

# The ethics of Enlightenment in the foundations of modern science

*Olga D. Kurakina*<sup>1\*</sup>

<sup>1</sup>Moscow Institute of Physics and Technology, Department of Social and Political Sciences, 9 Institutskiy per., Dolgoprudny, Moscow Region, Russia

**Abstract.** In the Age of Enlightenment, when each person, in the opinion of Kant, was called upon to “think independently”, a transition from the medieval “cult of faith” to the enlightened “cult of reason” was finally formed and the ethical foundations of modern science were laid. The ethos of modern science, as a set of moral imperatives of the scientific community, was reduced in the middle of the twentieth century to a specific set of norms which are currently being challenged in view of the transformation of science into a technological industry, removing the personal responsibility of a scientist for the results of his creativity. The institutionalisation of science in the context of the global world of universal competition leaves the scientist with a choice of “thinking for himself/herself” only through the moral feat of overcoming the evolving corporate system of abandonment of the ethical standards on which the foundations of science were once erected. In place of the ethos of the scientific era of Enlightenment must come the socially responsible ethos of the science of our day, followed by the ethos of Anthropos, which received its most significant development in the theonomic ethics of Russian religious thinkers. The ethics of Enlightenment, in particular the ethics of Kant’s categorical imperative, not only formed the image of modern technological civilisation, thus shaping the moral foundations of modern science, but still remains in demand owing to the boldness of scientific research, approaching the transcendental boundaries of local life which Kant so innovatively substantiated.

**Keywords:** Kant, ethics of Enlightenment, Kantian ethics, ethos of science, theonomic ethics

## 1 Introduction

The beginning of science, which created a unique image of modern technological civilisation, refers us to the age of Enlightenment, which Kant describes as “the human being’s emergence from his self-incurred minority” as overcoming the inability to use independently his own mind. Kant sees the reason for such a shameful state for a reasonable person not in the rational ability of a person, but in a “lack of resolution and courage” to use it independently without anyone else’s guidance. Hence the most appropriate motto of the Enlightenment for Kant

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\* Corresponding author: [kurakina.od@mipt.ru](mailto:kurakina.od@mipt.ru)

becomes the slogan: “Have courage to make use of your own understanding” which he expresses with the ancient Latin saying *Sapere aude* (*WA*, AA 08: 35; Kant, 1996a, p. 17). For several centuries, the slogan *Sapere aude* has remained no less in demand in the scientific community than in the time of Kant, becoming a symbolic designation of scientific research and, accordingly, the motto of a number of scientific research universities around the world, including the Moscow Institute of Physics and Technology as the flagship of modern Russian science.

Not all representatives of the age of Enlightenment, the age of Enlightened reason, will subscribe to this interpretation of the era in view of the vastness of the period and the variety of characters that form it. So the French encyclopedists, who proclaimed the “cult of reason” as opposed to the “cult of faith” of bygone eras, took the path of education, promoting awareness of the diverse knowledge of the time, demonstrating the omnipotence of the mind in the development of the world; the German Enlightenment, by contrast, focused on the justification of the priority of mind as such and of rational methods of understanding the world. For Cassirer, as well as many others who followed Kant, it is Kant who “is and remains the thinker of Enlightenment”, because he strives “for light and clarity, even when he talks about the deep and hidden ‘foundations’ of being”, which in Kant’s metaphysics refer us to the “last principles” of human knowledge (Cassirer, 1931, pp. 23-24). In place of the titans of thought, proud individuals of the Renaissance such as Leonardo da Vinci, Giordano Bruno or Galileo, there arises, if not the “enlightened age”, at least the “Age of Enlightenment”, where according to Kant’s hope there are “independent thinkers”, “who, after having themselves cast off the yoke of minority, will disseminate the spirit of a rational valuing of one’s own worth and of the calling of each individual to think for himself” (*WA*, AA 08: 36; Kant, 1996a, pp. 17-18).

## **2 Ethical issues – the key to the work of Immanuel Kant**

In the person of Immanuel Kant, the Age of Enlightenment, with its main figure the universal thinker Gottfried Leibniz, found its final conclusion, which influenced all subsequent development of scientific knowledge. Wilhelm Windelband, as a true neo-Kantian, in the introductory essay to the exposition of Kant’s philosophy, giving it the first place among philosophies, calls Kant’s philosophy “the culmination point” of the line of intellectual development of the Enlightenment era and, moreover, “the end of the enlightenment movement”, because it simultaneously “ends and overcomes the age of Enlightenment”. Windelband sees the reason for this exaltation of the seemingly equal among equals primarily in the personality of the philosopher, whose boldness of knowledge comes not only from an unshakeable belief in the power of reason, but is also rooted in the “moral reason of the human race”. On the one hand, Kant shares the aspiration of this epoch with its motto *Sapere aude* applied to all areas of human activity and, on the other hand, he rises above it in that he sees “the essence of this reason not in theoretical propositions, but in the energy of the moral will and self-consciousness” (Windelband, 2000, pp. 10-11).

So much has been written about Kant over the past two hundred years that by the time of his death, the bibliography of literature about him numbered more than three thousand sources, let alone our time. Any interpretation that highlights the central point of Kant’s philosophical system (whether it is the metaphysics of reason, or the ethical imperative or personal piety) can always be supported by like-minded people and pointed out in confirmation of the chosen point of view, so we do not hesitate to follow Windelband in his intention to appeal, first of all, to the personality of our philosopher. From the numerous testimonies of contemporaries we have the image of a thinker who was born into a poor, pious family of pietists, who preferred personal piety in constant standing before the Divine eye, and who retained a devotion to his childhood and youth experiences for life. Kant’s

whole way of life was subordinated to the search for truth, for the understanding of which he developed his own special behaviour, limiting himself in everything that could interfere with his constant reflection. Devotion to the truth in search of the last foundations of the knowing mind, loyalty to duty in the performance of his professional duties as a lecturer, attachment to his native land and city, all this testifies to the amazing, ascetic life of the great philosopher, who set for centuries the archetypal image of the true scientist, whose genius borders on Holiness, especially characteristic of the Orthodox ascetics of his posthumous homeland.

Kant's original idea in constructing his philosophical system was based on ethical issues, and his main work, which caused a "critical revolution" in European thinking, was only a preamble which his scientific conscientiousness did not allow him to omit. In his detailed study of the creative path of the thinker, Cassirer (1981, p. 232) points to this fact that initially the critique of "pure reason" and "practical reason" in Kant's teaching were conceived "as a self-contained whole", of which "ethical problems formed an essential, integrating constituent", and a truly "profound concept of 'reason'" can only be obtained "through this relationship". The fact that the three-month plan to publish this propaedeutics to the planned treatise on ethics was completed only nine years later only shows that the critical analysis of the boundaries of knowledge led Kant to such depths of human existence, which in its entirety none of his contemporaries had ever thought of.

No matter how much we try to reason about Kant's ethics based only on his works related to ethical problems, we cannot exclude the fact that he gained worldwide fame thanks to his first and main fundamental work of the critical period on metaphysics. This was the reason for the emergence of a popular opinion which naturally entered the educational literature, that the critical period in Kant's work begins with his first critique of reason, cleansed of all empiricism, and only later passes to the ethical motivation of reason. However, numerous scholars of Kant, referring to his correspondence of the seventies, also have drawn attention to the fact that Kant's initial intention in building the grandiose architectonics of the mind "which dared to know" contained this ethical problem as an integral part, if not the central part, of the work of his entire life.

Kant, having established the limits of metaphysical knowledge in the *Critique of Pure Reason*, moved on in his subsequent works to the originally conceived ethical problem, realising its importance for further justification of the self-activity of reason. Friedrich Paulsen writes about this transition as a continuation of the search for "pure *a priori* laws of reason, but only for the realm of freedom, not nature", which should thus form a "metaphysics of morals", an ethics of what should be independent of empirical reality (Paulsen, 1905, p. 282). Following Kant, this obliges one to consider his ethics in the broader context of his metaphysics, as well as his personality as a true scientist who carries within himself the norms of a morality that he proclaims.

### **3 Modern scientific ideas in the light of Kant's protestant piety**

Actualising Kant's ethical constructions, let us first of all ask the eternal question: "What does Kant's philosophy give to modern consciousness?" In our time, for scientists who are at the forefront of scientific research, this question can be raised more specifically, namely: "What can Kant's philosophy give to modern science in terms of scientific ideas, ethical norms and personal responsibility of the scientist?" Among the slogans of his followers and admirers: "back" or "forward" to Kant – choose "together with Kant", i.e. look at modern science "through the eyes of Kant".

This means that it is preferable to start understanding the state of modern science in all aspects of its manifestation as based on the deep foundations of Kant's personality and their corresponding worldview. As is the case with Kant's younger contemporary, Friedrich Schelling (1989, p. 28), who had the greatest influence on Russian thinkers, it is necessary to

pay tribute to the “scientific merit” of the Königsberg thinker, who brought a radical revolution in the awareness of the active activity of the cognising subject – “a revolution that penetrated like an electric spark into all branches of knowledge”. Schelling’s intention was not to develop this position because the task was too difficult for the prevailing scientific ideas, and it is only in our time that its obviousness is not in doubt, due to the development of scientific knowledge and its inclusion in a single picture of the world, particularly in Russian religious philosophy. This thesis was expressed most clearly by Nikolai Berdyaev (1991, p. 106), who wrote in his philosophical autobiography that among the thinkers of the past Kant for him was more a Christian philosopher than Thomas Aquinas since “Christian philosophy is a philosophy of the subject, not the object; a philosophy of ‘I’ and not the world; the philosophy expressed in the knowledge of redemption and the subject, a person apart from the power of the object”.

Kant’s innovation is so great that, looking closely at the life-creation of the thinker, we can state that, in his pious approach to the truth, Kant came much closer to modern scientific ideas about the world order than the boldest statements of his era. Answering the question: “What can I know?” in connection with the study of the boundaries of human knowledge, Kant discovered *a priori* forms of sensory knowledge – space and time – not sufficiently realised, perhaps, by his contemporaries who shared the increasingly popular mechanical-materialistic picture of the world. Kant was so far ahead of his time in his innovative understanding of space and time that it took more than two hundred years of scientific development for the relational concept to gain popularity in the scientific community against the background of the substantial concept of space-time.

In the light of modern concepts, Kant’s position that space and time “both taken together are, namely, the pure forms of all sensible intuition” (*KrV*, A 39 / B 56; Kant, 1998, p. 166) is easily perceived in the modern scientific environment, first, in terms of “virtual reality”, modelled both with the help of appropriate “virtual glasses” and computer graphics. Secondly, the awareness of the transcendental limits of phenomenality cannot be better suited to modern cosmological concepts associated with the “anthropic principle in physics”, which states the uniqueness of our Universe on the basis that only in it at a certain stage is the appearance of an *Anthropos* possible. The development of these constructions led to the concept of the Multiverse, as a variety of all possible universes that differ in their physical properties. Our perception of the world in its entirety is limited by the three-dimensional-spatial and one-dimensional-temporal “anthropic universe”, which is only one of the manifestations of the “Multiverse” of infinite space-time and infinite creative possibilities.

In terms of universal constructions, the state of the modern world is a consequence of an anthropic catastrophe that led to the isolation of the primordial earthly Universe, open to the fullness of the divine multidimensional Multiverse, in a cocoon of three-dimensional space and one-dimensional time, which is an essential element of any theological tradition. Our local three-dimensional spatial world and unidirectional time, being one of the manifestations of the Divine world, we perceive as the only possible one, forgetting about our divine dignity. The existence in this isolated world is limited by the laws of three-dimensional space, which does not allow for eternal life in it and is perceived by our darkened eyes as an irrevocable disappearance or death. Although the aggregate religious experience teaches the eternal life of human beings, not limited by physical bodily states, immersion in momentary existence makes this illusory world be perceived as the only possible one.

In the first “pre-critical” half of his life, Kant positioned himself primarily as a scientist in the field of natural sciences and, on the one hand, reflected on the natural origin of the solar system and similar star systems from the gas-field nebula due only to mechanical forces, and, on the other hand- based on his Protestant piety, did not exclude the Divine presence in such a rational plan of the world order. It is natural to assume that modern multiversal representations, as more fully reflecting the essence of the physical reality of our anthropic

universe, were also shared by Kant. This is to some extent confirmed by his remark about the multiplicity of worlds, which imposes on us responsibility for our anthropic universe, the boundaries of which Kant so innovatively outlined.

Let us turn to Kant's ethical works, which form the nerve node of his thinking about the world as such. On no account can these exclude his own religious attitudes and ideas about the Divine world beyond the empirical reality conditioned by our anthropic existence. Having established the limits of metaphysical knowledge in the *Critique of Pure Reason*, he focuses on ethical issues in his subsequent works, realising their importance for further substantiation of the self-activity of reason.

#### **4 Kant's ethical attitudes in the foundations of modern science**

Moving on from the question, "What can I know?" to the question, "What should I do?" Kant draws attention to the practical nature of human activity and its moral motivation, which is as free from empiricism as in the case of cognitive possibilities. Man in his knowledge of this world, conditioned not only by *empirica*, but also by a *priori* forms of feeling and reason, finds as the last refuge of his personality the only quality that separates him from the animal world (in modern terms, from the state of the biorobot), i.e. freedom. For Kant, the freedom of man, which cannot by its very definition be conditioned by anything, is limited by the same freedom of others forming a society which dictates its own rules of social community; these Kant formulates as a categorical imperative: "Act only in accordance with that maxim through which you can at the same time will that it become a universal law" (*GMS*, AA 04: 421; Kant, 1996b, p. 73).

In relation to the scientific community of the Enlightenment, the categorical imperative, the ethical norm designated by Kant, also set the rules of behaviour of the scientist, which he respected himself and expected their observance from colleagues in "the shop", thereby forming an unspoken "charter of corporate ethics". Being a prominent scientist himself, Kant not only demonstrated the wonders of personal asceticism in research (conscientiousness, honesty, hard work, punctuality, sociability), but also proved the unshakeable foundations of corporate scientific ethics, which remain valid for any true scientist who aspires to knowledge.

The era of brilliant individuals and closed esoteric schools of the past centuries did not allow science to develop as a cumulative process of continuous accumulation of knowledge and its dissemination to the advantage of future generations. In contrast to similar initiatives that were born during the past centuries and deeply embedded in other cultures, thanks to the collective form of organisation of research creativity, the educational project was the most successful in the scientific understanding of the world and the creation of a new technological civilisation on this basis.

The ethos of modern science, as a set of moral imperatives of the scientific community, dating back to the ethics of a "reasonable" understanding of the world of the Enlightenment, was reduced in the middle of the twentieth century to a certain set of norms of scientific activity such as "universalism", "collectivism", "selflessness" and "organised scepticism" by Robert Merton (1968). At present, this set, which is associated with prescriptions that relate primarily to the "subject" of scientific creativity, is not only being supplemented, but also challenged, owing to the fact that its content contradicts modern realities. The controversy surrounding the Declaration of the Ethos of Science has led to disappointing results. The main claims of such constructions are related to their identification with the ideal ideas about scientific activity in the academic environment of the seventeenth to nineteenth centuries, during the time of classical science. The transformation of science into a productive force of society, when scientific achievements are integrated into technological industry, and scientists themselves, owing to their increasing specialisation, are responsible only for certain

areas of scientific and technical production, changes the nature of moral norms that are increasingly moving away from the ethics of the Enlightenment.

Modern science, as a field of human activity aimed at developing a sound system of knowledge about the world, is usually considered in three structural aspects: as knowledge, as an activity, and as a social institution. Each of these functional areas of science is presented with its own authentic requirements, which are currently being questioned and revised, threatening to discredit science in the public consciousness. Science, as a constantly developing system of objectively true knowledge about the world, is subject to fundamental requirements that distinguish scientific knowledge from non-scientific, among which, first of all, is objective reliability and empirical confirmability. However, the requirement of objectivity, excluding subjectivity as such, was revised owing to the unavoidable effect of the “observer” in the physics of the microcosm. As for empirical confirmability in modern cosmological theories, it is so mediated by experiment that it calls into question any such models of reality. Despite this, the scientific community continues to proclaim a number of legislative principles in the pursuit of truth: objectivity, provability, empiricism, consistency, prognosticality, etc., the implementation of which is problematic.

If a modern scientist can still adhere to a categorical imperative in his scientific activity, following Kant, then the functioning of science as a social institution in a global world of universal competition (the struggle for resources, profits, national interests, etc.) leaves the scientist the choice to “think independently” only through the moral feat of overcoming the emerging international system of rejection of moral norms on which the foundations of science were once built.

The science of the twenty-first century, approaching the borderlands of the reality of the world, has not left a single area where scientific achievements might not be used to disrupt the structural fabric of phenomenal existence: from microphysics in the Large Hadron Collider to biophysics in genetically modified plants, from social engineering in changing the state structure under the influence of “spontaneous” revolutions to the development of outer-space, changing environmental conditions on earth. This brings us back to the question of the transcendental foundations of being here, forcing us to turn again and again to the ever-needed unshakeable foundations of science, first proclaimed in the ethics of the Enlightenment and, in particular, the imperative ethics of Kant.

Such an institutionalisation of science implies a further extension of moral imperatives beyond the scientific community into the field of public administration, requiring the social “responsibility of the scientist” for using the latest scientific achievements for military purposes that can lead to the death of all living things. If in the field of conceptual representations of the world as a whole, modern scientific knowledge can be compared with Kant’s world-view, then the ethos of science, considered as a generalised subject of scientific creativity, needs further development, based not only on the quite obvious justification from the ethics of existence, but also on Kant’s fundamental ideas about the structure of our world.

To replace the academic ethos of the Enlightenment, came the ethos of science of our day, which must be followed by the ethos of the Anthropos, from which in today’s world we can get an idea, perhaps, of “theonomous ethics”. This development in Russian religious philosophy over nineteen and twenty centuries, was developed in our days in the philosophy of Russian cosmism as the Russian World-Outlook. Its representative turned out to be our celebrated Russian philosopher, who completed the classical period of development of the original Russian philosophy. Nikolay O. Lossky (1991, pp. 68-69) in his book *Conditions of Absolute Good* defends the thesis that “a properly developed system of ethics can only be theonomic”, and it takes this name because “its norms correspond to the will of God and the structure of the world created by the Almighty and all-Good God”.

## 5 Conclusion. The enduring significance of Kant's ethical doctrine

So, the ethics of Enlightenment, in particular, the ethical doctrine of Immanuel Kant, not only formed the image of modern technological civilisation, and accordingly, affected the moral foundations of modern science, but still remains the quintessence of the answer to the question of what a person is in the structure of modern concepts of the universe. Kant's pious preoccupation with truth, transmitted to posterity in the form of the *Critique of Pure Reason*, thanks only to an incredible discipline of mind and heart, put Kant on a par with Plato, who told the ancient world about the reality of the supersensible. The enduring significance of Kant's scientific feat, which in its critical analysis approached the borderlands of human knowledge and being, and which may not have been fully understood by contemporaries, is becoming more and more relevant today.

In his article "Ultra-Gothic Kant", the English philosopher Ferdinand Schiller (1936, p. 384), paying tribute to Kant's work, describes it as "one of the Wonders of the World", as "a Gothic cathedral, vast and venerable, reared at a prodigious cost of human ingenuity and labour". And if for Schiller this once majestic cathedral of Kant's philosophical heritage fell into "ruins", then for us the restoration of the Cathedral literally before our eyes, at the walls of which our great philosopher found his rest, is a kind of symbol of the reconstruction from the depths of the scientific community's self-consciousness of all the questions that Kant posed to humanity. We agree with Schiller that no one has yet succeeded in fully understanding Kant, and therefore, like any incomplete and contradictory system, Kant's philosophy turned out to be a remarkable starting point for many and different currents of thought and thus acquired the character of a heuristic-provocative challenge.

"The fruitful influence of great philosophical systems lies not in the fact that the philosopher becomes an authority for us", writes Losky (1907, p. VII) in the translator's Preface, "but in the fact that by lifting us on his shoulders he opens up new horizons and forces us to build a new broader world-view". Among these "great educators of human thought" Losky certainly includes Immanuel Kant, whose influence can be "immeasurable", opening "new broad paths for his successors".

Kant's enduring innovative significance is so great that for many years to come he will encourage the younger generation to dare to know, admiring not only the starry sky above, but also trusting in the moral law within them, guided by which we all hope to push the transcendental boundaries of phenomenality into the space of starry worlds of limitless creative possibilities.

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