DIALECTICS OF SCIENTIFIC KNOWLEDGE AND ACTIVITY IN RELATION TO THE DEVELOPMENT OF POSTNONCLASSICAL SCIENCE: RESEARCH DIRECTIONS

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Abstract. This article analyzes how the dialectical connection between scientific knowledge and activity acquires new meaning in the context of postnonclassical science. Since the second half of the twentieth century, the postnonclassical stage of scientific development has promoted approaches based on the complex interaction between the knowing subject and the known object. On this basis, the article highlights the contextual, systemic, and self-organizing characteristics of knowledge activity. It also examines the philosophical methodology of scientific cognition, the role of human practical activity, and the socio-cultural factors that arise during the process of knowing, thereby demonstrating that scientific cognition includes not only theoretical but also activity-oriented forms.
Keywords: knowledge; activity; scientific cognition; practical activity; dialectics; postnonclassical science; subject–object relations; methodological pluralism; self-organization.

Human thought and its connection to surrounding reality through scientific cognition have always been central to philosophical inquiry. Since classical philosophy, thinkers have debated the inseparability of the cognitive process from human activity and their dialectical interdependence. However, only under the conditions of postnonclassical science has a fundamentally new, complex approach to the relationship between scientific cognition and activity begun to form. This approach interprets the cognitive process not as passive observation aimed at uncovering an objective truth in isolation, but as an active, contextual, and goal-directed form of human action.

The paradigm of postnonclassical science brings to the forefront, unlike earlier stages, the subjective, axiological, and socio-communicative aspects of science and cognition. The knowing subject is seen not merely as a reflector of an external object but as an active participant in interaction with that object. This necessitates interpreting scientific cognition itself as an integral part of activity. From this perspective, analyzing the dialectical interconnection between the cognition process and human activity becomes one of the urgent tasks of contemporary philosophy.

The complex ontological foundations of science and its epistemological content rank among the most pressing issues of today's philosophical thought. In particular, under the development of postnonclassical science, the very nature of the cognitive process, its main structural features, and its organic link to activity are being re-examined on new grounds not only within theoretical but also within practical ontology. In this approach, reality is not understood as a single layer but as a multilayered, interrelated system. Likewise, there is no longer a single knowing subject but a plurality of subjects, each requiring its own contextual approach. Moreover, science is no longer a claimant to absolute truth but a dynamic system capable of critically evaluating its own limits and methodological foundations. From this standpoint, activity is recognized not merely as personal experience but as a social-ontological practice aimed at fundamentally transforming reality.

The postnonclassical paradigm that emerged at the end of the twentieth and the beginning of the twenty-first centuries views the cognitive process not only through theoretical models but as a process tied to the subject's active stance and human practice [1]. In this view, science is not a neutral system that collects data, but a system of knowledge continuously shaped by human life activities, cultural values, and social needs, influenced by historical-legal, spiritual, and technological factors.

"The subject's activity in the cognitive process, the importance of intersubjective relations, and the dynamic nature of science demonstrate that scientific cognition is not universal but goal-directed. Subjectivity is not a deficiency of scientific cognition but its very essence" [2].

Research into the activity-related aspects of scientific knowledge must encompass all scientific investigations connected to human activity as well as analysis of all social relations that can influence scientific research. Several factors together have led to the contemporary urgency of these issues in the philosophy of science: social movements like environmentalism and feminism that critique science's dominant position in society; concerns about the social consequences of scientific discoveries; epistemological questions raised by "big science"; new trends in the history of science such as the move away from internalist historiography; and non-normative approaches in the sociology of science—all of which drive a renewed return to naturalism and pragmatism in philosophy.

Philosophers investigating the social character of scientific knowledge often trace the roots of these ideas back to John Stuart Mill. Both C. S. Peirce and Karl Popper, likewise, considered critical interaction among individuals central to validating

knowledge claims. Mill's arguments on this point—in his famous work *On Liberty* rather than in his logical and methodological treatises—state:

"If the opinion of one person were in solitude a private possession of no value to anyone else, suppressing it would be simply an injury to that one. But the peculiar evil of silencing the expression of an opinion is that it robs all of mankind… Both those who dissent and those who hold the opinion suffer. Were the opinion right, they lose the opportunity of exchanging error for truth; were it wrong, they lose, what is almost as great a benefit, the clearer perception and livelier impression of truth…"[3]

Mill thus shows that any claim to knowledge or truth applies universally: the possibility of error requires a free and critical public debate. Only through such debate can we be confident in our true beliefs and avoid one-sided or erroneous convictions.

"Scientific knowledge is now considered dependent on the social context of its creation. What is accepted as truth is not merely the product of empirical evidence but also of professional interests, political ideologies, and institutional loyalties" [4]

Such views have provoked reactions among philosophers who, while acknowledging the social dimensions of knowledge, strive to preserve the epistemological validity of scientific laws. Meanwhile, the organization of scientific research compels philosophers to examine the normative implications of scientific practices.

Research in other fields of science – such as work within the Human Genome Project – also exemplifies the traits of Big Science, demanding multiple specializations. The shift from small-scale amateur or university research to internationally funded, institutionally governed projects with significant economic impact underscores the need for new ethical and epistemological approaches. Moreover, dependence on centralized funding bodies and growing private or commercial foundations raises questions about the autonomy of modern scientific knowledge from its social and economic contexts.

Analyzing the dialectical relationship between scientific knowledge and activity in the context of postnonclassical science offers a profound understanding of the methodological and ontological directions of contemporary philosophy. As shown in this article, postnonclassical thought does not deny the interaction between subject and object but regards them as mutually formative active systems. Furthermore, the cognitive process is no longer passive observation but an activity-oriented phenomenon intrinsically linked to social and cultural contexts.

Recognizing the role of activity in scientific cognition necessitates viewing it as a means of understanding and transforming reality. In particular, the introduction of self-organizing system theories into philosophy has illuminated the dynamic, ever-

changing, and subjectivized character of the cognitive process. At the same time, within postnonclassical science, the interplay between knowledge and values, cognition and practice, is reaching a new level.

In conclusion, analyzing the dialectics of scientific knowledge and activity in harmony with the development of postnonclassical science stands as one of the most important tasks of modern philosophy, serving to clarify the social-spiritual foundations of cognition and its axiological and communicative criteria. This analysis reinforces the role of science not only as a producer of knowledge but as a conscious form of activity aimed at social progress.

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