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<i>Alan A. GODLAS</i>	5	Technology in Islam and The West: Consume With Caution Insights From Gadamerian Hermeneutics and Emotional Intelligence
<i>Süleyman Hayri BOLAY</i>	47	Does Technology Create Value?
<i>Zekai ŞEN</i>	70	Technology and its Place In Islamic Civilization
<i>Hamid Fahmy ZARKASYI</i>	90	Inculcation of Values Into Technology An Islamic Perspective

Technology in Islam and The West: Consume With Caution Insights From Gadamerian Hermeneutics and Emotional Intelligence

Alan A. Godlas¹

In addition to beginning with *Bismillāh ir-rahmān ir-raḥīm*, in the name of God, the Infinitely Merciful and Infinitely Compassionate,² traditional Muslim discourse should begin by a declaration of taking refuge in God from the deviousness of Satan, by saying *a'ūdhu billāhi min al-Shayṭāni'r-rajīm* (I seek refuge in God from Satan, the reviled one). This is not simply a cultural custom in Islam; rather, it has its source in the example (*sunnah*) of Muḥammad ﷺ, which we read about in the *Ṣaḥīḥayn*, the two sound ḥadīth collections of Bukhārī and Muslim: “Two men insulted one another in the presence of God’s Messenger ﷺ and one of them became angry to the extent that his face became red and swollen. The Prophet ﷺ looked at him and said: “I know a sentence (*kalima*) that were he to say it, that state he is in would leave him; and that sentence is: I seek refuge in God from the accursed Satan.”³

We say this, not just in the context in which the Prophet ﷺ used it, but as part of the *adab*, the customary manners of a Muslim, before beginning all endeavors. Unfortunately, this sentence often becomes a mere

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2 Among the hadiths that illustrate the importance in the *sunnah* for beginning endeavors, including speech, with the mention of Allah, we find that the Prophet ﷺ stated the following: “Every discourse that is not started, in the beginning, with mention of Allah, is cut off [from blessings] كَلِّمْ كُلَّ كَلَامٍ لَا يُبْدَأُ فِي أَوَّلِهِ بِذِكْرِ اللَّهِ، فَهُوَ أُبْتَرُ al-Nasā’ī, *al-Sunan al-kubrā*, #10331, <http://islamport.com/w/mtn/Web/1231/2767.htm>; and ed. Ḥasan ‘Abd al-Mun‘im Shalabī (al-Maktabah al-shāmilah) #10258. Similarly, it was reported that the Prophet ﷺ stated the following: كَلِّمْ كُلَّ كَلَامٍ لَا يُبْدَأُ فِيهِ بِبِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ فَهُوَ أُجْزَمُ every discourse that is not started by *Bismillāh al-Rahmān al-Raḥīm* is cut off. See Qurṭubī, *al-Jāmi‘ li-aḥkām al-Qur‘ān* (Beirut: Dār al-Kutub al-‘Ilmiya, 1988), 13:128/marg., 192).

3 Bukhārī and Muslim, *Ṣaḥīḥayn* (al-Maktabah al-Shāmilah).

cultural habit that is said and heard unthinkingly. So I would like to ask all of us here to stop for a moment, and say and contemplate this phrase together, remembering and taking refuge in God and reflecting upon the implications of this statement and what it should imply to us, right now, here, today, in a conference on Islam and Technology.

One thing that this ḥadīth should imply to us is that we should turn off our mobile phones. So just as you might remember to straighten your lines before praying in a group, please now, even though we are not praying, please check to make sure your mobile phones are turned off; or at least, if you think you may get an emergency call, please put your phone on vibrate; and then if it vibrates and if you need to answer it, please leave the room.

From these preliminary remarks, you might get the impression that today I will express the opinion that technology is an instrument of Satan. But that is not the case. In fact, I will only go so far as to state that technology can be an instrument of Satan, but it need not be so. Rather, technology can be an instrument of tremendous good. The fact, however, is that because of the potentially destructive power of technology, we need to exercise caution and *taqwá* (consciousness of God) and be highly conscious when using technology, otherwise instead of our mastering it for the good of humanity, technology will become our master and we will become enslaved to it.

One of the ways that we can avoid becoming slaves of technology is for any responsible person—and especially Muslim scholars and leaders—to do just as I have done today, and begin thinking about and developing recommended *adab* (good manners) concerning technology. We can build the foundation of this on Mevlana's words in his *Mesnevi*, words that Bediuzzaman Said Nursi also reminds us of in his *Lema'lar*:

از خدا جویم توفیق ادب بی ادب محروم شد از لطف رب⁴

*Tanrı'dan edepli olmayı dileyelim*⁵

*Edepsiz kişi Allah'ın lütfundan mahrum kalır.*⁶

4 Jalāl al-Dīn Rūmī, *The Mathnawi*, ed. Reynold A. Nicholson (London: Luzac, 1925), vol. 1 [containing the Persian text, book 1 and 2]:7, line # 78.

5 Erkan Türkmen, trans., *Mevlana'nın Gül Bahçesinden Bir Demet Gül*, Konya, 2012, http://www.rumierkan.com/TR/icerik.asp?content=Content_TR_65.00.htm.

6 Bediüzzaman Said Nursi, *Lem'alar*, On Birinci Lem'a: Yedinci nükte, 108, <http://www.sorularlarisale.com/index.php?s=modules/kulliyat&id=1922>.

We seek from God the grace of good manners!

Without good manners one becomes deprived of the benevolence of the Lord-Sustainer.

I hope that my presenting to you the concrete example of shutting off mobile phones during presentations in a conference such as this will help you to start thinking about and developing recommended *adab* concerning technology (if you have not already done so). I will return to the topic of the *adab* of technology later in my presentation today. So after these preliminary remarks, I would like to begin the core of my presentation:

بسم الله الرحمن الرحيم

The title of my presentation is “Technology in Islam and the West: Consume with Caution— Insights from Gadamerian Hermeneutics and Emotional Intelligence.”

While there is no question that technology has provided our world with many advantages, it is undeniable that technology also presents us with many challenging problems. As examples I will briefly note three of the many problems: the destructive potential of nuclear technology and other weapons systems, the unintended disruption of our ecosystems by things such as urbanization, pesticides, and genetically modified crops, and the colonization of our attention by television programming and advertising, the internet, tablet computers such as i-pads, and mobile telephones.

Taking into consideration such obvious problems with technology, a great deal of scholarly discussion concerning Islam and technology has revolved around the issue of whether or not technology is potentially advantageous, neutral, or inherently detrimental to religious values in general and to those of Islam in particular. Nevertheless, Muslim leaders and popular Muslim opinion, in general, agree that Muslims must advance quickly in science and technology. The importance of scientific and technological advancement was certainly at the core of the trajectory of modern Turkey. Atatürk himself stated,

We shall take science and knowledge from wherever they may be, and put them in the mind of every member of the nation. For science and for knowledge, there are no re-

*strictions and no conditions. For a nation that insists on preserving a host of traditions and beliefs that rest on no logical proof, progress is very difficult, perhaps even impossible.*⁷

Such an enthusiastic embrace of science and technology, however, is not unique to Turkey. Ibrahim Kalin⁸ maintains that this strongly felt need to advance swiftly in modern science and technology characterizes the Muslim world in general:

*From Mustafa Kemal Atatürk, the founder of modern Turkey, to Mahathir Muhammad, the prime minister of Malaysia, the goal has remained the same: to fill the gap between Western and Islamic societies by empowering Muslim countries with the tools and blessings of modern science. Not only are the ruling elites but also the populace at large convinced of the intrinsic power and necessity of science and technology.*⁹

In spite of the tremendous need for scientific and technological advancement, scholars such as Seyyed Hossein Nasr have urged us to exercise caution and not to run headlong into the arms of modern science and its technological progeny. Nasr, however, goes beyond pointing out the many obvious problems in our world for which technology is the guilty party. He strongly argues that technology is not value-free. Like its epis-

7 Kemal Atatürk, *Atatürk'ün Söylev ve Demeçleri* (Ankara, 1952) II, 44, 5. Baskı 2006, from a speech given in October 27, 1922; "İlim ve fen nerede ise oradan alacağız ve her ferdi milletin kafasına koyacağız, ilim ve fen için kayıt ve şart yoktur. Hiçbir delili mantıkiye istinat etmeyen bir takım an'anelerin, akidelerin muhafazasında ısrar eden milletlerin terakkisi çok güç olur; belki de hiç olmaz" Öğretmenlere (27. X. 1922), <http://atam.gov.tr/wp-content/uploads/S%C3%96YLEV-ORJ%C4%B0NAL.pdf>. Translated by Von Grunbaum in his *Modern Islam: The Search for Cultural Identity* (Westport, Conn.: Greenwood Press, 1983), reprinted (New York: Random House, 1963), 104. Also cited by Ibrahim Kalin, "Three Views of Science in the Islamic World" in *God, Life and the Cosmos: Christian and Islamic Perspectives*, eds. Ted Peters, Muzaffar Iqbal, Syed Nomanul Haq, (Ashgate, 2002), 43-75; and in Kalin, "Islam and Science," http://www.oxfordislamicstudies.com/Public/focus/essay1009_science.html.

8 Ibrahim Kalin, as of October, 2015, held the position of Deputy Undersecretary and Senior Advisor to the Prime Ministry of Turkey, now Deputy Undersecretary to the Office of the President.

9 Ibrahim Kalin, "Islam and Science: Notes on an Ongoing Debate" in Gary Laderman and Arri Eisen, eds., *Science, Religion and Society: An Encyclopedia of History, Culture and Controversy* (Armonk, N.Y.: M.E. Sharpe, 2007), 113.

temological father—modern science—technology marches through our world both carrying and being swept up by the modernistic worldview, which wreaks havoc on traditional religious worldviews in general and Islamic worldviews in particular.¹⁰ As Nasr expresses it:

Technology itself brings with it a certain technological culture which is against the soul of the human being as an immortal being, and is against the fabric of all traditional societies which are based on the spiritual relationship between the human being and the objects he or she creates. These objects [in a traditional society] are based on an art that is creative and reflects God's creativity as the Supreme Artisan....He has given us the power of creativity, which we reflect in our beings because we are His khulafâ, His vicegerents on earth....

*In traditional civilizations there was a continuous spectrum of creation which was always related to God, from the making of a simple comb to the composition of poetry and everything in between; everything was related to God and reflected His quality as the Supreme Artisan on the human plane. Now modern technology destroys that relationship.*¹¹

So, on the one hand, from Nasr's perspective, modern technology inherently cuts modern man off from the remembrance and awareness of God, the creator. Yet, on the other hand, there are Muslim scientists, such as Dr. Abdus Salam, the Pakistani physicist and winner of the Nobel Prize (in addition to numerous Muslim political leaders and large numbers of Muslims), who see modern science (and we can infer, modern technology)

10 Kalin (and others such as Huston Smith and S. H. Nasr) refers to the culture of which modern science and technology are the standard bearers as *scientism*. Science per se contrasts with "modern science" and *scientism*. "Scientism seeks to supplant the religious view of the universe and reduce religion to ethics without a claim over the nature of reality" (Ibrahim Kalin, "Islam and Science", *Oxford Islamic Studies Online* http://www.oxfordislamicstudies.com/Public/focus/essay1009_science.html). Huston Smith defines scientism as "the drawing of conclusions from science that do not logically follow" (Huston Smith, *Beyond the Post-modern Mind* [Wheaton, IL: The Theosophical Publishing House, 1989], 146). Furthermore, Smith states that [scientism] "goes beyond the actual findings of science to deny that other approaches to knowledge are valid and other truths true," (Huston Smith, *Forgotten Truth* [New York: Harper & Row, 1976], 16).

11 Seyyed Hossein Nasr and Muzaffar Iqbal, *Islam, Science, Muslims, and Technology* (Sherwood Park, Alberta, Canada: Al-Qalam Publishing), 98.

as being in complete harmony with Islam: “There truly is no dissonance between Islam and modern science.”¹² In other words there is no consensus among Muslims about the harmony or dissonance between Islam, on the one hand, and science and technology, on the other.

My perspective, which I will elaborate today, is that aside from whatever the inherent potential value of technology may be, we run the risk of allowing technology to become destructive as long as our educational institutions fail to train students how to become aware of and steer clear of their own “selfish interest,” this being a key concept in Bediuzzaman Said Nursi’s *Risale-i Nur*.¹³ Not being dominated by one’s own selfish interest is necessary if one wishes to become among the people of truth, guided by *īmān* (namely guided by faith undistorted by the ego-self). I argue that to the degree that we are dominated by our own selfish interest, in spite of our best intentions, we will fall short of becoming people of truth, and our *īmān* will become unconsciously distorted. Hence (because of the extreme danger of becoming subverted by one’s “own selfish interest”) I suggest that to develop an Islamic ethic of technology we must renew and refresh the three traditional Islamic principles of the *salaf al-ṣāliḥ* (our righteous predecessors), which principles are *islām*, *īmān*, and *iḥsān*.¹⁴ Furthermore,

12 Abdus Salam. *Ideals and Realities: Selected Essays*, ed. C. H. Lai (Philadelphia: World Scientific, 1987), 212 cited in Ibrahim Kalin, ed. *The Oxford Encyclopedia of Philosophy, Science, and Technology in Islam*, s.v., “Technology and Applied Sciences” by Aaron Segal, updated by Hassan Radoine (New York: Oxford University Press, 2014), 320.

13 On “selfish interest” in the *Risale-i Nur*, see Wan Kamal Mujani, Ermy Azzati Rozali, and Mohamad Zaidin Mat Mohamad, “The World Stability within Cosmology As Inspired by *Risale-i Nur*,” *Advances in Natural and Applied Sciences*, 6 (6): 980-984, 2012, <http://www.bediuzzamansaidnursi.org/en/icerik/world-stability-within-cosmology-inspired-risale-i-nur>. Note that the English phrase “selfish interest” is a useful way of conveying what is implied in the traditional Islamic term “*al-nafs al-ammārah*.” In describing Said Nursi’s perspective, M. Hakan Yavuz states:

These are the internalization of Islamic precepts and norms with the goal of self-transformation by subduing the *nafs al-ammārah* (the carnal soul) ” M. Hakan Yavuz, “The Sufi Conception of Jihad: The Case of Said Nursi,” <http://www.bediuzzamansaidnursi.org/en/icerik/sufi-conception-jihad-case-said-nursi>; and see also Muhammad Sirozi, “Nursi’s Ideas On Science Development In Muslim Countries,” www.bediuzzamansaidnursi.org/en/icerik/nursi-s-ideas-science-development-muslim-countries.

14 *Islām* (surrendering), *īmān* (faith), *iḥsān* (affirming virtuous beauty). These three words, to which translations do not do justice, have come to indicate the major emphases of Islam. Most significantly they were defined in what is known as the *ḥadīth* of Gabriel, in which the Prophet ﷺ defined *islām* as the principal pious actions of Islam (also known as the “five pillars of Islam”), stating that “*Islām* is to testify that there is no god but God and that Muhammad is God’s Messenger, to perform the prayer, bestow alms, fast Ramadan and

in the course of taking a fresh look at how we can adapt *islām*, *īmān*, and *iḥsān*, in order to develop an authentically Islamic ethic for the use of technology, we need to understand that these refer, respectively, to principles of *‘amal* (behavior), *‘ilm* (cognition), and *ḥāl* (affect, emotion, and state).

Moreover, since scholars in the West have also been dealing with the need to develop an ethic for coping with the challenges of technology, I argue that in our quest to develop an Islamic ethic for the use of technology we can benefit from understanding three recent developments in the West, and consequently train students in three ways that have parallels in the Islam of the *salaf al-ṣāliḥ* (pious predecessors): first, in the training of *‘amal*, we need to train students to act responsibly with technology by updating and developing Islamic *adab* for technology; second, in the training of *‘ilm*, we need to train students to cultivate a hermeneutical understanding (such as Gadamerian hermeneutics suggests, which involves cultivating self-understanding together with understanding of the world and technology—rather than striving for objectivity in a purely modernistic sense); and third, in the way of *ḥāl*, we need to train students to enhance their emotional intelligence (*duygusal zeka*).

The primary reason why renewing Islamic ethical principles and developing an ethical methodology for technology aided by insights from these Western developments is necessary is because the the human ego-self (*nafs*)—in spite of our highest intentions, aspirations, and efforts of religious leaders—will to varying degrees always be in danger of attempting to use technology (either unconsciously or consciously) without sufficient wisdom, leading to destructive outcomes because of the power of the ego-self (*al-nafs al-ammārah bi-al-sū’*), as we read in the Qur’an: *inna an-nafsa la-ammāratun bi-s-sū’* (Indeed, the ego-self commands to evil [Qur’an, Sūrat Yūsuf, 12:53]). Because of the degree to which the Muslim world, like the West, has already succumbed to many of the dangers of technology, it is essential that we use whatever insights we can find, as long as such insights are filtered by the light of Islam, just as Muslim

make if are able, to undertake the pilgrimage to the Holy House [the Ka’ba in Mecca].” *īmān* (faith), he stated, is to embrace the following six beliefs: “To believe in God and His Angels and His books and His Messengers and the Last Day, and to believe that no good or evil cometh but by his Providence.” *iḥsān*, as the Prophet ﷺ defined it is: “To worship God as if you see him, for if you do not see Him, then [know that] He sees you.” (Bukhārī and Muslim, *Ṣaḥīḥayn* [al-Maktabah al-Shāmilah]).

scholars throughout the centuries have taken wisdom wherever they have found it and then Islamicized it.

Furthermore, a *ḥadīth* of Tirmidhī, which he considered to have a high degree of authenticity (*ḥasan ṣaḥīḥ*), underscores the danger of the ego-self by highlighting the significance of working to diminish its power: The *mujāhid* is one who strives against his own ego-self (*naḥs*): *الْمُجَاهِدُ مَنْ جَاهَدَ نَفْسَهُ*.¹⁵ Hence, I argue that we should adopt as a basic framework, an Islamic ethical model for approaching technology in which we emphasize, first and foremost, the *jihād* ‘*an al-naḥs*, namely striving against our *naḥs*, against our ego-self, in order to reduce the distortions of our perception and self-deceptions arising from the *al-naḥs al-ammāra bi-al-sū*. Second, we must understand that success in the *jihād* against the *al-naḥs al-ammāra bi-al-sū* will increase the likelihood that our efforts to perceive and develop an Islamic ethic of technology will in fact be for the sake of God (*fi-sabīl Allāh*)—neither being for the sake of our ego-self (*fi sabīl al-naḥs*) nor for the sake of Shayṭān (*fi sabīl al-shayṭān*). In this, I follow Imām al-Ghazālī, who referred to striving against the ego-self (*naḥs*) as the greater *jihād*; while striving in the world, he regarded as a necessary, but lesser *jihād*: “The greater *jihād* is the *jihād* against the ego-self (*naḥs*), as one of the companions... stated: “We have returned from the lesser *jihād* to the greater *jihād*, meaning, the *jihād* against the self.”¹⁶

15 Abū ‘Isā al-Tirmidhī, *Sunan al-Tirmidhī*, ed. Ibrahīm ‘Aṭwah ‘Awaḍ (Cairo: Muṣṭafā al-Bābī al-Ḥalabī, 1975), 4:165, #1621.

16 الجهاد الأكبر جهاد النفس كما قال بعض الصحابة رضي الله عنه رجعتنا من الجهاد الأصغر إلى الجهاد الأكبر يعنون جهاد النفس

Abū Ḥāmid al-Ghazālī. *Iḥyā ‘ulūm al-dīn: kitāb al-‘uzla* (Jeddah; Dār al-Minhāj, 2011), 4:325-26. A *ḥadīth* of the Prophet ﷺ concerning the greater *jihād* was reported by both Bayhaqī and al-Khaṭīb al-Baghdādī. These two *ḥadīth* reports included their chains of transmission and with minor differences in the content of the *ḥadīth*. Bayhaqī himself noted that his chain of transmission (*isnād*) was “weak.” Other scholars have cast doubt on the validity of al-Khaṭīb’s *isnād*: The Prophet ﷺ said to a group of warriors who had just returned from battle, “You have arrived at the best place from which to embark; you have arrived [at the embarkation point of travelling] from the lesser *jihād* to the greater *jihād*.” So they asked, “What is the greater *jihād*?” He said, “The servant’s striving against his desires.”

فَدَيْمْتُمْ خَيْرَ مَقْدَمٍ، وَقَدَيْمْتُمْ مِنَ الْجِهَادِ الْأَصْغَرِ إِلَى الْجِهَادِ الْأَكْبَرِ. قَالُوا: وَمَا الْجِهَادُ الْأَكْبَرُ يَا رَسُولَ اللَّهِ؟ قَالَ: مُجَاهَدَةُ الْعَبْدِ هَوَاهُ

This version of the *ḥadīth* is from the *Tārīkh Baghdād*: al-Khaṭīb al-Baghdādī, *Tārīkh Baghdād* (Beirut: Dār al-Kutub al-‘Ilmīya, n.d.), 13:523-24, #7345; Abū Bakr Aḥmad al-Bayhaqī, *Kitāb al-Zuhd al-kabīr*, ed. ‘Amīr Aḥmad Haydar (Beirut: Dār al-Jinān, 1987), 165, #373;. Some scholarly criticisms of it were recorded by Ismā‘īl b. Muḥammad al-

Hence, I am suggesting first, that considering the two forms of effort—referred to as the greater and lesser *jihāds*—we should emphasize the greater *jihād* (which strives against the distortions of the *naḥs*) without neglecting the lesser *jihād* (which consists of striving to find the wisest solutions in our worldly affairs). Second, we should understand the greater *jihād*, on the one hand, as being both a *jihād* of *ḥāl* (affect) and a *jihād* of ‘*ilm* (cognition); and, on the other hand, we can understand the lesser *jihād* as a *jihād* of ‘*amal* (action). Third, I suggest implementing what I call an ABC approach to education for enhancing understanding, applying it specifically to the problem of developing an Islamic ethic for technology, with the “A” standing for “affect” (*ḥāl*), the “B” standing for “behavior” (‘*amal*), and the “C” standing for “cognition” (‘*ilm*). The greater *jihād*, as a *jihād* of *ḥāl*, is an affective *jihād* (a *jihād* relating to emotions), one that can decrease the power of the *naḥs* by directly increasing emotional intelligence, by enabling us to use emotions so that they will enhance wisdom and not become a means for increasing the distorting effects of the *naḥs*. In addition, the greater *jihād* is also a *jihād* of ‘*ilm* (cognition), when it is conducted so as to reduce the dominance of the *naḥs* by means of enhancing self-cognition, self-knowledge, self-understanding (all of which indirectly reduce fear deriving from the absence of these or from perceived threats to them), as well as by striving to understand the world and others. Fourth and finally, concerning the lesser *jihād*, a *jihād* of ‘*amal* (action), we must constantly strive to create an appropriate form of ‘*amal*, an *adab* for dealing with technology. In undertaking this, however, we must recognize that any failures of ours at attempting to create a successful *adab* for technology will be influenced, if not directly caused, by our unconscious-

‘Ajlūnī, *Kashf al-khafā* (Beirut: Mu‘assasat al-Risāla, 1979), 1:511-12. See also G. F. Haddad, “Documentation of ‘Greater Jihad’ hadith,” http://www.livingislam.org/n/dgjh_e.html.

A related and authentic *ḥadīth* that confirms the meaning, however, as narrated by Abū Dharr and authenticated by al-Albānī, is “I asked the Prophet ﷺ ‘Which *jihād* is the best?’ He replied, “[The best *jihād* is] striving against your self and your desires, for God (*fi dhāt Allāh*), may He be exalted and glorified”

عَنْ أَبِي ذَرٍّ، قَالَ: سَأَلْتُ رَسُولَ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ: أَيُّ الْجِهَادِ أَفْضَلُ؟ قَالَ: «أَنْ تُجَاهِدَ نَفْسَكَ وَهَوَاكَ فِي ذَاتِ اللَّهِ عَزَّ وَجَلَّ»

Abū Nu‘aym al-Aṣḥabānī, *Hilyat al-awliyā* (Beirut: Dār al-Kitāb al-‘Arabī, 1980), 2:249. Al-Aṣḥabānī, *Kitāb al-Arba‘īn ‘alā madh‘hab al-mutaḥaqqiqīn min al-ṣūfiyah*, ed. Badr b. ‘Abdallāh al-Badr (Beirut: Dār Ibn Hazm, 1993), 42. Nāṣir al-Dīn al-Albānī, *Silsilat al-ḥadīth al-ṣaḥīḥa* (Riyadh: Maktabat al-ma‘ārif, 1995), 3:483-84, #1496

ness of the distorting effects of our own *nafs* (which often undermines our best intentions). Furthermore, such distorting effects will arise because of our failures at our greater *jihāds*. Consequently we must recognize that any of our successes in creating an *adab* for technology will, for the most part, be due to our successes in our greater *jihād*. Nevertheless, such successes will ultimately all be due to the mercy of God, hence we pray as did the Prophet ﷺ: *allāhuma maghfiratuka awsa ‘u min dhunūbī wa-rahmatuka arjā ‘indi min ‘amali*. “O God, Your forgiveness is more encompassing than my sins; and Your mercy is what is hoped for more than my actions.”¹⁷

Before developing my Affective-Behavioral-Cognitive (ABC) approach toward enhancing understanding within the overall framework of the greater and lesser forms of *jihād* (effort or striving), it is necessary to note that a number of Muslim scholars have formulated an Islamic ethic of technology, in particular, Muslim reformers such as Bediuzzaman Said Nursi, the Ijmalī school of Ziauddin Sardar, and the traditionalist-perennial approach, which today is best articulated by Seyyid Hussein Nasr. Fortunately, Ibrahim Kalin has provided us with excellent articles that summarize their efforts and the major issues concerning Islam, science, and technology.¹⁸ These, together with Muzaffar Iqbal’s book on the perspective of Seyyid Hossein Nasr, *Islam, Science, Muslims, and Technology*, allow me to proceed with my contribution, which, as I have noted, highlights the importance of the distorting effects of the selfish interests of scientists, scholars, and anyone attempting to cope with the technological age.¹⁹ I should also mention that in developing the cognitive aspect of

17 *قُلِ اللَّهُمَّ مَغْفِرَتِكَ أَوْسَعُ مِنْ ذُنُوبِي وَرَحْمَتِكَ أَرْجَى مِنْ عَمَلِي* Al-Hākim al-Naysābūri, *al-Mustadrak ‘alā ṣaḥīḥayn wa-bi-dhaylihi al-Talkhīṣ* lil-Hāfiẓ al-Dhahabī (Beirut: Dār al-Kitāb al-‘Arabī, n.d.), 1:543-44; and ed. Muṣṭafā ‘Abd al-Qādir ‘Atā (Beirut: Dār al-Kutub al-‘Ilmīya, 1990), 1:728, #1994 at al-Maktabah al-Shāmīla.

18 Ibrahim Kalin, “Three Views of Science in the Islamic World,” <http://www.muslimphilosophy.com/kalin/Three%20Views%20of%20Science%20in%20the%20Islamic%20World.doc>; and “Islam and Science: Notes on an Ongoing Debate,” *Parabola* 33(3):66-73, September 2008, <http://tinyurl.com/kudwsrp>.

19 Kalin summarizes Nasr’s critique of scientism or “modern” science as being comprised of five main traits:
The first is the secular view of the universe that sees no traces of the Divine in the natural order. Nature is no longer the *vestigia Dei* of Christian cosmology but a self-subsistent entity that can be encapsulated exhaustively in the quantitative formulae of natural sciences. The second feature is the mechanization of the world-picture upon the model of machines and clocks. Once couched in terms of mechanistic relations, nature becomes something absolutely determinable and predictable -- a much needed safety zone for the rise of mod-

my ABC approach using a Gadamerian hermeneutic, I am indebted to an analytical framework that I learned from one of my formative professors, the late Huston Smith, in his book. *Beyond the Postmodern Mind*. There he defines an ethic as “an assemblage of guidelines for effecting the self-transformation that enables the world to be experienced in a new way”²⁰

Because the behavioral (B) (‘amalī) and cognitive (C) (‘ilmī) aspects of this ABC approach to enhancing understanding are more centered on the world in which we are living and relatively more accessible to readers, at this point we will begin our application of the ABC approach (to constructing an Islamic ethics of technology) with behavior and cognition, saving the affective (A) or emotional (ḥālī) aspect of the ABC approach for last. Prior to discussing the behavioral implications of our methodology as we construct Islamic ethics for technology, it should go without saying that because the epistemologies of modern Western science and philosophy as well as traditional epistemological Islamic values are accepted in varying degrees in the diverse cultures of the Muslim world, we should base our construction of an Islamic ethics of technology on values and guidelines that are shared in each of these epistemological cultural streams. Although some Muslims have argued for a return to the traditional Islamic epistemologies of *fiqh* (jurisprudence)—consisting of relying upon Qur’an, *ḥadīth*, *qiyās* (analogical reasoning), and *ijma’* (consensus) and the traditional schools of jurisprudence— and also, to varying degrees, to the wisdom of the Sufi shaykhs, our contention is that while the construction of an Islamic ethics of technology must be in dialogue with *fiqh* and Sufism, it must not simply rely on following the traditional behavioral guidelines of *fiqh* and Sufism, which have not been sufficient in enabling

ern industrial society and capitalism. The third aspect of modern science is rationalism and empiricism as we have alluded to before. The fourth trait is the legacy of Cartesian dualism that presupposes a complete separation between *res cogitans* and *res extensa*, viz., between the knowing subject and the object to be known. With this cleavage, the epistemological alienation of man from nature comes to completion by leaving behind a torrent of pseudo-problems of modern philosophy, the notorious mind-body problem being a special case in point. The last important aspect of modern science is in a sense a culmination of the foregoing features, and it is the exploitation of nature as a source of power and domination -- a fact not unknown to modern capitalist society.” Ibrahim Kalin, “The Sacred versus the Secular: Nasr on Science” in *Library of Living Philosophers: Seyyed Hossein Nasr*, L. E. Hahn, R. E. Auxier and L. W. Stone, eds. (Chicago: Open Court Press, 2001), 445-462.

20 Huston Smith, *Beyond the Post-modern Mind* (Wheaton, IL: The Theosophical Publishing House, 1989), 73.

our societies to cope with the technological age. One social scientist, Bart Barendregt of Leiden University, after studying South-East Asia's digital culture, noted somewhat alarmingly "Muslim youngsters are adopting technology to distance themselves from older, traditional practices while also challenging Western models."²¹ Peter Hershock noted that "the average American watches twenty-two thousand [television] commercials per year, as the average American father spends just forty-five minutes alone with his children each week while devoting an average of four hours daily to television."²² While some might hope that existing global educational systems offer an alternative to the materialistic brainwashing of television, Hershock informs us that "[money spent on] corporate advertising worldwide exceeds the total global expenditure on all levels of education."²³ When we add to this the problems of the proliferation of military technology and the use of technology that both directly and indirectly is destroying the biosphere, the need for an Islamic *adab* or *'amal* (i.e., an Islamic ethic) for coping with technology becomes stunningly obvious.

Some examples of such an *'amal* for coping with technology that we can suggest are that Muslim religious leaders need to develop recommendations guiding the usage for each society's major technologies. Ideally these recommendations should be based on scientific studies, which responsible Muslim businessmen may wish to communicate to prospective buyers on packaging. For example, televisions, tablet computers, and mobile phones marketed to children and adolescents can be packaged with a warning and recommendation to parents to limit usage to a certain number of hours today. Also recommendations from each Muslim country's ministries of religious affairs and ministries of health should note that everyone, but especially children, could benefit from periodic vacations from technology, even if it is only for certain periods, such as immediately before and after performing prayers (*ṣalāt*, *namaz*).

In spite of the virtues of such recommended *adab* for technology—because even Muslims' best efforts to follow such *adab* and take refuge

21 Bart Barendregt. *Economist*, "The Online Ummah" Aug 18th, 2012.

22 Peter Hershock. "Turning Away from Technotopia: Critical Precedents for Refusing the Colonization of Consciousness" in Peter D. Hershock, Marietta Stepaniants and Roger T. Ames, eds., *Technology and Cultural Values: on the Edge of the Third Millennium* (Honolulu: University of Hawai'i, 2003), 598.

23 Hershock, "Turning Away from Technotopia," 598.

in the Qur'an and *sunnah* will be sabotaged, distorted, and corrupted by the ego-self (*nafs*)—such an *adab* or *'amal* of technology (constructed both from traditional Islamic epistemologies and methodologies that have produced *sharī'a* and the *sunnah* together with contemporary scholars best efforts to construct an *adab* for technology), must be part of three-pronged strategy. The second component of such an approach should involve a cognitive (*'ilmī*), hermeneutic approach that integrates understanding one's self and its viewpoints in context, together with effort to understand the world and others. Third, any attempt to construct an Islamic ethic of technology should include an affective (*ḥālī*) approach consisting of enhancing emotional intelligence grounded in Islamic resources for doing so, accompanied by a strong dosage of humility, specifically the humble recognition that even our best efforts to create an *adab* for technology, such as I suggested at the outset, may ultimately be undermined by the ego-self.

Consequently, moving beyond the *'amal*, which is the behavioral aspect of my suggested methodology, we can now attend to insights from Hans-Georg Gadamer, which comprise the theoretical outline and overall bi-directional cognitive approach (hence the "C" of my ABC approach) or *'ilmī* aspect of my suggestions for building an Islamic ethic for technology that is informed by recent developments in the West.²⁴ Most important is

24 In this paper our subsequent discussion concerning the cognitive dimension of a hermeneutical approach to an Islamic ethic of technology principally focuses on theoretical and psychological reasons for such an approach and its bi-directional nature (i.e., on the one hand, it recenters efforts to understand one's self in one's contexts, together with, on the other hand, the commonplace modernistic and Enlightenment-era efforts to understand the "other" objectively). Beyond these very general concerns, however, what follows here is a more specific outline of two modes of contextual analysis (to be implemented hermeneutically, i.e., bi-directionally) and analytical lenses in the form of areas of inquiry, which comprise one of the two analytical modes. The two analytical modes are sociohistorical and what I have termed "religiological" analysis (but which would more precisely be termed pisteology, since it refers to inquiry into beliefs, which are not necessarily religious). Socio-historical analysis consists of analysis of events, viewpoints, and feelings in their socio-historical context, as is commonly taught by modernist historians; except since this is a hermeneutical method, each scholar or student analyzes sociohistorically both his/her own viewpoints and those of some "other." Religiological analysis uses a variety of analytical lenses in a coherent system, most of which (especially their coherence) I derived from Huston Smith's *Beyond the Postmodern Mind* (see especially 126-27, 210-11). One scholar who has used a number such lenses is Yasien Mohamed; although many scholars have used one or more of them (Yasien Mohamed, *The Path to Virtue: The Ethical Philosophy of al-Rāghib al-Isfahānī* [Kuala Lumpur: International Islamic University of Malaysia, 2006]). These lenses consist of a variety of questions about worldviews and beliefs in the following categories: epistemology, ontology (with subcategories of theology, cosmology, and eschatology), philosophical anthropology, psychology, teleology (under-

the idea—rooted in Gadamer’s works—that we can move toward a hermeneutically objective understanding of our problem (which in this case is technology and the need for an Islamic ethic in facing it). Simply put, a hermeneutically objective understanding is one in which we focus our analytical efforts in two directions: not merely outwardly at the customary problem at hand or some “other,” but also inwardly at our selves, where we also attempt to shine the light of understanding on our own prejudices or preconceptions in relation to their various contexts. Hans-Georg Gadamer (d. 2002), one of the most important 20th century philosophers, critiqued philosophers of the enlightenment, who asserted that in the search for truth and objectivity the “prejudices” (i.e., the prior views) of the subject (i.e., the interpreter) should be put aside and dismissed, as he stated it: “The fundamental prejudice of the enlightenment is the prejudice against prejudice itself.”²⁵ Furthermore, much of the thrust of Gadamer’s work is a sustained argument against a naïve “objectivity” that mistakenly imagines that the self of the interpreter and observer can simply be excluded or put aside in scientific efforts to reach truth. Rather than being a scientific truth, this is mere dogma. According to Gadamer, “Objectivism is an illusion.”²⁶ Instead, Gadamer strongly argued for the essential role of self-understanding in the interpretative process, a point that has been developed by others into a prescriptive interpretative method and pedagogy.²⁷

stood as inquiry into beliefs about ultimate purpose(s), and methodology. Their virtue is that a person’s beliefs in these areas can be constructed so as to cohere. When one’s own or another’s worldview coheres, it makes sense. The double virtue in this is that when someone is able to make sense of his/her own viewpoint, his/her own self-esteem and feeling of well-being are enhanced (and one’s natural feelings of discomfort when faced with viewpoints that conflict with one’s own become diminished indirectly). This enhancement of self-esteem, as Terror Management theorists inform us, is in turn a key to the virtue of not disparaging and not dehumanizing the other, and hence is a key to understanding them (Thomas A. Pyszczynski, Sheldon Solomon, Jeff Greenberg, *In the Wake of 9/11: The Psychology of Terror* [Washington, D.C.: American Psychological Association, 2003]).

25 Hans-Georg Gadamer, *Truth and Method*, eds. Garret Barden and John Cumming (New York: Crossroad, 1988), 239-40.

26 Hans-Georg Gadamer, “The Problem of Historical Consciousness,” trans. Jeff L. Close, in *Interpretive Social Science: A Second Look*, eds. Paul Rabinow and William M. Sullivan (Berkeley: University of California Press, 1987), 126.

27 For examples of how Gadamer’s work has been applied in the field of education, see David Blacker, “Education as the Normative Dimension of Philosophical Hermeneutics,” *Philosophy of Education*, 1993; https://www.academia.edu/1257855/Education_as_the_normative_dimension_of_philosophical_hermeneutics and <https://web.archive.org/web/20100706040009/http://>

This aspect of Gadamer’s hermeneutics could be termed a kind of subjective objectivity. Such a term was used by Ziauddin Sardar in 1985, although I have no idea whether or not Sardar considers himself to have been influenced by Gadamer. In describing Islamic science, Sardar was emphasizing the importance of individual selves of Muslims together with objectivity. He stated, “As such, Islamic science is *subjectively objective*; that is, it seeks subjective goals within an objective framework.” Some examples of such subjective but nevertheless normative goals are “seeking the pleasure of Allah, the interests of the community.”²⁸ Although what I am arguing in this paper could be similarly expressed as subjective objectivity (albeit in a somewhat different sense than that meant by Sardar), the main problem with such an expression, as I see it, is that it is a red-flag to many who regard the term as being associated with relativism, and hence the abandonment of truth or objectivity.

Consequently, rather than subjective objectivity, I prefer the term used by Jean Grondin, “hermeneutical objectivity.” Grondin, a biographer of Gadamer, stated, “One can dissociate illegitimate prejudices from those that are fruitful and can pave the way to a *hermeneutical objectivity* only

www.ed.uiuc.edu/EPS/PES-Yearbook/93_docs/Blacker.HTM; and Shaun Gallagher, *Hermeneutics and Education*, Albany, N.Y.: State University of New York Press, 1992. It also should be noted that Gadamer has had critics. Emilio Betti, E. D. Hirsch, and Habermas were the three most well-known strident critics of Gadamer. These were followed by Muslim scholars such as Fazlur Rahman and Aref Ali Nayed, who called attention to various problems in Gadamer’s philosophical hermeneutics, problems that seem to argue for the rejection of objectivity and the embrace of relativism. Fazlur Rahman—who in 1982 may have been the first Muslim scholar to discuss Gadamer—followed the criticism of Gadamer raised by Emilio Betti and regarded Gadamer as being “hopelessly subjective.” In discussing the processing of interpretation, like, E. D. Hirsch, they both rejected Gadamer’s emphasis on the need to take into account the totality of linguistic, socio-cultural and historical factors affecting the interpreter. In addition they took aim at what they considered to be Gadamer’s lack of emphasis on the need to understanding the intent of the author of a text. A more recent Muslim critic of Gadamer, who like Rahman supported Betti’s hermeneutics, is Aref Nayed. Nayed has noted that Gadamer never intended to advocate a method of interpretation. Although many scholars have advanced opinions to the contrary, to Nayed’s credit Gadamer’s emphasis is clearly on *describing* the human process of interpretation not on *prescribing*, Jeffrey Anthony Mitscherling, Tanya DiTommaso and Aref Nayed, *The Author’s Intention* (Lanham, MD: Lexington Books, 2004). The point is moot, however, because, in the very least, Gadamer has inspired numerous philosophers, social scientists and educators to argue for an integration of self-understanding into the interpretative process.

28 Ziauddin Sardar. *Islamic Futures: the Shape of Ideas to Come* (Chicago: Islamic Futures and Policy Studies, 1985), 175.

by critically taking into account [what Heidegger called] one's anticipations of the work."²⁹ In both Heidegger's and Gadamer's hermeneutics, such prejudgments determine one's understanding.³⁰ Grondin adds that Gadamer regarded distinguishing illegitimate from legitimate prejudices as being essential to the work of hermeneutics and to moving towards objectivity.³¹ Just as self-understanding for Gadamer is, as he himself put it, "Always on the way,"³² so too is an objectivity that integrates self-awareness, especially of one's own prejudgments. "Making evident the prejudices that orient understanding is not destined to destroy objectivity, but to make it possible."³³ So the task of the interpreter, in Grondin's view of Gadamer's thought, must be—together with a focus on the matter to be interpreted—"to formulate his or her own hermeneutical situation, taking into account prejudices, expectations, and questions that govern his or her research, [which is] the minimal condition of objectivity."³⁴ It is especially dangerous in the process of interpretation to imagine that oneself is free of prejudices. This, in Grondin's words, makes one "more blindly exposed to their [i.e., prejudices'] power. Prejudices will exercise their underground domination all the more strongly, and potentially distortingly, when denied or repressed."³⁵

In contrast to the flawed modernist view that science can proceed while simply trying to put one's prejudices aside or by ignoring them (a view that has unfortunately come to dominate the modern educational system), scholarly investigation and teaching should not only investigate the objects of our research, but at the same time should focus on the prejudices of the investigating subject and the understandings that he/she brings into the encounter with the object of his/her research, which in our present case is the task of constructing an Islamic ethic of technology. In an introduc-

29 Jean Grondin, "Hermeneutics and Relativism" in *Festivals of interpretation: essays on Hans-Georg Gadamer's work*, ed. Kathleen Wright (Albany, NY: State University of New York Press, 1991), 53-54.

30 Ibid., 61-62.

31 Ibid., 53-54.

32 Hans-Georg Gadamer, "Hermeneutics as practical philosophy" in *Reason in the Age of Science* (Cambridge: MIT Press, 1982), 103.

33 Grondin, "Hermeneutics and Relativism," 54.

34 Ibid.

35 Ibid.

tion to a compilation of key articles on Gadamer's work, the editor, echoing Grondin's view of Gadamer, writes "Because prejudices function as a necessary condition of historical understanding, Gadamer argues, they should be made the object of hermeneutic reflection."³⁶ Hence it makes perfect sense that in his "philosophical hermeneutics" Gadamer attached great importance to the perspective of not only the object, but also the subject, in creating understanding.

Building especially on Heidegger's work, Gadamer further developed the concept of the hermeneutical circle.³⁷ He characterized understanding as a "hermeneutical circle [which] is in fact a contentually fulfilled [*inhaltlich erfüllter*] circle, which joins the interpreter and his text into a unity within a processual whole."³⁸ Furthermore, he viewed the manner in which understanding occurs as follows: "Understanding always implies a preunderstanding which is in turn prefigured by the determinate tradition in which the interpreter lives and that shapes his prejudices."³⁹ Consequently, in developing a method of bridging science and technology with religion, it stands to reason that effort must be made, while studying "religion as object," to investigate what Gadamer termed the "preunderstanding" that the interpreter as subject is bringing to his/her encounter with it, which "preunderstanding" is itself formed by the "determinate tradition" that is the interpreter's context and that (from a psychological perspective) conditions and unconsciously shapes the thought of the interpreter. As Gadamer himself stated, "Every textual interpretation must begin then with the interpreter's reflection on the preconceptions which result from the hermeneutical situation in which he finds himself. He must legitimate them, that is, look for their origin and adequacy."⁴⁰

In discussing the interpreter's encounter with the object of his/her study, Gadamer expresses this whole/part dialectical relationship as a "fusion of horizons." One of the two fusing horizons is the interpreter's "horizon of understanding," which consists of his/her prejudices, history, and context, all of which inform his perspective and interpretive angle;

36 Kurt Muller-Vollmer, ed. *The Hermeneutics Reader* (New York: Continuum, 1988), 39.

37 Gadamer, "The Problem of Historical Consciousness," 129.

38 Gadamer, "The Problem of Historical Consciousness," 87.

39 Gadamer, *ibid.*

40 Gadamer, *ibid.*, 130.

and the other horizon is that of the object of his or her study, together with its historical context.⁴¹ To facilitate this understanding or “fusion of horizons,” scholars should both be open to the object of study and its horizon of understanding as well as shine the light of awareness on his/her own prejudices or horizon of understanding. David J. Blacker (a Professor of Philosophy of Education and Legal Studies at the University of Delaware) asserts that “Gadamer argues that... one must maintain — at least initially — an attitude of ‘openness’ to the other. But this does not mean that one can, or even ought to, strive to eliminate one’s own prejudices; on the contrary, Gadamer argues against the possibility or desirability of a neutral, nonprejudicial standpoint from which to ‘evaluate’ the other... The interpretive challenge is to maintain simultaneously the attitude of openness toward the text or person while also permitting, as best one can, one’s own prejudices to rise to the surface so as to ‘put them at play.’”⁴²

In contrast to Gadamer’s critics (noted previously), numerous scholars, among whom are Muslims such as Osman Bilén,⁴³ T. J. Winter,⁴⁴ and Reza Shah-Kazemi,⁴⁵ do not see a necessary conflict between Gadamer

41 *The Encyclopaedia of Educational Philosophy and Theory*, s.v. “Gadamer and the Philosophy of Education” (Pádraig Hogan), 2000, in https://web.archive.org/web/20120119004025/http://www.ffst.hr/ENCYCLOPAEDIA/doku.php?id=gadamer_and_philosophy_of_education. See also *Encyclopedia of Educational Philosophy and Theory*, s.v. “Gadamer and the Philosophy of Education” (Pádraig Hogan) (Singapore: Springer, 2015), https://link.springer.com/referenceworkentry/10.1007/978-981-287-532-7_171-1. Note that although the author and title of both these articles are the same, they are in fact different articles, with the more recent of the two being more substantial and including more recent references.

42 David Blacker, “Education as the normative dimension of philosophical hermeneutics” (paper presented at the Annual Meeting of the Philosophy of Education Society, New Orleans, LA., 1993). Blacker is a professor of Philosophy of Education and Legal Studies at the University of Delaware. http://www.academia.edu/1257855/Education_as_the_normative_dimension_of_philosophical_hermeneutics.

43 Osman Bilén, *The Historicity of Understanding and the Problem of Relativism in Gadamer’s Philosophical Hermeneutics* (Washington, D.C.: Council for Research in Values and Philosophy, 2001). Bilén refutes the charge of relativism leveled against Gadamer by some critics.

44 Tim Winter, “Qur’anic Reasoning as an academic practice,” *Modern Theology*, July 2006). Winter mines Gadamer for various insights in this paper, among which is Gadamer’s understanding of interpretation as a “three-way activity” between the interpreter’s understanding (*verstehen*) of a text and the understanding (*verständigung*) of one interpreter with another interpreter. <http://www.interfaith.cam.ac.uk/resources/lecturespapersand-speeches/quranicreasoningasacademicpractice>.

45 Reza Shah-Kazemi, *The Other in the Light of the One* (Cambridge, UK: Islamic Texts Society, 2006), 48-50. Shah-Kazemi compares and contrasts Gadamer’s approach to interpretation with a Sufi approach.

er and objectivity. Similarly, I argue that Gadamer can assist us in refining our understanding of religious and scientific objective methodology by insights such as “The *wirkungsgeschichtliches Bewusstsein* (consciousness of effective history) seeks to be aware of its prejudgments and to control its own preunderstanding; and thus it does away with that naïve objectivism that falsifies ... the positivistic theory of science.”⁴⁶

Hence, an alternative to naïve objectivism, as we construct an Islamic ethics of technology, is the methodological pursuit of a hermeneutically informed objectivity which, like self-understanding, according to Gadamer, is “always on-the-way.” Furthermore, as I will subsequently argue in my discussion of the affective “A” component of my ABC approach (in contrast to a Stoic and Enlightenment influenced paradigm of intellectual cultivation, which maintains that emotions should be ignored and suppressed in the classroom and scholarly endeavors), the methodological pursuit of a hermeneutically informed objectivity must include awareness of emotions and their cognitive dimension.⁴⁷ Naïve objectivism is naïve because it fails to recognize the unconscious and distorting influence of prejudgments, preunderstandings, and emotions (in spite of our best attempts to remain unbiased and unemotional). Consequently, to the degree that we can become aware of our prejudgments, preunderstandings, and emotions about the normative role of technology in Muslim cultures, we will be decreasing our distorted understanding and increasing our objectivity. Although absolute objectivity is unreachable, we can and should strive for the relative objectivity that hermeneutical objectivity can produce.

Supporting this is a consensus in contemporary Western psychology that most, if not all, human behavior and thought is guided, influenced, or distorted by unconscious emotions and motives. This insight was crucial for the Pulitzer Prize winning work of Ernst Becker,⁴⁸ which

46 Hans-Georg Gadamer, *Philosophical Hermeneutics* (Berkeley and Los Angeles: University of California Press, 1976), 27.

47 Ingrid Schleibler, *Gadamer: between Heidegger and Habermas* (Oxford: Rowman and Littlefield, 2000), 162-63. Schleibler argues that Gadamer’s conception of humans as belonging to a part of nature and not being separate from it provides a basis for seeing in Gadamer the potential for overcoming the dominant understanding of the separation of reason and emotions. See also Susan James, *Passion and Action: The Emotions in Seventeenth Century Philosophy* (Oxford: Clarendon, 1997).

48 Ernst Becker, *The Denial of Death* (New York: Free Press, 1973).

was subsequently developed by social psychologists into what is now called “Terror Management Theory (TMT).⁴⁹ As Greenberg, Solomon, and Arndt note, psychological research specifically in the areas of “cognitive dissonance, motivated reasoning, terror management, and goal priming . . . demonstrates that human behavior is indeed often if not always guided by motives operating outside conscious awareness.”⁵⁰ Hatred, for example—as Willard Gaylin, a noted psychiatrist, states—is generally an unconscious misdirection and outward projection of inner turmoil, which then takes the form of antagonism directed against someone or some entity in the world. “Hatred is rarely a rational response to a real threat or affront. Acts of hatred represent displacements of an internal conflict onto external sources....Displacement is an essential feature in the process of scapegoating....It [i.e. displacement] is a central mechanism of bigotry and hatred.”⁵¹

Moreover, such unconscious motives, especially when we are ignorant of them, often lead us to act in ways that are destructive. Hence the methodological pursuit of hermeneutically informed objectivity needs to be supplemented by emotional awareness, which can facilitate control of emotions without going as far as the Stoic rejection of emotions. We can certainly recognize the inherent danger especially in powerful unconscious emotions such as anger; a danger that has been pointed out by western psychologists and which is underscored in both the Qur’an and *ḥadīth*. “The self strongly commands one to evil” (*Inna n-naḥḥa la-ammāratun bi al-sū’*) (Qur’an, Sūrat Yūsuf 12:53). Also, as the Prophet ﷺ is reported to have said, “Your worst enemy is your self which is between your two sides.”⁵² Especially when people are under stress, unconscious egotisti-

49 Thomas A. Pyszczynski, Sheldon Solomon, Jeff Greenberg, *In the Wake of 9/11: The Psychology of Terror* (Washington, D.C.: American Psychological Association, 2003).

50 Jeff Greenberg, Sheldon Solomon, and Jamie Arndt, “A Basic but Uniquely Human Motivation: terror management,” in James Y. Shah and Wendy L. Gardner, eds., *Handbook of Motivation Science* (New York: Guilford Press, 2007), 114, <http://tinyurl.com/5hqdam> (Google Books, 23 March 2015) which includes citations to a number of studies that point to the unconscious motives that influence us.

51 Willard Gaylin, *Hatred: the Psychological Descent into Violence* (New York: Public Affairs, 2003), 90, 100-101], <http://tinyurl.com/62mqbg> (accessed 23 March 2015). Gaylin uses the Freudian term “displacement” rather than a similar term “projection.”

52 A’da ‘adūwika nafsuka allatī bayna janbayka.
ابن عَبَّاسٍ رَضِيَ اللهُ عَنْهُمَا قَالَ: قَالَ رَسُولُ اللهِ صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ: «أَعْدَى عَدُوِّكَ نَفْسُكَ الَّتِي بَيْنَ جَنْبَيْكَ»
The chain of transmission (*isnād*) for this *ḥadīth* was included in Bayhaqī (d.458/1065-66), *Kitāb al-Zuhd al-kabīr* (Beirut: Dār al-Jinān, 1987), #343, 156-67. Al-Ajlūnī noted

cal motives—impelled by “the commanding self” (*al-naḥḥa al-ammāra*)—will dictate and govern one’s actions. In such situations, people’s unwise reactions are varied: for example, concerning the emotion of anger, at one end of the spectrum people sometimes unleash anger in ways that are harmful to both others and themselves. In this regard, the Prophet ﷺ, underscoring his point by repeating himself a number of times, said, “Do not get angry” (*la taḥḥadab*)!⁵³ At the other end of the spectrum, people sometimes go way beyond this behavioral (*‘amālī*) guideline of refraining from reactively unloading their anger on someone into the other extreme of numbing their angry feelings and blinding their minds to the situations that produced their angry feelings. Without a doubt, numerous Muslim parents every day must vacillate between anger and numbed frustration when they see that their children have spent days lost in the stupor of some computer game. Ecologists and Muslims sickened by the often toxic urban air, as societies rush headlong into the pursuit of the latest industrial technology, certainly face frequent eruptions of anger and waves of hopelessness. Fortunately, informed by hermeneutical understanding, we and our leaders are freed from the need to Stoically extirpate such feelings, on the one hand, as well as the need to adopt ill-conceived solutions frantically, on the other. With such freedom granted by our hermeneutical understanding, now before proceeding into the fray of constructing and implementing an Islamic ethic for technology, we can shine the light of understanding to the contexts in which our feelings, our prejudgments, and our existing attitudes make sense. Of course, simply making sense of our feelings and attitudes does not necessarily mean that we assume that they are even

that its *isnād* in Bayhaqī was “weak.” See Ismā’īl b. Muḥammad al-Ajlūnī, *Kaḥf al-khaḥfā’ wa-muzīl al-ilbās* (Beirut: Mu’assasat al-Risāla, 1979), 1: 160, #412. Although Imām al-Ghazālī included it in the *Iḥyā’ ulūm al-dīn*, al-‘Irāqī noted that one of Bayhaqī’s transmitters of it was among the fabricators of *ḥadīth* (waḥḍā’īn). See Zayn al-Dīn al-‘Irāqī, *al-Mughnī ‘an ḥaml al-asfār*, in *Iḥyā’ ulūm al-dīn* (Beirut: Dār al-Ma’rifā, 1982, 3: 4 marg.).

53 It was narrated from Abū Hurayra that a man said to the Prophet, “Give me advice!” The Prophet answered, “Do not get angry!” Then he [i.e., the man] repeated his request a few times. And [each time] he [i.e., the Prophet] replied, “Do not get angry!” *Anna rajulan qāla lil-nabī: ‘Awḥinī,’ qāla ‘lā taḥḥadab’ fa-raddada mirāran, qāla: ‘lā taḥḥadab.’*
عَنْ أَبِي هُرَيْرَةَ رَضِيَ اللهُ عَنْهُ، أَنَّ رَجُلًا قَالَ لِلنَّبِيِّ صَلَّى اللهُ عَلَيْهِ وَسَلَّمَ: «أَوْصِنِي، قَالَ: «لَا تُغَضَبْ» فَرَدَّدَ مَرَارًا، قَالَ: «لَا تُغَضَبْ»
Al-Bukhārī, *Ṣaḥīḥ al-Bukhārī* (Liechtenstein: Thesaurus Islamicus Foundation, 2000), 3:1247, kitāb al-ādāb, bāb 77, *ḥadīth* #6185

relatively objectively true. Understanding ourselves or others also does not necessarily mean that we should condone what we and others feel and do. Rather, the two-fold consequence of hermeneutical understanding is that by bringing our emotions and attitudes into the daylight of understanding, the many feelings and prejudices that were churning in the darkness of our unconscious, first of all, will have less power to distort unconsciously our thoughts and actions; and second, now *informed by*, rather than simply *driven by* such unconscious feelings and prejudicial attitudes, we will be better able to sift through them, leaving behind maladaptive feelings and prejudices, while utilizing our beneficial feelings and attitudes as we pursue a hermeneutically informed Islamic ethic of technology in the service of understanding and nurturing healthier societies.

In sum, arguments of Gadamer and his supporters, scientific research of Western psychologists, and Islamic primary sources point to the conclusion that the cognitive aspect of an Islamic ethic of technology can move toward hermeneutical objectivity by incorporating a Gadamerian hermeneutical approach to integrating awareness (in our contexts) of our selves' ideas, beliefs, and prejudices as well as by cultivating awareness of the largely unconscious impact of emotions. In this manner such an approach will assist in building a bridge between science and technology, on the one hand, and religion, on the other.

Returning now to the affective "A" component of developing an Islamic ethics of technology, scientific evidence comes principally from neuroscience and the psychology of intelligence. Arguably the leading neuroscientists writing about emotions and cognition has been that of Antonio Damasio, especially in his 1994 book *Descartes' Error: Emotion, Reason, and the Human Brain*. There he brought together many years of research by neuroscientists that clearly demonstrates that feeling and thinking go hand in hand.⁵⁴ Such research has gone a long way towards dispelling the Stoic paradigmatic myth that emotions should have no place in education and have helped to buttress the scientific claims of psychologists of intel-

54 Antonio Damasio, *Descartes' Error: Emotion, Reason, and the Human Brain*, Putnam, 1994; revised Penguin edition, 2005. He followed this book by a number of others related to emotions and consciousness: *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, (Orlando: Harcourt, 1999); *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (Orlando: Harcourt, 2003); *Self Comes to Mind: Constructing the Conscious Brain* (New York: Pantheon, 2010).

ligence. Consequently, such research can prove to be useful in justifying the need for integrating emotions into the development of an Islamic ethics of technological education.

In the field of the psychology of intelligence, researchers of emotional intelligence, led by Salovey and Mayer, have mapped out ways in which awareness of emotions can enhance intelligence. This emotional dimension of intelligence is now called emotional intelligence (EI), which in Turkish has commonly been translated as *duygusal zeka*.⁵⁵ More specifically, the leading researchers of EI define it as the capacity "to carry out sophisticated information processing about emotions and emotion-relevant stimuli and to use this information as a guide to thinking and behavior."⁵⁶

Concerning emotional intelligence, known as EI (or sometimes EQ), this research, especially in the "abilities" model of EI, has been led by Peter Salovey of Yale University and John Mayer of the University of New Hampshire, since 1990. Although "emotional intelligence" did not become the focus of scientific research until the work of Salovey and Mayer, in 1983 the renown Harvard psychologist, Howard Gardner, had clearly demonstrated the need for abandoning the concept of one intelligence and replacing it with the concept of multiple intelligences.⁵⁷

From the time of the original work of Salovey and Mayer, EI has gone from being simply an important area of research in intelligence and emotions to a widely popular topic, which popularity was due to the publication of Daniel Goleman's best-selling book.⁵⁸ In response to various criticisms and advances in research, the definition has undergone a number of changes and has been developed in variety of ways by different researchers. The primary criticism of EI has been that it is not really a form of intelligence; but it is rather a personality trait. One critic, Edwin A. Locke (a leading industrial-organizational psychologist and devotee of Ayn Rand), argued that "the concept of EI has now become so broad and

55 Daniel Goleman, *Duygusal zeka neden IQ'dan daha önemlidir*, translated by Banu Seçkin Yüksel (İstanbul: Varlık Yayınları, 2002). In Arabic "emotional intelligence" is translated as *al-dhakā' al-'ātifi*; instead, I would suggest *al-'aql al-hālī*.

56 John D. Mayer, Peter Salovey, and David R. Caruso, "Emotional Intelligence: New Ability or Eclectic Traits," *American Psychologist* 63, no. 6 September (2008): 503.

57 Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, [1983] 2011).

58 Daniel Goleman, *Emotional Intelligence: why it can matter more than IQ* (New York: Bantam Books, 1995).

the components so variegated that no one concept could possibly encompass or integrate all of them.”⁵⁹ Similarly, as Mayer, Salovey, and Caruso noted in a response, Locke asserted that “EI is an invalid concept in part because it is defined in too many ways.”⁶⁰

In order to refute the criticism, Salovey, Mayer, and Caruso have found it necessary to differentiate clearly their “ability model” from the “mixed models” of Goleman and Bar-on (among others). Salovey and Mayer maintain that three problems with the mixed models is as follows: first, they include “an eclectic mix of traits, many dispositional, such as happiness, self-esteem, [and] optimism” in addition to abilities (Mayer, Salovey, and Caruso, *ibid.*, p. 503); second, many qualities of mixed models, such as self-esteem, “do not directly concern emotion, intelligence, or their intersection;” and third, this has led to confusion, which has weakened the case for the legitimacy of EI as an empirical construct (*ibid.*). Consequently, since Mayer, Salovey, and Caruso’s ability model of EI is distinct from the mixed models; the criticism of the mixed-models of EI is not applicable to their ability model. Furthermore, the mixed models of EI, because they include personality traits and not just abilities, go beyond what appears to be legitimately termed an “intelligence.” Nevertheless, the mixed models have found acceptance in the business community, among educators, and to some degree among psychologists —because research does confirm them both as assessment tools and guides to enhancing performance.⁶¹ Because Salovey and Meyer have successfully differentiated their ability model from the mixed models and have demonstrated its soundness through numerous empirical studies, the ability model of EI is gaining scientific and mainstream institutional acceptance. Among the evidence for this is that in the Fall of 2008, Salovey was appointed as the Provost of Yale University and in 2013 became Yale’s president.

59 Edwin A. Locke, “Why Emotional Intelligence Is an Invalid Concept,” *Journal of Organizational Behavior* 26.4 (2005): 425-31.

60 John D. Mayer, Peter Salovey, and David Caruso, “Emotional Intelligence: New Ability or Eclectic Traits,” *American Psychologist* 63, no. 6 September (2008): 503. Other criticisms can be found in Kevin R. Murphy, ed. *A critique of emotional intelligence: What are the Problems and How Can They Be Fixed?* Mahwah, N.J.: Lawrence Erlbaum Associates, 2006; see also the critiques in Gerald Matthews, Moshe Zeidner, Richard D. Roberts, *Emotional Intelligence: Science and Myth* (Cambridge, Mass: MIT Press, 2002).

61 Cary Cherniss, Melissa Extejn, Daniel Goleman, Roger P. Weissberg, “Emotional Intelligence: What Does the Research Really Indicate?” *Educational Psychologist* 41(4), 2006, 239-245].

One final problem in integrating emotional intelligence enhancement into an Islamic ethics of technology is that in addition to there being various definitions of emotional intelligence, there are different understandings of the term “emotion” and its relationship to related terms such as affective experience, mood, affective trait, and feeling. Robert Emmons, one of the leading researchers in “positive psychology,” states that the field of affective science (i.e., the study of emotions and emotion related phenomena) is in the process of standardizing its terminology. He follows E. L. Rosenberg, who regards common “affective experience” as a hierarchy consisting of three main levels (beginning with the top of the hierarchy): “affective traits, moods, and emotions.” Specifically, Rosenberg defines emotions as “acute, intense, and typically brief psychophysiological changes that result from a response to a meaningful situation in one’s environment.”⁶² Antonio Damasio, arguably one of the leading neuroscientists researching emotions, differentiates feelings from emotions by defining emotions, on the one hand, as the body’s physical signals as it responds to stimuli outside of it; feelings, on the other hand, are the product of our brain’s interpretations of emotions. “During the past 30 years, Antonio R. Damasio has strived to show that feelings are what arise as the brain interprets emotions, which are themselves purely physical signals of the body reacting to external stimuli.”⁶³ He defines a feeling as “That process of continuous monitoring, that experience of what your body is doing while thoughts about specific contents roll by, is the essence what I call a feeling.”⁶⁴ In contrast, he defines an emotion as “a collection of changes in body state connected to particular mental images that have activated a specific brain system.” Furthermore, he states that “the essence of feeling an emotion is the experience of such changes in juxtaposition to the mental images that initiated the cycle.”⁶⁵

62 Robert Emmons, “Sacred Emotions,” in *Soul, Psyche, Brain: New Directions in the Study of Religion and Brain-Mind Science*, ed. Kelly Bulkeley (New York: Palgrave Macmillan, 2005), 94.

63 Manuela Lenzen, “Feeling our emotions” [An interview with Antonio Damasio]. *Scientific American Mind* 16(1) (2005), 14–15, <https://www.scientificamerican.com/article/feeling-our-emotions>.

64 Antonio Damasio, *Descartes’ Error: Emotion, Reason, and the Human Brain* (G. P. Putnam’s Sons: 1994; New York: Penguin, 2005), 145.

65 *Ibid.*

So now that we have discussed a number of problems as well as foundational definitions for anyone interested in integrating emotional intelligence enhancement into an Islamic ethics of technology, we can proceed to explore in greater depth the four abilities of Salovey, Mayer, and Caruso's ability model of EI. As noted at the outset of this paper, Mayer and Salovey define EI as the "set of abilities" (that people have developed to varying degrees) that enable them "to carry out sophisticated information processing about emotions and emotion-relevant stimuli and to use this information as a guide to thinking and behavior."⁶⁶ Their original instrument for testing their four-branched ability model of EI was called the Multifactor Emotional Intelligence Scale (MEIS). In 1999, they revised it substantially, calling it the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT).⁶⁷ Currently they define four main branches of this model, from lowest to highest complexity⁶⁸ and with each of the names of these branches denoting a number of qualities.⁶⁹ The four branches are as follows: (1) Perceiving emotions accurately in oneself and other;⁷⁰ (2) Using emotions to facilitate thinking;⁷¹ (3) Understanding emotions, emotional language, and the signals conveyed by emotions; and (4) Managing emotions to attain specific goals.

66 John D. Mayer, Peter Salovey, and David R. Caruso, "Emotional Intelligence: New Ability or Eclectic Traits," *American Psychologist* 63, no. 6 September (2008): 503.

67 *Ibid.*, 507-512.

68 *Ibid.*, 507.

69 John D. Mayer and Peter Salovey, "What is Emotional Intelligence?" in Peter Salovey, ed. *Emotional Development and Emotional Intelligence: Educational Implications*, Perseus Books, 1997, reprinted in *Emotional Intelligence: Key Readings on the Mayer and Salovey Model* (Port Chester, NY: Dude Publishing, 2004) 35-40. For the clearest exposition of the four principal abilities of EI of which I am aware, see Peter Salovey, Brian T. Detweiler-Bedell, Jerusha B. Detweiler-Bedell, and John D. Mayer, "Emotional Intelligence," in *Handbook of Emotions*, eds. Michael Lewis, Jeannette M. Haviland-Jones, and Lisa Feldman Barrett (New York: The Guilford Press, 2008), 535-38.

70 It is important to remember that emotions contain and can convey useful information; and that "Emotional Intelligence theory explicates the cognitive and emotional mechanisms that process emotional information." Emotional awareness enables us to begin to process, sift through, and at some point, ideally, to utilize the information about engagement with the world (Marc A. Brackett and Susan E. Rivers, Sara Shiffman, Nicole Lerner and Peter Salovey, "Relating Emotional Abilities to Social Functioning: a comparison of self-report and performance measures of emotional intelligence," *Journal of Personality and Social Psychology* 91, no. 4 (2006): 780).

71 Previously, in 1997, Mayer and Salovey termed this second ability "emotional facilitation of thinking" (Mayer and Salovey, "What is Emotional Intelligence?", 12).

Because the fourth of these branches can easily be misunderstood and because, if properly understood, it has the potential to give rise to significant insights, it needs clarification. "Managing emotions" is the "ability to stay open to feelings, both those that are pleasant and those that are unpleasant."⁷² In contrast to someone with relatively low EI on the scale of "managing emotions" (who will consciously or unconsciously seek to avoid unpleasant emotions and be unaware that s/he can relate to such emotions with openness), someone with relatively high EI on this scale realizes that s/he can choose to respond with openness even to one's own unpleasant emotions or s/he can choose not to experience them. This highest or most complex branch of EI necessitates that (in the words of Mayer and Salovey) "[one's own] emotional reactions must be tolerated—even welcomed—when they occur, somewhat independently of how pleasant or unpleasant they are. Only if a person attends to feelings can something be learned about them."⁷³ In contrast to the rationalist's fear (that by staying open to emotions reason will become overwhelmed), staying open to a feeling in fact produces freedom from being dominated by emotions and from the ego's distortions deriving from its habitual attempts to avoid uncomfortable emotions, such as the uncomfortable emotions that arise when encountering viewpoints that conflict with one's own (viewpoints that evoke the primitive "fear of the other" studied by psychologists working with Terror Management Theory, which viewpoints and feelings commonly occur in the course of sustained inter-civilizational or intercultural encounters).

While Salovey and Meyer have spent the bulk of their research on identifying and measuring emotional intelligence and its component abilities, Leslie Greenberg, a prominent Canadian psychologist, has for years pursued empirically validated methods of enhancing what amounts to EI. Although originally he developed what he termed "Emotion focused therapy" (EFT) and "Emotion Coaching" independently of Salovey and Meyer, his work of late has been converging with theirs.⁷⁴ The focus of

72 *Ibid.*, 11.

73 *Ibid.*, 13-14.

74 Evidence for the convergence of Greenberg's EFT with the work of Salovey and Meyer is that Salovey is among the most frequently cited authors in *Emotion Focused Therapy*, being cited seven times (without criticism). Of the numerous authorities whom Greenberg cites, only two were cited more than Salovey (Leslie Greenberg, *Emotion Focused Therapy: Coaching Clients to Work Through Their Feelings* [2002]: 317-8).

EFT involves a process consisting of five principles to be cultivated in the following order: (1) increasing awareness of emotion, (2) expressing emotion, (3) enhancing emotion regulation,⁷⁵ (4) reflecting on emotion, and (5) transforming emotion.⁷⁶

Three possible objections to applying EFT (and any other methods of enhancing emotional intelligence) in higher educational classrooms are first, in the original design of EFT the psychotherapist is the key to its implementation; second, few professors are trained psychotherapists; and third, some students may feel that even filling in an emotion inventory and handing it in to the professor may constitute an invasion of their privacy. Nevertheless, Greenberg's understanding of the therapist as an emotional coach, who even gives what he calls homework, can be developed into the role of the teacher and professor as an emotional educator. Early studies by colleagues of Salovey indicate that EI can be enhanced through appropriate emotional education; and they are currently in the midst of large-scale research testing the efficacy of EI education in schools.⁷⁷ Consequently, the future looks promising, not simply for enhancing emotional education in the US, but for developing an affectively informed Islamic ethics of technology, and also for the possibility of integrating emotional education into classes on Islam in secular universities and even in Islamic education curriculum in Islamic schools and seminaries.⁷⁸

75 According to Greenberg, not all emotions need regulation. Undercontrolled secondary emotions and maladaptive emotions are what need to be regulated. A key to emotional regulation, for Greenberg, is developing the ability "to tolerate emotion and to self-soothe automatically" (emphasis from the author).

76 Leslie S. Greenberg, "The Clinical Application of Emotion in Psychotherapy," in *Handbook of Emotions*, ed. Michael Lewis, Jeannette M. Haviland-Jones, and Lisa Feldman Barrett (New York: The Guilford Press, 2008), 90-97. After briefly noting each of the five steps of emotion coaching, Greenberg discussed them in detail. A few years earlier he had identified eight steps (Leslie S. Greenberg, *Emotion-Focused Therapy: Coaching Clients to Work Through Their Feelings* [Washington, DC: American Psychological Association, 2002], 85-99).

77 L. Nathanson, S. E. Rivers, L.M. Flynn, and M.A. Brackett, "Creating Emotionally Intelligent Schools With RULER," *Emotion Review* 8, no. 4 (October 2016): 1-6. RULER is an acronym that stands for "(R)ecognizing emotion in the self and others, (U)nderstanding the causes and consequences of emotions, (L)abeling emotions with a diverse and accurate vocabulary, (E)xpressing emotions constructively across contexts, and (R)egulating emotions effectively," *ibid.*, 4.

78 One Islamic seminary to institute classes in emotional intelligence as well as a certificate program in it has been the Madina Institute (Duluth, GA, USA), headed by Shaykh Muhammad bin Yahya al-Ninowy, <http://www.madinainstituteusa.org/nonviolence/eq/>.

Fortunately, Islamic cultures have their own rich resources for enhancing emotional intelligence. Nevertheless, such resources have not been adequately mined, especially in the 20th century, in spite of the strong presence of emotionally intelligent concepts and practices in the teachings of figures such as Mevlana Celaluddin Rumi. Hence, we can propose possible Sufi-Islamic methods of cultivating EI (methods that can be tested), suggesting a pedagogy along the lines of Greenberg's model of EFT but using Islamic concepts (drawn from the Qur'an, the *Sunnah*, and Sufism) for enhancing EI and thereby integrating emotional intelligence enhancement into an Islamic ethics of technology.

In looking at how we can correlate Islamic concepts with the paradigm of the process of EFT developed by Greenberg, we see that the first step of the process "increasing awareness of emotion" involves gaining self-awareness in general and awareness of one's emotions in particular. Greenberg elaborates, stating that "increasing awareness of emotion," enhances people's abilities to "approach, tolerate, and accept their emotions" rather than avoiding them.⁷⁹ The problem is that people habitually try to avoid unpleasant feelings. As Greenberg states, people "often try to regulate their [disturbing] emotions by trying not to feel whatever it is they feel. This is not helpful in the long run." Hence, one of the first functions of what Greenberg calls an "emotional coach" is to coach people to identify, be aware of, and experience an emotion.

This corresponds to a central principle in Islam, but especially in Sufism, which is "cultivating awareness of self" (*ma'rifat al-nafs*). We see this in particular in the well-known saying repeated throughout Sufi texts: "Whoever knows one's self, knows one's Lord-Sustainer."⁸⁰ This was further elaborated by Sufis such as Ahmad al-Rifā'ī, who took it to mean "One who realizes his self is passing away (*bil-fanā*), realizes that His Lord-Sustainer remains (*bil-baqā*)."⁸¹

79 Greenberg, "The Clinical Application of Emotion in Psychotherapy," in *Handbook of Emotions*, 90.

80 *Man 'arafa nafsahu fa-qad 'arafa rabbahu*. al-'Ajlūnī noted, "Ibn Taymīya said that was fabricated; that al-Nawawī regarded it as being without a firm foundation (*laysa bi-thābit*); and that it was reported as having been said by Yaḥyá b. Mu'ādh al-Rāzī. In spite of such criticisms, al-'Ajlūnī noted one report in which Ibn 'Arabī stated, "This *ḥadīth*, if it is not authentic by way of its chain of narrators, it is [nevertheless] authentic by way of unveiling (*kashf*) (Al-'Ajlūnī, *Kashf al-khafā*, 343-44).

81 Ahmad b. 'Alī al-Rifā'ī, *Ḥālat ahl al-ḥaqīqa ma'a Allāh ta'ālā*, ed. Ahmad Farīd al-Mazīdī (Beirut: Dār al-Kutub al-'Ilmīya, 2004), 60.

Awareness of self and emotions occurs particularly in the process of what is called in Islam “remembrance of Allāh” (*dhikrullāh* or *zikir*). Especially in the beginning as a result of practicing “remembrance” as directed by an experienced shaykh, paradoxically one will become aware of one’s self, one’s thoughts, and one’s emotions. When dhikr is done with the awareness that the Divine name “Allāh” is the all-inclusive name of God (*al-ism al-jāmi*), then awareness deepens and each emotion one feels is not simply an emotion; rather it is regarded as a “state” (*ḥāl*) from God, who is regarded as the “transformer of states” (*muḥawwil al-aḥwāl*). Similarly, one’s emotional awareness will increase when *dhikr* is done with the awareness that God, as the “Lord-Sustainer of all the worlds,” (*rabb il-‘alamīn*) is the sustainer (*murabbī*) of every state. In particular, for Muslims grappling with the issues of technology—issues that may appear at times to be in conflict with Islamic values—it is essential that both scholars and their students face their uncomfortable emotions with as much emotional awareness and intelligence that Islamic cultural resources, such as *dhikr*, will enable them to bring to bear.

Since the second and third steps in EFT are closely interrelated, we will discuss them together. The second step in EFT is emotional arousal and expression; while the third is emotional regulation, especially the regulation of negative or maladaptive emotions. In EFT, the major key to both of these is the nurturing relationship with one’s emotion coach or trainer. Having been apprised of this, today’s scholars must realize that they are not merely transmitters of information and technology to their students. In particular scholars of the Muslim world are also responsible to face to their own emotions (and those of their students’) in an emotionally intelligent fashion (by means of Islamic and Western scientific resources) as they grapple with constructing an ethics of technology. In this way they will model for their students how their students, too, can face the various issues and emotions evoked by technology. In particular, as Greenberg states, “The emotional validation and empathy of the therapist” is what helps people “to learn to self-soothe and restore emotional equilibrium.”⁸² In Islam, emotional arousal and expression, which is the second step, is facilitated in a number of ways, such as the following: First of all, through

82 Greenberg, “The Clinical Application of Emotion in Psychotherapy,” in *Handbook of Emotions*, 91.

sincerity (*al-ṣidq*) in canonical and supplicatory prayers and in *dhikr*. This is when one stands before God and prays with *iḥsān*, as the Prophet ﷺ said in an authentic *ḥadīth* when defining *iḥsān* (which can literally be translated as the “affirmation of beautiful virtue”), “*Iḥsān* is worshipping God as if you are seeing Him; and if you are not seeing Him, then [at least realize that] He is seeing you.”⁸³ Similarly, this arousal of emotion can come about by praying as the companion of the Prophet ﷺ, ‘Abdallāh b. ‘Amr b. al-‘Ās (65 AH / 684 CE), recommended, “Plant for your world as if you are going to live forever, but act with regard to the Hereafter as if you are going to die tomorrow.”⁸⁴ In other words, one’s eternal spiritual well-being depends upon one’s spiritual practice right now in any given moment. Second, emotions are aroused and expressed by reading and listening to Qur’an and stories about the Prophet, practice of Sufi *awrād* (litanies), in addition by participating in *samā’* (sema) (Sufi sessions of meditation to poems of praise of the Prophet or Sufi poems, which often deal with emotionally painful themes such as the separation from a lover from his/her beloved). Such sessions are well-known for arousing many emotions often to the point of tears and involuntary screams.

The third step in EFT, “regulating emotions,” in Islam is commonly accomplished by following the *sharī‘a* (Islamic law, including regulations governing conduct), *sunnah* (the example of how the Prophet acted), and *adab* (manners) of Sufism. These all encourage Muslims and Sufis to restrict expression of hurtful and maladaptive emotions in particular. Fasting is especially useful in this regard. While today’s relationship with technology may at times seem depersonalizing or at odds with religious values, scholars need to resist the temptation to express their frustration in maladaptive ways. The key to this is just as in EFT, where the 2nd and 3rd steps emphasize the importance of the relationship between the emotion coach or therapist and the client, the example of the teacher in a person-to-person transmission has always been an important key to transformation

83 Al-Bukhārī, *Ṣaḥīḥ al-Bukhārī*, Kitāb al-tafsīr. فَإِنْ لَمْ تُكُنْ تَرَاهُ فَإِنَّهُ يَرَاكَ

84 Ibn Qutayba al-Dīnawārī (d. 276/889), *Gharīb al-ḥadīth*, ed. ‘Abdallāh al-Jabūrī (Baghdad: Maṭba‘at al-‘Ānī, 1397/1976-77 and al-Maktabah al-shāmilah) 1: 81 and islampost.com, <https://tinyurl.com/jwb9n89>, both of which contain the chain of transmission of this report; and Ibn Athīr, *al-Nihāya fī gharīb al-ḥadīth wa al-athar*, ed. Tāhīr Aḥmad al-Zāwī and Maḥmūd Muḥammad al-Ṭanāḥī (Beirut: al-Maktaba al-‘Ilmīya, n.d.), 1: 359; Ibn Athīr’s version lacks an *isnād*. أَخْرَجْتُ لَدُنْيَاكَ كَأَنَّكَ تَعِيشُ أَبَدًا، وَاعْمَلْ لِأَخْرَجْتَكَ كَأَنَّكَ تَمُوتُ غَدًا

in general and in evoking and controlling emotions in particular. Traditionally one learned to approach emotions by being in the presence of elders (literally “shaykhs”) in the community. The prime example of this was the Prophet Muhammad ﷺ, —since he lived, married, and worked in the world like ordinary people—whose life is, among other things, a record of the richness of human emotions. Sufis of course have regarded their shaykhs as living examples of the Prophet’s character. Today, Greenberg directs emotion coaches, in particular circumstances, to evoke, express, and control emotions. Similarly, educators in general—by learning how to both express and control their own feelings and thereby to enhance their EI in general—can build on Greenberg’s examples; and in the case of Muslim educators or with Muslim students, one can build on the example of the Prophet in order to facilitate the enhancement of their own EI and the EI of others. In an Islamic pedagogy for enhancing EI while facing the problems of a technologically dominated society and the emotions such problems evoke, as I have indicated, the trained Muslim emotional educator’s ideally greater degree of empathy, emotional awareness, and ability to self-nurture will naturally create a fertile and safe space for the arousal and emergence of students’ habitually suppressed emotions and will give rise to empathy, which will help to teach self-nurturing in his/her students. This self-soothing or self-nurturing, by diminishing the intensity of maladaptive emotions, will help them to regulate themselves. Even though it may be obvious to Muslim scholars, it bears remembering that God instructs Muslims “Do not despair of the mercy of God!” (*lā taqnaṭū min raḥmatillāh*) (Qur’an, Sūrat al-Zumar 39:53)⁸⁵ and “My mercy encompasses everything!” (*wa-raḥmatī wasi’at kulla shay’in*) (Qur’an, Sūrat al-A’rāf 7:156).⁸⁶ Reminding oneself and one’s students of such *āyas* can certainly take the edge off of difficult states and regulate maladaptive emotions that the encounter with technology can evoke.

The fourth step in EFT, reflecting on emotions, consists of understanding emotional experience and developing “new narratives to explain [one’s] experience.”⁸⁷ Three interrelated narratives can be discussed in or-

85 قال الله سبحانه وتعالى: لا تَقْنَطُوا مِنْ رَحْمَةِ اللَّهِ.

86 قال الله سبحانه وتعالى: وَرَحْمَتِي وَسِعَتْ كُلَّ شَيْءٍ

87 Greenberg, “The Clinical Application of Emotion in Psychotherapy,” in *Handbook of Emotions*, 93.

der to give some examples of possible narratives that can facilitate understanding the emotions that arise in the encounter with technology and in the process of developing an ethic of technology: the first narrative is to awareness of the theophanic signs that are everywhere in existence; the second is related to recognizing that the gratitude of humankind is being tested by God; and the third is a narrative related to being attracted by love to know God by means of actualizing the Divine qualities of our primordial nature. Concerning the first of these narratives, recognizing and reflecting on God’s theophanic signs can assist Muslims in understanding, in an emotionally healthy manner, the feelings that they experience as they attempt to cope with a world dominated by technology. Specifically, God, in the Qur’an, repeatedly not only tells Muslims to use their intellects but advises them to recognize and reflect about the signs of God in the creation, which God states God has not created in vain (Qur’an, Sūrat al-‘Imrān 4:191).⁸⁸ Moreover, we read in the Qur’an, where God states that the signs of God are both in the created world and one’s self: “We will show them Our signs on the horizons [of the world of existence] and within their selves” (*sa-nurīhim āyātina fil-āfāqi wa-fi anfusihim*) (Qur’an Sūrat al-Fuṣṣilat 41:53).⁸⁹ So the Muslim scholar who is endeavoring to construct an emotionally intelligent ethics for facing technology should remind Muslim students to reflect upon their emotions by using an Islamic narrative framework such as I have sketched out, a narrative in which emotions are among the signs (*āyāt*) or theophanies of God’s attributes (*tajalliyāt ṣifātihi*).

Further developing this narrative is that traditionally Sufis termed the signs and theophanies that were difficult to face as the theophanies of God’s attributes of *qahr* (severity) or *jalāl* (celal/grandeur), while the signs or theophanies that were relatively easy to cope with were signs or theophanies of God’s *lutf* (benevolence) and *jamāl* (*cemal*/beauty). This understanding of the positively and negatively shaded polarities of the theophanic signs, goes hand in hand with the understanding that God is the ultimate agent of everything, and that everywhere is God’s marvelous face, since “Wherever you turn, there is the face of God” (Qur’an, Sūrat al-

88 قال الله سبحانه وتعالى: الَّذِينَ يَذْكُرُونَ اللَّهَ قِيَامًا وَقُعُودًا وَعَلَىٰ جُنُوبِهِمْ وَيَتَفَكَّرُونَ فِي خَلْقِ السَّمَاوَاتِ وَالْأَرْضِ رَبَّنَا مَا خَلَقْتَ هَذَا بَاطِلًا

89 قال الله سبحانه وتعالى: سنُرِيهِمْ آيَاتِنَا فِي الْأَفَاقِ وَفِي أَنفُسِهِمْ

Baqara 2:115). We add to this mix the awareness that although the Prophet ﷺ is the *ḥabiballāh* actualized, we are also *ḥabibullāh*, God’s lovers, on the way to becoming actualized as we follow in the Prophet’s ﷺ footsteps. Consequently, in this narrative, all of the difficult feelings that arise—as we face the modern world in general, and as we feel ourselves at times to be overwhelmed by its technological omnipresence, in particular—all these *qahrī* difficult feelings (as well as any *lutfu* pleasant ones that might arise) are new theophanic signs and faces of our Beloved that we are invited to love and reunite with. Here İbrahim Tennuri (d. 1482 CE), in a well-known poem, underscores the importance of responding with equal appreciation to the bi-polarity of the theophanic signs:

Cana cefa kıl ya vefa

Kahrın da hoş, lutfun da hoş,

Ya derd gönder ya da deva,

Kahrında hoş, lutfun da hoş.

O Beloved, whether you treat me badly or well

I’m happy with your severity or benevolence

Whether you send pain or the cure

I’m happy with your severity or benevolence

Hoştur bana senden gelen:

Ya hil’at-ü yahut kefen,

Ya taze gül, yahut diken..

Kahrında hoş lutfun da hoş.

I’m happy with whatever comes from you to me

Whether it’s a robe of honor or a burial shroud

Whether it’s roses or thorns

I’m happy with your severity or benevolence

Gelse celalinden cefa

Yahut cemalinden vefa,

İkaside cana safa:

Kahrın da hoş, lutfun da hoş.

Whether difficulty comes from your Grandeur

or ease from your Beauty

both of them are pure goodness for my soul

I’m happy with your severity or benevolence

Ger bağ-u ger bostan ola.

Ger bendü ger zindan ola,

Ger vasl-ü ger hicran ola,

Kahrın da hoş, lutfun da hoş.

Whether I’m in a garden or an orchard

in chains or in prison

in union or separated

I’m happy with your severity or benevolence⁹⁰

A second interrelated narrative for approaching the many different emotions that arise while encountering technology and developing an ethics for engaging with it is that potential disturbing emotions can be understood as a means by which God is testing whether individuals will turn away and attempt to avoid these emotional theophanies or whether they will approach them with awareness and even appreciation. God states, “As for man, when his Lord-Sustainer tests him, honoring him, bestowing bounty upon him, he says, ‘My Lord-Sustainer has honored me.’ But when his Lord-Sustainer tests him, restricting his sustenance, he says ‘My Lord-Sustainer has humiliated me’” (Qur’an Sūrat 89: 15-16).⁹¹ To the degree that scholars themselves can respond, as a test of their gratitude to God, to the emotional difficulties they encounter when attempting to face technology and develop an ethic for it, they will be better able to assist their students in facing the emotions that technology has evoked in them; and they will also be better able to help students to utilize various Islamic narratives and to develop their own personal Islamic narratives as a foundation for understanding, utilizing, and transforming their emotions as they make their way through the technological age.

A third interrelated narrative that can facilitate emotional understanding in the context of our encounter with this technological age and help to make sense of one’s emotional experience is the theological belief that God created creation because God loves and wants to be known directly, through experience, as indicated by the well-known *ḥadīth qudsī* transmitted by Sufis: I was a hidden treasure and I loved that I be known, so I

90 Numerous online sources ascribe this poem to İbrahim Tennuri’s *Gulzar-i Manevi*, although some attribute it to Yunus Emre.

91 قال الله تعالى: فَأَمَّا الْإِنْسَانُ إِذَا مَا ابْتَلَاهُ رَبُّهُ فَأَكْرَمَهُ وَنَعَّمَهُ فَيَقُولُ رَبِّي أَكْرَمَنُ وَأَمَّا إِذَا مَا ابْتَلَاهُ فَقَدَرَ عَلَيْهِ رِزْقَهُ فَيَقُولُ رَبِّي أَهَانَنِ

created creation in order to be known (*kuntu kanzan makhfiyan fa-ahbabtu an 'urafa fa-khalaqtu l-khalqa likay u'rafa*).⁹² God made manifest all of the names and qualities in creation, such that creation consists of nothing but traces of these Divine names and qualities, which are called *āyāt* (God's signs). Moreover, God "taught" Adam all of the Divine Names; and since we are the inheritors of Adam's being, we too have been taught all the Divine Names. This teaching of the names comes about since a God actually created Adam's nature and hence our nature in order to mirror the Divine Nature. As the Prophet ﷺ in an authentic *ḥadīth* stated, God created Adam in His image (*Inna Allāha khalaqa Ādama 'ala ṣūratihī*).⁹³ So, this primordial Adamic human nature of ours is a theophany (*tajallī*) of all of God's names and attributes, as the Prophet ﷺ, in authentic *ḥadīth*, said, "Everyone who is born is born according to the primordial nature (*kullu mawlūdīn yūladu 'alā al-fiṭra*)."⁹⁴ But like after the fall of Adam and Eve, we too are forgetful of our theophanic nature, unaware that God is our Rabb, the Lord-Sustainer of all of our qualities, including all of our thoughts and emotions. In our forgetfulness, when our emotions are disturbing we do not respond to our emotions with sufficient intelligence and gratitude to God. If, however, we were to respond even to our disturbing emotions and thoughts with sufficient intelligence and gratitude, we might be graced to remember that all of our emotions and thoughts, including our sense of self, are a continuous shower of God's unconditional mercy (*rahma*). Such forgetfulness is one aspect of what being dominated by our *nafs* (ego-self) consists of. It results in a distortion of our awareness, such that we are not aware that all of our thoughts, perceptions, and feelings are theophanies being sustained by God (even our forgetfulness!). Because of this domination by our *nafs*, we do not see each moment's theophany (*tajallī*) with *ihsan*, as if we are seeing God or God's manifestation. Consequently, by depriving ourselves of the awareness of God, we

92 'Ajlūnī noted that Ibn Taymiya and others asserted that because it lacks any chain of transmission, that it was not a *ḥadīth* of the Prophet. Nevertheless, 'Ajlūnī did quote the *ḥadīth* scholar, Mullā 'Alī Qārī (d. 1014 CE/1605 AD), who stated, "But its meaning is authentic," being in harmony with the Qur'anic *āya*, "I only created jinn and humans in order to worship Me" (Qur'an Sūrat al-Dhāriyāt 51:56), 'Ajlūnī, *Kashf al-khafā*, 173.

93 قال الله سبحانه وتعالى: وَمَا خَلَقْتُ الْجِنَّ وَالْإِنْسَ إِلَّا لِيَعْبُدُونِ
 بِتَرَوْصَ يَلْعَمَدًا قَلَّخَلَّ لَانِافِ Muslim, *Saḥīḥ al-Muslim*

94 Bukhārī and Muslim, *Saḥīḥayn*: كُلُّ مَوْلُودٍ يُولَدُ عَلَى الْفِطْرَةِ

respond to each *tajallī* not as a theophanic mercy from God, but as a feeling that we must either crave or from which we must distance ourselves. In worst case scenarios this drives us in an evil direction, make it more likely that we will commit some form of evil, as God states, "The ego-self commands to evil" (Qur'an, Sūrat Yūsuf 12:53). Fortunately, since we have free will, we have the potential, at any moment, to rediscover our true theophanic nature and to recognize that God is our Lord-Sustainer now, along the lines of primordial man who, when asked by God "Am I not your Lord-Sustainer?" replied "Yes, we have witnessed [that]" (*Alastu bi-rabbikum, Qālū balā shahidnā*) (Qur'an Sūrat al-A'rāf 7: 172). By repeatedly responding to each new divine manifestation in one's heart with unconditional openness and gratitude and even with love for God (even if such manifestations happen to be the sometimes troublesome feelings that humans experience when faced with the behemoth of technology), over time the ego-self along with its emotions can be refined and transformed to the point where it has the quality of peacefulness: "O ego-self at peace, return to your Lord-Sustainer, content [with Him] and pleasing [to Him]" (Qur'an, Sūrat al-Fajr 89:27-30).⁹⁵ To the degree that the ego is at peace, its previous distortions and addictions will neither cause it to act when it would be beneficial and intelligent not to act, nor cause it to refrain from acting when it would be intelligent and beneficial to act. Such a peace increases the likelihood that we will be able to receive greater wisdom (less distorted by the conditioned and unconscious fears and desires of our ego-self), greater wisdom about our optimal conduct in our relationship with God and in our relationship with this world of ours. This is the wisdom that Muslims believe was most perfectly manifest in the example of the Prophet ﷺ but which we can aspire to now as we endeavor to construct an ethics of technology .

Moving to the fifth and final step in our effort to apply Greenberg's process of cultivating emotional intelligence to an ethics of technology, we come to emotional transformation. The key to this transformation in EFT, as is often seen in what is now called "positive psychology" in general, is to substitute a positive emotion for a maladaptive emotion (after having become aware of it sufficiently to learn whatever useful information it is

قال الله تعالى: يَا أَيُّهَا النَّفْسُ الْمُطْمَئِنَّةُ ارْجِعِي إِلَىٰ رَبِّكِ رَاضِيَةً مَّرْضِيَّةً فَادْخُلِي فِي عِبَادِي وَادْخُلِي جَنَّاتِي

conveying). For the Muslim scholar who is striving to provide optimal guidance to her/his students in this technological age—in particular to assist them in facing the emotional fallout that is one of its products — the way to take this last step of emotional transformation (in harmony with EFT’s sense of substituting positive emotions for maladaptive emotions) is to educate students to attempt to (or to intend to) respond to every thought, feeling, and perception with even just a drop of the positive emotion of unconditional gratitude to God, namely, with gratitude to the Lord who is the Sustainer of all the worlds —with *al-ḥamdu lillāh wa-ashukru lillāh* (all praise and gratitude is due to God). Concerning the importance of gratitude, God states in the Qur’an, “If you are grateful, I will give you more” (Qur’an Sūrat Ibrāhīm 14:7).⁹⁶ And as the Prophet, in an authentic *ḥadīth*, said, “Should I not be a thankful servant?”⁹⁷

In conclusion, it is my hope that by using the overall framework of the greater *jihād* to reduce the unconscious dominance of the ego-self (which is strengthened by the largely unconscious influence of emotions), scholars will begin to diminish the degree to which the ego-self obscures and distorts our efforts to construct an optimally humane Islamic ethics of technology. Practically speaking, I am suggesting that we, as educators, should adopt a methodology for developing an Islamic ethics of technology that is, on the one hand, harmonious with Qur’an, *sunnah*, and the wisdom of our pious predecessors, and, on the other hand, an approach that utilizes insights from Gadamerian hermeneutics and an evidence-based model from the psychology of emotional intelligence. This is what I have attempted to do with my (A)ffective (*ḥālī*), (B)ehavioral (*‘amalī*), and (C)ognitive (*‘ilmī*) approach that I have outlined. Through the affective aspect, I suggest approaching the emotions (*ḥālī*) we encounter in the technological age based on empirically verified and testable concepts and methods, specifically Salovey and Mayer’s “ability model” of emotional intelligence and Leslie Greenberg’s Emotion Focused Therapy. Through the behavioral aspect, I suggest a method involving efforts by scholars, scientists, and leaders to develop engaged best practices (*‘amal*) or *adab* for technology. Lastly, by means of the cognitive or *‘ilmī* aspect, I suggest

utilizing a Gadamerian hermeneutical cultivation of self-understanding together with attempts to understand our technological world, while we move toward constructing an ethics of technology. Of course, all of this must be tempered by the humble recognition that if it is God’s will, even our best efforts may fail; but, also, if it is God’s will, we will succeed.

Wa-billāhi t-tawfīq.

96 قال الله سبحانه وتعالى: لَئِنْ شَكَرْتُمْ لَأَزِيدَنَّكُمْ

97 ارواۃش اذبع نولفاً الفأ *Ṣaḥīḥayn* Bukhārī and Muslim,

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Does Technology Create Value?

Süleyman Hayri BOLAY¹

There has been an ongoing dispute on 'whether technique and technology create value' for more than half a century in Turkey. Is technology an indispensable element of need which shall definitely be acquired? What is it behind the obvious technique and technology that has a power to create value? What is the philosophical basis of the idea "Human Machine?" Can we use the technology we purchase with an ease of mind by satisfying our needs? Should we continue to buy more technology without damage awareness just because it satisfies our needs? Should we produce technology instead of importing it? Can we prevent the damage if we manufacture our own technology? How did technology affect our values and in what way? If technology creates a value, how and with what means does it do that? Does technology mechanize humans? Can humans become machines? Can robots replace humans? Can humans become robots? Can the human, mechanized and robotized, lose its liberty? Can humanistic features be preserved? The statement is in search of answers to these questions.

Of course if we regard all these questions, the universe and the man as one and acknowledge these as a whole, we can give more accurate answers. Worshipping, and working towards the guidance of his religion will be the main elements which will grant the most sacred place to the man in nature. The man has an honorable place in the universe. Societies and civilization can easily disperse if cultural features of mankind are not acknowledged. In this case, culture will produce a stereotypical persona without culture, personality, or any ideal; who will work like a machine. Regarding people as a machine, a tool, will fail to reinforce its spiritual level. According to distinguished Professor Hilmi Ziya Ülken, the dispersion that we see in the West is a result of the fact that cultural features of the West see people as machines, without acknowledging them as a whole.

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For, according to him, man is not only a rational being, but also a spiritual being.² The reason for this is that emotions and the feeling of love are what people get in touch with each other, enabling them to understand others, before the mind. Erich Fromm (1900-1980) defines educational sciences, which ignore these features of man, as follows: “Education produces machines that behave like people; and people who behave like machines...” According to him, a human being is a *machine* which is running on a certain level of sexual energy called “libido” due to influence of materialistic ideas of 1900’s and dominance of Freud’s libido tendencies.³ Again, according to E. Fromm, the modern man has become an object for the blind economic focuses of power that is running his life; worshipping his own hands and transforming himself into a product of its own.”⁴ He asserted that; the man has become to robot, a machine which starts to worship its own efforts. This pagan-like machine, alienates the man from his own lively, vital, powers.”

On the other hand, Fromm states that the principle behind monotheism relies on the fact that humans have no limits, but neither of their own features can represent the whole being of man. Humans are created as a resemblance of God and hence they are the carriers of his unlimited powers.⁵ However, the modern secular approach is interpreting this human nature as materialized people who have been turned into machines and thus have lost their supreme qualities from their birth, and become worshippers of their own products.

On the other hand, the real question should be how dependent are the humans and social life to technique and technology. To answer this question, of course, we shall first ask what is technology and technique. The concept “technique” is derived from the Greek word “*tekhne*” which has been given many different meanings. Heidegger states that this word is originally related to the concept of information/episteme at first, but later on it was also given different meanings, such as “bringing to life.” According to him, this provisional feature is not about production or ability

2 Hilmi Ziya Ülken. *Felsefeye Giriş* (Istanbul: Türkiye İş Bankası Kültür Yayınları, 2009), 2: 11.

3 Ibid, 41-42.

4 Ibid, 92.

5 Ibid, 71.

to produce; but is about *creating something new*.⁶ In that case we need to discuss this concept further in its application today.

I. What Is Technique?

As science is the continuous practice of learning and understanding the universe and beings it needs to be applied, realized with certain actions. As it also shows itself at the level of technique we may describe technique as modifying different tools for attaining a specific goal or for a certain purpose to meet present needs. Therefore, technique can be regarded as a product of man’s will to control the surrounding environment. It shall also be noted that this will also serves as an agent for man to dominate the world spiritually.

Oswald Spengler states in his book *Man and Technique* that the most basic instinct of living beings is to compensate their weaker side and accomplish superiority among other beings. Therefore, technique can be regarded as a natural tactic of human life.⁷ Man shall use technique as an agent, a medium to impose its influence upon its surroundings. Technique, from this perspective, and according to the statement of Heidegger, is a form of resurfacing other elements. He, defines technique as a medium, rather than a goal. Technique, as a medium, alienates people from each other. And unfortunately, this alienation results in many different issues.

Technology is, on the other hand, includes all scientific concepts, intellectual researches, defined rules, data and methods which are developed for acquiring new products by means of techniques. Technology, then, can be regarded as the concept of acknowledging features of tools, materials and objects in terms of their effects on man’s perspective. Through this perspective, technology becomes a cultural activity. In fact, technique and technology, even though primitive, has been present since the first man on earth. In some manner, technique and technology can be found everywhere that man resides. Therefore, the Qur’an includes a chapter (*sûrah*) called “Hadid/Iron”. In this chapter, it is said that God provided man with iron as a strong and beneficial material to distinguish the ones who will use it

6 Martin Heidegger. *Die Technik und Die Kehre*, translated into Turkish as *Teknik ve Dönüş* by Necati Aça (Ankara: Bilim ve Sanat Yayınları, 1998), 18.

7 Quoted by Nabi Avcı, “Teknoloji ve İnsanî Değerler Meselesi”, *Türk Yurdu*, 27 (1989), 53-54.

to help others with the belief of Allah and Muhammad the Prophet in their minds (Hadid, 57/25). Also, the Prophet David was taught how to make armor. The fact that Allah has filled a valley between two mountains with iron to prevent a wild tribe from attacking others, the wise man Dhul-qarnayn sealed the gates with copper to protect them. This shows us that technique and technology were both rather advanced even in those times.

Yunus Emre; shared the following poem for a reason:

“İdris nebi Hulle biçer,
Prophet İdrîs sees heavenly dresses,
biçer Allah deyu deyu.”
And he sees saying Allah Allah.

We can infer from these lines that technique and technology is taught and used even in the Heaven. A contemporary Turkish thinker M. İzzet has interesting ideas about technique and technology. He asks the question of how dependent is social life to technology. “In fact, technique is a means which the civilization uses to process its surroundings.” Techniques are between nature and man because major industrial movements which are created by development of techniques is a common consequence of focusing human ideal towards nature. Thanks to the technique, humans have a major control over soil, its products and nature. Human beings also develop, mature and rises above his nature “because it adapts its habitat to surrounding nature”. This way he creates both its tools and himself. Unless our technological research progresses, our knowledge of civilization will be based on missing or even decaying principles.⁸

Techniques which have been used by men in Stone Age or Bronze Age continuously changed and evolved. Along with military technology, civil technology and scientific developments it has reached at higher levels. In other words; humanity has never been far away from technique and technology and has always lived alongside it. Today, same also applies. Nobody seems to be able to live without (credit, etc.) cards, planes, buses, telephones, radios, TV, dishwashers or washing machines. On the other hand, nobody goes to pilgrimage on camels. Therefore, we can say that development of new tools, techniques and usage of these for communication, teaching, travelling, information and livelihood is an essential part of

⁸ Mehmet İzzet. *Makaleler*, ed. Coşkun Değirmencioğlu (Ankara: Kültür Bakanlığı Yayınları, 1989), 240-242.

humanity. In this respect, human beings are in need of technology. They have to develop and use it. They will not be able to live without it. Therefore, to blame technology in a dramatic way is not a logical action. Is not applying a technique using our mind skillfully within the world of realities and controlling the natural forces that may harm us?

In fact, technological advancements have many benefits for us. Our information on civilization and society would be based on a corrupt structure without technology. Also, one of the major benefits of science and technology is its ability to assist cleaning misleading information from minds of man. The main issue here is to ask if technology poses any sole moral value or not. It is not possible to refuse technology and mechanization because refusing consequently leads to discontinuation, backwardness and devastation. On the other hand, is a machine with freedom possible?

Technology on the one hand facilitates people’s work and as such it is an essential part of our life, but on the other hand it leads us into a competition of destroying people, even mass massacre and wars. There is also a competition for new weapons because of technology, human societies are inventing ever new weapons. How can we get over this? Modern technique is of course totally different from the past one. Why? Because, modern technology is based on natural sciences of the New Age. Heidegger states that; *modern technique challenges the nature*. Why a challenge? Because, according to him, technique has a constant requirement to acquire all the energy it can get from nature. Heidegger warns us about this danger of modern technique while he informs us that technology also involves the ability and power to protect us from this constant challenge. Therefore, it has been believed that appearance of technique will also prevail its protective features for man because, through this perspective which approaches with a dialectic focus, just like the inert “being” concept of Hegel which involves mutual presence with the opposite, we see that technology may have the ability to protect itself from the danger it creates. But, the present state of affairs is not exactly like Heidegger explains. The main problem of this philosopher arises at the exact point that he regards man and nature as being sufficient in themselves.

His claims do not seem very accurate because, technique is only a means for creation. This instrumentation, makes people become instru-

ments themselves. In this case, how can we say that the man is sufficient by himself? It is always possible that the concept of *tekhne* may dominate man. For, contrary to Heidegger's claims, human being is not an independent being itself. He cannot be! Because man needs to be connected to a Creator more strongly than he needs other people and beings. On the other hand, is it not a logical assumption that storage and the ability to use the environment can make a person superior human? Is this not going to refer to humanity as the absolute dominion of the earth? Yes, humanity has started to think that everything that can be produced in nature is a product. It is always possible to be deceived. Here again, humans face the threat against human beings.

II. Negative Impacts of Technology

Is there a danger here against the human spirit? Such a danger may be resulting from sacralizing, enrooting technological mindset. Behind this sacralization lies the belief that technique and technical thinking give us the most accurate and true knowledge about reality. We can call this "technic worshiping". The greatest danger of technological thinking is the fact that it leads man to think that he is the sole creator of values because *this* technic worshiping mentality regards nature, environment and the universe as a resource of satisfying humane desires. Of course, here a practical "human-centrism" is the dominant approach. Such a person and such an understanding does not accept a being, an authority, an agent, a Creator other than his own being; moreover, this approach does not accept the possibilities and values that come from metaphysical sources, trusts or believes in things he has done with his own technology, So that he will be able to glorify himself. Therefore, as seen in the period of enlightenment, such a person puts his mind in place of the Creator thus turning himself into a machine and a god.

A. Naturalistic Conception of God

But, where does this ideology of sacralizing human mind come from? The first candidate for this is the naturalistic conception of God primarily represented by Spinoza (1632-1677) who identified God with

the nature and created a naturalist mindset which asserted that, nature is God itself. Thus, God of Western mindset, so to speak, was lost in the universe. A new step has been taken when the age of enlightenment has arrived: "Man's continuous tendency to highlight egoistic values as well as its practices which brought him far away from himself has led to expansion of ego across the universe; resulting thus in adopting power and authority of God in a misguided way."⁹

Thus Newton's conception of the universe, which was based on God, has been isolated from divine basics and relied on a solely positivist mindset. Now, people has started to rely on unmistakable rules and formulas of mathematics and geometry to explain the Universe in a mechanized manner. Kant was expelling god from the field of information and morale. This way, the Man has been alienated from envisagement of Universe. It was like he was lost in a mechanical universe. Due to advances in Natural Sciences; adjectives which were previously related to God such as holiness, divinity, dynamism and mysticism were started to be used for defining the Universe. Humanist mindset which has been relied on the ideas of Enlightenment Age were claiming to be liberalizing the ego of man while trying to remove the dependency of human mind on a divine will. This is based on the words of Descartes (1596-1650); "*Cogito ergo est*" (I think, therefore I, myself create the reality in the universe). Encouraged by these ideas, supporters of the mindset characteristic of the Enlightenment Age have tried to establish principles which are independent of God subsisting by themselves and are solely based on naturalistic way of thinking. Descartes inaugurated a new pathway for the mindset of enlightenment by creating a mechanical world conception which conceives the universe as working like a machine. At the same time this conception led to the idea that an animal is a machine. Three-quarters of a century later, De La Metterie (d. 1751) has taken these ideas of Descartes further and declared that humans are also machines in his book *Machine Man*.¹⁰ Today, there are men of science and philosophy who adopt this materialist mindset. Another representative of materialist mind and human is the French cytologist and 1965 Nobel Prize winner Jacque Monod (d. 1976). He said:

9 George Frankl. *Western Civilization: Tragedy and Utopia*, translated into Turkish by Yusuf Kaplan (Istanbul: Açılım Kitap, 2003), 175.

10 See Julien Offray De La Metterie, *L'homme Machine* (Paris: Denoël/Gonthier, c1981).

“a cell is a machine; animal is a machine; therefore, a human being is also a machine.”¹¹

The idea of automatic machines eliminates the human element as an actual agent. It represents domination of automatism in machinery and technology. Machines cannot adapt themselves to all conditions. Likewise, living beings, despite the machine-like appearance, are not machines because they have a purpose. A machine cannot set a goal for itself and then run after it. If a human becomes mechanized then will not the “machine man” be nothing but a robot which has been deprived of its spirit, mind, heart, faith and love? We have asked whether machines or technology can create values and it seems that our answer is “yes”. But what kind of a value? As we see in the poem of Turkish national anthem poet, the great, Mehmet Akif’s depiction of Western civilization and technology as “the monster with a single tooth” is surprisingly successful explanation of this technology created value. We can easily see an accurate example of this by looking at the following poem of renowned communist poet Nazım Hikmet:

*Trumm trumm
Trum trick track
I want to be a machine
My brain, my flesh hungers to be,
A machine I want to be;
I am dying to have all these generators and dinamos,
My tongue licks the copper wires,
Automatic trains chase locomotives,
In my veins mechanized,
I want to be a machine,
Trumm trick track,
There needs to be a cure,
And I’ll be only happy then,
A turbine I’ll put on my stomach
And I’ll wear a propeller on my tail,
Trumm trick track,
I want to be a machine,*

11 Frankl, op. cit., 207.

As is known, machines do not have a homeland in the true sense. A car belongs to the one who drives it. The one who has invented the cell phone should be the one using it. Nazım Hikmet’s crazy desire to be mechanized gives us a true depiction of mechanized human model. In any case, this is one of the most accurate examples of the automatic people, created by the technology, rather than values. So if a human being melts in nature and society, if ideology translates him/her as a robot, then a person in the example of Nazım Hikmet becomes crazy to become a machine. Why? To produce more. To create more values as byproduct. More for prosperity ... But does life just consist of these?

B. Can Machinery and Automation Replace Humans?

Hilmi Ziya Ülken has dealt with the concepts of technique, machinery and mechanization for a long time. He asserts that mechanization, cybernetics, automats and robots, which are practical and technical results of naturalism, cannot replace human beings. He confronts the idea explaining humane functions mechanically as if a machine and regarding humans as redundant with automatical controls. Mechanization means development of the automatism. Man behaves as himself with the guidance of his mind, using his will and freedom. Machines do not have this feature. “It just tries to fulfill its intended and established purpose.” At this point, Ülken asks: “Is a machine with free will possible?” Seeing this impossible he adds: “Looking for made-up, mechanical reasons for providing an answer to the question of the reason of nature is an inert practice.”¹²

C. Relationship Between Technique and Culture

Nureddin Topçu has come up with influencing ideas half a century ago about the relationship between technique and culture. According to him, technique is “a mandatory result of culture. It is a fruit of culture tree, a natural leakage of culture.” He adds further “separation of technique from culture is like a boy, denying his father.” In his perspective, “the concept of culture penetrates in our souls. Our lives can only flourish with its guidance.” If you ignore it, the clash between spirit and body will bring devasta-

12 Ülken, op. cit., 107.

tion. European civilization could not prevent this danger.”¹³ Topçu in this way relates technique and culture with social ethics and states that “technique shall always stand one step behind culture, this is an ethical mandate, technique shall serve to the ruling of culture, and otherwise technique poses an important danger” and warns us that “*technique shall be a blind and destructive danger if it is not led by the culture.*” On the other hand, it becomes impossible to avoid hearing the voice of the technique in phrases such as “I want to be a machine” when culture is ignored completely.¹⁴

Here we can ask the following question: Cannot technique produce a unique culture for itself, with all its predominance and allure? We say yes it can and it does. On the other hand, this culture that has been created by the technique, is not a spiritual and moral one such as the one Topçu states, but a completely materialistic concept which totally depends on mechanization and production. If we remember the famous movie producer Charlie Chaplin then I would like to remind his movie, in which he makes fun of mechanization and device craze. In the film Charlie Chaplin shows the ridicule of mechanization as follows: A man sits at the table, eating dinner. A mechanical hand puts the food into his mouth. Another mechanical hand wipes his mouth after each bite. Then, suddenly a malfunction occurs in the hand which gives the food. But, the other hand automatically continues to wipe the man’s mouth... Could there be a better example than this to depict the fact that a machine will continue to do what it has been told to do without mind or spirit even if it is broken with zero efficiency and any bit of rationality? This extreme worship like addiction to technology makes people see that everything around them is a product of their own technique. This approach and understanding, as also stated by Eric Fromm, become an act of idolatry leading the masses into worshipping their own efforts and products.¹⁵

III. Who Will Pay The Bill For Technology?

Technology is a product of human mind, imagination, dreams, researches and actions. Of course this rapid advancement of technology in

¹³ Nurettin Topçu. *Kültür ve Medeniyet* (Istanbul: Hareket Yayınları, 1970), 13.

¹⁴ Ibid, 17.

¹⁵ Eric Fromm. *Yeni Bir İnsan ve Yeni Bir Toplum*, translated into Turkish by Necla Arat (Istanbul: Say Yayınları, 1984).

the last two centuries would have a price to pay; and indeed it requested that price. So, what’s that price? This bill has begun to be paid for over 250 years of industrialization and mechanization, with machines starting to dominate the technology. Number of people who say that technology causes important problems for human life, is not low. Of course major technological changes and developments appeared after the industrial revolution and emergence of technologically developed communities. These changes are also considered as a technological bombardment. Under such a bombardment; traditions, beliefs and cultures of societies have witnessed deep vibrations, changes, and even material, spiritual and moral devastations.

Interpersonal and inter-social relationships were mechanized, and materialized even more, so to speak. Harmonious relations between people and societies have lost their value. Industrial societies which have advanced in the direction of industrial and technological development; have lost the control of the continuously developed culture without any moral value. It has become a virus which destroys the other surrounding cells. The values which are reflected by Western science and technology have always been materialistic concepts based on human greed to earn more wealth. These values have been transformed into an always-unsatisfied ambition of winning, a Darwinist competition and exploiting ideology and an uncontrollable mentality of growth. The world has been filled with the billions of products waiting for their buyers. Natural sciences have been guided to new researches by using many of these also technological products. Then, Naturalism produced new elements of information and imposed these to the rest of the world as the unchangeable, sole truth. It directed individuals and societies to manufacturers with endless propaganda and advertisements. It has created new and unlimited needs. For example, how many people are there on earth that do not use cell phones?

These are all done in the same way. And what is that way? Of course it is *rationalization*. What does this concept involve? Following words have been widely used together with this expression: “*Freedom, personalization, communication and spread of these values.*” Rationality involves different elements such as appreciation and evaluation. “*Rationalization*” of society is about industrialization of scientific and technical

progress. The key issue here is not mere usage of technique but using it as an instrument to acquire dominance on nature and a rule over humans. This is of course a well calculation and a calculating rule. Machines and mechanization grinds down humane characteristics of man, and it deeply intervenes in his being. For example, our ability to think is reduced by using calculator and becoming dependent on it while we are using the pen and pencil and some of our organs it actually progresses. Intervention of machines to humane characteristics can blunt creative powers of man. A sociologist goes to a region, a village and hands out questionnaires. Then he picks them up and enters into computer. The rest is up to the computer. It calculates, evaluates and decides on features of that particular region. Is it wrong? Of course it is not. It is beneficial in saving time. On the other hand, mechanization imposes particular molds that make humans artificial, standardized beings. Back in the olden days people would test and then choose with their own free will. With mechanization everyone has to use the same products almost every time. The choice is based solely on brand recognition. The arrangement of the houses of the family, the decoration, the arrangement of the cities are almost the same. Is not subjectivity and creativity going to disappear in such an environment?

Machinery and mechanization save time and of course, certain needs can be satisfied in a quicker manner by working with machines. On the other hand, capitalist market creates much more needs for people in return for this time saving. On one side technology eases work of man, and creates indispensable benefits. But on the other side, it puts people into a competition which may lead to a mass clashes and warfare. Man take sides in a race of armament and warfare inventions, as well as start wars to try their new toys. How can these be solved? As Russell says, of course, our only solution will be including morals and ethics into the great power of science. Philosophy, will fail to prevent the clash by itself. All beings need to have a strong faith, only this way we can “love others, because of our love for the Creator.”

Machines will not consider race, religion, morality, nation or tradition of others because it cannot adapt itself to other’s characteristics. With a continuous deterministic production tendency, it is busy with flooding the earth by producing masses of unnecessary goods. Consultants called

technocrats invent new ways and methods to beat and destroy opponent companies. They change the quality, the ingredients or the secrets of the goods they produce. Companies which are left behind in this race are damaged or expelled from the market. In other words, this is the exact Darwinist, tiger-like, live-or-die life struggle. These “tecnocrats” who started to emerge as a new social class with the development of technology, create a dictatorship. These people control and designate the fate of societies. This mechanization and technocracy, lead to a new *economic fascism*, which is more dangerous than the fascism we know. Other fascist regimes can be eliminated, but this one cannot.

A. One Dimensional Man

Technology, in the words of Herbert Marcuse is creating a “one-dimensional man” almost everywhere. According to him, advanced industrialized civilization fails to provide a safe, reasonable and democratic environment of civilizations. Here, rights and freedoms are surrendered themselves to the hands of society’s highest echelons. Traditional principles and their meanings are lost.¹⁶ According to Marcuse, industrial society strangles libertarian needs and ideas in an effective manner, while maintains the dominant pressure of welfare community.¹⁷ This way, technology is able to rationalize loss of human freedom and makes a free order of living technically impossible. Thus, according to Marcus, technological rationality protects injustice of power rather than prevailing it; which consequently leads to a totalitarian society. The most annoying side of industrial civilization is the fact that irrationality has been given a rational character. In this civilization object alienates people from the world. People identify themselves with materials; and find their souls in music players and cars. The instrument which connects individuals to the society has been changed. Thus, not the sole usage of the technique, but the technology itself has become a dominant power over nature and man.

Today, people and organizations can be watched or eavesdropped even as they relax in their bedrooms. New and reliable behavior-modifier education and propaganda techniques, mind-stimulation tools posing as

¹⁶ Herbert Marcuse. *One Dimensional Man*, translated into Turkish as *Tek Boyutlu İnsan*, by Aziz Yardımlı (İstanbul: İdea Yayınları, 1986), 21-22.

¹⁷ Ibid, 26-27.

practical utilities of communication, new and effective counter-guerilla techniques, mind blowing types of drugs for controlling and regulating human mind; are only a few of dangerous instruments which have been produced, and stocked in masses by authorities. Erol Kılıç defines this single-dimensional people as differing from materialists as follows:

A person who relies on materials to go on his life, is living in exile from his heart... Modernism, which increases the gap between the material and the meaning, has made Man a single winged being. Modern man is more like a robotic being; machine without remorse, spirit or will... Entirely focusing on dominating the nature; adopting earning and interest as the only goal; doing anything he can to attain his goal, even in return for his life... Ecological disasters, chemical weapon, dispersed countries and people with wars that fill the headlines everyday... Okay, violence and death have been around since Kabul; but it won't be wrong to say that, lethality of our time is fueled by the inverted values of modernism.¹⁸

B. Genetic Engineering

Developments in genetic engineering is one of the direct consequences of technology's intended purpose. This branch of engineering creates "new beings with new features" by modifying human genes. On the other hand, we know that studies in the field of genetic engineering is intended to solve some crucial problems of people. Yet, these studies have important biological, psychological, sociological, economic and moral issues. Problems arising from consumption of genetically modified products still dominate the headlines in our country as well as the rest of the world. Also, diseases and discomforts resulted by these products have become a major concern for governments. As an addition to these; implementation of concepts such as fertilization via sperm banks, in-vitro fertilization, and surrogate motherhood; create important problems in families and cause family disasters. Mechanization takes moral values into account during its efforts of increasing the number of consumers. It denies these values and forces people to ignore ethical principles.

It seems that technology aims at appraise people according to the comfort, luxury and consumption they possess. For; mechanized and in-

¹⁸ Mahmud Erol Kılıç. *Hayatın Satır Araları* (Istanbul: Sufi Kitap, 2013), 15.

dustrialized societies are based on wasting, not saving. Machines to mechanization save time. We become more competent to meet our vital needs by the help of machines. But in return, capitalist market puts new problems, bills and other weights on our shoulders. Thus Enlightenment and rationalization approaches praise a monotonous, mathematical, technical, mechanized world perspective which is based on materials, nature, and mechanized elements.

IV. Does Technology Create A Value?

We are now in a better position to answer our question which is definitely "yes". It indeed created added values. It makes people wealthy; enable them to live a rich, comfortable and luxurious life. Makes him one of the richest people in the world. Makes him embrace a life which is based on wasting everything. Increases reputation of businessmen and industrialists around the world. On the other hand, all these values are materialistic. The values we try to emphasize here are moral, spiritual principles. Is technology capable of creating an ethical system such as Christianity, Buddhism, or Islam? It certainly cannot. This brings us to discuss the nature of actual values which are beneficial for humanity and at home with their primordial nature.

A. What Is "Value"?

We can give following answers to this question: Man acts in accordance with a certain ethical and moral system of which he himself constitutes a part. In fact, "values" are parts of man's existence, belonging to his spirit. They do not come from the outside world. Value is an action, an activity. Values are established to prevent conflicts and unrest which may occur if acts of man are performed randomly in an uncertain environment. These values enable man to choose what is more valuable for himself and acknowledge its surroundings accordingly. As these values expand and open themselves, man is also elevated to higher levels of humanity, his personality develops and his actions become more meaningful. For example, Selimiye Mosque in Edirne continues to enrich the value of both Selim the Second, who built it and its architect, Mimar Sinan ("Sinan the Architect").

In this sense a value is something to be desired, sought after. A value in this sense is something to be desired, and sought after; more importantly it is something bestowing meaning to life and that which mainly protects one from evils, sins and false addictions. Spiritual values are values of metaphysical origin. Thanks to these values, humans can protect their hearts from darkness, or they can become able to clean and purify their selfish desires. A value does not impose itself on people, people adopt it voluntarily. Sartre and similar thinkers had claims that life is “ridiculous”. On the other hand, if life is ridiculous, then in life values are absurd, not true values. If values are wound up because of such insights, then values start to be seen as ridiculous, which leads to anarchy of values.

Also, it should not be forgotten that value has a goal and a rhythm. It is only necessary to establish a harmony between the purpose and the means. In addition to this, it is necessary to consider the correct rhythm between the values system and the goals toward which that system aims at. If God does not exist, as Sartre and other atheists say, then values which define man do not exist either. In such a case, there will be no value or personality, but egoism. In fact, as values are adopted accordingly, a “commitment” is present to these values. This commitment is only possible with faith, a religious belief.

From this perspective, it can be easily understood that the main question is whether technique can represent moral/spiritual values. Technology tries to cut the relationship between the mind and superior beings; as it tries to eliminate all differences in perspectives towards life because technique gives us information only about reality of an object in the outside world. On the other hand, it fails to provide any information about metaphysical realities.

B. What Should Be Done Against the Danger of Mechanization?

Technology comes from a different belief and cultural environment, together with its own principles. Also it brings values such as problem solving, or increased productivity together. It establishes its own system by imposing its own values to civilization. “If technique becomes the main element of materialistic production then it will be able to reshape the entire culture and design a new historical integrity and world

conception.”¹⁹ What is the main element to determine direction, speed and function of technological advancement? According to Habermas, “social interests are determined.”²⁰ Moreover, “scientific-technical developments have already started to impose re-organization of social infrastructure in terms of its rational intentions; making these rational goals more and more mandatory.”²¹ On the other hand, elements of national culture can resist to technology if historical heritage has not been damaged and cultural elements have not been dispersed. These elements, if suitable conditions are established, can resist to fundamental influence of technology by creating new cultural principles. The important thing here is the fact that, elements of national culture, especially a conscious religious life shall be kept alive. To acquire this goal, today’s conditions must be evaluated and designed according to previous developments.

C. Is It Possible to Struggle Against Technology?

Technology may feel the need to modify itself as a result of the strong opposition leveled by local cultures and traditional values. But, is it possible to struggle with this technology? Is it possible to make products of technology inert? Of course this shall be realized by means of keeping religion, the real pillar of national culture, alive. This struggle can only be accomplished by means of considering man as meaningful spiritually and filling his heart with love of Allah, His holy Prophet Muhammad (pbuh) and our country. This will surely fill his heart with a divine light. Every person should be supported by his family, his society, his state and other relevant assisting organizations during this struggle and shall never be left helpless. Obligatory responsibilities of the community shall be evaluated clearly. There is a tradition of Islamic culture and wisdom. Human beings are God’s caliph on earth, but, they shall not forget that, each human being is helpless, destitute and weak against the divine power of Allah. Only this way, man can avoid worshipping himself.

On the other hand, we should not surrender ourselves to technol-

19 Jürgen Habermas. *Technik und Wissenschaft als Ideologie* (Frankfurt am Main: Suhrkamp, 1968). Translated into Turkish as *İdeoloji Olarak Teknik ve Bilim* by Mustafa Tüzel (İstanbul: Yapı Kredi Yayınları, 1997), 40.

20 Ibid, 54.

21 Ibid, 65.

ogy. In other words, man shall not be captive of technique and machinery, but shall dominate and control it. How can this be possible? This depends on how we understand human nature. The successful perspective is the one that does not perceive human nature in a materialistic way. A human being should not be isolated from spiritual values and turned into a machine like being. Man, as a being is indeed not self-sufficient, and hence needs a creator fulfilling his needs. In fact human beings are in utter helplessness when left by themselves. For example, in the midst of all the abundance man still feels needs for many other things that are missing and he thus feels his poverty; moreover, he feels helpless before the concept death in the depths of his mind. But, unfortunately, he forgoes his helplessness and begins to worship his ego.

Actually a human is a divine being. He has been created from the breath of his Creator, as stated in the Qur'an and other holy books in other religions. This is a divine status which has also been set forth by the religion. This status assigns the title of God's vicegerent (Qur'anic term *khalifah*) on earth to Man. If man manages to use these values and divine features accordingly, he can free himself from animal instincts and the carnal desires of his lower being. Only this way he can go beyond his physical features. *A mechanized man only produces and thus fails to think of anything else. He continuously consumes what he produces and creates artificial values with production.* For, ruling organizations create needs first. Other people are forced to feel the need to share these needs. Therefore, we shall struggle against these approaches so that people shall not worship machines, and alienate from each other. This can only be possible with a strong spiritual, moral, principle and mental strength.

It is possible for man to protect himself from falling into captivity to nature and the thing he has shaped himself on these conditions. Otherwise, he can neither transcend himself nor renew himself. In modern paganism, man submits to the projection of some of his qualities, and worship them. However, in monotheism, and especially in Islam, the fact that man has no restrictions on his feelings is the dominant principle that none of his individual qualities can represent the whole of his being. As God's creature man has unlimited qualities as the embodiment of His eternal names. Therefore, the person who believes in God's unity and binds him-

self firmly to this belief does not turn his production and work into an idol and worship it.

Endless respect towards technical mentality leads to belittlement and even to the denial of a life based on traditional and spiritual values. Technical and technological mentality or machine guided mentality can neither protect, nor console man about his worries and fear for death and sufferings of life. Will technological achievements naturally lose hope if they make man dependent on technique and make it a shelter for him? Will technical thinking connect us with life and provide values that will guide us in life? If not, will it not turn us and our societies into ruthless crowds without any significant roots, and souls? Does not technology develop weapons of mass destruction instead of providing a better life? Does it not lead even the higher power of science devoid of wisdom to the wholesale extermination of humanity? Does not technology bring societies in which family values, privacy, respect, and morality to the brink of aimless herds? If the values that constitute the soul of people and societies have disappeared and technical and matter replaced them, then does not it cause the loss of human dignity and honor? I think it does. For when man abandons the guidance of virtue, prudence and mercy which the Creator has granted, he has neither human dignity left nor any honor and respect.

Not even that much. It is an apparent truth that the West uses science and technology to penetrate into countries it desires to use as a colony, deteriorate their culture and social balance to acquire its constant goal of total world domination. And through this perspective, when we consider the argument of whether "technology creates any value" in our country; then we shall easily state that, it creates new values to demolish the social values in its future colonies, and deteriorate previously established cultures of that society. Modern production techniques replaced traditional and family values with productivity principles and personal interests to create an imposed, artificial lifestyle. What is not natural here is that the modern production culture does not esteem the traditional and does not distinguish the material from the non-material; moreover, it puts the means in front of the goal which is neglected in the backward plane in which case the goal becomes means. In a true culture, all the activities of the people were within a whole which was very meaningful for them. However, in

contemporary culture the needed meaningful spheres were imprisoned in a limited amount of confined spaces. What is dominating today's life is the machine industry, which keeps the system up to date, continues on its way with the soulless specialists under its control. What is noteworthy here is the process that changes the significance which is attributed by a being called man to modern knowledge and technology. This process is an axis shift in the sense of value that initiates the great change called industrialization. Modern technology instead of making the new knowledge an occasion for offering thanks turns it into an opportunity for pride.

Reducing the meaning of man to sole positive ideologies results in massification of man and in melting his being which is then lost within masses. This massification enables external factors to dominate internal factors as a result of the strong and reckless tendency towards technology. Inner values are ignored, sacrificed to technology and mechanical civilizations which fed on one-dimensional development of natural sciences and materialism. The structure of technology deteriorates not only material, but also spiritual and mental features of man; aiming to cut his connections with the Divine Creator; therefore, eliminating the metaphysical dimension and spiritual depth of man.

However, what is to be done in technology and science / knowledge production is to establish a balance in every way, to understand the human nature and penetrate more deeply to understand the universe, to give an opportunity to establish the bonds between man and Revelation. In establishing the balance metaphysical truths must be in the central place. Technology is dominating the societies wherever it enters today and it carries the mentality of that place to its own sphere. What is more specifically emphasized here is the mechanization and technology developed after 18th century in order to develop and protect Western colonialism behind which is contemporary Christian mindset and modernization mentality. Technology exploits modernization, and Christianize it as it exploits. Therefore technology is an instrument for spreading Christianity in developing countries by means of corrupting their cultures and using them as colonies.

In this century mechanization and technology are not entirely suitable for cultural lives of other nations as these are concepts developed in foreign, particularly western cultural environments; according to the

common history, traditions, and principles of living and faith of Western nations. These elements of technology are subjected to different changes by the dominant culture as the technology penetrates into that particular society. The host culture also experiences different influences of this technology. Technology and technique do not create love. There was once a famous song in Turkey which was sung by the youth long ago with the following lyrics: "She has a car, so beautiful. Also has a driver, private and exclusive." And the song, especially the chorus, ended as follows: "Unfortunately, it does not have a soul." The song is saying that unfortunately the car, the machine, does not have a soul. Then the machine does not have a spirit. Therefore, it would be would be pointless to expect a mindless instrument to enrich divine and moral values of individuals, families or societies.

In that case, the fact that technology prepares the ground for globalization, and the resistance of cultures to a uniform community structure and urbanization; yet at the same time these cultures try to absorb technology, shows that the nature of technology, even its content, and essence can be changed. This is a fact that the elements of national culture can survive or be revived, even if they have suffered destruction.

Therefore, here, no matter whatever culture, whatever invasionist mentality, which ever conception of science and power technology may represent it will find in one way or another an indigenous culture in opposition and indeed it must find such a reaction; and these are national cultures. Basis of national culture includes religion and language. Just as it was in the past, unified nature of civilization is protected by the language and the religion in today's world also because both of these make up the common ground for the diversified societies. Religion, has become an ideal of Turkish nation throughout history. Religious ideals have been merged with ideals of the state. Therefore religion should definitely be given the utmost importance in terms of culture and moral values. Only this way, deformation of cultural changes, resulting from the clash between civilization-culture and technology can be avoided.

We can protect our own genuine values and create new values for ourselves with the guidance of our own cultural structure if we manage to produce technology and science according to our perspective towards life.

An individual shall not base his/her morale and ethical values on concepts of others but shall determine the best and the most beneficial approach on a personalized level. Continuity and maintenance of ethics and ethical values depend on adoption of a divine and absolute source, a creator. For, this will enable commitment to the rules of an Absolute Being. Only this way, ethical values and rules may be universally valid. Even people who claim to be atheists will benefit from the ethical environment relying on application of these strong values.

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Technology and its Place In Islamic Civilization

Zekai ŞEN¹

Knowledge production, science and art have only been offered to the service of humanity by the nations that have magnificent civilization and culture in history. Nations with such a civilization and culture could raise knowledgeable people who contribute to universal humanitarian work. These important people have been recognized and respected as members of all nations, regarded as values for the entire humanity. For, knowledge and systematic data produced by such great persons provide benefits not only to their own communities but also to many different nations and cultures that accept them. Knowledge and scientific concepts have always been present throughout history of man and gradually developed into what they are today. Not every culture and civilization have participated this progressive process. On the other hand, many different nations and cultures have carried these knowledge to their communities and benefit from it greatly. In the course of history, scientific and technological developments never stopped but slowed down and kept on moving forward. The only thing that changed has been the civilizations and cultures that performed these developments. For this reason we can trace the movement of technology in different cultures, in Egypt, Mesopotamia (Babel, Akkad, and Sumerians), and Ancient Greece, Islamic civilization (Arabs, Persians and Turks), Europe (different nations) and American societies. All these cultures have acquired scientific heritage of others and developed further. The same civilization and culture is not always blessed with this precious gift. This is an interesting phenomenon which should be investigated in a detailed manner. Civilizations which have failed to contribute to development of knowledge, science and technology shall start to evaluate their past and to reconsider the elements that prepare the ground

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for the emergence of science and technology. They should also know that the cultures and worldviews of nations play a primary role in this process. Important conclusions can be acquired by looking at production of information, science and technology by societies. Therefore, a nation cannot put its sign to sustainable, fundamental scientific studies without strong moral values, culture, religion and a belief system.² People may believe in the illusion that may be generating original knowledge in a society which dresses, behaves and thinks like other societies. Even if someone performs scientific studies with culture and perspective of other societies, s/he cannot truly implement these into her/his own culture. In fact, such a scientist will be forced to use the language of other societies for writing new works, which will cause the history to regard these works as success of other societies.

Having said that, importance of language, culture, tradition, and moral values can be understood, especially in terms of performing scientific studies in a society. Therefore, a country or a society shall look into its own cultural values for inspiration, rather than embracing the values imposed by imperialism, to perform their scientific activities. On the other hand, if a culture has not experienced any production of knowledge, scientific studies or technological progress, then it shall benefit from the sources of knowledge in other civilizations in order to assimilate them creatively by developing important concepts and ideas to implement these works. When history of science is carefully studied one can see that societies need to implement beneficial concepts of science according to their cultural perspective, language, traditions and moral values rather than adjusting their culture and moral values to the societies where scientific enterprise is progressed.³

The true aim of science is to discover quantity, features and characteristics of events in nature on every aspect and level as well as to evaluate the relationships between different beings and concepts. This way, science is able to acquire the required knowledge which may be used to predict

² Zekai Şen. *Philosophy, Logic, Science and Ethics in Engineering* (Istanbul: Su Vakfi Yayınları, 2011). For the second edition see *Philosophical, Logical and Scientific Perspectives in Engineering* (Cham, Heidelberg, New York, Dordrecht, London: Springer International Publishing, 2014).

³ For more information see George Sarton, *Introduction to the History of Science*, 3 vols. (Baltimore: The Williams and Wilkins Company, 1927).

what may happen in the future and how events in the future can be controlled. On the other hand, scientific studies are also performed to satisfy man's need to understand and know the unknown. Today, science has provided advanced technological developments by providing the foundation that is essential for the development of useful tools and devices for people. In fact, the development of tools and equipment called technology began before the phenomenon called science, and it has constantly progressed since the early times. Following the cutting tools of Stone Age; man has continued to create new tools with copper, iron, etc. to satisfy his needs, without having any scientific basis. Invention of the plow to till the field, the discovery of the wheels and the discovery of gunpowder are all technological developments. All of these developments have been created to satisfy a certain need. Hence, today the organized body of knowledge obtained through systematic thought with a specific methodology, called "*science*".

Activities that we call science today had close relationship with philosophy during the centuries when Islamic civilization had its golden age in scientific advancement. Philosophy may simply be defined as the love for wisdom or acquisition of knowledge with systematic and critical thinking. Knowledge, technology, philosophy and religion have moved from one civilization or culture to another welcoming it; and served humanity perfectly. Middle ages, is the term between the end of West Roman Empire in 476 and invasion of Istanbul by the Ottomans in 1453, marking the end of Byzantine Empire, which has been a successor of Eastern Roman Empire. This period witnessed an immense activity by Islamic civilization in terms of science, philosophy, technology, military, education and social solidarity. At that time, the West was struggling to take a breath of relief from political instability of feudalism, coupled with darkness, filth and absence of human rights. With the order of Pope, the West attacked Eastern Roman civilization to acquire their wealth and heritage, by showing Jerusalem as an excuse and calling these wave of attacks "Crusades". Many of their fellow religious peers were killed; cities, even Istanbul, which was then Constantinople, the center of Orthodox world, were raided and pillaged. Later in 16th century this period in Western history is referred to as the Dark Ages by their historians when ignorance dominated due to the dark, self-centered, inhumane behaviors that the world had witnessed.

This adjective may be very accurate for that age, but not for all civilizations that lived at those times. As it may be suitable for Europe, the term "Dark Ages" was the exact opposite of what Islam was right at that time because, especially when we consider the period between 7th century and 12th century there has not been a single scientist in the West that could be recognized as peers to Turkish - Muslim thinker or scientists of that time.⁴ For Middle Ages has been the most beneficial, rich and bright era for Muslims up to date. For this reason, the term of Dark Ages shall not be used especially in education systems of Muslim countries. Unfortunately, Turkish students and general public are deprived of the fundamental knowledge concerning philosophy, science and technology of their ancestors. As a result they apply the term "Dark Ages" referring to this bright age of Islamic civilization due to the modern, western mindset. In some way, education system of Turkey, has been left very weak in terms of its own science and religion. Our younger generations do not know the history of science and technology in their own civilization. Therefore, roots of abundant trees have been cut, only western philosophy and culture have been inoculated. On the other hand, one side of these vaccinated trees can give their own fruits. Our education system ignores Islamic sciences and technologies completely. Our youth has been raised with an inferiority complex, stating that we are not capable of developing such high and mighty products of science. Consequently, we have found ourselves in an inert position, imitating scientific history, scientists, cultures and traditions of others. Especially, history of Islamic science and technology should be known and taught. Mindset and philosophy of the Antique times, which are far darker and older from the aforesaid eras, have dominated the world. On the other hand, even in the West al-Farabi (d. 950) was regarded as the "Second Master" (*al-Ustadh al-Thâni*) after Aristotle. The year 1950 was confirmed and declared by UNESCO as "The Year of Farabi" to commemorate his 1000th birthday as a reputable philosopher and scientist. Even many scientists in our country are still unaware of this fact.

Unfortunately, as a result of forgotten sources, the Islamic intellectuals today claim that they are only doing imitative investigations in

⁴ See *ibid*, vol. 1. In fact Sarton thinks that in these centuries it is not worth studying any civilization other than the Muslim world where original scientific works were produced primarily in this part of the world, 1: 543ff.

the direction of the West. The small amount of scientific contribution from these countries as we see today, creates an important contradiction when compared to their past. This should not lead us to say: “we should boast about our past”. But, we should not despise it either. Instead of mechanically writing scientific articles in international magazines, we should embrace our past and diffuse the awareness in the minds of the public to change this sad portrait that we face today. Otherwise, the act of looking for solutions in a mechanized and artificial manner, will be permanent. Especially, the idea which claims that “the distance between the West and us in scientific progress is growing further, that is pointless to try catching up with them” confines our minds in narrow gaps. We shall be absolutely positive about the fact that we are at an equal distance, and sometimes, may even be superior to the West, especially when we consider the huge contributions which have been made by Islamic scientists and technology researchers, despite our present inability to contribute right now. Otherwise, we will not accomplish anything by regarding pioneers of today’s science, who are worshiped but not respected at all. Especially, the act of despising our own culture, society, history and resources while worshipping and aggrandizing West, which has dominated Anatolia for the past 200 years, has become the most influential element which holds us back in terms of scientific and technological developments. Especially, adoption of such an idea by the pioneering thinkers of our country, has reflected its negative influences onto the public and started deteriorating our wellbeing and self-confidence, preventing us to be happy and continue creating, just like a computer virus. Therefore, our pioneering thinkers shall definitely be aware of our major contributions in the arena of science and technology; and convey this self-confidence to the public, as we are successors of those great Islamic thinkers. The West, has become what it is today, thanks to the heritage of Muslim world. On the other hand, the West has wrongly based these values to Ancient Greece, which had been regarded culturally similar to themselves, and created their own Christian foundation for science and technology while ignoring major contributions of Islamic civilization to science and technology. Western civilization, which had a feeling of inferiority especially in terms prior to 16th century, had inverted this status and started to feel like they are superior to other cultures and socie-

ties. We start our lives by accepting superiority of the West, even without needing them to state this expressly. In the Middle Ages, Islam has not acquired anything from the West. Without the past products of Muslim contributions and movements, the West would have been in a far more backward condition today. We can eliminate this feeling of inferiority only if we start to imitate, so to speak, the Western ideas only in certain areas. For example, they have created their own world views and moral values without sacrificing much from their traditions, cultures and religious beliefs. The only opposition came from the authoritarian pressure of the Church. Similarly, we should base our scientific and technological future on our own traditions, beliefs, language and culture. None of the cultures, which has strong influences in the history of science and technology, has made a sacrifice from their culture, language or religion, but successfully blended the new knowledge they developed or even borrowed from others with their own culture. While it is an apparent fact that doing otherwise will not be a wise choice in the future, changing our culture, traditions and beliefs to imitate the West seems preposterous. Historical realities show us that we do not need to subject ourselves to Christianity, change of language or cultural erosion to become successful. Just like Muslims, who have acknowledged and blended the products of Greek, Indian and other scientific traditions without sacrificing their language, religion or culture, European civilizations also preserved their values while they acquired the intellectual products of Islamic civilization. Nobody has changed his/her clothing, language or belief. On the other hand, they have succeeded in advancing to even higher level of development.

Which scientists and engineers do you think created the first drafts for automation systems and robotics industry that are admired and thought to be performing many hard tasks for mankind? Most of us would probably think that they were from the West or at least, we would not think that such a person was possibly a Muslim scientist. Similarly, most of the Muslims who live in the “modern” “information society” of our time most probably thinks that these ideas have come to life in Ancient Greece, developed in Middle Ages for a thousand years, and finalized to be what they are today following the Renaissance movement in Europe. On the other hand, we must see that this is not the case when we refer to Western books which in-

terestingly approach this issue objectively. But unfortunately, in the modern age of today when we cannot even trust our own resources; we insist on acquiring our scientific and cultural heritage from the west, and keep on ignoring these fundamental facts of history with a skeptical mindset. Even people who refer to these resources, refuse to adopt, acknowledge and embrace these information, therefore resulting in our inability to develop our own resources. The first lesson that we learn from all these are the facts that the scientists of our own cultural heritage, have the right to be embraced and taught at the same level with thinkers of Ancient Greece. This is not only their right but also has a rightful need of our young students, who will be thinkers, scientists and technologists of the future, as they may inspire greatly from their own culture, lose this pointless sense of inferiority and even succeed in eliminating this feeling. For many people who do not know their history, their past, their family learnt from the history with bitter experience that it is not possible to advance without the light illuminate their way from their past. While important works of Islamic thinkers have been translated into Latin, the mostly accepted language of science in Europe, different nations have translated these resources again to their respective languages, enabling them to benefit from these works, creating their own resources by planting their own, adapted seeds.

Especially the wave of terror which has been created in Islamic countries and societies, make everyone think that knowledge, science, technology and even human rights are only products of ancient Greece and today's West. Civilizations that have lost their touch with their histories and repelled their own historical values, have become blind followers of the West. These societies have even ignored and despised all scientific and technological ideas and developments in their own country and accepted ideas and movements from other cultures with blind imitation. This is such a pitiful state and a miserable position to be in. History tells us the fact that societies may only acquire the age of enlightenment by creating their own sources of knowledge with their own cultural resources. Today, all societies and particularly Muslim nations, struggle to maintain their origin in an environment which has been invaded harshly by foreign and western approaches.

One definite example which may even serve as an accurate illustration of today's world of science and technology is Bediuzzaman Abu'l-'Iz

al-Jazari's technological automation researches. 800 years ago, and before capitalist and imperialist so-called technological and scientific products were presented to humanity for the purpose of material gain, a Muslim scientist have produced the same kind of technical devices solely for serving humanity, making us feel the need to start reconsidering our heritage. This scientist engineer is al-Jazari, whose complete name is Abū'l-'Izz ibn Ismā'īl ibn al-Razzāz al-Jazarī, who has been the only and most influential thinker throughout history. Abū'l-'Izz al-Jazarī developed highly admired ideas of "cybernetics", "automation" and "robotics" which are held highly important today. His "engineering" and "innovation" capabilities have been so unique that only a few scientists showed to have this kind of expertise throughout the following history of man. Also, he has based his technological ideas on objective concepts rather than speculative, abstract ideas as it was in ancient Greece, nor did he expressed his ideas with symbols.

In the rest of this article because of his importance in the field, I would like to highlight the works of Abu'l-'Iz al-Jazari and contribution in the field of technology and its significance for the technology-value relationship. This way I hope to spread awareness about his rich capabilities as a Muslim Scholar. The main aim of this article is to provide a brief perspective towards works of mechanical devices and automation concepts which have been created by Muslim scientists between 9th and 13th centuries as well as evaluate works of Abu'l-'Iz al-Jazari. He is indeed one of the most notable and progressive Muslim scientists working in this area. The work of al-Jazari has inspired from the works of previous researchers before 12th century and thus created important exemplary works which have acted as a basis for conical threads, suction and force pumps and even steam machines. Unfortunately, even imitations of these works, which have been products of Muslim scholars that have been blended with their own culture and resources, could not be made in the following centuries, resulting in the lack of ability to acquire further developments in this area. Moreover, another objective of this article is to embrace this important examples of mechanics and automation by Muslim scholars due to their historical importance. Particularly, contributions of Muslims to automation, have been the most ignored efforts of this unique society, which are unfortunately overlooked and almost forgotten completely.

I. A Brief History

During the time of Abbasid caliphates in Baghdad, many works of antique Greek have been translated into Arabic. The intention was to enable scholars who are competent in Arabic to benefit from previous studies. Among these translations, the most notable ones were works of Byzantine Philon's works on pneumatic (air powered) devices in 2nd century B.C. as well as mechanical works of Egyptian scholar, Heron, which have been performed in Alexandria in 60 A.C. Also, works of Archimedes on water counters were also translated into Arabic. Particularly, works of Archimedes has been noted in studies of Abu'l-'Iz al-Jazari's whose works also took into consideration previous studies of Archimedes, Philon as well as Arabic scholars, more particularly Banu Musa brothers. Involvement of Muslims in the field of mechanics start with the works of Banu Musa brothers in 850, and reached the peak level thanks to the works of al-Jazari in 1206, who was an Artuk Turk and has lived in Diyarbakır.

One branch of Turkish tribes has started to head west, as Sultan Alparslan has stepped in Anatolia in 1071. Artuk Tribe, being one of these Turkish tribes, has established a state near Diyarbakır. Abu'l-'Iz al-Jazari, who lived in the time of this state, has caught the attention of state authorities thanks to his knowledge and capabilities; and has been able to continue his studies in a confident and relaxed manner thanks to this direct support from the ruling class. At this time he wrote a book on robotics and automation devices.⁵ By also applying his drafted works on real machines, he has received admiration of the public. The title of this scholar is Badī' al-Zaman (we shall spell it as it is pronounced in Arabic as "Bediuzza-man") which means "the prodigy of his time." By only taking his pictures and drawings into consideration and comparing these to machines and robots of our time; we can easily see that his works were spread to other centuries. Additionally, as we can clearly see that the idea of "cybernetics" has been created by western scholars in 19th century by evaluating his books and drawings; the influence of al-Jazari can be better understood. First information about our robotist can be found in the foreword of his book.

5 Abu'l-'Iz al-Jazari. *The Book of Knowledge of Ingenious Mechanical Devices (Kitāb fī Ma'rīfat al-Hiyal al-Handasiyya)*, translated and annotated by Donald R. Hill (Dordrecht, Holland: D. Reidel Publishing Company, 1974).

Based on this information we know that he served to the ruling family, especially Nasreddin himself, his father and his brothers for a total term of 25 years during the time of Artuk Turks. This reign continued during the rule of Melik Shah, the sultan of Anatolian Seljuks in the 11th century. Then they were divided into two branches as Ilghaz and Sukman Artuklus. Especially in the 12th century, the Artuk Turks established a state in Diyarbakir during the time of the Seljuks who were stronger than themselves, Byzantines and the Crusaders who also came occasionally to their regions.

II. Islamic Technology and Al-Jazari

The title of this section is taken from the first book of al-Jazari that have been translated into English by Hill.⁶ In some way, works of al-Jazari are regarded as "Islam technology". Especially, among works of all Muslim scholars in the Middle Age which have served as a basis for scientific and technological developments in following centuries, works of al-Jazari have been the only one which has included practical and objective examples. Sarton has accepted the fact that, works of al-Jazari can very well be considered as the peak works which had been performed by Muslim scholars up to that date.⁷ Unfortunately, number of books which include works of Muslims in fields of technology and science is rather low. Among these, information and technological developments that have been provided by Nasr serve as an important resource.⁸ Especially, the works of Wiedemann and Hauser and engineer Fritz Hauser have been the most important examples of studies involving al-Jazari in Western world.⁹ Wiedemann was a physicist who knew Arabic. Therefore, study of his works by physicists and engineers, instead of a historians, social scientists and lectures shows us the fact that, works of al-Jazari have important economic, practical and up-to-date benefit which may be used in terms of engineering designs with correct physics principles. It has been known that, drawings and explana-

6 See Sarton, op. cit.

7 See Ibid.

8 Seyyed Hossein Nasr. *Three Muslim Sages* (Cambridge, Mass.: Harvard University Press, 1964).

9 E. Wiedemann and F. Hauser. "Über die Uhren in Bereich der Islamischen Kultur", *Nova Acto Academiae Caesararum Leopoldino*, 100 (1915), 167-272.

tions in al-Jazari's book involves an important plausible information for practical development in terms of their design and technical applicability.

Other thinkers and scientists which has contributed to Islamic technology before al-Jazari was Banu Musa (The Musa Family) heritage, Khwarizmi and Ridwan. In the Musa Family, there has been three notable scientists including Abu Ja'far Muhammad, Abu Qasim and Hasan. These thinkers have been raised under the rule of Caliph al-Ma'mun, following the death of their father. Three brothers seem to have influenced al-Jazari in his works. Works of these brothers include 100 different devices. These involve seven different designs of fountains, four automatic shaving (chipping) machines, one automatic music instrument, one gas mask for working on a dirty well, and one mechanical containment device for excavation in wells. The rest of their works mainly includes different mechanisms with water depots. Designs of these scholars were influenced by some ancient Greek thinkers such as Philon and Heron, who had similar concepts in their works. Therefore, Muslims of those times have also used the principle of referencing, which is still a respected rule of scientific practice. Works of Musa family are more systematic and automation works as technological devices.

Al-Jazari has used the idea of water counter, which had been set forth by Archimedes. As also explained by Drachmann,¹⁰ insufficient features of Archimedes' design have been modified, adapted and corrected by Muslims who have also invented first working water counter in the world. Another example of mechanical device parts developed by Muslim scientists for the first time in history and could not be found in prior ages is conical valves. This mechanical part is used in different parts of al-Jazari's book. According to Western sources, the idea for the conical valve, has started flourishing in 8th century, and developed fundamentally in 9th century.¹¹

Moreover, the book of Abû Abdillâh Muhammad ibn Ahmad ibn Yûsuf al-Kâtib, known for short as "al-Khwârizmî" (d. 997), entitled *The Key of Sciences (Mafatih al-'Ulum)*, included important technological information which is used by Muslim scholars. The section which catches

10 A. G. Drachmann. "Ktesibios's Waterclock and Heron's Adjustable Siphon", *Centaurus*, 20, 1 (1976), 1-10.

11 See Hill, op. cit.

our attention in Khwarizmi's book is called "*hiyal*" (Inventions) involves an in-depth knowledge of different mechanism. Fundamental definitions which have been used by al-Jazari are also included clearly in this book.

Another important work, which influenced al-Jazari belongs to Fakhr al-Din Ridwan ibn Muhammad al-Sa'atî (d. between 1220-1229) who was a scholar and mechanical engineer, author of the book *'Ilm al-Sâ'ât wa'l-'Amal bihâ*¹² in which he described the public clock set in Damascus by his father. Being a doctor, Ridwan set forth important opinions in different areas such as rhetoric, logic and philosophy. On the other hand, the insufficiencies in his drawings show his lack of competence in these areas. Nevertheless, even insufficient drawings of Ridwan have played an important role in development of Islamic technology. Ridwan does not have a technical background, but his works include even the minute details, unlike al-Jazari.¹³

Lack of importance given to automatic devices which were also designed and explained widely by Banu Musa brothers and later by al-Jazari and other Muslims in the following centuries, have led to the loss of the light of Middle Age Muslim Science. Unfortunately, this has been also felt by al-Jazari as he pointed out these matters in the foreword of his book; and stated: "I have put in so much effort to this work and I am deeply worried that my works will be lost with the blowing wind, and erased like the night does to the day." As Muslims have not paid the required level of attention to works of al-Jazari, especially to his book called *Kitab al-Hiyal* (The Book of Inventions), despite the fact that he provided important explanations in this book. This fundamental issue may be set forth as an important reason which neutered the development of automation science in Muslim societies, which held indeed a potential to make an important revolution. Many scientists, who were influenced by this book have made science and technology what they are today. Al-Jazari not only developed important device mechanisms that pioneered technology but also provided many influential concepts and ideas that have later been contributed to sci-

12 For the sake of practical reading for the layman we did not follow the Arabic transliteration very meticulously. Only in certain cases we followed the general convention to make sure the correct reading of the words.

13 For more information see also Donald R. Hill, *Arabic Water Clocks* (Aleppo: Institute for the History of Arabic Science, University of Aleppo, 1981).

ence, philosophy and engineering. This can also be understood from the foreword of al-Jazari's book. Because of its importance I would like to list these as follow:¹⁴

1. The inventor starts his book with the "basmala" (saying "in the Name of God, most merciful most beneficent"), and continues, stating that the real secret and power of everything on the land and in the sky, belongs to the Allah, the most high.
2. He asks more of these scientific discoveries from Allah, and respects his powerful ruling and decision. Such a request can be also found similar to the desire of Einstein; to know how God wanted to create the earth and what was the divine design behind the creation.
3. It has been also noted that al-Jazari has researched all the works in world literature before him. Therefore, al-Jazari provides us with an excellent example of Muslim's indebtedness to other works which were written prior to them by showing references, in the history of science. Such a behavior is expected morally by the scientific community.
4. Foreword of al-Jazari's book also tell us that he has researched works on how objects can be used to move other objects as well as other articles which prove different laws involving the sky and earth; and decided to focus on his energy on the field of robotics. This means, works which had been made prior to him has given him the will to perform his own studies. Here, we also understand that al-Jazari was also interested in physics, the philosophy of nature.
5. Reading the previous works without criticism is good for only transmitting the knowledge acquired in this way and that is why he wanted to free himself from

¹⁴ See Zekai Şen, "Robot ve Otomasyon Biliminin Öncüsü Ebu-l 'Iz al-Jazari" (Robotic and Automation Science Pioneer Abu-l 'Iz al-Jazari) presented (in Turkish) in the *Osmanlı Su Medeniyeti Sempozyumu*, Feshane, İstanbul, 2000.

being a simple transmitter. This way he was able to keep himself from just repeating what others have done, and return to his problems to investigate with his own insight. Thus, to continue the work independently to produce original works and do research freely.

6. He also stated that he had to pass through subtle and difficult ways during his studies and felt himself in distress from time to time, but he continued to work for years. Al-Jazari is so determined and stated: "I have awakened my ideas of drowsiness by extraordinary effort to stimulate my determination." In this, he has done all he can in order to make every effort to do more research. At the end of this, he has become a scientist who excelled in the society he lived in.
7. Despite all his successes, competence and achievements, he could not help to save himself from skepticism, just like Rene Descartes, a thinker of 16th century 400 years after his time, who states his famous methodical skepticism.
8. Another sentence in the foreword of al-Jazari's book, which is so well-thought that can still enlighten the world of industry and science today, states that "a technique (technology) will be left stranded between right and wrong if not realized and brought to application. With these words, he has expressed his desire for all researches to be realized and transformed into machines and mechanism that may be used to serve humanity.
9. Another important fact which has been given in the foreword of his book is his success in creating basic elements of science by gathering previously acquired dispersed sources of knowledge and then organizing them systematically. He highlights the fact that difficulties will arise in all fields of work, while these can be eliminated by means of systematic working and

organization of findings during the course of scientific studies.

10. Al-Jazari not only wanted to satisfy his curiosity but also wanted to teach his findings to others. He has stated this as follows: “I wanted to leave a decent work behind me which will convey what I wanted to teach and enable others to write what I have accomplished in my works.” Therefore, he also took into consideration the connection with other generations after him. On the other hand, he decided not to follow this decision as he explains this in the following way: “But I gave up on this idea because I was afraid that an influential critic would find my mistakes.”
11. Later on, the adherents of the people of benevolence appealed to al-Jazari to discover various aspects of his beautiful wisdom. He has expressed his feelings by stating “I have received such an interest and assistance of rulers and thinkers of my time that I was able to see the products of my work.” Ruler of Diyarbakır, Abu'l-Fath Mahmud bin Muhammad ibn Qaraaslan, who was aware of his studies told him once: “You have created unique plans, realized these from as if absence into existence. Do not waste all this effort and the foundation you have created. I want you to create a book for the projects you made and drawings you drew.” Therefore, the book of al-Jazari, *Kitab-ul Hiyal* has been flourished with state support and encouragement, and was thus transmitted up to date. Unfortunately we do not see any such work after that until today.
12. Another message that we can receive from the foreword in this book is the fact that, humans should be wise when deciding upon something; and everyone has been created with the competence required to perform a task easily. Everyone is also required to share what

he/she has. He thus said: “I am sharing what was given to me. Nobody would keep useful information to himself and nobody would be obliged to perform something beyond his/her ability.” He points out here that information can spread towards society easily.

13. Another message of al-Jazari in his book is his engineering concept. He explains, these concepts with drawings and annotations he provides. As engineering has just started to be acknowledged as an “applied science”, al-Jazari’s flowmeter is an important example with fine details.

Focus of al-Jazari’s works have been “brilliant” technological devices called “hiyals” (inventions). At his time, these devices were using water and air pressure, as there were no valuable resources of energy to empower devices. His empirical knowledge is also based on the sources of that date, as he produced such operating systems and devices. Especially, copper depots, pipes, pontoons and wheels were his creations with these materials. He used syphons, nozzles, orifices, taps and valves to control the movement of water. All kinds of wheels were manufactured from wood or iron, and settled on shafts.

While al-Jazari had a wide knowledge of numbers, Banu Musa brothers had used letters to represent figures. Even though mathematical relations were not known very well, experiences up to that date were used during studies. Even though Banu Musa brothers did not know the concept of pressure difference, they have successfully designed devices based on hydraulics and air pressure.

III. Automation, Robots And Comparison With Today’s Technology

Works of other scholars and scientists prior to al-Jazari were not recorded in a written manner but successfully conveyed from one generation to another verbally. Usage of these transmitted technical knowhow by al-Jazari and Banu Musa brothers have resulted in creation of many brilliant technological devices. Al-Jazari’s efforts in accumulating these technical knowhow and organizing them in a book subsequently enabled engineers after him to produce works of technical devices. Mathematics, space geom-

etry and other different measurement systems have been used in creating of these devices. Also, Abu Abdullah al-Khwarizmi's book called *Mafatih al-'Ulum* which was written in 991, managed to enlighten the path of future studies as a science and manual of technology. This book also included etymological data about meanings of different parts used in those brilliant inventions. An important feature of this book is the fact that it involves the common terminology, used by Muslim engineers up to end of that century. 200 years after this incident, in the year 1203, al-Sa'ati provided an important source, indicated above, concerning mechanical operations and performances of technical devices, which was intended to be used as a guidebook for repairing clocks. Besides these works, different books of Muslim engineers and scientists of nature also included certain sections on engineering, technical devices and mechanics. An organized and careful research should be carried out to collect all these works and present them for scholarly use. Notable works among Muslim philosophers, scientists and thinkers belong to al-Biruni, al-Hazini, Ibn al-Haytham and Jabir ibn Hayyan.

Of course the only book which has directly influenced modern engineering is the book of al-Jazari because his book included drawings and information about materials, methods, and simple explanations that anyone can easily understand. By considering his works with today's technology, the most notable invention is most probably the mechanical device which involves moving pistons placed in cylinders. This machine involves a wheel with scoops, which is used as a source of movement. This movement is controlled with a gearing system to harmonize the movement of a slot shaft. The movement of the slot shaft is transferred to horizontal movement to move the cylinders on sides, for the purpose of pulling water continuously according to open/close status of valves. This device involves three important characteristics which is still used in the water pumps as we use today. The first is presence of bidirectional pistons; the second is conversion of the rotation, the harmonic movement, to horizontal forward and backwards movement, and the third is its exemplary features for a water pump today. For all these reasons, al-Jazari's double water pump system, has provided an important mechanism for drafting the vapor machines in 19th century. In fact, many mechanical device models of al-Jazari has served as a basis for modern mechanical engineering.

Another element that has been used by al-Razzaz al-Jazari is conical valves. Although there is a claim that these valves were used by Leonardo Da Vinci for the first time in 16th century it has now been proved that al-Jazari's first book of drawings did actually include conic threads which means that this valve has been invented by al-Jazari in 12th century.

Drop-type buckets are also one of many robotic mechanic devices which have still been used today. Drop-type buckets are essential elements of rain meters we use today. This bucket drops with certain intervals and prepares itself for the next fill. Also, al-Jazari has successfully discovered the correct orifice diameter to use by expanding the diameter slowly until he reached the correct level, despite his lack of knowledge about orifice formulas. In other words, empirical manual works have been performed rather than theoretical studies. This also shows the fact that al-Jazari has been the first to perform empirical studies which have flourished in Islamic cultures. He has also used rules of geometric similarities, by creating paper models of his invention designs before. He is also the first engineer who invented usage of oil dipped wooden shafts to prevent from scraping. One of his water rising devices involved transfer of power by means of a crank shaft. This can be acknowledged as one of the first examples for today's modern crank shafts used widely in different machines. Crank had been known before him but had been used manually before him.

Conclusion

Technology, especially in early ages, have been developed independently from philosophy and scientific theories. First humans were struggling to satisfy their most basic needs such as shelter, protection from the outside world, and finding food. China, India, Mesopotamia, Egypt, ancient Greece, Islamic civilization and today's Western culture have all contributed to the development of technology throughout the history. Information about technology in early ages could only be acquired from excavations. Also, different cultures have written records involving development of technological literature. As these technological developments could easily be written with Arabic alphabet, rapidly, many scripts successfully conveyed these information to us. Particularly, primitive technol-

ogies of ancient Greece and other civilizations have been carried to their prime condition by the help of Islamic civilization and other centers of interest (namely Andalusia); before being successfully carried to Western societies devoid of this kind of knowledge then, Africa, Andalusia (Spain), and Islamic nations of Middle East. This influential development wave has sparked Europe, and enabled it to become what it is today. Although Islamic civilization is the most influential spark of Western science and technology, this truth is not known even by most Muslims today. Many convoluted ideas flood these nations, asserting that technology has always been created by Western civilization.

This article has given a brief information about the history of technology in different civilizations and provided information about Islamic technology, especially before, during and after reputable al-Jazari. This Muslim thinker, inventor and scientist, who created prime examples of technology before Renaissance, has enlightened the path of future studies. The Article also tried to highlight these important contributions of al-Jazari with brief examples. Also, examples of first pistons, cylinders, crank shafts and water pumps in Islam society throughout 1200's have been explained to support the idea that; Islam societies have also been pioneers in benefiting from human, animal, water and wind power. Unfortunately, today's Muslims turn their backs to great contributions of Islamic civilization to science and technology, and turn their face towards the Western civilization as they regard it the only way of development. This mindset is surely confined and sterile, as the history has not witnessed a single civilization which managed to provide innovative and developed products of high science and technology without preserving its own traditions and cultural heritage. In the future, this issue shall be taken into consideration and our nation shall first start to embrace its own values and features while remembering contribution of our successors to the world of science and technology.

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Inculcation of Values Into Technology An Islamic Perspective

Hamid Fahmy ZARKASYI¹

The rapid development of science and technology, with all the advantages and benefits has brought for man a negative effect on moral and human values in society. The age of technology has caused a type of mechanization of human life and human behavior. It has caused people to drift far away from virtues and the accepted traditional values of society. The main reason for this is the industrial development of most of the countries without adequate attention to the values dominating that society. Therefore it is the appropriate time, if it is not too late, to discuss and propose the inculcation of values into modern science and technology. However, this is not simply cosmetic addition of religious values and terminology to modern sciences and applied technology, neither is this an attempt to lend a sort of religious legitimacy to technology by grafting of relevant Qur'anic verses on technology as well as science. On the contrary, it is holistic approach involving in the first place the evaluation of modern science and technology that emerged out of Western philosophy of science which diametrically incongruent with the Islamic one, traceable from the worldview that Islam and the West have.

Moreover, since technology is the product of creative mind of technologists, the value inculcation should be through them as the producer, yet the society that needs technology also have rights to demand from technologist certain requirement for solving their problem of life including religious one. In order to discern the *rationale* of value inculcation in technology it is worth discussing the sources of the problem namely the modern science and technology. Subsequently the value inculcation that will be proposed here are three *first* shifting worldview of scientist or technologist, *second* by infusing the principle of *maslahah* in technological

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works by referring to the social expectation or demand to technology and third through knowledge transformation at university education.

I. Modern Science and Its Problems

Before dealing with the process of how to inculcate values into technology from Islamic perspective, it is imperative that we define the meaning of sciences. There are disagreements among scholars regarding the status of modern science, whether it is neutral or value laden. Some believe that science is cognitive in attitude and aiming to obtain “objective” knowledge, therefore there is little room for morality or in other words it is neutral. Others argue that that natural objects and physical laws are considered neither “good” nor “bad” and science is pursued to discover the natural laws and therefore no value in this objective of knowledge.² However, others argue that science in the West is problematic, for it is no longer associated with religion, the source of moral values. So it is neutral from religion but it is not free of secular values. So it is said that “Religion and science are separate and mutually exclusive realms of human thought and consequently it leads to “misunderstanding of both scientific theory and religious belief”.³ Due to its separation from religion it is called “science without God” to borrow the term of Arnold E Loen.⁴

Historically, the separation of science from religion is back to the conflict between science and religion as early as the 17th century, when Galileo (1632) was persecuted by the Roman Catholic Church for his view that the earth went round the sun. He also asserted that physical science must be separated from theological studies. This is because, he argues, the goal and the job of the two disciplines are totally different. The job of scientist is to examine nature, while the business of theologian is to make sure that the Bible agrees with it. In the same century Bacon also emphasized that religion is not a means of establishing physical truths, because it does not rely on practical experimentation. He also suggests that since

² Susan Ella George. *Religion and Technology in the 21st Century: Faith in the E-World* (London-Melbourne: Information Science Publishing, 2006), 7, 187.

³ National Academy of Sciences. *Science and Creationism: A View from the National Academy of Sciences* (Washington, D.C.: National Academy of Sciences Publications, 1984), 6.

⁴ See Arnold E Loen. *Secularization, Science without God?* (London: SCM Press Ltd., 1967).

the Bible was written centuries ago, it lacks the information of scientists established from natural experiments. This means using it to explain the natural phenomena is not appropriate.⁵ This separation was also driven by Renaissance of the Western civilization (14th-17th centuries) with its new spirit of inquiry and discovery that opened the gates to new scientific and technological developments. This separation was affirmed rigidly by the French Revolution (1789–1799). From these historical facts, it is clear that modern science is separated from religion from its early inception.⁶

The above separation has resulted in the rise of the principle of duality between “fact” and “value”, by which science is regarded as neutral or having no values. This duality is based on the myth of ethical neutrality in a value-free social science discussed by G. E. Moore in his *Principia Ethica* (1903), where he argues that science is restricted to what can be empirically proven. This means, only facts in the empirical sense are considered to be capable of being known *scientifically*. In this viewpoint the truth is measured only from objective facts separated from values.

The dual vision that separate fact from value led to another epistemological dichotomy of “subjective truth” and “objective truth”⁷ Not only has science been limited to empirical phenomena that everyone could analyze and evaluate quantitatively without interference of the subject but could also be assumed as fully independent of time.⁸ What they mean by the objective refers to two modes: *first* is a specific characteristic of scientific methodology, which is systematic, empirical of nature that leads to truthful generalization that could be empirically verified by repeating the experiment. *Second* is characteristic of the orientation and practice of

5 George Bugliarello. “Science, Technology, and Society—The Tightening Circle” in Glenn Schweitzer (ed.), *Science and Technology and the Future Development of Societies, International Workshop Proceeding* (Washington, D.C.: National Academy Press, 2008), 106.

6 Douglas G Long divided the period separation of science from religion into three: *first* is a period when the philosophy of science is a branch of theology, and scientific inquiry arrive at truth or certainty by confirming religious truth; *second* is a period when science has been secularized in a negative sense: confined to the realm of the secular, cut off from ultimate truth, having lost the capacity for unmitigated certainty as believer might lose the capacity for faith. The last period is a period when science has really been secularized. See Douglas G Long, “Science and Secularization in Hume, Smith and Bentham” in James E Crimmins (ed.), *Religion, Secularization and Political Thought, Thomas Hobbes to J. S. Mill* (London and New York: Routledge, 1990), 96.

7 Peter R Senn. *Social Sciences and Its Method* (Boston: Holbrook Press, 1971), 55.

8 Alanc Isaak. *Scope and Method of Political Science: Introduction to the Methodology of Political Inquiry* (New York: The Dorsey Press, 1969), 24.

scientists. In other words, is the behavior of researchers and practitioners of science objective?⁹

However, what is claimed as objectivity in science is not really objective in the real sense of the word. For we only make up our vision of reality and our perception of the world in general according to its reflection in our subjective natures. In this sense, there is no purely objective world which we are bound to regard as representing reality. The world is the interaction between the human selves reflecting upon multiple meanings and then imposing them over things. So, we cannot separate the thinker from his thought and the scientist from his responsibility. More generally, we cannot separate man from the reality he studies with this approach because reality is very complex and the world’s elements are shaped according to our perspectives and interpretation. The more we examine the element of reality from a different perspective the more aspects we can see.¹⁰ Therefore, the perception we gain is totally different from the actual reality.¹¹

Science is not practiced within a cultural or societal vacuum. It is not only the product of logic, but is an integrated part within this impure world in which we live. Science, is thus subject to the economic and political power that abuse science for political, commercial or military interests. So there is no empirical proof for the claim concerning the objectivity of scientific research. In the mid-70s, for example, excessive writings on sciences suggests that works of scientists in various fields including medicine and technology were not really neutral. It was because those works had been influenced by politically dominating power, especially in their job of formulating a certain perspective for science and technology.¹² Even in certain cases, science depends on government, institutional and organizational funding, and that scientists interact with and are dominated by the interest of various economic, political and military powers.¹³

9 Helen E Longino. *Science as Social Knowledge: Value and Objectivity in Scientific Inquiry* (New Jersey: Princeton University Press, 1990), 66; see also Nasr Arif, “Science, Objectivity and Ethic in Research Methodology”, *The American Journal of Islamic Social Science*, 15: 1 (1998).

10 David Halbrook. *Education and Philosophical Anthropology* (London Associated University Press, 1987), 150-151.

11 Harold Brown. *Observation and Objectivity* (New York: Oxford University Press, 1987), v.

12 Les Levidow, ed. *Science as Politic* (London: Free Association Books, 1986), 3.

13 Steward Richards. *Philosophy and Sociology of Science* (Oxford, Basil, Blackwell, 1987), 127-128.

In addition, the principle of duality brought about a dichotomy between physical and metaphysical reality that can hardly be reconciled. This is exactly what has been asserted by Silver that “the polarization between science and religion weakens societies and continues to be unresolved.”¹⁴ Seyyed Hossein Nasr criticized this by asserting that sensualist and empirical epistemology that dominated the horizon of Western people in this modern era, has successfully reduced the reality of the world of experience into sense perception. This has limited the meaning of reality and eliminated the concept of God’s reality.¹⁵ Human domination of searching the truth implies that the Ultimate reality i.e. God is forgotten or left behind. There is no principle higher than human being. More fundamentally modern science was founded on Western worldview which was colored with Western culture and psychological perception. At least there are five characteristics of Western civilization:

First, relying merely on reason to guide the life of human being;

Second, following the validity of dualistic view about reality and truth;

Third justify the aspect of temporal Being that project secular worldview;

Fourth advocate the doctrine of humanism.¹⁶

Fifth so, modern science is value laden and not neutral at all.

A. Technology and Its Problems

Having delineated so far the problem of value in modern sciences, we shall now elaborate such a problem in technology since the former related closely with the latter. Technology is a complex phenomenon and therefore it has no single meaning. There had been much effort devoted to work out precise definition of technology but it finally failed. Be that as it may, there are still some definitions that can be used for basic understanding of technology. Etymologically, the word “technology” comes from the Greek word “*techne*” meaning a systematic treatment of an art or craft and

14 L. M. Silver. *Challenging Nature: The Clash of Science and Spirituality at the New Frontiers of Life* (New York: Ecco, Harper Collins 2006), ix.

15 Seyyed Hossein Nasr. *The Need for a Sacred Science* (New York, SUNY Press, 1993), 7 & 20.

16 Syed Muhammad Naquib al-Attas. *Islam and Secularism* (Kuala Lumpur: Angkatan Belia Islam Malaysia (ABIM), 1978), 127– 132. See also by the same author *The Concept of Education in Islam* (Kuala Lumpur: Muslim Youth Movement of Malaysia, 1980), 45.

suggests craftsmanship. Other definitions summarized from *Answers.com* (n.d.) show that there are at least five definitions of technology:

- 1) The application of science, especially to industrial or commercial objectives.
- 2) “Applying a systematic technique, method or approach to solve a problem” (Computer Desktop Encyclopedia).
- 3) “The discipline dealing with the art or science of applying scientific knowledge to practical problems”.
- 4) “The creation of products and processes for the purpose of improving human chances for survival, comfort level, and quality of life”.¹⁷
- 5) “The practical application of knowledge, especially in a particular area such as engineering”¹⁸

It was these senses, in which ‘technology’ is used to refer to a body of knowledge about the useful arts that prevailed from Renaissance times well into the industrial era.¹⁹ However, when technology is defined from other discipline of knowledge it appears somewhat different. In relation to economic discipline ‘technology is simply anything that is important in constraining the feasible combinations of certain inputs to produce certain outputs’.²⁰ In the Standards for Technological Literacy, technology is also defined as: “... the diverse collection of processes and knowledge that people use to extend human abilities and to satisfy human needs and wants.”²¹ Another definition that emphasis social and environmental factors in technology is this:

The use of knowledge, skills and resources to meet people’s needs and wants by developing practical solutions to problems, taking social and environmental factors into consideration.²²

17 [www.geog.ouc.bc.ca/conted/online courses/enviroglos/t.html](http://www.geog.ouc.bc.ca/conted/online%20courses/enviroglos/t.html).

18 www.projectauditors.com/Dictionary/T.html. See also Susan Ella George, *Religion and Technology*, 7.

19 T. J. Misa. “The compelling tangle of modernity and technology” in T. J. Misa, P. Brey & A. Feenberg (eds.), *Modernity and technology* (Cambridge, MA: The MIT Press, 2003), 1-30.

20 Sonja Vandeleur. “Indigenous Technology and Culture in the Technology Curriculum: Starting the Conversation: A Case Study”, unpublished Ph. D. thesis, Rhodes University, January 2010, 12.

21 International Technology Education Association. *The Standard for Technological Literacy* (2002), 2.

22 The National Curriculum Statement: Technology, South Africa, Department of Education (2002), 4.

All those meanings show that technology understood as practical application, creation, method, technique, approach of scientific knowledge. In this sense technology applies the finding of scientific research or in other words science “come before” technology and enabling advances in technology. It could also be assumed that technology come first before the next scientific breakthrough can be made. It is through technology that science is enabled to advance. So in fact, there is a reciprocal relationship between science and technology.

Those diversified definitions of technology can be simplified into its types. Foucault, for instance, proposed four types of technology:

- 1) Technologies of production, is technology that allow us to produce, transform or manipulate things;
- 2) Technologies of sign systems, is technology that permit us to use symbols, signs or meanings;
- 3) Technologies of power is that which determine individual behavior and;
- 4) Technologies of the self is an approach to study the ethics of the individual.²³

According to Foucault, these four types of technologies always function together but they are not reducible to one another as each type is associated with a certain domination. It is a framework that enables researchers to better identify patterns, structures and relationships in a socio-technical system.

Be that as it may, technology is related closely to sciences in at least three points. *First* science (*episteme*) is about the unchangeable, while technology (*techne*) is about the changeable. *Second*, science starts from sensations of concrete things, whereas technology goes one step further and applies general knowledge back to concrete things. *Third*, scientists look for theoretical knowledge (*theoria*), that is, an activity having an end in itself; technicians produce new things (*poiesis*), and such an activity has always an end in something else.²⁴ In this sense technology has been seen as “flowing from” science.

23 M. Foucault. “Technologies of the self” in L. H. Martin, H. Gutman & P. H. Hutton (eds.), *Technologies of the Self: A Seminar with Michel Foucault* (Cambridge, MA: MIT Press, 1988), 16-49.

24 Susan Ella George, *Religion and Technology*, 6.

Just as it is proven that science is not neutral, while technology has reciprocal relation with science, it can be inferred that technology cannot be “neutral” too. Technology is applied and it cannot escape the question of whether its use is moral and ethical or not. Technology should answer the question of what is done with the “product.” Hence, we have the situation where machines and technological products are developed with no moral guidelines on their use.²⁵ In technology, there are questions of what applications are made and what is done with the technological product.

B. Evaluating Technology

In the situation where technology is not “neutral” and is not developed with moral guidelines on their use, one of the most poignant questions is the extent to which technology is “under the control” of society versus the extent to which it controls society. In most of the cases the change and innovation of technology is so rapid that society cannot control it and even could be trapped on using certain machine. Instead of looking at root causes problem, people continue to apply one technology after another to solve their problems, making them dependent on new machines. For example, too much of the rich food and a life of physical ease means people need new anti-obesity technologies or machine to enhance the “natural” diet. This means that each time we create a technology it has both positive and negative implications. The next time technology is created it is to correct the negative aspects of the previous one in so rapid way that creates a never-ending cycle of increased complexity. Similarly in society with certain lifestyle and culture that depend their life on technology, machines demand machines, people no longer have much say in determining direction, let alone values. So it can be inferred that human being in certain case cannot control the advancement of technology as well as the technological product. On the contrary technology even can change the ways the society live and thus requires examination in the question of technology’s impact upon society. The presence of television at home, for example, could destroy the tradition of family gathering in an extended family where the relationships are primary and everyone feel as part of it. Let alone the present of game technology (like play station) that practically waste the time of students.

25 Ibid, 187.

In such situations where technology cannot be controlled by human beings there is an attempt to evaluate it. The issue raised by Dreyfus and Spinoza regarding the role of technology in humanity and the way it should be evaluated.²⁶ In this issue the pivotal point is that to evaluate one would depend on a worldview by which all merit of technology such as efficiency, ease, freedom, pleasure, usefulness for social and cultural life, and even religion can be measured. The issue was then advanced to the problem of philosophy of technology. The renowned figure who began developing the field of philosophy of technology was Martin Heidegger. In his essay entitled *The Question Concerning Technology* he analyzes the true nature of technology and criticizes modern technology. However, he is also interested to find the way how to have free relationship to modern technology but under the condition that technology should be perceived as an instrument that we can retain it in the hand in will to master it.²⁷

One who started classifying and bridging two philosophical approach to technology was Carl Mitcham. He categorizes the approach into two: “engineering” approach and the “humanities” approach.²⁸ Engineering philosophy of technology – posits that technology is central in human life as the philosophical project aimed at understanding the phenomenon of technology as instantiated in the practices of engineers and others working in technological professions. Here technology is approached as tool and machine experienced in everyday life as material objects (from kitchenware to computers). Humanities philosophy of technology, on the other hand, consists of more general philosophical projects in which technology *per se* is not principal subject of concern. Technology is approached as a case study by examining how technology affects human life especial-

26 H. L. Dreyfus & C. Spinoza (1997). “Highway Bridges and Feasts: Heidegger and Borgmann on how to affirm technology”. Retrieved from <http://www.focusing.org/dreyfus.html>.

27 Martin Heidegger. *The Question Concerning Technology and Other Essays*, trans. by William Lovitt (New York: Harper and Row, 1977), 50.

28 The explanation of these two approaches are as follows: 1) Engineering philosophy of technology: Uses technological thought and action as a model for understanding even non-technological thought and action; 2) humanities philosophy of technology, this approach regards technological thought and action as only one aspect of human thought and action; delimits the technological thought within a larger framework such as life world or culture. C. Mitcham, “Notes toward a philosophy of meta-technology” in D. Baird (ed.), *Society for Philosophy and Technology* 1 (1-2). Retrieved from http://scholar.lib.vt.edu/ejournals/SPT/v1_n1n2/mitcham.html.

ly within the moral and cultural boundary. In other words technology is discussed as knowledge (including recipes, rules, theories, and intuitive “knowhow”), as activity (design, construction, and use), and as volition (knowing how to use technology and understanding its consequences). By elucidating these multiple aspects, Mitcham establishes criteria for a more comprehensive analysis of ethical issues in applications of science and technology.

However Mitcham finds that using the approach of engineering philosophy of technology is more successful where the engineers are requested to think about their works and to distinguish technology from science as the object of evaluation. However, unlike Heidegger’s position who criticizes modern technology, engineering approach praise modern technology uncritically and thus failed to deal with its problem. In contrast, the “humanities” philosophy of technology is regarded as not an effective instrument for evaluation and it is unnecessarily obscure and not easily comprehensible. In fact, the critique of humanities philosophy of technology is plausible, because there is growing hegemony of technology with the orientation of temporality and efficiency that constitutes a threat to meaning in life.²⁹ In other words, technology removes “meaning” from the world.

In addition to the above approaches to technology there are another attempt that introduce new name of technology, that is meta-technology, hyper-technology, virtual technology, or post technology.³⁰ Meta-technology has the mission of a re-contextualization of technology, which in turn become a technology that form a new culture of its own, and it is named trans-cultural culture or technoculture that transcends traditional particular culture and become global culture. The term which was coined by Mitcham, intended not only to distinguish meta-technology from modern and premodern technology,³¹ but also to capture the progressive development

29 Susan Ella George, *Religion and Technology*, 31.

30 C. Mitcham and R. Mackey, eds. *Philosophy and Technology: Readings in the Philosophical Problems of Technology* (New York: The Free Press, 1983), 254; see also C. Mitcham, *Thinking through Technology: The Path between Engineering and Philosophy* (Chicago: University of Chicago Press, 1995), 58.

31 Pre-modern technology or *technics* is technology where *technics* is embedded in a life world or culture that can be examined by general philosophy. Modern technology or autonomous technology: is a technology which is decontextualize or disembodied from society, in which its instrumentality was studied separate from culture. Susan Ella George, *Religion and Technology*, op. cit., 4-5.

of a global electro-media infrastructure and its culture. It is because science depends on technology as much as technology has been reputed to depend on science. This “inter-connecting of the realms” is applicable to economics and politics and vice versa; politics and religion and vice versa; art and economics and vice versa. The best instance of this meta-technology, according to Mitcham is the World Wide Web. It is from this latest type of technology that the inculcation of values is possible.

The foregoing discussion suggests that there were attempts among scholars to inculcate values into technology albeit the values meant therein are more cultural, social and moral in humanistic sense rather than religious. Moreover, from anthropomorphic approach we can use technology as a vehicle to understand humanity, or some other aspect which technology impacts. From sociological approach we examine whether technology is compatible with the need of society. Using philosophical approach we examine the underlying worldview within which technology is produced. With reference to economic approach we examine whether technology is instrumental for the process of production and distribution. This implies that technology opens its gate to be discussed from religious perspective or to be infused with religious values.

II. Inculcation of Values Into Technology

From the above discussion of sciences and technology, it is obvious that despite their secular orientation and application there are still spaces to inculcate value into technology. We would like to argue that there are at least three mediums of value inculcation into technology. I shall try to evaluate these means of value inculcation: through shifting worldview or paradigm; introducing objectives of *sharī'ah* and public goods; and modifying university curriculum.

A. Shifting Worldview

The basic problem of science and technology is dualistic worldview adhered by most of Western scientists, which in turn bring about various epistemological implication as has been alluded above. Therefore inculcation of Islamic values into Western science and technology requires a shift of paradigm or worldview revolution. In other words, in order to

infuse Islamic values in technology we have to liberate the worldview of Muslim scientist and technologist from Western influence and infuse them with the worldview of Islam.

The worldview of Islam projected by the revelation is a conceptual edifice that consists of seminal concepts that are subject to further interpretation and explanation with the support of prophetic tradition, reason, experiences and intuition in order to be instrumental for understanding reality as a whole. This explanation, demonstrate the structure of metaphysical foundation of Islam which is the basis of epistemology.³² The definition of this worldview according to al-Attas “...the vision of reality and truth that appear before our mind’s eye revealing what existence is all about”. This vision is not only limited to the vision of human reason towards physical world or the world of sensible experience, but encompasses both the worldly aspect (*al-dunyā*) and that of the hereafter (*al-ākhirah*). The former must be related profoundly to the latter and even the latter has ultimate and final significance.³³

The vision of two aspects of reality in an integrative fashion in Islam is manifest in analogous depiction of the Qur’an that is composed of symbolic form (*āyāt*) and the world of nature that consist of symbolic form (*āyāt*) like words in a book.³⁴ Certain people call the symbolic form of the Qur’an as linguistic symbol (*āyāt qawliyyah*), while the symbolic form in the world of nature is named symbol of the nature (*āyāt kawniyyah*). Since the Holy Qur’an and the nature have both ambiguous and clear or established symbolic forms one need to employ allegorical interpretation (*ta’wīl*) to detect, discover and reveal the concealed meaning of the ambiguous sign and symbols, yet it should be based on the interpretation of those that are apparent (*tafsīr*). Based on this method of interpretation al-Attas define Islamic science as:

...ultimately a kind of *ta’wīl* or allegorical interpretation of the empirical things that constitute the world of nature. As such science must base itself firmly upon the *tafsīr* of interpretation of the apparent or obvious meanings of the things in nature.³⁵

32 Syed Muhammad Naquib al-Attas, *A Commentary on the Hujjat al-Şiddīq of Nūr al-Dīn al-Rānīrī* (Kuala Lumpur: Ministry of Education and Culture, 1986), 464-465.

33 Syed Muhammad Naquib al-Attas. *Prolegomena to the Metaphysics of Islam: An Exposition of the Fundamental Element of the Worldview of Islam* (Kuala Lumpur, ISTAC, 1995), 1.

34 Ibid, 133.

35 Ibid, 137.

From other viewpoint the neutrality of science can be repudiated from the theory of worldview. The connection between worldview and sciences is traceable from the relation between worldview and epistemology. Scientific activity is within the domain of epistemology, while epistemology is developed within certain worldview and even influenced by it and vice versa in vicious circle. A belief in God, for example, could influence the way someone comprehend the nature of knowledge. It is because God and other non-empirical reality is regarded as the source of knowledge. On the contrary, if the existence of God is denied in a certain worldview all non-empirical reality is excluded from sciences. The statement of Thomas F. Wall below regarding this notion is interesting:

It (belief in God's existence) is very important, perhaps the most important element in any worldview. First if we do believe that God exists, ... we will have to believe that knowledge can be of more than what is observable and that there is a higher reality – the supernatural world. ... if on the other hand, we believe that there is NO GOD and that there is just this one world, what would we then be likely to believe about the meaning of life, the nature of ourselves, and after life, the origin of moral standards, freedom and responsibility and so on.³⁶

The foregoing quotation suggests that belief, either in the existence or in the nonexistence of God, related closely to the way the human being comprehend the nature of reality and knowledge, including the method to attain and utilize them in their life. The connection between worldview and science as well as technology is clearly defined by Professor Alparslan Açıkgenç, who asserts that “worldview is the foundation of all human conduct, including scientific and technological activities. Every human activity is ultimately traceable to its worldview, and as such it is reducible to that worldview.”³⁷ This implies that scientific and technological activities are carried out within the ambit of worldview. Thomas Kuhn who was well known as one who coined the term “scientific paradigm” connected conceptually the

36 Thomas F. Wall. *Thinking Critically About Philosophical Problem: A Modern Introduction* (Belmont, CA.: Wadsworth, Thomson Learning, 2001), 126-127, 532.

37 Alparslan Açıkgenç. *Islamic Science: Towards Definition* (Kuala Lumpur: ISTAC, 1996), 29; see also Alparslan Açıkgenç, “The Framework for a History of Islamic Philosophy”, *Al-Shajarah, Journal of The International Institute of Islamic Thought and Civilization*, 1: 1&2 (1996), 6.

term “paradigm” with worldview,³⁸ as he asserts that *paradigm shift* can be deemed *weltanschauung Revolution* (worldview revolution). Paradigm consists of values, standards and methodologies which are the very meaning of worldview, but at the same time it is also conceptual framework required by scientific studies,³⁹ and that paradigm “determines the way science should be practiced”.⁴⁰ Therefore it is quite plausible when Garry Gutting asserts that “to accept a paradigm is to accept a comprehensive scientific, metaphysical and methodological worldview”.⁴¹ From the preceding delineation it is clear that the basis of scientific and technological activities is worldview or paradigm. So, to inculcate values into technology one has to change the way he looks at sciences and technology in the real sense of the words.

As the matter of fact, employing worldview perspective for looking at technological issues is rarely considered by scholars.⁴² From this perspective technology might be more than just the material artifacts or conditions of our lives, more than just mean to accomplish end. Infusing worldview requires more holistic approach for it based on an integrality of spiritual-rational view of the Qur'an and the *Sunnah* (the Prophet's sayings and practices). Such an approach provides a better alternative of philosophical framework for a person's interaction with nature and his/her fellow human beings.⁴³ It is the Qur'an that has such an approach, since according to al-Shāṭibī, the criteria whether something is beneficial and

38 Kuhn states: “scientific research are directed towards the articulation of phenomena and theories where the paradigm is already provided.” Thomas S Kuhn, *The Structure of Scientific Revolutions*, International Encyclopedia of Unified Science, vol.2, no 2 (Chicago: University of Chicago Press, 1970), 24.

39 See Edwin Hung, *The Nature of Science: Problem and Perspectives* (Belmont, California: Wadsworth, 1997), 340, 355, 368, 370.

40 Ibid, 368.

41 Gary Gutting, “Introduction” in *Paradigm and Revolution: Appraisal and Application of Thomas Kuhn's Philosophy of Science*, (ed.) (Notre Dame, Ind.: University of Notre Dame Press, 1980), V, 1.

42 Commenting on this matter James P Buchanan asserts that “None consider that technology is a profound worldview and ontological shift that changes not only the way we are in the world but also the ways in which we should reflect upon it”. James P. Buchanan, “Critical Literacy: Technology and Cultural Values (Comparative Philosophy and Philosophy of Technology in Conversation)” in Peter D Hershock, et. al., *Technology and Cultural Values, On the Edge of the Third Millennium* (Honolulu: University of Hawaii Press, and East West Philosopher Conference, 2003), 583.

43 Khaliq Ahmad. “Islamic Ethics in a Changing Environment for Managers” in *Ethics in Business and Management: Islamic and Mainstream Approaches* (London: Asean Academic Press, 2002), 97-109.

harmful cannot be left to human reasoning alone, like the social contract theory and the normative stakeholder theory advocated by most Western theorists. Human reasoning plays a role only in a framework guided by the Shari'ah.⁴⁴ Islam recognizes the role of reason and experience in theorizing the affairs of worldly life only in a manner that embraces the transcendental aspect of human existence, because human beings' have inherent limitations that requires divine guidance, especially to ascertain what is right and what is wrong.⁴⁵ Hence, our rational faculties can – and should only – be used to complement, support, and strengthen ethics and morality as defined by the *shari'ah*. Now, we shall elaborate the objectives of *shari'ah* and the public good (*maslahah*).

B. Applying Objectives Of Shari'ah

The values that are to be inculcated in technology are derived from understanding *shari'ah*. *Shari'ah*, as one of the most fundamental elements of Islamic worldview cannot be separated or isolated from basic belief and values. It is also a system of ethic and values covering all aspect of life such as individual, social, political, economic and intellectual.⁴⁶ In other words, it reflects the holistic view of Islam, which is a complete and integrated code of life encompassing all aspect of life, be they individual or social. In Islam, all activities in life including technology cannot be isolated from moral and spiritual aspect and vice versa. The relevance of *shari'ah* in relation to technology can be discerned from the objectives defined al-Ghazzali in the following:

The objective of the *shari'ah* (*Maqāsid al-Shari'ah*) is to promote the wellbeing of all mankind, which lies in safeguarding their faith (*din*), their human self (*nafs*), their intellect ('*aql*), their posterity (*nasl*) and their wealth (*mal*) whatever ensures the safeguard of these five serves public interest and is desirable.⁴⁷

44 Cited in Imran Ahsan Khan Nyazee, *Islamic Jurisprudence (Usul al-Fiqh)* (Islamabad: Islamic Research Institute Press, 2000), 65.

45 Nyazee's argument is supported by a number of Qur'anic verses, among them 23: 71.

46 Muhammad Hashim Kamali. "Sources, Nature and Objectives of Shari'ah" *The Islamic Quarterly*, 35 (1989), 215.

47 M. Umer Chapra. *The Future of Economics: An Islamic Perspective* (Leicester: The Islamic Foundation, 2000), 118. Since the Arabic words are known to the experts we shall not always follow the standard transliteration in order to make it easier for the general reader to pronounce them.

The foregoing Shari'ah objectives listed by al-Ghazzali are approved by al-Shatibi thereby indicating that they are the most preferable in terms of their harmony with the Shari'ah's essence.⁴⁸ Generally, the Shari'ah is predicated on benefiting the individual and the community, and its laws are designed to protect these benefits and facilitate the improvement and perfection of human life in this world which corresponds to the purposes of the Hereafter. In other words, each of its five worldly purposes (viz., preserving faith, life, posterity, intellect, and wealth) is meant to serve the single religious purpose of the Hereafter.

The ultimate objective of Shari'ah rest within the concepts of compassion and guidance,⁴⁹ which seek to establish justice, eliminate prejudice, and alleviate hardship by promoting cooperation and mutual support within the family and society at large. Both of these concepts are manifested by realizing the public good that Islamic scholars have generally considered to be the *Shari'ah*'s all-pervasive value and objective that is, for all intents and purposes, synonymous with compassion. The objectives of the *Shari'ah* (*Maqāsid al-Shari'ah*) sometimes connotes the same meaning as public good (*Maslahah*), and scholars have used these two terms almost interchangeably.⁵⁰

Maslahah (pl: *masālih*) is etymologically "welfare, interest, or benefit. Literally, means seeking benefit and repelling harm. It is defined as a juristic device used in Islamic legal theory to promote the public good and prevent social evil or corruption. *Maslahah* and *manfa'ah* (benefit or utility) are treated as synonyms. However, *manfa'ah* is not a technical meaning of *maslahah*, which Muslim jurists define as seeking benefit and repelling harm, as directed by God or the Shari'ah.⁵¹ Al-Ghazzali defines *maslahah* as follows:

48 Nyazee, *Islamic Jurisprudence*, 121.

49 These attributes correspond to Qur'an 21:107 and 10:57.

50 Many classical-era Islamic legal scholars advocated the principle of the public good (*maslahah*) and the Shari'ah's objectives (*maqāsid al-Shari'ah*) in Islamic legal thought (*fiqh*): e.g., al-Juwayni (d. 1085), al-Ghazzali (d. 1111), al-Razi (d. 1209), al-Umīdi (d. 1233), al-Salmi (d. 1261), al-Qarafi (d. 1285), Ibn Taymiyyah (d. 1327), al-Shatibi (d. 1388), Ibn al-Qayyim al-Jawziyah (d.1350), and al-Tūfi (1316). Cited in Deina AbdelKader, "Modernity, the Principles of Public Welfare (*Maslahah*), and the End Goals of the Shari'ah (*Maqāsid*) in Muslim Legal Thought," *Islam and Christian-Muslim Relations*, 14: 2 (2003), 164-74.

51 Cited in Nyazee, *Islamic Jurisprudence*, 161.

Maslahah is essentially an expression for the acquisition of benefit or the repulsion of injury or harm, but that is not what we mean by it, because acquisition of benefits and the repulsion of harm represent human goals, that is, the welfare of humans through the attainment of these goals. What we mean by *maslahah*, however, is the preservation of the *Shari'ah's* objectives.⁵²

Since *maslahah* is synonymous with *maqasid*, al-Ghazzali emphasizes the importance of preserving the *Shari'ah's* objectives as *maslahah's* fundamental meaning. By preserving those objectives we may gain flexibility, dynamic and creativity in policy, in economics, science, technology, environment and politic.⁵³ Al-Shatibi, closely following al-Ghazzali's taxonomy, defines *maslahah* in his *al-Muwafaqat* as a principle that concerns the subsistence of human life, the completion of one's livelihood, and the acquisition of what his emotional and intellectual qualities require of him in an absolute sense. He further classifies *maslahah* into three categories: *daruriyat* (the essentials), *hâjjiyât* (the complementary), and *tahsîniyyât* (the embellishments).⁵⁴ These categories are briefly discussed below:

Darûriyat (The essentials): these are the self-interests upon which people essentially depend, such as faith, life, intellect, posterity, and wealth. These elements are, by definition, absolutely necessary for the proper functioning of a person's religious and mundane affairs, to the extent that their destruction and collapse would precipitate chaos and the collapse of society's normal order. Thus, protecting them reflects the effective way of preserving the *Shari'ah*, as outlined in its objectives.⁵⁵

Hâjjiyât (The complementary): these category is complementary to the essentials and refer to those interests that, if neglected, would lead

52 Al-Ghazzali, *al-Mustasfâ Min 'Ilm al-Usûl*, (edited by M. Sulayman al-Ahqar), vol. I, Mu'assat al-Risalah, Beirut, 1997), 416-417; see also Ahmad al-Raysuni, *Nazariyat al-Maqasid 'inda al-Imam al-Shatibi* (Riyadh: Dar al'Alamiyyah Kitab al-Islami, 1992), 41-45.

53 Wael B. Hallaq. *A History of Islamic Legal Theories: An Introduction to Sunni Usul al-Fiqh* (Cambridge: Cambridge University Press, 2004).

54 Abu Ishaq al-Shatibi. *Al-Muwafaqat fi Usul al-Shari'ah*, (ed.), Abdullah Draz (Beirut: Dar al-Ma'rifah, 1996), 2: 25; see also Hallaq, *History*, 168.

55 According to Hallaq, the essentials are maintained by two means: on the one hand, they are enhanced and strengthened, while on the other, all potential harm that may arise to affect them is averted. For example, protecting life and intellect are examples of important elements of the essentials that can be enhanced by providing proper food, shelter, clothing, education, and so on. On the other hand, any potential harm that might threaten these essentials may be averted by means of a penal law or punishment that prohibits alcohol or dumping toxic waste that may cause harm to one's intellect and life, respectively. Cited in Hallaq, *History*, 168.

to hardship but not to the total disruption of life's normal order. In other words, they are needed to alleviate hardship so that life may be free from distress and predicament. An example is seen in the sphere of economic transactions, where the *Shari'ah* validates such contracts as forward buying (*sallam*) and lease and hire (*ijarah*), because people need them, notwithstanding a certain anomaly attendant in both.

Tahsiniyyât: The embellishments refer to those interests that, if realized, would lead to refinement and perfection in the customs and conduct of people at all levels of achievement. For example, the *Shari'ah* encourages charity (beyond the level of *zakat*) to those in need and, in customary matters and relations among people, urges gentleness, pleasant speech and manner, and fair dealing.

Relevance to the three principle of public good (*maslahah*) there are three groups of technologies to support national development: a) technologies for basic needs equal to first principle, essential (*darûriyyât*); b) technologies for the improvement of quality of life, equal to complementary (*hâjjiyât*) and c) technologies for wealth creation, which is the same as the embellishment (*tahsiniyyât*). Science and technology strategy must therefore be holistic and comprehensive, addressing the role and needs of the main players in a nation, which are government, industry, the science and technology community and society at large.⁵⁶

The above classification is not only to seek of benefit and to repel harm as directed by the lawgiver (Allah and His messenger), but also to ensure that society's interests are preserved in the best fashion both in this world and in the Hereafter. The above principles of public good and theories of objectives (*maqâsid*) tend to be concerned only with individual rather than society and human in general. Those principles also exclude the most universal and basic values such as justice and freedom. It is therefore quite reasonable that contemporary thinkers such as Ibn Ashur (d.1907), Rashid Rida (d.1935), Muhammad al-Ghazali (d.1996), Yusuf al-Qaradawi (b. 1926) and Taha al-Alwani (b. 1935) proposed new additional principle of public good and objectives of *Shari'ah*.⁵⁷ Some of the

56 George Bugliarello. "Science, Technology, and Society: The Tightening Circle" in Glenn Schweitzer (ed.), *Science and technology*, op. cit., 104-5.

57 Jasser Auda. *Maqasid al-Shriah as Philosophy of Islamic Law, A System Approach* (London, Washington: The International Institute of Islamic Thought, 2008), 5-7.

new principles of public good are knowledge, wisdom, freedom, social-political and economic reform and women rights, preservation of natural disposition (*fitrah*), justice, human dignity and right, purifying the soul, restoring moral values, and developing civilization on earth. So, when those principles are elaborated further in so comprehensive manner we could provide a framework for making decision and a mechanism for adapting change and producing as well as utilizing technology.

Before applying the principle of *maslahah*, it is imperative that we delineate the reciprocal relation between society and technology. The society (through social organization) may exploit or expect technology in order to meet their objectives and needs, whereas technologists diffuse their technological products to support the advancement of social wellbeing. Eliezer Geisler categorizes the expectation of society to technology in his work *Creating Values with Science and Technology* into three categories: mission and objective, internal functioning and intangible factors. The detail can be clarified below:

1. Mission and objectives: this is the expectation to accomplish the mission of social institution within budgetary constraints, and also to perform maximum satisfaction of recipients of services, expectation of constituencies, meeting performance standard of higher order of national and social goal. This is more ideal in nature rather than practical.
2. Internal functioning: this is related to the social expectation for technology to provide efficiencies in administration and management, procedure and methods, cost-saving and cost cutting, also efficiencies in empowering inter-organizational coordination and cooperation. This expectation is more practical in relation to the operation of organization or institution.
3. Intangible factor: such as prestige, maintaining traditions, and recognition by funding bodies and public at large are important expectation. So technology is expected to assist in maintaining the high level of these factors through.⁵⁸ This is concerning about some factors that are more practical.

⁵⁸ Eliezer Geisler, *Creating Values with Science and Technology* (London: Quorum Book, 2001), 245-246.

Obviously, the foregoing categories refer to modern secular society of the West, where their ideal expectation to technology are limited only to develop the materialistic society. Therefore that social norm, ethics and morality are regarded as insubstantial factor, whereas in Islamic society ethic and morality is part of the essential element of *maslahah*. However, in order to inculcate values to technology, we shall accomplish the expectation of Western society to technology with principle of *maslahah* discussed previously.

The first expectation to technology to accomplish the mission and objective of social institution could be infused with factors mentioned in *maslahah* as *darûriyyât* (The essentials). In this category, technology is expected to enhance the protection or the preservation of five essential factors namely: faith, life, intellect, progeny and wealth. It is not the matter of engineering technological product but about the worldview of technologist. It is because the preservation or protection of five objectives of Shari'ah is affirming one's worldview. The protection of faith or religion means the betterment of man-God relation, by which the mode of his relationship with his fellow human being would consequently be better. This would bring about the good relationship between staff and his manager in a social organization. In this situation there will be no conflict of interest, since everyone has a unity of purpose in his life that is to serve Allah. This also would inevitably lead to formation of a society whereby every member will cooperate with each other rather than compete, to obtain the ultimate happiness (*falāh*). If the whole member of society including the producer and procurer of technology were guided by proper relationship with God, the working ethic of every person would be inspired by the values of truthfulness, firmness, fairness, and respect for the law, kindness, forbearance, tolerance and uprightness, instead of deceit, haughtiness, class consciousness, ostentation, insubordination, envy, jealousy, backbiting and the like.⁵⁹ This should naturally be manifested in individuals' involvement in producing and procuring technology.

In terms of technological product the technologists are expected to produce technologies that are conveniently protect man essential need ac-

⁵⁹ See M. K. Hasan, "Worldview Orientation and Ethics: A Muslim Perspective" in A. M. Sadeq, *Ethics in Business and Management: Islamic and Mainstream Approaches* (London: Asean Academic Press, 2002), 67.

ording to dictate of Shari‘ah i.e. faith or religion, life, intellect, progeny and wealth, in all walk of life. The technologists, for example, are expected to create safety and health facilities in the working places in order to save the human life; the technologist in the field of communication had created a product of cell phone by embedding compass in it, in order to help Muslims in looking for direction of Mecca to perform their prayer whenever they need it.

However, in the field of architecture or in urban planning certain aspect of “essentials” are not taken into consideration. In designing modern building, such shopping complex, airport, hospital and others, Muslim architect used to forget to provide adequate prayer room. Seyyed Hossein Nasr, for example depict the criteria of Muslim architect as the following:

The heart of many Islamic cities today still display this remarkable unity of space and function within the mosque, *madrakah*, bazaar, private home and the like. Needless to say, secularism destroys this vision of unity and the integration of all human activity within a divine norm and pattern.⁶⁰

So, in Muslim society or other society where religious rituals need a space to perform, architect or urban design technologists should take so seriously into their consideration that all necessary or essentials aspect of social life are to be provided adequately in their urban design.

The *second* expectation to provide efficiencies in administration and management of organization could be practical in nature, but it is still related to the first expectation i.e. to accomplish mission and objective or the essential needs. If the expectation to accomplish mission and objective can be infused with the essential needs (*darûriyyât*), we could also infuse this second expectation with the accomplishment of complementary needs (*the hâjiyyât*). The complementary needs are the whole supplementary to the five essential values especially on protecting life and intellect. However, this complementary principle focuses on avoiding hardship in the life of the community and giving convenience to human life including efficiencies demanded by modern secular society.

The Internal functioning as the expectation of society to technologist can be accomplish by creating technology that can avoid hardship in working places, in school, in the mosque, in the airport and the like. Also for the purpose of efficiencies computer and communication tech-

⁶⁰ Seyyed Hossein Nasr. *Traditional Islam in the Modern World* (Lahore: Suhail Academy, 1987), 232.

nology are appropriate product, yet it should be controlled by the goal to accomplish the essential needs. Technology of producing alcohol should be directed only for the purpose of medication; also technology of printing should be directed not to trade with or manufacture or sell of pornographic magazine that promote indecent behavior of the society. The principle that should be held by producer and user of technology is that self-interest should be linked to the overall concept of public goodness and justice. Technology should be protected in order not to create social disruption or violation of the norm of Islamic justice.

The *third* expectation to technology is to create positive image of social institution including in this is making the success of institution in its program as traditions. This point has been accomplished by the second principle of *maslahah* discussed above. This third principle is beyond the discussion of Eliezer Geisler’s expectation of society to technology. In the principle of embellishments (*tahsiniyyât*) the corporations are expected to discharge their social responsibilities by engaging in activities or programs that may lead to improvements and attainments of perfections of public life conditions. Involving in charity or giving donations to the poor and needy; providing scholarships to the less fortunate students and providing sufficient, correct and clear information or advertisement regarding products offered to customers are some of the examples of commitment with respect to achieving the embellishments for society. In the light of this principle, technology is expected to fulfill the duty of embellishing the quality of life or the improvement and attainment of perfection of public life condition. For example technology is expected to create transportation with free air pollution, technology for water purification and the like.

To integrate the social expectation to technology proposed by Eliezer Geisler above and three principle of *maslahah* proposed by Muslim scholars we may infer generally that both *maslahah* and Western expectation need common good or public good by having peace, economic prosperity, justice and mechanism to keep and perpetuate them. However, there should be in accordance with different levels of importance and severity of consequences. In other words priority should be given to the accomplishment of the essential needs (*darûriyyât*). Therefore one must not focus on attaining embellishments while jeopardizing the essentials. Similarly, one

must not obsess with the attainment of benefits to the extent of creating harm or inflicting injury to others. So the duty of science and technology can be simplified into two: 1) related to common good of social life such as maintenance of system of government, economic prosperity, civil stability, national defense, environment protection, national prestige, justice, exploration etc. 2) related to public benefit in relation to everybody's business such as healthcare, transportation, social service, taxation and redistribution of resources, full employment, housing, law enforcement, education, administration of justice, administration of national and local affairs and the likes.

In short Islamic guidance, enshrined by its principle of justice, brings about a balance between individuals' rights and their duties and responsibilities toward others, and between self-interest and altruism. Islam recognizes self-interest as a natural motivating force in all human life, but it has to be linked to the overall concepts of goodness and justice.⁶¹ Therefore, social responsibility is not solely a duty of the government, rather, it is a duty of all members of the community, including scientist, technologist, corporations, social organization and institution. Thus, individuals and society as a whole are encouraged to sacrifice, and protect the faith, the life, then intellect, the progeny and wealth of the society. This sense of duty, responsibility, and spirit of sacrifice, which Islam nurtures, actually helps remove self-centeredness and greediness and promotes compassion, caring, cooperation, and harmony among people.

Thus, political system of a society, culture, and organizations are the essential ingredients for the creation and enhancement of science and technology. Only well-organized societies are able to build large public works and logistic networks. Today global corporations, financial institutions, and venture capital have become key enablers of discoveries and technological development. In general, the culture of the nineteenth century encouraged a great flourishing of science and technology, which in turn led to the modernistic culture of the twentieth century. However, society is not a monolith. Scientific and technological developments may impact certain aspects or parts of society faster or differently from others, whether one considers laws, the attitudes of leaders, military prowess, commerce, health, or education.⁶²

61 Syed Nawab Haider Naqvi. *Perspective of Morality and Well-Being: A Contribution to Islamic Economics* (Leicester: The Islamic Foundation, 2003), 99-110.

62 George Bugliarello. "Science, Technology, and Society: The Tightening Circle" in Glenn Schweitzer (editor), *Science and technology and the Future Development of Societies, International Workshop Proceeding* (Washington, D.C.: National Academy Press, 2008), 120.

Moreover, technologist must possess certain characteristics in order to play its pivotal role as a connecting link between society and the industrial sectors. The general belief is that an engineer must possess broad information skills that transcend his technical and technological skills. A good engineer, over and above being skilled in analyzing theories and their practical applications, must possess an analytical mind in critical situations. He must possess the ability to cope with prevailing work conditions, managerial skills, and the capacity to learn and to teach in the long run. He must also possess virtuous moral qualities.⁶³

C. Modifying University Curriculum

Since university is the very place where various technologies are studied and applied, it is the most proper place to inculcate moral, social and environmental values to technology. The good start is to inculcate Islamic ethic to student of sciences and technology or students studying in the faculty of engineering and other related faculties of applied technology.⁶⁴ This has to be under the supervision of a professor experienced in engineering, who has close connections with industry on the one hand and technical innovation on a world scale on the other. The other subjects might include the following:

1. The worldview of Islam,
2. History of technology in Islam and in the West,
3. Working relations and industrial laws,
4. Islamic economic and production relations,
5. Standards of design and productivity,
6. Professional ethics,
7. Human values and ethical engineering,
8. Environmental protection and sustainable development,
9. Relation of industry and university.

63 This has been experienced by certain university in Iran. See Mehdi Bahadori and Mahmood Yaghoubi, "Ethics in Engineering as a Prerequisite for Technological Development of Societies" in Glenn Schweitzer (ed.), *Science and technology and the Future Development of Societies, International Workshop Proceeding* (Washington, D.C.: National Academy Press, 2008), 120.

64 The courses of engineering ethics were conducted for the first time in the United States in the 1960s. In the present Iran the subject is also taught to students at engineering department.

Moreover, each student should present a seminar on any of the topics listed above. Students trained not only in engineering subjects but also in ethics can lead the way to developing a profession that responds to societal interests in a rapidly changing world. By teaching them such subject we will help the future technologists to build a well-integrated character.

In addition to curriculum the university should provide centers relating to ethics where student can consult in matters pertaining to ethics in technology and engineering, make a research in order to write articles and books about ethics in science and engineering that can be published. To enrich the concept of ethic in relation to technology the university could manage scientific and technical cooperation with other university, so that students at the undergraduate, graduate, and postdoctoral levels could study abroad or trained by other professional professors. Another form of cooperation is the undertaking of joint projects between two university laboratories, with exchanges of personnel and ideas and joint publication of results.⁶⁵ This is in order to improve student awareness of this responsibility. Finally, the commitment of the student to apply Islamic values in their profession should be proven during their graduation, in which they have to sign text of oath mentioning their future responsibility to take into account the importance of protecting and safeguarding welfare of human beings throughout the world based on the above principle public good (*maslahah*) or the five objectives of Sharī‘ah.⁶⁶

A Concluding Note

I would like to conclude that inculcation of values into technology is not so simple, for it involves understanding the worldview that underlines the sciences as the source of technology. The worldview upon which Western science and technology refer to, is secular. This secular worldview is the main problem of modern sciences and technology that should be liberated and Islamized. One of the problems of modern sciences and technology is that they are separated from religion. This problem should be resolved by the process of worldview revolution and the shift of para-

⁶⁵ Norman Neureiter. “The Role of International Scientific and Technical Cooperation in National Economic Development”, in Glenn Schweitzer (ed.), *Science and technology and the Future Development of Societies*, International Workshop Proceeding (Washington, D.C.: National Academy Press, 2008), 55-56.

⁶⁶ This has been experienced by certain university in Iran. See Bahadori and Yaghoubi, “Ethics in Engineering as a Prerequisite for Technological Development of Societies”, *op. cit.*, 118.

digm, by which science is integrated with religion and technology. Technology that relies on religious values could be invented or created based on objective of sharī‘ah or public good, which is exactly the same as trilogy of fulfilling human basic needs, improving quality of life and creating the wealth. The final task to be done is to enforce this concept of value inculcation in university education, the place where the forthcoming generation of scientists and technologists are prepared.

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