The Human-Technology Interface: Consequences for the Human Condition

I want to thank the University of Hong Kong and Lumina College for asking me to make this presentation to you today. I'm humbled by the opportunity to speak about a troubling topic, and one that I've been reading about, and thinking about, for several months now in preparation to make a book proposal dealing with a philosophy of technology. I'm still learning and thinking, so this presentation will be about my current thoughts, not THE definitive guide to navigating what may prove to be a difficult minefield.

Do you know what's creepy? Being referred to as a "meat sack" or a "skin bag." These seem to be the current words of the day for many science fiction writers and some academics who attempt to explain the differences between artificially-intelligent robots or automatons and human beings. That, or soft machines. None of these monikers indicate much respect for the human condition, or reference the dignity of humankind. We could rage about it ("I'm not a meat sack!"), but that is unlikely to change anyone's mind who is attempting to rile us up – actually it would prove that the tactic worked.

So, my fellow meat sacks and skin bags, today I'd like to explore the relationship between our humanity and the communications technology that we have adopted to connect with one another, and with the growing number of digital entities with which we interact.

The Canadian media theorist, Marshall McLuhan, once wrote that all technologies were extensions of human beings. As our legs begat the wheel, so our ears begat radio, our eyes television, and our brains computers. In his view we were not so much separate FROM technology as we were connected TO it. Andy Clark actually calls humans "natural-born cyborgs" because using technology to achieve what he calls "cognitive hybridization" is as

"basic and ancient as the use of speech." The chiseling of stone to create or reproduce the Ten Commandments was, in his view, no different than developing brain-computer interfaces that allow us to control advanced prosthetic devices, replace a keyboard and mouse on a laptop with gestures, or even upload our brains into the cloud to achieve immortality.

I don't agree with McLuhan's or Clark's assessment, but not for the usual reasons. The usual reasons would have to do with rejecting most technological advances whatever – with the possible exceptions of indoor plumbing and electricity. I do not reject technology, I'm using it right now to address you. I teach using it five days a week. My home is full of it and I wrote this speech on a computer. And like the 95% of people in Hong Kong, I use a mobile device. I picked my provider based on which one had the best and least expensive international coverage. I'm probably not much different than all of you in regard to adopting communications and information technologies and putting them to use on a daily basis. But I still don't buy the argument that technologies – and especially communications technologies – are merely an instrument in human hands. What we think of naively as simply a device, a means of connection, an app-laden piece of technology to make life easier or more entertaining is far more than that.

To return to Clark briefly, "The human mind, if it is to be the physical organ of human reason, simply cannot be seen as bound and restricted by the biological skinbag. In fact, it has never been thus restricted and bound, at least not since the first meaningful words were uttered on some ancestral plain. But this ancient seepage has been gathering momentum with the advent of texts, PCs, coevolving software agents, and user-adaptive home and office devices. The mind is just less and less in the head." There's that meat sack (or skinbag) reference again.

But is that it? Should we be comforted? I get it. But the debate between those who embrace these technologies or explain their origins in human desire, and those who fear

technology and reject its "takeover" of human fate, is uninteresting. It is merely the opinion of one side or the other. Neither side of this debate – technophiles versus technophobes – are able to convincingly persuade all of us that they are right. Technology is too complicated for that; it has too much potential to be rejected and too much power to be dismissed. This debate is thus a deadend.

I want to avoid this deadend. I want to explore some implications of technology that I don't think are as easy to embrace or dismiss. I want to focus on what it means to be human, and how technological development may affect how we have to think about ourselves – how technology could change what IS, and what is NOT, human.

How would you define the human being – as animalus economicus, as homo faber, as a particularly clever ape or highly evolved crustacean? I personally like Kenneth Burke's definition: "Man is", Burke wrote, "the symbol-using animal, the inventor of the negative, separated from his natural condition by instruments of his own making, goaded by the spirit of hierarchy, and rotten with perfection." This is a complex definition, but humans are complex creatures. And although there is not time today to explore every nuance of this definition, I do want to emphasize three aspects of it.

First, human beings invented the negative. Burke explained that there are no negatives in nature. When humans began to use language, they needed a way to distinguish one thing from another: we could know what something WAS by knowing what it was NOT. We needed the negative in language just as we needed the zero (zed) in arithmetic – a completely artificial concept, but essential to making sense of symbols – linguistically or arithmetically.

Second, humans are separated from their natural condition – their nakedness and simplicity, their dependence on the provision of nature in the raw, by what they created and manufactured themselves. At first, merely roofs to escape the rain, clothing for warmth, basic tools to till the soil and so forth, until inventors and entrepreneurs developed more and more sophisticated systems to manufacture goods, provide services such as electricity, water, education, or entertainment. They sped up transportation and eventually connected with one another on a global 24/7 basis. Each time a new means of ease, movement, education or connection came into being, human beings were taken further away from their original condition – and in each case, they were separated by the instruments they had made.

Third is the spirit of hierarchy. What Burke meant by this is that human beings need to know the ORDER of things. Humans know that there are differences among us. Some are smarter, some stronger, some more beautiful. Some lust for power while others wish to be left alone to live without interference. But what matters the most in a society – is who is in charge, who makes the rules and enforces them? Humans are anxious without such knowledge. They are goaded by the spirit of hierarchy.

So man needed language – a way to act outside the merely physical. They needed what Burke called a means of "symbolic action." A way to write poetry, law, and news reports. A way to understand their situation, to evaluate it, to determine truth from falsity, the significant from the trivial, so that life could go on. This language enabled human beings to share their ideas, conclusions, imaginings and dreams. It gave them not merely an instrument, a tool, to wield in the world, but a dynamic context that could alter or confirm other human's perceptions and ideas and to establish and maintain the hierarchies that allowed them to live in understanding – accurate or not – of their plight. It also gave the means to settle disputes or to initiate them, to tell

truth or lies, to free or oppress. It provided both the single edge and double-edged sword – the means to cut both ways.

With language ability humans moved, I think, from mere skin bags to lingual beings – and became – as Burke would say – fully human.

Since human beings became lingual they have sought two enhancements that are relevant to us here today. First, they sought to repair, and then enhance, their humanity itself. They repaired it by developing correctives for their frailties. They created peglegs and hooks for missing limbs, eyeglasses and hearing aids for sensory deficits. They developed artificial hearts and pancreases, implants and transplants, the ability to move parts of their bodies to new locations to correct failings or accidents. They enhanced their memories by creating manuscripts, books, newspapers. They started schools to educate the young and scientific apparati to extend their capabilities through microscopy and telescopy. They began to work inside the human body itself, even to repair it while still in the womb. As they learned more and more about their world and themselves, they also began to enhance their humanity. Inert prosthetics transmogrified into smart prosthetics, making it possible for them to control techno-limbs with neurological connections. They began to tinker with the human genome to correct genetic faults. They began to talk about the ability to extend the human lifespan by growing new organs from stem cells to replace those that wore out and to upload human consciousness to the web or the cloud to create the possibility of a digital immortality.

As these developments occurred, they were, and are, considered progress. Progress toward a new humanity that would not suffer, would not die, would not be hampered by frailty that would prevent the achievement of a superman – essentially eugenics by another name.

Simultaneously, human beings were applying creative skill to create ever-more capable homonculi. The fully mechanical robots developed to replace workers on assembly lines to increase productivity were gradually made mobile, given new programming to mimic the decision-making of humans and christened "artificially intelligent." They were then given the ability to learn through trial and error how to accomplish designated tasks. The artificially intelligent robot that could accomplish specific tasks is now giving way to the artificial generally intelligent contrivance that will be capable of self-learning and replication. It will have skin mimicking the human, be anatomically correct to allow sexual engagement, will respond to facial expressions and gestures, and be capable of carrying on conversations about arcane and highly sophisticated topics. Already Sophia – created here in Hong Kong by Hanson Robotics – has achieved citizenship in Saudi Arabia – although this was probably more stunt than serious action. Already there is a brothel in Berlin staffed by sex robots. Gradually the awkward and inhuman monster of Frankenstein's making has become more human, more lifelike. A Presbyterian minister in Fort Lauderdale has called robots the next great mission field. A man in Britain has indicated a desire to wed his sexbot. And gradually these artificial beings are becoming lingual – the characteristic that separated humans from animals. We also refer to all of these developments as progress.

As the human becomes more technologically, biologically, cybernetically capable, so the cyborg becomes more human-like. There is even talk of robots becoming surrogates for the childless, carrying their progeny in artificial wombs. The human and the engineered human meet, coexist, co-create, co-operate in the lingual environment, perhaps even dispute the means of understanding their shared environment as they spar over the symbols used to create meaning to control their world to engage, in other words, in symbolic action. What, then, is human, and what

is not? What is the line the human must cross to LOSE his humanity, or the line the robot must cross to GAIN it.

No, I am not predicting the apocalypse: the rise of machines and the termination of humankind. And I am not taking a position as technophile or technophobe. I'm also not a technological determinist who thinks we have already entered the zone where we are not able to control our own destinies because we have given over that power to technology. None of these perspectives, I think, are accurate reflections of our situation now, or going forward. All of these perspectives are too simplistic – too mundane – too philosophically uninteresting.

I do want to make several arguments, however – each informed by different understandings of the significance of technology generally, and of the relationship of human beings to these specific technologies.

First, to reference James W. Carey's examination of the significance of the original electric technology for communication (a lingual technology). Carey remarked that the telegraph was the first communications technology to separate the idea of transportation from that of communication. Before the telegraph, anything communicated had to be carried from one person to another, so the terms were used synonymously. The walker, the horseback rider, the wagon and stagecoach, even the train, all carried newspapers, letters and other correspondence from one place to another. But the telegraph was an altogether different phenomenon. It carried messages on "lightning lines." It did not depend on transportation, but was a system independent of transportation.

But this was not its most significant feature. What was more crucial to understanding the telegraph's innovative role in society was to recognize its use to control transportation. It was

crucial to the creation of railroad timetables and the prevention of collisions between trains using the same trackage. It was instrumental in the creation of time zones to regularize and control the planned arrival and departure of trains. It overlay the world not only with long distance submarine cables that enabled Great Britain to create the "All-red Route" that meant that a message could circumvent the globe without leaving British territory, but also standardized time zones that permitted businesses and individuals to better send their messages so that they could arrive in a timely fashion across vast distances. The telegraph also provided the means for financial, stock, and commodity trading to become more abstract, replacing the transfer of paper, cattle, grain, and pork bellies with trading instructions, prices, promises to pay, and money transfers delivered at the speed of light. Commerce quickened; capitalism was legitimized; wealth increased. The principle of efficiency underlay the spread of the telegraph and the telegraph, in turn, certified the wisdom of using efficiency as a yardstick to evaluate progress.

And the telegraph was expected to conquer time and space, introduce a more vibrant democracy, knit together a nation, and permit the evangelization of the planet – it had mythic dimensions: the speed of Mercury, the intelligence of Athena, the boldness of Icarus.

My first conclusion: Human beings use communications technology for control under the spell of the technological sublime: mythos.

Second is the perspective of Peter-Paul Verbeek on human-technology relations. He argues that technological artifacts play what he calls a "constitutive role" in the relations between human beings and the world. "When a technological artifact is used," he writes, "it facilitates people's involvement with reality, and in doing so it reshapes how humans can be present in their world and their world for them." Artifacts are, in essence, mediators of the human-world relationships, not as neutral intermediaries, but as co-shapers of people's existence. His examples

include the telephone and the typewriter, technologies that emerged from the efforts of inventors to facilitate the world-relationships of the blind and hard of hearing. Human beings who did not suffer these infirmities, however, turned these technologies to new uses for the able-bodied, making them systems for general communication, which then helped shape what people thought of as "real." The telephone, for instance, took its place in homes and became the reality that demanded attention when it rang. It insistently interrupted leisure and work, meal preparation and enjoyment, child rearing and sexual relations. People allowed this technology to dictate their use of time and others to interrupt their routines including, eventually, telemarketers, poll takers, political solicitors and wrong number dialers. The telephone became a nearly unavoidable aspect of people's material environment and, as such, helped focus attention, affect behavior and values, and certify the significance of connection with others through technology as being equivalent to physical presence. People dreaded the middle-of-the-night telephone call on the assumption that it would be bad news; they anticipated the ring during daylight hours for its potential to deliver the good news of connection with the desired other.

Verbeek refers to this shaping of human behavior in response to the arrival of technology as technological intentionality. By this he does not mean intentionality as we would use it to refer to our own intentions. My intention, for instance, to address the human—technology interface in this presentation. What Verbeek means is that technologies direct people's minds and actions in particular ways. The telephone directed their attention, provided the basis for their anticipations as they encountered its ring at different times of the day. The fact that it mediated people's response to their world once it was ensconced in their homes should be seen, he wrote, as "a specific, material form of intentionality." The telephone induced specific behaviors from its users. Verbeek claims that analyzing technological mediation makes it clear that technologies

always shape human actions, so seeing them as the influences they are on human actions should lead people to attempt to give such influence a desirable form.

My second conclusion: Technology has intentions that human beings respond to as an aspect of their material world. They should try to shape technology into desirable forms so that they can control their material environment.

Third is Langdon Winner's perspective on the politics of technology. To Winner technology change "expresses a panoply of human motives, not the least of which is the desire of some to have dominion over others." It is not merely political institutions and practices that define politics proper to Winner, but also the tangible arrangements of technology that enable political solidarity and fragmentation, dissent and acquiescence, the exercise of power or resistance to it.

The development of highly centralized and directed technologies, such as production technologies, public utilities and other infrastructure elements, all of which are seen within society as crucial technological systems that must smoothly function for society to flourish, have tended, Winner says, to eclipse any consideration of moral or political reasoning outside the practical necessity of maintaining them. And when these technologies are seen as particularly dangerous or vulnerable to disruption, such as nuclear power plants and enrichment sites, then everyone associated with their ongoing functioning must be subjected to background security checks, covert surveillance, wiretapping, informers, and even emergency measures under martial law – all in the name of security expediency that overrides any other considerations of privacy, intrusion, dignity, or relationship – that might otherwise receive a moral examination.

My third conclusion: Technology, then, constitutes an instrument of oppression or liberation outside the moral considerations of human existence.

I'll mention, fourthly, the perspective of Andrew Feenberg, who comments on the instrumentalist orientation toward technology with the observation that "technology gives the illusion of godlike power to master nature and bend it to our will." This is an illusion, he says, because humans are finite beings who would better understand technology if they recognized that their ontological finitude should result in an approach of restraint when it comes to technology. Instead, humans have allowed technological development to leave the hands of craftsmen who saw it merely as a means to improve their own performance of craft, to capitalist enterprises and their agents that only understand it as a means to increase profit. While both of these understandings define technology in instrumentalist terms, the replacement of the craft interpretation by that of the capitalist one is what has led to the illusion of mastery and played into the hubris of humanity. This replacement has led to the moral question of hubris: "What is the ultimate reality – the object of science or the world of experience?" Technology, of course, is the object of science. Should its demands (if we can call them that) – the demands for greater efficiency, greater profit, greater power, further development into an ever-closer replication of human abilities – have more purchase in the human lifeworld than the actual experience of people IN that lifeworld – people who know, as David Nicholson put it – that someday they are going to die and that technology is incapable of doing anything for their souls?

My fourth conclusion: Instrumentalist interpretations of technology emerge from the hubris of humanity.

Let me mention only briefly here the recognition by Martin Heidegger that what technology reveals is not its power or the uses to which humans might put it – it has no essence

we can see by examining it, however closely – but the human need, desire, or hubris that has led

to its creation. People crave communion, communication, the common, so they develop

technologies that can provide a measure of this on a planet of many billions who do not know

nor understand one another's traditions, cultures, or disparate values. People crave control and

certainty, so they develop technologies that they believe will provide a measure of it – and thus

predictability to everyday life – in an uncertain world fraught with chaos and randomness.

People seek recognition and status, to make a name for themselves, so they invent and develop

and apply technologies to raise themselves above others and, in some cases, control others

through the application of what they have achieved.

My fifth conclusion: Technology is a transparent expression of the underlying and

unrequited needs of humanity that itself created the very deficits that it develops technology to

correct.

Next, I want to introduce a perspective from Primavera Fisogni who, writing about a very

different phenomenon – the rationales for terrorism and its inhuman manifestations –

nevertheless provides a clue as to how we could, perhaps, better understand humans' relationship

to technology. Fisogni writes that "the close society where terrorists are indoctrinated is the very

heart of their dehumanization. Precisely the process is at the origin of the terrorists' deprivation

of sensing," sensing being "an original experience of the human being and . . . . deeply related to

the human condition of being in the world," a concept based in the work of Thomas Aquinas.

The reason this is relevant to our examination today is that the development of

technologies – and especially those imbricated in the effort to communicate – have replaced the

original condition of humans as finite beings with illusions of enhancement and immortality that

paradoxically dehumanize them as they increasingly develop capacities and perspectives that are

more mechanical or synthetic than anthropomorphous. We have supplemented, and then gradually replaced, what we might call our original sensing equipment with technological capabilities that paradoxically limit our organic relations with the world in favor of technologically mediated ones that we believe to be superior. We have, like terrorists who have lost connection to their true human condition, likewise lost our sensing ability that connected us to other frail human beings. Those that we care most about we increasingly know, or connect to, via technology rather than human touch.

My sixth conclusion: Technology use deprives us, and then replaces, our essential and delimited human existence.

Finally, Ivan Illich. Illich argued in favor of what he called a convivial society, a society in which individuals rather than managers – entrepreneurs, owners, developers – were the focus, a society where the triadic relationship between persons, tools, and a new collectivity was the focus – not efficiency, profit, empire, or a transhumanist vision. He advocated an austerity that would conserve personal relatedness by limiting the human propensity for escaping from their skin sack and replacing it with a personal technological cocoon that would separate and isolate people in the name of solidarity.

I have pushed Illich's ideas here beyond his 1972 treatise, but I think this expansion is true to his original vision. This sets up my seventh conclusion: technology is an expansive and destructive force in the hands of a managerial class that dehumanizes humans in the interests of technological values.

We have now arrived at the crux of my argument. This crux, or nexus, is based on these several perspectives. Allow me to summarize:

- James Carey: Human beings use communications technology for control under the spell of the technological sublime.

- Peter-Paul Verbeek: Technology has intentions that human beings respond to as aspects of their material world. They should try to shape technology into desirable forms so that they can control their material environment.

- Langdon Winner: Technology constitutes an instrument of oppression or liberation outside the moral considerations of human existence.

- Andrew Feenberg: Instrumentalist interpretations of technology emerge from the hubris of humanity.

- Martin Heidegger: Technology is a transparent expression of the underlying and unrequited needs of humanity that itself created the very deficits that it develops technology to correct.

- Primavera Fisogni: Technology deprives us, and then replaces, our essential and delimited human existence.

- Ivan Illich: technology is an expansive and destructive force in the hands of a managerial class that dehumanizes in the interests of technological values.

Now, the crux of the matter: technology has demonstrated, and continues to do, enormous good for some people who, for a variety of reasons, have found their ability to engage in a full human life compromised in some fashion. Robots are now assisting in care for Alzheimers' patients. Neuro-prosthetics are allowing those injured in accidents or war to begin to control their artificial limbs by learning to do so by thinking so as to activate the appropriate muscles. Dangerous jobs are beginning to be filled by robots that will likely save lives. Cochlear implants enable the deaf to hear. Soon medications will be delivered by nanobots traversing the blood

streams of patients. Autonomous cars are expected to reduce accidents and thus save lives. Heart scans and MRI images can be analyzed far more quickly by artificial intelligence than by cardiologists, radiologists or neurosurgeons. All of these developments will assist people to live fuller lives – physiologically speaking.

However, at the same time, the internet and social media sites are being weaponized to control information and political decision-making. The Amazon smart speaker, Alexa, is laughing at people. And Brendan Canavan at the University of Huddersfield has said that people should fear themselves "becoming more artificial by outsourcing important actions and decisions to devices like her. "The Guardian newspaper carried a story in late March this year detailing the various ways that robots have introduced new mechanized dangers to the world – from the death of a pedestrian by an autonomous Uber vehicle, to surgery patients dying from robotic surgery when parts fall into their bodies or the machines turn on and off at the wrong time, to South African soldiers dying when a semi-autonomous anti-aircraft gun jammed and then fired high-explosive rounds at them. Another report about the introduction of algorithms in Arkansas to replace human decision-making about the needs of the chronically ill resulted in many people's life support systems – including in home care for those with multiple sclerosis and cerebral palsy – to be drastically reduced. *The Verge* website reported on March 21 that: "Algorithmic tools like the one Arkansas instituted in 2016 are everywhere from health care to law enforcement, altering lives in ways the people affected can usually only glimpse, if they know they're being used at all. Even if the details of the algorithms are accessible, which isn't always the case, they're often beyond the understanding even of the people using them, raising questions about what transparency means in an automated age, and concerns about people's ability to contest decisions made by machines."

So what technologies are to be encouraged and what discouraged? Let me suggest the following. First, whatever technologies are developed should only be distributed or sold after a comprehensive review of their potential benefits and harms – not merely in the medical, construction, or manufacturing spheres, but in the moral sphere as well. The question of the point of developing the technology should be carefully examined. Is there a reason that a human capacity should be replaced by an artificial one? Will the existential condition of the people affected by the technology be enhanced by it, or will they find themselves responding to the demands of the technology without recourse because some industry scion determined that it would be good for them. But were they adequately consulted about whether they needed or wanted the replacement?

Second, is there an assumption underlying technological development that can be sustained in the light of day? Corporate developments for purposes of profit, or expansion, are inadequate rationales for new technologies – even of new pharmaceuticals and delivery systems that claim to correct diseases or conditions that are, at worst, inconvenient. Advertising such products using fear tactics or attempting to put pressure on physicians through encouraged patient demands are not ethical by any measure. Such technologies and their accompanying marketing tactics should be condemned.

Third, many technological developments are as oppressive as they are liberating. The appropriate measure to apply to evaluating technological change should be the question of whether the human condition is to be eased or impeded by the development, whether humanity will flourish as a result of the technology, or find itself enthralled, captured, or addicted to it. Fascination with change is not an ethically adequate rationale, and certainly creations that are more efficient in capturing resources – whether financial or time-based, or those that lead to

addictions of such severity that people are prevented from participating in normal everyday life and contributing to the well-being of others, should be avoided, and their dangers clearly delineated through educational and mediated systems. Human frailty should not be exploited..

Fourth, all of us need to be mindful that technologies are not merely instruments that we can put to certain purposes. To see them merely as means to our own ends is to fail to see through them to what lies beneath. A technology whose creation is a function of the will to power will not shed that foundational element because we learn to use it in a different manner. It will still enable some people to find an easier way to elevate themselves at others' expense, or to control the thoughts or behaviors of others, regardless of what more benign use we believe we can use it for. Human beings are excellent rationalizers. We should not rationalize our way out of enslavement because we manage to explain consequences in a way we find acceptable. Eventually what is hidden by our excuses will out, as will our hubris. Technologies we adopt become part of the human repertoire to experience life. As Peter-Paul Verbeek put it, "technologies give shape to what we do and how we experience the world."

Fifth, the efforts to make humankind more mechanical merely to make people stronger, faster at calculation or decision-making, more capable of absorbing massive amounts of data, or even immortal, along with those that aim to make robots more spontaneous, capable in conversation or lending a listening ear, more human to the touch, more capable of replacing basic human capabilities such as bearing children, raising them to adulthood, or having a fulfilling job or career, should be stopped before what I call the "crossover" occurs. This crossover is the point at which that which is human and that which is not crosses over into the opposite domain, and it becomes problematic to know one from the other. This is the theme of many current dystopian fictional accounts of the human future, best exemplified by "Black

Mirror," but including such films as "Her," "Ex Machina," "Chappy" and Steven Spielberg's recent "Ready Player One," that takes the issues I've addressed here into the realm of virtual reality.

Finally, we are smack up against the issue of reality itself. Our lifeworld is about to become only one of two or three that people will have to navigate and make sense of. Their everyday lifeworld will be subjected to augmentation by the layering of data through technological projection onto it. Perhaps this will add useful data. Perhaps it will clutter everyday existence to such an extent that it will be exhausting, or it will become a new means by which some people are able to lord it over others, or hack others' reality, spread fake information to lead people to decisions that are not to their own benefit. If information is power, then false information, lacking clear differentiation –is illegitimate power, unchecked.

And then there is virtual reality – the reality to replace the physical world with an ersatz one, enabling people to have new experiences in new environments without realistic consequences. Reality with a re-do button. Jumanji – the latest incarnation. What are the consequences for the human situation, for how people treat one another? Will they be able to tell the virtual from the physical, especially as the technologies now under development allow the realism of video games to increase exponentially in real time, people to replace the features of an avatar with their own or others' images, and participate in the direction and endpoint of games – and this is merely in the gaming world. Apply this in scenarios that people typically encounter in the physical world. Do these two worlds then merge into a single experience, with behavior making a smooth transition between one world and another with such finesse as they become indistinguishable to the mind? Must there be a physical prop – a crutch – somehow available to

remind people where they are, to ground them in who they are, or has the crossover then occurred – while no one noticed?

These, I think, are the issues we face as humanity interfacing with technology. Exciting times. Dangerous times. Unpredictable times. I hope we can navigate our way through it and know, at the end of the day, where we have arrived and why – and that the destination is one that we can be at peace with – wide awake, morally intact, and wholly human.

Thank you all for your patient attention.