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Article Review

## **Icarus 2.0: A Historian's Perspective on Human Biological Enhancement**

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In his paper Icarus 2.0: A Historian's Perspective on Human Biological Enhancement, Michael D. Bess states *“The technological watersheds of the past came about gradually, building over centuries. People and social systems had time to adapt. Over time they developed new values, new norms and habits, to accommodate the transformed material conditions. This time around, however, the radical innovations are coming upon us suddenly, in a matter of decades. Contemporary society is unprepared for the dramatic and destabilizing changes it is about to experience, down this road on which it is already advancing at an accelerating pace.”* The claim Bess makes here is that we're living during a turning point in history, in which, our knowledge and technology have reached a high enough level of sophistication that it allows for us to significantly modify the human body & mind and may prove to be the most significant change that any civilization has ever been faced with. Bess approaches this subject in a topical manner by stating his thesis and then attempting to substantiate it by examining historical, social, political, and cultural data and by exploring current examples of biological enhancements. By putting all of these things into context with each other and past technological changes, Bess hopes to prove that biological enhancements will reshape our species and culture.

He introduces his paper with the stories of two people, Johnny Ray, who suffered from “locked-in syndrome”, and Ashanti DeSilva, who suffered from “bubble boy disease.” Johnny Ray was implanted with a wireless chip in his motor cortex, giving him the ability to use a computer interface and communicate by way of “thinking” messages onto a computer screen. Ashanti DeSilva received gene therapy by injecting ADA gene's into her blood cells and repairing the deficient genes that cause

her disease. Now with regular injections, her immune system is strong enough for her to lead a normal life. These stories are significant according to Bess because they show that the technology works and is already impacting the world of medicine.

Bess goes on to outline three “major” areas of biological enhancement. These three areas include (1.) pharmaceuticals, (2.) neuroscience & its intersection with the technologies of prosthetic, robotics, informatics, & artificial intelligence, and (3.) genetic modification. The major significance of these three areas are their expansion from being, not used just as medical or military technologies, but into civilian technologies as well.

Bess sees the area of pharmaceuticals expanding from physical performance enhancing chemicals, like steroids, into mental performance enhancing chemicals. This will dramatically increase people's cognitive abilities and memory. This increase in the brain's power to process information and react faster, he claims, will cause a significant shift in the values, expectations of the individual, and most likely a paradigm shift in societal “norms”. What's expected of the individual will be based on higher standards and those who perform to the old standards may be looked down upon and *“our society's sense of what constitutes normal ability and basic mental well-being being destabilized.”*

The areas of neuroscience & its intersection with the technologies of prosthetic, robotics, informatics, & artificial intelligence are also going to be very significant on civilian life. Bess believes that when these technologies are adopted by the everyday public we will see more and more people replacing parts of their bodies for reasons other than to fix physical defects or immobility, things of this nature. These technologies will soon be used to enhance the abilities of everybody. Bess uses the example of people being able to see in multiple types of vision like thermal vision. These types of changes to our bodies will further cause a perception shift or *“blurring”* in the *“the boundaries between the human body and information-processing machines.”*

The final area Bess outlines, and the one he argues might be the most significant, is genetic

engineering or the direct modification of our DNA. Bess claims this area may be the most significant one of the three, because, through genetic engineering it is not only possible to modify an individual person, it is also possible to have these modifications pass through generations of people. The example Bess uses to illustrate this is that of a Princeton biologist named Joe Tsien who modified the genes of mice and was able improved their memory. Although there are many experiments like this being done in many different areas of genetics all the time and we have learned a great deal in genetics since the science began, Bess does admit that there's still an incredible amount of information left to be decoded in the human genome and *“no one knows for sure today how great a role genes play in making us who we are, how each of us is shaped by inherited genetic predispositions, and to what extent our personalities and capabilities are the result of non-genetic factors in our upbringing and life experience.”* These gaps in our understanding mean that genetic engineering is perhaps the least understood as well as the most powerful area of biological enhancement and implies it's also the most dangerous one if misused.

Bess concludes his outline of the three major areas of biological enhancement with the question of whether or not it is still possible to stop our society from transitioning into a society that allows the use of biological enhancements outside the realms of medical and the military? He answers by saying that it would be near impossible, requiring a worldwide, *“vast, draconian system of surveillance and regulation.”* Instead of a global ban of this nature, he says that government regulation of and a proper campaign to keep people informed about biological enhancement is more likely to be our best chance of keeping the dangers and misuses of these technologies in check. He then uses the example of the progress of the “green movement”, which has grown from a small group of people into a significantly large movement in the span of 40 or 50 years.

Bess moves on to the last portion of his paper, outlining the four major challenges that he see's for the future of civilization and discusses what thinks is the best course of action for our society to

take. The first challenge is going to be in avoiding the “Slippery Slope” of ever increasing demand for biological enhancements. What he is referring to is the “slippery slope” fallacy. He talks about this rapid and steady march toward complete biological enhancement, that we are already participating in, and how people living in this new society will be drawn into a sort of “biological enhancement arms race.” Bess thinks the “*pressure will ratchet up*” and people will be forced to modify and upgrade their bodies just to stay competitive and productive in society. The eventual outcome of this biological enhancement “slippery slope arms race” could be the creation of a new species of human and brand new civilization, entirely.

Dealing with all of the bizarre new behaviors that are likely to develop in this new society are the next challenge that will need to be addressed. These behaviors of future people would be virtually unrecognizable to us today. This is significant enough to make the list because when you look at the portrayal of technology in popular movies, like Star Wars and Star Trek, which depict technology as being associated with “dark side”, greed, and corruption, he states that we are “*psychologically unprepared for what is actually far more likely to happen.*” Biological enhancements will likely be widespread in the civilian population. Greed and corruption already exist. A person having biological enhancements would not be a valid way of classifying a person as “evil.” These negative stereotypes will need to be overcome in the future.

The third challenge Bess sees in the future would be the co-existence of those people who choose to become biologically enhanced and those who choose not to become biologically enhanced. According to Bess the biological, social, physical, and mental differences between these two groups of people will be such huge differences that it is “*not at all clear whether a population of highly enhanced humans can coexist peacefully alongside a population of unmodified humans.*” Bess fears these technologies will cause such extreme polarization and division in the population that the two groups of people will simply not be able to live together in a harmonious way.

The final significant challenge Bess identifies is retaining the current definitions of our most sacred social and cultural values like equality, human dignity, not viewing people as objects, etc. He then sites different examples of the dangers of not upholding these values, the most important of his examples was the actions of Adolph Hitler and the Nazi's during World War II. Bess says the only way to prevent dangers like this by preventing these new technologies from altering our most sacred social and cultural values or *“eroding the foundations of equality and human dignity on which our political and social systems rest.”* This means making sure we do not reduce our view of the human being to that of being just an object.

Bess concludes his paper giving his personal thoughts on the matter and gives some idea's for overcoming the challenges he has laid out. He believes biological enhancements being integrated into society is a matter of “when” they will happen, not “if” they will happen. He makes an interesting comment that some people would see the inevitability biological enhancements as “technologically deterministic” but he asserts it is not, stating several times he believes that *“it will be up to us as citizens and as consumers”* to choose to apply these technologies in the correct ways. Instead he states *“Either human beings will learn how to reconfigure their societies along more equitable and civically inclusive lines, or the dehumanizing tendencies, identity tensions, and centrifugal forces unleashed by these technologies will risk tearing their societies apart.”* Bess is saying the answer to preventing the horrible negative effects of biological enhancements on our society is the examination of ourselves and the redefinition, in advance, of our values and cultural norms.

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After digesting all of the information that I absorbed from Bess' paper the one thing that I was struck by, at first, was how many of his points I found myself agreeing with. Maybe it's because I read books, watch movies and television shows, and play video games that are science and science fiction based myself or maybe it's because I do notice the desire for and potential benefits that biological

enhancements can have for our species. But I questioned if I would be able to critique him in an effective way or if I would merely be parroting him on every point. I feel the questions that he poses are relevant ones and on the surface the things that he says just make. Soon though, I realized there were some considerations that were either left out or not thought about when he write his paper and the existence of a possible bias, which might have altered some of his conclusions, if they had been considered.

Bess' thesis depends on two different aspects that he see's as truths. These two aspects are (1) that we are, in fact, on a “slippery slope” that we cannot stop or reverse and (2) that biological enhancements will be as widespread as he claims. But I question these things on whether or not they are actually absolute. Also, is it possible that Bess holds some personal bias that may be reflected in his reasoning? I'll take a closer look at these questions in a moment, but first, I want to quickly go through the things I do agree with him on and why.

The first thing I agree with Bess on is that we're living during a “watershed” or turning point in history in which these questions of how biological enhancements will be used and their potential impacts on our civilization will need to be asked. The two examples of Johnny Ray and Ashanti DeSilva do prove that these technologies are real and viable. The changes to our species, both physically, mentally and culturally, as a result of biological enhancement will be more radical changes in human history.

I also agree it's likely that as the availability and use of these modifications becomes more and more prevalent in the future that there will be significant paradigm shifts in our behaviors, culture, in what's expected from individuals, and in what's considered to be normal in society. And when you look at how radically the world has changed because technologies like electricity, it doesn't seem unreasonable to think that the modification and mechanization of the human body can have just as radical or even more radical impacts on our society in the future making the gradual evolution into a

completely new species of human a real possibility. What will these new abilities and behaviors look like, Bio-luminescent or color changing skin, like an octopus or squid which changes the mating behaviors of humans? A change that extremely radical would most definitely be “alien” to many people and would be very difficult to adjust to at first.

Secondly, biological enhancements could easily result in an entirely new species of human, an entirely new system of values which is going to be in direct conflict with the cultural norms that exist today. If people in that era are so completely different in terms of their behaviors, their physical and mental capabilities, and their needs and desires, will it be possible for regular people of that era to relate to them? If regular people are unable to relate themselves to these new humans, will it be possible for a harmonious transition? It's very unlikely. This new subsection of humans and the new cultural norms, that are sure to develop, will be so alien to regular people that it will cause chronic fear and irrational behaviors, which will likely cause some form of conflict and/or collapse of society.

If you look at the effects of today's technologies that we are causing social division, like the effects of the internet, our ideas of personal privacy are constantly under attack. You might imagine what it would be like for us to be faced with coexisting with a more advanced species. Do we amend the Constitution? Do we regulate the internet? Either of the last two options, if enacted in America today, it would at the very least, take generations to adjust and at the very worst, result in another civil war or even global conflict. So, it's safe to say the significantly more radical effects of redefining our species and value systems would be the same or even worse. The most extreme outcome of a scenario like this would be similar to what happened when Neanderthals, who no longer exist, were forced to compete with the emergence of modern humans.

Now, like I said above, there are several things Bess overlooked or didn't consider. I want to be clear on one thing, though. My questioning of whether or not we are on a “slippery slope”, if biological enhancements will be as widespread as he thinks, and whether or not he holds any biases, does not

mean that Bess' thesis isn't accurate. If those things turn out to be true in the future, then the conclusion he draws is a likely one in my opinion. I just feel that as of yet, those things are currently not accurate, which means that they are not yet the certainties that Bess claims they are and that it would have been beneficial for him to address these things in more detail.

The first of Bess' assumptions that I want to address is his claim that we are on a “slippery slope.” The reason he thinks this is the case is because he sees the social pressures, and the physical, mental, & economic benefits of biological enhancements as too hard for us to resist. This will lead to a biological enhancement “arms race” and lead to the proliferation of these technologies into the mainstream. And according to Bess, we are already engaged in this process, citing the use of performance enhancing drugs like steroids as the beginning indications of this. The fact that Bess' calls this a “slippery slope” indicates that he doesn't see anything that would be able to stop this from happening because it's already being carried by its own momentum.

But is this really true? Is it actually certain that we are already engaged in this process and have no hope if we decide we want to reverse or stop it? Of course it's possible but does not mean that it's certain. I'm not so sure and the reason for this is because there have been beneficial technologies throughout history that are now limited in use or not used at all due to a shift in perception of said technologies, as a result of some type of accident or disaster. Nuclear fission for example can produce substantial amounts of energy and was on track in the past to being a significantly used technology. But crisis like Three Mile Island and Chernobyl effectively changed the public's perceptions about the safety of that technology and still today is not usually considered a viable energy source, even though we are faced with a huge energy crisis.

This doesn't mean that a similar scenario, only involving biological enhancements is sure to cause the same type of negative reaction that occurred with nuclear fission, but it possibly exists. And to be fair, there are also many examples of technology sometimes being harmful to people and yet is

still in use, like the case with automobiles. But the fact remains, that, even though we may be heading down the biological enhancement road, that doesn't necessarily mean we have no ability to stopping or reversing our course. Therefore I don't believe we're actually on the "slippery slope" that Bess' see's as of yet.

Next, Bess' thesis also seems to infer that biological enhancements are already seen as needed and desirable, not only by the medical industry and the military realms which are in but also by the global civilian population. He states that because "*the technologies for repairing a malfunctioning human body are inseparable from the technologies that allow us to push human capabilities to ever higher levels*", the motivation for acquiring these modifications will drive them to be adopted by and distributed to the civilian population. Otherwise, if the technology is privilege only to the rich and elite there will be negative social and political ramifications. This is why he calls for the radical reconfiguration of our social and political landscape, including government regulation will be needed to mitigate the changes that will occur in society.

I agree with these points that he makes, but, the question I ask is even if we "*reorient the totality of our economic system by profoundly changing not only products, laws, and industrial practices but also consumer habits and mentalities.*" how does that necessarily mean that the accommodate of the demand for the mass production and widespread distribution of these technologies is a reality. What exactly would the details be on how to pay for the carrying out of such an undertaking? Is it actually fiscally conceivable? The current state of the economy is still not anywhere as strong as it once was. High unemployment and trillions owed in debt and deficit, rising food and fuel prices, along with the rising costs of health care, I feel, are more pressing issue that demand solutions before we country can really be able to have a meaningful debate on how to implement biological enhancements into the equation. And if we do reach that point how do we make the decision of who will have control over these technologies, the government or private sector? If it's the private sector

they will need to make a profit and I question if it's morally right to make something like biological enhancements a commodity to be bought and sold. Also if biological enhancements becomes an industry who will be able to afford its products? How do you keep the price down so the average American can afford it?

On the other hand, if the government takes control, they will most certainly need a higher level of participation in the medical industry. Not only will proponents of small, limited government find this unacceptable due to the amount of power the government would acquire, but with the marriage of the government, the medical industry, and science there runs the risk of changing the very nature of how scientific progress works right now. The way science works today is that science is in pursuit of truth and the course that scientific inquiry is more random or knowledge driven. But truth has no agenda and if the government and medical industry are interconnected and they start to dictate the course of scientific progress, then the very purpose of science will have been altered. This is risky because politics driving science is arguably one of the contributing ingredients that leads a nation to carry out horrible atrocities on its own population and was characteristic of Germany and the Nazi's during World War II. These questions about how all of this technology is going to be payed for was not address by Bess directly. He sort of just assumes frames his argument as if by the time these issues are here that issue will have already been corrected and money is already there ready to be used.

The final possible issue that I noticed with Bess' paper centers around a possible bias embedded in his paper for how our society should handle the radical paradigm shifts to our bodies, minds, politics, economy, environment and culture. He says, *“Either human beings will learn how to reconfigure their societies along more equitable and civically inclusive lines, or the dehumanizing tendencies, identity tensions, and centrifugal forces unleashed by these technologies will risk tearing their societies apart.”* From Bess' point of view, this is the one and only way to avoid the negative outcomes that are likely to permeate our society as a result of significantly modifying ourselves. This I also agree with to a certain

extent. I think it's unavailable for humans to not be affected in some way by the technology that we create. Just maybe not to the extent that Bess says is necessary, and I'll explain why that is in a moment. But if and when the time comes that this scenario is a reality then adapting to the resulting changes will need to be necessity. But is it really the only option as Bess claims?

The above quote from Bess has one underlying theme. He is basically saying that we, mankind, must learn to adapt to the technology. We must “*reconfigure*” our behaviors, policies and traditions to accommodate the technology and changes that are inventively coming. This sounds very familiar to the slogan of the 1939 World's Fairs in New York and San Francisco: “*Science Finds—Industry Applies—Man Conforms.*” This is the basic message that I get from Bess' conclusion. So is it possible that this underlying theme is a bias and had some influence on Bess' thinking when he crafted his solution? I think it's safe to say the answer to that question is yes. So I think it's important to understand this before we just automatically “reconfigure” everything.

Perhaps he will ultimately be right in the end, but, by leaving no significant chance of a credible alternative he may be committing some logical fallacies himself, like the fallacy of the “false dilemma” to name one. Maybe in the future people decide to not significantly modify their bodies with biological enhancements, instead limiting those technologies to only the medical and military realms. Or instead of letting it run wild there like it's a cosmetic surgery there is more of a focused or “need to modify” only policy. For instance, allowing modifications that would specifically help someone in their line of work and not allowing it to just anyone, for any reason. They would instead need a good reason to get the modification. The point I'm trying to make is that there may be alternative approaches to managing these technologies, not just the “*reconfiguration*” of everything just for the technology or we all die.

In conclusions, I found Bess' paper to be very interesting and I do agree with his thesis for the most part. I think he constructed his argument is a good way and presents a valid question that is important to think about. I also think he makes some good ,valid points about how biological

enhancements area already changing our world and the potential use and consequences of that use in the future. And the two examples that he uses of Johnny Ray and Ashanti DeSilva do support part of this theory. I do agree with him that if the conditions that he outlines do actually become reality, what he warns will happen is a possibility. But I do not agree with him that we are on a “slippery slope” and can never stop the direction that our society is going. Bess also left out the details on how our infrastructure and economy can bring these things into fruition, if they are in fact, what we as a society decide that we want to do.

Finally, I leave open the solution that Bess outlines as a possibility to handle whatever changes occur. But I do not think it is the one and only possibility out there. Alternatives approaches are out there as options for us to use but only if we are aware of them and only if we accept them as viable alternatives. By truly understanding that we ultimately control how we apply technology and that we can configure technology around us, if we allow it to, then we can exercise that control in reasonable and appropriate ways when envisioning & creating our future. This opens up the possibility that the future can be entirely different than what is envisioned by Bess.