of steak, burger, bacon, or organ meat just on their countertop. But to get this far, somebody needs to check if there are any faults within the preparation of these self-culture kits. And that person is me.

The culture machines themselves are quite straightforward but the usage of the culture meat packages for non-laboratory people is the tricky part, especially since certain compounds need to be added later. These compounds are the flavor and growth enhancers together with the building structures. However, during the testing phase there were some problems experienced by the participants. Certain compounds won't mix as well since the solvent in the lab cannot be used at home. With this, it isn't surprising why the replacement solvent also didn't work, but this is not the thing that I wonder about. I wish to see what other combination has failed in the earlier prototype testing, so I wouldn't make a known mistake. I tried to check multiple files within the computer system, but I don't have access to them. When checking the backlog, it jumps from prototype testing #4 to prototype testing #13. So what happened to the 8 files between them?

"I don't think I ever saw you making this face," says Freek as he puts down a cup of hot tea on the desk. I ignore the cup for now and look into earlier versions of the backlog.

"Yes, there seem to be some missing files which I want to read before I start writing on a new preparation proposal." When I check them, it turns out that it is literally the same version for 2 months straight and then file #13 pops up, meaning that somebody had deleted them. "Freek, do you know anything about these files?" as I point to the gap between the file numbers on my computer.

"Hmmm, I think there is a chance that I have file number 12 since Liz sent it to me via the mail. Although every email of hers has been declared "unfitted" they deleted all the content but maybe I have a physical copy laying around."

"Are you able to print the documents of the company? There is a very strict blocking wall on the computers for that" I ask him.

"You don't know me that well but I'm an old soul. When it comes to long reports which need to be read, I print them by bypassing the system." He says proudly. He seems like the person to do the things which make him happy, even if they are against the rules.

"Don't tell the boss though, I have worked here for more than 30 years but I don't think she will ignore this" He said sheepishly. I suppose it is also late for him to reveal such information.

"If you would be so kind as to pass me those papers, I would highly

appreciate that." I say looking him in the eyes while trying to pull off a warm smile. Freek realizes how much effort it takes for me to do this and answers:

"Wow, you are still full of surprises. Sure, the process I was running is finished now so I will get the papers for you and then be on my way home."

"Thank you, Freek."

As Freek brings me the file and goes home, I read it multiple times trying to wrap my head around it. There was an additional compound in the preparation kit which wasn't named before. Reading about this APF-43h, scratches a part of my brain. I have heard of this but cannot recall it. Due to the fact that they blacked out the biological effect of the compound at the beginning of the report it couldn't provide the information I was looking for. Normally this wouldn't bother me as much, since it was not an unusual measure but I know this name. I should know this compound and its use. But what was it? And then it happens. A handwritten note on the very back of the paper. Assuming it is Freek's handwriting; it states: Stop ordering APF-43h from BioCognito Inc. Will be included via the cell cultures.

BioCognito Inc. is this big medicine producer in Europe which was one of the first pioneers in preventing Alzheimer's to develop. I wrote my whole thesis on this when I was still in my master's. I knew the history of the disease, the cure and made a right prediction regarding the time when it could be implemented to the patients. Even though a lot has been forgotten, I remember the first common name of this cure: AFP, which stands for Anti-prion formation and is used to stop the formation of wrongly folded proteins. But why was this added to the preparation kits for meat? Animal meat isn't known to infect humans with prions so why add it?

I look up from the papers. HMP has always been discrete about what kind of meats they use for their steaks but has admitted to using different species of animal cells to promise the best flavors. This was found to be true due to the characteristic meat flavor to let this company excel among all its competitors. To prevent people from discovering this, they made many implementations such as triple-bounded DNA to hide the percentage of certain animal cells. But I would never have thought about this. And I can see why they would want to hide this information. It could bring scandal, uncountable court cases, and people losing their minds if they know about this. And that is when my conclusion leaves my mouth as a soft whisper.

"There is human meat in there..." "Our cultured meat is human meat..."



DYSTOPIC



DRUG WASTE



SYSTEM COLLAPSE

When Medicine gets Mutagenic

MICHELLE CLEVIS
+ REBECCA DE WIT

“Oh, look! It’s a pod of whales!” The narrator of the documentary croons. The animals are swimming calmly. One of them breathes out from its blowhole, launching the water vapor high up in the air. “These gentle giants are blue whales.” He continues, “During the summer months, they migrate here, to the polar seas, where there is plentiful krill for them to eat.” I am treated to the view of a whale’s baleens, filtering the water for its food. I looked at the little booklet that came with the DVD. This documentary was made in the early 2010’s, over 70 years ago. My grandmother had given it to me for my tenth birthday. It was

hard to believe that such a little thing sparked a love for nature so deep that years later, I was heading research dedicated to saving it. As the whales swam by the ship of the documentary crew, I was reminded of how big they were. Unbelievable. I wish I could have seen them in their glory days. But the whales were one of the first animals to disappear when the seas were poisoned by our own medications. Algae and plankton were severely affected, and with no krill to eat... Whales were long gone by the time I was born, in 2057. Many other species followed suit, unable to adapt fast enough. Others...changed.

I was startled out of my reverie by the hissing sound of the automatic door. Sage came waking in, a box in her arms. “Are you watching that old film again?” She shook her head, sighing fondly. “Come on, we have work to do.” “Right, sorry.” I quickly turned the documentary off. She lifted the box up higher. “As you can see, we have yet another delivery. This one’s fit for the freezer.” She said, handing it over to me. “I’m going to feed the Girls. Call me if you need me!” ‘The Girls’ was the nickname Sage had given the all-female group of carp we had under observation. They were some of the only live specimens we had received. At least two of them showed residual traits of male fish, so it was likely high levels of estrogen seeping into their habitat had induced a feminization. “Will do.” She nodded, then disappeared into the next room. Before she closed the door behind her, I could hear the water sloshing. They were always excited to see her. I put the box down on the table. Pulling open a drawer, I retrieved a pen and a sheet of labels. Specimen #1309, I wrote down. Ever since Sage and I had started our research initiative, nearly five years ago, we had been receiving many odd creatures and plants people had come across. Though pharmaceutical companies may have denied it in the beginning, biologists had known increasing medication waste was at fault for the loss of biodiversity and the higher mutation rates in animals. They had eventually managed to implement better strategies for the medication waste, but significant damage was already done. For us, there was a different task set out; to study the resulting creations, in hope of saving what was left. Once we’d properly identified what kind of creature we’d received, we’d re-label it, but until then it was just another mystery specimen. For now, I would just put it away. Instead, I exchanged it for another specimen that I hadn’t gotten around to studying yet, labeled #1287. Inside the container was a creature that looked to be somewhere between an armadillo and a pangolin. I put on my gloves and started on the routine check, noting its physical characteristics; it was a pale cream color, with each scale speckled in a dark blue that was almost black. On its head, the spots made way for stripes in the same color. An unusual pattern.

It had multiple extraneous ears, which judging by the way they drooped, were not properly developed. Its eyes were larger than usual. Then I moved on to the contamination measurements. As I already expected, given its appearance, the armadillo had enormously high levels of pharmaceuticals in its body. Its hormone levels, in particular, were much higher than would be expected. I took off my gloves, carefully entering the information into our database. I returned to the freezer, opening the door and shelving the specimen again. As I put it back into its place, my hand bumped into the box beside it. It tilted and fell back with a soft thump. Seeing it was now close to the edge, I pushed it a bit deeper onto the shelf. Just as I was about to close the door, the box jumped. I shrieked involuntarily, which only seemed to encourage whatever was in there to struggle more. The box was jerking left and right, as if the thing in it was bashing itself against the walls of its prison. Paralyzed, I could only stare at it. All specimens in the freezer were meant to be dead. Judging from its position on the shelf, that box had to have been in there for weeks, at least. Even for frozen material, it had been nearing its expiration date. As I stood paralyzed, the container finally tipped over the edge, falling to the floor. The fall only took a split second, but it felt like a century. The lid was flung away on impact, landing a few feet away. Crawling out of the container came... Something. I had no idea what it was. Its body was so irregularly shaped, I couldn’t determine what part was original to the animal, and what had been mutated beyond recognition. A foul odor came from it, sickeningly sweet, like rotting fruit. Its large, dark eyes looked up at me from the floor, before it let out a low croak. A...frog? I could see it now. Its skin was pink and glossy, nearly pearlescent. It was pretty, in a weird way. The frog confirmed its species as it did what frogs did best; it jumped up on the work table and headed determinedly towards our collection of pinned bugs. Maybe some things did stay the same after all.



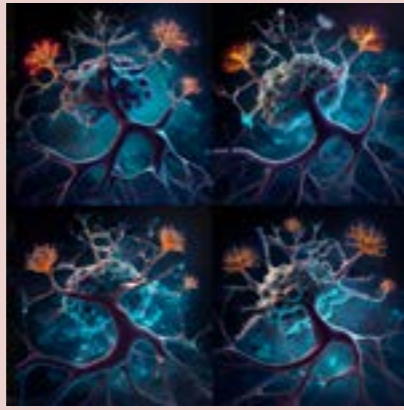
DYSTOPIC



IMPLANTS



SMART MEDICINE



When It Seems too Good to Be True

BATTICE WESTENDORP
+ ROSALIE VAN MILTENBURG

It's January 26th, 2083, and it's cold as I'm walking towards the hospital entrance from the parking lot. My legs are feeling stiff. It takes quite some time to reach the doors from the main entrance, where a breeze of warm air greets me. It's not the first-time walking through these doors. Unfortunately, I have suffered my fourth stroke in 5 years, which explains the stiffness I am feeling. It does seem like a lot, however as I haven't changed my lifestyle since the first stroke, it was to be expected. At this old age, I do not feel the need to get very active anymore and nowadays the impact of a stroke doesn't have to be as great as fifty years ago. A few days ago, I felt the numbing feeling in my arm and knew exactly what was happening. The notification on my phone confirmed my suspicions: I was having a stroke, again. I must admit, it felt kind of weird to have my phone tell me I was having a stroke right as it was happening, but at least the implant in my brain works just as my doctor told me after the operation: when the implant detects a lack of oxygen in part of the brain, it sends a signal to your phone to let you know you're having a stroke. That way, you can undertake action immediately, resulting in fewer damage. It is a fairly new technology offered by the hospital for a couple of years now. At first, I was hesitant, but I trust my doctor, as he has helped me

successfully during the previous times I came in for a stroke. I also know what the procedure following the detection is: the implant will be activated in the hospital to start producing artificial stem cell neurons that will help with regeneration of dead brain cells, making full recovery after stroke possible. It sounds like a miracle, and I wouldn't have believed you if you told me about it. However, since I have experienced it for myself, I can only say that it works perfectly. They have found no permanent damage in my brain as of yet. Contrary to the first time they activated the chip, I am now not nervous anymore. I know that it will work, and I have faith in the technology that my doctor told me has been in development for the past 15 years. The use of stem cells has been researched for even longer than I am alive. As I am walking towards the neurology department, my eyes detect a glimpse of blue in the corner. I turn my head and as I am registering the scene in front of me, I feel a wave of anxiety pass over me. 'Haven't you heard?', the receptionist is standing next to me. 'Doctor Johnson is getting arrested for using fake data in order to get his new technologies approved for clinical use. They do not know what the implications of his operations might be for patients.' I feel the ground underneath me sinking as I watch my doctor get escorted out of the hospital.

Bored of Living in a Bubble

STERRE ROOSEN + MINA MASOUDNIA



DYSTOPIC



PANDEMIC



HIGH-TECH AGE



MENTAL HEALTH



SOCIAL DISCONNECT

It seems like a dream, when we were actually allowed to play outside, hug each other, do normal stuff, but it is not normal anymore, we always have to keep our 5ft distance from each other. Based on grandmother's stories there was a time when everyone was outside without wearing a protection bubble. people could wander around easily, without the fear of infections or live out of the shadow of developing IBD or MS. In the hospitals there were actual doctors instead of robots tending patients in isolated rooms. Actually grandpa died a few months ago, I couldn't go to visit him. No funerals. Just sitting in the darkness and wishing I could see him one last time. I found Mom's diary yesterday: "Looking back, my childhood was a dream. The best of both worlds some might say. On one hand, I would be exploring a new online world, playing the sims and chatting via MSN. The limit seemed endless. On the other hand, no pants ever remained intact because of the amount I played outside. Hide-and-seek, tag, or maybe just running until my lungs give out with friends. My mom wouldn't even allow me to use the computer if the weather was too nice. "Go ask the neighbors if they can play, be home for dinner!" I can still hear her shout." She was born right after the stupid COVID-19 finished. She had quite a happy childhood, unlike me sitting behind the screen, virtual friends. I don't wanna even think about how I was born anymore. I just know that I grew up in one of the incubators. Although whenever I ask my mom, she denies it, I feel it in my bones that I was also genetically modified. I keep recalling what I heard my grandma say once: "The way my grandchildren spend their days right now hurts to see. Government mandated enrichment videos and food so clean I doubt bacteria have ever been near it. Completely separated from any actual

nature that is still left out there. Disinfecting everything after every little interaction, petrified of what the big bad outside could do to them. Which nowadays is actually a valid concern. I know it hurts other grandparents too. But we keep quiet, no need to remind them of everything they are missing out on. And it's not their fault. If anyone is to blame, it would be the generations that came before them. Us. That might be the worst part, the fact that we did it to ourselves. The big shift was during the COVID-19 pandemic. We were becoming too clean. Scientists warned the public about the fact that we were ruining our immune systems, that they would not be able to handle anything if we kept pampering them like this. But people chose short term protection from viruses over a long term strong immune system. By continuing to use antibiotics, all bacteria slowly grew resistant. And now here we are, weak and unable to protect ourselves in any other way than just completely cut ourselves off from what's out there. Nature, fresh air, and most of all, memories. " I don't know how others get adapted to this situation, but I simply can't. I read on the news that a new planet has been discovered, with features close to those of the earth. Scientists are encouraging people to sign up for the trip. I filled in the form yesterday. They are concerned that the volunteers might get infected by unknown viruses. To be honest, I don't care. I want to take a deep breath, touch the grass, take an apple off the ground and bite or even kiss someone. I will take the risk, my body will remember how to defend, thousands years of evolution couldn't have just flushed down the drain. I might not survive but others will. we will go back to what we had.



UTOPIA

HIGH-TECH
AGENEW
DRUGSMENTAL
HEALTH

Erasing the Boundaries Between Illicit Drugs and Medicine

A trip to 2083



Oh, the serenity. I'm leaning on the pearl-white balustrade of my balcony. It is early in the evening and the sunset starts marking the skyline of Nijmegen in beautiful orange sunlight. After the flooding of the western part of the Netherlands in 2053, Nijmegen has quickly expanded and transformed in an important metropolis in the Netherlands. I have lived here for my whole life and I have almost entirely experienced the metamorphosis this city has gone through. My ears catch the hushed sounds of one of the several sky trains that traverse the centre and outskirts of the city. The train moves towards the city centre and the three peculiar Tesla Inc. skyscrapers in the distance are being lit up by the setting sun. For decades, Tesla and a handful of other multinational businesses have dominated the free markets of the western world. The smallest skyscraper of the Tesla skyscraper complex is where I work. The building houses several branches belonging to the overarching Tesla Food Industry branch. My job is to work on the innovation of 3D printing food items, which has been an upcoming technology this past decade. I love my job and feel very fortunate that I'm able to practice my passion in good health.

I let out a satisfied sigh. Life is marvellous when one does not have to worry about excruciating headaches, I think to myself. I was diagnosed with cluster headaches when I was 20 years old. I was still a student at the Radboud University when I got my first cluster headache episode. The pain was unbearable. It felt like someone had twitched a knife inside my eye socket and this pain would continue for days on end. I decided to seek out help and I went to the general practitioners practice. The doctor prescribed me Qualarin, a powdered, water-soluble drug manufactured by Tesla Medicine that I were to take every six months. The frequency and intensity of my headaches were almost completely absent for the coming years after I started my Qualarin treatment. How remarkable that a powder like Qualarin is able to effectively counter the excruciating pain of my disorder.

Reminiscing back, I remember being shocked at first to find out that the working substance of Qualarin was the hallucinating drug LSD. I found the thought of taking a hallucinating drug very frightening, but the doctor assured me that the dose would be too low to experience any hallucinogenic effects. Fast-forward 10 years, and I had already partially forgot about the working substance of my cluster headache medicine. But that changed almost a year ago. Out of nowhere my headaches starting coming back more frequently and Qualarin was unable to effectively combat the pain. I went to the doctor once more, and he prescribed me a higher dose of Qualarin. My headache episodes were suppressed again, but the hallucinating effects were definitely more pronounced.

Tomorrow it will be the second time I have to take this higher dose of Qualarin.

I sigh.

As beautiful as this evening sunset is, I can't help but to start pondering about tomorrow morning. I'm a bit frightened about the hallucinations I might experience, especially since I also will have to go to work.

I wake up by the sound of my alarm clock. It's 05:30. I get dressed and make my way to the living room of my apartment. At the kitchen counter, I print my breakfast with the latest model of the 3D Food Printer by Tesla Inc. and take a glass of water. My heart begins to beat faster when I start to dissolve Qualarin in my glass of water. I take a few deep breaths to calm myself and subsequently I take a few sips of my drink. I finish my breakfast and I wait patiently if I experience any hallucinations.

Forty-five minutes have passed and suddenly I start noticing visual changes. Anxiety creeps up and the sense of time is slowly fading away. I start to panic. There is no way I will be able to go to work in my current state. I decide to call my boss and tell him about the negative side-effects I'm experiencing as a result of my treatment. He responds emphatically. We have discussed my disorder and required treatment multiple times in the past, and once more he tells me how he recognises my complaints. His wife also uses a high dose of a psychoactive drug for her treatment against borderline personality disorder, so he is familiar with the problems I'm experiencing. My boss grants me a paid day off and tells how he sees forward to seeing me tomorrow.

I lay down on my bed whilst the hallucinations slowly begin to subside over the following hours. I do not like to trip, but the absence of my cluster headaches make this tough day absolutely worth it. I suddenly realise how lucky I am that my environment is so accepting of my drug use. I have read on the internet that hallucinogenic drugs used to be stigmatised not even too long ago. I cannot imagine having to deal with these social issues and the need for justifying the treatment for my horrible disease. The world has changed for the better in that regard.

The light of the setting sun reaches my eyes once more. I get up from my bed and make my way over to the balcony. The city is quiet but a beautiful sight to behold in the orange glistening sunlight. I once more let out a deep sigh. Life is marvellous when one does not have to worry about excruciating headaches.



DYSTOPIC

SOCIAL
DISCONNECTHIGH-TECH
AGE

PANDEMIC

What Is Scariest Than a Lion?



LEONIE CZERNIK, JORINE SANDERS
+ WILLEM FREDERIKS

With the hot summer sun shining on his face, Bokamoso was enjoying his greatly deserved retirement by enjoying some family time at his ancestral home. A home that was once filled with neighbors, friends and family was now empty most of the time. Once located in the middle of the village, it was now situated between the new modern elderly complex on the left and the savannah on the right. A lot of changes happened while he lived there but losing the once homey village he grew up in was still hard to come to terms with. Luckily, his whole family stayed in

the area. Even his daughter and her family were staying at his home for the weekend. His favorite grandchild Bobo was playing outside with his new hoverboard. A hoverboard... wow, Bokamoso thought. He would have never believed that he would see this in his lifetime. But then again, he never thought a lot of things would happen here in Zimbabwe. All of the technological advances and the improvements in the day-to-day life made the once poor and unhealthy Zimbabwe into a place for new settlers. Here, families from all over the world came to make their new home.

This train of thought took him back to the past, the way it used to be. He started to reminisce about how a community would come together for each and every event. The cooking that took place for each party, the dances they performed at weddings or even funerals, and the comradery and hope people provided when someone was sick. Especially this last thought almost brought him to tears. His wife died of tuberculosis when she was just 32 years old. Everyone gathered around her to tend to her. They cooked, made sure the kids were taken care of, did the housework and even took the effort to prepare the funeral when the time came. People did not stand still at the fact that her disease could infect those around her. No real knowledge was there about the disease that took her life. Not until researchers from the capital Harare came to the village. They came with this small box that held the capacity of a full laboratory, "portable sequencers" they were called. Everything changed after that moment. People could be diagnosed with what type of bacteria they were infected and how this could be treated. People were clustered into groups that contained further spread. For the tuberculosis epidemic this was a game changer.

That became astonishingly clear when his daughter Kiki also got tuberculosis. With the fear of losing another one of his loved ones, Bokamoso hurried to the local medical house. When he entered, he saw it was nothing fancy. Just some people with pipets in their hands, a few bottles, tubes, and laptops, and these small new devices, the portable sequencers. Bokamoso told them his daughter was sick and they came with him to their house. In the shortest time they diagnosed her with a tuberculosis strain that was apparently resistant to the standard treatment. Luckily, they had a different antibiotic treatment at hand that cured little Kiki. Without this knowledge provided by the portable sequencer, she could have received the wrong treatment, leaving her worse off than before. After nursing her, they proposed an isolation protocol so that no other people would get sick. This was a very new way of dealing with the disease, as normally the village would constantly surround her and take care of her. After a few weeks, Kiki was back to her happy self, but a shift was seen in the village. Due to the new technologies and the clustering aspect that came along

with it, the community changed their way of treating the sick. No more tending to each other vigorously, but rather keeping their distance in order to not get infected. People became more and more disconnected from each other, and not too soon after, people stopped caring all together.

Throughout the years, application of new technologies became more frequent. Everything could be made smaller, cheaper, and more accessible. More treatments were possible, and more prosperity came to their village. Tuberculosis became a disease of the past. More and more diseases were eradicated due to these new and personalized antibiotic treatments. To keep up with all these new evolutions, Bokamoso started to dive into the subjects of bacteria and their resistance. He felt it was something too good to be true. He spent years of his life investigating the topic. Learning that, even though these treatments gave his country and many others alike the opportunity to modernize and become more technological, something was off. He realized using antibiotics for everything created a huge new problem. That treating tuberculosis in the past was just the tip of the iceberg. A new pandemic was lurking in the shadows. The worst problem yet: antibacterial resistance. He knew that this was something his children and grandchildren would have to face. He got emotional just thinking about it and a tear streamed down his face.

"Boka, why are you so sad? What are you thinking about?" Bobo asks as he came around on his new hoverboard. "I was just thinking about the past, and how a lot has changed." Bokamoso said. "You get to enjoy a life without worrying about this disease that had a grasp on all of us. Tuberculosis was a real challenge, but you don't have to face it anymore." He said with a subdued smile. He was just about to warn Bobo about the future, when Bobo yells "HELP, THERE IS A LION!". Bokamoso shot out of his lounge chair and shouts to Bobo "We have to get inside!" While they were running inside, Bokamoso glanced worrisome at the lion. He was not afraid of the lion, though. This acute danger will be nothing compared to the challenge his grandkids will face with drug resistances. The bacteria are going to feast on the dreams of the children...



A Hopeless, Burned Out World

LISA VAN ZUUK + LIZE DEKKERS

Another day at work, each and every day the same... More and more patients coming in and more staff quitting every day. It's just too much. I sigh and pick up my patient list for the day. I see that my day starts with Mrs. Jacobs. She's been a patient here for as long as I can remember. When I had just started working as a social worker with the mental healthcare services, Mrs. Jacobs was in her 40s. Around the same age I am now. She's been struggling with burn-out and depression for the last 20 years. In my first conversation with her I remember her telling me about her family, her son was still a toddler then. She was exhausted and so stressed, but she couldn't quit her job. How else would she be able to feed her child? Now, 20 years later, she is still providing for her son and is working overtime every week. It's starting to take a toll on her health. She gets sick a lot and takes all sorts of medication to get by. Soon her employer will lose their patience and fire her. She will be too sick to work at all and will have to get by on the small payments she will get from the government. I see it happen often enough and Mrs. Jacobs is one of the tough ones. For most

patients it takes about 10 years to collapse under the pressure of life nowadays.

When you look outside, the world is empty. The streets are quiet and most stores have been completely abandoned. You could fill graveyards full of the companies that went bankrupt. There are no longer workers to pick up the trash and clean the streets. No workers to look after the trees and plants. Buildings are falling apart and robberies are frequent, because the police force has waned. There is no time or energy left for art or music. The world has become sad and dull.

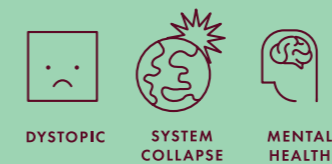
According to my mom, this all started around the beginning of the 21st century. Back then, the workforce experienced a shift in age. The population was graying, as we called it. The baby boom generation was going into retirement. A huge proportion of the working force suddenly disappeared. There were huge shortages of employees and those people that did have a job had to

compensate for the colleagues they didn't have. People started to burn-out and at a surprising rate. By 2030 about 70% of people aged 16 and above had experienced a burn-out. In the beginning, there was still space for people to cut back on their job and take the time to recover from this burn-out. But not everyone did. As time went on, the amount of people that were still capable of working got smaller and smaller. There was less and less time to recover from burn-outs and chronic stress became the new norm.

By 2050 The problem has gotten so bad that around 40% of people over 18 years of age have been declared unsuitable for work; another 30% was only able to work part time. In 2051 governments across the globe intervened and there was a huge distribution of the workforce, which they called the global workforce act. Jobs that were deemed unnecessary were banned. Nearly half of the population was forced to quit and choose another profession. Artists and gardeners had to become teachers and farmers. Museums, theaters and cinemas were closed. Only those institutes necessary for survival remained. Schools, banks,

hospitals, grocery stores, retailers, etc were allowed to survive. It has been 32 years since the enactment of the global workforce act. But still the burn-outs keep coming and they are not stopping. Otherwise my job would have become obsolete. The situation is grim. Aside from their stress, people are starting to get more and more depressed. There is no joy left, no art, no music, no time to "waste" on things as frivolous as happiness. The world has turned from a place of joy into a place of survival. I still remember the plays my mom would take me to as a child. The dancers on stage. I haven't seen a person dance in years. Now that I think of it, I don't remember the last time I heard someone laugh.

I walk into the meeting room where Mrs. Jacobs is already waiting for me. There is little comfort I can offer her. In this world there is no recovering from a burn-out anymore. There is no recovery from depression. All I can do is smile and give a listening ear. At the end of our conversation I wish her well and that I hope to see her again next month. But will she still be there in a month, I can only hope.





Reduced By A Mistake



25 - 01 - 2054

Dear diary,

Today is the day. Today we will start the process of finding out who our son is. Exactly a week before his second birthday we got the invitation by GeneQ and today, on his birthday, we are taking him to our local GeneQ department to have his blood taken and brain scanned. I hope he loves games like the rest of our family, oh and I hope he has the traits to be a good father, I would love to be a grandma someday. But dear don't let him be gifted like our neighbours daughter Lilly, I couldn't stand sending him off to one of the gifted children's boarding schools. I want to keep him close.

26 - 01 - 2054

Dear diary,

He was brave, like he always is when going to the doctors. They had to re-do the brain scans because the calibration was off, but he was a champ. I can't wait to tell you the results.

01 - 02 - 2054

Dear diary,

The results are in! We gathered around the dining table with the whole family to listen to the results. I couldn't be more pleased. Jacob will follow my interests of photography and his dad's of bird watching. He will have strong legs, but a tender figure if we feed him right. Extra iron and calcium is needed in his diet, just like mine. He may have aptitude for sports like high jumping, or

dancing like his grandma Polly, who knows! Like the rest of the men in our family he will have cholesterol problems, and heart defects later in life. But we will get him his monitoring chip when he turns five. We got a perfectly healthy boy, we are so pleased!

18 - 04 - 2056

Dear diary,

Dan caught Jacob playing with my make-up and dresses again. It's okay, I think it is cute. Dan is having more difficulties with it, but I tell him it's a phase. After all, his GeneQ said Jacob is a straight boy.

09 - 11 - 2056

Dear diary,

We got called to the principles office. Jacob told all the kids he is a girl and asked them to call him Janny. I thought it was pretty funny, the boy has a thing for drama. The school was less amused, they wanted to see his GeneQ results, as if we wouldn't tell them if our boy was actually a girl!

22 - 01 - 2058

Dear diary,

The most horrid thing happened! I went upstairs to the to get Jacob for school. When I opened the door to the bathroom he was standing there, scissors in his little hand, ready to cut off his penis. "I will do it" he said, "maybe then they will believe I am a girl." Of course I contacted his doctor right away, but he won't get him an appointment with a psychiatrist. His GeneQ results said everything should be fine mentally and so they won't waste

resources on him. But he needs help!

24 - 01 - 2058

Dear diary,

I contacted GeneQ. It was not easy to find their contact information and it was definitely not easy to get a hold of them. They tell me Jacob his test results can't be wrong, all he is going through must be a phase. And maybe we shouldn't take him too seriously, his results say he has a thing for drama after all...

02 - 08 - 2064

Dear diary,

Dan and Janny got into a massive fight again. Dan just keeps refusing to call Jacob Janny and Janny can't stand it. I don't know what to do anymore. I already pulled Janny out of school, because the bullying was getting unbearable, but I now she has no contacts at all and a dad who is refusing to accept her.

01 - 02 - 2069

He did it. My worst fear came true. Dan found him in the bathtub. He left us.

08 - 02 - 2069

A letter from GeneQ came in. How they were sorry for our loss. How the test is of course not 100% accurate and so mistakes happen. How we can contact their legal team if we feel the need. There it is, my perfect little Jacob got reduced by a mistake.

