



AL-BIRUNI: AN INTERDISCIPLINARY APPROACH TO INDIAN CIVILIZATION, RELIGION, SCIENCE AND GEOGRAPHY

Dr. Md. Abu Bakkar Mondal¹, Mahmudul Hasan Mondal²

¹HoD, Department of Arabic, Progati College, Agomani.

²Department of Humanities and Social Sciences, NIT Rourkela, Odisha.

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ABSTRACT

This article examines the intellectual contributions of Abu Rayhan Muhammad ibn Ahmad al-Biruni (973–1048), with particular emphasis on his approach to the study of Indian civilization, comparative religion, science, and geography. The primary objective of the study is to examine how Al-Biruni developed an interdisciplinary and comparative approach to knowledge and how his methods enabled him to investigate a civilization different from his own through language, textual study, observation, comparison, and critical inquiry. The study focuses especially on *Kitab al-Hind*, in which Al-Biruni explored Indian religious and philosophical traditions alongside mathematics, astronomy, geography, chronology, customs, and social organization. It also considers *Kitab al-Athar* to examine his comparative treatment of religious calendars, festivals, and traditions across different civilizations. Particular attention is given to his learning of Sanskrit and his engagement with Indian scholars which allowed him to approach Indian thought through its own conceptual and literary traditions. The article further analyses the relationship between his scientific method and his broader intellectual outlook, including his reliance on mathematical reasoning, observation, comparison, and critical examination of earlier authorities. His geographical ideas are also discussed, especially his recognition that the limits of contemporary geographical knowledge did not necessarily represent the limits of the physical world. The study argues that Al-Biruni's enduring significance lies not merely in the breadth of subjects he investigated, but in the disciplined method through which he sought to understand unfamiliar intellectual and cultural traditions. His work demonstrates the importance of linguistic knowledge, empirical inquiry, comparative analysis, and awareness of the limits of existing knowledge in the study of human societies and the natural world.

KEYWORDS : Al-Biruni; *Kitab al-Hind*; *Kitab al-Athar*; Comparative Religion; Indian Civilization; Sanskrit; Science; Geography; Cross-Cultural Scholarship; Medieval Islamic Scholarship.

INTRODUCTION

Abu Rayhan Muhammad ibn Ahmad al-Biruni (973–1048) was one of the most remarkable intellectual figures of the medieval world. His scholarship extended across astronomy, mathematics, geography, chronology, history, mineralogy, pharmacology, philosophy, languages and the study of religions. What distinguishes him from many other scholars of his period was not simply the extraordinary range of subjects that attracted his attention, but also the methods through which he pursued knowledge. He combined the study of earlier texts with observation, calculation, comparison and critical examination. Al-Biruni is particularly significant for the history of India's intellectual and religious traditions. During the period of Ghaznavid expansion into north-western India, he accompanied Sultan Mahmud and acquired knowledge of Sanskrit and engaged with Indian scholars and texts. The result was one of the most remarkable works of medieval cross-cultural scholarship, *Tahqīq mā li-l-Hind*, commonly known as *Kitab al-Hind*. Completed in 1030, the work examined Indian religion, philosophy, science, mathematics, geography, customs and social organization. It was written in Arabic as a philosophical and scientific investigation rather than as a conventional court history. Al-Biruni represents an early and sophisticated attempt to understand a civilization through its own intellectual categories while simultaneously comparing it

with other traditions. His work offers an important example of how knowledge could cross linguistic, religious and cultural boundaries in the medieval world.

Early Life and Intellectual Formation

The available literature does not agree on when and where Al-Biruni was born. But some scholars mentioned that, he was born in 973 A.D. in Khawarizm, near modern Khiva in Uzbekistan, and died in 1048 A.D. probably in Ghaznah, today's Afghanistan. His intellectual development, however, is better documented. During the first part of his life in Khwarizm, he studied both the traditional Islamic sciences and the mathematical and natural sciences associated with the Greek intellectual tradition. From an early age, astronomy became one of his principal interests. His first teacher was an unknown Greek scholar. He learnt astronomy and mathematics from his teacher Abu Nasr Mansur, who was a member of the royal family at Kath. He developed a reputation for mathematical and astronomical observation and came into contact with several prominent scholars of his time. The political instability of Khwarizm in the late tenth and early eleventh centuries, changing dynastic power forced scholars and intellectuals to move between different centres of learning. Al-Biruni's career consequently developed across a broad geographical area. His intellectual contacts extended beyond Khwarizm, and his



movement through centres of scholarship exposed him to different scientific and philosophical traditions. This mobility was important because medieval scientific knowledge was transmitted through networks connecting Central Asia, Iran, Iraq and South Asia. His encounter with the Ghaznavid ruler Mahmud of Ghazna was decisive for the later development of his scholarship. Following the Ghaznavid conquest of Khwarazm in 1017, Al-Biruni entered the Ghaznavid sphere. He subsequently spent much of the remainder of his career under Ghaznavid rulers. During this period, his opportunities to study India increased considerably.

Al-Biruni in India

Al-Biruni's engagement with India developed in the context of Ghaznavid expansion into north-western India. He has spent substantial time in Indian subcontinent under Ghaznavid control, including areas of the Punjab, Sindh, Balochistan, and Peshawar. His Indian studies were remarkable because he did not restrict himself to political events or descriptions of geography but wanted to understand Indian civilization through its intellectual traditions therefore he learned Sanskrit and interacted with Indian scholars. His knowledge of Sanskrit enabled him to engage with Indian philosophical, religious and scientific literature in a manner that was unusual for a non-Indian scholar writing in the eleventh century. His interest in Indian learning included mathematics, astronomy, philosophy, religious thought and cosmology. This linguistic engagement is one of the foundations of his comparative method. Instead of depending exclusively on information obtained through translators or second-hand reports, he attempted to approach Indian intellectual traditions through their own texts and scholarly explanations. His study of India consequently became much more than an account of a foreign land. It was an intellectual investigation into a civilization with a sophisticated literary and scientific heritage.

Kitab al-Hind: A Study of Indian Civilization

Al-Biruni's most famous work on India is *Tahqīq mā li-l-Hind min maqūla maqbūla fī'l-'aql aw mardhūla*, commonly called *Kitab al-Hind*. It was completed in 1030, shortly after the death of Sultan Mahmud of Ghazna. The title itself indicates the character of the work. Rather than presenting a conventional political history, Al-Biruni sought to investigate what could be known about Indian beliefs, intellectual traditions and practices. His subject was therefore broad and interdisciplinary. The work discusses Indian religion and philosophy alongside mathematics, astronomy, geography, chronology, literature, customs and social organization. This combination reflects Al-Biruni's conviction that a civilization cannot be properly understood by studying one isolated aspect of it. His approach was also different from the panegyric style common in much court literature of the period. *Kitab al-Hind* was conceived as a philosophical and scientific study and an unprecedented work devoted to North Indian Brahmanical culture and natural history. The work is especially valuable because Al-Biruni frequently attempted to explain Indian ideas before judging them. He wanted his readers to understand what Indian scholars believed, how their philosophical systems were constructed and how their religious practices related to their broader worldview.

Language as a Foundation of Cross-Cultural Understanding

One of the most important features of Al-Biruni's scholarship was his recognition that language is fundamental to understanding another culture. Religious and philosophical ideas cannot always be translated accurately without understanding the concepts behind the words. Al-Biruni understood that an outsider could easily misunderstand another civilization if its beliefs were interpreted exclusively through foreign categories. His method was not free from limitations as no scholar can completely escape the intellectual assumptions of his own time, and Al-Biruni sometimes interpreted Indian ideas through categories inherited from Greek and Islamic philosophy. Modern scholarship has also identified cases where his interpretation of Indian astronomy was shaped by Aristotelian and Euclidean assumptions. Nevertheless, his willingness to learn another language and engage with primary intellectual traditions remains one of the most impressive aspects of his scholarship.

Al-Biruni and the Comparative Study of Religion

Al-Biruni occupies an important position in the history of comparative religion. His interest in religion was not limited to one tradition. He wrote *Kitab al-Athar* to demonstrate why different people use different calendrical systems and to understand why certain nations preferred certain times and events for their festivals and commemoration days. In addition, this book pays great attention to various civilizations' festivals. He collected information on various civilizations' calendrical systems, which are related to religious events. These festivals and feast days, religious traditions, calendrical systems of the Jews, Persians, Christians, pre-Islamic Arabs, Sabians, and Muslims were the main topics of *Kitab al-Athar*. Determining the dates of festivals required knowledge of timekeeping and astronomical calculation. Consequently, Al-Biruni did not draw a strict boundary between the study of religion and the study of astronomy or chronology. This interdisciplinary character is central to his intellectual method. He investigated Hind's religious tradition and compared its theological and philosophical thought with the classical Greek religions, Christianity, Judaism. He also gave a conclusion of comparative method by applying critical insight, a careful outlook, and an accurate stance in looking at one or more religious traditions. About al-Biruni's comparative method when studying Hind, Jeffery notes:

[H]e will place before the reader the theories of the Hindus exactly as they are, and where there are similar theories among the Greeks, or in the teaching of the Christian sects, or the Sufis, as for example in the matter of transmigration of souls, or pantheistic doctrines of the unity of God with his creatures, he will accurately report their theories also for comparison. (Jeffery5, 1951: p 128).

A striking feature of Al-Biruni's discussion of Indian religion is his effort to explain beliefs through Indian sources and intellectual categories. He frequently drew upon Sanskrit texts and the explanations of learned Indians. He could explain an Indian doctrine carefully without accepting it as true himself. His work therefore provides an early example of intellectual engagement across religious boundaries. He recognized differences between philosophical speculation and popular



religious practice. His discussions indicate that he encountered philosophical traditions that emphasized a supreme and transcendent reality, while also observing religious practices involving images and multiple divine figures. He attempted to explain how these different dimensions could coexist within Indian religious life. As a Muslim scholar, Though Al-Biruni regarded idol worship negatively from the perspective of Islamic theology, yet he also tried to investigate why images become important within Indian religious traditions. He also compared religious symbolism across cultures. In doing so, he treated religious practices as historical and social phenomena that could be investigated rather than simply condemned. This combination of theological distance and intellectual curiosity is one of the defining features of his religious scholarship.

Al-Biruni as a Scientist

His *Qanun al-Masudi* was a major astronomical and scientific work originally written in Arabic and later translated into Persian. In this book he summarizes almost all scientific achievements in the field of astronomy and mathematics preceding his times. Thus *al-Qanun* is an "up-to-date Encyclopedia of Astronomy supplanting all previous works ranging from Ptolemy's *al-Magest* to al-Magestiu'sh-Shahi of his own teacher Abu Nasr". Various chapters of this monumental work have been devoted to his theory of the Universe, Cosmogony, Geo-Centric Theory, Calendars and Chronology, trigonometry, geographical coordinates, planetary movements, eclipses and the measurement of the Earth. His scientific method involved mathematical calculation, observation and comparison with earlier authorities. He did not simply repeat inherited knowledge. He examined earlier results and attempted to improve or test them.

Geography and the Question of Lands Beyond the Known World

Al-Biruni's geographical thought is particularly interesting when considered in relation to the limits of geographical knowledge in his period. He was aware that the known world did not necessarily constitute the entire inhabited Earth. In his geographical discussions, he considered questions concerning regions that were poorly known or unknown to scholars of his time. He believed that the length of the inhabited world is greater than its breadth and it is surrounded by the seas on all its sides, and the various occasions in the North, East, West and South all combine at different points. In the North, his limits are set by the habitations of the Suvars, Bulgars, Russians, Slavs and Azovs, in the West by the northern regions in Africa, Spain, France and some other parts and unknown lands, and then the coldest regions unsuited for habitation. In the South, except the groups of East Indies Islands and Ceylon and a few others, he admits nothing much is known of the lands or people from the sailors in those parts. In the East, China forms his terminus, although as mentioned above, he very much believed in the existence for the regions (e.g. Japan) lying in the Far Eastern ocean as in the West. It is indeed most remarkable that in his *At-Tahdid* he goes further by asserting that land must exist beyond the seas between the Western and Eastern coast lines of the known world, thus anticipating the discovery of the American Continents in the Western hemisphere. This sometimes led to claims that Al-Biruni

predicted or discovered America. Though There is no evidence that Al-Biruni visited the Americas or that he possessed knowledge of the American continents comparable to that which became available after Christopher Columbus's Atlantic voyages but the significance of his geographical thought lies in the fact that he understood that human knowledge of the Earth was incomplete and his scientific approach allowed room for geographical possibilities that had not yet been empirically established. He recognized that the boundaries of contemporary geographical knowledge were not necessarily the boundaries of the physical world. This is an important intellectual distinction.

Conclusion

Al-Biruni stands among the most remarkable scholars of the medieval world because he combined intellectual breadth with an unusually investigative spirit. His interests ranged from the movements of celestial bodies to the beliefs, languages and social institutions of human communities. His study of India remains his most important contribution to cross-cultural scholarship. Through learning Sanskrit, engaging with Indian scholars and examining Indian intellectual traditions, he produced a work that went far beyond the conventional descriptions of foreign peoples common in medieval literature. His contribution to the comparative study of religion is equally significant. He attempted to describe religious beliefs before judging them, compared Indian ideas with traditions from other civilizations and recognized the importance of language and dialogue in cross-cultural understanding. He remained a Muslim scholar with his own theological commitments, but those commitments did not prevent him from seriously investigating traditions different from his own. His scientific writings reveal the same intellectual character. He valued observation, mathematical reasoning, comparison and evidence. His willingness to reason beyond established geographical knowledge illustrates the intellectual openness that characterized much of his work. Ultimately, Al-Biruni's greatest legacy may be found in the relationship he established between knowledge and inquiry. He demonstrated that understanding another civilization requires more than collecting information about it. It requires language, patience, comparison, intellectual discipline and a willingness to recognize the limits of one's own knowledge. For this reason, Al-Biruni remains important not only as a scholar of the medieval Islamic world or as an observer of India, but also as a major figure in the longer history of science, historical inquiry and comparative study of religion.

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