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## “Our Grandchildren Redesigned: Navigating the Bioethics of the Near Future”

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In preparation for teaching a six-week bioethics course at UUCF this fall, I read the new edition of a widely-used undergraduate introduction to bioethics, published this year by Oxford University Press. Although it covered core issues in the field (Moral Reasoning, Paternalism & Autonomy, Truth-telling & Confidentiality, Informed Consent, Human Research, Reproductive Technologies, Dividing Up Health Care Resources), it only lightly touched on some of the emerging issues that most interested me. Here’s the problem: **technology is advancing so quickly that even a textbook published this year can end up in many ways behind the curve.**

In my revised plan, we still touched on all those classic topics, but we started with the sermon in September that some of you will recall about the **revolutionary new gene-editing technology CRISPR**. I knew I had made the right decision to start with cutting-edge issues when the morning after preaching that sermon, I woke up to discover that the front cover of *The New York Times* was about the ethics of access around these new CRISPR technologies: who should receive them, who should pay for them, and who will be paid for them?? The title of the article was “**New Gene-Therapy Treatments Will Carry Whopping Price Tags.**”

Throughout the course this fall, I invited the class to be on the lookout for news stories about bioethics and biotechnology. And without fail, multiple members of the class were easily able to find important new stories every week. I’ll give you a few examples:

- UK scientists edit DNA of human embryos (BBC)

- Mutant butterflies reveal the genetic roots of colorful wings (Washington Post)
- The Zika Virus Grew Deadlier With a Small Mutation, Study Suggests (New York Times) — with parallels to how minor changes to the genetic code using CRISPR could have unintended consequences, both positively and negatively. The overall point is that **the pace of change is breathtaking—kind of like a rollercoaster: both exhilarating and scary.**

I encourage you to look for future articles about CRISPR. It is an acronym for “Clustered Regularly Interspaced Short Palindromic Repeats.” But kind of like DNA, it doesn’t really matter if you remember that it stands for “Deoxyribonucleic Acid” if you know that DNA is a molecule that contains our genetic code. Similarly, **you don’t have to remember what CRISPR stands for if you remember that it is kind of like a “designer molecular Swiss army knife”** (Doudna 101). The bioethical challenge is that CRISPR can alter not only *somatic* cells (throughout the body of individuals), but also *germline* cells, whose traits can be inherited by future generations (158). All of a sudden, we humans—ourselves products of the evolutionary process—have the power to micromanage evolution.

However, since we spent good bit of time reflecting on that challenge in September, today I would like to invite us to glimpse into related bioethical challenges to come. The best guide I have found recently is a book titled **Our Grandchildren Redesigned: Life in the Bioengineered Society of the Near Future**, published last year by our own Beacon Press and written by Michael Bess, a professor at Vanderbilt University who specialized in the history of technological change.

Although I recommend his book, Bess also points beyond the pages of his writing to **some of the best science fiction films and TV shows, which are among the more fun ways of opening our minds to the ethical implications of forthcoming technology.** I’ll limit myself to five quick examples for now:

- **Avatar**, a few years ago, was the “first film to gross more than \$2 billion” and sequels are scheduled for release in 2020, 2021, 2024 and 2025. The title refers to remotely-located humans controlling genetically engineered bodies.

- **Battlestar Galactica** (four seasons, 2003-2009) - this twenty-first century reimagining of a classic show depicts humans “at war with an android race of their own creation, known as the Cylons.”
- **Ex Machina** (2016) - about whether an android is “genuinely capable of thought and consciousness, and whether a human can relate to her despite knowing she is artificial.
- **Her** (2013) has similar themes about a man developing a relationship with an “intelligent computer operating system personified through a female voice.”
- **Westworld** (2016 - ) about a technologically advanced Wild West-themed amusement park populated by android hosts.

There are so many other great examples to explore.

If you do watch (or revisit) some of our culture’s best sci-fi, Bess has some suggestions for two common pitfalls to be aware of. It’s not that you should avoid shows that make one of these errors. Rather, it’s about equipping yourself to be aware of **which aspects of sci-fi are likely forthcoming science (“future reality”) and which are simply entertaining aspects of fiction.**

The first common pitfall is what Bess called the “**Jetsons Fallacy.**” Some of you will recall the Hanna-Barbera cartoon *The Jetsons*, which premiered in 1962 and imagined a technological utopia a century into the future in the year 2062. For those of you who can picture images of *The Jetsons* in your head, here’s a fundamental flaw: *The Jetsons* shows us **a future world in which technology has evolved “dramatically and even radically,” but in which humans “stay fundamentally the same”** (4).

Among many other examples that are guilty, at least in some aspects, of the Jetsons fallacy are *Star Wars*, *Star Trek*, *Blade Runner*, *AI*, and *Gattaca*. In each of these instances, “**Intelligent robots coexist alongside unmodified humans no different from today.**” There are related issues with works like *The Six Million Dollar Man*, *The Bionic Woman*, *Inspector Gadget*, *Iron Man*, or *Limitless* in which “**modifications are uniquely confined to a single individual.**” Although our actual future will almost inevitably include wealthy individuals who can afford the high-end of biotechnologies, changes will also be much more widespread (4).

Relatedly, when reading or watching sci-fi, Bess also recommends keeping an eye out for the “**Terminator Fallacy**,” affectionately known as the “Paranoid cousin of the Jetsons Fallacy.” The Terminator Fallacy, named after the series of Arnold Schwarzenegger movies about a cyborg assassin from the future, imagines that machines will be our *enemies*. Bess cautions that **the much more insidious truth is that “machines” will increasingly be us** (37).

For example, today most of us can tell the difference between *ourselves* and *our vehicles*. That may seem stupidly obvious. But with forthcoming bio-enhancements, machines will increasingly be *integral* to ourselves. Especially with advances in **nanotechnology**—through the ability to increasingly manipulate matter on a super-tiny, atomic scale—the line will blur between ourselves and our technology.

To give an example of what I mean, if you are an avid smartphone user, **think about how you feel if you lose your smartphone? At least some of you likely feel disoriented, lost, or like part of yourself is missing**. Smart phones are an example of a technology that changes how we exist in the world. Similarly, think about how you feel when you lose electricity in your house (37). This effect—of feeling like our fundamental relationship to the world is altered when technology is absent—will be vastly augmented through biotechnology. And whereas the Terminator Fallacy imagines that machines “out there” will one day come and get us, the truth is likely that biotechnology related to ourselves will more insidiously alter our understanding of what it means to be human. Indeed, there is a burgeoning field of study of what that might mean, called **Transhumanism** (8).

I should also hasten to add a few examples of how I am very much not talking hypothetically. When you have a chance, google, “Paralyzed woman moves robot with her mind.” This YouTube video from 2012 shows Cathy Hutchinson, who has been a quadriplegic since having a stroke, **feeding herself for the first time in fifteen years using a robotic arm controlled solely through her thoughts**, using an interface sensor implanted in her brain. Watching this video it is easy to imagine that it will not be long before we humans can similarly control an exoskeleton, robot, or drone through our thoughts alone. Extrapolating further, “Wired and connect to each other through a computer interface, how long before you and I can directly share our thoughts, memories, or feelings—brain to brain (25)?

There are a lot more examples I would like to give you, but to paint in broad strokes, Bess traces the ways that the near future will increasingly include:

- Pills to make us stronger and faster
- Devices which will interface with the human brain
- Genetic modifications that will allow people to increasingly reshape their own physical and mental identities at will.

We already have versions of these technologies, but they will each be increasingly more *potent* and *finely calibrated* (100).

If we do not get ahead of the curve and help co-create a future that is fair for *all* (and not merely for some), the implications will likely be:

- A **growing rift** between the biologically enhanced and those who cannot afford such modifications
- A **constant cycle of upgrades** and boosts as the bar of “normal” rises ever higher—“Humans 95, Humans XP, Humans 8”
- A gradual **blurring of the boundaries between “person” & “product”**
- Extreme forms of self-modification, with some individuals **no longer recognized as unambiguously human.**

Again, there’s so much more to be said about all of this—and I have a sermon in the works for this spring about the forthcoming promises and perils of Artificial Intelligence—but for now, I will limit myself to highlighting two major considerations for navigating the bioethics of the near future.

The first is that the parallels are strong between future bioethical dilemmas and two major debates in our society here in the present: healthcare reform and tax reform, which are both related to the underlying issue of wealth inequality. A fundamental question (that will only be exacerbated by biotechnology) is **whether we are going to allow a society of peace, liberty, and justice only for an elite few**—or are we building a world with at least a minimum “floor” of benefits for *all*.

At the heart of the healthcare debate is whether we will create a world with *universal access* to healthcare? Or will we continue to allow the cost of healthcare to unnecessarily

devastate some people's families and lives? The fundamental issue of equality is similar for biotechnology. Will we tolerate the creation of a **“Biostratified Caste System”** in which the “most effective enhancement technology will be prohibitively expensive and accessible only to rich?” Or will we create a system of *universal access to at least a “basic package” of enhancement technologies* (87)?

In addition to the question of universal access, the second major point I would highlight for navigating the bioethics of the near future is **privacy** (193). It is no coincidence that companies like Google and Facebook offer their products seemingly for free. If you scratch the surface, you discover that **the platform is free because you are the product**. You are paying Google and Facebook by sharing details (“data”) about your private life that these corporations can then sell to advertisers and other interested entities. This dynamic will increase many times over as biotechnology—instead of just being in our pocket—is integrated ever more fully into our *selves*.

Now, we have spent a good bit of time trying to project ourselves into what the future might be like. And there is wisdom in that practice. After all, as the words of one of our classic UU hymns says, we tend to be a people who **“revere the past, but trust the dawning future more.”** We are a theologically liberal religious tradition, giving us a natural inclination to hope in the ways that forthcoming technology can improve our lives and lessen suffering, but there are shadow sides to everything as well.

So, as I move toward my conclusion, I want to end on a different note by inviting us to hear the prophetic caution from authors like Wendell Berry, who are conservative in the *best sense* of the word: caring about conserving nature, upholding the beauty of traditions and rituals, reminding us of the importance of community, authority, sanctity, and loyalty. I want to amplify Berry's words because I have no doubt that techno-*optimists* such as the “big four” tech companies known as GAFA (“Google, Apple, Facebook, and Amazon”) will do everything in their power to sell us on the *advantages* of forthcoming biotechnology. Although I agree with them in part, techno-*pessimists* like Berry offer a vital counterbalance that the GAFA companies do not want you to hear. Berry writes: “I knew a man who, in the age of chainsaws, went right on

cutting his wood with a handsaw and axe. He was a **healthier** and a **saner** man than I am. I shall let his memory trouble my thoughts.”

The creators of all these new products want us to ask, “What does this allow me to do that I couldn’t do before?” But the more important question may be **“How does this new capability contribute to my overall quality of life?”** Marketers want us to ask, “What shall I do next with my newfound powers?” But more important questions may be, **“Do I really need these, and what are their indirect or hidden drawbacks?”** (196)

There is a real risk of biotechnology turning each of us human beings into “just another product struggling to keep up the pace of performance amid a seething market of rival products.” But our UU First Principle calls us to a different worldview: remembering that each of us *in this present moment* is *already* a human being with “inherent worth and dignity.” **As radical as the coming biotechnology will be, I promise you that embracing your own inherent worth and dignity will remain the even more radical choice.**

Can you feel that tension within yourself? On one hand, the *dissatisfaction* advertisers are constantly trying to make us feel? (Take a moment to remember that latest new device or product you have been tempted to buy.) On the other hand, take a deep breath in—and *breathe out the advertising propaganda!*—and open your heart to the many ways—in this present moment, right here, right now—that you are *already* enough. You already have what you need. You are already a blessing.