Nestor Pestana, from After Information series, The Exudaters (2015).

Malleable Bodies: Life Beyond Utilitarianism

Nestor Pestana

We have modified ecosystems around us to control the means of food production over millennia. In how far we understand this in terms of relationships between ourselves and other forms of life is a question each generation asks anew. In this interview, Nestor Pestana asks whether our conception of ecosystems as a source of nourishment that exists external to our own bodies is now an idea ripe for challenge.

When we think about food production, we inevitably make reference to forms of interdependence between different living, non-living, and technological systems. Where have you imagined in your work a different site for those interactions to lie?

The human body is highly malleable, and new and emerging technologies are now allowing us to make more significant and profound interventions than ever before. My project – 'The Exudaters' – is a conceptual piece exploring how we might modify our biological systems to attain our most complex desires. I was particularly interested in using design approaches to take advantage of the symbiotic relationships that we have with microorganisms, such as bacteria, and looking at the human body as a source of production – a little bit like a farm (our bacteria the crops and animals, our own flesh the land). During my research, I learned that there were many

libertarian communities in the 19th century Essex, UK. Whilst some were self-sufficient, others promised salvation to juvenile delinquents through labour or a way of life that ensured their inhabitants' entrance through the gates of heaven. They were social and utopian experiments: escapists, fourierists, and owenists. They also did not last very long.

The narrative of 'The Exudaters' is modelled on these Utopian communities of Essex, depicting a biohacker community living in isolation from an industrial and materialistic world (and perhaps even sharing a similar fate). The project's focus was not so much on whether the Exudaters succeeded, but rather on how biotechnology might allow biohackers to pursue similar libertarian goals − albeit to more extreme ends. Perceiving their bodies as a complex combination of living agents that can be enhanced or maximis ed to produce all they need for survival, they essentially push the boundaries of the probiotics industry through biotechnological interventions. Not only do they introduce new bacteria into their bodies (such as *Synechococcus elongatus*) and genetically enhance them to produce nutrients from sweat, but, most importantly, they design and bioengineer the ecosystem for the bacteria to operate in. The result is sweat glands in the skin that have been modified to serve three functions: The first is to contain the sweat produced by the body; the second is to host the bacteria which feed on sweat and excrete nutrients; the third is to absorb the nutrients produced by the bacteria into the bloodstream. These bioengineered sweat glands become, effectively, tiny digestive systems. More than trying to imagine a self-sufficient human being, however, I was interested in how technologies can push us beyond utilitarianism, i.e., how they might be used to fulfil our own ideals. The threat of pain or disease come to mind when we think about the transformation of living human matter in the way discussed. 'The Exudaters' depicts a world where we have surpassed these fears and are now able to understand matter beyond pain, and aesthetics beyond disease.

You address the condition of post-humanism through your work – a speculative endeavour to imagine future human capacities expanded through new technologies. What does post-humanism mean to you, and what themes within this condition strike you as most interesting?

Post-humanism embraces the idea of a human being defined not only by a biological body but also the technologies that are produced at a given place and time. For this reason, and through the lens of post-humanists, we are in a constant state of definition that depends on our contemporary technologies. For example, in the current informational era (one governed by informational technologies), data is what primarily defines us; we have the urge to understand ourselves through it. Take the human genome project – a pure translation of our materiality into a series of codes that ultimately hold the promise that, one day, we will take evolution fully into our own hands. But this post-human definition cannot be detached from the socio-cultural, political, and ecological contexts of the time and place in which it exists. They inform how we see ourselves and the world around us, and how our obsessions, frustrations, desires, and aspirations manifest in relation to 'being human'. These are interesting subjects to explore for any artist or designer.

In my work, I have been exploring speculative scenarios where we modify our bodies through emerging technologies – a very post-humanist subject. These modifications, however, are problematic in our real world: Our bodies adapt on an evolutionary timescale, and as we introduce more 'novelties' into them, we are forcing rapid change without time for our bodies to adjust. (We also introduce body and gene modifications that become sites for commercial interest and activity.) If we are to tackle this post-humanist world responsibly, I think we have first to seriously address the social, political, and ecological inequalities that characterise life today. I do not claim to have answers for how we achieve this, but evolutionary theorist Bret Weinstein presents an interesting view: He states that a tremendous

amount of what we are is stored not in our genomes but in a cultural layer that is passed on outside of genes. This layer is vastly more flexible and easier to grasp than our genomes, with the possibility of providing mechanisms to help us increase the capacity of our minds to address such concerns and clearly identify ways to solve them, so enabling us to move forward as a species. That being said, I think that whatever methods we use to create the right kind of environment for an exploration of our bodies through technology, working with sensitivity to the dangers of utopian idealism will be critical.

`The Exudaters' is a work that seems to point away from the realm of fiction. Not only is it a piece that gets figuratively under your skin, but your consultation with a scientific team suggests a kind of `actionable future'. How have people responded to, or been drawn into, your work?

The aesthetic language of my work plays a fundamental role in drawing people's attention to my pieces, inviting viewers to dive deeper into their conceptual and scientific layers. I see an eclectic range of responses according to the project in question, but there is a common theme of 'shock' (especially in my 'After Information' series), which I think is caused by people's confrontation with another human being that has a modified and unusual appearance. Perhaps, people feel the work in their own bodies too. In 'The Exudaters', for example, the human body becomes exposed in a new way as a malleable material – one transformed through a visual language borrowed from the realm of human disease, namely blisters. I am conscious that this might be a little disturbing for some, but I think that developments in biotechnology are going to inform our aesthetic models of the body in a much deeper way than they do today.

The film produced for 'The Exudaters' is quite abstract, partly because I wanted to capture a scenario that is highly speculative in nature – in line

with the utopian, self-sufficient values held by the community in the film. I wanted people to perceive the piece as something that is not part of this world, and perhaps never will be (which, in a way, is what utopias are really all about). But this abstraction, along with its strong visceral aesthetics, creates a sort of tension that directs people either to look for a more scientific explanation of the piece or to remain in a state of aesthetic exploration: On the one hand, there's an audience of people with a scientific background that tend to engage with the research behind the project (or at least they seem to fully understand this aspect and, perhaps, are looking to see how other people, such as artists and designers, are envisioning a translation of this scientific knowledge through their work); on the other hand, there is an audience with a greater distance from Science that seems to be curious about the opportunities and threats arising from scientific advances that will shape our future lives − I suspect that they are also the ones in shock.

In `Only Information' (Post-heaven), you explore the possibility of human states that are, in contrast to `The Exudaters', digital and hyper-connected. Where do these two projects converge or diverge as part of your ongoing exploration of the post-humanist condition?

Both projects are about the transcendence of matter, imagining scenarios in which we fully control it rather than being subjugated by it. Here, we take hold of our own evolutionary paths, manipulating our bodies beyond their current human form and limitations by means of science and technology. But the projects also diverge in many ways, principally in the type of technology that is being explored (informational versus biotechnological) and the way matter is conceptually and philosophically perceived through the lens of those technologies.'Post-heaven' explores the desire, enabled through informational technologies, to get rid of the body and so become

pure information; this is the state that primarily defines who we are as seen through the lens of this technology. Materiality, and hence the human body, is secondary. If we were to become pure information, we would exist in a universe of material abstraction and mathematical formulae, interconnected in a dimension of nothingness. This is something we are not able to experience or understand because the human condition is limited to materiality — each of us connected by a culture but separated by matter. Perhaps, this is what death is all about? Stephen Wolfram, and most recently Elon Musk, has suggested that we might live in a computational universe, and matter is just a simulation that allows us to experience reality. In this sense, informational technologies are not promising us the power to translate ourselves into different material formats — this is something that is already happening. In contrast, 'The Exudaters' explores the direct manipulation of our material reality: It imagines a more complex, rapid iteration of the human form as enabled through advances in biotechnology. In this way, it addresses how human beings are made of complex interactions of different types of living organisms, such as cells and bacteria, all playing a crucial role in constructing our experiences in the world. It also focuses on the importance that the body (and all its constituent organisms) has in the construction of our identities, and the role technologies play in providing us with tools to further express ideological discourses through matter. The project is ultimately a celebration of reality in its different forms.

By pushing the boundaries of the human body through these two technological approaches, I was trying to understand the strengths and weaknesses of each position, a route to answering the question of why we are so enthralled by technology. The answer I think is a very simple one — a desire for growth. We seem to seek in technology the solutions to global economic growth and sustainability, as well as the solutions to our own most personal growth and development. But technologies always have unpredictable consequences, and they often are not the right solution to a given problem: It is these issues that I am committed to exploring through my practice.

Both projects envisage new types of relationship between our biological selves and emerging technological, social, and market economic forces. What are some of these interactions you have been considering, and are these different forces now becoming more inextricably linked?

New technological developments exert both positive and negative impact on our social and economic landscape: Positive in that they can be a motor driving society forward, for example, with regard to scalable medical advances, but also negative in how they generate inequalities, ultimately around who has access or control over new technologies. These are complex issues with overlapping and blurry boundaries. I find the social dynamics raised by the biohacker communities particularly interesting in that they have taken technological developments into their own hands, learned how to manipulate them, and even successfully incorporated them into their own bodies. In other words, they do not need experts to make these procedures because they have gathered a level of expertise themselves.

This triggers a series of ethical and legal concerns, but it also raises fundamental questions about body ownership. Germany, for example, has banned such biohacker practices. To what extent do others have the right to dictate what we can do to our own bodies? Although I am of the opinion that we each should have the ultimate say over our bodies, we should not ignore that such experiments might lead to the kind of injuries requiring medical assistance ; if publicly funded health care services are brought into play, then taxpayers will be indirectly contributing to such experiments, even without their consent. We will need new types of regulation over emerging technologies and technological practices to prevent them from being abused. A stronger engagement around the ethics of technology is also going to be needed. What if these new approaches are used to create bio-weapons? As John Gray puts it in his book 'Straw Dogs' , 'New

technologies of mass destruction are cheap; the knowledge they embody is free'.

Do the two post-human conditions you describe exist as alternative states, or might they sit side-by-side in diametric opposition within the same lived reality? Put another way, when does living as a disembodied brain or a body-dependent Exudater become a matter of choice (or last resort)?

These two post-human conditions (concerning the biological and informational) are to some extent antagonistic: One is about wetware and biological matter, the other about hardware/software and the absence of biological matter. Taking the post-humanism principle that our technological landscapes play a role in defining us, one could imagine the existence of two types of humans in the future: One smelly and biologically enhanced, the other odourless and living in a series of microchips. Projecting this idea further – imagining a course in which transhumanists were to achieve their end goal of immortality – we would soon witness a highly unbalanced distribution of technological control. Perhaps, in this extreme dystopian scenario, having a physical body might even become a luxury, the joys of experiencing reality (including dying) reserved only for a technological elite, whilst the rest of the post-human population would live in an immaterial, labour-led, and death-free world designed to sustain the material world.

Although the main goal of many transhumanists is to become immortal, I imagine that if they were to achieve such a state, they would soon realise the value of dying, if only to put an end to one life phase in order to start afresh with another. (We could, of course, imagine in such a scenario that artificial systems able to mimic death might be developed, again with access restricted to some and not others.) These speculations might seem a little far-fetched, but they reflect common concerns for our current social and

technological landscape (that is, the role of information in sustaining the material world and generating inequalities through the way technologies are designed and controlled). Sadly, I do not think we currently have the right cultural and social frameworks in place to develop such transhumanist ideas responsibly without moving towards dystopian scenarios such as those described. Perhaps, we need first to develop our capacity to address the many social and cultural injustices that we face today.

Science fiction has been a key stimulus for your work, offering original thought experiments around the science of post-humanism. In your eyes, what role does science fiction play in how to envisage the complex challenges and opportunities that arise from the use of new technologies?

The things that we produce through emerging technologies are often confined to labs and other controlled environments, isolated from the rest of the world by safety and containment requirements. As these new artefacts and objects get developed, we will start to see the move from these controlled environments to more complex, diverse ecosystems. This is when things become interesting and potentially messy. We have already witnessed how disruptive the introduction of a new element (biological or technological) can be to a foreign ecosystem. For example, when we first brought the car into our lives ('everyday life' as a complex but tightly balanced ecosystem), we also introduced car crashes and pollutants released through combustion. Such ecosystem interventions often have unforeseen consequences, especially when the 'thing' introduced has been developed in isolation from the rest of the world. Furthermore, it is just impossible to determine or predict how all components of an ecosystem will react to a new element added into it.

So, we can only speculate, and this is when science fiction can actually play an important role. It can be used as a tool to explore such interventions by,

for example, examining the potential impact of a technological product in a given ecosystem, and so help us imagine what sort of new dynamics and consequences might arise. As nothing operates in isolation in the real world, this can provide us with a more holistic understanding of new technological interventions being developed in controlled environments but destined for 'release' into a wider ecosystem.

As new interfaces between art and design, biotechnology, and economics emerge, we can surely expect the parallel development of new areas of crossover expertise. What is the role of the artist today in not only exploring speculative scenarios but also collaboratively testing the boundaries between science fact and science fiction?

The process of generating speculative scenarios often requires working in a multidisciplinary team, one involving like-minded individuals able to raise questions from within their field of expertise, and ready to say 'how things might look' in the world that is being imagined. I think it is the richness of these collaborations that lays the value and relevance of a sci-fi project. As important questions are explored together, creative outputs emerge that can then shape how ideas develop out in the real world. Collaborations are becoming increasingly important in defining the role of the artist and designer today, especially those interested in geopolitics, philosophy, science, and technology. These subjects are too complex to be dealt with alone. The role of the artist is to find a way to effectively translate these dialogues into something tangible and meaningful to themselves and the public they are trying to reach, promote creative and critical thinking, and both share and exchange knowledge along the way.

Although the formulation of a speculative project might be, to some extent, similar to those addressing real-world utilitarian concerns, the pressures and anxieties are, of course, very different: The first is wholly conceptual,

the second practical, and this is how they should rightly be distinguished in any approach. Ultimately, both are trying to respond to a kind of reality (one that is imagined versus one that actually exists in the world), which is why they tend to inform each other so strongly. In my experience, scientists and other experts have shown a healthy interest in fostering such crossovers that involve creatives and fictional practitioners in their investigations; it is, for them, an opportunity to think differently about what they do, which might, on the one hand, enrich their research, and, on the other, help them translate their work into formats suitable for public engagement. The reappraisal and reimagining involved in speculative projects does require a high level of research and partnership capability, especially if the project pushes the boundaries of plausibility and predictability.

Of course, collaborations do not always run smoothly, and there is no formula for how they should be conducted (or who should be involved). Each project is a different journey with its own needs and specifications, so collaborations need to be tailored accordingly. I normally follow a loose plan to start with, one based strongly on both research and intuition: First, I test the project with people I think could bring relevant insight to the project (often before inviting them formally to take part); then things start to happen more naturally when we are all on the same page, working with the same dedication and energy. This might all sound very generic, but I really do not believe that a successful collaboration can flourish in an environment devoid of these characteristics.

Author Biography

Nestor Pestana is a speculative designer and multimedia artist based in London. A core focus of his work is the post-human condition, one in which the human body is understood as malleable material for modification through innovative emerging technologies. His work is collaborative and multidisciplinary, finding expression in a variety of media that includes props, films, animations, interactive installations, workshops, and performances. He holds a bachelor's degree (Hons.) in Design from the University of Aveiro and a master's degree in Design Interactions from the Royal College of Art in London. Exhibition highlights include 'Paths to Utopia: A Night School on Anarres' at Somerset House in London, 'Bio-Art Seoul 2015: Abundance of Life', and the Swiss Pavilion's 'School of Tomorrow' at the Venice Architecture Biennale. His work is in the Wellcome Trust Collection. More on Nestor's work can be found at http://nestorpestana.co.uk/