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RESEARCH ARTICLE

The Inductive Method and Its Path within Experimental Studies

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ABSTRACT

The inductive method is a new alternative to the classical approaches used in scientific research. Muslim philosophers, in turn, studied Greek heritage and benefited from the experimental methods of the Greek era, starting with Socrates, Democritus, and others. These methods also align with both scientific and religious spirits, as Islam encourages the use of reason and research to manage life's affairs, harness nature for various purposes, and discover the laws governing different phenomena. This led to the emergence of a new scientific rationalism that encompassed the field of scientific knowledge through the use of the inductive method as praxis for experimental scientific studies. Hence, we can pose the following problem: What is the nature of scientific research among Muslim philosophers through this new praxis? And what are the contributions of Muslim philosophers in the field of inductive scientific studies?

INTRODUCTION

Muslim scholars contributed to establishing the foundations of the inductive experimental method and pioneered the science of research methodologies across various scientific fields. In doing so, they played a significant role in building human civilization during a crucial and transformative phase in human history. A review of the history and development of human thought reveals that people have crafted methods for their lives, making life easier by benefiting from the experiences of previous scholars and researchers.

The invention of the experimental method began when humans first started contemplating nature and uncovering its causes. Various civilizations attest that the starting point was with the early Greeks, who developed a classical, formal method to help them move from premises to conclusions without error. Formal logic, with its topics and theories, served as a method in harmony with the scientific spirit of that era. However, Democritus advanced the idea of dealing with nature methodically, asserting a fundamental principle that the components of nature are nothing but atoms. In this regard, Democritus was among the Greek philosophers who believed that knowledge must be certain or experimentally proven in an absolute sense. Yet, as experimental rationality gradually evolved, it revealed the limitations and inadequacies of this ancient logic. Consequently,

scholars refined their studies and discovered a new method that aligned with the spirit of the modern age the inductive method.

However, the birth of the experimental method was preceded by the Islamic civilization, which used science as a tool to improve life. This civilization saw the flourishing of experimental practices and the emergence of Muslim scholars who adopted the inductive approach, benefiting from Greek heritage in all fields, especially in the scientific, intellectual, and cultural domains. Muslims established scientific rules and laws across various fields, drawing on both the Quran and Sunnah on one hand and the scientific achievements of neighboring ancient civilizations on the other, particularly those reached through conquests. Islamic civilization served as a bridge between ancient civilizations, such as those of the Egyptians, Greeks, Romans, and others, and the modern Renaissance. They did not merely transmit the knowledge of earlier civilizations but also added their original contributions, characterized by scientific authenticity. Islamic thought transcended the formal boundaries of Aristotelian logic. Arabs opposed the deductive method and moved beyond its confines, considering observation and experimentation as sources of scientific inquiry.

In our study, we found that the historical method aligns with the nature of this approach to explore the intellectual journey of both Islamic and Greek thought. Additionally, the analytical method was employed to examine the original texts of philosophers and delve into their depths. The critical method also played a role in critiquing the various views that addressed the scientific structures foundational to research methodologies and epistemology, particularly the nature of the new methodology. Therefore, we can pose the following problem: What is the historical and philosophical trajectory of the inductive experimental method? And what are the contributions of Muslim philosophers in the field of inductive methodology?

METHODOLOGY: ESSENCE AND CONCEPT

Linguistically, the word "method" is derived from the verb "nahaja," which means to pave, follow, or adopt a path. "Nahj," "manhaj," and "minhaj" all signify a clear path[1]. Terminologically, it refers to a way by which a person reaches truth or knowledge. It is thus linked to epistemology[2]. According to Muhammad Al-Badawi, methodology is "a science concerned with researching the easiest ways to obtain information while saving effort and time. It also implies organizing and categorizing knowledge[3]." From these definitions, we can conclude that the purpose of methodology is to clarify and facilitate the path to knowledge.

Definition of Research: Linguistically and Terminologically

Linguistically, "research" is derived from the past tense verb "bahatha," which means to seek, search, investigate, inquire, attempt, or discover[4]. Terminologically, research is the process of contributing new knowledge to the sciences, based on evidence and proof. Thus, the research method is the set of rules governing any attempt at study or evaluation on sound foundations. The scientific research method is one of the approaches and techniques that help organize, present, and analyze ideas to reach precise scientific results formulated into unified and general laws. It is also a method that contributes to understanding a problem or subject in a structured way. Scientific research methods can be defined as "a series of systematic steps that can be relied upon to study scientific problems and discover new knowledge." The scientific research method is considered the most effective means of applying rational principles to confront reality and facts. For this reason, the word "method" among the Greeks meant the way, with Plato using it to refer to research and inquiry, a view supported by Aristotle[5]. The general purpose of the method was to reach the desired goal despite challenges and obstacles.

The Nature of Induction:

Linguistic and Terminological Definition of Induction:

Induction is derived from the verb "istaqra," which means to investigate or follow to understand the condition of something. It originates from the triliteral root verb "qara," which signifies following or examining the state of something. In essence, induction refers to the process of observation and review to determine the characteristics of things by using sensory perception and observation during this investigation to understand the truth of something and make judgments about it. The one who engages in induction collects individual pieces of evidence, secondary judgments, and various phenomena, then examines them through observation, sensory perception, and rational consideration, one by one, to derive a general rule or conclusion that applies to all observed instances or a universal principle that governs them.

From this, we understand that through induction, the researcher generalizes the specific study they conducted to apply to the broader study related to the subject. This method is characterized by the researcher's progression from the particular to the general, moving from specific observations to broader conclusions. Initially, the researcher generalizes results based on specific instances, and once their validity is confirmed, they are generalized to the whole. In logic, induction involves tracing particulars to arrive at a universal conclusion. Philosophically and mystically, it refers to a form of rational inference that transitions from specific cases to general principles. The inductive method contrasts with the deductive method. While the inductive method produces broad generalizations from a limited set of observations, the deductive or inferential method works in the opposite direction[6]. In induction, the researcher transforms multiple observations into general rules, whereas in deduction, the general rule is broken down into specific observations. Reassembling these observations eventually leads to the reformulation of the general rule[7].

Induction is also defined as the process of tracing particulars to establish a universal judgment. Logicians define it as a universal judgment based on the confirmation of that judgment in specific cases. As Laland states, "Induction is the definition of the universal through all of its instances[8]." It is also described as guidance or direction, and it is one of the methods of reasoning and inquiry, often referred to as "examining inference," which transitions from phenomena to laws.

The Historical Path of Induction:

Induction is a method used to establish general laws that explain natural phenomena, which are inherently uncertain, making them probabilistic rather than definitive. However, these generalizations drive scientific progress and serve as the foundation for practical life. The concept of induction itself is as old as Greek philosophical tradition. Socrates used induction to discern the common essence among things, and Plato employed it to understand universals, which the mind reaches after acquiring specific knowledge.

Aristotle, on the other hand, used the term to refer to a universal proposition that encompasses particular sensory-perceived entities. Aristotle is recognized as the first Greek philosopher to appreciate the importance of the senses as gateways to knowledge. His belief in induction was as strong as his belief in deduction. Just as deduction is the certain means of linking the minor premise to the major premise via the middle term, induction is the certain, and indeed the only, way to form major premises. In other words, there can be no premises without induction, and no deduction without premises, thus no deduction without induction. Aristotle was therefore a significant advocate of induction and is credited with coining the term "epagoge," though he used it in multiple senses. He did not understand it in the same way that Francis Bacon later would.

Aristotle laid the foundation for the concept of induction, particularly when he divided it into complete induction, which involves a thorough enumeration of examples that fall under a general judgment. This is known by some logicians as "summative induction." Intuitive induction, on the other hand, involves moving from one particular example or a small number of examples to a general judgment, which is closer to the modern scientific understanding of induction. Dialectical induction does not start from a total or small number of examples, but rather from well-known or common premises, which makes its conclusions less certain and more subject to doubt, probability, and debate. Aristotle emphasized that we cannot know the universal without induction and cannot engage in induction without sensory perception, as the senses relate to particular things. Without induction, we cannot derive universals, and without sensory perception, there can be no induction. Knowledge, therefore, is universal and results from examining a set of sensory phenomena to uncover their causes or effects by describing them and determining their state according to reality.

The value of incomplete induction according to Aristotle:

First: Aristotle established that the causal link between two phenomena exists if their conjunction occurs frequently or always. This is because, according to Aristotle's rational principles, "this conjunction does not occur by chance since chance does not happen always or often." Human beings, through induction, observed that the principle of conjunction came as a result of human experiences and reality, and occasionally, by coincidence, judgments were generalized based on this. If this is correct, then the frequent conjunction between two phenomena may be sufficient to establish a fixed causality between them without the need for this principle since it was itself derived in the same way.

Second: We can also say that the previous principle, which asserts that chance does not occur always or frequently, is logically unreasonable, as there is no reason to prevent such occurrences.

Third: Certain knowledge cannot be established based on this, but rather it remains probabilistic. One of the criticisms of Aristotelian inductive logic is that it is not true induction but rather a form of deduction, where the conclusion is equivalent to the premises, and the principle of contradiction is sufficient to justify deductive reasoning. This is similar to how deduction is demonstrated in all cases of deductive proof. Additionally, there is a logical impossibility in fully enumerating all particulars. It is impossible to account for the particulars in the sense of individuals because even if an external power could enumerate the existing instances of a phenomenon, what could it do regarding those of the past and future? Even if we could, with Aristotle, count all species, there would be no further inference to rely on when encountering something new.

The difference between induction and deduction: Aristotle generally defined reasoning as the intellectual transition from the known to the unknown. This transition of the mind takes two forms: either the transition from particular instances to what is general, which is induction, or the transition from the universal whole to the specific particular that falls under it, which is deduction. For example, if we say "all metals expand with heat," and "iron expands with heat," this is deductive reasoning. In contrast, induction operates differently: if we observe that "iron expands with heat," the conclusion drawn is that "all metals expand with heat." Therefore, inductive reasoning is material reasoning based on experiment, observation, and reading of reality, and on gathering as many observations as possible to formulate a general law that encompasses the universal meanings of various particulars of the same kind. On the other hand, deductive reasoning is intellectual and analytical reasoning that relies on abstract logical thinking to derive the conclusion from its premises. Thus, inductive reasoning is suitable for natural and human sciences, while deductive reasoning is more appropriate for mathematical sciences, logic, and related issues. Inductive reasoning is composite, and the truth of its conclusions depends on referring back to reality, whereas deductive reasoning involves

analytical issues, and the truth of its conclusions depends on the consistency between premises and conclusion.

Inductive reasoning among Islamic thinkers: In the Islamic era, the chemist Jabir ibn Hayyan, who made significant contributions to the fields of cosmology, music, medicine, magic, biology, chemical techniques, engineering, grammar, metaphysics, logic, and astronomy, stands out. Some of his works in chemistry were translated into Latin during the Middle Ages and widely spread among European chemists. Jabir ibn Hayyan was influenced by the writings of ancient Egyptian and Greek chemists such as Zosimos of Panopolis, Democritus, Hermes Trismegistus, Agathodaimon, and the writings of Plato, Aristotle, Galen, Pythagoras, Socrates, as well as the commentaries of Alexander of Aphrodisias, Simplicius, Porphyry, and others.

Moreover, the optics scholar Alhazen (Ibn al-Haytham) and other Arab scientists advocated for this scientific method and practiced it in their scientific research. Ibn al-Haytham employed a special interpretation to express the meaning of experimentation according to modern terminology. He referred to it with the term "consideration" (al-i'tibar) and called the person conducting the experiment "the considering one" (al-mu'tabar). He described something that aligns with the truth and is derived from experimentation as "establishment by consideration" (ithbat bi al-i'tibar), to distinguish it from establishment by analogy (ithbat bi al-qiyas).

Additionally, it became evident that "consideration" had two primary tasks in scientific research: the first was to induce general rules and laws, and the second was to verify that the inferred results were correct. From this, it appears that the term "consideration" became a scientific term closely associated with Ibn al-Haytham. Even Kamal al-Din al-Farisi, who explained Ibn al-Haytham's "Book of Optics," extensively used the term "consideration" and adapted its technical meaning with methodological application. The concept of "consideration" changes in Ibn al-Haytham's work depending on the subject of study. In geometric optics, "consideration" refers to a somewhat complex experimental composition. However, in physical optics, where concepts are vague and ambiguous, Ibn al-Haytham uses experimentation to restore these incomplete and distorted concepts through geometry to the experimental field, which alone constitutes their place of existence.

Thus, it is clear that Greek heritage in logic and sciences was transferred to the Islamic world through translations. Greek culture reached the East with the conquests of Alexander the Great, which stretched from Libya in the west to India in the east. Alexander worked to spread Greek culture and merge it with the cultures of the peoples in the regions he conquered. Most of the lands Alexander conquered fell within the boundaries of the Arab-Islamic state after the Arab conquests. Therefore, it was natural for Greek culture to reach Arabs and Muslims through various cities that remained important centers of Greek culture, such as Alexandria and the Nestorians.

Among the translators was Hunayn ibn Ishaq, a Nestorian from al-Hirah. He was proficient in four languages: Syriac, Greek, Arabic, and Persian. He translated from Greek and Syriac into Arabic. Al-Ma'mun would reward Hunayn ibn Ishaq with the weight of the texts he translated in gold. Hunayn and his disciples translated the most significant Greek works, providing explanations and summaries. His son, Ishaq ibn Hunayn, was at his father's level in translation from Greek and Syriac into Arabic. He assisted his father in the House of Wisdom and translated and corrected more than half of Aristotle's works. Thabit ibn Qurra, a Sabian from Harran, moved to Baghdad with Muhammad ibn Musa ibn Shakir, who introduced him to the Caliph al-Mu'tadid, who then included him among his court astronomers. Thabit was unmatched in translation and medicine in his time.

It is important to note that the first to combine logic with the principles of Islamic jurisprudence (usul al-fiqh) was Abu Hamid al-Ghazali in his logical introduction, which he placed at the beginning of his

book "Al-Mustasfa." He believed that logic was the foundation of all sciences and that without mastering it, one could not trust their knowledge at all. Ali al-Nashar says, "The blending of Aristotelian logic with Islamic theology (kalam) and Islamic sciences in general began in the late fifth century (Islamic calendar) through the hands of later theologians, particularly by the prominent Sunni theologian Abu Hamid al-Ghazali, who considered it the 'standard of all sciences[10].'"

The concept of induction according to Imam al-Ghazali: Al-Ghazali defined induction as "the process of tracing a ruling across many particulars that fall under a general concept. Once a ruling is observed in these particulars, that ruling is applied to the general concept." In this sense, induction works by linking results to causes through the identification of the laws that regulate these phenomena, their internal structures, and the theoretical framework that helps us lay the groundwork for understanding them[11].

Induction, in this context, is the examination of numerous specific instances that fall under a general meaning, so that when a ruling is found in those specific cases, it is applied to the general principle[12]. An example of this is the ruling on the Witr prayer. In his book "Al-Mustasfa," he defines it as "the examination of specific matters so that their ruling can be applied to something that encompasses those specifics[13]." He divided induction into two types: complete induction, which is used in definitive matters, and incomplete induction, which is used in jurisprudential matters[14]. Al-Ghazali says, "If the induction is complete, it is suitable for definitive matters, and if it is not complete, it is suitable for jurisprudential matters." Al-Ghazali summarized his view on induction by saying, "Induction is of no use if there is disagreement on some specific instances[15]." This means that a ruling based on induction does not apply to individuals that have not been examined. "If it extends to something broader and more general, the benefit of induction in building certainty is lost, and thus the benefit of analogy based on premises is lost[16]." In "Mi'yar al-Ilm," he further explained by saying, "It is to follow the ruling in many specific instances that fall under a general meaning, so that when a ruling is found in those specific instances, it is applied to that specific matter[17]." Induction, in this sense, works to link results to causes. This is done by defining the laws that govern these phenomena, their internal structures, and the theoretical framework that helps us facilitate them. If induction is not complete, it is only suitable for jurisprudential matters because, whenever the majority follows a certain pattern, it is assumed that the rest will follow the same pattern as well. It seems that Al-Ghazali categorized induction according to logical divisions, but he gave the sciences of Sharia a special status in their discourse and scientific nature. Complete induction holds conjectural consideration for what has not been induced, making complete induction rare, and if it does occur, it is definitive; anything else falls under the conjectural category.

Al-Ghazali's real attempt to blend logic with jurisprudence is evident in his book "Mihakk al-Nazar," where he explains "Qiyas al-Dalalah" (analogical inference) according to logicians, and "Qiyas al-'Illah" (analogy of cause). He supports them with jurisprudential examples. Al-Ghazali says: "As for Qiyas al-Dalalah, it is when the repeated element in the two premises is a result and an effect because the cause and the effect are correlated. Or, if you wish, you could say the necessary and the necessitated. If you infer the effect from the cause, your analogy is 'Qiyas al-'Illah' (analogy of cause), and if you infer the cause from the effect, it is 'Qiyas al-Dalalah' (analogical inference). An example of Qiyas al-'Illah in jurisprudence is inferring one ruling from another in jurisprudence[18]. For instance, in the case of adultery, it does not necessitate the prohibition of marriage by affinity because it is intercourse that does not establish a prohibitive relationship, and what does not establish a prohibitive relationship does not necessitate the prohibition of marriage. Since it does not establish prohibition, it does not necessitate the prohibition of marriage. The common element in the two premises is stated by our saying that affinity is not a cause of prohibition, nor is prohibition a cause of it. Rather, they are both results of a single cause. The occurrence of one result indicates the other

by way of the cause, as it is linked to its cause, the second result also correlates with its cause, and what correlates with something else must necessarily correlate with it as well. If it appears that the prohibitive relationship is the cause of the prohibition of marriage, then this would not be valid as an example for us. An example of "Qiyas al-Dalalah" from jurisprudence is your statement: "This is an impure substance, therefore, prayer with it is not valid." Conversely, the opposite of "Qiyas al-Dalalah" is when you say: "This is a substance with which prayer is not valid, therefore, it is impure[19]."

We notice in "Qiyas al-'Illah" and "Qiyas al-Dalalah" that Al-Ghazali was influenced by his teacher Al-Juwayni in both. Al-Ghazali then goes on to discuss the sources of jurisprudential analogies. It is also evident that Al-Ghazali begins to introduce new terms in "Mihakk al-Nazar," in addition to the terms he introduced in his book "Mi'yar al-'Ilm." He replaces the terms "tasawwur" (conceptualization) and "tasdiq" (affirmation) with "ma'rifah" (knowledge) and "'ilm" (science), following the grammarians in this. He refers to abstract universal propositions as "faces" or "conditions," which are theological expressions, or as "rulings," which is a jurisprudential expression[20].

Ibn Taymiyyah

considered the method of inference from rational evidence as a way to demonstrate the validity of Islamic law, with its results aligning with the Sharia. He viewed it as a means to either force an opponent into agreement or convince them of the desired conclusion. Ibn Taymiyyah argued for the widespread presence and variety of rational evidence in the Qur'an and Sunnah, countering the claims of philosophers and theologians who suggested that the Prophet (peace be upon him) did not clarify the foundations of the religion and its rational proofs.

Ibn Taymiyyah referred to what was conveyed by the messengers as "auditory evidence" or "the evidence of hearing," in contrast to "rational evidence," because the former reaches us through hearing and reports. He stated: "If it is understood that auditory evidence includes reports as well as guidance, instruction, and clarification of rational proofs, and that just as people derive rational evidence that clarifies the truth from the words of authors and teachers, their benefit from the words of Allah is more complete and superior. Thus, that evidence is rational in the sense that the mind recognizes its validity when it is pointed out, and it is Sharia-based in the sense that the Sharia has indicated it and guided to it. In either case, the evidence is both rational and Sharia-based[21]."

As for Ibn Rushd's inductive method, he placed great importance on science and the experimental method, which is evident in his awareness of the importance of classifying sciences and defining them without mixing different subjects. He believed that the theoretical subject matter of one science differs from that of another, but this distinction does not hide the overlaps and points of convergence between various sciences. The results obtained in one field can be applied to others. Ibn Rushd viewed all sciences, whether theoretical or practical, as sharing a common methodology since they all rely on analogy and seek to build a coherent and solid theoretical framework. Logic plays a crucial role in Ibn Rushd's works, as all sciences depend on it as a method for evaluating and arranging statements, from the most credible to the least, progressing from demonstrative, dialectical, rhetorical, sophistical, and finally to poetic statements, with the demonstrative statement being the only scientific one.

Ibn Rushd's

classification of names into univocal, equivocal, and analogical terms is also used in all sciences, employing logical methods such as deduction, induction, composition, division, and explaining the meanings of names. The importance of logic in Ibn Rushd's corpus is highlighted by the differentiation between sciences and the superiority of some over others. Theoretical sciences are

superior to practical sciences, and among other sciences, the mathematical sciences are superior to natural science because their subjects are abstract and separate from matter in theory, while the subjects of natural science are mixed with matter and not separated from it, either in theory or in existence. Natural science deals with complex material subjects, whereas the mathematical sciences deal with simple subjects.

Logic is distinguished by its dual function: either as a set of rules that guide and free the mind from error, which is its primary use, or as principles that, once established, can be applied in other fields as premises or foundational assumptions. This indicates that demonstrative sciences share in using the principles proven in other fields[22].

Ibn Rushd also believed that human nature must follow the path of intuition in order to reach theoretical sciences. Through intuition, we acquire primary premises, and with it, we are able to arrive at universal premises through abstraction. He stated that we do not reach knowledge except through universal premises: "And there is no way to know universal premises except through induction." This is because the universal premise is taken in the mind as an abstraction from material realities[23]. If a person tries to demonstrate its truth, they do so through induction, either by demonstrating it absolutely if it is such that it can be abstracted from material realities, like the premises of mathematical sciences or by affirming it in connection with a material reality, if it pertains to something that exists in a particular material context[24].

Scholars of Islamic civilization were deeply influenced by religious teachings and developed a unique Islamic scientific method that went beyond the philosophical ideas characteristic of Greek sciences. They moved towards conducting experiments and drawing conclusions with all the rigor of a meticulous researcher. They understood that their new method required theoretical, practical, and faith-based conditions and elements that needed to be mastered. Islamic civilization in the Middle Ages is considered a significant chapter in the history of science due to the foundational scientific methods developed by its scholars, which contributed to the advancement of new knowledge.

CONCLUSION

The research of Arab philosophers spread from the sciences of the Greeks and Romans and the civilizations of Asia, leading to significant advancements in mathematics, mechanics, medicine, chemistry, and applied sciences, in addition to theoretical research and technology. Between the 8th and 13th centuries, some of the most important scientific discoveries were made, laying the foundations for modern civilization. Muslim scholars contributed a vast number of scientific discoveries, which included remarkable artistic and architectural innovations, large libraries, extensive hospitals, various technologies, universities, industries, world maps, and navigation methods using celestial bodies, among many other contributions. This knowledge was then transmitted to Europeans through centers of Islamic civilization around the world.

Furthermore, Islamic civilization made many advancements in scientific research, leading to numerous changes in various fields of study and science. It also placed a strong emphasis on religious aspects, making it a civilization that blended reason with spirituality, distinguishing it from many earlier civilizations. Islam, being a universal religion, encourages the pursuit of knowledge and the cultivation of the earth to advance its nations and peoples. The development in various fields, such as urban planning, science, and others, remained within the framework of Islamic principles. This civilization, once it had established its institutions and channels, spread its light to the West and opened its doors, showcasing the contributions of Muslims in various areas of human, social, environmental, and scientific life.

Muslim philosophers pioneered research methods and techniques to achieve accurate knowledge, such as experimental reasoning and the inductive method, which relies on the examination of particulars to derive general rules. Through this, humanity learned how to arrive at scientific truth with confidence and capability, free from doubts, illusions, and whims. This remarkable discovery in the field of induction led to the development of the empirical scientific method in both scientific and legal research, based on observation and experimentation. Additionally, they infused a type of Islamic rationality into all their serious endeavors in various fields. It can be seen as a purely Islamic rationality, as the inductive method encompassed fundamental, religious, and scientific studies, transforming theoretical studies into practical applications.

From the previous examples, we have arrived at several important conclusions in the history of Islamic thought. Al-Ghazali's inductive reasoning shows that the primary objectives of the Qur'an, which hold precedence and priority, revolve around three main matters: knowledge of the one being worshiped (Allah) through correct belief, knowledge of the "straight path" in order to fulfill servitude to Him through the obligations He has placed upon His servants in worship and guidance regarding what is obligatory and what is forbidden, and knowledge of the final outcome, which is the Hereafter, the Day of Resurrection, and reckoning. Thus, the fundamental Qur'anic objectives are centered on achieving servitude to Allah and preparing for the Hereafter, with other rulings serving these main objectives.

As for Al-Razi, he shifted induction from logical inference to being one of the debated sources of legal evidence. Al-Razi defined incomplete induction as establishing a universal ruling based on some of its particulars. In the field of Usul al-Fiqh (principles of Islamic jurisprudence), induction has a different approach. A careful reading of scientific texts in the Islamic tradition reveals that the discovery of the scientific method (the empirical and inductive method) is not attributed to a single Islamic scholar, as is often the case with Aristotle, Bacon, or Descartes. Rather, it is credited to many scholars who paved the way for it across various fields of knowledge. Muslim scholars highlighted the characteristics of the experimental method they followed and emphasized that "every craft has its own techniques." They also warned against excessive confidence in the results of experiments, despite their objectivity in scientific research.

For instance, Jabir ibn Hayyan stated: "We mention in these books only the properties of what we have seen ourselves not what we have heard or what has been told to us or what we have read after we have tested and experimented with it. What we have discovered, we have compared with the statements of others." He also said: "No one has the right to claim that what is unseen is exactly like what is observed, or that the past and future are exactly like the present."

In conclusion, the success of this empirical inductive method lies in its alignment with the movement of scientific progress, which is encouraged by the noble teachings and principles of Islam as found in the verses of the Qur'an and the prophetic traditions. These teachings honor knowledge and scholars, encourage the use of reason, and promote continuous research into the universe. They also advocate for freeing thought from the constraints and illusions that hinder discovery and creativity, and they oppose astrology and random predictions.

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