

# Features of Scientific Knowledge Motivation Factors

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**Abstract—** The article discusses the patterns of scientific knowledge development as factors of human effort motivation. Some features and principles of openness of science to their own development are revealed. The author traces the formation of inducement factors to a change in the state of consciousness during the evolution of science and human readiness to master epistemological innovations. Scientific work comes to the end of the evolution of knowledge, devoid of compulsory obligation. The main feature kind of knowledge in article is no limited freedom for the independent goal-setting by a person of the knowledge efforts and the absence of restrictive culture regulation of that electoral process, which is responsible for gaining knowledge. Such restrictiveness contradicts the basic motivation, which raises the locally selective interest to the level of extra-personal knowledge culture. A person here sets himself a task in the context of his own existence, determines for himself the conditions for the decision, significance and judges himself according to the laws, which he recognizes above himself.

**Keywords—** science, scientific knowledge, non-scientific knowledge, motivation, consciousness, individuality, epistemological problem

## I. INTRODUCTION

In social reality, the relation of a singular principle (a concrete action of an individual, a personality, some event, etc.) and its environment acquires its own characteristics, and in this connection a specific nature of the generation of order, the law-making of the human world, its way of knowing it is born.

One of the features of human consciousness, and at the same time, man himself, is duality, which is expressed in dividing the *strategy of epistemology* into two levels - basic (given by the science of the New Age) and new (epistemology of subjectivity). The ability to say no to both the external requirements of the world and the internal requirements of the mind, that is, the ability to deny is a constitutive trait of man. Therefore, at the level of the human world, an absolutely new principle of being of a

singular principle is fixed, which finds its being not due to these conditions, but contrary to them.

Human consciousness is ambivalent originally: it is, on the one hand, a reflection of reality. Therefore its content is not sovereign, dependent on the external world. But, on the other hand, it is capable of producing such content that has no equivalents in the external world. It imagines, fantasizes and remembers, etc., to the extent that the same duality manifests itself in the relations of a person with the conditions of his life and activity. Man is not only subordinate to reality, but also produces it. Consciousness not only takes from the world, but also gives it new states. Consciousness actualizes the meaning, introducing it into human activity, and actualizes it (introduces it into an act, into action) in two ways. First, consciousness makes those meanings work, i.e. those references that are already established in culture and society. Secondly, consciousness establishes new references, which are fixed in people actions, and thereby new meanings are formed [1].

The purpose of a scientific article is to show that a person's ability to determine his or her own selective interest in the knowledge of the world divides knowledge into specific heterogeneous paradigms that branch like a tree and are capable of contradicting each other. Ignoring these contradictions and incomplete correspondence to the facts, having no intention to come to a unified unity, a person is motivated to scientific knowledge.

## II. RESULTS AND DISCUSSION

Scientific knowledge as a specific way of asking questions to reality and selecting acceptable answers that have emerged in the European culture of modern times goes beyond the simple understanding of the reality perception, but obeys the same laws of functional evolution ways of their participation in culture. The path of this evolution is specified in several directions.

In cognitive science, consciousness is studied through the prism of the «brain-thinking-language» interaction. Moreover, consciousness and cognition are characterized as

an evolutionary ability. This characteristic was given in the context of *evolutionary epistemology*. Evolutionary epistemology is a cognitive practice that was developed in English-speaking countries by K. Popper, S. Toulmin, D. Campbell, in German-speaking countries by K. Lorenz, G. Vollmer, R. Riedl, E. Oiser, and others. Evolutionary epistemology is defined as “the theory of knowledge, which proceeds from the interpretation of man as a product of biological and social evolution” [2]. The subject of evolutionary epistemology is the evolution of cognitive structures, growth mechanisms of knowledge, cognition, understood as a function of development, a function of life. In this context, evolutionary epistemology is simultaneously presented as “biologization of epistemology” and “epistemologization of biology”, a new interdisciplinary communication of science and philosophy.

According to D. N. Dubnitsky, new knowledge begins in the same way, as all forms of self-organization begin, going beyond the limits of the existing causal relationships of events, - with the generating situation, i.e. the *crisis of the existing knowledge* of the unsolvable without going beyond it. It begins with the concentration of attention of knowledge carriers on a local problem, which is created by existing ideas and concepts based on them, but is not solvable within these limits.

This local problem motivates the appearance of a multitude of local personal attempts to solve it within the limits of existing ideas by their forced adaptation to the situation that has arisen. Each of these attempts, without solving the problem radically, can go far enough away from basic concepts, but has no other result than increasing their regulativity. Amid this chaos of forced, but not productive innovations, such a solution may appear that radically solves a local problem at the cost of drastically going beyond the most common prevailing ideas and concepts, exposing their electoral locality, limitation and non-obligation [3]. Solving a local knowledge problem with such a price has far-reaching consequences: it motivates the need to go beyond the limits of existing ideas with an uncertain and unpredictable outcome.

The carriers of the emerging knowledge at the stage of a chain reaction of an epistemological explosion are not all, but several specific people, known by name (if not the only person), who know about the existence of a local crisis of existing knowledge, first of all, and about the existence of a non-local exit from it. Secondly, they are ready to go beyond the general concepts and concepts that have shaped this crisis.

Forced efforts to adapt existing knowledge to a local situation are inverted into an independent stable factor of effort motivation, no longer dependent on the combination of circumstances that created a local *epistemological problem*. At the same time, a local problem that served as a motivating factor for going beyond the current knowledge is fixed in the minds of the knowledge carriers as a steady and reproducible stimulator of innovations with an uncertain outcome, performing the function that the

“theodicy of suffering” performs according to Max Weber’s religions of salvation. The forced dependence of the efforts of human consciousness on the unsolvable problem that has arisen turns into a stable feedback between the mutual dependence of the impulses and the results of the realization of this urgency [3]. When igniting a chain reaction of urgency, going beyond the limits of existing knowledge from forced adaptation to a local situation becomes an independent stable factor in the motivation of human effort. This is not yet new knowledge, reproducible and alienated from the states of consciousness of its carriers, but it is something more important - the readiness, ability and desire to acquire new knowledge beyond the limits of the already existing, inalienable from the state of consciousness of the carrier of knowledge. This indefinite willingness is ahead of certain forms of new knowledge, but it is a prerequisite and a necessary condition for its acquisition.

*The arising knowledge* is personified and inalienable from the state of consciousness of its carriers. Essentially, this is nothing more than a personally experienced transformation of one’s own consciousness — salutary enlightenment at the transition of the line separating immersion into an insoluble crisis and its radical resolution beyond the limits of the knowledge that formed this crisis. Repeated experiences of this dimension of consciousness are the first and at this stage the only interpersonal component of the emerging knowledge.

The compelling reflection motivation of the existing knowledge foundations and the chain reaction of radical innovations on their revision with the unpredictable outcome of each of them can form a steady feedback of mutual dependence with some definite (not all) results of the implementation of such causality. This additional feedback determines the selectively restrictive regulators of innovations — the goal-setting imperatives of research programs and hypotheses that allow testing outside the local concourse of the circumstances of the initial generating situation and are already independent of it.

The goal-setting imperatives of some successful research programs and hypotheses that do not meet refutations can (but not necessarily and certainly not all) form a stable feedback of mutual causation with some results of their own realization, acquiring the epistemological function of the cognition invariant that precedes the *knowledge efforts* and is constant before and after the fact of such efforts. These stable invariants are functionally independent of the circumstances of the acquisition of knowledge, the fact of cognitive efforts, and even the fact of the existence of a particular carrier of knowledge. Invariants participate in cognition as an all-embracing-universally significant “objective” knowledge, utterly alienated from the states of a single person consciousness. The knowledge of the interpersonal becomes unpersonal.

However, according to Dubnitsky, there is never any guarantee (and, conversely, there are examples abundant

refutations) that the most “objective” theories sooner or later meet with contradictory facts that demonstrate their limitations, incompleteness and, finally, dependence on the relative selectivity of human consciousness, due to his tendentious interest in the circumstances of the situation. The “objectivity” of “solid” knowledge is not a break in the connection of knowledge with the state of consciousness of its carriers, but a specific kind of such connection.

Dubnitsky D. N. writes that, as a rule, in a synchronous section of human knowledge state at any time point there are components that are at various stages of functional development - problems that require going beyond existing knowledge, imperatives of hypotheses, invariants of theories, categorical imperatives “natural obviousness”, free innovations that go beyond the obvious, without feedback with the conditions of their cultural assimilation, innovations related to the self-limiting discipline of consciousness, relative local adaptations of the hyper-stable core of knowledge to any new facts in uncertain limits [3].

Husserl insists that in addition to *adequate obviousness*, which, apparently, can never have an absolutely perfect character, the construction of science meaning can also be a perfection question of a higher degree connected with the idea of *apodictic evidence*. “The apodictic evidence, however, possesses the remarkable feature that it not only at all certifies the existence of things evident in it or the circumstances connected with them, but through critical reflection is revealed as the simple inconceivability of their non-existence” at the same time. That is, the apodictic evidence from the very beginning excludes any possibility of doubt. The discovery of apodictic evidence suggests Husserl to suggest that a real beginning has been found for thinking about the idea of genuine science. The evidence underlying all other evidence must be apodictic; even if the evidence is inadequate, then at least it should have an apodictic content, “some existential content, which, thanks to its apodicticity” is always absolutely certain. [4] The motivation of knowledge includes the selective personal interest of a single person, which is motivated by the circumstances of his own existence in an experienced situation. Only the relationship between personal and cultural components of motivation is changing: personal components of motivation are no longer subject to non-personal, but subject them to themselves, but without imperativeness. *The epistemological innovations* are assimilated by the culture as secondary invariants of knowledge realization events, deprived of compulsory obligation.

Personal innovations carry in themselves not “natural” knowledge, but “unnatural” knowledge, which goes beyond the limits of direct a priori obviousness, accessible to everyone, but not obligatory for anybody. For example, in phenomenological theories “immanent objectivity” or “intentional object” is recognized as an essential feature of the psychic in general or at least many realities of the psyche (including value acts), and since this intentional object is in any case understood as a cognitive phenomenon

(even if its content is the fruit of fantasy or delusion), there is every reason to qualify these theories as cognitive. This cognitivism becomes even more obvious when theories describing and explaining value consciousness are built on these psychological concepts basis. An example of such constructions is the theory of morality, in which the phenomenon of morality is directly identified with “moral knowledge” [5].

The source of secondary invariants is that form of relative non-obligation, which is pushed beyond categorical imperatives limits. This knowledge solves the problems of *personal existence* in the culture of a single person and, possibly, the problems of the existence of other people.

This form of knowledge motivation is characterized by the desire to go beyond the restrictive limits of already existing knowledge as a special merit, anticipating the fact of meeting with the “*generating*” situation and the collective or interpersonal interest in its resolution. Its structure can include bold concepts of understanding a single fact, not necessarily confirmed by other facts, and anticipating the possibility of such confirmation, on the one hand, and individual facts that go beyond the limits of understanding and anticipating the possibility of their understanding, on the other [3]. Within the limits of such a knowledge motivation, a theory can develop, not complying with all known facts, without practical applications, and facts can be accumulated and used practically, ahead of their theoretical understanding.

Going out of reality realizing is not just far, but arbitrarily far - without definite boundaries beyond the area of its original origin, it can be combined with limitless localization and the most narrow pragmatic specialization, to the point of alienated knowledge and inalienable personal skill. Knowledge does not necessarily go through all the listed stages, from indefinite readiness and *providential enthusiasm* to a hyper-stable theory capable of adapting to any indefinite aggregate of new facts. But if its cultural functions change, then this evolution goes irreversibly in one direction of the successive closure of motivation to the results of its own realization.

The most obvious feature of our time is the availability of information. On the one hand, this is a blessing, since it significantly simplifies the solution of a wide range of tasks. It turns out that the availability of large amounts of information on the Internet reduces the motivation of students to generate new knowledge. Instead of interpreting the available information, comparing it with personal experience and creating their own new knowledge, students and listeners prefer to search for information on the Internet and automatically transform it into the expected result from them. In this case, the substitution of knowledge with information most often occurs. One of the negative consequences of such a substitution is the destruction of the distinction between knowledge and information in the minds (or subconscious) of students. Another negative result is a decrease in the skill of critical analysis of information that promotes the formation of knowledge. The

second problem, to a certain extent related to the first, can be defined as a paradox of uncertainty. As is known, decision making, which is the most important component of any activity, is associated with the generation of alternatives and the act of selecting one or more of them. Multiplying the number of alternatives often improves the quality of decisions. But the increase in the amount of information available, leading to an increase in the number of alternatives in the decision-making process, reinforces the feeling of uncertainty in the situation. Social psychology has long concluded that the growth of uncertainty, as a rule, leads to increased anxiety and reduces a person's tolerance to the outside world. This anxiety makes it necessary to search for new information in order to reduce uncertainty, but due to the huge amount of information available, uncertainty only increases. Similar position and with knowledge. Knowledge only expands the zone of ignorance.

Here it is appropriate to draw an analogy between the change in the psychology of a man of the Middle Ages, described by E. Fromm in his work "Escape from freedom" [6], and changes in the psychology of our contemporaries. Fromm linked the separation of man from nature and the destruction of traditional social relations characteristic of the Middle Ages, that is, the growth of freedom, with the emergence of a person's feeling of increased anxiety, which led to "escape from freedom." The increase in the availability of information leads to the liberation of a person from "informational dependence", that is, to the same increase in freedom. The enormity of information volumes and the obvious impossibility of reworking them often lead a person to the realization of his own "intellectual insignificance", which further limits the desire to generate new knowledge.

The changes in the nature of human activity and society in the "information age" described by M. Castells [7] led to a number of paradoxes. Anthony Giddens questioned the excessive emphasis on the new role of information in society and led the discussion in a wider framework [8]. He clearly showed that the changes occurring affect the deep foundations of building society, are associated with the erosion of identity, national structure, but, more importantly, highlighted the paradoxes of modern society.

The fundamental error of the society analysis by scientists is that they did not make a difference between information and knowledge. From the critical analysis of F. Webster it is clear that all theories built without such separation have significant weaknesses [9]. However, the criticism of these theories does not open new horizons. It is clear that it is necessary to take the point of view of Theodore Rozak [10] and to make clear distinctions between such concepts as "information", "knowledge", "experience" and "wisdom". This is nothing new. In everyday life, most people imply a distinction between these terms. But science longer ignored these differences.

But this set of concepts is not enough. Productive is the point of view of Nanaki and Takeuchi, which distinguish

two types of knowledge - formalized and non-formalized [11]. Formalized knowledge is that which is "translated" into a verbal form and, therefore, can be encoded. In other words, they can become information.

Formalized knowledge can be transferred from one person to another without direct social contact between these two individuals. Non-formalized knowledge is knowledge that is not translated into verbal form. To transfer non-formalized knowledge, joint activities are necessary. We can get formalized knowledge from the textbook, and non-formalized master knowledge - only after passing the journey of an apprentice. Thus, knowledge becomes subjective and is only partially separated from the subject, to the extent that it can be transformed into formalized knowledge. If we allow subjectivity in relation to knowledge, then it is necessary to link it with the individual intention and the collective intention of society. Knowledge and will are interrelated. In this case, knowledge can no longer be considered outside the experience and intentions of a particular individual, outside of his individual way of thinking. Jean Baudrillard pointed out this peculiarity: "Information becomes more and more, and there is less sense" [12]. Outside the way of thinking, new knowledge can only be obtained through the formal restructuring of information. However, in most cases, information permutations produce only new information, not new knowledge. That is why as a result of the technological revolution in the field of information processing, the volume of information began to grow catastrophically quickly, but the corresponding growth of knowledge does not occur. The search for meaning is the work of thinking, and as a result of this work, new knowledge arises, but it turns out to be closely related to the way of thinking of a particular individual and cannot always be transformed into formalized knowledge. The ability to generate new knowledge can be developed in several ways. One of them is lowering the threshold of sensitivity to cognitive dissonance. For this, it is possible to use the history of science exceptionally efficiently, which is full of examples of great discoveries due to the high sensitivity of their authors to cognitive dissonance. In practice, this sensitivity develops during the critical examination of various kinds of cases, when using the well-known approach underlying business process reengineering: none of the elements of the situation should be taken as an obvious fact. Motivation to generate new knowledge can be effectively formed through group research work, with the proper organization of which a synergistic effect arises and there is an awareness that joint activities lead to the formation of new knowledge. The main in this case is the internal motivation, however, creating new social standards, within which the generation of knowledge provides their creator with high social status, it is possible to use external motivation.

As for the motivation to create new knowledge, and in fact for this creation it is important to realize the fact of the acquisition or generation of new knowledge. It is known that success in achieving the goal is an effective



motivational factor contributing to obtaining even more important results. Meanwhile, in modern universities, little is done to make students aware of the importance of acquiring knowledge. This is due to the substitution of the generation of knowledge by the information transfer that is not connected to the action: not seeing the results of the application of knowledge, there is no motivation for their expanded reproduction.

### III. CONCLUSION

In the context of the modern science discourse of, the problem of the scientific knowledge motivation is increasingly intertwined with the problem of consciousness, since the acts of cognition and observation expand from physical reality to informational reality. The content of consciousness does not affect the nature of reality, but information reality, as a new external reality, forces consciousness to conduct activities in search of knowledge. Based on informational approaches, actions (*efforts*) to resolve cognitive problems of the already practically established synthetic, physical-informational reality create context-dependent knowledge that requires synchronization with the environment. Scientific knowledge combines a spectrum of epistemic values expressed using predicates, therefore, it is motivated to obtain new objective informational links of the spiritual and material, extension and consciousness, body and thought. With such motivation, the autonomy of the cognizing subject is ensured, the opportunity to regulate efforts and perseverance to obtain

new knowledge opens up, and emotions and perceptions of reward are exacerbated when the desired goal is achieved.

The disadvantages of this kind of knowledge motivation are the continuation of its advantages and cannot be eliminated without going beyond its limits.

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