

Technology in Muslim Moral Philosophy

Ebrahim Moosa¹ 

© Springer Science+Business Media New York 2016

Abstract The article explores the place, role and status of technology in Muslim moral philosophy. Invoking early Muslim encounters with technology the author makes the case why technology is already deeply embedded in contemporary Muslim bioethical thinking. Due to an absence of the philosophical grounding there remains some ambivalence as to why technology is essential to Muslim ethical thinking. Countering the techno-pessimists, the author makes a case in favor of compositional thinking, namely that our thinking itself is altered by our tools and our environment. Compositional thinking opposes the representational mode of thinking that creates a dichotomy between nature versus culture, and technology versus nature. One should, however, anticipate an environment in which technology would be beneficial and not be viewed as potentially harmful.

Keywords Bioethics · Islam · Muslim ethics · Technology and Islam · Islamic philosophy of science · Modern Islam

In the thirteenth century the mechanical engineer Ismā'īl b. al-Razzāz al-Jazarī, who flourished in the latter part of the twelfth century in the region historically known as al-Jazīra, a land area spanning today's Syria, Iraq and Anatolia in Turkey, designed and built water clocks, drinking vessels, water fountains and mechanical flutes (al-Jazarī 1409/1989 (first published 1974); Hill 2015; al-Jazarī and Hill (trans. and annot.) 1409/1989). Scholars like al-Jazarī, and before him the three brothers known as the Banū Mūsā, the sons of Mūsā bin Shākir who earlier flourished under the patronage of the Caliph al-Ma'mūn in the ninth century, all made significant contributions to Muslim technological practices and innovation (al-Jazarī 1409/1989 (first published 1974); al-Jazarī and Hill (trans. and annot.) 1409/1989, p. 9; King 1975).¹ While our knowledge of the history of Muslim technology is still at its infancy, from the materials available it appears that

¹ The names of the three brothers were: Abū Ja'far Muḥammad, Abū al-Qāsim Aḥmad and al-Ḥasan.

✉ Ebrahim Moosa
emoosa@gmail.com

¹ 100 Hesburgh International Center, University of Notre Dame, Notre Dame, IN 46556, USA

craftsmen who developed technology grasped both the metaphysical dimension and the empirical dimension of their craft. They could, for instance, imagine technological crafts as the Divine revealing the “secrets of His wisdom to the earths” as a sign of divine dominion and sovereignty. And yet they could also simultaneously adhere to the protocols of empirical observation, testing and experimentation. Jazarī proudly claims awareness of certain developments which in his words were: “types of [machines] of great importance came to my notice, offering possibilities for types of marvelous control (al-Jazarī 1409/1989 (first published 1974), p. 15).” “Technological and cultural methodologies,” writes the historian Lucie Bolens, “were informed by the need for renovation while remaining empirical (Selin 1997, pp. 46, 44–47).”²

The confluence of the metaphysical and the empirical was not only naturalized in Muslim thought but it also had its roots in Muslim political theology, namely the nexus of the divine, the human and the world.

Early writers like the philosopher Abū Naṣr al-Fārābī (d.950) described this divine–human nexus in the world as political philosophy (Mahdi 2001). Muslim philosophers, theologians and moral philosophers over time understood that one of the major purposes and functions of prophecy was to not solely announce the divine proclamation, but they also felt the need to create conditions for human material flourishing aided by a divinely inspired moral order. It would not be incorrect to describe this kind of order as an order adhering to a political theology.

At least the early modern Indian Muslim thinker Shāh Walī Allāh (d.1762) sees the role of a prophet as someone who is a leader and legislator. In an innovative move, this sage from Delhi engenders the theological grounds for humans to pursue specific activities to improve the world in which they lived, by outlining topics we would today discuss in disciplines such as political economy.³ What Walī Allāh had in mind was more than the mere material realization of the good life. Most revealing was his use of an Arabic neologism, *irtifāqāt*, literally meaning, to rely on that which is beneficial in order to bring about improvement. What Walī Allāh intends with his concept of useful things for the improvement of human life, resembles what Norbert Elias defined as civilization. Civilization refers to a wide variety of facts: from the level of technology, the types of manners, the development of scientific knowledge, religious ideas and customs that shape one’s view of the world (Elias 1994, p. 5). Of course, Walī Allāh was acutely alert to the self-awareness of Muslims about their role in the world and their service to divine stewardship. Civilization and the comforts it provides are integral to a developed notion of stewardship: It ranges from the technologies of governance to the use of tools and physical technologies.

For social technologies such as governance Walī Allāh requires people to foster an outlook that is inclusive, and he vigorously advocates the cultivation of an esthetic sensibility, as well as the ability to nurture the value of intellect and reason. What unifies people, he reasoned, was a common language, their multiple and interdependent ways in which they earned their livelihood by making use of common conventions. In addition, they had to competently manage the domestic sphere, efficiently govern the polity and ensure only that the highest conduct is performed on the part of the rulers (al-Dihlawī

² Lucie Bollens, “Agriculture in the Islamic World.”

³ Walīyullāh uses the term *irtifāqāt*, which literally means “to take support” and “to rely on.” Technically *irtifaqat* means that which is beneficial and makes things easy, literally gentle and generous (*rifq*). Translators like Hermansen translate *irtifāqāt* as “supports of civilization” which is descriptive, see al-Dihlawī (2003, p. 115). However, the equivalent of *irtifāqāt* in political thought is “political economy.”

2003, pp. 115–144). Yet there is an indispensable link between habits of thought and practice and technology.

Human flourishing is fulfilled by technologies (*ṣinā'āt*) in Walī Allāh's view, which is also at the heart of governance. Humans need to dig wells, cultivate the land, and maintain hygiene as well as build roads for travel and transport, or erect dams for irrigation purposes. The latter was quite a sophisticated technology in Muslim lands as was chemical technology (Hill 1997).

Technology, Walī Allāh explains, imitates nature. The industriousness of the bee serves as a key analogue for him. The queen bee systematically puts together an organization, employing a vast number of bees in order to manufacture honey and other products. An organization is a model *for* technology, in his view. Put differently, technology is a regime of ordering things in a specific manner. Technology here means “knowledge and instruments that humans use to accomplish the purposes of life (Friedel 2007, p. 1).” The creation of technologies and the technological order throughout the world sustains the “culture of improvement” is Robert Friedel's core analysis (Friedel 2007, p. 2). A more philosophical definition of technology points to the “activity by which people give form to nature for human ends, with the aid of tools (Schuurman 1980, p. 5).” Walī Allāh, I suspect, would have had little difficulty in appreciating that a culture of improvement means “the ascendancy of values and beliefs permeating all levels of society that things could be done better (Friedel 2007, p. 2).” But whether Walī Allāh would agree with the alteration of nature in the way modern technology enables us to manipulate it for now remains moot. More cautious contemporary specialists of technology are conflicted about the merits and demerits of modern technology and these are themes to be discussed below.

Designs and the creation of artifacts, we have to bear in mind, are often in the service of political economy. Hence, institutionalizing governance such as the provision of social services like water and energy needs, to enabling social engineering by installing infrastructure that would advance the economic welfare of society, are all intimately related to political economy, and in our day these relate to the question of the economy. This would include the need to establish rules of social regulation in order to make the establishment of a good society possible. Walī Allāh, as well as the English political philosopher John Locke, who died the year before the Indian scholar was born, shared a common aspiration in founding a general political authority. Neither deemed it worthy to leave people ungoverned, or as Locke would put it, to leave them in a state of nature. Walī Allāh defined the necessity for political order in India, clearly inspired by Muslim intellectuals from al-Fārābī and Ibn Sīnā to al-Māwardī as well as the pragmatic realities of the tottering Mughal Empire. Humans, Walī Allāh insisted, needed to refine their character and adopt self-restraint in order to produce an ordered civilization, one that was sustained by a robust political order. If humans were indeed created in a world fashioned by God, then they would surely also live for God's purposes. In pursuit of such ends it was part of human responsibility to establish a civil government (*siyāsat al-mudun*), an infrastructure, which enabled many systems and practices so that the human condition was enhanced in the final analysis. Technology was certainly one of them. Yet, much of the history of technology in Muslim societies of the past remained unrecorded for obvious reasons. Technique in bygone eras was “less a matter of words and recipes than of skill and feeling,” and actually the product of “tacit knowledge (Friedel 2007, p. 6).” But in the modern era technology is amply documented and responses and reactions to technology are well recorded.

Technology and the Ethical

Islam's dilemma with technology is similar to that of many other faith traditions: Inherited ethical sensibilities and teachings are challenged by the emergence of modern technology. Often the ethical templates of ancient religions were mapped to technologies that were closely bound to nature with primitive forms of energy and basic tools. If technology as technique has been around for centuries, then it was part of culture, like handicraft technologies were viewed as part of the natural order (Schuurman 1980, 2005, p. 5). Hence, technology in the past was self-evident and unproblematic: It was interested in the here and now and was highly dependent upon the demands of practical life (Schuurman 1980, p. 7).

Modern technology is very different from its premodern antecedents: It is highly automated, based on design and abstract imagination, while technological instruments are increasingly independent of human control and volition. But there is also another difference that complicates the story of technology. Technology and science comes to different parts of the global south as part of the colonial difference. Multiple cultures and societies of the global south are conflicted over the colonial difference inherent in technology and one that has yet to be resolved (Mignolo 2002). Thus technology is webbed into the cultural narrative of modernity since technology is not culture neutral. Technology has altered our inherited imaginaries of the ethical where ideas and facts were once concretely embraced. Beginning with changes in our conceptions of geometry, technology is located somewhere between mechanics and biology. This alters our inherited understanding and mental images of science within a framework of technology. Against this backdrop it is important to bear in mind that technology impacts our understanding of what constitutes a notion of personhood, consciousness and value.

Muslim reflections on technology and related issues such as science, medicine and biotechnology are marked by vast discrepancies. These discrepancies occur first at the level of the representations of reality (epistemology), and as a consequence this diversity also impacts the nature of ethical deliberations. Due to the cultural and political diversity of Muslim societies around the globe, reaching meaningful consensus is difficult. Given major transitions that Muslim ethical practices experience under pressures of rapid modernization and globalization, civil wars and in places experiments with democracy and in other places one has failed states, making general statements is a risky business.

Ethicist Cole–Turner some time ago asked whether technology, especially biotechnology, could square with notions of justice in Christian theology. One could pose this same question to Muslim theologians in a slightly modified manner and ask: What is the relationship of technology to ethics? How does a Muslim practice ethics in an age of technology? Of course, this question immediately triggers issues related to economics, politics, culture, society, and questions related to the environment in which technology is embedded. Needless to say, institutional politics do indeed connect and shape the life—worlds inhabited by a differentiated humanity. So clearly politics does indeed affect the most sensitive and deepest recesses of our beings. For a religious humanity confronting a range of challenging and practical bioethical questions within larger structures of governance—from globalization to liberal capitalism—debates about technology often sponsor a set of larger concerns.

Such concerns are mediated by what one could best call, political theology: How Muslims mediate and relate to the human–divine nexus. Humanity has always been challenged in how to deal with the larger forces beyond its control. How does God act in the world; how does divine power and influence intervene and at what point does human

responsibility and ownership begin? At more critical moments in the lives of human beings, in almost all traditions, believers struggle with questions as to how does divine justice (theodicy) work in the world, if at all. Or are humans always at the will of an omnipotent and omniscient Creator whose will we can only faintly descry, but never fully grasp? These questions become especially relevant when the vehicle of human life and vitality the body is afflicted with disease, illness and disrepair.

Theology and Global Technology

Philosophers and ethicists are divided over our relationship to technology. Positivists approve of the role of technology while transcendentalists are suspicious of its power to dominate humans. Configuring the divine–human nexus in an age of science and hyper techno-science, in the view of some techno-pessimists or transcendentalists, brings with it a certain conceit: a hubris that humans had finally conquered nature. Probing the outer limits of our vast cosmos together with finding the arrow of time in evolutionary biology within two centuries can to some appear as an instance of human vanity, but it need not be so dire. So when the next generation of cutting-edge physics and biology comes on-stream in the form of nanotechnology, genetic reproduction, human embryonic stem-cell research, enhancement, and germline therapies, our humanity is saddled with both the hubris of a post-human age coupled with a surge in anxiety and trepidation about our capacity to self-implode. It is at this stage that we are confronted with major questions about the viability of our collective future. This concern about the autonomy of scientific technology has been around for some time. But the anxiety has been heightened with the advent artificial intelligence and advanced biotechnologies, especially when some scientists weigh in with alarm (Joy 2000). Technology poses a threat to human freedom, in a view held by transcendentalists, who fear the autonomous power of technology.

While newer installments of techno-science raise new questions for ethics and challenge the philosophical frontiers of thinking about human beings, as we know the species, yet many other people view technology with favor. Our reality which is accelerated by technology, especially biotechnology, is one where our bodies and our technologies act upon each other in unprecedented ways. In some ways our ontologies, our way of being or existence in the world, are altered by technology: Technology gathers the potential of existence and discloses itself to world (Heidegger 1977).⁴ Through the use of technology, existence itself is being ordered or re-ordered. While this might be a challenge for transcendentalists, another school of thought, the positivists would welcome such change. Today many people of faith and devout individuals use a variety of techniques of self-fashioning. They listen to audio cassette recordings, follow online advice via computers, watch YouTube, enroll in online classes and use handheld gadgets in order to better themselves as individuals and communities of faith (Hirschkind 2006; Keane 2014).

Let's look at how we are wired to our biotechnical reality consisting of our dependence on food, health, and animal life to the need to find alternate sources of energy. Our existence is in one way or another always-already impacted; and, these various biotechnologies shape who we are as human beings just as we shape our surrounding reality as a result of the choices we make. With the advance of a new generation of biotechnologies

⁴ Heidegger uses the neologism *Ge-stell* translated as *Enframing* to indicate “that challenging claim which gathers man thither to order the self-revealing as standing reserve”, p. 19.

some of the earlier bioethical qualms surrounding organ transplantation and brain death suddenly sound remote, if not passé, though not entirely.

If we stay with biotechnological examples we might be able to illustrate several issues. On the face of it biotechnology tends to have a semblance of being global. But it is possibly the best candidate for the term “glocal,” an awkward neologism that connects the global to the local or the local to the global. What might appear to be global vestiges are actually connections forged between numerous global elites and consumers of biotechnology around the world. Concurrently there are also entire, if not larger global networks of people who are deprived of the fruits of biotechnology.

Economically deprived and less visible communities in both developed and developing countries might only receive the dregs of such global dispersal of expensive and intensive biotechnological therapies or public resources. For some of the poor in the world, the low fruits are what they enjoy of biotechnology such as immunization, HIV/AIDS tests, and if they are extremely lucky, they could be recipients of basic health care. That might be the sum total of the benefits of biotechnology the largest segment of human beings in the world currently enjoy.

At the same time for the affluent of the world, biotechnology can bring the benefits of organ transplantation with the help of super-advanced surgeries and they can acquire access to anti-retroviral drugs that can restore a viable life to AIDS sufferers and offer advance reproductive and fertility treatments to those who desperately want offspring. The key moral question is the following: Can biotechnology be democratized and made accessible to the most deprived? Would this not be one of the moral determinants about the viability and future of this technology? Is biotechnology on the same democratic trajectory, as say, computer and cyber technology is? If so, such considerations could be a game changer.

For most devout Muslims and Muslim majority societies questions of biotechnology intersect with at least three large sets of issues. The first are socioeconomic and political realities. These socioeconomic and political realities are immensely diverse across different Muslim contexts: They either facilitate or impede access to advanced science or otherwise distort access along lines of privilege and class. The second are bio-cultural and psycho-social questions. By this I mean the way science and technology produced in the West are translated and received within the social imaginaries of individual Muslims and collectivities, and how biotechnology ultimately becomes enacted in their lived reality. The third cluster of issues relate to Muslim moral philosophies and theologies that are by their very nature, very complex examples of work in progress. Due to multiple reasons not easily distilled here, there remain within Muslim cultural settings, an urgent but unattended debate about a cluster of burning epistemological questions: Whether representations of reality are both legitimate, theologically and culturally speaking and accurate, scientifically speaking. Due to a whole host of reasons resulting from colonization, post-colonial blues and globalization, the important questions such as epistemic dislocations, fractures and contestations over knowledge within many Muslim societies both exacerbate and impact debates related to Muslim ethics (Rees 2010).

Technology and Bioethics in the Mirror of Tradition

The audiences who engage in these debates are vast and diverse: These include theologians belonging to a spectrum of traditionalist or orthodox interpretations and scientists who adhere to a broad spectrum of philosophical understandings of science and technology.

Often, reality is marked by the in-between positions, navigating these two extreme boundaries, since reality is never neatly sliced. Technology surely poses major challenges for Muslims living in Europe, North America and those prosperous parts of the Muslim world such as the oil rich Gulf region where medical infrastructure resembles those used in developed societies.

Yet, for Muslims living in rural Mali or in the slums of Jakarta in Indonesia, technology, and especially biotechnology might bring golden rice and as a result end infectious pestilences. But at the same time artificial fertilizers and genetically modified seeds bring new hazards in agriculture and threaten food integrity compared to a time when farmers used natural compost and when people consumed food grown from unmodified agricultural seeds.

Debates about the next generation of biotechnological issues under the impact of heightened Darwinian impulses are a reality in many Muslim contexts from Gainesville in Florida to Ghaziabad in India. Technology, especially biomedical technology, has made a range of interventions possible. The possibilities now range from molecular genetics, stem cells and regenerative medical technologies. All these arrive at a time when Muslim ethicists have barely come to grips with an earlier generation of biotechnology: transplantation surgery, brain death and artificial enhancements.

Let's examine practices of transplantation surgery in places like Egypt and Pakistan in order to review the fascinating responses. In Egypt, momentous and highly publicized as well as mediatized disagreement on transplantation surgery has created high levels of confusion among healthcare practitioners and sections of the religious establishment about the permissibility of such procedures in terms of Islamic law (Hamdy 2006, pp. 277–278). Ironically, some former transplantation surgeons have publicly renounced their involvement in transplantation surgery, explaining that the body is sacred and that their surgical procedures involved mutilation and an affront to the integrity of the body (Hamdy 2006, p. 282). Given disagreement among religious authorities as to whether brain death constitutes an acceptable definition of death in terms of Muslim ethics and law, the topmost former jurisconsult (mufti) of Egypt, Shaykh 'Ali Jumu'a had declared *live transplantation* to be impermissible. Relying on the expert opinion of the physicians, Jumu'a argued that his opposition was premised on the disagreement among medical experts and physicians themselves as to whether brain death qualifies as an indicator of death. If the medical experts gained greater consensus on brain death, Jumu'a hinted, he might revise his theological and ethical position on the subject.

Ironically, these debates that surfaced in the late 1990s were preceded decades earlier by official rulings by Egyptian religious authorities about the permissibility of organ transplantation procedures (Moosa 1999). With an active professional community engaged with transplantation practices, bioethical issues do not only become complicated and ambiguous, but they are also connected to lived reality. Nevertheless, in Egypt and Pakistan, for instance, cornea transplantation is popularly accepted from cadaver donors. One reason why there is less resistance to cornea transplantation compared to say, a kidney or a heart, is perhaps due the difference in the materiality of the transplantation. However, the principled objection to cornea transplantation should in theory be valid too.

In Pakistan the gulf between healthcare professionals and the religious authorities on crucial bioethical issues has remained as distant as ever (Moazam 2006, pp. 6, 7). According to ethnographic studies, families and patients do demonstrate a sense of altruism in donating organs. However, there is little evidence that religious authorities are consulted in many of the bioethical deliberations taken by medical professionals.

In 2010 Pakistan passed a law regulating transplantation and human tissue donation even though the practice has been in vogue for some time. In the meanwhile, religious authorities have yet to validate or proscribe transplantation surgery in terms of Islamic ethics. The partition between stakeholders to transplantation surgery such as physicians and the religious authorities in Pakistan is so polarized that conversation between those sectors is limited (Moazam 2006, p. 7). In the absence of a national ethics forum, it appears from the outside that the incommensurability in worldviews held by the various stakeholders might be the reason for the deadlock, although this might in itself not truly reflect the full and complex reality of Pakistani society. Transplantation does continue at a growing rate in Pakistan. But as Hamdy has pointed out in the Egyptian context, advanced technology-intensive health care is only available to some.

The ethical complexity has a political and an economic dimension. Surely, people in Muslim majority societies and in minority contexts, all of them do encounter a new generation of biotechnology in one form or the other. Enthusiasm for the novel clearly is a factor. Often debates about technological transfer occur without adequate discussion about the cultural adaptation and moral domestication of such practices. Another factor is that governance of both politics and medical politics inhibits contestation and debates about the merits and demerits of technologies. Some of these tensions arise from what might on the surface appear to be irreconcilable differences.

If a whole new generation of biotechnological innovations forms part of a Darwinian template of evolutionary science, then such discussions would certainly raise the theological red flag for some Muslims and will give them pause. In many Muslim societies Darwinism has had an uneven reception and was also subject to mistranslation, suspicion and has mostly been met by rejection (Elshakry 2003). While many Muslim thinkers and professionals might resist the *philosophy* of Darwinism, they paradoxically give very little attention to the glaring contradiction of Muslims profiting from research and technology derived from evolutionary modes of thinking. And many designs found in advanced technologies are the harvest of a Darwinian template!

Darwinism was viewed to be part of a naturalistic philosophy that made nature autonomous and independent of divine intentions, with an open-ended if not undetermined telos. But more significantly, naturalism challenged inherited Muslim theological precepts that were part of a speculative philosophical tradition. Many precepts and concepts, especially about nature, gender, sexuality and race, were treated as essences in the speculative tradition. Now these concepts were being challenged, and for all practical purposes, were supplanted by the rationality of empirical science. For some Muslim thinkers this open-ended idea of nature threatened their telos-driven theological doctrines, centered on two crucial aspects: firstly, a purposive notion of nature and, secondly, a belief in a fixed and permanent human nature. Both aspects were once viewed as the ontological pyramid or the pyramid of being that gave coherence to a body of knowledge that supported certain theological beliefs. Among such beliefs, were the twin ideas of divine creation and the finitude of the material world.

Technology Highlights the Epistemological Crisis in Muslim Ethics

When one explores Muslim ethical teachings and deliberations involving biotechnology then the anxiety of dealing with an emerging techno-science is palpable. Few Muslim thinkers and institutions have recognized how much the epistemological grounds of

understanding the world from a believers' traditional perspective have shifted. One diagnosis leads to the acknowledgment of how much premodern theologies require recasting and updating. While this desideratum is frequently upheld as a pious hope, it is perhaps often done in a piece-meal and ad hoc fashion. Muslim discourse on the bioethics of science is often steeped in an ethical pragmatism about the permissibility, impermissibility and the beneficence or malfeasance attached to the discoveries of techno-science. Unwittingly traditional authorities using hermeneutical methods of interpretation are endorsing forms of technological rationality. What is lacking and remains elusive is a critical and informed discourse as to the philosophical content underpinning a contemporary Muslim moral and ethical vision in a prospective manner, especially one in conversation with technology.

Anxiety-ridden sentiments mixed with theological undertones often strongly surface in encounters with biotechnological practices. Anxieties specifically peak in discussions over genetics where incredible as well as intimidating feats of techno-science potentially lie in store. Let's for the sake of convenience use the rubric "genetics" to cover a host of issues related to the transfer, use, manipulation and experimentation of genetic materials. Many Muslim authorities often cite a text of the Qur'an as proof and evidence denoting the prohibition of genetic therapies. The verse in question goes back to a conversation between God and Satan before the latter's expulsion from Eden for refusing to honor Adam (Fadel 2001). Satan in this account vows to avenge his expulsion from Eden on the children of Adam, striving henceforth to "disfigure the creation of God." Generations of Muslim exegetes understood this fragment to mean Satan's threat to sponsor the moral corruption of Adam's offspring and to disfigure their moral selves. However, in a post-Darwinian era techno-science meets crass Muslim scripturalism in order to give that very same verse a completely new application and meaning. Now it means Satan enabling humans to molest the genetic composition of their bodies! What better illustration of grotesque disfigurement of the body than messing with genes. In the view of many Muslim ethicists of a traditionalist and revivalist orientation, this Qur'anic verse serves as a cautionary tale of the physical disfigurement of creation that awaits a humanity that experiments with evil and profane science. This perspective engenders sympathy with the transcendentalist view on technology fearing the autonomy of science and technology as harmful to human freedom.

Two principle objections are frequently made against genetic engineering. One objection conveys the anxiety as to how this brand of techno-science could open the door to asexual reproduction (Ahmad 2003). The second objection defines the essence of genetic engineering as a violation of human dignity and one that scoffs at the sanctity of life. More generally, many Muslim religious authorities view genetic engineering procedures as a frontal assault on the structure of the Muslim family. They fear genetic engineering will undermine the notion of paternity as a central artifice of many aspects of Islamic law. Paternity in terms of Islamic law, for instance, is only established within a heterosexual marriage. Hence, asexual reproduction threatens the biological architecture that informs classical Islamic law. Intergenerational inheritance of property occurs along the lines of kinship associations in Islam, and therefore, the hype of biotechnology surrounding genetic engineering threatens that specific narrative of kinship relations the way we know it. Genetically engineered offspring, it is feared, will find themselves in a legal and ethical no man's land in terms of existing Islamic criteria and challenges the entire system. One concern most religious experts voice is that asexual reproduction will promote discrimination between different *kinds* of offspring: children with naturally reproduced genetic makeup who will be subject to one set of rules versus children bearing artificially

engineered genetic makeup who will be subject to a different set of norms. In short, what they dread is discrimination coupled with normative anarchy.

Experts on technology like Schuurman will hasten to support Muslim ethicists and laud them for resisting the role of technology in Muslim philosophical and theological ethics (Schuurman 2008). Schuurman embraces the autonomous human person and resists perspectives that enable the unlimited adventure of technology. Like Schuurman, many Muslim ethicists say “no” to some practices. They tenaciously hold on to the integrity and sanctity of life and conceptions of certain values that derive from a social imaginary formed by a premodern technological universe. They deem such values to be more important than the magic of technology. In other words, human beings want to be in control of technology and not face a scenario where technology owns us.

Much of the negative reaction to genetic engineering on the part of many Muslim traditional jurists and ethicists pointed to the cloning of the sheep named “Dolly.” This event was viewed as an index of the malevolent trajectory of techno-science (Sachedina 2009). Human cloning, most authorities feared, would be the ultimate perversion of reproduction the way we knew it and as a result of the Dolly experiment anxieties among Muslim religious authorities spiked fearing its sinister consequences. While a very few scholars were unconditionally open to the possibility of therapeutic uses of genetic engineering, the majority of views canvassed and reviewed by Abdulaziz Sachedina expressed caution with deep suspicion about the purposes of techno-science (Sachedina 2009, pp. 205–210). Other scholars in south Asia, especially in Pakistan, dismissed the merits of therapeutic uses of genetic engineering from the outset (Madani 2003, 2005).

Critical changes in the construction of knowledge have created a crisis in Muslim epistemology. Since the seventeenth century the new ideal of knowing is through *doing* or knowing by *construction* (Funkenstein 1986, p. 297). This definition of knowledge is the one that principally informs techno-science. In the view of Muslim traditionalists, the only knowledge worth pursuing is that which leads to knowing God. All other modes of knowledge fell in the ancillary category of necessary, but secondary. As long as the dissonance in the social imaginaries fostered by techno-science, on the one hand, and Muslim ethics on the other hand, persists then the communicative deficit between these two ethical regimes will only increase: in effect they might be speaking different languages. But it might well be that these differences could also signal the beginning of a new way of imagining the ethical and life itself. It could well open up new possibilities.

The Philosophical Challenge

Neil Postman in his very readable book, *Technopoly: The Surrender of Culture to Technology* tells us that technology is our friend for two reasons. First, it makes life easier, cleaner and longer. Second, due to the intense and inevitable relationship of technology to culture, technology invariably does not invite a close examination of its consequences (Postman 1993). However, he concedes that the lack of self-reflexivity about technology also results in the uncontrolled growth of technology that in turn destroys the vital sources of our humanity.

To illustrate his point, Postman points out that cultures may be classified into three types. Tool-using cultures where the main characteristic of such cultures was to do two things: (a) to solve specific and urgent problems of physical life, such as in the use of waterpower, windmills and the heavy-wheeled plow; (b) to serve the symbolic world of art,

politics, myth, ritual and religion as in the construction of castles and cathedrals (Postman 1993). One of the distinctive features of tool-using cultures, even in the case of military technology, spiritual ideas and social customs acted as controlling forces. “We may say, further, that all tool-using cultures—from the technologically most primitive to the most sophisticated—are theocratic or, if not that,” says Postman, then they are “unified by some metaphysical theory. Such a theology or metaphysics provides ordering and meaning to existence, making it almost impossible for technics to subordinate people to its own needs (Postman 1993, p. 26).”

However, Postman also cautions that it is an oversimplification to say that tool-using cultures never had their customs and symbolic life reoriented by technology. The second kind of culture is what Postman identifies as technocracies where “tools play a central role in the thought-world of the culture. Everything must give way, in some degree, to their development. The social and symbolic worlds become increasingly subject to the requirements of that development. Tools are not integrated into the culture. They attack the culture (Postman 1993, p. 26).” Kepler took the first significant step toward a technocracy, in Postman’s view, in the West. It was Kepler who separated between theology and philosophy and argued for a split between authority and reason. A technocracy is defined by its essential “separation of moral and intellectual values, a separation that is one of the pillars of a technocracy.” Francis Bacon was the first man of technocracy. “In doing so, people came to believe that knowledge is power, that humanity is capable of progressing, that poverty is a great evil, and that the life of the average person is as meaningful as any other (Postman 1993, p. 28).”

The third is the rise of the technopolis in Postman’s schema. Before the rise of technopolis it was eminently possible for two opposing world views, namely the technological and the traditional to coexist in uneasy tension. But with the rise of technopolies, one of the thought-worlds disappears, namely the traditional ones. Technopolies eliminate alternatives to itself in precisely the way Aldous Huxley outlined in *Brave New World*. “Technopoly, in other words, is totalitarian technology,” notes Postman (Postman 1993, p. 48). According to one of the major figures of scientific management Frederick W. Taylor society was best served when human beings are placed at the disposal of their techniques and technology. Which leads Postman to conclude that human beings are worth less than their machinery (Postman 1993, p. 52). Technocracy and its successor the technopolis were both fueled by information—about the structure of nature as well as the structure of the human soul. The endpoint is the emphasis *on speed and information*. “This is the elevation of information to a metaphysical status,” notes Postman, where information is viewed as both the means and end of human creativity (Postman 1993, p. 61).”

We have now reached a state, where we can talk about the technological world picture as Egbert Schuurman put it. The technological world picture is different from technology. “By using technology,” the technological world picture, “strives to dominate or control both nature and society. Technological-economic powers, in particular, are the driving forces behind this picture of the world, and yet we all breathe its air. We all compromise ourselves with the desire for power and control by being touched as we are by the greed of consumerism (Schuurman 2005, p. 20).”

Schuurman argues that the norms that follow from the values of the technological world picture are “effectiveness, standardization, efficiency, success, safety, reliability, and maximum profit (Schuurman 2005, p. 22).” But Schuurman also cautions that these values are attained with little or no attention given to the cost to humanity, society, the environment and nature. In summary, the first and great commandment of “technological culture” is: “Be as effective as is technically possible;” while the second commandment is:

“Be as efficient as is economically possible (Schuurman 2005, p. 22).” Where Christian philosopher–ethicists like Schuurman find common cause with some Muslim thinkers is the underlying concern that a technological world picture deepens our plunge into a technological–materialistic culture.

Material values and standards have clearly enjoyed the upper hand in the technological world picture. Given the recent degradations of nature and related environmental problems, however, some are convinced that these values and standards, which continue to control culture under the banner of “progress,” need to be transformed with an eye to “survival.” That said, adjustments to date have come after the fact and are seldom more than politically correct.

Yet with technology embedded in our everyday lives, as part of our ontological makeup, we might have to think about it in a different mode. Hence, the modes of thinking adopted by especially Schuurman, and perhaps even Postman and others, about technology lead us to dichotomous thinking. This mode of thinking privileges nature as normal and culture as additional and often as unnatural and fallen. So, for instance, Walī Allāh’s improvements in culture would be viewed as unnatural and part of dispensable thinking. Yet, we observe that the Delhi-based scholar does not disown technologies of improvement, but rather proclaims it as good. Therefore William E. Connolly helps me make the point that *technique* is part of culture and that thinking is *neurocultural*. He avoids representational modes of thinking that is good at knowing, explaining, evaluating and judging. In neurocultural and compositional modes of thinking, he points out, thinking itself participates in composing our thoughts; thinking itself shapes and modifies our thinking as well as our thoughts. We are daily engaged in compositional and inventive modes of thinking (Connolly 2003, pp. 102, 104). Thinking itself can sometimes modify the microcomposition of the body/brain processes as a new pattern of thinking becomes infused into body/brain processes. In other words, information technologies as well as other forms of dependencies we have on technology, enters our body and mind-streams. Neurons that fire together, wire together, Connolly approvingly cites two leading neuroscientists. In other words, we are not altering culture as such with technology. Rather, our bodies and our brains adapt together with our environment. This approach makes technology look less ominous.

Conclusion

Technology, according to a common complaint, turns all of life into an instrument or means to certain ends that are determined by technology; these are not ends and values, determined by religious values or cultural norms. Now this might be an exaggerated picture. The transplant surgeon clearly thinks about the well being of his or her patient. He or she does not think of his patient as an instrument nor about the donor as a piece of material to be used. Elaborate protocols, rules and regulations are set in place to prevent the abuse of patients and to reduce them to becoming the objects of technics. Yet, if we were to give attention to technology we must also listen to the critique of technology. So a Muslim ethicist and or any faith-based ethicist will most likely ask the question: Is it conceivable to begin a process by which we can alter the telos of techno-science. In other words, can we move the needle away from self-aggrandizing human autonomy into another direction? Can we move in a direction where technology and responsibility are paired? And, can we do so without undermining intellectual curiosity and technological progress, even though some people despise the idea of progress? The latter is a very important

question to ponder. In other words, would a faith-based orientation to technology have allowed people to courageously think of exploring space, landing humans on the moon and land a vehicle on Mars? Or would they have thought it blasphemous to interfere in the integrity of the heavens and would they have viewed it as an affront to theology to undertake such daring space exploits? But it is a particular mental attitude and curiosity untrammelled by theological restrictions that took the leap in order to think about the exploration of space. And it became possible to explore space only because technology made it *thinkable*. And space exploration was not only a vanity project. Rather, moon-shot thinking realized so many spin-offs for medical technology and industry, so that even if a moon landing was never achieved, an innumerable number of benefits and spin-offs from the audacious project made the effort worthwhile.

But I want to pursue another question. Instead of creating the unhealthy form of dichotomous thinking about technology, either the pessimism of the transcendentalists or the optimism of the empiricists, there could be a third way. As Henri Atlan reminds us, “The most pessimistic scenarios are not necessarily the most probable ones. We can heed the prophets of disaster and avert their predictions. In the end, there is no reason moral progress cannot accompany technical progress (Atlan 2011, pp. 7, 8).” Can we re-educate ourselves on the basis of ecological thinking. If we keep in mind Neil Postman’s insight that “technological change is neither additive nor subtractive” but it is ecological. In other words, one significant change will over the long duration generate total change. For instance, the Benedictine mechanical clocks did not only provide the regulation of time in monasteries, but in due course the watch also synchronized and controlled the actions of people. Take another example of the printing press with movable type. This technology might have altered the epistemology of the oral tradition but it also brought about a revolution in knowledge.

So by ecological thinking we might be able to espouse restraint but also harvest the valuable assets that technology offers. Hence, we could explore technology that abandons the technological world picture that prized autonomous freedom and instead propose a notion of freedom that takes seriously the task to address values like pluralism, discipline, authority, respect, trust, mutual help, human solidarity and a place for transcendent authority. Could we reach a place where our engagement with technology is driven by an ethics of responsibility?

My tentative view is that the way forward in Muslim ethics in relation to technology is not to be alarmist but to be good listeners. One should listen and act on the best part of speech, as the Qur’an says, in other words, hear and understand: Yet, we might have to hear differently, with our bodies and understand together with our emerging culture. This raises new challenges for Muslim ethics. In light of old modes of thinking that Connolly and others critique, there might be a need to rearticulate Muslim ethics in terms of compositional thinking. We might begin to understand that technology does not only do one thing, but does multiple things at the same time and that not all the things it accomplishes in our human nature and our environment is entirely scrutable, or something we can fully explain at this stage. Since the ethical is also part of compositional thinking we can devise ways to rethink what moral agency and responsibility means and what kinds of values are more in tune with a technological age. That goes hand in hand with compositional thinking. To cite Atlan again: “So nothing prevents us from imagining an era when humanity, at peace and increasingly open to the refinements of the life of the mind, makes intelligent and constructive use of the results of technological progress, including those related to the production of life. Nothing is inherently evil, in this domain as in others. Everything depends on the intellectual and moral environment...practices that raise the specter of

serious moral regression, in our present environment, might one day, in a different moral and intellectual context, be beneficial (Atlan 2011, p. 8).” The fear that we might surrender to technology or relinquish our need to retain a form of human agency or autonomy over the machine is largely the product of representational thinking. If we go along with Connolly’s proposed way of thinking and Atlan’s philosophical optimism then surely, our bodies, our cosmologies and values too are moving or ought to move in some kind of step with technology.

Compliance with Ethical Standards

Conflict of interest The author declares that he has no conflict of interest.

Research Involving Human Participants and/or Animals This article does not contain any studies with human participants or animals performed by the author.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

- Ahmad, N. Ā. (2003). Istinsākh (Cloning) kā sā’insī ‘amal. *Muhaddis*, 35(1), 53–69.
- al-Dihlawī, S. W. A. (2003). *The conclusive argument of god: Shāh Walī Allāh of Delhi’s Ḥujjat Allāh al-Bāligha* (M. K. Hermansen, Trans.). Islamabad: Islamic Research Institute.
- al-Jazarī, I. a.-R. (1409/1989 (first published 1974)). *The book of knowledge of ingenious mechanical devices* (D. R. Hill, Trans.). Islamabad (Dordrecht, Holland): Pakistan Hijra Council (first published by D. Reidel Publishing Company).
- al-Jazarī, I. i. a.-R., & Hill (trans. and annot.), D. R. (1409/1989). *The book of knowledge of ingenious mechanical devices*. Islamabad: Pakistan Hijra Council.
- Atlan, H. (2011). *The sparks of randomness* (L. J. Schramm, Trans. Vol. 1). Stanford, CA: Stanford University Press.
- Connolly, W. E. (2003). *Neuropolitics: Thinking, culture, speed* (Vol. 23). Minneapolis and London: University of Minnesota Press.
- Elias, N. (1994). *The civilizing process* (E. Jephcott, Trans.). Oxford: Blackwell.
- Elshakry, M. (2003). *Darwin’s legacy in the Arab East: Science, religion and politics, 1870–1914*. Ph.D., Princeton University, Princeton, NJ.
- Fadel, M. (2001). Islam and the new genetics. *Saint Thomas Law Review*, 13, 901–909.
- Friedel, R. D. (2007). *A culture of improvement technology and the Western millennium*. Cambridge, MA: MIT Press.
- Funkenstein, A. (1986). *Theology and the scientific imagination from the middle ages to the seventeenth century*. Princeton, NJ: Princeton University Press.
- Hamdy, S. F. (2006). *Our bodies belong to God: Islam, medical science, and ethical reasoning in Egyptian life*. Ph.D., New York University, New York, USA. Retrieved from <http://proquest.umi.com/pqdweb?did=1179955691&Fmt=7&clientId=15020&RQT=309&VName=PQD>.
- Heidegger, M. (1977). *The question concerning technology and other essays* (W. Lovitt, Trans.). New York: Harper Torchbooks.
- Hill, D. R. (1997). Technology in the Islamic World. In H. Selin (Ed.), *Encyclopaedia of the history of science, technology, and medicine in non-Western cultures* (pp. 2099–2103). Dordrecht, Boston: Kluwer Academic.
- Hill, D. R. (2015). al-Djazarī. In P. Bearman, T. Bianquis, C. E. Bosworth, E. v. Donzel, & W. P. Heinrichs (Eds.), *Encyclopaedia of Islam* (2nd ed.). Brill Online.
- Hirschkind, C. (2006). *The ethical soundscape: Cassette sermons and Islamic counterpublics*. New York: Columbia University Press.
- Joy, B. (2000). Why the future doesn’t need us. *Wired*, 8(4), 1–8.
- Keane, W. (2014). Ethics as Piety. *Numen*, 61(2–3), 221–236. doi:10.1163/15685276-12341317.
- King, D. A. (1975). The book of knowledge of ingenious mechanical devices: Kitāb fi maʿrifat al-hiyāl al-handasiya by Ibn al-Razzaz al-Jazari by D. R. Hill. *History of Science*, 13(4), 284.
- Madani, H. H. (2003). Cloning kā ‘amal kyā hai? Ghair sā’insī alfāz main. *Muhaddis*, 32(6), 70–71.

- Madanī, H. H. (2005). Islām main nasab awr nasal ka taḥaffuz: ithbāt-i nasab main qayāfa wa qarāʾ in aur DNA kī test waghayra ki ḥaythiyat. *Muḥaddith*, 7(37). <http://tinyurl.com/j6pnclb>.
- Mahdi, M. (2001). *Alfarabi and the foundation of Islamic political philosophy*. Chicago: University of Chicago Press.
- Mignolo, W. (2002). The geopolitics of knowledge and the colonial difference. *The South Atlantic Quarterly*, 101(1), 57–96.
- Moazam, F. (2006). *Bioethics and organ transplantation in a Muslim society: A study in culture, ethnography, and religion*. Bloomington: Indiana University Press.
- Moosa, E. (1999). Languages of change in Islamic Law: Redefining death in modernity. *Islamic Studies*, 38(3), 305–342.
- Postman, N. (1993). *Technopoly: The surrender of culture to technology*. New York: Vintage.
- Rees, M. (2010). *Scientific horizons: Lecture 1: The scientific citizen*. Paper presented at the The Reith Lectures.
- Sachedina, A. A. (2009). *Islamic biomedical ethics: Principles and application*. Oxford, New York: Oxford University Press.
- Schuurman, E. (1980). *Technology and the future: A philosophical challenge* (H. D. Morton, Trans.). Toronto: Wedge Publishing Foundation.
- Schuurman, E. (2005). *The technological world picture and an ethics of responsibility: Struggles in the ethics of technology*. Sioux Center, IA: Dordt College Press.
- Schuurman, E. (2008). The challenge of Islam's critique of technology. *Perspectives on Science and Christian Faith*, 60(2), 75–83.
- Selin, H. (1997). *Encyclopaedia of the history of science, technology, and medicine in non-Western cultures*. Dordrecht; Boston: Kluwer Academic.