CHAPTER «SOCIAL COMMUNICATIONS»

FORMATION OF BEHAVIORAL NORMS OF PROFESSIONAL COMMUNICATION FOR THE SCIENTIFIC COMMUNITY

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Abstract. The purpose of the paper is to summarize and present stages of formation of behavioral norms of professional communication for the scientific community. The objectives of the study are following: to characterize the meaning of the concept of "scientific community" and clarify its definition; to consider the formation of views on the behavioral norms of the scientific community; to define a set of norms of a modern scientist's professional ethics.

The study presents a narrative review of the literature. During the selection of the papers for review, preference was given to the scientific publications of the classics of sociology of science, in particular published in the form of a monograph and in the journals included to the Web of Science Core Collection. An additional Google Scholar search was conducted to provide a more complete presentation of the scientific results. At the same time, the articles published in predatory journals were excluded from the search (where there are no reviews, the editorial boards of which do not correspond to the subjects of the journals, where articles from journals belonging to leading international scientometric databases, etc. are not cited). We also used the method of analysis of scientific sources, chronological method, methods of classification, comparison, and scientific generalization.

The scientists used various metaphors to denote the scientific community: "institute of science" (R. Merton), "field of symbolic production of science" (P. Bourdieu), "invisible college" (D. Price and R. Merton), "social circle of scientists" (D. Crane), "social network of scientists" (R. Collins),

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"expert reality of science" (P. Berger, T. Luckmann), "scientific discourse" (J.-F. Lyotard).

R. Merton codified the norms of science and formulated a "scientific ethos" by proposing a set of four imperatives as normative regulations of science: 1) communism; 2) universalism; 3) disinterestedness, and 4) organized skepticism. T. Kuhn "epistemologized" Merton's sociological concept of science. R. Merton's followers T. Parsons and N. Storer developed indicators of the scientist's profession: a specialized amount of knowledge; high autonomy in attracting and training new members of the scientific community, control of their professional behavior; the need for reward (moral and material). R. Boguslaw rejected Merton's ethical system as mythological and proposed a set of anti-norms. Later, this system of anti-norms was developed by I. Mitroff, S. Fuller, J. Ziman, and others. P. Bourdieu highlighted the problems of the struggle for a monopoly on scientific competence, the accumulation and investment of scientific capital.

Today, the scientific community is understood as a complex system of teams, organizations and institutions that interact both vertically (from laboratories and departments to national academies) and horizontally (the whole set of social institutions, informal groups that do not have an institutionalized structure and administrative regulation). The functioning of the scientific community is determined by the support of the system of values and norms of behavior. Currently, the following key norms of professional ethics of a scientist have been formed: prohibition of plagiarism, objectivity of a scientist; focus on the search for truth; social responsibility of the researcher.

1. Introduction

Recently, the number of scientific journals, including international ones, has been growing rapidly, the processes of globalization in scientific communication are deepening, the behavioral norms of the scientific community on reviewing, communication of authors with editors and reviewers, as well as co-authors are being developed and improved. However, there is still a lack of systematic analysis of the evolution of scientific ideas about the behavioral norms of the scientific community to trace their formation and transformation. The purpose of the paper is to summarize and present stages of formation of behavioral norms of professional communication for the scientific community. The objectives of the study are following:

– to characterize the meaning of the concept of "scientific community" and clarify its definition;

– to consider the formation of views on the behavioral norms of the scientific community (theories of R. Merton, T. Kuhn, R. Boguslaw, I. Mitroff, J. Ziman, P. Bourdieu, J. Habermas);

– to define a set of norms of a modern scientist's professional ethics.

The study presents a narrative review of the literature. During the selection of the papers for review, preference was given to the scientific publications of the classics of sociology of science, in particular published in the form of a monograph and in the journals included to the Web of Science Core Collection. An additional Google Scholar search was conducted to provide a more complete presentation of the scientific results. At the same time, the articles published in predatory journals were excluded from the search (where there are no reviews, the editorial boards of which do not correspond to the subjects of the journals, where articles from journals belonging to leading international scientometric databases, etc. are not cited). We also used the method of analysis of scientific sources, chronological method, methods of classification, comparison, and scientific generalization.

2. The concept of the scientific community

The scientists used various metaphors to denote the scientific community: "institute of science" (R. Merton), "field of symbolic production of science" (P. Bourdieu), "invisible college" (D. Price and R. Merton), "social circle of scientists" (D. Crane), "social network of scientists" (R. Collins), "expert reality of science" (P. Berger, T. Luckmann), "scientific discourse" (J.-F. Lyotard).

The concept of "scientific community" was introduced by M. Polanyi, defining it as a special form of organization of free scientific communications that provide a scientific tradition. Joining the scientific community involves the restructuring of the individual, the willingness to think as it follows from the recommendations of the scientific elite. Leaders of science schools influence other members of these schools by demonstrating patterns of activity that other scholars may follow. By observing the teacher and striving to surpass him, the student subconsciously masters the norms of art, including those unknown to the teacher himself [1, p. 87]. M. Polanyi directly connects the development of science with the conflicts between the established authoritative positions and the changes that take place in fundamental scientific beliefs. The researcher draws attention to the non-viability of the idea to link scientific progress with the victory of one of the scientific paradigms. Progress is not in the movement towards universal, impersonal knowledge, but in the growth of opportunities for personal participation in cognitive processes, the expansion of education systems and the scale of research activities.

According to J. Habermas, the scientific community cannot claim the role of discoverer of absolute truth but should contribute to the actualization of the potential of rationality inherent in communicative action. Rational consensus is ensured through discourse, a dialogically equal procedure of argumentation. J. Habermas's "Ethics of Discourse" is based on the imperative of equal participation in discussions of all stakeholders, the development of universal norms of discussion and acceptable forms of argumentation, a detailed statement of the rules of discussion and the prohibition to reformulate rules during it. The formation of these rules in the scientific community promotes effective communication. The conceptual and social cohesion produced in such communications enables the scientific community to develop a dialogue with society and official authorities [2].

That is, J. Habermas stands on the positions of social solidarity, considering scientists and the public as equal participants in scientific communication for achieving valid knowledge. The scientific community cannot determine the content of consensus; its role is to open important topics for the society, to manage the formal aspect of communicative practices, to conduct a free and continuous dialogue with the public and to monitor communication violations.

P. Berger and T. Luckmann described the emergence of a new type of scientific community consisting of intellectuals (marginal experts), whose expertise is not desirable for society. Unlike the "official expert", the intellectual is a "counter-expert" in determining reality: the project of intellectuals exists in an institutional vacuum, its social objectification at best occurs in a sub-society of the same intellectuals [3]. Marginal experts can defend their definitions of reality by uniting with their like-minded people in the scientific community.

Another image of the scientific community in the postmodernist interpretation was proposed by M. Foucault. In his view, scientific knowledge is relative and therefore questionable in terms of "general truth". It is imposed on the minds of people as an authority and makes them think with ready-made concepts and ideas. At the same time, the scientific community is an artificial social construct that forms relationships, norms, and patterns of behavior as natural and objective, protecting and supporting the institutions of power and domination. In postmodern culture, the role of the scientist is not to tell others what to do, not to shape the political will of others, but to reincarnate evidences and postulates through the analysis [4, p. 390].

According to H. Collins, the scientific community is not a single structure, but a "granular" environment. Everything essential for the development of scientific knowledge takes place first within the granule as a close scientific group that collectively creates a new element of knowledge, and then in the struggle and compromise with other similar groups. The image of the scientist is also undergoing radical changes: the scientist has become a subject with completely different behavior in two different areas of action – legal and situational [5].

The French poststructuralist L. Pento noted that the scientific community as a holistic phenomenon does not exist at all, and in its structure should be distinguished between "state experts" and "pure theorists" – university scientists. For L. Pento, the space of scientific positions is a field of struggle between two "types of capital": secular (political and administrative order) and spiritual (scientific capital) [6, p. 60–61].

The common network approach offers to consider the scientific community "vertically" in time and "horizontally" among contemporaries and based on this distribution to identify a stable structure or patterns of scientists' stable personal contacts [7].

The theorist of "risk society" U. Beck highlighted that the institute of experts has become a politically engaged scientific community that determines the level of socially acceptable social risk. Science as a social institution is divided into two: academic and laboratory science and the science of experience, based on public discussions and life experience. U. Beck proposes to recognize the latter as an alternative to expert knowledge, to give it the status of a new type of scientific community authorized to make decisions [8, p. 16].

Today, the scientific community is understood as a complex system of teams, organizations and institutions that interact both vertically (from laboratories and departments to national academies) and horizontally (the whole set of social institutions, informal groups that do not have an institutionalized structure and administrative regulation). All these groups and organizations are communicatively connected with each other and with other subsystems of society and the state (economy, education, politics, culture, etc.) [9, p. 140].

3. Ethos of scientific creativity. Merton's school

The specificity of scientific communication is related to the peculiarities of scientific activity itself, which, on the one hand, involves strict organization and institutionalization (the presence of status-role structures, normative value systems, traditions), and on the other – typical characteristics of institutionalized activity are determined by the cognitive status of science, aimed at the constant production of new true knowledge [10, p. 316].

Within the paradigm of one of the leaders of American functionalism, R. Merton, who has priority in discovering the ethos of scientific creativity, all studies of scientific activity are based on the idea that the functioning of science is determined by the support of values and norms of behavior. They ensure both the uniqueness of this social institution and the stability of its functioning. The essence of Merton's sociological concept of science is that the research is not conducted by individual scientists, but a scientific community of professional scientists who carry out similar activities, the results of which form its common product – scientific knowledge. For this product to be holistic, its creators must adhere not only to common intellectual algorithms, but also to common values and rules [11]. R. Merton applied a functional approach, which is based on the task of identifying and describing the mechanisms of functioning of a stable society and its subsystems [12].

As early as 1942, R. Merton codified the norms of science and formed a "scientific ethos", proposing a set of four imperatives as normative regulations of science: 1) communism; 2) universalism; 3) disinterestedness (impartiality, uselessness) and 4) organized skepticism (CUDOS system of norms). These rules are expressed in the form of permits, prohibitions, regulations, benefits, etc. and are transmitted through guidelines and examples [13].

These imperatives became the rules for members of the scientific community, and they began to consider the process of producing scientific knowledge as activities under these rules. Thus, the issues of values, norms, and sanctions for deviations from them became relevant. The ethos of science over more than half a century of history has become the ethics of science – a new scientific direction of philosophy and sociology of science.

The imperative of communism has a directive character: after verification, the scientist should immediately transfer the scientific results obtained by him to public use. According to this imperative, there can be no property rights or monopolies in science. The need for a scientist to use his intellectual property is limited to the recognition and respect that the researcher receives as the author of the discovery. According to R. Merton, the driving force of the entire social institute of science is professional recognition, which the scientist seeks.

This idea originated in ancient times, as evidenced by the legend of the philosopher Thales of Miletus. According to it, when delegates from the people of Miletus came to the legendary philosopher with gratitude for valuable advice and asked what they could thank, the astonished citizens heard that it would be enough for the legendary thinker if society told about his discoveries and said that he made them [14, p. 7].

The imperative of universalism is due to the impersonal nature of scientific knowledge. Because scientific statements belong to objective phenomena and relationships, they are universal – valid wherever similar conditions are met, they do not depend on the nationality, scientist's personality or his social characteristics, such as reputation or belonging to a scientific school. The evaluation of any scientific idea or hypothesis can be influenced only by the content and compliance with the standards of scientific activity, scientific progress is not limited to anything but the lack of scientific competence. The imperative also requires that scientists consider only rational-logical evidence and experimentally confirmed assumptions.

The requirement of impartial and selfless activity instructs the scientist not to use research to achieve financial or other personal gain. Organized skepticism requires detailed objective analysis and critical perception of scientific results, and rejects the strategy of blindly imitating authorities, aiming at cultivating critical thinking. Subsequently, R. Merton added to his system of norms two new ones: originality and humility [13, p. 293–305].

In the context of our study, the imperative of organized skepticism becomes especially important. After all, it follows from it that no contribution to the development of scientific knowledge can be allowed to be made public without a thorough examination. As an institutional basis for the professional honesty of scientists, a directive requirement for scientists, this imperative creates an atmosphere of mutual responsibility, making scientists to constantly give critical weight to the work of their colleagues.

In the late 1950s and early 1960s, R. Merton brought to the attention the "pathology" of science – competition, suspicion, envy, the phenomena of plagiarism, and so on. The pathology of science affects the motivation of the scientist, resulting in "ambivalence" – the duality and contradiction of motives and behavior, the tension of choosing between diametrically opposed imperatives of attributed behavior. An ambivalently motivated scientist can not only develop scientific knowledge, guided by the value of selflessness, but also make a scientific career, seek professional recognition.

Studying priority conflicts and repeated discoveries, R. Merton was convinced that the real relationship between scientists is significantly different from those attributed to the regulations of science. Therefore, to characterize the real behavior of scientists, R. Merton, in addition to the norms of "scientific ethos", proposed nine pairs of normative principles, according to which the researcher has to:

1) transfer scientific results to colleagues as soon as possible, but not to hurry with publications;

2) be receptive to new ideas, but do not succumb to "intellectual fashion";

3) strive to obtain knowledge that will be highly praised among colleagues, but at the same time work without paying attention to ratings;

4) to defend new ideas, but not to support unsubstantiated conclusions;

5) make every effort to know about all scientific works related to the field of his activity, but at the same time remember that erudition can inhibit scientific creativity;

6) be attentive to the wording and details, but not too meticulous;

7) remember that knowledge is universal, but any discovery is honorable for the nation to which it belongs;

8) to educate a new generation of scientists, but not to give all their time to it;

9) to learn from the best representatives of his scientific field, but not to imitate them [15].

R. Merton called the form of organization of scientific communications outside institutional structures as a network of personal contacts and information exchange procedures a “republic of scientists”, a “scientific school”, and (according to J. Price) an “invisible college”. Members of these “colleges” form an internally connected social group with their leader, actively communicate, share research results, interact in seminars and conferences.

“Invisible college” is a group of geographically unrelated people involved in cognitive interaction. For members of this community, it is important to think about the work of other members of this community. The invisible college as a new historical form of scientific communication (interaction of the scientific community and society) is based on the principle of social usefulness of scientific knowledge and appears because of informal contacts between scientists. Status positions in “invisible colleges” are regulated based on expert assessment, which is subject to scientific publications.

R. Merton’s system of imperatives was focused on ensuring the quality of the product of science – knowledge. However, the researcher did not consider the personal motives and needs of scientists. That is, the positivist-oriented Merton’s conception of science completely excluded the influence of the subject from scientific knowledge. Sharing the position of materialism of the XVIII century and considering the traditions of science unshakable and ethical norms historically unchanged, R. Merton did not consider the normative regulations of science as the result of the activities of specific individuals, considering only the impact of rules on people and ignoring the feedback.

On the question of the autonomy of science and the relationship between science and ethics, R. Merton did not share the popular opinion of American sociologist J. Landberg, who said that a chemist who invents explosives should not worry about how his invention will be used – to destroy churches or build tunnels [17], and tried to find out how the socio-cultural context affects science.

In 1952, B. Barber’s monograph “Science and Social Order [18]) was published, in which the norms of science that developed R. Merton’s theory were proposed. The researcher replaced the concept of “organized skepticism” with “individualism”, collectivism with “communism” and added “rationality” and “emotional neutrality”. Norms, according to the researcher, resemble an unwritten code – the consensus of most researchers and moral authorities [18, p. 84–85]. At the same time, B. Barber emphasized for the first time the regulatory possibilities of ethical norms, as well as the fact that the need for moral codes becomes obvious only when the norms of scientific activity have already been violated.

4. Modifications of Merton's sociological concept of science

T. Kuhn "epistemologized" Merton's sociological concept of science. In his opinion, norms regulate not only social, but also "semantic" behavior of scientists, and they are not sustainable. The creation of new theories is opposed by those experts whose sphere of competence they affect. The main unifying principle of the scientific community is not so much the values and norms of professional ethics, as a single style of thinking within a historically defined paradigm [19].

According to T. Kuhn, the scientific community is not an association of researchers on the basis of formal features (same specialty, professional skills, common research subject), but a rational subject of scientific activity that consolidates scientists who share a common paradigm as a set of fundamental theories, laws, examples of solving problem situations, a conceptual scheme that the scientific community recognizes as the basis of its practical activities.

It is the paradigm ("institutional matrix") – the main condition for an individual's membership in the scientific community, membership in which is ensured by his willingness to accept the dominant paradigm as an indisputable truth. The development of the scientific community for some time takes place within a specific paradigm: scientists accumulate empirical material, process data, improve research methods and more. T. Kuhn considers this period of scientific knowledge to be "a normal science".

However, gradually doubts are formed about the validity of generally accepted theoretical positions. The paradigm as a habitual style of thinking is swaying, much of the scientific community is losing confidence in its original principles. It is important that the paradigm shift is determined not so much by internal scientific factors as by socio-psychological circumstances. In addition, T. Kuhn drew attention to the fact that in different paradigms, scientists "see differently", emphasizing the relativity of scientific knowledge [19, p. 29–30]. Scientific knowledge began to be understood as an element of creating a professional group.

In 1965, W. Hirsch considered Merton's set of imperatives as "rules of the game" that science establishes for those who choose this type of activity: there are always those who do not follow the rules, but in the future violators of the rules will be removed from the game, and the rules will remain [20, p. 29]. At the same time, he identified two new roles in this game – a scientist-administrator and a scientist-politician [20, p. 30].

R. Merton's followers T. Parsons and N. Storer developed indicators of the scientist's profession: possession of a specialized amount of knowledge; high autonomy in attracting and training new members of the scientific community, control of their professional behavior; the need for reward (moral and material) [21; 22].

According to N. Storer, scientists adhere to the norms of science because of the interest in the continuous and adequate circulation of the product of their activities (commodity) – scientific knowledge. Norms are important because they are useful not only in the distant future in the form of scientific progress, but also here and now [21, p. 84].

5. Anti-norm system

In 1968, R. Boguslaw rejected Merton's ethical system as mythological and contrasted R. Merton's norms with anti-norms. Later this system of anti-norms was developed by I. Mitroff (1974), S. Fuller (1997) and J. Ziman (2000). According to R. Boguslaw, the antithesis of the principle of universalism was the principle of particularism, according to which personal, ethnic, social, and other characteristics of the scientist affect both the activities of the scientist and the evaluation of the results. The principle of communism is opposed by the principle of avarice, according to which it is necessary to hide one's own scientific research so that it is not used by colleagues. The anti-norm of the principle of disinterestedness has become the principle of interest: the scientist and his professional community must profit from research. Opposition to the principle of organized skepticism was the principle of organized dogmatism: the scientist should not doubt the fundamental assumptions made by his predecessors [24].

Like Merton's system of value bases of science, the theory formulated by R. Boguslaw was characterized by maximalism, obvious extremes and needed revision. An attempt to overcome this maximalism was the concept of I. Mitroff (1974), according to which the scientific ethos emerged as a system of binary oppositions, where within each pair a confrontation is established between its structural elements. I. Mitroff concluded that the professional behavior of a scientist fluctuates between the norm and the counter-norm.

For example, the norm of emotional neutrality is opposed by the counternorm of emotional involvement, fidelity to one's own ideas. The norm of communism corresponds to the counter-norm of secrecy (sole ownership). The requirement of universalism in practice is manifested as a counternorm of particularity, because in their work, scientists are usually guided by personal preferences and sympathies. The imperative of rationality is contrasted with belief in the moral imperative of rationality and irrationality, and organized skepticism is opposed to organized dogmatism. Absolute impartiality is not possible at all, because scientists from a large number of works on their subject choose the works of only those colleagues who are most trusted, and therefore evaluate individuals, not their scientific achievements.

According to the scientist, binary oppositions in practice become an effective regulatory mechanism. For example, due to particularity, scientists can save time working with scientific literature, and the counter-norm of secrecy allows to avoid premature conclusions by properly checking the reliability of scientific results [12]. R. Merton himself responded to I. Mitroff by formulating the idea of the functional value of the confrontation between the polarities of norms. In his opinion, the activity of only one component in a pair of ambivalences leads to the doomed unilateral development and undermines the main goals of scientific activity [15].

The American sociologist M. Malkey analyzed possible interpretations of the research results of R. Merton and I. Mitroff. In his view, R. Merton's approach is limited in the sense that the scientist does not identify all the components in the system of institutional values of science. Instead, I. Mitroff's approach is characterized by skepticism about the existence of universal values in science [25].

A set of anti-norms was proposed in 1997 by S. Fuller, the founder of social epistemology, who opposed R. Merton's communism with "mafia" (good relations with "science bosses" who approve articles before publication), and universalism with "cultural imperialism" (dominance of English-language academic journals), organized skepticism with "collective irresponsibility" (indifference to possible social cataclysms caused by research), disinterest with "opportunism" (lack of interest in using the results of their own research) [26].

At the turn of the millennium, physicist and scientist J. Ziman (USA) stated that the transition from "small science" to "big science" was accompanied by the spread of science beyond laboratories and the growth of cooperation between scientists and government, industry and finance. Under such conditions, the traditional scientific community is replaced by a new, post-academic community, which is characterized by collectivism, the command nature of the organization of science. Competition for funding has given rise to research expertise on scientific perspectives: the ethics of utilitarianism has taken first place, the temptation to research scientific problems of interest to the state or business, so science has increasingly become a market for research services [27].

J. Ziman believed that the development of science is the interaction of basic science and technology, which together form a technoscience, in which the norms of R. Merton or no longer apply, or operate in a new way). In addition, J. Ziman emphasized the tendency towards increasing "bureaucratization of scientific work", its regulation [28]. The differences between the norms of ethos of J. Ziman and R. Merton are as follows (PLACE system) [27; 28]:

– Proprietary – the spread of property rights to the results of scientific activities, patents (instead of the general right to own these results);

– Local – solving local scientific problems, which are determined by authoritarian leadership (instead of evaluating scientific results on the basis of non-personal criteria);

– Authoritarism – the dependence of scientific products on the tasks of management and the customer (instead of autonomy, disinterest, freedom of scientific work);

– Commissioned – research work is performed to order, not for the sake of "pure science";

– Expert Work – recognition of the expert nature of scientific activity (instead of organized skepticism, namely a critical attitude to both others and their own work).

These systems of anti-norms reflect the growth of commercialization in science, trends in the transformation of research groups into business units, as well as interest in funding (through a system of grants) the most promising research that can be monetized.

6. Family scientific field as a place of political struggle

An original approach behavioral norms of modern scientists are determined by their attitude: 1) to scientific knowledge (reliability of published data, attitude to plagiarism, means of ensuring the recognition and citation of scientific publications); 2) to each other (communication with co-authors, editors, reviewers, establishing professional contacts); 3) society (social responsibility); 4) themselves (the choice of the source of publication of scientific results, the formation of reputation).

The system of professional communication, in which the scientist works, sets the conditions of his communicative behavior and determines the limits of communicative interaction, the purpose of which is to achieve scientific truth to the study of science and professional culture of the scientific community was developed by P. Bourdieu, actualizing the problems of the struggle for a monopoly on scientific competence, accumulation and investment of scientific capital and more. According to P. Bourdieu, the scientific field, as a place of political struggle for scientific dominance, dictates to each researcher political and at the same time scientific problems and methods [29].

In "Field of Science" P. Bourdieu set the task to identify social conditions and mechanisms of generation of scientific truths and proceeded from the postulate that the nature of scientific truth as a product of scientific practice is in special social conditions of production, or rather, in a certain state of structure and functioning of the scientific field [30, p. 15]. The scientist proposes to get rid of the idea of science as a sphere subject to internal immanent laws, and of the scientific community that fights for "pure science".

According to B. Latour and S. Woolgar, scientists advance their statements in the so-called "field of contradictions", which clarifies their modality from assumptions to well-known fact. The task of the researcher is to increase the modality of his own statements and reduce the modality of the statements of other authors if they contradict his or her position. The ability of members of the scientific community to interpret reality similarly and agree on the criteria of scientificity or validity of hypotheses is due to the skills and knowledge they acquire in the process of their socialization in science – learning and cooperation [31]. P. Bourdieu considers science as a field of symbolic production, within which two types of capital are important: pure scientific capital and institutional (administrative) capital. Informal communications contribute to the distribution of capital, as well as determine the impact of politics and economics on the processes taking place in the field of science [32].

P. Bourdieu contrasts Merton's imperative of disinterestedness with the statement that it is the functioning of the scientific field that forms a specific form of interest [30, p. 16]. The main idea of P. Bourdieu's theory is that the action of the individual is always collective and social, because, existing in different social fields, the individual borrows different ways of perception, thinking, evaluation and behavior (habitus). Habitus indicates the unity of practice and the wellbeing of an individual or social group and combines perception, thinking, evaluation and communication.

P. Bourdieu also defined the essence of the scientific community as a set of real or potential resources associated with owning a stable network of more or less institutionalized relationships of acquaintance and mutual recognition [33, p. 519]. In his opinion, the scientific community is a symbolic reality, an arena of struggle, a specific stake in which is a monologue on scientific authority, defined as social power, as socially recognized for a particular individual (group) ability to speak and act legitimately on behalf of science [30, p. 16]. The functioning of the scientific community, according to P. Bourdieu, involves a specific form of interest of the researcher, as well as the interests of other entities and groups [30, p. 18]. Russian academician V. Stepin emphasizes the need to explicate the links between fundamental scientific values (search for truth, growth of knowledge) with non-scientific values of a general social nature [34].

7. Norms of professional ethics for the modern scientist

With the beginning of the new millennium, three groups of norms of professional ethics for the scientist were formed. The first group includes universal moral norms adapted to the peculiarities of scientific activity (prohibition of plagiarism, distortion of research results, objectivity of the scientist). The second group includes ethical norms designed to protect the actual scientific values (search for truth). The third group consists of moral rules concerning the interaction of science and scientist with society (the problem of freedom of scientific research and social responsibility of the researcher) [35].

The standard moral and ethical principles of a modern scientist are:

1) diligence – refers to the formulation of goals, planning and conducting research, selection of research methods and procedures, interpretation of conclusions, as well as identification of probable threats and opportunities (benefits), practical and other applications and predictions formulated more or less unambiguously;

2) trustworthiness in conducting research; a critical approach to results; care for details and diligence in collecting, recording and storing data, as well as in presenting research results; avoiding statements on issues beyond one's competence;

3) objectivity – interpretations and conclusions should be based solely on facts, logical reasoning and verifiable data;

4) impartiality – in the process of interpretation of the problem or phenomenon, in the process of knowledge exchange with other representatives of the scientific community;

5) resistance – refers to any attempts of external influence on the conduct of a particular study by those who commissioned it, or an expert whose opinions reflect the interests of the customer, as well as political, ideological or business pressure groups;

6) openness in discussions with other scientists, which is one of the key conditions for progress in science; it should also contribute to the development of knowledge through the publication of research results and the desire to share this knowledge with society as a whole;

7) transparency – refers to the collection, analysis and interpretation of data, which is determined by the proper storage of empirical data and their availability through publications;

8) responsibility – to the participants of the research and their objects, including the environment and cultural values; for research on living beings, which should be conducted only with due respect for human dignity and animal rights, with the permission of the relevant bioethics commissions;

9) reliability – the recognition of the scientific achievements of other researchers through appropriate references to sources and the true recognition of the contribution of other scientists, regardless of who they are: colleagues, competitors or predecessors;

10) concern in relation to future generations of scientists, which is manifested by teaching ethical standards and norms to students and subordinates;

11) courage in defending views that contradict traditional scientific knowledge and practice, as well as the principles of scientific reliability [36].

At the same time, the modern scientist is in a new communicative environment, when, on the one hand, he needs to work accurately in a projective theoretical, conceptual or methodological network determined by a specific approach or paradigm, and on the other build communicative actions on the research field as a whole, represented by numerous heterogeneous network interactions of actors and concepts related to them [37].

During the formation of "big science", people in charge of science policy have the illusion that science can be effective without bright personalities through successful organization and that the science is a simple sum of equipment, facilities, money, scientific programs and a set of scientific institutions. There are a number of researchers who differ only in positions and salaries [38, p. 33].

However, as early as 1960, S. Dedier wrote that the organizers of science on painful experience and disproportionate losses made sure that this formula contradicts the fact that it does not take into account the effect of some hidden parameter [39, p. 20–52].

This parameter is the personality of the creator, and its effectiveness is determined by the stock of knowledge and the material base of research [38, p. 33].

Education, equipment, and salaries are not enough to succeed in science. The scientist must be guided by scientific values and focus on recognition and advancement in science.

In the second half of the twentieth century scientists were divided into two types: "specialists" and "institutionalists". The "specialist" seeks the approval of as many representatives of his profession as possible, wherever they work; instead, the "institutionalist" seeks encouragement only within the local organization, the institute. The specialists ignore the the interests of their organizations, but pay attention to opportunities they provide them. Studies have shown that scientists can have both types of orientation: the first as a traditional, the second as a consequence of new forms of organization of science. However, the truly scientific activity corresponds to the orientation of the specialist. That is, to succeed in science, the researcher needs to feel like a scientist, have the self-awareness of a scientist [38, p. 33–34].

8. Conclusions

In our opinion, the scientific community is a discursive unity of communicators, a social group (social context) of scientific communication, which arises on the basis of the use of common knowledge, language and values.

The main mechanism that determines the functioning of science is a set of rules that operate in the scientific community and regulate the professional activities of scientists. In fact, today in science we observe the effect of Merton's behavioral norms: the greatest recognition belongs to international scientific publications and conferences; the authority and reputation of a scientist are related to how well he is known in narrow professional circles; as a criterion for assessing the status of scientists and still appears their contribution to the training of future generations of scientists.

Behavioral norms of modern scientists are determined by their attitude: 1) to scientific knowledge (reliability of published data, attitude to plagiarism, means of ensuring the recognition and citation of scientific publications); 2) to each other (communication with co-authors, editors, reviewers, establishing professional contacts); 3) society (social responsibility); 4) themselves (the choice of the source of publication of scientific results, the formation of reputation).

The system of professional communication, in which the scientist works, sets the conditions of his communicative behavior and determines the limits of communicative interaction, the purpose of which is to achieve scientific truth.

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