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ISLAMIC SCIENCE AS A SCIENTIFIC RESEARCH PROGRAM:
CONCEPTUAL AND PRAGMATIC ISSUES

Islamic Science, Islamization, and the Road Ahead: Conceptual Issues

The idea of Islamizing the sciences has become a matter of much passionate discussion and debate among Muslim intellectuals and academicians, including professional scientists, mathematicians, engineers and technologists. Many books and articles have been written and seminars held to clarify the idea in conceptual and pragmatic terms. However, it would seem that little progress has been achieved so far toward achieving a broad consensus among them on a positive reception of the idea. Some, like Abdus Salam and Hoodbhoy,¹ reject the idea altogether, while others accept it wholeheartedly without a clear understanding of what the idea really means and entails for their scientific work, but most working scientists have only a hazy notion of the idea without any genuine intellectual commitment for or against it.

This situation is not surprising given the realization that the idea of Islamization of sciences necessarily demands close, critical engagement with the philosophy, history and practice of both Islamic and modern

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1. Hoodbhoy, Pervez Amiral, *Muslims and Science: Religious Orthodoxy and the Struggle for Rationality*, foreword by Mohammed Abdus Salam (Lahore: Vanguard Books, 1991). A comprehensive survey of Muslim intellectual responses to modern science is Osman Bakar, *Tawhid and Science: Essays on the History and Philosophy of Islamic Science* (Kuala Lumpur: Nurin Enterprise, 1991), 201-26.

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science. Thus, only a very few Muslim scientists and philosophers of science (e.g., Nursi,² al-Attas,³ Nasr,⁴ Bakar,⁵ Golshani⁶ and others) have been successful in articulating the idea with any degree of intellectual insight—though not all use the term ‘Islamization’—based on a thorough knowledge of both the Islamic and Western scientific traditions, including the contemporary ubiquity of modern science. However, after three decades or so of Islamization, my feeling is that their works need to be further explicated in terms that can provide practical direction to scientists not exposed to the history and philosophy of Islamic and modern science. One thing that all parties in the debate have realized is that the Islamization of the sciences has to be far more substantial than merely citing the relevant Qur’ānic verses and Aḥādīth, for the real intellectual challenge lies in articulating the religious textual relevance in conceptual terms rich enough to determine the content and direction of actual empirical scientific research.

In view of this complex and difficult situation, it should be fruitful for Muslim scientists to conceive of the Islamization of the sciences or Islamic Science as a long-term scientific research program.⁷ Like other

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2. Mermer, Yamine and Aneur, Redha, “Beyond the ‘Modern’: Saʿīd al-Nūrī’s View of Science” in *Islam & Science*, Vol. 2 (Winter 2004) No. 2, 119-60.
 3. Seti, Adi, “Al-Attas’ Philosophy of Science: An Extended Outline” in *Islam & Science*, Vol. 1 (December 2003) No. 2, 165-214.
 4. Nasr, Seyyed Hossein, *Science and Civilization in Islam*, 2nd ed. (Cambridge: Islamic Texts Society, 1987).
 5. Bakar, Osman, *The History and Philosophy of Islamic Science* (Cambridge: Islamic Texts Society, 1998).
 6. Golshani, Mehdi, *Issues in Islam and Science* (Tehran: Institute for Humanities and Cultural Studies, 2004); reviewed by Osman Bakar in *Islam & Science*, Vol. 2 (2004) No. 2, 209-14. See also Golshani, Mehdi, *The Holy Qur’an and the Sciences of Nature* (Tehran: Global Publications, 1997).
 7. For modern scientific research programs see Lakatos, Imre, “Falsification and the Methodology of Scientific Research Programmes” in Musgrave, A. and Lakatos, I. (eds.), *Criticism and the Growth of Knowledge* (Cambridge: Cambridge University Press, 1970), 91-196. *Kalām* physical theories are investigative in nature and hence are research programs, see Sabra, A. I., “Science and Philosophy in Medieval Islam: The Evidence of the Fourteenth Century” in *ZGAIW*, 9 (1994), 1-42. For a critical overview of Islamic

scientific research programs (such as *kalām* and *falsafah* physical theories,⁸ Ibn al-Haytham's optics,⁹ classical Newtonian mechanics,¹⁰ Darwinian evolution,¹¹ Einstein's relativity,¹² quantum mechanics and David Bohm's implicate order,¹³ Chomskyan linguistics,¹⁴ Eccles' and Popper's mind-brain interactionism,¹⁵ cognitive psychology,¹⁶ big-bang

science, philosophy and theology as investigative scientific research programs, see Adi Setia's "Introduction" to his unpublished doctoral thesis "The Physical Theory of Fakhr al-Dīn al-Rāzī" (Kuala Lumpur: ISTAC, IUM, 2004), 1-23.

8. See Adi Setia's "Introduction" to his unpublished doctoral thesis, "The Physical Theory of Fakhr al-Dīn al-Rāzī" (Kuala Lumpur: ISTAC, IUM, 2004), 1-23.
9. Saud, Muhammad, *The Scientific Method of Ibn al-Haytham* (Islamabad: Islamic Research Institute, 1990); Omar, Saleh B., *Ibn al-Haytham's Optics: A Study of the Origins of Experimental Science* (Minneapolis: Bibliotheca Islamica, 1977); Anton, Heinen, "al-Biruni and al-Haytham: A Comparative Study of Scientific Method" in Said, Hakim Mohammed (ed.), *al-Biruni Commemorative Volume* (Karachi: Hamdard National Foundation, 1979), 501-13.
10. Newton, Isaac, *The Principia*, trans. by Andrew Motte (Amherst: Prometheus Books, 1995). See also Burt, E. A., *The Metaphysical Foundations of Modern Physical Science: The Scientific Thinking of Copernicus, Galileo, Newton and Their Contemporaries*, reprint of 2nd ed. (Atlantic Highlands, NJ: Humanities Press, 1980).
11. A recent, somewhat dogmatic, restatement of the Darwinian paradigm is Mayr, Ernst, *What Evolution Is* (New York: Basic Books, 2001).
12. Einstein, Albert, *The Meaning of Relativity* (London: Routledge, 2003); see also David Bohm's interpretation of relativity in his *The Special Theory of Relativity*, reprinted (London: Routledge, 2002).
13. Bohm, David, *Wholeness and the Implicate Order* (London: Routledge, 2002); idem and Hiley, B. J., *The Undivided Universe: An Ontological Interpretation of Quantum Theory*, paperback reprint (London: Routledge, 2002).
14. Chomsky, Noam, *Language and Problems of Knowledge: The Managua Lectures* (Cambridge, MA: MIT Press, 1989).
15. Popper, Karl and Eccles, John, *The Self and Its Brain: An Argument for Interactionism*, reprinted (London: Routledge, 2003).
16. Jackendoff, Ray, *Patterns in the Mind: Language and Human Nature* (New York: Harvester Wheatsheaf, 1993); idem, *Languages of the Mind* (Cambridge, MA: MIT Press, 1992); idem, *Consciousness and the Computational Mind* (Cambridge, MA: MIT Press, 1987); idem, *Semantics and Cognition*, (Cambridge: MIT Press, 1985).

cosmology,¹⁷ chaos and complexity theories versus intelligent design, irreducible complexity and creation hypothesis,¹⁸ and now superstring theory¹⁹), the scientific research program of Islamic Science has a core metaphysical component consisting of basic, abstract theoretical assumptions underpinning the program, and a network of auxiliary hypotheses providing directions for the conceptual clarification and empirical investigation of this core metaphysical component, and hence providing rational and scientific evidential support for it. Empirical clarifications, once achieved, may even lead to practical, useful technological and engineering applications which can serve to realize the axiological implications of the core metaphysical component in contemporary Muslim communities throughout the world.

The core metaphysical component here obviously consists of the fundamental elements of the Islamic worldview (i.e., the Islamic vision of man, nature and ultimate reality), while the auxiliary hypotheses provide guidance toward working out the implications of this worldview in empirical terms, for instance, the implications of (i) the Islamic vision of man for formulating a contemporary empirical Islamic psychology and epistemology,²⁰ (ii) the Islamic vision of nature for formulating an empirically fruitful alternative to Darwinian evolution,²¹ (iii) the Islamic vision of ultimate reality for deciding between the Copenhagen instrumentalist and the Bohmian realist interpretation of quantum

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17. Craig, William Lane and Smith, Quentin, *Theism, Atheism and Big-Bang Cosmology* (Oxford: Clarendon, 1993).
 18. Moreland, J. P. (ed.), *The Creation Hypothesis: Scientific Evidence for an Intelligent Designer* (Downers Grove, Illinois: InterVarsity Press, 1994); Behe, Michael, *Darwin's Black Box: The Biochemical Challenge to Evolution* (New York: Free Press, 1996).
 19. Green, M. B., Schwarz, J. H., and Witten, E., *Superstring Theory* (Cambridge: Cambridge University Press, 1988).
 20. Here, Muslim psychologists may draw from traditional Islamic faculty psychology and modern cognitive psychology of especially the Chomskyan school.
 21. The positive research program here may be referred to as the intelligent design or creation hypothesis based on the Qur'anic concept of *taskhīr* and other related concepts such as *uqān* and *ihsān*; for elaboration, see Setia, Adi, "Taskhīr, Fine-Tuning, Intelligent Design and the Scientific Appreciation of Nature" in *Islam & Science*, Vol. 2 (Summer 2004) No. 1, 7-32.

mechanics,²² (iv) the Islamic medical methodological alternative to vivisection,²³ and so on and so forth. This research program pertains to both the ongoing conceptual clarification of various aspects of the Islamic worldview, and the concomitant working out of their empirical implications for Islamic science, technology and engineering. In short, a major cognitive function of this research program is to provide directions toward critical conceptual and empirical reevaluations of modern scientific theories which are found to be problematic from the perspective of the Islamic worldview, with a vision toward their eventual modification and even replacement with better theories if necessary.

The articulation of this Islamic Science research program, conceived thus, necessarily requires critical, creative engagement at a deep theoretical level with modern science since it is the default science for which Islamic Science is proffered as the more viable alternative, at least for Muslims if not for humanity at large. Obviously, the ambitious scope of this research program for the revival of Islamic Science necessarily entails an interdisciplinary collaboration between scientists, technologists and engineers on the one hand, and historians, philosophers and sociologists of science on the other.

Also, the axiological, as opposed to the cognitive and methodological, aspects of Islamic Science will require the informed input of authoritative experts in *Fiqh*, *Uṣūl al-fiqh* and the *Maqāṣid of the Sharī'ah*. Furthermore, non-Muslim intellectuals, academicians and scientists may also want to participate and contribute to the elucidation of the content of this

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22. Here, Muslim scientists may also draw from and work out the empirical implications of Sufi ontology as outlined in al-Attas, Syed Muhammad Naquib, *The Positive Aspects of Tasawwuf: Preliminary Thoughts on an Islamic Philosophy of Science* (Kuala Lumpur: Islamic Academy of Science, 1981), and further elaborated in his *Prolegomena to the Metaphysics of Islam: An Exposition of the Fundamental Elements of the Worldview of Islam*, 2nd ed. Kuala Lumpur: International Institute of Islamic Thought and Civilization (ISTAC), especially Chapters III, V, VI, VII and the Epilogue.
23. Here, Muslim medical researchers may draw from the history of Islamic medicine as well as from the modern scientific and methodological critique of vivisection by Croce, Pietro, *Vivisection or Science?: An Investigation into Testing Drugs and Safeguarding Health* (London: Zed Books, 1999); see review of this book in this issue of *Islam & Science*, Vol. 3 (Summer 2005) No. 1, 87-90.

research program given the present-day widespread self-critical spirit of modern science leading to serious consideration of scientific methodological pluralism²⁴ and the search for alternative, more “democratic” sciences and technologies, a.k.a., science and technology with a human face.²⁵

Pragmatic Issues I:

Globalization and Techno-Scientific Creativity in the Islamic World

Universities (including other forms of public and private educational organizations) throughout the Islamic world may want to establish, say, departments, centers or institutes of integrated studies in science with a clear vision toward facilitating this wide ranging multi- and inter-disciplinary collaboration at the local, regional and international levels of intellectual and scientific networking. This institutional framework provides a regular, ongoing formal intellectual platform for promoting interdisciplinary discourse amongst scholars and students toward acquiring a profound and sophisticated understanding of the Islamic worldview in relation to science and technology and its clarification in terms of cognitive, pragmatic and axiological directions for empirical and technical research in the challenging global context of contemporary scientific and technological enterprise.

Through the local, regional and international research and networking activities of these institutes of integrated studies in science, policy makers in the Islamic world can have access to responsible advice with regard to enhancing Muslim techno-scientific creativity while avoiding a scenario in which globalization—if “allowed to run its course”—results in the Islamic world remaining “at the receiving end of technology i.e. continuing to use other people’s technology to produce goods and services for other people’s market without itself ever producing competitive technology.”²⁶

24. For instance, Paul Feyerabend’s seminal *Against Method*, 3rd ed. (London: Verso, 1993).

25. A useful collection of articles on the search for a democratic scientific future is Harding, Sandra (ed.), *The “Racial” Economy of Science: Toward a Democratic Future* (Bloomington: Indiana University Press, 1993).

26. Daud, Wan Ramli Wan and Zain, Shaharir Mohamad, “Indigenisation of Technology and the Challenge of Globalization: The Case of Malaysia” in *MAAS Journal of Islamic Science*, Vol. 15 (1999), 110.

Since long-term prosperity cannot be a borrowed one, it will have to be one whose conceptual and pragmatic bases are self-consciously defined first and foremost from within the context of Muslim societies. In practical terms, this means that the techno-scientific endeavor has to be eventually homegrown, cultivated and geared ultimately to serving the authentic creative and material needs of indigenous Muslim communities and then (when opportunity beckons) the global community at large. This means empowering promising young scientists and technologists to conceptualize, choose, propose, plan and direct their own research agendas, to pursue plausible novel theories, to experiment, and to innovate in thinking and implementing, and lastly but not least, to be continually well-informed of, and hence to be involved fruitfully in debates on, the shifting, global political economics of issues pertaining to intellectual property rights, research agendas, and alternative and emerging technologies.

In order for science, engineering and vocational students to be able to do meaningful non-trivial choosing and conceptualizing, it will not be enough to expose them merely to the “hard facts” of the standard, mostly western contextualized, textbooks and technical manuals. Provisions must also be made not only for teaching science and technology as such, but also for educating students in the creative conceptual foundations of theories, methodologies and techniques, as well as exposing them to the “cultural expectation matrices” within which the techno-scientific enterprise is socially supported and finds its axiological direction and meaning. This consideration is especially important in the overwhelmingly religiously oriented nations of the Muslim world, including countries like Malaysia, in which the major world religious cultures (Islam, Christianity, Buddhism and Hinduism) play a pivotal role in determining the worldviews and value-systems of its citizens, and hence, in providing their lives with an ultimate sense of direction, meaning and purpose. Here again, institutes of integrated studies in science, as conceived above, can provide the kind of historically and philosophically grounded conceptual and pragmatic perspectives needed to formulate scientific and technical educational policies geared to the attainment of a creative, holistic understanding of science and technology amongst students, teachers, intellectuals and policy makers.

Pragmatic Issues II:

Islamic Science as Re-Democratizing Science

Seen as a universal human activity, science is a way of thinking about and experiencing the world, and ordering it in thought and act, hence it is neither the invention nor the monopoly of the modern West, but a natural birthright of every human being who experiences and interacts with his or her environment. Just as there is cultural diversity amongst humankind, so too there is scientific diversity as part and parcel of this universal cultural diversity, which in turn is reflective, even expressive, of the diversity and complexity of the natural world.

The history of Islamic science is the history of a truly scientific cosmopolitanism in which the positive, creative contributions of all ethnic and religious communities were welcomed, appreciated and critically integrated into the framework of an intellecto-spiritual and ethico-moral outlook toward the bounties of nature as a divinely bestowed trust. To be free and creative, Muslim scientists can and should learn from this rich history. They should reclaim their heritage and their birthright by renewing all that is good in their scientific history and rearticulate it in contemporary terms in full, unapologetic critical engagement with modern western science.

Therefore, the call for the revival of Islamic Science as a viable scientific research program is in a way a call for the redemocratization of the scientific endeavor of all mankind. It is a call for the study of nature in terms of not only its temporal utility, but also and more importantly in terms of its transcendent significance for the ultimate salvation of humanity.

Accordingly, there are two interlocking dimensions of study in Islamic Science. One pertains to utility, i.e., to the improvement of the socio-material conditions of temporal earthly life. The other, more important, dimension pertains to intellectuality, i.e., to the contemplative appreciation that the way nature functions indicates that it is thoroughly dependent on an intelligent designer who transcends it and to whom scientists will be accountable for what they do in and out of their study of nature. The latter dimension is more important because it underlies the first and provides the scientific enterprise with an organizing vision of ultimate meaning, direction and purpose that can curtail the commercial monopolization of science and technology for individual and corporate greed masquerading as progress, development and change “for the better.”

The problem now is that mainstream, western modern science ever since Darwin is thoroughly imbued with a naturalistic, reductionist, utilitarian and hence manipulative outlook toward the natural world. Naturalistic because it sees nature as self-subsisting and self-organizing and thus independent of the Creator; reductionist because it reduces all natural phenomena to physical, linear, quantitative and quantifiable causes and effects; utilitarian and manipulative because it studies nature for the Baconian purpose of controlling, manipulating and exploiting it to realize vague, elitist notions of the 'good life'. The unabashed three-way wedding of science with multinational corporations and state power in the West for controlling and exploiting the world's resources is a clear indication that much of modern scientific research may never achieve its self-proclaimed democratic, liberal and humanitarian goals.

To be precise, mainstream modern science and technology is basically the Euroamerican way of doing science and technology. This "technopoly"²⁷ is thoroughly imbued with a totally secular, utilitarian outlook to the natural and social world. To a large extent, its present-day global ubiquity is due to the after-effects of systematic colonial destruction of indigenous, holistic systems of science, technology, knowing and living, and their replacement with reductionist forms of knowing and living now indirectly (but nonetheless, aggressively) imposed on poor indebted nations through the various 'structural adjustments' programs of international lending institutions like the World Bank and International Monetary Fund.

Again, Islamic Science conceived as a scientific research program carried out by Muslim institutes of integrated studies in science can provide the formal research and scholarly framework for contributing the Islamic intellectual input to the global, grass-roots movement toward the dewesternization and hence redemocratization of science and technology. Toward the attainment of this goal, Muslims may share a common vision and mission with non-Muslims in the East and West through the various formal and informal avenues for mutual collaboration at their disposal.

27. Postman, Neil, *Technopoly: The Surrender of Culture to Technology* (New York: Vintage Books, 1993).