

CONTEMPORARY PHILOSOPHY OF SCIENCE IN AZERBAIJAN: CHALLENGES AND DIRECTIONS

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Abstract. This paper examines contemporary philosophy of science, particularly the theory of knowledge, and explores its development in Azerbaijan. The authors argue that scientific knowledge emerges not only from interactions between diverse disciplines but also from the cultural and historical contexts in which it evolves. Philosophy of science, therefore, recognizes these contexts as integral to the formation of thought, highlighting how languages, conceptual frameworks, and inherited intellectual traditions shape the act of knowing. In the Azerbaijani context, the significance of these issues reflects a conditional transition from gnoseology to epistemology, marking a turn from strictly prescribed methodologies toward the adoption of subjective, locally grounded approaches to scientific inquiry.

Keywords: Philosophy of Science, Azerbaijan, epistemology, historical epistemology, subjective reality, methodology.

I. INTRODUCTION. FROM HISTORY OF SCIENCE TO PHILOSOPHY OF SCIENCE

For years, reflections on what philosophy of science is, what it should be like, and its relevance have been a source of genuine concern for many philosophers. Essentially, they face the question of whether it will retain its defining functions, capable of changing the vector of development of science and society. Indeed, the philosophy of science addresses not only the methodological foundation of scientific inquiry but also the realization of new meanings and values within science, for as human reflection deepens and transforms, the existing values and norms are reevaluated in all domains. In this process of reevaluating and rethinking, philosophy itself plays a key role, particularly in creating the necessary theoretical foundation for scientific research. The prospects of philosophy, accordingly, are linked to the extent to which it can bring new insights to science,

which today represents a constantly evolving platform for research that includes intersections and collaborations among various technologies and disciplines. Furthermore, contemporary reflections on the philosophy of science inevitably engage us, narrowly, with the latest scientific and technological developments, and more broadly, with the spirit of the time we live in. That is, philosophical research, being both a prerequisite for the development of science and its reflection, help us comprehend the historicity of ideas and the connection with time, understand the past and present reality, as well as direct our gaze to the future, defining the values and goals of tomorrow.

At the same time, the history of science, with its rich literature on thought, the philosophy of science, human nature and consciousness, directly influences our understanding of philosophy itself and its heuristic and scientific functions. It allows us to trace how scientific paradigms are formed, how the past, present, and future are connected in our subjective experience, how science interacts with society, religion, morality, and politics, and how once-radical ideas can gain new meaning as science and technology advance.

It should be noted that the history of any science is important not only as a chronology of discoveries or a catalog of names, but as an internal reflection of the science itself on its own boundaries. It is an integral component of scientific reason, for through turning to its own past, science recognizes the limits of its methods, the meaning of its aspirations, and the human cost of its successes. Without this reflective dimension, scientific knowledge loses depth, and science itself becomes a set of tools without a clear orientation. History as the memory of any science, its meta-consciousness reminds us that all knowledge is born in culture, in language, and within a particular time. Science, in turn, through historical self-understanding, sustains the connection between idea and experience, the search for truth and the forms of its cultural expression, seeing knowledge not as a mere sum of facts, but as a movement of the spirit and a continuous dialogue between tradition and innovation.

However, the history of any science ceases to be the sole or primary component during periods of turning points, when new paradigms and approaches are needed, and consequently, when a breakthrough, a break with history and gradualism are required. While appreciating how philosophers of past centuries grappled with particular questions remains inevitable for gaining insight into contemporary science and its influence on the evolution of philosophical thought, today the study of the history of philosophy or science alone is no longer sufficient. Its narrowly disciplinary perspective often constrains our ability to confront the deeper, more pressing philosophical challenges that arise at the intersection of science, knowledge, and understanding of technologies.

The latest technologies and scientific discoveries in fields such as mathematics, biology, and physics have accelerated a shift from the study of the history of science and philosophy toward a more thorough examination of science and its discoveries as objects of philosophical inquiry. Today, each new technology inevitably raises questions of a philosophical nature. However,

the task of philosophy does not “end” with the clarification of phenomena or scientific theories, as L. Wittgenstein noted¹; rather, philosophy looks forward, proposing new hypotheses and thereby laying the groundwork for future scientific discoveries.

Aaron Sloman, in *The Computer Revolution in Philosophy*, identified four fundamental tasks shared by both science and philosophy: (1) the development of new concepts and intellectual tools; (2) the clarification of what kinds of things are possible; (3) the explanation of how and why these possibilities arise; and (4) the discovery and explanation of the limits of what is possible². The relationship between the aims and methods of science and philosophy, as explained by Sloman, continues to shape philosophical inquiry and remains relevant to the intellectual history of scientific thought, including within the context of Azerbaijani science.

In recent years, philosophical discourse in Azerbaijan also has shown a movement from the history of philosophy and science to the philosophy of science, with its wide and diverse range of problems. Whereas earlier philosophers primarily concentrated on the history of ideas and their influence on contemporary thought, much of today’s works are devoted to examining the problems of science and its methodology. For instance, scholars increasingly explore issues such as national philosophy and its scientific foundations (Ilham Mammadzada³, Ali Abasov⁴, Abulhasan Abbasov⁵), methodology and cognitive theory (Fuzuli Qurbanov⁶), logic and fuzzy logic in relation to scientific method (Arif Bunyatov⁷), the epistemological foundations of emerging technologies and the ethical implications of artificial intelligence (Ilham Mammadzada, Samira Dadashova⁸)

¹ O. Bouwsma, L. Wittgenstein, *Conversations 1949–1951*, J.L. Craft and R.E. Hustwit (eds), Indianapolis, Hackett Publishing Company, 1986, p. 28.

² A. Sloman, *The Computer Revolution in Philosophy: philosophy, science and models of mind*, Stanford Terrace, Hassocks, Sussex, 1978, 304 p.

³ I. Mammadzada, *On the Philosophy of Science and Some Problems of Artificial Intelligence* [Elm fəlsəfəsi və süni intellektin bəzi problemləri haqqında], ANAS, 2021.

⁴ A. Abasov, “Problems of the National Philosophy of Azerbaijan” [Проблемы национальной философии Азербайджана], in *Problems of Eastern Philosophy*, no. 26, 2022, pp. 11–27.

⁵ Ali Abasov, A. Abbasov, *Modern Philosophy and Azerbaijan: History, Theory, Teaching* [Müasir fəlsəfə və Azərbaycan: tarix, nəzəriyyə, tədris], Baku, Elm, 2011.

⁶ F. Qurbanov, “Synergetic Aspects of Intercultural Interaction” [Синергетические аспекты межкультурного взаимодействия], in *Interaction of Cultures in the Context of Globalization*, Moscow, Kanon, 2010; F. Qurbanov, V. Zulfuqarov, *Post-Academic and Post-Normal Science: An Interdisciplinary Approach*, ANAS, 2024; T. Alibeyova, F. Qurbanov, “Unity of Knowledge, Expansion of Rationality, and ‘Digital Cognitive Expansion’: An Epistemological Approach”, in *Journal of Young Researcher*, vol. 9, no. 3, 2023, pp. 140–148.

⁷ I. Mammadzada, A. Bunyatov, and others, *Contemporary Philosophy, Artificial Intelligence, and Fuzzy Logic* [Müasir fəlsəfə, süni intellekt və qeyri-salis məntiq], 2022.

⁸ I. Mammadzada, S. Dadashova, “On the Philosophy of Artificial Intelligence and the Scientific Revolution” [О философии искусственного интеллекта и научной революции], in *Questions of Philosophy*, 4 (Apr. 2023), pp. 206–215, doi:<https://doi.org/10.21146/0042-8744-2023-4-206-215>; I. Mammadzada, S. Dadashova, “On the Question of Epistemology, Consciousness, and Intelligence” [К вопросу об эпистемологии, сознании и интеллекте], in *Questions of Philosophy*, 9 (Oct. 2024), pp. 167–176, doi:<https://doi.org/10.21146/0042-8744-2024-9-167-176>.

and so on. Such a broadening of philosophical research allows Azerbaijani scholars to engage with both local and global debates.

II. WHAT IS THE PHILOSOPHY OF SCIENCE, AND WHY IT MATTERS?

Throughout the 20th century, the philosophy of science experienced profound debates about the nature and limits of scientific knowledge. These debates defined the face of modern science and continue to influence how we understand truth, meaning, and its methods. Major philosophers such as Rudolf Carnap⁹, Gaston Bachelard¹⁰, Karl Popper¹¹, and Thomas Kuhn¹² proposed various concepts that explored different aspects of the same problem: whether science is a system of ultimate truths or a dynamically evolving form of human knowledge, subject to change and revisions of its foundations. While logical positivism as represented by Carnap and the neopositivists of the Vienna Circle was characterized by a desire to purge science of metaphysics and build it on strictly logical and empirical foundations, a different line emerged in the mid-20th century – a historical-critical approach, associated with the names of Bachelard, Popper, and Kuhn. Bachelard introduces the concept of “epistemological rupture”, arguing that the development of science occurs through the destruction of old forms of thought and the emergence of new types of rationality. Popper advances the principle of falsifiability: scientific knowledge cannot be final; it is constantly tested by experience and can be refuted. Kuhn, in turn, demonstrates that the development of science is not a linear accumulation of facts, but occurs through paradigms that determine what is considered scientific truth in a given era. These concepts, taken together, changed the very understanding of science: it ceased to be perceived as an absolute and unambiguous source of truth. Instead, it came to be seen as a historically evolving, culturally conditioned form of rationality, capable of introspection and self-correction.

While philosophical understanding of science has demonstrated the fallacy of the idea of “final” or “eternally true” theories, the history of science convincingly has shown that any theory has limits of applicability, and the emergence of new concepts does not always destroy old ones, but rather integrates them into a broader context. Closely related to this reflection is the attitude toward doubt in science. For a long time, it was believed that doubt undermines the authority of science and the scientific community. However, doubt does not destroy truth, but makes it

⁹ R. Carnap, *The Logical Structure of the World*, translated by Rolf A. George, University of California Press, 1967.

¹⁰ G. Bachelard, *The Formation of the Scientific Mind: A Contribution to a Psychoanalysis of Objective Knowledge*, translated by M. M. Himes, Beacon Press, 1986.

¹¹ K. Popper, *The Logic of Scientific Discovery*, translated by G. W. Boyce, Routledge, 2002.

¹² Th. Kuhn, *The Structure of Scientific Revolutions*, 2nd edition, University of Chicago Press, 1970.

possible to refine it. It is doubt and critical thinking that drive scientific progress for science lives and develops only when it subjects its foundations to scrutiny and allows for the possibility of revision.

Soviet and then Russian philosophy of science, despite its ideological constraints, also engaged in intense debates about the nature of science and scientific knowledge. The works of philosopher Vyacheslav Stepin occupies a special place in this context. Stepin's *The Formation of a Scientific Theory*¹³ is a key work in Soviet philosophy of science and epistemology. He analyzes the dynamics of scientific process and paradigm that renew themselves through internal conflict and contradictions – a continuous rethinking of the very concepts through which humanity understands reality. This idea permeates all of his philosophical work, ultimately giving rise to the claim that contemporary science, in its pursuit of knowledge, is inseparable from the reflective task of examining the very principles on which it rests. In *Philosophy of Science*¹⁴, for example, he proposed a concept of historical types of scientific rationality, noting that a relatively independent field of research has emerged, based on two groups of factors: the search for new research strategies and the needs of science itself for philosophical methodology. This indicates that philosophy of science considers not only scientific and methodological aspects, but also value-based, ethical, and social dimensions. It is essential both for analyzing the logic of scientific theories and for understanding how science itself relates to culture, technology, society, and humanity in general.

According to Stepin, as “*scientific knowledge develops, it differentiates. New scientific disciplines emerge, influencing previously established fields, fostering integrative connections between sciences, and giving rise to interdisciplinary research. New knowledge results from both intradisciplinary and interdisciplinary interactions. The philosophy of science studies their shared characteristics. It aims to identify the features of scientific knowledge and its structure, and to analyze the cognitive procedures and methods through which new knowledge is generated*”¹⁵.

Contemporary philosophical studies of science necessarily involve examining the nature of science, its essential structure, and the historical stages of its development, as well as analyzing knowledge and its justification, classifying scientific theories, and defining their philosophical meaning and significance. For Stepin, it means that philosophy possesses a unique ability to consider science in its multifaceted form: as a special type of human activity, as a system of disciplinary knowledge, as a social institution, and as a key factor determining the development of culture and society.

In Azerbaijani science, this insight into knowledge within the Soviet philosophy remains significant as it has left a lasting imprint on the scientific

¹³ V. Stepin, *The Formation of a Scientific Theory* [Становление научной теории], Moscow, Nauka, 1976.

¹⁴ V. Stepin, *Philosophy of Science: General problems* [Философия науки: Общие проблемы], Moscow, Gardariki, 2006.

¹⁵ *Ibidem*, p. 6.

thought, informing its development and creating the conditions for the ongoing evolution of knowledge. This influence manifested not only in methodological approaches but also in the very structure of philosophical thought, shaping the understanding of science's role in society and the interpretation of the categories of knowledge, truth, and rationality. During the Soviet period, a scientific-philosophical approach emerged in Azerbaijani science, dedicated to analyzing the dialectic of scientific knowledge, the interplay between science and society, and the study of historical forms of rationality. This tradition has retained its relevance in the post-Soviet period, evolving through contemporary epistemological and cultural-philosophical perspectives while engaging with reflections on emerging technologies.

Today, the mutual influence of science and culture has become a crucial aspect of social existence, as scientific discoveries shape new cultural meanings and values, while the cultural environment, in turn, determines the directions and forms of scientific inquiry. This interaction is particularly pivotal for the development of the Azerbaijani philosophy of science as it actively integrates cultural and national context into the structure and purpose of scientific knowledge. Historically, some cultures, having reached a more advanced level of development, generate their own scientific knowledge, while others primarily assimilate existing knowledge. Yet even borrowed knowledge, when interacting with the cultural context, inevitably transforms the culture itself, its structures, symbolic systems, and, consequently, worldview and forms of human consciousness. Thus, in Azerbaijani philosophy, science is not only a cognitive phenomenon, but also an anthropological and cultural one, informing the ways people understand themselves, their relationship to the world, and their own existence and identity.

Recognizing this multifaceted role of science invites a deeper reflection: on one hand, the philosophy of science seeks to grasp the unity, logic, and epistemological status of knowledge itself; on the other hand, the philosophy of individual scientific disciplines attends to the conceptual and ontological questions that arise within the particular fields such as physics or biology, for example. This insight involves not only interdisciplinary research but also a reflection on the very idea of science and the ways philosophers interpret its contemporary forms and practices. For instance, the long-standing tendency to elevate the mathematical approach as the dominant paradigm within the philosophy of science appears to have waned, giving way to a broader recognition that the study of science cannot be reduced solely to formal structures, but must also account for its conceptual, cultural, and ethical dimensions.

In this context, it becomes obvious that science has a profound influence on the development of philosophy; it creates a unique type of human consciousness, reframes and reconstitutes it at every stage of the historical process. A worldview, encompassing an individual's understanding of nature, society, and their own activities, is largely shaped by the ideas and values of a scientific worldview. Science becomes one of the primary sources of rational understanding of reality, defining ways of interpreting the world and understanding its structure and patterns. However,

this does not mean that human cognitive activity is limited to scientific knowledge. Human cognition is diverse: it includes artistic, imaginative, religious, and everyday forms of understanding reality. Each of these forms reflects the world in its own way, expressing various aspects of human experience and spirituality. Nevertheless, science does not exist in isolation from other types of knowledge, manifesting itself both in the process of scientific inquiry itself – in the choice of methods and descriptive languages – and in the broader cultural dimension, where scientific discoveries become part of the spiritual life of society.

Thus, the philosophy of science has evolved from a belief in the absolute objectivity of knowledge to an understanding of science as an open, historically fluid, and value-laden system. The controversies of the 20th century demonstrated that no theory is definitive, but this does not devalue science – on the contrary, it makes it vibrant and capable of development. With the emergence of artificial intelligence, digital technologies, and neuroscience, the role of philosophy is once again becoming crucial, as these fields challenge the assumptions underlying the conventional methods. And philosophy is demanded to make sense of the deeper questions about knowledge and science – questions that science alone cannot fully answer. Furthermore, traditional scientific methods are not always prepared to answer traditional questions about the definition of knowledge, consciousness, intelligence, or truth. Philosophy of science, supported by the latest scientific and technological foundation, may be able to outline the contours of a new rationality in which science, culture, humanity, and technology, merge in a single process of understanding reality.

III. THE DEVELOPMENT OF EPISTEMOLOGY IN AZERBAIJAN

The expansion of ideas beyond the boundaries of specific societies and cultures, along with advances in science and technology, has contributed to the renewed prominence of many traditional issues in Azerbaijani scientific-philosophical discourse, particularly those shaping epistemology. The relevance of epistemology today, though, does not imply that it has been insufficiently explored in academic circles: its renewed significance arises not from a lack of prior scholarship, but from the need to reinterpret established epistemological structures in light of contemporary cultural, technological, and scientific advancements.

The growing interest among Azerbaijani philosophers in questions concerning the nature of knowledge, its justification, and truth is expressed primarily through a historical and cultural lens. This orientation emerges from an understanding of epistemology grounded in the role of subjectivity in philosophy, where subjectivity is interpreted through the prism of Azerbaijani culture, history, and language¹⁶.

¹⁶ I. Mammadzada, A. Bunyatov, *Epistemological features of nationality and national identity in the context of fuzzy logic* [Milliliyin, milli özünudərkin qeyri-səlis məntiq kontekstində epistemoloji xususyyətləri], Baku, “Elm və Tehsil”, 2023.

This understanding of epistemology implies an interdisciplinary approach, not only because it engages philosophy and consciousness, history, and culture, but also because it addresses the methodology of interaction, both within scientific fields and across the philosophy, consciousness, and history of different cultures. Consequently, this type of epistemology requires comparative analysis within the context of philosophical intersections such as logic, ethics, and cognition, which contributes to a more objective understanding of the principles underlying the nature of knowledge. Drawing on diverse value systems and methods of explaining reality, cultural-historical epistemology investigates human cognition in relation to thinking, consciousness, and memory. No wonder then that reflections by Azerbaijani scientists on knowledge led to the conclusion that epistemology has an applied nature, which has become an objective basis for many controversial issues. Some of these issues, which we aim to explore in this paragraph, include:

- a) the difference between gnoseology and epistemology (if any);
- b) the interaction of cultural-historical epistemology, subjective reality and consciousness.

a). From Gnoseology to Epistemology

Since knowledge is a complex concept whose limits and functions have expanded over time, epistemology has gradually separated from the once unified theory of knowledge to develop into a more rigorous discipline. For example, Richard Rorty embraced this historically and socially aware approach. In the work *Philosophy and the Mirror of Nature*, he distinguished epistemology from the theory of knowledge: “The theory of knowledge will be the search for that which compels the mind to belief as soon as it is unveiled. Philosophy as-epistemology will be the search for the immutable structures within which knowledge, life, and culture must be contained-structures set by the privileged representations which it studies.”¹⁷ So, if the theory of knowledge tries to find the ground of knowledge, epistemology, for Rorty, studies structures and practices that shape knowledge itself. It’s less about absolute certainty and more about understanding how humans construct knowledge and belief.

Before addressing the question of the separation of epistemology into a distinct field of study, or the transition from gnoseology as the general theory of knowledge to epistemology and whether such a transition is occurring in principle, it should be noted that the concept of epistemology in Azerbaijani philosophy – much like in the philosophical traditions of other post-Soviet countries – has emerged only relatively recently. It is generally understood as a system of scientific knowledge concerned with the acquisition of knowledge, the verification of achieved knowledge, and its practical application.

The concept of gnoseology is earlier and has deep roots, particularly in German and Russian philosophical traditions. Karl Leonhard Reinhold developed

¹⁷ R. Rorty, *Philosophy and the Mirror of Nature*, Princeton University Press, 1979, p. 163.

the concept as a systematic study of human knowledge. He even described gnoseology as ‘first philosophy’, suggesting that our attempts to understand knowledge stand at the very beginning of how we make sense of the world¹⁸. Thus, gnoseology appears to lie at the foundation of epistemology and equips it with the conceptual basis that makes it possible to explore how, and to what extent, humans can know the world. This, however, does not prevent them from reflecting different approaches or functioning at different levels. According to William B. Gomes, for example, gnoseology is defined as a branch of philosophy that studies the nature and limits of human cognition, as knowledge about the human capacity to know, while epistemology focuses on the task to confirm what has been given as knowledge¹⁹. A somewhat different definition is offered by Lyudmila Mikeshina (co-author). In line with this definition, gnoseology represents a striving for maximal abstraction and an impersonal scientific language in both the fundamental and social sciences, whereas epistemology tends to consider the social characteristics of the knowing subject²⁰. Thus, epistemology relies on knowledge expressed through the scientific language of a specific researcher, shaped by their system of thought and awareness of particular aspects of reality.

Undoubtedly, epistemological thinking is closely related to gnoseology, yet it clearly goes beyond this level of analysis, as it seeks to understand the specific conditions for the accumulation, development, and justification of knowledge – historical, sociological, and otherwise. This, in turn, underscores the need to draw on insights from research in the philosophy of consciousness and language (Robert Audi²¹, Samira Dadashova²²), the history of science and cultural studies (Ilham Mammadzada 2020²³, Vladimir Porus 2021²⁴), etc. Epistemology, therefore, relies on the objectivity of knowledge and simultaneously strives to discover truth²⁵.

¹⁸ K. Reinhold, *Essay on a New Theory of the Human Capacity for Representation*, translated by Tim Mehigan and Barry Empson, De Gruyter, 2011.

¹⁹ W. Gomes, “Gnoseology versus epistemology: distinction between the psychological foundations for individual knowledge and philosophical foundations for universal knowledge”, in *Temas em Psicologia*, 17 (1), 2009, pp. 37–46.

²⁰ L. Mikeshina, M. Mikeshin, “Epistemological traditions in the modern Russian philosophy” [Эпистемологические традиции в современной российской философии], in *Voprosy Filosofii*, 11, 2023, pp. 67–77.

²¹ R. Audi, *Epistemology: A Contemporary Introduction to the Theory of Knowledge*, 3rd edition, in *Routledge Contemporary Introductions to Philosophy*, 2010.

²² S. Dadashova, “On Philosophy Today” [О философии сегодня], in *Alma Mater*, Higher School Herald, no. 7, 2022, pp. 15–21, <https://doi.org/10.20339/AM.07-22.015>.

²³ I. Mammadzada, *Philosophy about modernity, history and culture (on the contours of historical and cultural epistemology)* [Философия о современности, истории и культуре (О контурах историко-культурной эпистемологии)], Baku, Elm ve Tehsil, 2020.

²⁴ V. Porus, “Historical epistemology – a trigger for the reform of philosophical knowledge” [Историческая эпистемология – триггер реформы философского познания], in *Voprosy Filosofii*, 5, 2021, pp. 47–57.

²⁵ The problem of truth, or true knowledge, though recurring throughout the work, is deliberately not explored in detail, as it involves a controversial nature that requires separate consideration. We will only outline the concept: because a gap exists between the subject’s perception and the perceived object mediated by sensory data, subjective experience, historical context, and

In this context, what, then, does gnoseology aim for? What is its relationship to truth? We can assume that the theory of knowledge, whether framed as ‘general’ gnoseology or ‘specific’ epistemology, ultimately pursues the same overarching goal: to uncover truth in hypotheses, judgments, and inferences. The most significant difference between the two does not lie in their purpose but in their subject matter and the methods they employ.

With the advancement of scientific and technological progress, it has become evident that epistemology has gained prominence, focusing more on the study of specific phenomena rather than on “things in general”. Today, epistemology addresses not only questions concerning the transcendence or transcendental nature of knowledge but also the analysis of incoming information – its truthfulness and value – through interdisciplinary research, including neuroscience, computer science, and related fields.

From our perspective, contemporary epistemology does not aim to create a completely new theory of knowledge; rather, it seeks to update the methodology underlying research foundations. As the logic of scientific inquiry and a reflection on the essence of knowledge and science in general, epistemology also examines the role of consciousness and intellect, as well as the use of metaphors and analogies. While these issues have not traditionally been central to the theory of knowledge, they are significant in contemporary philosophical discourse and require rigorous investigation within an interdisciplinary framework. The high relevance of these topics allows us to speak of a *conditional* transition from gnoseology to epistemology in Azerbaijani science as a shift from a strict, prescribed methodology to the adoption of one’s own methods and approaches to scientific investigation. It is important to recognize that the boundaries between areas of philosophy are often blurred, including those between gnoseology and epistemology. Just as each ontological question entails its own system of thought, and each thought is underpinned by moral and/or value categories, so too all knowledge is grounded in fundamental scientific principles.

b). Cultural-Historical Epistemology in Relation to Subjective Reality and Consciousness

As we have mentioned before, the development of science and philosophy has led to the understanding that absolute truth is unattainable in our interpretation of the world. This, in turn, highlights the need to explore subjective reality and individual experience. The growth of scientific knowledge across fields such as sociology, anthropology, cultural studies, and psychology has clearly shown that knowledge cannot be separated from the social and historical context in which it

specific conditions of development, absolute knowledge of an object is impossible or extremely difficult to achieve. This perspective also applies to false knowledge, which is likewise relative. Philosophy in all its forms, particularly epistemology, seeks truth, but it does so while questioning and scrutinizing it. Knowledge that can be challenged cannot claim absolute truth a priori, just as facts supported by additional evidence are not always guaranteed to be true, though they may increase the degree of truth.

emerges. And the necessity of *cultural-historical epistemology* has become evident in addressing such a multidimensional nature of knowledge.

In Azerbaijani philosophy, the relevance of cultural-historical epistemology arises not only from the commitment of Azerbaijani thinkers to studying the historical and philosophical continuity of thought, but also from the qualitative transformation of the internal mechanisms, logic, and methodological basis of cognition. An analysis of the formation and development of the historical-epistemological tradition is based, above all, on the recognition that contemporary epistemology and the philosophy of science accept the sociocultural determinacy of knowledge and the historical nature of reflection. Within this context, knowledge itself takes on the qualities of a historical process through which individuals transform and refine themselves.

History plays a key role in addressing many epistemological questions – how we arrive at knowledge, how epistemological concepts emerged, and what methods and criteria we use to determine the truth of what we know. The study of the nature of knowledge and cognition, in turn, examines the social and cultural dimensions of science, including the organization of scientific process, social mechanisms that form scientific inquiry, and the role of science within culture. Therefore, the integration of historical and cultural perspectives into epistemology enables a deeper understanding of the processes by which knowledge is formed, the dynamics of scientific communities, and the influence of cultural norms on the development of scientific thought.

Thus, cultural-historical epistemology represents a comprehensive, multi-disciplinary approach to the study of knowledge, one that takes into account its relationship to the specific cultural conditions in which it emerges and develops. In this context, the question of the truth of knowledge becomes particularly significant, as the diversity of cultural perspectives and epistemic frameworks shows that conceptions of truth and scientific understanding may vary across cultures. At the same time, it should be acknowledged that although culture and history profoundly shape how we interpret reality and how we acquire knowledge, the primary principles of epistemology, grounded in empirical evidence and logical analysis, retain a degree of universality that allows them to be applied across different cultural contexts.

According to Jurgen Renn, “historical epistemology requires an integration of social, cultural, and cognitive studies of science. While methods and results of the cognitive sciences, for instance, or of the structuralist tradition of psychology, or of philosophical theories of concept development can help to compensate theoretical deficits in the history of science in a narrow sense, in particular when it comes to explaining thinking processes, the history of science can, inversely, contribute to overcoming the limitations of theoretical approaches whose claims have never been systematically confronted with the results of historical research”²⁶. Renn claims

²⁶ R. Jürgen, *Historical Epistemology and the Advancement of Science*, Preprint 36, Max Planck Institute for the History of Science, Berlin, 1996, p. 4. URL: <https://www.mpiwg-berlin.mpg.de/Preprints/P36.PDF>.

that since science has become tightly intertwined with political, industrial, and military power, historians have also begun to examine more closely how scientific knowledge interacts with social and cultural structures. Also the declining credibility of traditional rationalist accounts of science has opened space for viewing social factors not just as influences on the use of science but as part of how scientific knowledge itself is formed and validated.

History and culture, approached through the lenses of philosophy and epistemology, are inseparable from subjective reality, understood as the interaction of a scientist's intellect and consciousness, and the capacity to grasp the meaning of human actions across time. In invoking subjective reality here, we turn our attention to the scientist as a knowing subject and to the works they create, for it is through these works that the world is rendered intelligible and 'reality' is brought forth. The reality functions as not as fixed entity but as a fluid assemblage of meanings and an engagement of ideas with individuals, and societies.

At the same time, transformations in consciousness, including that of the researcher, inevitably influence the ways which truth is sought and understood. Within the context of cultural-historical epistemology, it is important to acknowledge that the past is something interpreted, understood, and repeatedly reconstructed, as we do not grasp the past itself, but only its historically conditioned representations. Nevertheless, these representations continue to shape collective consciousness and inform the ways we respond to the challenges of the present. Epistemology, one might say, acts as the internal mechanism of science, its logic expressed in the consciousness of its era. It provides a solid ground for the study of both subjective and objective reality and enables an exploration of the broader interactions of epistemology, the philosophy of mind, intellect, and experience. Professor Michael Huemer, for instance, argues that contemporary epistemology aims not only to establish connections with other branches of philosophy, particularly the philosophy of mind and language, but also to provide a realistic understanding of human cognition and to integrate its findings with psychological and neurobiological research²⁷.

It should be noted that the problem of consciousness as a phenomenon influencing our understanding of the nature of reality and cognition remains one of the most significant topics in philosophy in general, and in epistemology in particular. In Azerbaijani philosophy, this problem is either understudied or primarily examined through the lens of national self-consciousness²⁸. Nevertheless, the study of consciousness is becoming increasingly relevant in the context of the growing flow of information and implementation of AI-based technologies into everyday life, where epistemology provides a conceptual framework for all areas of philosophical inquiry. It establishes the foundations for distinguishing scientific

²⁷ M. Huemer, *Epistemology: Contemporary Readings*, M. Huemer (ed.), introd. by R. Audi, London & N.Y., Routledge, 2005.

²⁸ I. Mammadzada, A. Bunyatov, *Epistemological features of nationality and national identity in the context of fuzzy logic* [Milliliyin, milli özünüdərkin qeyri-səlis məntiq kontekstində epistemoloji xususyyətləri], Baku, "Elm və Tehsil", 2023.

knowledge from faith or opinion, assessing the truth or falsity of our claims, and understanding the social factors that shape the process of knowledge formation, including cultural norms and societal attitudes.

An important contribution to understanding the interplay between the philosophy of consciousness and epistemology is Declan Smithies' work *The Epistemic Role of Consciousness*, in which the author approaches the theory of epistemic justification from two complementary perspectives: 1) grounded in philosophical claims about the role of consciousness in mental representation, perception, cognition, and introspection, and 2) based on general principles of epistemology concerning the nature of epistemic justification²⁹. For Smithies, the relations between the philosophy of mind and epistemology rests, above all, on the recognition that consciousness underpins all our epistemic faculties. Phenomenal experience, in turn, enables us to form justified beliefs and thereby acquire knowledge about the world.

According to Max Velmans, consciousness itself is an epistemic concept, denoting a special kind of first-person knowledge³⁰. Yet, the study of consciousness requires attention to contextual aspects tied to the spatio-temporal continuum, including cultural and social factors. This distinction allows us to differentiate between individual and social consciousness, highlighting the connection between the general and the particular, collective mentality and individuality. Such considerations are crucial for the development of epistemology and emphasize the relevance of historical and cultural dimensions to scientific inquiry, methodology, and the collective acceptance of knowledge. Tom R. Burns and Erik Engdahl, in *The Social Construction of Consciousness*, argue that the cultural cognitive structure carried by all members of a community provides a common knowledge, including concepts, meanings, and practices. These practices form the basis not only for reflection on the collective 'I' or consciousness, but also for intersubjectivity, in which each individual becomes the object of their own awareness³¹. Collective concepts and processes are thus integrated into the inner life of each person as a social being, since cultural and institutional concepts, based on systems of rules and symbols, play a central role in shaping and regulating human thought and behavior.

Thus, epistemology, and, in particular, cultural-historical epistemology, is a form and method of inquiry in which the scholar's choices and approach determine the style of reasoning, the language of research, and the conclusions drawn. Understanding knowledge in its historical and cultural context deepens our comprehension of the differences between individual and collective consciousness, how they interact, how these interactions evolve, and how past choices influence

²⁹ D. Smithies, *The Epistemic Role of Consciousness*, Oxford, Oxford University Press, 2019.

³⁰ M. Velmans, "An Epistemology for the Study of Consciousness", in *The Blackwell Companion to Consciousness*, M. Velmans, S. Schneider (eds.), London, Blackwell Publishing, 2007, Chapter 55, pp. 711–755.

³¹ T. Burns, E. Engdahl, "The Social Construction of Consciousness: Part 1: Collective consciousness and its socio-cultural foundations", in *Journal of Consciousness Studies* 5(1), 1998, pp. 67–85, p. 70.

the present and shape the future knowledge. The knowledge of historical experience and its reconstruction functions not only as an understanding of the past but also as insight into the present. This approach allows for a fresh perspective on the history of science and philosophy, encouraging a reevaluation of knowledge that arises at the intersection of different eras. It is here that epistemological interaction and communication across diverse value systems, goals, and methodologies become evident.

IV. FINAL REFLECTIONS ON PHILOSOPHY OF SCIENCE

In conclusion, we would like to offer some reflections on the philosophy of science:

- 1) Today, philosophy of science, including epistemology, is increasingly developing as a methodological approach to reflecting knowledge and science, which has, in turn, made philosophy itself more scientific. It is no longer confined to the study of the history of science or the formation and evaluation of knowledge about the external world. It now intersects with cognitive sciences, benefiting from interdisciplinary analysis that integrates epistemology, philosophy of consciousness, natural sciences and AI-based technologies. And as a central field of philosophy, philosophy of science engages with these multifaceted connections and incorporate innovative insights from across disciplines.
- 2) Scientific knowledge grows from the connections within different disciplines and the cultural and historical experiences alike, and philosophy of science considers these experiences not as external constraints, but as integral to the development of thought. This approach reminds us that the act of knowing is shaped by languages and conceptual categories available to us, as well as by the cumulative experience of prior generations. Reflecting on this, we can see more clearly the evolving relationship between continuity and innovation in science or between the preservation of traditional methods and new ideas. It helps explain why cultural-historical epistemology is developing in Azerbaijan today, as it is precisely this interaction between inherited intellectual traditions and the need for the transformation of the internal logic and methods of cognition that has created a ground for this approach to understanding knowledge and its origin.
- 3) Epistemology, understood as the internal logic of scientific inquiry, reveals that subjective reality arising from the interplay between consciousness and culturally conditioned forms of representation, constitutes the very medium through which history and culture become intelligible; thus, because all knowledge of the past and present is filtered through evolving structures of consciousness, the study of mind is inseparable from the study of truth and knowledge, and contemporary approaches to epistemic justification demonstrate that phenomenal experience is the foundational basis upon

which human cognition, scientific understanding, and individual and collective consciousness are formed.

- 4) The expanding scope of the philosophy of science raises urgent ethical questions. Although, we deliberately chose not to focus on the ethics of science in this work, since ethics, especially in relation to emerging technologies like AI, is a vast and complex domain that deserves careful, dedicated attention beyond the scope of our current discussion, we decided it was important to at least mention it. As scientific knowledge and technological capabilities expand, philosophy of science cannot remain purely theoretical or methodological. Any knowledge – from consciousness research to AI algorithms – places weighty ethical duties on both personal and collective levels. Understanding not only how we acquire knowledge, but also how we apply it, becomes a central concern as knowledge is not neutral: it carries profound responsibilities for individuals, societies, and the environment alike. In this context, the study of science should be closely aligned with the study of ethics as ethics cultivates the moral responsibility within scientific research process and extend to the way its results are applied in the real world.