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THE NOTION OF 'OPEN SCIENCE': ITS VALUES AND MEANING FOR THE HIGHER EDUCATION SYSTEM

The article is dedicated to the analysis of the notion and phenomenon of 'open science' as a way to solve the paradoxes of the today's science as a mass occupation, especially in higher education. In the absence of inner motivations for scientific investigations among both undergraduates and professional researchers, science becomes a 'closed' system, which turns into a profanation of academic activities and is deprived of connection with society in general. The concept of "open science" that has appeared in the public discourse in 2010s is presented as a complex multilayer phenomenon. The analyzes reveals that this notion combines the emphasis on behavior, practices and procedures (free and open public access to data, methods, research results and publications) on the 'lower' level with the urge to create technological platforms, services and tools for scientists to enable their wide international and interdisciplinary cooperation on the 'middle' level and with the theory and values that would enable science to re-institutionalize itself in today's society as a public activity on the 'higher' level. The values here refer to the classical scientific ethos: openness of science acts as an explication of the mertonian principles of universalism and communism as fundamental values of science. It is argued that the development of the 'open science' concept corresponds to the democratization of science in general: a truly effective academic activity could be based only on the moral imperative of each human person as an autonomous and creative subject of judgment and of reconstruction of the ideal of scientific ethos. At the same time, 'open science' partly resembles today a popular slogan actively used in public discourse and in various declarations, but the task of filling it with meanings and translating it into practices is still unsolved.

***Keywords**: open science, ethos of science, academic integrity, science in universities.*

Introduction

Today science in general and the academic research activity of university staff in particular faces a number of problems that hinders its development. In my opinion, one of the most pressing challenges for the academic activity in

the 20th and the 21st centuries, which has not yet been met with the sufficient philosophical reflection, is its, so to speak, mass character, associated in particular with the advancement of mass higher education in industrial and then postindustrial countries. Classical science, which has traditionally been the endeavor of a selective circle of enthusiasts, mostly engaged in scientific investigation as their leisure activity, has rather suddenly become the occupation of millions, both as a compulsory task for university students engaged in writing at least one thesis and/or several term papers during their course of study and as a vocation for an army of research fellows.

At the same time, the rapid development of science in our days, and its ever-increasing differentiation has led to the practical impossibility for many representatives of university staff, heavily employed in the direct educational process, especially in the less economically developed countries, to conduct their own research at the appropriate level of academic novelty – especially in such areas of knowledge that require expensive equipment to gather the necessary data. Even just the task of keeping themselves 'fit' by communicating with colleagues and getting acquainted with the latest academic achievements could be quite difficult, taking into account not only the amount of time needed to perform the task in question, but also the fact that many high quality publications appear in academic journals with paid access that most scholars and even universities from underdeveloped countries can't afford to subscribe to.

The result of this situation is a whole variety of negative phenomena in today's world related to science and academic practices. It would be appropriate to take as an example the prevalence of plagiarism in higher education: according to various sources, more than 90% of Ukrainian university students use plagiarism in one form or another; no less than 75% of the USA undergraduates violate the principles of academic integrity; the same or similar behavior has been revealed in relation to Poland (84% of students of that country use plagiarism), Russia (80–90% of students in Russian higher education institutions download term papers from the Internet or copy them from textbooks) etc. [Mielkov 2021: 120–121; Fishman 2014: 10]. Such high figures could surprise or lead to some pessimistic conclusions, however it would be much more constructive to comprehend such a situation in terms of questioning and improving the motivation of students towards the research activity and the very nature of academic values. At the same time, one more negative phenomenon is the decline of the prestige of science in society as a whole and as a consequence – even greater impoverishment of academicians and the rapid 'brain drain' of personnel, especially young people, to other spheres of professional activity. Paradoxically, the relatively mass nature of scientific activity leads to its isolation within certain communities, deprived of direct contact with the society in general – while the latter, in turn, starts

to find consolation in various forms of 'alternative science' or pseudoscience, from archaic superstitions to the latest varieties of "folk science".

However, there is one conception that has appeared lately in both academic and managerial circles that seems to be capable to reverse the said trend, to strengthen the social impact of science and to improve the broad academic activity in universities – the conception of "open science". The *analysis of recent publications* on that topic demonstrates that scholars are only starting to study the phenomenon in question and to define its meaning. The lack of formal definition has been noted [Vicente-Saez & Martinez-Fuentes 2018]; several rather different approaches to the notion identified [Dijk et al. 2021]; some criticism as to the correctness of the usage of the term raised [Mirowski 2018; Knöchelmann 2019]. All that entitles us to say that conducting a philosophical consideration of the notion of open science and its possible impact on the academic activity in higher education present itself quite an urgent and promising task.

The genesis of the "Open Science" conception and its definition

The topic of "open science" has been established in academic discourse in the mid-2010s, accumulating in itself a number of different previously expressed ideas on the latest manifestations of scientific activity known as "science 2.0", "e-science" etc. It should be noted that in English, in contrast to some other languages, including Ukrainian, the term *science* traditionally refers exclusively to natural science; accordingly, some English-speaking researchers are inclined to comment their consideration of the "open science" phenomenon with certain reservations about the possibility (or impossibility) of using this term in relation to humanities and social disciplines as well. In particular, there are statements that in the latter cases we have to use other notions, like 'open humanities' or 'open scholarship' [Knöchelmann 2019: 65]. However, in my opinion, the noted reservations are largely artificial, being based on the spirit of the outdated concept of "two cultures" dating from the age of Modernity: the formation and the spread of the idea of open science owes to the humanities no less than to natural sciences, while appropriately emphasizing the unity of the world academic culture and its inherent values.

But first it would be appropriate to note that the concept of open science has already gone beyond purely academic discourse and is now the subject of numerous declarations of a fairly broad level, including that of governmental and intergovernmental bodies. Some critically inclined scholars, and particularly Philip Mirowski, the author of arguably one of the most profound socio-philosophical studies of this phenomenon, are surprised to note the strange enthusiasm of the European bureaucracy for the use of the term [Mirowski 2018: 171–172]. In fact, it may seem that 'open science' has become

a kind of popular slogan today – almost a common notation for the latest trends in science in general. In particular, the document titled "Amsterdam Call for Action on Open Science", which has been adopted as a result of the Amsterdam Conference 'Open Science – From Vision to Action', hosted by the Netherlands' EU Presidency in April 2016, is a clear example of such an approach. According to this document, open science is seen as an agency that has the potential to increase the quality and benefits of science by making it "faster, more responsive to societal challenges, more inclusive and more accessible to new users": open science emerges as a "citizen science" that brings research closer to society and vice versa [Amsterdam Call... 2016: 2]. To achieve this goal, we need a radical change in the way science is evaluated, rewarded and stimulated by society – first of all, it is a question of refusing to emphasize publications by their number and prestige (including the impact factor) of journals in which they appear: "This emphasis does not correspond with our goals to achieve societal impact alongside scientific impact. The predominant focus on prestige fuels a race in which the participants compete on the number of publications in prestigious journals or monographs with leading publishers, at the expense of attention for high-risk research and a broad exchange of knowledge. Ultimately this inhibits the progress of science and innovation, and the optimal use of knowledge" [Amsterdam Call... 2016: 6]. Accordingly, to overcome the current situation, it is necessary to search for new forms of communication – to achieve wider dissemination of research results in society, even for a kind of new institutionalization of science.

So, what exactly is 'open science'? Ruben Vicente-Saez from the University of Valencia and Clara Martinez-Fuentes, while trying to answer this question in 2018, as mentioned above, have pointed the lack of a formal definition and even of any agreement on this issue among stakeholders [Vicente-Saez & Martinez-Fuentes 2018: 428]. However, the authors, trying to find a solution to this issue, have followed rather an empirical path – by analyzing the usage of the term by the authors of existing publications. According to their conclusion, the vast majority of such authors agree that 'open science' is knowledge that meets certain criteria – transparency and accessibility, and at the same time it is "shared and developed through collaborative networks" [Vicente-Saez, & Martinez-Fuentes 2018: 429–434]. Without denying the fact that the phenomenon of 'open science' indeed possesses such features, it should be argued that an overview of statistical vocabulary in existing publications is not exactly a conceptualization or a definition, as the authors of such publications can use one or another notion without any profound understanding of the term they use, for various and completely different reasons. Therefore, when trying to determine the meaning of a phenomenon and the definition of a term, it is impossible to limit oneself to statistical analysis of a word usage:

somewhat more thorough historical, systematic, philosophical consideration of the issue is desirable.

In fact, as for the genesis of the phenomenon in question, some authors claim that the term 'open science' has been introduced into academic discourse by Canadian scientist and inventor Steve Mann in 1998, when he registered the corresponding domain name (Wills, 2019). However, it is difficult to agree with this conclusion: the concept itself was known and used long before (in particular, in the context of discussions about 'open society'), while its penetration into public discourse took place almost twenty years later. The corresponding concept could be found in works that appeared already in the 1980s [Chubin 1985]; it should be noted that such scholars as Paul David, whose first attempt of a historical essay on 'open science' dates back to 1991, link the formation of the idea of 'open science' to the paradigm of classical science – that is, to the late 16th and early 17th centuries [David 2008: 1–2]. Therefore, the ideas of the new scientific revolution, which is happening just before our eyes thanks to the latest concepts and procedures of the scientific research, obviously resonate with the concept of post-non-classical science by Vyacheslav Stepin, which has been proposed in 1989 and is being actively developed, by philosophers from Ukraine as well, while implying a certain dialectical 'come back' to classical ideas and values of scientific research [Stepin 2005].

Another thing is that the idea of 'open science' became widespread in the public discourse somewhat later – and for more practical (or even pragmatic) reasons than pure philosophical reflections on the dynamics of historical types of scientific rationality. In particular, there was the so-called 'replication crisis' of the 2010s – when the international psychological community was faced with the problem of reproducing certain experiments. In fact, in the beginning of 2010s, 270 specialists in psychological science quietly and without publicity have studied the data of one hundred psychological experiments published in leading journals for four years. The results were published on August 27, 2015: it was found that only 36% of such experiments could be replicated – "and a large majority of this 36% resulted in effects smaller than the original effects" [Dijk, et al. 2021: 140]. In fact, soon after this rather shocking revelation, questions arose about a similar situation in other disciplines – and for the most part the situation there was not quite different from the psychology. Thus, in the economics, about 50% of the results were replicated, and in such active and resourceful area as cancer research only 11% of the data were found to be reproducible [Wills 2019].

Accordingly, the concept of 'open science' has first appeared in 2015 as an effective way to solve that crisis of replication (thus, it is quite obvious that the term does not apply to natural sciences only, as the said crisis concerned social sciences and humanities as well). It is not surprising though that it was

the problem of the transparency of data and research results that came to the fore. That emphasis is stated by some authors who analyze the phenomenon of open science – and define it as a replication of empirical research (almost in the positivist sense of verification) and a way to ensure free access to the results obtained. As elaborated by Kendal N. Smith and Matthew C. Makel: "The traditional academic research process hides research articles behind expensive paywalls, thus making them only accessible to those with resources or an affiliation to an organization with resources. Similarly, important research materials such as surveys, analysis code, and even data have also often historically been kept by those who developed them only to be shared with friends or sold for profit. Under open science models, such products are freely shared (by default, not upon request) whenever possible" [Smith, & Makel 2019: 114]. Most of the declarations mentioned above follow a similar approach. For example, in the Roadmap for Ukraine's Integration into the European Research Area accepted in 2018, there is a sub-priority 5b, which deals with open science: the latter term is somewhat narrowly understood as "the development of electronic infrastructure and services of research and innovation, promoting open access to publications and scientific data" [Roadmap 2018: 27].

The diversity of "Open Science": major trends and "schools of thought"

However, upon closer examination, it should be noted that the contents of the concept of 'open science' is not limited to just replication and open access. Wilhelmina van Dijk and her co-authors point out five critical components of this concept: 1) "Open data": free access to all empirical basic data serving as a starting material for scientific research; 2) "Open analysis": the scientists should demonstrate the full path of their data processing, as opposed to the traditionally short description of this procedure; 3) "Open materials": ensuring the same complete replication of all experiments and procedures used in research; 4) "Preregistration": the need for researchers to outline all the parameters of their research, clearly describing their hypotheses, methods for data collection, and data analysis plan before executing a study; 5) "Open access": perhaps the most popular and generally accepted of the characteristics of the new concept, which postulates the need for free access to scientific publications, contrary to the practices of costly and restricted mode of reading articles and monographs [Dijk, et al. 2021: 139].

In my opinion, such an approach to the interpretation of the concept of "open science" can be called *procedural*: defining the nature and essence of this phenomenon, its supporters list certain practices that should be followed for its implementation, without involving with more fundamental, systemic, historical and philosophical study of the principles on which these practices

are based. A slightly deeper classification of approaches to defining the concept of 'open science' is proposed by sociologists form Berlin, Benedikt Fecher and Sascha Friesike. In particular, they single out five "schools of thought" that are interested in various aspects of this phenomenon. Thus, the current they call 'the infrastructure school', aims to create technological platforms, services and tools for scientists, in particular to enable their cooperation; 'the public school' is concerned about free public access to research results; 'the measurement school' tries to develop an alternative to the existing system of evaluation of the researcher's contribution to the development of science; 'the democratic school' is outraged by the uneven distribution of knowledge in today's world and promotes the ideas of free access and open data; Finally, 'the pragmatic school' justifies the need to ensure close cooperation between researchers for a more efficient and focused process of knowledge creation [Fecher, & Friesike 2014: 19–20]. The authors conclude that 'open science' is an "umbrella term" that encompasses virtually any consideration of future ways of creating and disseminating knowledge, a term that takes on quite different meanings depending on who views it. Moreover, while acknowledging the obvious lack of conceptual transparency of the phenomenon of 'open science', the sociologists definitely refuse to try to formulate a clear definition – in order not to "prevent fertile discussions from the very beginning" [Fecher, & Friesike 2014: 43–44]. Without denying the evident fundamental pluralism of the contemporary cognitive situation (that it is inherent in the post-non-classical type of scientific rationality in general and is indeed one of the indicators of 'openness' – if not of science in general, then at least of the discourse of science), it should be noted that clarification of terms has always been and still is one of the major missions of philosophical thought. In addition, of the five schools mentioned, 'the democratic' and 'the public', on the one hand, and 'the infrastructural' and 'the pragmatic', on the other hand, are, in my opinion, could refer to roughly the same approach of the two possible alternative ones: thus, the latter two rather represent a more applied aspect of reasoning about the practices of open science, as opposed to the theorizing and conceptualization inherent in the first two.

Even more consistent in the context of trying to bring the 'open science' of official declarations closer to the human and everyday dimension is the view of psychology, expressed in particular by Katie Corker: 'open science' is first and foremost a *behavior* [Corker 2018]. In other words, it is indeed a set of practices that a scientist pursues in order to make his or her work as transparent as possible to others, accessible to the community for verification and criticism. The researcher contrasts this definition with the understanding of open science as an identity or a value ("like being an Open Scientist is just an achievement you can unlock or a t-shirt you can wear"), pointing out the variability of practices, their non-identity when applied to projects of different

nature. In my opinion, while such an approach is indeed not at all incorrect, it is difficult to fully agree with it: on the one hand, there is no denying the need for practical conclusions from the guidelines of open science; however, on the other hand, such practical conclusions should be based but on certain values and individual beliefs, be a form of their implementation. Therefore it is of no consistency to oppose a practical, 'behavioral' approach to that of values and theory. At the same time, we can admit that at present 'open science' really resembles rather a popular slogan, which is actively used in public discourse and in various declarations (and could be thus put on a t-shirt you can wear, yes), but the task of filling this slogan with real meaning and value remains far from being realized – as well as the task of transforming the ideology of open science into a set of practices and behavioral guidelines for the higher education system and for the academic circles in general. In fact, I would say that such a transformation could be based only on the further clarification and evaluation of the very idea and theory of open science, and not as kind of a practical alternative to it.

Thus, when studying the content of the concept of 'open science' it is necessary to refer not only to the procedures that follow from the basic ideas of open access and verified replication, but also to the theoretical, axiological and even methodological principles of the concept. Among those studies that try to consider the phenomenon of open science in this very aspect, we should mention first of all the work of Philip Mirowski from the John J. Reilly Center, University of Notre Dame (Indiana, USA), who expresses a somewhat critical attitude to the already mentioned 'enthusiasm of the bureaucracy' in relation to open science. According to the researcher, there is nothing new in the current ideas of open science in relation to the classical methodology of scientific research, but it is rather an attempt to reconfigure knowledge "as to better conform to market imperatives" [Mirowski 2018: 172]. 'Open science' appears in this regard as a way to put the regulation of scientific activity in the 'invisible hand' of the market, as proclaimed by Adam Smith: platforms of 'open science' are some kind of injection of neoliberal ideas into the scientific community, where each individual appears as the locus of knowledge production by reducing the communal nature of research. "The mantra of 'openness' thus becomes a synonym for gameplay, and flexibility in responding to market-like signals from the platform. Your own opinions only become actualized when they are channeled into the structured activities permitted by the platform; eventually, truth itself is conflated with quantified scoring" [Mirowski 2018: 192]. According to such critical position, it is useless to offer neoliberal market ideas as a solution to the problems of science that have arisen as a result of the past neoliberal reforms themselves. For example, the researcher refers to a boycott by the scientific community of large corporations with their costly publishing policies, such as Elsevier

(the owner of the infamous Scopus database), which was organized precisely within the framework of spreading the ideas of open science: such campaigns have either failed or led to the emergence of new journals with even higher publication fees. Large publishers had quickly adopted 'open science' as their business plan, setting the APC (a fee for processing an article when published in a journal) from $ 500 to $ 5,000, and, say, on August 30, 2016, the U.S. Patent Office granted a patent for 'Online peer review and method' to the same Elsevier [Mirowski 2018: 196]. I can also add here a note that quite a large amount of papers devoted to the study of the phenomenon of open science are being published in paid-access journals of the for-profit mega-publishers: this fact not only makes it somewhat difficult to analyze the phenomenon in full, but also acts as a kind of "contradiction between form and content", quite a manifestation for the current situation with open science in everyday practices.

Open Science and the fundamental values of science

At the same time, while profit-making (rather than the search for the truth) is indeed the ultimate (if not the only) goal for the publisher as a commercial enterprise, such motives do not exhaust the forces that motivate a person to engage in academic activities. In other words, the analyzes of the foundations of 'open science' can't be reduced to a critical approach only, but must also contain an indication of positive values as well. Thus, in his latest work with co-authors, Ruben Vicente-Saez points out that open science, which is based on the mechanisms of openness and coherence of the organization of scientific activity, in all its practices, from open data and free access to publications up to the introduction of transdisciplinary research platforms, is being ultimately rooted in the classical values of the scientific ethos (although it develops their guidelines in accordance with the requirements of today's situation) [Vicente-Saez, et al. 2020: 2]. The question of scientific values was first posed with due completeness by Robert Merton in 1942 [Merton 1942/1973: 267–278]. Codifying what he called the 'ethos of science', the American researcher identified four categories of institutional imperatives of science: first, it is *universalism*, which postulates the super-personal, universal nature of scientific knowledge, the independence of scientific results from personal characteristics of a scientist, emphasizing the incompatibility of effectiveness of the results of academic activity with any kind of particularism. Some examples of the latter are failed historical attempts to create a 'national science' in totalitarian countries, particularly in Germany in the 1930s or in the Soviet Union in the late 1940s [Merton 1942/1973: 271]: science is fundamentally international and cannot be squeezed into any national state or other local entity. Secondly, the imperative

of science is *communism* – in the sense of the attitude towards free transfer of the results of scientific investigation to the general public: "The scientist's claim to "his" intellectual "property" is limited to that of recognition and esteem" [Merton 1942/1973: 273]. The third component of the ethos of science is *disinterestedness* – the selflessness of scientific activity, which has no interests and motives other than the comprehension of the truth. Finally, fourthly, the norm of science is *organized skepticism*, the attitude that is both institutional and methodological, which involves an objective analysis and the exclusion of uncritical perception of any subject.

Robert Merton has repeatedly emphasized that what he has formulated are the institutional ethical values of science, rather than personal or motivational ones; however, in my opinion the defined axiological principles should be attributed to morality rather than to the ethos of science – that is, to the ideal norms, and not to the existing customs. Numerous critics of Merton's approach have drawn attention just to the inconsistency of his formulations with actual practices, especially taking into account the historical dynamics and the local specifics of those practices. Still, norms and ideals are hardly to be judged by the degree of their statistical distribution in any scientific community, and even more so by the local peculiarities of their implementation, because such criteria obviously contradict the imperative of universalism. At the same time, institutionalized morality, described by R. Merton as an ethos of science, can still be based on the moral imperative of a person as an autonomous subject of ethical judgment: a trait that reveals humanity and democratic perspective of scientific activity where each specific human personality is a measure of understanding the world and an autonomous subject of evaluation of one's own activities in relation to its cognition. Openness of science as a feature of the latest concept of research development in the direction of free access to all stages of research and public involvement acts as a natural explication of Merton's principles of universalism and communism (i.e., common ownership of research results), which leads us to the comprehension of 'openness' in society in general.

Science, democracy, and education

The very idea of 'openness' of scientific activity has been present in philosophical discourse long before the conceptualization of 'open science'. Thus, back in 1985, Daryl Chubin studied the relationship between 'open' and 'closed' science in the context of the phenomenon of democracy – pointing out that Merton's principles describe the situation of a democratic society in which, therefore, science should prosper – assuming that there is a concordance of external cultural values and the norms operative within the internal social system of science [Chubin 1985: 73]. In any case,

both democracy in general and the principles of scientific ethos could be problematic in terms of their relevance to real practices, but they still provide a good theoretical and methodological basis for conceptualizing the ideas of 'open science'. After all, it is the commercialization and policies of liberal democratic governments that have threatened to turn science into a 'closed' field of activity – the researcher defines 'closed science' as "research which, in its production, communication, or utilization, is inaccessible to potential consumers. The grounds for such closure are always political, in the sense that certain interests, fortified by legitimate power, can exercise democratic control. The information denied to interested parties becomes the focus of a dispute or controversy which includes the means of control and ways of opening it" [Chubin 1985: 74]. Accordingly, in the context of commercialized corporate science, its 'closeness' or 'openness' is determined by whether the sponsor interferes directly in the research process, dictating what should be private and what can be given free access to.

Due to the commercialization and the growth of that very "sponsor intervention" in the process of scientific investigation, we can now witness in today's world what Jürgen Habermas already in 1962, in his first major work used to call "the re-feudalization of the public sphere" (Refeudalisierung der Öffentlichkeit) [Habermas 1962/1990: 90]. The meaning of such "feudalization" is that private interests acquire direct political functions: large corporations begin to gradually control the public sphere (primarily through the media) and the state itself. The latter, in turn, is an increasingly active player in the private sector, blurring the boundaries of private and public and turning citizens into consumers. The essence of the social sphere, as the German philosopher rightly demonstrates, is its universality – and as soon as some social groups are excluded from it, it is not that it becomes less complete or less adequate – it just ceases to exist at all.

Of course, such concept refers to society as a whole, but, in my opinion, it can also be applied to any community as well – including the scientific community. Science becomes 'closed', thus distorting the values of universality and common property, when scientific community becomes a closed community – that is, when, on the one hand, the selfless search for the truth on the methodological basis of organized skepticism as motives for research activities is being replaced with other values related to just profit or career intentions, and on the other hand – some members of society are denied access to the results of scientific activities. The "mass science", thanks to mass education, has replaced the classical science of the previous centuries with its *République des Lettres*; the paradox here is that a kind if dissemination of scientific activity in broader society has led to the "closing" of scientific communities, to attempts of both governmental and market forces to violate the principles of scientific universalism and communism by constructing

'national', 'corporative' etc. science. The way out of this paradox, in my opinion, lies in the further *democratization* of science, with the new public 'open science' presenting a dialectical comeback of the classical "international republic", but on a much broader scale.

More than a hundred years ago, John Dewey (1916) was one of the first to point to the profound affinity of education, science and democracy, while opposing the idea of science as an esoteric occupation of a handful of 'initiates' to its understanding as a public enterprise. Indeed, it should be emphasized that the phenomenon of democracy fits well within the ideal of classical scientific rationality: the idea of democracy is inseparable from the idea of humanism. It is a natural consequence of the philosophical appeal expressed in the famous words of Kant about the courage to use one's own reason. According to the logic of the Enlightenment, such courage should by definition be given to every human person with no exception: freeing oneself in the course of one's development and education from the power of traditions and authorities, every person learns how to manage one's own life and the life of one's own society without the urge to alienate that natural ability for the benefit of kings, presidents, deputies or anyone else [Myelkov, et al. 2016: 18].

That is why democracy and rationality are inseparable from education as a matter of educating a human person capable of using one's own reason. Contrary to the procedural understanding of democracy as a mechanism for electing representatives, established by liberal ideology in the philosophical thought of mostly English-speaking countries in the 20th c., Dewey emphasized the importance of democracy as a culture of thought and way of life: "The devotion of democracy to education is a familiar fact. The superficial explanation is that a government resting upon popular suffrage cannot be successful unless those who elect and who obey their governors are educated. Since a democratic society repudiates the principle of external authority, it must find a substitute in voluntary disposition and interest; these can be created only by education. But there is a deeper explanation. A democracy is more than a form of government; it is primarily a mode of associated living, of conjoint communicated experience" [Dewey 1916: 101]. The departure from this profound understanding of democracy is associated with the formation of the idea of the nation-state, the dictates of which already at the end of the 18th c. came to replace the ideal of the Enlightenment – especially in Germany, where the philosophical idea of the full and harmonious development of human forces and abilities has found its practical embodiment in the education system subordinated to the apparatus of the existing political power, and therefore humanity as a whole (which is, we should note, is an open society!) is gradually replaced by a closed community, human is being replaced by a citizen, and nationalism takes place of cosmopolitanism [Dewey 1916: 108–109].

I would argue that this is indeed how science historically became a 'closed' system. However, now with the emergence of the phenomenon of 'open science' enabled by the development of distance learning, informal education and information technologies, we can witness the reverse processes that allow to talk about the possibility of the New Enlightenment, the chance to come to a new level of humanism, to a democratic understanding of each person as a creative personality. As the categorical antithesis of the singular and the general dialectically finds its resolution in the notion of the special, then the contradiction between classical elitism with its cosmopolitan ideal of "the all-round development of personality" and the mass higher education with its emphasis on narrow professional skills – that contradiction could lead today to the broad cultural development of each person with no exception. Of course, it would be an utopia to require each high school student to make real scientific discoveries, but trying to introduce academic culture and its inherent values into the system of university education can help form the necessary foundation for students to be able generate new knowledge throughout their further lives. The same applies to the activities of professors who can get new motivation for their own scientific research, as well as to the promoting science and scientific culture in society, increasing its prestige and demand for the results of scientific developments.

Conclusion

The rapid development of science in our times has led to the occurrence of some negative phenomena in academic and education practices. In the absence of inner motivations for scientific investigations among both undergraduates and professional researchers, science becomes a 'closed' system, which turns into a profanation of academic activities and is deprived of connection with society in general. The way out of this situation could be presented by the concept of "open science" that has first appeared in the public discourse in 2015 as an effective way to solve the 'crisis of replication' but actually has much more rich history that links it with the general philosophical conceptions of democracy. In fact, open science manifests itself as a complex multilayer phenomenon combining the emphasis on behavior, practices and procedures (those of free and open public access to data, methods, research results and publications) on the 'lower' level – with the urge to create technological platforms, services and tools for scientists to enable their wide international and interdisciplinary cooperation on the 'middle' level – and with a theory and values that would enable science to re-institutionalize itself in today's society as a public science on the 'higher' level.

The concept of 'open science' is in fact deeply grounded in the classical values of the scientific ethos. Openness of science as a feature of the latest

concept of research development in the direction of free access to all stages of research and public involvement acts as a natural explication of classical principles of universalism and communism as fundamental values of science. Thus, in the mirror of philosophical reflection, the dissemination of the 'open science' concept corresponds to the democratization of science in general. A truly effective academic activity of either an undergraduate student or a professor of HEI could be based only on the moral imperative of each human person as an autonomous subject of judgment and the subject of reconstruction of the ideal of scientific ethos, which is opposed to the compulsory methods of forcing a person to academic creativity without any inclination and inner motivation.

At the same time, there are many problems still remaining unsolved that comprise a vast number of further research directions on the topic. 'Open science' resembles today a kind of popular slogan actively used in public discourse and in various declarations, but the task of both filling it with meanings and values and translating it into practices is still at hand. In particular, special attention could be given to the introduction of academic culture and its inherent values into the system of university education that can help form the necessary foundation for students to be able generate new knowledge throughout their further lives while not demanding from them any formal research activity that results rather in violation of academic integrity principles.

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Юрій Мєлков. **Поняття «відкрита наука»: його цінності та значення для системи вищої освіти**

Статтю присвячено аналізу поняття та феномена «відкритої науки» як способу вирішення парадоксів сучасної науки в якості масового заняття, особливо у сфері вищої освіти. За відсутності внутрішньої мотивації до наукових досліджень як у студентів, так і в наукових працівників наука стає «закритою» системою, яка перетворюється на профанацію академічної діяльності та позбавляється зв'язку з суспільством у цілому. Концепція «відкритої науки», що з'явилася в суспільному дискурсі в 2010-х роках, подається як складне багатошарове явище. Аналіз показує, що це поняття поєднує в собі акцент на поведінці, практиках та процедурах (вільний та відкритий публічний доступ до даних, методів, результатів досліджень та публікацій)

на «нижньому» рівні з прагненням до створення технологічних платформ, сервісів та інструментів для вчених з метою забезпечити їх широке міжнародне та міждисциплінарне співробітництво на «середньому» рівні та з теорією та цінностями, які дозволять науці реінституціоналізувати себе в сучасному суспільстві як публічну діяльність на «високому» рівні. Такі цінності відносяться до класичного наукового етосу: відкритість науки постає як експлікація мертонівських принципів універсалізму та комунізму в якості фундаментальних цінностей науки. Стверджується, що розвиток концепції «відкритої науки» відповідає демократизації науки загалом: ефективна академічна діяльність може бути заснована лише на моральному імперативі кожної людської особистості як автономного та творчого суб'єкта суджень та реконструкції ідеалу наукового етосу. Водночас «відкрита наука» сьогодні частково нагадує сьогодні популярне гасло, яке активно використовується в публічному дискурсі та в різних деклараціях, але завдання наповнення його смислами та втілення його у практиках залишається невирішеним.

Ключові слова: *відкрита наука, етос науки, академічна доброчесність, університетська наука.*

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