ON THE SHOULDERS OF GIANTS
Author: Craig Loehle
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Craig Loehle's book *On the Shoulders of Giants* explores the deep implications of the Bahá'í tenet that there should be compatibility and harmony between science and religion. The title, taken from a remark by Sir Isaac Newton that if he had seen farther than others it was because he stood on the shoulders of giants, is extended by Loehle to mean that by standing on the shoulders of Newton representing science and, at the same time, the shoulders of Bahá'u'lláh representing the world of religion and divine guidance, one can see very far indeed. Writing from his background in ecology and environmental matters on the one hand and his Bahá'í convictions on the other, the author shows many ways in which religion and science can truly support and reinforce one another. His approach is to examine how this partnership can be effective in addressing diverse practical issues of daily life, including racism, the environment, and human development as well as more abstract matters of concern, including ingredients for effective creativity, integrity of the sacred texts, prophecy, and evidence for the existence of God. Quotations from the Bahá'í writings are interspersed in a natural way, providing overall an easy-to-read book that offers new insights for seasoned Bahá'ís and, at the same time, interesting and informative reading for others.

The strength of the first part of the book dealing with social matters lies in part in its pointing out the inadequacies of prevalent, largely spirituality-devoid attempts to solve the problems of society and in its demonstrating the necessity of incorporating the missing spiritual dimension. In referring specifically to environmental destruction, the author identifies three contributions to the shortsightedness of society's response to its problems, *viz.*, materialism, apocalyptic views of the future, and religious "me-ism," which he defines as the view that the sole purpose of religion is to save oneself and that one's responsibility is fulfilled once one becomes a believer. The author seems, at first sight, to be stretching things somewhat when he points to prejudice and the non-equal status of women as being hidden causes of environmental degradation. However, he justifies this relationship in terms of chained connections whereby these social injustices have undesirable physical consequences (wars and overpopulation) that in turn adversely affect the environment. As the author says in the conclusion of this part of the book, "It is obvious that these multiple connections of cause and effect, of attitude and social structure, cannot be changed piecemeal but require that a coherent system replace the current incoherent one. Such a coherent system, that harmonizes all the elements of individual and social life, is provided by Bahá'u'lláh" (67).

The author directs attention to the strong reverence for nature in the Bahá'í writings, where it is seen as a manifestation of the names of God, as shown by the following quotation from Bahá'u'lláh:

> Say: Nature in its essence is the embodiment of My Name, the Maker, the Creator. Its manifestations are diversified by varying causes, and in this diversity there are signs for men of discernment. Nature is God's Will and is its expression in and through the contingent world. It is a dispensation of Providence ordained by the Ordainer, the All-Wise.[1]

By contrast the author identifies the views of nature stemming from other religions as ones instilling a sense of separateness that can lead to an uncaring and hostile attitude toward the environment. He does not mention, however, as well he might, that the Bahá'í writings also contain some cautions about things of this world which might be understood as decrying nature and the environment, for example: "The world and its vanities, and its glory, and whatever delights it can offer, are all, in the sight of God, as worthless as, nay, even more contemptible than, dust and ashes."[2] Such a passage taken out of context could cause the seeker or casual reader of the Bahá'í writings to stumble. The difficulty is largely semantic insofar as, "the world" very often as used in the Writings refers to human materialistic doings on the planet; whereas, "the earth" usually means God-created nature.

In the chapter on creativity, Loehle speaks quite generally as a scientist and not specifically as an ecologist or environmentalist. He brings out very clearly several important points centered on the notion that the basic spiritual teachings of the Bahá'í Faith are conducive to increased creativity in science. He begins by providing a practical resolution of how to achieve the desired balance between humility and hubris (of a denatured kind), which, together adding up to what he labels "strength of character," are important for success in science. He then analyzes at length the importance of detachment, tranquility, honesty, and service as other ingredients of creativity bolstered by Bahá'í teachings.

On the subject of evolution, Loehle gives a thought-provoking review of how the Bahá'í Faith surmounts the misunderstandings and contradictions leading to conflict in some minds in this subject area. Subtopics discussed include the relative roles of chance and divine intervention in events as well as the important questions surrounding the role of the Creator in human evolution. He concludes that "God's existence and influence do not conflict with science

1. *Tablets of Bahá'u'lláh Revealed after the Kitáb-i-Aqdas*, comp. Research Department of the Universal House of Justice, trans. H. Taherzadeh et al., 2d ed. (Wilmette, Ill.: Bahá'í Publishing Trust, 1988) 142.

2. Bahá'u'lláh, *Gleanings from the Writings of Bahá'u'lláh*, trans. Shoghi Effendi, 2d ed. (Wilmette, Ill.: Bahá'í Publishing Trust, 1976) 304.

and evolutionary theory. . . . Humanity evolves, our spirits evolve, and society and religion evolve. We thus need not be afraid that teaching children about evolution will lead them astray or destroy their faith. It is also no longer necessary for the devout to fear science or rational argument" (114).

A well-presented chapter on knowledge and faith ends with the following observations among others:

> There is no absolute certainty in science. What scientists do have, however, is faith in the *process* of science. . . . It is this same type of certitude that Bahá'ís manifest. It is a certitude based on the experience of finding answers, experiencing spiritual growth and witnessing small miracles daily. This is certitude of faith which is not to be confused with certitude of knowledge.
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> Just as in science where the structure of knowledge is never complete, so also in the Bahá'í Faith. . . . the spiritual life is a quest, not a place; a journey, not a condition. . . . It is the process of searching for the Friend that brings us closer to Him. We are never truly worthy; it is only by striving to reach Him that we become worthy. (125–26)

When he discusses growth and stability, Loehle turns to his scientific foundations in biology to give an enlightening comparison of the growth strategy of the Bahá'í Faith to the growth of a tree and its success in propagating around the world to that of a particularly successful agricultural weed. He likens the processes leading to stability of the Bahá'í Faith to those supporting homeostasis in biological systems and draws parallels between the Bahá'í administration and continually adapting systems in biology.

In addressing entropy and the sacred texts, Loehle draws parallels between the inevitable loss of signal and build up of noise in physical systems to the garbling and masking of the essential information in religious messages. In an idea new to this reader at least, he explains the unique robustness of parables to ensure against the garbling of a message by translation and by changes of word meaning over time. He concludes by pointing out the unique safeguards inherent in the Bahá'í Faith that work to preserve as accurately as possible the intended meaning of the texts over millennia to come.

In his chapter on probability and prophecy, the author presents an analysis of the probability that various prophecies concurrently fulfilled by the Báb and Bahá'u'lláh could have been *simply* a matter of chance. In his conclusion (having allowed for the possibility, however unlikely, that fulfilment of one of the prophecies might have been deliberately arranged by the founders of the Bahá'í Faith), Loehle still arrives at the extremely small probability of about 1 in 80 billion. This chance is further reduced by the concurrent fulfilment of yet additional prophecies, the likelihood of which Loehle does not attempt to quantify.

The final chapter, written perforce from a Bahá'í standpoint, first points out the flaws in several quasi-scientific arguments against the existence of God and

then presents a large number of arguments for God's existence classified under three categories, *viz.*, predictive power, theory coherence, and "consilience" of different lines of evidence. These latter arguments individually carry varying degrees of weight, but their combined impact is, in the author's words, that "there is an unobservable essence called God and the Prophets are His messengers" (190).

The author expresses himself with great knowledge and clarity, especially when he expounds within his own fields of expertise. Inevitably, he is occasionally overtaken by rapid advancements of science of which he is unaware at the time of writing. Although these occasions do not affect his argument, they are perhaps worth noting. Thus, in connection with his discussion of race and cultural development, he makes the point that while some degree of cultural development is possible based on hunting and gathering, advanced culture requires an agricultural basis, and he uses the case of the aboriginal Australians as a particularly strong example of a primitive people who did not advance because of the absence of plants and animals for domestication. But a report in *Science* (264 [3 June 1994]: 1403) describes how Australian archaeologists have found an enormous cemetery near Lake Victoria in Australia showing a complex society had flourished there for 7000 years simply because they could be sustained by natural resources of the region without having to develop agriculture. In the last chapter, Loehle states that atoms cannot be seen except indirectly by their effects as, for example, in a bubble chamber. In recent years, however, atoms have been imaged by scanning tunneling microscopy and field ion microscopy in almost as direct a sense as somewhat larger microscopic objects can be seen by optical or electron microscopes. But these points are quibbles; in general the author's grasp of scientific matters and his presentation are, from this reviewer's standpoint, sound and clear. By this book, Loehle has made a significant addition to the literature on science and religion as viewed from the vantage point of the Bahá'í Faith and, indeed, has demonstrated compelling reasons for a vigorous partnership between the two.

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