Anticipated Technological Breakthroughs and Their Possible Impact on Democratic Legitimacy

ELSI and the Political Implications of Neuroscience[1)]

TSUTSUMIBAYASHI, Ken

1 Introduction

Major technological innovation often affects patterns of human behavior. At times, it could even perturb and reconfigure the organizational forms of collective human existence. History is full of examples where scientific inventions have induced changes in warfare, economic structure, social arrangement, and political organization.

This article deals mainly with technologies that are still in the making,

1） This article is based on the presentation given by the author at the NCCU-Keio-Yonsei Inaugural Joint Conference on "Regional Development in East Asia: Security, Economy, and Technology," held at the National Chengchi University (Taiwan) on 10 January 2023. This work was supported by JST, Moonshot R&D Grant Number JPMJMS2012.

hence the focus on "anticipated technological breakthroughs." However, the adjective "anticipated" is not meant to imply "probable," but rather "aspirational," though some are more probable than others, and it is reasonable to assume that not all the scientific projects mentioned in this article will come to fruition. Indeed, it may transpire that some are untenable even in theory. Notwithstanding this uncertainty, however, I believe it is worthwhile to reflect on what some scientists are attempting to achieve in the realm of neuroscience, for this will not only shed light on the directionality of current research (much of which is heavily funded by governments, universities, research institutes, and high-tech firms), but will also provide materials from which to think or brainstorm about what such technologies, if realized, could mean for ethics, law, society, and politics. This in turn could provide certain insights and prospective outlooks on what the future might hold for humanity, thereby enhancing normative arguments about where we ought to go, as well as where we ought not to go.

While it is true that technology impacts how we live here and now, it is also true that whatever scientific and political decisions we make today will have consequences that reach far into the future. Moreover, if the technology promises to be such as one that brings about a massive change in how we see ourselves as human beings, then there is all the more reason to think politically as well as from the perspectives of ELSI (ethical, legal, and social issues) about the directionality of where we would wish or not wish that technology to take us.

This article examines mainly, though not exclusively, technologies being developed by certain groups within the Moonshot Research and Development Program, a hugely ambitious research initiative launched by the Japanese government. An initial focus will be on the debates surrounding the ethical, legal, and social implications of such technologies. This will take the form of reviewing journal articles that are based on interviews with three of the scientists involved in the Moonshot Program. The interviews were conducted mainly by legal scholars and lawyers who belong to a group that is also attached to the Moonshot Program.

Against this backdrop, I will extend the argument by including what this might mean for politics, with particular focus on the implications for democracy.

2 The impact of Game-changing Technologies

Rapidly evolving technologies such as Big Data, SNS, AI and algorithmic tools capable of micro-targeting are ineluctably (and most likely irreversibly) transforming the landscape of our social life. To what extent this will have an impact on politics remains to be seen, though there are already signs that electoral behavior is for better or for worse susceptible to such technological intervention. Undoubtedly however, in recent years, public awareness concerning its negative impact has become more pronounced, as high-profile incidents such as those related to the Mueller Report and the Facebook/ Cambridge Analytica scandal have exposed the risks and dangers that could result from these technologies[2]. At the same time, there are more and more informative studies on how seemingly innocuous or even benign technologies could have serious and far-reaching negative consequences for the organizational structure and ethos of democratic society[3].

Also of concern is the military application of machine or robotic technology that is becoming ever more sophisticated with the aid of AI. While automated machines may well contribute to saving lives or decreasing the risk for human workers in dangerous conditions, they could also be weaponized to increase the level of efficiency in taking out designated targets. Lethal autonomous weapons ("killer robots") such as drones are becoming increasingly more agile, small, low-cost, and deadly. Not surprisingly, therefore, there are now calls by the UN, EU, and some states and NGOs for a treaty to ban such weapons, though consensus on how and at what level (whether to ban just their use or also their development) has not yet been reached[4].

All this goes to prove the obvious point that technology is a double-edged sword: both good and bad could result from it. Nevertheless, some technologies

2） E.g., Normann Witzleb and Moira Paterson, "Micro-targeting in Political Campaigns: Political Promise and Democratic Risk," in Uta Kohl and Jacob Eisler (eds.), *Data-Driven Personalisation in Markets, Politics and Law*, Cambridge University Press, 2021, pp. 223–240.

3） E.g., Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, PublicAffairs, 2019.

are more consequential than others, and this article deals with those that could have massive consequences for humanity at large.

In discussing the possibilities and risks related to general-purpose AI technology, Stuart Russell (a renowned professor of computer science at UC Berkeley who also advises the EU on regulating AI) remarked that its success could signify "the biggest event in human history … and perhaps the last event in human history."[5] The same could be said of specifically neuroscience, as I hope to demonstrate in the ensuing discussion.

3–1 The Moonshot Research and Development Program

The Moonshot R&D Program is a highly ambitious scientific research initiative that was launched by the Japanese government in 2019. With a budget of 1,000 billion yen over 5 years[6], it "aims to create disruptive innovations from Japan and promotes challenging R&D based on revolutionary concepts that are not simply the extension of existing technologies."[7] Since its inception a few years ago, the program has evolved into a massive multidisciplinary research network involving scientists and researchers from various universities, research institutes and high-tech firms in Japan and beyond. The multifarious individual projects within the overall scheme fall into one of the following nine categories, each of

4) See the initiatives by United Nations Office for Disarmament Affairs (UNODA), United Nations Institute for Disarmament Research (UNIDIR), United Nations Convention on Certain Conventional Weapons (CCW), European Parliament's Special Committee on Artificial Intelligence in a Digital Age (AIDA), Campaign to Stop Killer Robots, and Human Rights Watch.

5) Stuart Russell, *Human Compatible: Artificial Intelligence and the Problem of Control*, Penguin Publishing Group, 2019, p. 17. Russell delivered the 2021 BBC Reith Lectures entitled "Living with Artificial Intelligence" (https://www.bbc.co.uk/programmes/m001216k). There, he reiterated his view that machines more powerful than humans could pose an existential threat for humanity. Russell also collaborated with the Future of Life Institute to produce a short film entitled *Slaughterbots* to raise awareness about the risks of weaponizing AI technology.

6) *Nikkei Shimbun*, 30 March 2019.

7) Cabinet Office HP, "About Moonshot Research and Development Program" https://www8.cao.go.jp/cstp/english/moonshot/system_en.html

which is defined by its goal[8].

Goal 1: The realization of a society in which human beings can be free from limitations of body, brain, space, and time by 2050

Goal 2: The realization of ultra-early disease prediction and intervention by 2050

Goal 3: The realization of AI robots that autonomously learn, adapt to their environment, evolve in intelligence and act alongside human beings by 2050

Goal 4: The realization of sustainable resource circulation to restore the global environment by 2050

Goal 5: The creation of an industry that will ensure a sustainable global food supply by exploiting unused biological resources by 2050

Goal 6: The realization of a fault-tolerant universal quantum computer that will revolutionize the economy, industry, and security by 2050

Goal 7: The realization of sustainable care systems to overcome major diseases by 2040, in order to enjoy one's life with relief and release from health concerns until 100 years old

Goal 8: The realization of a society safe from the threat of extreme winds and rains by controlling and modifying the weather by 2050

Goal 9: The realization of a mentally healthy and dynamic society by increasing peace of mind and vitality by 2050

In terms of the organizational structure, Goals 1 to 9 each have one Program Director under whom there are several Project Managers[9]. Project Managers, in turn, head research teams comprising Project Facilitators, each of whom also manages a group of researchers.

This article focuses on research that aims to achieve Goal 1[10]. In particular,

8） https://www.jst.go.jp/moonshot/en/index.html

9） For the overall management structure (including the Governing Committee, Advisory Board, Subcommittees, and their members), see https://www.jst.go.jp/moonshot/en/index.html

it tries to capture certain aspects of research pursued by the IoB (Internet of Brains) team led by Project Manager Ryota Kanai[11], who is CEO of Araya Inc. More specifically, I will recount and reflect on those research activities coordinated by Project Facilitator Keigo Komamura.

Keigo Komamura is a professor of constitutional law at Keio University, Faculty of Law and Graduate School of Law. As Project Facilitator under Project Manager Ryota Kanai, he has established the research unit IoB-S ("Internet of Brains"-Society), the mission of which is to "explore the Ethical, Legal, and Social Issues (ELSI) on neuroscience and its social use"[12]. Since May 2022, IoB-S has become a project within the Keio University Global Research Institute (KGRI)[13] as well.

Komamura's group, of which I am a member, comprises thirteen researchers (most of whom are legal scholars and lawyers)[14]. Since October 2021,

10) Program Director in charge of Goal 1 is Norihiro Hagita, Professor of Osaka University of Arts, Art Science Department. He elaborates on the aims of Goal 1 as follows: "To overcome the challenges of a declining birthrate, aging population and associated labor shortage, the key is to realize a society free from the limitations of body, brain, space, and time and allow people with various backgrounds and values — such as the elderly and those with responsibilities for nursing and childcare — to actively participate in society. Our R&D will develop core technologies related to cyborgs and avatars, called 'Cybernetic Avatars', allowing expansion of human physical, cognitive and perceptual abilities. We will build 'Cybernetic Avatar Infrastructure' in the cloud while easing the acceptance of Cybernetic Avatars into future society." (https://www.jst.go.jp/moonshot/en/program/goal1/index.html) And in his "Message from PD," he states the following: "Our human-centered R&D projects on Cybernetic Avatars will support the creation of cloud infrastructure and core technologies that enable a diverse range of social activities via remote operation. We also intend Cybernetic Avatars to augment the physical, cognitive and perceptual capabilities of people from various social and value backgrounds. Cybernetic Avatars will be developed from the viewpoint of both providers and users in future society. Therefore our R&D projects should also do basic research on human stress caused by them, and methods to relieve this stress, while taking into account ethical, legal, social, and economic (ELSE) issues and information security. I hope these projects will help us adapt and adjust to a new human-centered 'Cybernetic Avatar Life'."

11) Kanai defines his project as follows: "Liberation from biological limitations via physical, cognitive and perceptual augmentation." https://brains.link/en/research-theme

12) https://www.iob-s.com/about

the group has been meeting regularly to learn and discuss about the technologies being developed mainly by scientists in the Moonshot Program, with the aim of ascertaining their ethical, legal, and social implications. To this end, the group has organized a series of in-depth interviews and discursive sessions involving these scientists, and the findings are currently being published in the form of articles in the law journal *Hougaku Seminar*. Since the publication process (as well as the sessions) are still on-going, I shall only discuss here those technologies mentioned in the first seven of those articles.

3–2 Junichi Ushiba's Research on BMI

The first three articles[15] revolve around the BMI (Brain-Machine Interface) research carried out by Junichi Ushiba, professor at Keio University's Faculty

13） https://www.kgri.keio.ac.jp/en/index.html
Keio University Global Research Institute (KGRI) is directed by Yuko Kimijima, Professor of Intellectual Property Law at Keio University's Faculty of Law and Graduate School of Law. She is also director of Keio University's Cyber-Physical Sustainability Center that aims "1) to create an environment to experience the actual use of CA [cybernetic avatars]; 2) to organize events to discuss a sustainable society, law, and policy through cyber-physical space; and 3) to propose sustainable lifestyle, society, law, and policy using CA as a cyber-physical system." Kimijima is also affiliated with the Moonshot Program as Project Facilitator under Project Manager Fumio Shimpo, who is a professor at Keio University's Faculty of Policy Management.

14） Aside from Keigo Komamura, the other twelve researchers are: Yoshinori Ohshima (Project Associate Professor, Graduate School of Law, Keio University / Attorney-at-Law), Tamami Fukushi (Professor, Faculty of Human Welfare, Tokyo Online University), Yuka Koide (Data Scientist, DIGITAL BCG JAPAN), Masatoshi Kokubo (Researcher, Graduate School of Law, Keio University), Takayuki Matsuo (Attorney-at-Law), Satoshi Narihara (Associate Professor, Faculty of Law, Kyushu University), Tomoumi Nishimura (Associate Professor, Faculty of Law, Kyushu University), Kunifumi Saito (Associate Professor, Faculty of Policy Management, Keio University), Machiko Sakai (Associate Professor, Interfaculty Initiative in Information Studies, Tokyo University), Masahiko Sudo (Attorney-at-Law), Ken Tsutsumibayashi (Professor, Faculty of Law and Graduate School of Law, Keio University), Satoshi Yokodaido (Professor, Law School, Keio University).

15） *Hougaku Seminar*, 807 (2022), pp. 57–70; 808 (2022), pp. 58–64; 809 (2022) pp. 56–63.

of Science and Technology, Department of Biosciences and Informatics. Ushiba specializes in neuroscience and rehabilitation medical science, and is one of the leading scientists in Japan working on BMI. He also serves as one of the Sub-Project Managers in Kanai's Moonshot research group IoB (Internet of Brains).

The centrality of BMI in IoB research is evident from the following statement by Kanai:

> The ultimate goal of this project is to realize the "Internet of Brains (IoB)," where the brain is connected to the Internet using brain-machine interface (BMI) technology, and can freely control CAs [Cybernetic Avatars] in cyber-physical space, where cyberspace and real space are fused together, and directly communicate with other humans and AI.[16)]

Ushiba's research on BMI, or BCI (Brain-Computer Interface) as it is sometimes called, is focused mainly on the development of a scalp-electroencephalogram-based device that can aid people in the areas of healthcare, sports, music, and research industries[17)]. The BMI wearable headset created by his team is slightly larger than an ordinary audio headphone and is non-invasive, that is to say, the sensors do not penetrate the skull or the brain. The sensors attached to the scalp detect the brainwaves that are subsequently decoded and transmitted to machines such as robotic hands and computers equipped with communication and cybernetic avatar appliances. By the use of this BMI technology, Ushiba has made considerable advancement in the treatment of patients with brain stroke paralysis and has also succeeded in creating BMI-controlled cybernetic avatars that could allow people with disabilities to move freely in cyberspace or metaverse.

16) https://brains.link/en/research-theme

17) In his project statement, Ushiba announces the following: "In this R&D project, we will develop scalp-electroencephalogram-based brain-computer interface (BCI) technology for everyday use. A large-scale field study will be conducted with the healthcare, sports, music, and research industries. We will consider the social implications of AI-aided non-surgical BCI and its application to 'Cybernetic Avatars,' using evidence-based research and ethical guidelines." https://brains.link/en/interface

This technology is evolving at an exponential pace and will most likely revolutionize medical treatment in the near future. It is also likely to have a massive transformational impact on business and other transactional conducts, leading in turn to the transformation of people's way of life in general.

What is revolutionary about this technology is that it has the potential not only to by-pass verbal, facial, and gestural forms of volitional expression (hitherto the only means humanly possible), but also to make explicit those pre-volitional thoughts and desires that are opaque even to the person having those thoughts and desires. As Ushiba points out, "with the emergence of BMI, it has become possible to by-pass one's own body and informationally connect [the brain directly] to the outside world and the social system"[18].

Ushiba realizes that this technology may prove problematic in terms of ELSI, especially if the subconscious locomotion of the brain is translated via the BMI device directly into verbal or physical action. This becomes all the more problematic given our increasing understanding that whatever thoughts and desires form the subconscious realm are not only diverse and often mutually inconsistent, but may also contradict the conscious and outwardly expressed volition as well as the intended action.

This was indeed one of the most fervently discussed issues in Komamura's group. A person may have various conflicting thoughts and desires, some conscious, others subconscious. A person may or may not choose to verbalize or act upon what is consciously registered in the mind. However, in legal and ethical terms, what matters is what is actually said or done. The existing societal system is founded on the idea of free will and personal autonomy, however intangible, fictional, and unprovable they may appear from the standpoint of natural science. (Benjamin Libet's famous experiment was no doubt one of the focal points in discussing the fictional or retrospective nature of intention and free will[19].) Furthermore, it matters little what goes on in the mind, good or bad, so long as the externalized thought and action do not transgress the rules and norms of society.

Confusion or even chaos may therefore ensue from the application of

18） *Hougaku Seminar*, 807 (2022), p. 60.

technology that translates a person's purported intention into action even before the person's conscious decision is made. For instance, if an urge to hit someone (a kind of urge that is more often than not restrained at the conscious level) is automatically carried out by the robotic arm, who would bear responsibility for it? (Although of course, the robotic arm can be programed not to execute desires that would lead to violence[20].)

Another point of concern is privacy and the protection of data extractable from the brain via BMI. Privacy and data security are already major issues of concern in various areas of information technology and the social network industry, but this is likely to reach a new level of complexity and sensitivity with the advance of BMI technology.

Ushiba is well aware of these concerns, and is himself active in formulating ELSI guidelines. Already in 2017 he announced, together with his colleagues around the world, three ethical guidelines for BMI research.

(1) The clarification of legal responsibility for accidents or incidents caused by BMI-induced actions (accountability)
(2) The protection of neuronal data and the prevention of unauthorized access to the brain (protection of personal information)
(3) The promotion of social acceptance (public awareness) and advancement of ethical norms based on the swift disclosure and accuracy of technological information[21]

In discussing these issues with the members of Komamura group, mention

19) Benjamin Libet, "Unconscious Cerebral Initiative and the Role of Conscious Will in Voluntary Action," *Behavioral and Brain Sciences*, 8–4 (1985), pp. 529–566. It was concluded from the experiment that conscious awareness of voluntary action is preceded by electrophysiological "readiness potentials" (RPs). This experiment inspired a host of philosophers, many of whom claimed to have found a scientific proof of the non-existence of free will. But so far, scientists and philosophers are divided as to what this experiment entails for free will.

20) This issue was discussed extensively with Kanai as well. *Hougaku Seminar*, 811 (2022), pp. 52–56.

was also made of other attempts by other concerned actors from around the world, most notably the NeuroRights Foundation in the U.S. and their collaborative effort with the Chilean politicians and academics who brought about the historical constitutional amendment in Chile (the first of its kind in the world) to protect brain activity and information from neurotechnological intervention[22].

Many other important topics were covered in the discussions with Ushiba, but for the purposes of this article, I should like to focus on just one more aspect of BMI that could prove potentially controversial in many ways. This is the issue of "Think Communication," a new method of communication that by-passes the use of language and instead relies on the direct brain-to-brain thought connection made possible by a cyber-mediated exchange of brainwaves. While

---

21） Jens Clausen, Eberhard Fetz, John Donoghue, Junichi Ushiba, Ulrike Spörhase, Jennifer Chandler, Niels Birbaumer, Surjo R. Soekadar, "Help, Hope, and Hype: Ethical Dimensions of Neuroprosthetics: Accountability, Responsibility, Privacy, and Security are Key", *Science*, 356–6345 (2017), pp. 1338–1339. For further detail concerning Ushiba's contribution and his collaborative effort with neuroscientists and ELSI specialists from around the world, see the following press release by Keio University. "Three Ethical Guidelines regarding the Rapid Social Development of Brain-Machine Interfaces Published in the Science Magazine: Research Results of an International and Interdisciplinary Team Comprising of Neuroscientists, Ethicists, Jurists and Pedagogists" (13 July 2017). https://www.keio.ac.jp/en/press-releases/files/2017/7/13/170713-1.pdf

22） The stated mission of the NeuroRights Foundation is as follows: "Our goal is to protect the human rights of all people from the potential misuse or abuse of neurotechnology. We are working to incorporate five Neuro-Rights that have been identified as critical into international human rights law, national legal and regulatory frameworks, and ethical guidelines." https://neurorightsfoundation.org/
The Neuro-Rights Foundation collaborated with the Chilean politicians to accommodate neuro-rights in their Constitution. https://neurorightsfoundation.org/chile
Ushiba also mentioned the four ethical principles proposed by a team of Japanese scientists in 2010. (1) Prohibition of the use of BMI in war and crime, (2) Prohibition of BMI-assisted mind-reading against one's will, (3) Prohibition of BMI-assisted mind-control against one's will, (4) Admission of the use of BMI technology only when the benefit outweighs the risks and dangers, and only when acknowledged by the user. See Mitsuo Kawato and Osamu Sakura "Proposal for Four BMI Ethical Principles," *Gendai Kagaku*, 471–6 (2010), pp. 21–25.

this technology is still in its infancy, and may never materialize, if successful, it has the potential to change not only how we communicate and interact with each other but also the nature of humanity itself. This technology was briefly discussed during the conversation with Ushiba, but since it constitutes one of the core themes of research in Kanai's group, this will be discussed in the following two sections.

3–3 Ryota Kanai's Project on the IoB and Think Communication

As mentioned above, Ryota Kanai is a Project Manager of the Moonshot Program and heads the IoB (Internet of Brains) research team. He was formerly an associate professor of cognitive neuroscience at the University of Sussex (UK), but now conducts and coordinates research activities at a high-tech firm, Araya Inc., which he founded in 2013[23].

During the discursive session organized by Komamura[24], Kanai explained the aims and aspirations of his project in the Moonshot Program by focusing on the idea of "Think Communication" or "Thought Cloud (Society)." He envisions a society where people evolve into a "homo deus"-like existence[25], that is to say, beings able to live fulfilling lives free from the constraints of illness, disabilities, senescence, and human suffering in general. There is a pictorial illustration (entitled "In 2050, people will live in a Thought Cloud Society where a person's brain is directly connected to others' and AI, being able to descend upon the physical world via robots, and transforming into homo deus that joyfully engages in creativity") with the explanation of how this society might function[26]. Disabled people as well as the aged live healthy, free and active lives, fully participating in society. Each person is able to control several robots or cybernetic avatars (on earth and beyond) just by mental volition, thereby helping to build social infrastructure. There is also

23) https://www.araya.org/en/about/company/

24) This is documented in *Hougaku Seminar*, 810 (2022), pp. 45–51; *Hougaku Seminar*, 811 (2022), pp. 52–59.

25) Needless to say, "homo deus" is an allusion to Yuval Harari's notion of a transhumanist being described in his book *Homo Deus*.

26) *Hougaku Seminar*, 810 (2022), p. 46.

an image of a brain in a vat with the explanation: “people are able to participate in society as a brain or machine even after the demise of the physical body.” This involves the concept of “mind uploading,” where “the brain function is transferred into a machine.” According to Kanai, consciousness can be reduced to information. In a separate article, he claimed that “consciousness is no longer something mysterious and magical” and “we are seeing AI researchers getting closer to architectures relevant to consciousness.[27)]” This, it seems, is tantamount to achieving immortality, and perhaps for this reason, Kanai describes the Thought Cloud Society as “heaven,” a place that even caters for the afterlife.

Of course, Kanai does not claim that this will happen overnight. This is a long-term vision that can only be achieved as an outcome of long and accumulative effort in neuroscience with strict ethical guidelines. Therefore, while he is committed to creating technology that connects brains in cyberspace, he obviously does not experiment with human beings (though he referred to some scientists experimenting with animals such as monkeys). Kanai’s approach is to use non-invasive BMI for discovering the mechanisms of “Think Communication.”

Moreover, to complement non-invasive BMI, he underlines the importance of “non-contact BMI.” This is a technology that relies not on brain information but on visual data collected from, say, facial expressions and walking patterns (with the use of facial recognition devices and motion capture cameras). By analyzing such data with the aid of AI, it becomes possible, according to Kanai, to read the intentions of the human subject. The data may not be as precise as those obtained from the brain, but they are useful enough to understand what the person is intending to do, for instance, to pick up a glass of water and convey it to the mouth, which can then be carried out by a robotic arm.

Thus, for Kanai, the development of non-invasive as well as non-contact BMI constitutes the first step towards realizing the Internet of Brains or Think Communication. The second step is to improve invasive BMI technology and its application through medical practices, but this he thinks will take a long time. The third and final step is to achieve direct brain-to-brain communication and

27） “All in the Mind’s AI” (https://www.nature.com/articles/d42473-022-00218-7).

the connecting of the brain with a highly sophisticated AI.

As mentioned earlier, Kanai for now relies on non-invasive BMI to explore the mechanisms of Think Communication. One of the central aims at this stage is to find a method for decoding the encoded (or internally represented) perception of a person (say A) in such a way that another person (say B) could come to perceive whatever is perceived by A directly, that is to say, through the transfer and translation of brain signals from A to B via a machine, and without the mediation of natural language or verbal exchange. If successful, this may even allow subjective experience, with all its detail and vivacity, to be shared with another person. For instance, a person overwhelmed by the beauty of a sunset may be able to communicate not just the full range of images on display but also the sense of awe evoked.

While articulating these futuristic visions, however, Kanai does not ignore the risks and dangers that may result from such technology, and has thus outlined concerns about ELSI in the following way.

He says there are short-term and long-term issues. One of the short-term issues is the protection of personal information. With the wider use of non-invasive BMI, there will be more and more brain data uploaded to the cloud system, thereby increasing the risk of their misuse. This can be aggravated by the rapid rise in the commercialization of this technology. Kanai is not at all against the idea of commercialization itself, but fears that "honest science" can be compromised if there is too much haste to monetize it. This calls for guidelines and mechanisms for assuring safety. Kanai also mentioned that devices such as tDCS (transcranial direct current simulations) are already easily accessible and can even be purchased at Amazon.

As for the long-term issue, which concerns the creation of an IoB society, Kanai thinks it is important to find ways for people to overcome their psychological fears of invasive BMI, while guaranteeing the safety of its use.

In any case, Kanai suggests that we should start thinking about how to deal with the externalization or exposure of inner thoughts that have hitherto remained private and opaque. In a world where brains are directly connected with each other, how do you define the boundaries of an individual? What happens when humans attain immortality by becoming a bundle of data?

These questions, raised by Kanai, are certainly food for thought, but what if brain data belonging to separate individuals are to be merged to create a single entity? This question will be addressed in the next section, since it is precisely one that is being explored by another scientist, Shuntaro Sasai, the third scientist invited to the Komamura session[28)].

3–4 Shuntaro Sasai's Project on the IoB and Think Communication

In addition to being a Sub-Project Manager in Kanai's Moonshot research group, Shuntaro Sasai is Chief Research Officer at Araya Inc., so Sasai and Kanai basically work together in developing Think Communication[29)]. Sasai is also a member of the Center for Sleep and Consciousness at the University of Wisconsin-Madison. Not surprisingly, therefore, Sasai provides similar examples of what Think Communication might allow us to do.

> A person travelling to outer space is likely to have an awesome experience that is hard to come by on earth. Think Communication can be used to share this (i.e., sharing of sensation and conscious experience). It will also become possible to communicate in its entirety the excitement induced from watching TV or delightful sensation from drinking Sake.
>
> Next, imagine a meeting. There are occasions where communication fails to occur as expected. In order to avoid miscommunication and misunderstanding, you just have to convey your thoughts directly to the other person (i.e., zero miscommunication).[30)]

Like Kanai, Sasai explains the mechanism of Think Communication in terms of transferring the decoded representation of a person's inner thought in such a way that it can be intelligible to another person. This involves a process

---

28） *Hougaku Seminar*, 812 (2022), pp. 64–70; *Hougaku Seminar*, 813 (2022), pp. 54–61.

29） https://research.araya.org/member/shuntaro-sasai-phd

30） *Hougaku Seminar*, 812 (2022), p. 64. Sasai even suggests the possibility of brain-to-brain communication between humans and animals.

of "translation," which requires a "codebook" that allows differently organized perceptional organs (each brain has a distinctive way of processing information) to come to the same understanding.

Thus, one of Sasai's main research activities for the Moonshot program is to create this codebook, which he believes is possible by employing the Global Workspace Theory. Araya Inc. provides the following account of this theory.

> The Global Workspace Theory posits that the human brain is made up of a number of modules, each specializing in a particular function, such as sight, hearing, movement or language. Consciousness acts as a bridge between these modules. We believe that we are able to act appropriately in the real world because our consciousness is a clever coordination of several dedicated modules. The "global workspace" is the place where the information between the different modules is exchanged.[31)]

If this Global Workspace exists, so the argument goes, it would suffice only to extract the information from this part of the brain, since all the other pieces of information formed around various modules are connected to it in an orderly manner.

This, again, is an approach common both to Kanai and Sasai, but what stands out in Sasai's remark is the mention of "super-consciousness," a form of combined consciousness created by merging the different consciousnesses of separate individuals.

---

31) https://www.araya.org/en/randd/consciousness3/
Further explanation follows: "the global workspace theory was first proposed in the 1980s and has been supported by a number of experimental results [Bernard J. Baars, "The Conscious Access Hypothesis: Origins and Recent Evidence," *Trends in Cognitive Sciences*, 6–1 (2002), pp. 47–52]. Through computer simulations and other means, research has been carried out to determine which neural circuits shape the global workspace [George A. Mashour et al., "Conscious Processing and the Global Neuronal Workspace Hypothesis," *Neuron*, 105–5 (2020), pp. 776–798]." Mention is also made of Kanai's article co-authored with the Research Director of CerCo (Centre de Recherche Cerveau et Cognition) in France: Rufin VanRullen, Ryota Kanai, "Deep Learning and the Global Workspace Theory," *Trends in Neurosciences*, 44–9 (2021), pp. 692–704.

It is well to acknowledge that in making this argument, Sasai is not saying that we should aim to achieve this novel state of consciousness, but rather, given its possibility, we should think about its various implications (including risks and dangers) in the event that it may one day happen. He also warned against the misuse of brain information as BMI technology becomes more and more advanced and accessible, a concern (as noted earlier) that was voiced also by Kanai and Ushiba.

However, it is interesting to note that a lot of discussions in Komamura group revolved around the question of what the emergence of "super-consciousness" might entail, philosophically and existentially. What happens to, say, X and Y when they merge to become Z? Will X and Y still exist or not? What happens to consciousness? Will X, Y, and Z all remain conscious? Or will it just be Z who remains conscious? Who will have control of the body or the brain, and to what degree?

These questions are impossible to answer with any degree of certainty, but Sasai's position (or conjecture) is that X and Y will cease to exist once they merge to become Z. This, he thinks, is problematic even if the process is reversible, since in retrieving X and Y by dismembering Z, Z in turn will have to perish.

4–1 The Political Implications of Neuroscience

Thus far, we have surveyed some aspects of the research activities conducted in the Moonshot Program and have briefly discussed what they might entail in terms of ELSI. We have also noted in passing attempts by overseas organizations to address ELSI in neuroscience. This global trend is hardly surprising given the huge amount of attention and funding invested by governments, universities, research institutes, and high-tech firms from around the world in developing the kind of technologies described in this article.

Research in this field and concern for ELSI are likely to increase and intensify in the future, especially in light of the breakneck speed with which invasive BMI devices are being developed. Experiments on animals such as rats, pigs, and monkeys are already taking place, and recently it was reported that Elon Musk's neurotechnology company Neuralink sought, though without

success, clinical-trial approval from the U.S. Food and Drug Administration to implant a BMI device in human brains[32].

Although Musk's bid was rejected by the FDA, it will probably not deter him from pursuing his project. This is most likely true of many others who are currently working on BMI and other mind-reading technologies.

What could all this mean for politics in general and democracy in particular? How can we avoid a dystopian future?

On one level, we could simply reiterate the old adage that it is all a matter of how we employ technology. All technologies are double-edged, so it is a question of making wise decisions, which calls for serious thinking about ELSI and policy-making.

It would certainly be unwise to weaponize these technologies and use them for purposes of war, domination or political control. In this respect, the news that a research institute in China has claimed to have developed an AI capable of reading facial expressions and brain waves to "discern the level of acceptance for ideological and political education" is worrying, to say the least[33]. It appears that they did not really succeed in creating this AI, but the fact that they aimed to do so at all (and publicly announced it, though the announcement soon disappeared from the internet) is a cause for concern. What is more, it would be naïve to think that this could only happen in China.

This kind of incident could certainly serve as a wake-up call for thinking about the potential dangers, and the misuse or abuse, of this technology and for the need to formulate globally coordinated guidelines for research and development in this area.

As important as this call for attention and action is, however, this article will focus on issues that concern the possible impact of aforementioned

32) Rachael Levy and Marisa Taylor, "U.S. regulators rejected Elon Musk's bid to test brain chips in humans, citing safety risks," *Reuters*, 2 March 2023. https://www.reuters.com/investigates/special-report/neuralink-musk-fda/

33) This was announced by the Institute of Artificial Intelligence at Hefei Comprehensive National Science Center. See Angelica Oung, "China uses 'mind-reading AI' to test loyalty of Communist Party members," *The Telegraph*, 4 July 2022; Didi Tang, "Chinese AI 'can check loyalty of party members'," *The Times*, 4 July 2022.

technologies on democratic legitimacy. This would require us to pay attention not so much to how technologies could be misused or fall into the wrong hands, but rather to what kind of political system or ideas people are likely to embrace if and when the technological breakthroughs occur.

What would or could happen if scientists succeed in developing a machine that is capable of knowing ourselves better than we know ourselves? What would or could happen if it becomes possible to share directly via a machine our thoughts and experiences with others, or even merge them to create a new conscious unit?

Philosopher Slavoj Žižek in his recent book, *Hegel in a Wired Brain*, asks precisely these questions, and answers: "It is clear that contemporary liberal democracy with its individualism is doomed in this case."[34] Similarly, historian and author of *Homo Deus*, Yuval Harari, asserts that "liberalism will collapse on the day the system knows me better than I know myself."[35] While Žižek further warns that this could spell the end of freedom as we know it,[36] Harari goes on to explain how the twenty-first-century technologies (potentially capable of augmenting the physical, emotional and intellectual abilities to an unimaginable level) could give rise to a new kind of inequality that divides "humankind into a mass of useless humans and a small elite of upgraded superhumans."[37]

This may very well be the future, and it would seem plausible to argue, as does Harari, that "liberal habits such as democratic elections will become obsolete, because Google will be able to represent even my own political opinions better than I can."[38] One may also begin to question why human

34） Slavoj Žižek, *Hegel in a Wired Brain*, Bloomsbury Academic, 2020, p. 49.

35） Yuval Noah Harari, *Homo Deus: A Brief History of Tomorrow*, Harper, 2017, p. 396.

36） *Hegel in a Wired Brain*, pp. 176–177: "The distance between our inner life, the line of our thoughts, and external reality is the basis of the perception of ourselves as free: we are free in our thoughts precisely insofar as they are at a distance from reality, so that we can play with them, make thought-experiments, engage in dreaming, with no direct consequences in reality, no one can control us there. Once our inner life is directly linked to reality so that our thoughts have direct consequences in reality (or can be directly regulated by a machine that is part of reality) and are in this sense no longer 'ours,' we effectively enter a post-human state."

37） *Homo Deus*, p. 408.

rights such as freedom of opinion, thought, and conscience have to remain inviolable if, say, it becomes possible to detect harmful intention in advance of willful action. (Of course, there is also the question of what constitutes harm and who decides.)

The future is not set in stone, however, and the technological breakthroughs in question have yet to occur. Thus, for those who find the above scenarios unpalatable and wish to preserve some aspects of democratic practice or values into the future, it is still possible to think and act in the hope of realizing viable alternatives. Not to raise expectations too high though, I will declare at the outset that this article does not outline how this can be done. What I hope to do instead is to think about the future of democracy in terms of legitimacy so as to adumbrate what challenges lie ahead if we are to contemplate saving democracy in the face of the aforementioned technological transformation.

It is widely acknowledged that legitimacy constitutes one of the key factors contributing to the stability and longevity of collective human existence. In addition, for a new form of enduring entity to emerge, the old order has to give way to the new through the process of delegitimization and re-legitimization. Thus, even if democracy is to become obsolete with the advent of new technologies, it would still have to go through a transitional phase during which the existing democratic system becomes delegitimized. Furthermore, the process of delegitimization would have to involve people's opinion and collective decision-making, given the nature of the existing political order: only then would it become possible to legitimize whatever is to follow. In other words, the transition from democracy to another form of governance or rule would have to involve some form of popular assent.

To elaborate on this point, let us first consider the nature of legitimacy in relation to opinion.

4–2 Legitimacy and Opinion

Legitimacy is a polysemous term that would require a whole new article (or even

38) *Homo Deus*, p. 394.

book) to cover all the meanings attributed to it. Thus, for the purposes of this article, I will simply take legitimacy to mean a relatively durable belief concerning rightful obedience to certain forms of authority or rule. This implies that authority or rule must be voluntarily accepted and sustained from below, that is, by the opinion of the ruled or the people. (In democracy, people theoretically rule and are ruled at the same time—the notion of self-rule.)

I emphasize the role of opinion in legitimacy because opinion is, as David Hume explained almost three centuries ago, the source of authority for any form of government (whether democratic or despotic).

> NOTHING appears more surprising to those, who consider human affairs with a philosophical eye, than the easiness with which the many are governed by the few; and the implicit submission, with which men resign their own sentiments and passions to those of their rulers. When we enquire by what means this wonder is effected, we shall find, that, as FORCE is always on the side of the governed, the governors have nothing to support them but opinion. It is therefore, on opinion only that government is founded; and this maxim extends to the most despotic and most military governments, as well as to the most free and most popular.[39)]

Hume lived in an aristocratic era where the elite few ruled the many. However, as he stated: "FORCE is always on the side of the governed." This is true even today, since it is the majority of the people who labor to produce things that are necessary for collective human existence. It is the people who till

39) David Hume, "Of the First Principles of Government (1741)," in *Essays, Moral, Political, and Literary*, ed. Eugene F. Miller, Liberty Fund, 1985, p. 32. Hume is often credited for articulating this maxim, but William Temple claimed something quite similar seventy years or so before Hume. William Temple, "An Essay upon the Original and Nature of Government," in *Miscellanea*, Edw. Gellibrand, 1680, pp. 53–54: "Nor can it be in the other case, that when vast numbers of men submit their lives and fortunes absolutely to the Will of one, it should be want of heart, but must be force of custom, or opinion, the true ground and foundation of all Government, and that which subjects Power to Authority. For Power arising from Strength, is always in those that are governed, who are many: But Authority arising from opinion, is in those that Govern, who are few."

the soil, manufacture goods, transport them, engage in commerce, and fight for national defense. Furthermore, even in the age of democracy, the ruling elite has not disappeared (though there is perhaps more social mobility, comparatively speaking). And yet, without people's economic and military cooperation, the elite or the regime would be powerless.

This is why opinion becomes fundamentally important. So long as the majority of the people share an opinion that it is right or natural or normal to obey the regime under which they live, the regime will continue to exist with a grip on authority (barring force majeure). People do not necessarily have to be ardent supporters of the regime. Even reluctant or fearful obedience could contribute to maintaining legitimacy.

All enduring societies in human history have known the importance of opinion (especially the leaders), either consciously or instinctively. And all enduring societies in human history have had a language or theory of legitimacy.

Here, I distinguish between the language of legitimacy and the theory of legitimacy, though they often overlap. By the language of legitimacy I include, among others, non-linguistic means of persuasion, representation, and communication such as rituals, customs, symbols, art, dance, and music. Through these means, people come to foster a sense of shared identity or belief, and accept (often unconsciously and without express consent) the existing form of rule. In contrast, the theory of legitimacy is characterized by its express attempt to explain through language what good reason there is to obey and respect certain authority. In my view, neither one nor the other is superior in moral or any other terms. Historically however, and prior to modernity, only in certain regions of the world such as the West and China did the theory of legitimacy come to play a significant role.

Today, however, in almost all parts of the world, a particular strain of the theory of legitimacy predominates. This is democracy, the idea that authority or rule is legitimate only insofar as it derives from and pursues the interests of the people. How this came to be is a long and bloody story involving the rise of modern sovereign states. I have co-authored a book recounting the historical process by which one theory of legitimacy after another rose and fell in accordance with the changing sea of opinion, finally to end up with the

predominance of the theory of legitimacy underpinning the modern state and democracy[40]. Here, I shall simply reiterate the point that any theory of legitimacy is only as effective as its underlying support (i.e., opinion) from the people. And, while the theory of legitimacy often serves as a means to mustering and shaping opinion, opinion is not always compliant. Moreover, opinion can shift towards endorsing a different theory of legitimacy if enough people find it more appealing. During the French Revolution, for instance, opinion shifted from the theory of the divine right of kings to one of popular sovereignty, thereby delegitimizing the Ancient Régime and legitimizing what followed (though the latter faced a significant period of instability).

In view of the nature of democratic legitimacy, which institutionalizes opinion through elections and other instruments for ensuring popular expression, its delegitimization would most likely occur (if it were to occur) through the use of these instruments. There are numerous historical examples where democracy was overthrown through democratic means.

Thus, any hope of saving democracy in the face of technological breakthroughs must comprise the continued endorsement of democracy by people's opinion. Nonetheless, today, for all kinds of reasons, people from around the world are becoming increasingly disenchanted with democracy. This in itself is a recipe for the erosion of democratic legitimacy. However, this tendency could accelerate to the point of delegitimizing democracy if people are presented with a viable and attractive alternative based on technological rule. And, as I hope to show in the next section, once humanity passes beyond a certain threshold, there will arise an unprecedented situation in which people's opinion will cease to have relevance in politics. In fact, politics itself might cease to exist.

40） Ken Tsutsumibayashi and Megumi Tsutsumibayashi, *"Opinion" no seijishisoshi: Kokka wo toinaosu*, Iwanami Publishers, 2021 (in Japanese, but an English translation with the title *Past and Future of "the State that Never Dies": A History of State Theory through the Lens of Opinion* under preparation).

4–3 The Challenges Ahead for Democratic Legitimacy and Opinion

What would or could tempt people to forsake democracy in favor of technological rule? What is required in order to save democracy in the face of technological breakthroughs?

As for the second question, we already know that continued endorsement of democracy by people's opinion is a prerequisite. But how is this possible? What are the incentives, or rather disincentives, for doing so? To answer these questions, let us begin by acknowledging some of the reasons offered in defense of democracy.

It would seem naïve to think that democracy has come to prevail because it is true or just in some metaphysical or providential sense. There is little reason to believe that the history of humankind is one of teleological development or providential design. Then, why is democracy (as a language and theory of legitimacy) so prevalent in today's world? On the one hand, one could argue that it is simply a product of historical contingency, that nothing was inevitable. Conversely, every historical event has a cause, and it would be hard to deny the existence of path-dependent constraints. So, to understand why and how democracy has come to attain its present status, a thorough historical analysis would be required[41].

Here however, I shall focus not on how democracy came to prominence but on how it is being defended. My following account is hardly exhaustive but it is possible, it seems to me, to group various arguments into three types.

(1) Democracy as capable of delivering desirable outcomes
(2) Democracy as a form of just procedure
(3) Democracy as an intrinsic value

For each type, there are variations. Proponents of (1) may argue that democracy ensures good or correct decisions in achieving the common good. Or

41) E.g., John Dunn, *Setting the People Free: The Story of Democracy*, 2nd ed., Princeton University Press, 2018.

more modestly, that democracy is better than other systems in delivering desirable outcomes. It may also be claimed that democracy is better suited to garnering talents, preventing corruption, and maintaining peace, thereby making the system more resilient to crisis[42].

As for (2) and (3), they provide not so much rational justification of democracy's superiority but rather how it would play out in various significant ways if it was to be admitted.

Now, all these arguments are in one way or another contested, and there is constant disagreement among various defenders of democracy (not to mention criticism from those who deny democracy per se). This is also true in the related discourses where there are disagreements over the guiding principle for collective decision-making: whether to opt for utilitarianism or deontology (i.e., duty ethics).

Notwithstanding these differences, however, there is at least for now a broad consensus (i.e., opinion) among these various proponents that democracy (of the liberal kind) is best suited to the human conditions of the presently existing world. Afterall, without this democratic space that ensures academic freedom, it would not even be possible to have these disagreements. Moreover, even at the practical level of politics (at least in liberal democracies), there is still a widely shared opinion that democracy is the best (or the least bad) system for achieving the common good, or at least one that allows people of differing views, beliefs, status, and backgrounds to coexist peacefully with some degree of freedom and dignity.

This opinion, it is worth repeating, is what sustains the present form of democracy. Furthermore, in the final analysis, what matters is not whether it is possible to come up with a rational justification of democracy, but whether it is possible to maintain wide and continued support for it.

However, once technological breakthroughs occur, this may change.

42） David Runciman, for example, states the following in his book *The Confidence Trap* (Princeton University Press, 2013): "it is this capacity to stumble through crises that gives democracy the edge over its autocratic rivals. Democracies are better at surviving crises than any alternative system because they can adapt. They keep groping for a solution, even as they keep making mistakes" (pp. xvi–xvii).

Opinion could shift towards supporting a new theory of legitimacy based on technological rule. In fact, the more likely scenario might be for opinion to become deeply divided between supporters of democracy and those of the new order. In any case, democracy would face a legitimacy crisis, and given that opinion will ultimately decide its fate, it becomes important to focus on this transitional phase.

What aspects of technological rule might people find alluring? This would no doubt vary between individuals, but it is not hard to imagine that many will find the promise of happiness, health, and longevity (if not immortality) attractive.

As for the pursuit of happiness, one might see an affinity with utilitarian thought, but it is fundamentally different in that it is not about "the greatest happiness of the greatest number." Rather, technology (if successful) would make each and every person happy, while eradicating all kinds of pain and suffering. Thus, unlike utilitarianism, it no longer relates to policy-making, and what is more, there is no possibility of a minority losing out.

Happiness or pleasure, of course, is not a uniform idea or emotion, and as with J.S. Mill, one might wish to distinguish between high and low pleasures. One may also believe that suffering is essential to making happiness meaningful. Despite this, once it becomes technologically possible to experience unmitigated pleasure without pain or suffering, it is questionable whether the majority of people would still opt for a life in which happiness (however singular or intense) could only be attained sporadically or after a long journey of torment.

The same may also apply to health and longevity. While immortality may not seem appealing to many alive today, there may be appetite for technology that would vastly extend the period of healthy life, say, by a couple of hundred years. Moreover, it would not be hard to imagine that there might be those who would welcome technology's enhancing of intelligence as well as physical capabilities—transforming them into homo deus.

Whether this appears as a utopia or dystopia will differ among individuals, but what makes prediction or moral judgement difficult is that our own views tend to change in accordance with changing times and circumstances. What may seem far-fetched or morally repugnant today may become normal and just in

the future. This may be the case, especially for those who will be born into the world after the technological breakthroughs. To them, everything will seem normal, not knowing what it was like before the transformation. And yet, even for those who experience the transformation, it may transpire that the future self thinks that the past self was primitive and immoral, just as we might today think that slavery, gender discrimination, and homophobia are detestable sentiments which we are glad to have left behind.

It is difficult to freeze time and to ensure that future generations will abide by the rules and norms created in the past. This is a familiar problem among political theorists, and it becomes an issue when, for instance, one tries to defend constitutionalism. What good reason is there for the present will of the people to be constrained by past agreements? What justification is there for the living to be ruled by the dead? Precommitment theory is sometimes invoked to solve this dilemma, but the issue remains controversial[43)].

What is more, this kind of temporal dilemma becomes all the more acute in a democracy where the people is sovereign. As Jean–Jacques Rousseau stated in the *Social Contract*:

> The sovereign may indeed say: "I want now what a certain man wants, or at least what he says that he wants"; but he cannot say: "What that man wants tomorrow, I shall also want," since it is absurd that the will should take on chains as regards the future, and since it is not incumbent on any will to consent to anything contrary to the welfare of the being that wills. If, then, the people simply promises to obey, it dissolves itself by that act and loses its character as a people; the moment there is a master, there is no longer a sovereign, and forthwith the body politic is destroyed.[44)]

Democracy has the inherent tendency to privilege the present, but the

43） E.g., Jon Elster, *Ulysses Unbound: Studies in Rationality, Precommitment, and Constraints*, Cambridge University Press, 2000; Stephen Holmes, "Precommitment and the Paradox of Democracy," in *Constitutionalism and Democracy*, eds. Jon Elster and Rune Slagstad, Cambridge University Press, 1988.

situation could be further complicated if there appear people who do not die, or whose life expectancy is vastly extended. In this case, it becomes a question of self-restraint, that is, voluntarily adhering to one's own decisions. This would certainly be a challenge in the absence of objective and immutable criteria such as natural law or sacred canopy[45].

Finally, technological progress may bring about an era in which, for the first time in human history, opinion ceases to be relevant in politics. As acknowledged earlier, force resides with the people because people provide the means and goods necessary for the functioning and survival of a society. So long as this remains the case, people's opinion will matter. But what if machines, robots, and avatars replace humans in their hitherto activities? While this might liberate people from labor, their opinion will most likely lose its potency. And if, as Harari points out, this leads to a situation in which humankind is divided between "a mass of useless humans and a small elite of upgraded superhumans,"[46] why should the latter bother with politics or care about the plight of the former whose opinion no longer has any clout?

5 What Remains?

From what we have seen thus far, the future does not bode well for democracy. As I hope to have shown however, much will depend on how we maintain opinion in its support. And equally, opinion will matter in deciding the fate of

---

44) Jean-Jacques Rousseau, *The Social Contract and The First and Second Discourses*, ed. Susan Dunn, Yale University Press, 2002, p. 170. Rousseau makes a similar point at several occasions. For example, he states that: "a nation is always at liberty to change its laws, even the best; for if it likes to injure itself, who has a right to prevent it from doing so?" (Ibid., p. 191); "I presuppose here what I believe that I have proved, that there is in the State no fundamental law which cannot be revoked, not even the social compact; for if all the citizens assembled to break this compact by a solemn agreement, no one can doubt that it would be quite legitimately broken" (Ibid., p. 226). See also Ibid., 165.

45) Peter L. Berger, *The Sacred Canopy: Elements of a Sociological Theory of Religion*, Anchor, 1990.

46) *Homo Deus*, p. 408. Harari also states that "technological developments will make humans economically and militarily useless" (pp. 357–358). See also Ibid., pp. 382, 403, 407.

humanity. Whether to opt for a posthuman society in which humans evolve into a homo deus-like existence, or to remain humans with recognizably human qualities, is a matter of choice, at least in the phase leading up to or immediately after the technological breakthroughs outlined above.

In any case, it would seem worthwhile to think about where we would like the technology to take us (or not take us) while opinion still has force and influence. This calls for a wide and extensive discussions involving all kinds of actors. And needless to say, this should include scientists and entrepreneurs working on the technologies in question. The opinion of the scientific community no doubt matters.

In this respect, it is consoling to learn that the three scientists mentioned in this article are all committed to ELSI and care deeply about humanity. Ushiba's following remark is indicative of this point.

> Personally, I see BMI as a means to identifying the non-mechanical traits characteristic of humans such as the richness of the mind and kindness of heart. IoB is characterized in some sense by an extreme view of things. The research heads towards deciphering the brain in a mechanistic way, with a view to replacing with machines whichever part that can be replaced, and to extending its function by connecting the brain with machines. But despite this effort, I am inclined to think that something will always remain undecipherable, something very non-mechanical and human. I would like to hold on to the view that there is only so much you can do to understand the brain in mechanistic terms, that in the end we realize how much we do not understand about the brain or humans. I feel I am doing this research, wanting to find out the core elements of what makes humans human. I am attracted to human qualities, those precious and endearing attributes, and I find the IoB research interesting since it ironically involves a search for things that are human.[47)]

However, it is important to be reminded that BMI is, as Ushiba himself

47） *Hougaku Seminar*, 807(2022), p. 70.

admits, a technology that has the potential to "reveal the subconscious mind and control it"[48]. This could mean that whatever the qualities that make humans human may not be as immutable or undecipherable as one assumes. In which case, even human nature may not remain unchanged or unchangeable, making it a subject of choice (if not manipulation).

For the longest time in human history, human nature has been thought of as something given. And indeed, many have tried to construe ideas and theories about society and sociability (as well as their opposites) based on this seemingly immutable premise. Of course, there are in fact numerous interpretations of human nature, and what seems natural may turn out to be a product of culture and history. Even so, mind-reading or mind-controlling technology could lead to consequences of a completely different order, transforming humans into something no longer recognizably human.

And yet, if to remain human or not is a question of choice, then it seems worthwhile to reflect on the history of humanity and think collectively about what we may wish to preserve[49]. Today, despite all the differences in cultural, linguistic, and temporal context, many of us are still able to appreciate art, literature, music, and artefacts from different regions of the world (however anachronistic it may seem from the viewpoint of those who created them). Of course, it may be argued that a lot of what we cherish today are products of mortal beings whose experience of suffering as well as joy lies at their heart. And for those who attain immortality, the idea or sentiment of dying for or losing loved ones, for example, may become simply incomprehensible.

It would be pointless to predict what people might think or feel in a distant future replete with vastly advanced technologies. But for now, we are the ones occupying the world and what we think and decide to do will influence the shape of what is to come.

---

48) *Hougaku Seminar*, 807(2022), p. 60.

49) The emerging field of comparative political theory or thought can, I believe, contribute to this endeavor. E.g., Melissa S. Williams (ed.), *Deparochializing Political Theory*, Cambridge University Press, 2020; Leigh K. Jenco et al. (eds.), *The Oxford Handbook of Comparative Political Theory*, Oxford University Press, 2019