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Responder ILL #: 7949468

Printed Date: 02-JUL-2014

Status: In Process

Original Call Number: Western Taylor reference (no loan) QB980.5.E53 1993
Responder Call Number:

Title: The Encyclopedia of Cosmology
Author: Ed. N.S. Hetherington
Publisher:

ISBN/ISSN: 0824072138

Date (Monograph): 1993

Edition:

Volume/Issue:

Pages: 299-301

Date (Serial):

Article Title: Ibn al-Arabi
Article Author: William Chittick

DETAILS

Requesting Library: Library, Carleton University

Supplying Library: York Scott Library

Requester Symbol: OOC01

MLC-BNC Code: NLC-BNC:OOCC

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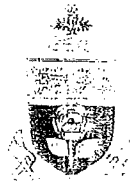
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Ibn al-'Arabî (1165-1240)

Mu hyî al-Dîn Muḥammad ibn 'Alî ibn al-'Arabî (1165-1240), known as al-Shaykh al-Akbar ("the greatest master"), has probably been the most influential cosmologist in Islamic civilization for the past 750 years. Born into a family of government officials and scholars in Murcia in Andalusia, Ibn al-'Arabî grew up without any special religious training, but in his early teens he experienced an "opening" (fath) toward the invisible world that utterly transformed his life. He then devoted himself to spiritual practices under a series of teachers. He left Andalusia for the central Islamic lands in 1200, finally settling in Damascus in 1223. He wrote his first book by age 30, and he continued writing and teaching until his death. He produced more than 700 books and treatises, of which about 500 are extant (Yahia 1964). His longest work seems to be *al-Futûḥât al-makkiyya* (*The Meccan Openings*), which will fill about 15,000 pages in its new edition.

In contrast to most authors of learned works, Ibn al-'Arabî was introduced to the

academic disciplines at a rather late age, probably not before he was 25 (Addas 1989, 131). He does not seem to have studied the philosophical and cosmological texts of authorities such as Avicenna and the Ikhwân al-Şafâ', although he often employs the same terminology, which, by his time, was part of the general intellectual heritage. The major sources for his own teachings were the Koran and Hadith (the sayings of the Prophet) and his own "openings," or visionary experiences.

Ibn al-'Arabî trained many disciples, the most influential of whom was probably Şadr al-Dîn Qûnawî (d. 1274). Qûnawî, like most of his students, wrote in both Arabic and Persian; this indicates already that Ibn al-'Arabî's works were especially influential in the eastern lands of Islam, where Persian was the spoken language and the great medium of poetical expression. Within 100 years of Ibn al-'Arabî's death, his teachings were known throughout the Islamic world. Although Avicenna and other Peripatetic philosophers continued to be influential only in intellectual circles, Ibn al-'Arabî's works permeated popular modes of exposition as well, especially poetry. His views became the most important theoretical framework for the practice of Islam's spiritual dimension, known as Sufism; and Sufi practitioners were largely responsible for the continuing spread of Islam during the subsequent centuries.

One can summarize Ibn al-'Arabî's significance for Islamic cosmology as follows: Within a relatively short period after his death, most Muslims who asked questions about the nature of the universe would be answered with terminology and concepts drawn directly or indirectly from Ibn al-'Arabî's grand vision. Only those with thorough academic training in the intellectual sciences and philosophy would resort to the more technical expositions given by professional philosophers such as Avicenna, Suhrawardî, and Mullâ Şadrâ. But this does not imply that Ibn al-'Arabî was considered more "popular" than the learned philosophers. Rather, since he stayed relatively close to the mythic language of the Koran and the Hadith, his teachings were accessible in some degree to all Muslims with an intellectual bent. At the same time, he was considered the most abstruse and difficult of all cosmological thinkers, since a thorough understanding of his works presupposed knowledge of all the disciplines.

It is highly significant that there is no Latin form for Ibn al-'Arabî's name; in other words, he remained unknown in the West until recent times. His meeting (as a boy of 12 or 13) with Averroes provides us with an event that symbolizes the parting of intellectual ways between two civilizations (cf. Corbin 1964, introduction). In a brief discussion, Ibn al-'Arabî told the greatest philosopher of the age that although rational philosophy coincided with spiritual knowledge in one sense; ultimately it was entirely inadequate to its aims. This same Averroes, perceived as a great Aristotelian, helped Western thinkers close the door to the invisible domains of reality, although he has no significant followers within Islamic civilization itself. In contrast, Ibn al-'Arabî, who marks the happy marriage of rational and visionary knowledge, becomes one of the major determinants of the course of Islamic intellectual history.

It is utterly impossible to suggest the breadth of Ibn al-'Arabî's cosmological teachings in anything less than a major book, but two of his most significant ideas may be mentioned here, the first of which describes the interrelationships among all existing things

in terms of archetypal numbers, especially 2, 3, 4, 12, and 28. Also profoundly significant is the concept of "imagination," or the inherent ambiguity of all things, which allows for the integration of countless intermediate domains into an overarching view.

Ibn al-'Arabî's influence can be seen clearly in two basic ideas discussed in much of later Islamic cosmological writing: the oneness of being (*wahdat al-wujûd*) and perfect man (*al-insân al-kâmil*). The first idea implies that a single reality known as *wujûd*—a term that can be translated as being, existence, or finding—underlies all that exists. This reality is identical with God himself, who alone is *wujûd* in the true sense, and who alone is one. Everything other than God possesses certain characteristics of *wujûd* but not all. There is a single true *wujûd*, and an indefinite variety of dependent or unreal *wujûds*. Because of the ambiguous status of everything other than God (i.e., the "cosmos"), all things dwell in "imaginal" realms, like images in a mirror.

The concept of perfect man—who has human, cosmic, and divine dimensions—stands at the center of Ibn al-'Arabî's visionary scheme. On the most basic level, perfect man represents the goal that all human beings should strive to achieve, as exemplified by the prophets. On the cosmic level, he is both the pattern in God's mind that gives birth to the universe and the ultimate fruition of the universe, which was created to manifest every quality of *wujûd*. Only through perfect man can certain ontological qualities (such as knowledge, love, compassion, wisdom, and justice) be fully realized within the created order. On the divine level, perfect man is the logos or God's self-expression. In short, he is the microcosm who rules over the macrocosm through intelligence, the image of God who knows God as he is in himself, and the synthesis of all ontological levels. He is the human embodiment of cosmos and cosmology.

See also ISLAMIC COSMOLOGY

[W.C.C.]

Further Readings

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Ibn Al-Haytham

See ALHAZEN

Ibn Rushd

See AVERROES

Ibn Sina

See AVICENNA

Index Catalogues

Two supplements to J.L.E. Dreyer's 1888 *New General Catalogue of Nebulae and Clusters of Stars* (NGC) were published in 1895 and 1908 and are known as the first and second *Index Catalogues* (IC). The NGC contains 7,840 nebulae and clusters. By 1908, the year of publication of the second *Index Catalogue*, over 13,000 nebulae were known.

See also DREYER, JOHANN LOUIS EMIL; NEW GENERAL CATALOGUE

[N.S.H.]

Inflationary Universe

In about 1978 a small drove of particle theorists began to dabble in the early universe. They were motivated partly by the intrinsic fascination of cosmology, but also by developments in particle physics itself. The motivation arose primarily from the advent of a new class of particle theories known as "grand unified theories." These theories were in-

vented in 1974, but it was not until about 1978 that they became a topic of widespread interest within the particle physics community. The theories are spectacularly bold, attempting to extrapolate our understanding of particle physics to energies of about 10^{14} GeV (1 GeV = 1 billion electron volts \approx rest energy of a proton). This amount of energy, by the standards of the local power company, may not seem so impressive—it is about what it takes to light a 100-watt bulb for a minute. The grand unified theories, however, attempt to describe what happens when that much energy is deposited on a single elementary particle. This extraordinary concentration of energy exceeds the capabilities of the largest existing particle accelerators by eleven orders of magnitude.

To get some feeling of how high this energy really is, imagine trying to build an accelerator that might reach these energies. One can do it in principle by building a very long linear accelerator. The largest existing linear accelerator is the one at Stanford, which has a length of about two miles and a maximum energy of about 40 GeV. The output energy is proportional to the length, so a simple calculation shows how long the accelerator would have to be to reach an energy of 10^{14} GeV. The answer is almost exactly one light-year.

The U.S. Department of Energy, unfortunately, seems to be very unreceptive to proposals for funding a one-light-year accelerator. Consequently, if we want to see the most dramatic new implications of the grand unified theories, we are forced to turn to the only laboratory to which we have any access at all and that has ever reached these energies. That "laboratory" appears to be the universe itself, in its very infancy. According to the standard hot big bang theory of cosmology, the universe had a temperature corresponding to a mean thermal energy of 10^{14} GeV at about 10^{-35} second after the big bang. So that is why particle theorists suddenly became interested in the very early universe.

Big Bang Theory

Cosmology in the twentieth century began with the work of Albert Einstein. In March 1916 Einstein completed a landmark paper