# Towards a Contemporary Philosophy of Islamic Science

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Our understanding of science itself as a body of knowledge and as a system of analysis and research has changed over the last decades, just as over the last two centuries, or especially after the age of Enlightement in Europe, science has become more powerful, more sophisticated and complex.

It is rather difficult to determine where science ends and where technology begins. In fact there is a growing awareness that the physical or natural sciences, as a means of studying and understanding nature, are relying on the more "humanistic" and cultural approaches adopted by the social sciences or the humanities. The tradition of natural science is being challenged by new discoveries of the non-physical and non-natural sciences which go beyond the physical world.

Certainly research is vital for the growth and development of all sciences that attempt to discover and understand the "secrets" of nature. The validity of any scientific theory depends on its research and methodological premises and even that – its proposition or theories (in the words of a leading cosmologist and theoretical physicist, Stephen Hawking) – is tentative. Hawking says: "Any physical theory is always provisional, in the sense that it is only a hypothesis: you can never prove it. No matter how many times the results of experiments agree with some theory, you can never be sure that the next time the result will not contradict the theory. On the other hand, you can disprove a theory by finding even a single observation that disagrees with the predictions of the theory."

The history of Western science is rooted in the idea of finding the 'truth' by objectivity. Nothing can be believed until there is a scientific proof of its existence, or until it can be logically accepted by the rational mind. The classical scenario of scientific work gives you an austere picture of heroic activity, undertaken against all odds, a ceaseless effort to subjugate hostile and menacing nature, and to tame its formidable forces. Science is depicted

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as a selfless venture in pursuit of some objective truth. The scientists themselves appear to be lonely figures, locked in their laboratory, and obsessed with objectivity and scientific truth. The method they use is simple enough: it involves empirical observation, deduction, induction, experimentation, and conclusion in a linear process which epitomizes the evolutionary nature of scientific development. This "pure" scientific method is to be completely detached from human and cultural elements. Morals and value judgements are to be excluded because they are looked upon as unscientific because they can, supposedly, colour our objective evaluation.

This is the dogma of scientific inquiry. We know that this analytical framework of scientific inquiry is not only limited, but also in danger of becoming obsolete in an environment where the relationship between the various scientific disciplines themselves is no longer characterized by linear boundaries, but rather by an interdisciplinary nature, or a unitary wholeness, to reflect the unitary system of nature and the universe. Even the modified system of the positivist science of the 1930s and the 1940s which Karl Popper, with his theory of falsification has made such a brave attempt to preserve, stands discredited. The Popperian belief, as Hawking suggested in a somewhat similar vein, that science advances when a dominant theory is falsified by results of new experiments or observations of new facts and phenomena does not cover the whole truth as the works of both philosophers and historians of science such as Kuhn and Feyerband have shown. Scientific decision-making is basically a political and propagandistic affair, in which prestige, power, age and polemics decisively determine the outcome of the struggle between competing theories and theorists. Thus, subjectivity and value judgements are believed by modern philosophers of science to be the conditioning influences of scientific activity, despite obvious opposition by scientists. Apart from this, numerous Marxist philosophers and historians of science, from J.D. Bernal and J. J. Solomon to Hilary Rose, have highlighted the key role of ideology and politics in the development of science. In the contemporary world, these scholars argue that scientific activity is shaped not only by pure concern for some illusive truth and dictates of clinical objectivity, but by ideological factors and political considerations and constraints. The emergence of new disciplines, such as the sociology and anthropology of knowledge, has further emphasized the subjective elements of science.

It would therefore appear that subjectivity and value judgements enter into almost every stage in the so-called scientific enterprise, from the selection of problems to selected observations, from how theories are constructed to how "facts" are discovered and interpreted, from how research is funded to how the results of research are used.

We need thus to be wary of the promotion of the ideals of a positivist science. We should not perceive Western science as our unique focus,

compelling us to believe that "knowledge, science and culture" in the West are identical with the history of the human race – a reincarnation of August Comte (1798-1857) who was convinced that all civilizations would unavoidably advance along the same lines as Western civilization. The postulate that knowledge is socially constructed has become axiomatic in social theory. One of the major issues in this context is the relationship between social structure and the use of knowledge as a form of political hegemony or social control.

Our contemporary understanding of science essentially demonstrates that science is a human activity, encompassing and subject to the whole spectrum and complexity of human behaviour. Emotions, personal beliefs, political values and constraints, cultural values, even personal, petty political interests, moral concerns – all these elements are as valid as any empirically observed physical or concrete facts, and they cannot perforce be detached or excluded from any scientific study, right from the laboratory stage up to the publication of research findings. They determine which one of the competing theories has the consensus or support of the scientific establishment. Moreover, since science is not a study of "dead" objects, but of a living world of dynamic forces of nature, it cannot remain static and dogmatic in its approach; it has to reflect Nature, and not challenge the Natural Law; it has to be dynamic, and an open-ended enterprise. Its results may not be absolutes; its theories may no longer be eternally valid. In essence, science is not an adventurous pursuit of some romantic objective truth, but an organized, systematic, interdisciplinary and rational problem-solving enterprise.

The function of scientists is to solve problems. They do not discover absolute truths. The facts of science are just facts: they may be right, and they may be wrong. But they must be distinguished from Truths. Scientific theories are true in the sense that they work within a given framework, a set of equations, a dominant paradigm. Change the framework, the equations, the paradigm, and the theories change, too!

All this makes science a much more humble and down-to-earth activity. In the new picture of science, it is less sure of itself; it ought to be somewhat less arrogant, but for all that, it ought to remain an intellectually enriching and exciting endeavour. Moreover, science cannot be seen as a supreme activity, totally devoid of all social and cultural dimensions, a right unto itself. It has to become more directly relevant to society, to our cultural and social needs, as well as to reinforce our ethical and moral values. For if science is devoid of values, if science is stripped of its external pretence to objectivity and neutrality, then we might as well bring in ethics and values of our world views and cultures in shaping our scientific philosophy of science which is a challenging necessity. Indeed, given the importance of science in modern society, it becomes an imperative for our civilization.

However, we must differentiate between science and non-science. We know that values, politics, ideology, power, prestige and polemics, all play an important role in science. But just because this is so, it does not mean that we cannot differentiate between science and non-science. There are many features or characteristics of science that make this distinction possible. Science is the name given to a mode of inquiry which is systematic, rational and empirical.

Despite the fact that secrecy or exclusivity has become a common character of modern science, particularly where scientific activity is used for defence and military purposes and for protection of industrial complexes, where research results are the private property of some multinational corporation, openness is still a prerequisite of science. Science is not a secret activity; it is not something that groups of individuals undertake in isolated enclaves, hidden from the rest of society. Scientific results must be amenable to rationalist interpretation. Once metaphysics and values have played their part, all people of reason should be able to see and make the rational connection between cause and effect; without this connection science cannot be science, it is belief. But perhaps the most important of all features of science is its empirical and experimental nature. All the grand theories of science ultimately come down to some empirical observations and experimental work. Even with all the interplay of power politics and personal rivalries, a scientific theory has to work in practice, offer a rational explanation of a phenomenon, before it even stands the chance of dethroning its rivals. Without empirical and experimental work, there can be no science. And finally, the result of a scientific activity, no matter what ethical and value criteria played a part in shaping it, must be reproducible; unless other people can reproduce your results, they have no validity, therefore, no universality.

In shaping an Islamic philosophy of science, we must keep these features in mind which distinguish between science and non-science since we are seeking to infuse the entire system of science, its method, its processes, its goals, with the ethical and value concerns of the world view of Islam. In this endeavour, we have two main guides: the Qur'an and the history of science in Islam.

The Qur'an is not a textbook of science. It is a Book of "Guidance." While the Qur'an obviously contains a number of descriptions of physical phenomena, we should not be looking into it to find the proof for every scientific 'fact' and discovery. This is a dangerous and futile exercise for the simple reason that the Qur'an is the domain of eternal absolute truth; science's domain is relative truth and changing facts. The two cannot be compared. If we justify what is absolute truth with what is relative, we are then going to modify the absolute when the relative changes.

Hence the theories and discoveries of science, no matter how certain

they may appear to be, cannot be equated with the verses of the Qur'an. Instead, we should be looking at the Qur'an to provide us with the ethical and value guidelines to shape all aspects of our scientific activity.

Our attempts to develop a contemporary Islamic philosophy of science cannot be divorced from Islamic science in history. Up to quite recently, the history of Islamic science was one of the most neglected fields of study. But now, thanks to the efforts of various Muslims as well as Western scholars, for example Fuat Segzin, S. H. Nasr, David King and E. S. Kennedy, we are developing a good understanding of the breathtaking scope of the history of Islamic science. Just as the 12th century crusaders were crude barbarians as compared to the Muslim opponents, so then and later, the Latin scholars could do little beyond translations and explanations of their sources in natural science. It seems fair to say that only after the Enlightenment in 18th century Europe did the level of technical excellence in the West in most fields of science and engineering surpass that of their Islamic sources. In medicine, the best Islamic practice was not surpassed by contemporary European medicine until modern surgery was introduced and modern hospitals were established. Recent research has highlighted these and other achievements of Islamic science. But despite all this, there is still much to be discovered. We have not delved deeper into the substance and real essence of the scholarship, other than making some descriptive historical accounts of the works and their authors. In retrospect, we now realize, for example, that the Islamic science community has not yet produced its own Joseph Needham, whose epochal achievements in undertaking the study of the history of Chinese science has now become public knowledge. But we knew from existing documentation and studies that the history of Islamic scholarship has bequeathed a large enough amount of material for present-day Muslim scholars and scientists to unveil the underlying structure and spirit of medieval Muslim scholarship.

While looking at Islamic science in history, it is important that we examine it in its total perspective, in all its richness and diversity. We should not be tempted to promote sectarian causes, to project minor trends and aspects at the expense of major themes, or to focus on obscure areas such as astrology and the occult at the expense of what we understand today as "hard" sciences. This is not to say that such practices did not exist nor that they should be entirely ignored. They should, however, be understood and appreciated in their true and total perspectives.

In shaping a contemporary philosophy of science, we need to search history for answers, among numerous others, to fundamental questions: (1) What was original and Islamic about Islamic science; and (2) How did Muslim scientists infuse and interpret the ethics and values of Islam into their work?

To answer these questions, we need to go beyond the mere collecting

of historical facts or the writing of the profiles of celebrated scientists and philosophers. We need to look at Islamic science in history in terms of its systematic structure, the conceptual processes that were at work, and the research modalities upon which the Muslim scientists undertook their research. We need to develop historical theories and test them empirically; or in terms of T.S. Kuhn, we need to discover the paradigms within which Muslim scientists worked. All this will provide us with the essential material and conceptual framework to shape or develop a contemporary philosophy of Islamic science.

The purpose of any philosophy is not purely intellectual illumination for its own sake but also to guide behaviour. The purpose of developing a contemporary philosophy of Islamic science is not simply to satisfy some intellectual curiosity, or to glorify Islamic scholasticism, or to aggrandize its superiority. Its ultimate purpose is to help Muslim scientists construct a global foundation for contemporary Islamic knowledge or science, to develop a pragmatic philosophy, a philosophy that takes the ethical concerns of Islam into the laboratory. Many theories of modern science are motivated by ideological edicts; an example would be the theory of evolution and its modern offspring, sociobiology. But these theories, particularly when they work in a laboratory setting cannot be wished away or discarded simply by making metaphysical declarations or statements of grand philosophy. They have to be combatted and disproved by empirical and rational method or replaced by new theories. A contemporary Islamic theory of science should provide guidance for such work and development of new theories. It should develop the ethical and value concerns which should be the principal focus of Muslim scientists. It should be able to delineate the areas of science which ought to have priority in Muslim societies, highlight the areas of research which need to be emphasized, and bring out the basic determinants for the formulation of science policies in Muslim countries.

Ultimately, this policy should aim at changing the direction of science itself. It should thus provide us with the challenging and innovative task of developing new insights into both the ends and means of science. What should be the goal of science in a Muslim society? The broader implications of this fundamental question go far beyond the mere making of metaphysical interpositions. The goals of science have to be stated both in general terms as well as in more specific terms, focusing on numerous interrelated disciplines. The methodology has to be reexamined and positive and ethically solid alternatives should be developed. All this means that a contemporary Islamic philosophy of science should be able to show how values could be integrated or moulded into it, within the framework of the world view of Islam, and how this synthesis would make Islamic philosophy of science more open, humanistic and universal, rational and accessible, culturally significant and

ethically beneficial. It should be able to demonstrate, to both Muslims and non-Muslims alike, that the purpose of science is not limited only to meeting the intellectual and physical challenge of modern times; it can also solve the contemporary problems of mankind in a more satisfying and ethically sound way.

Given these most basic questions and issues, the development of a contemporary philosophy of Islamic science is not an easy task. It is a challenge that we ought to take very seriously; and our concern should be reflected in the way that we are ready to go beyond simple statements of what we hold as metaphysical truths and glorification of our historic legacy. Al Ghazali, Ibn Sina, and Ibn Rushd were indeed great philosophers and scientists; we must study them and learn from them, but we should not allow ourselves to be encapsulated by their thoughts and methods. Our true appreciation of their legacy would lie in the extent to which we succeed in developing, reforming and, where necessary, modifying their ideas and thoughts.

The development of an Islamic philosophy of science must begin with the appreciation of the complexity and sophistication of the activity that we call science. The addition of the adjective Islamic to this activity means much more than simply putting a metaphysical envelope around it and infusing it with defunct ideas and thoughts of yester-year. It means shaping every aspect of the scientific enterprise with the ethical and value criteria of Islam, taking Islamic values right down to the laboratory, and developing a contemplative as well as an explanatory model for the understanding of the universe and the relationship between man and nature. Any attempt at formulating a philosophy for contemporary Islamic thought, science and scholarships must, at the very minimum, satisfy these basic criteria.

In the contemporary great transition from manpower to mindpower the work of the great Algerian thinker, Malek Ben Nabi, acquires new meanings. "A society which does not have its own guiding ideas can make neither its consumer goods or its equipment. It is not by means ot ideas imported or imposed that a society can develop. We must recover our intellectual originality before we can regain our political and economic independence."