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Are the Ideals of Rationality Rational? On the Experimenter's Regress, the Theoretician's Regress, and the Epistemologist's Progress

Olga E. Stoliarova ✉

Institute of Philosophy of Russian Academy of Sciences,
bd. 1, 12 Goncharnaya St., 109240, Moscow, Russian Federation
✉olgastoliarova@mail.ru

Abstract. The research is devoted to the problem of philosophically justifying rationality, which inevitably takes the form of a circular argument: to define what rationality is, we must refrain from referring to its criteria, which must be rationally defined beforehand. This epistemic circle is compared to the so-called "experimenter's regress". The experimenter's regress involves reasoning in which judging the correctness of obtained scientific results can only be based on the correctness of the procedure of obtaining them and judging the correctness of the procedure of obtaining them can only be done by relying on the obtained results. From the perspective of social researchers of science, the experimenter's (and the theoretician's) regress casts a shadow on traditional theories of rationality that take science as a model of rational knowledge. The research analyzes the experimenter's regress in the context of virtuous and vicious circles. It is shown that the experimenter's regress is overcome by turning to external factors. These factors are proposed to be interpreted in terms of extended rationality. By analyzing the experimenter's regress, social epistemologists consciously or unconsciously rationalize these "external" factors and enrich the concept of rationality. This allows qualifying the circle described by rationality in defining itself as virtuous and the work of the epistemologist as a progressive activity, during which both epistemology and its subject undergo qualitative changes.

Keywords: standards of rationality, epistemology, science, circular reasoning, closure of disputes in science, vicious circle, virtuous circle

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Рациональны ли идеалы рациональности? О регрессе экспериментатора, теоретика и прогрессе эпистемолога

О.Е. Столярова

Институт философии Российской академии наук,
Российская Федерация, 109240, Москва, ул. Гончарная, д. 12, стр. 1
olgastoliarova@mail.ru

Аннотация. Исследование посвящено проблеме философского обоснования рациональности, которое неизбежно принимает форму кругового доказательства: чтобы определить, что такое рациональность, мы не можем не ссылаться на ее критерии, которые должны быть заранее рационально определены. Данный эпистемический круг сопоставляется с так называемым «регрессом экспериментатора». Регресс экспериментатора представляет собой рассуждение, при котором судить о правильности получаемых научных результатов можно только на основании правильности процедуры их получения, а судить о правильности процедуры их получения можно, только опираясь на полученные результаты. С точки зрения социальных исследователей науки, регресс экспериментатора (и теоретика) бросает тень на традиционные теории рациональности, которые принимают науку за образец рационального познания. В исследовании регресс экспериментатора анализируется в контексте концепций добродетельного и порочного круга. Показано, что регресс экспериментатора преодолевается за счет обращения к внешним факторам. Эти факторы предлагается трактовать в терминах расширенной рациональности. Анализируя регресс экспериментатора, социальные эпистемологи вольно или невольно рационализируют «внешние» факторы и обогащают понятие рациональности. Это позволяет квалифицировать круг, описываемый рациональностью при определении самой себя, как добродетельный, а работу эпистемолога — как прогрессивную деятельность, в ходе которой качественно изменяются и эпистемология, и ее предмет.

Ключевые слова: стандарты рациональности, эпистемология, наука, доказательство по кругу, закрытие споров в науке, порочный круг, добродетельный круг

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Introduction

Let us try to justify the legitimacy of the question in the title. At first glance, it is a tautology. We recognize rationality as a value (perhaps the highest value [1]) of our (Eurocentric) culture. It is, then, also an ideal. Value and ideal are extremely

close concepts, often almost synonymous (an ideal is what we aspire to and aim at as a model; a value is what we recognize as desirable or useful and strive for). If this is the case, the question can be reformulated as follows — is rationality itself rational? Thus formulated, the question becomes meaningless. However, the word *ideal* is used in the plural, and the question of rationality is asked in relation to ideals, which apparently cannot be identified with rationality. Ideals of rationality are our images of rationality and, at the same time, normative properties, descriptive characteristics that we attribute to it — these are external forms of its existence, expressing its essence. When we discuss rationality, we must refer to its stable manifestations. It is impossible to understand what rationality is by abstracting from its traits[1]. Alternatively, understanding would be akin to an intuitive *grasping* in which the essence of rationality coincides with its existence. Unfortunately, such an understanding will remain the individual property of the hermetic subject. To achieve an intersubjective understanding of rationality, we need to explicate its characteristics to give the fullest possible definition of what it means to *be rational*.

Epistemic Circularity: Instrument and Outcome

This clarification still needs to make our title question valid. Suppose we appeal to images and ideas of rationality (reasonableness) to work out its definition. However, in doing so, can we ask about the rationality of these images? If we have yet to define rationality and understand it, we need to appeal to its ideals or normative characteristics. It is pointless to ask about the rationality of these ideals. Yet the point is that it is impossible to ask about rationality without falling into a logical circle. On the one hand, rationality is the subject of study in several disciplines. First, it interests philosophers, especially representatives of epistemology and logic. It also comes to the attention of historians of thought and culture, social and cultural theorists, and anthropologists. On the other hand, rationality can only be studied by being armed with a methodological tool, which is rationality itself. In this case, those ideals and criteria we use in the study of rationality must have rational descriptive characteristics, i.e., they must be consciously (rationally) selected by us in advance [4. P. 132; 5. P. 201]. Therefore, although there is a problem of a logical circle in asking this kind of question, we can get away from it only by not asking about rationality at all, i.e., by taking it on faith.

This is often the case. We appeal implicitly or explicitly to rationality without questioning it, as if it were our natural and only possible mode of being ("man is a rational animal"). The situation looks unproblematic once we face the problem of

[1] In *the Stanford Encyclopedia of Philosophy*, there is no article on *Rationality*, although there are articles that discuss certain forms of rationality – *Historicist Theories of Scientific Rationality*, *Instrumental Rationality*, and *Bounded Rationality* [2]. In the Russian New Philosophical Encyclopedia (2001), we find the article *Rationality*; its author, V.N. Porus, in the very first lines, indicates that this term is a problem, "the solution of which is determined by the general content of a particular philosophical and methodological concept" [3. P. 425].

choice. This may be a choice in practical action or the face of theoretical alternatives. The necessity to make the right choice, convincing for us and our target audience, forces us to extract from the depths of implicit knowledge the principles of correct — approved by reason — behavior and thinking, to analyze the criteria of reasonableness, to search for undoubted grounds and justifications for our choice. However, even in this case, the matter does not always come to rationality as such. It is often limited to appealing to some criteria of correct (reasonable) behavior and thinking accepted in a given community. It may be enough to remove the alternative and close the dispute. However, the more general question remains as to why we consider some criteria correct and reasonable and others incorrect and unreasonable, and what, after all, is this correctness or rationality that ensures our correct choice. This is where philosophy comes in, which has long been concerned with questions of ultimate generality relating to the foundations of our thinking, being, and acting.

Thus, we find ourselves together with philosophers in a logical circle. It is different from the trap of circular reasoning, which awaits us when we try to find the meaning of general concepts, such as goodness, justice, and beauty, by pointing to their external manifestations and qualifying them based on general definitions. These traps cause concern among philosophers and provoke debates about the possibility of a priori knowledge, the cognitive status of induction, the nature of universals. In the case of rationality, the situation is even more complicated because when we reason about rationality and its properties, we carry out this reasoning by employing rationality itself. To evaluate the correct result with this tool's help, we must ensure the tool is fine-tuned and functions correctly. We can judge this tool's capabilities and its application's correctness only based on the evaluation of the results obtained with its help.

The situation is analogous to the so-called *experimenter's regress*. This phenomenon was investigated and described by the sociologist of science Harry Collins [6], although in the more general form of skeptical evidence, it was known much earlier; it is traced back to ancient skepticism and is found in the philosophical heritage of Michel de Montaigne [7][2]. If we omit the details, the experimenter's regress argument is as follows. Facts to be trusted can only be obtained with a reliable instrument, but a reliable instrument can only be recognized as one that produces trustworthy facts. Collins' focus is on scientific theory and its experimental verification. In science, knowledge is extracted through observation of nature under predominantly artificial conditions. The reproducibility of artificial conditions is necessary to produce a stable result and verify the original experience. Let us assume that a stable result is obtained and does not contradict the theoretical assumptions and expectations according to which the artificial conditions were constructed. Even in this non-conflicting case, there remains uncertainty as to what

[2] Although H. Collins represents sociology (more precisely, the sociology of knowledge), the target audience of the experimenter's regress argument is philosophers, primarily philosophers of science and epistemologists. It is from their side that the most remarkable reaction is expected.

and by what means we confirm — theoretical expectations utilizing the obtained result or the obtained result employing prior theory and adequately conducted research[3]. The situation is more complicated in the case of an unexpected or questionable result. It is also complicated in those typical cases where the experimenter expects the result obtained but new to scientific community members. Claims from critics may be made about the instrument (Collins considers a gravitational wave detector) or about improperly executed replications (the question of whether perfect replications of artificial conditions are feasible further confuses the matter [9]). In turn, it is only possible to ensure that the instrumental and theoretical components of the scientific problem are securely protected from criticism by considering the data obtained. Suppose the theory allows any variant of the development of events (presence/absence of phenomenon x in the experiment). In that case, the experiment cannot be considered decisive since there is no situation of choice.

Collins focuses on the scientific problem. He describes the mutual determination of theoretical and experiential (experimental) knowledge. The argument presented by Collins is broader than science and scientific practice. He problematizes rational cognition as such in its general sense. Researchers who have taken an interest in the experimenter's regress with Collins' light-handedness rightly draw parallels with Sextus Empiricus' long-known skeptical argument, namely, his discourse on the criterion of truth — to judge a criterion, we need to have an already recognized criterion by which we can discuss it; to have a recognized criterion, we must first resolve the dispute about the criterion [7. P. 139][4]. We find an extended understanding of the experimenter's regress in the reasoning about the theorist's regress. David Gooding writes: "The use of mathematics and logic involves judgment too. It is easy to envisage a theoretician's regress in which skilled processes of modeling, inference-making, and so on, are criticized *ad infinitum*." [11. P. 212]. Daniel Kennefick, involving materials of sociological case studies in the field of theoretical physics, shows that the mathematical result obtained by the theorist is challenged by pointing to incorrect mathematical models and computational algorithms. At the same time, the best or the only means of their verification is the results obtained [12]. If we follow the logic of this reasoning, we will have to admit that the cognitive procedure and its result are doomed to a vicious circle of mutual justification. However, in the actual practice of scientific research, the problem, as a rule, gets a solution. The scientific community's choice in favor of or against this or that result is made due to the

[3] Alexandre Koyré, drawing attention to the flawlessness of the results obtained by Galileo in his experiments with the inclined plane, concludes that Galileo's experiment is an embodied theory [8]. The circular confirmation of theory and experiment should be recognized as natural if we remember that *the book of Nature is written in the language of mathematics*. The mathematical mind modeling Nature and the realized model are consistent. In the proper application of reason, we always obtain the proper result; in obtaining the proper result, we are assured of the proper application of reason.

[4] The close problem of *epistemic regress* is also addressed in modern analytic theories of justification [10].

appeal (implicit or explicit) to "external" factors. These are circumstances such as the reputation and status of scientists, metaphysical beliefs and preferences, peculiarities of collectively learned research techniques, and style of thinking. A scientific result becomes credible when defeated by an alternative that looks less convincing or improbable considering the extrinsic conditions.

The goal of the scientific community's activity is the cognitive exploration of the surrounding world and the production of new objective knowledge that will be collectively recognized as such. When the dispute is closed, the goal is achieved, and science moves on, formulating and solving new research problems. However, what is the situation with philosophical theories of rationality, which apparently must experience problems similar to the regress described above? Do they break the vicious circle, and if so, by what means? Do they appeal to "external" factors, and what factors concerning theories of rationality could be recognized as "external"?

Rationality Bears Witness to Science, Science Bears Witness to Rationality

For philosophical theories of rationality and philosophy in general, unlike science, the state of disagreement is not something out of the ordinary. On the contrary, the more fundamental the issue at hand is recognized, the more disagreement philosophers demonstrate with each other [13]. If scientists argue to close a dispute, philosophers argue to start it. Reaching consensus is optional for developing the philosophical enterprise. Consequently, circular reasoning that fails to achieve reasonable agreement should not appear as flawed as it does in science.

On the contrary, unlike object-oriented science, philosophy, especially epistemology, is introspective and subjects the very procedure of reasoning to reflection. Therefore, epistemologists are much more sensitive to these logical traps than scientists. It is no accident that sociologists of knowledge and social epistemologists have problematized the phenomenon of experimenters' (and theorists') regress. In their search for consistent theories of rationality, they directed their criticism at science and, indirectly, at their argumentation.

The need to elaborate objective (intersubjective) criteria of rationality and to identify stable forms of rational behavior leads rationality theorists to science [14; 4; 15]. Researchers of rationality have reasons to prefer science to other collective practices and types of cognitive activity. A distinctive feature of science is that science prioritizes verification because of its results. However, this verification does not coincide with the reflection of the speculative (philosophical) mind turned on itself. The scientific mind maintains a connection with nature through experience. Therefore, it occupies a specific position: it dominates nature by subordinating it to the internal mechanisms responsible for the observed order of things. Hence, collective skepticism serves as a tool for ridding cognition of "idols" and a means of achieving collective agreement in the face of the obviousness of the correct result. The correct result is recognized as such, which refers to the regularity of

natural processes and can be reproduced many times *ceteris paribus*. Nature is conquered only by submission to it, and what in contemplation appears to be the cause, in action, is the rule. Following this attitude formulated by Francis Bacon, the scientific mind proves successful. Knowledge of causes and anticipation of effects determine expedient, reason-approved (adaptive) behavior that seeks to achieve what is desirable (good) and to avoid what is undesirable (evil).

Science appears for epistemologists as a normative image and a valid example of theoretical and practical rationality. The uncertainty about the rational grounds behind this choice is difficult to resolve. Can we say that science maximally conforms to the criteria and ideals of rationality? Or do the ideals and criteria adapt to a scientific methodology that has proven successful? Or do we again find ourselves in a vicious circle of reasoning that does not allow us to resolve the dilemma in favor of one of the above alternatives?[5] In what follows, I will show that problematizing the experimenter's (and the theorist's) regress 1) balances the first and second alternatives and 2) although it does not allow us to break the logical circle definitively, it does allow us to interpret it as a virtuous one that ensures the development of rationality.

As Collins and his followers demonstrate, it is impossible, while remaining within accepted standards of scientific rationality, to resolve disputes about factual obviousness that arise among members of the scientific community. The fact that such disputes arise in science demonstrates that "obviousness" does not provide a reliable intersubjective foundation for further inferences. The illusion of obviousness (if I may put it this way), which sociologists of knowledge and social epistemologists denounce, has much in common with the *myth of the given* (Wilfrid Sellars), according to which the beginning of the cognitive process is direct (inferable) knowledge that conveys the nonverbal content of sensory perception. Nevertheless, any minimal (initial, inferable) knowledge already contains knowledge, i.e., the content of the experience event, which, in the words of Wilfrid Sellars, is placed "in the logical space of reasons" [17. P. 76]. This means that any obviousness translated into the intersubjective mode can be criticized. Thus, 1) we may assume that the communication about some givenness includes a coherent set of hidden inferences from which it (the givenness) is a conclusion, and 2) we can interrogate these hidden inferences. In everyday communication, we are far from

[5] A.Yu. Antonovski poses a similar problem in terms of evolutionary epistemology: "Does the observer adapt to the observed, developing his means of cognition, which are " 'sanctioned' by the environment, selected by it as adequately fixing it or, on the contrary, rejected by appropriate filters? Alternatively, on the contrary, does the observed external environment offer its observer such 'eminent' or 'useful' properties to be noticed, 'mastered' and selected by the corresponding observer?" [16. P. 105]. A reasonable answer to this question is hardly possible, and it would not solve the problem of the experimenter's regress. Even if we chose one of the proposed alternatives, it would not help us to get out of the circle of mutual dependence on the evaluation of 1) the telescope as a scientific instrument and 2) the results obtained with its help in the case of Galileo noted by Antonovski. Antonovski rightly suggests that the paradox of regress is resolved beyond the subject level of the system – as he writes, in the temporal or social dimension of scientific communication.

resorting to this kind of criticism. However, in science, where clearing the mind of *idols* is a prerequisite for access to *nature*, any *obviousness* comes under suspicion when it first makes itself known. As Collins shows for empirical knowledge and Kennefick concerning theoretical knowledge (Kennefick is referring to mathematical models that make it possible to predict the behavior of an object), there is no method of verifying obviousness that would be independent of this obviousness itself. Defenders of the latter believe that the correct procedure for obtaining it is the one that produces it; opponents believe that the correct procedure is the one that *does not* produce it.

As Collins and his followers suggest, the vicious circle[6] (rather than testing an obviousness for its benignity, such testing is itself an integral part of scientific inquiry) does not fit within the standards of rationality that we think are inherent in science. If, between two alternatives, a scientist cannot make a choice sanctioned by reason, then we were wrong when we claimed that science necessarily realizes the ideal of rationality, i.e., that it makes a reasoned choice in favor of the correct result. Then, we have mistakenly endowed the scientific method with the properties (rationality characteristics) it does not possess. We noted above that rationality is parasitic in its manifestations; it is impossible to talk about rationality without referring to rational behavior. In that case, what conclusion should we reach if we do not find signs of rationality where we had hoped to find them? Should we not recognize that rationality is a contentless concept? Moreover, if we agree with this, should we not also recognize that the only sound advice to which we should resort when discussing rationality was given to us by the ancient skeptics when they enunciated the principle of abstaining from judgment? Since it is impossible to make a reasoned choice, the right thing to do is not to choose at all.

However, theories of rationality show us something different. The principle of abstention from judgment must be implemented in these theories and, as a rule, does not even find support. Of course, epistemologists are human beings like everyone else. They need to earn a salary, and who would pay money to abstain from judgment? Of course, it is not just that. Epistemologists always get out of an epistemic impasse because epistemic discontinuities never remain an insurmountable obstacle in the cognitive activity that is the subject of their study. Epistemologists seek justification for what they observe — the empirical fact of resolving "intractable" contradictions and reaching agreement among scientific community members. On the face of it, Collins and his supporters leave no stone unturned from rationality. They argue that resolving disputes and reaching

[6] Sellars (as, indeed, any critic of foundationalism) faces a similar problem of circular justification (and infinite regress) in his critique of the myth of the given. Suppose no such minimal knowledge is epistemically independent and acts as a fulcrum for subsequent knowledge. In that case, any epistemic "fulcrum" needs a fulcrum, and so on ad infinitum – or in a circle. Sellars tries to avoid the problem by epistemic holism and epistemic multidimensionality (some knowledge, which serves as a justification for other knowledge, is itself supported by other knowledge, yet not linearly and temporally, but structurally and conceptually, and in different relations, i.e., knowledge is supported from different sides at the same time) [17. P. 76–77; 18. P. 88–95].

agreement among scientists is irrational. Collins insists that reason in science does not eliminate but, on the contrary, generates disagreements and disputes: in science, education disputes with education, qualification with qualification, and intelligence with intelligence [19. P. 502]. Consensus is reached when other factors come on the scene. Let us try to look at the "other" factors more carefully. Collins refers to a social solution that ends the dispute based on trust. What is *trust*? In this case, it is nothing more than a substitute for *objectivity*. Scientists express trust in colleagues who propose a language of description and theoretical and practical results that will be accepted by most or all. Epistemologists, albeit social epistemologists, who study the phenomenon of dispute closure may appeal to various "non-scientific factors" for explanation, such as theoretical premises, metaphysical assumptions, thinking styles, reputation and status of the scientist, technical skills, cultural traditions. No matter what we are talking about, all these factors in the hands of the epistemologist turn into reasonable grounds for choice [20]. Even such a seemingly irreconcilable opponent of rationality as tacit knowledge, which Collins considers the key factor that ultimately determines the choice of scientists, turns into an argument in the epistemological *laboratory*. Only in an argument can epistemology explicate it, and then it appears as the accepted rules of behavior, language games, skills, experience[7].

It should be recognized that epistemologists always stay upright. By making epistemic traps and difficulties the subject of study and then revealing the conditions for overcoming them, epistemologists expand argumentation and add to the baggage of grounds for reasonable agreement. As V.N. Porus shrewdly noted, rational criticism, like King Midas, who turned everything he touches into gold, turns any of its objects and fragments of reality into rational constructs [4. P. 83]. If Midas soon begged to be rid of the gift, which turned out to be unbearable, rationality would not think of giving up the development of new territories. Its adaptive possibilities are limitless. We see that social epistemologists and sociologists of knowledge learn from the material they extract from scientific practice. They supplement old and construct new images and ideals of rationality to which science conforms. However, it should be considered that the argument of experimenter's regress and the corresponding discussions arise and get a residence

[7] The concept of *tacit knowledge* was proposed by Michael Polanyi [21] to describe nonverbal knowledge, which is initially *embedded* in the human organism and provides the individual with a gestalt perception of the surrounding world. This perception acts as a condition for the possibility of verbal intersubjective knowledge. Philosophers of the phenomenological tradition, particularly Hubert Dreyfus [22], resort to tacit knowledge to emphasize the non-algorithmic character of human bodily presence in the world that precedes rational knowledge and action. Harry Collins adjusts the concept of tacit knowledge [23]. As a sociologist and social epistemologist, the individualism of tacit knowledge is unacceptable for Collins. Collins believes that it is in language as a social practice that the key to rational knowledge and science should be sought. Tacit knowledge, for Collins, is knowledge of the meanings of word uses, and it arises in the practical interaction of people, i.e., when a human community arises. It is the collective condition for the possibility of rational (articulated, intersubjective) knowledge.

in the sociology of scientific knowledge after the anti-fundamentalist theories of scientific rationality of Karl Popper, Paul Feyerabend, Stephen Toulmin, Thomas Kuhn, etc. are formalized, i.e., against the background of new images and ideals of rationality that epistemologists have provided sociologists of scientific knowledge with.

The Vicious Circle and the Virtuous Circle

The circle in rationality's definition of itself, which we diagnosed at the beginning of this article, has once again closed. Rationality extracts from its images and ideals what it puts into them. It adjusts the criteria of rationality to the scientific method, which is chosen in advance as an ideal that expresses the essential characteristics of the rational understanding of the world. Should this circle be considered vicious? Logicians have continuously negatively assessed circular reasoning, referring it to logical fallacies and emphasizing its ineffectiveness. However, not all philosophers agreed with this assessment. Let us recall Friedrich Schleiermacher and the subsequent hermeneutic tradition, which contributed to the conceptualization of rationality. Although the similarity of the interpretive circle to the vicious circle of the logicians is striking, Schleiermacher speaks of the productivity of circular reasoning. The recursive movement of the interpreter of a text never leads to the preceding position in its original form but rather enriches the understanding at each subsequent turn [24. P. 334]. Wilhelm Dilthey, Hans-Georg Gadamer, Martin Heidegger, Paul Ricœur, and many others shared the idea of deepening and enriching meaning when moving along the hermeneutic circle. In the paradigm of system theories dealing with irreversible processes, the paradoxical idea of circular development (*spiral*) turns out to be highly demanded. Here, the vicious circle is contrasted with the virtuous one in the following way.

Both in the case of the vicious and in the case of the virtuous circle, we are talking about temporal irreversibility. Accordingly, both circles possess resultativity. The difference is that the vicious circle reinforces adverse feedback effects, while the virtuous circle, on the contrary, reinforces positive ones. Based on this distinction, we should recognize the experimenter's regress as an example of a vicious circle if it leads to *pathological science*[8], and as an example of a virtuous circle if the result is an optimization of knowledge. Resting within the discourse of the experimenter's (and the theorist's) regress, we cannot recognize this circle as vicious or virtuous. The point of the dispute between dissenting scientific

[8] The term "pathological science" was first used by the 1932 Nobel Prize winner, the American chemist Irving Langmuir, to describe a state where the scientist is a prisoner of his or her illusions. This state leads to confirmation bias, i.e., not fully realized selectivity of the means and results of research — the scientist seeks and searches for ways to confirm what he is sure of in advance. If the experimenter regresses, circular reasoning, which acts as a feedback system, can lead to pathological science. The experimenter's theoretical expectations push him to accept those results that fulfill the expectations and confirm the (false) theory. The confirmed theory, in turn, reinforces the obtained (false) results.

community members is precisely how to evaluate the result obtained — as false (if we persist in it, we get pathological science), or as true (then persistence proves helpful). Collins and his followers rely on external influences — *other* factors that intervene and break the circle, leading to an agreement between the parties. Let us turn to the theories of rationality that superstructure the experimenter's discourse of regress (though to some extent serving as its basis). We may qualify the circle that rationality describes as virtuous. When epistemologists do their work and identify the *external* or social factors in the closure of *intractable* disputes, they replenish the grounds of rational agreement, expand the ideal and material space of science, and ultimately enrich the notion of rationality. This allows us to interpret the activities of epistemologists as progressive. However, we are not talking here about linear progress but systemic development, characterized by qualitative changes in both the discipline (epistemology) and its subject matter.

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About the author:
Stoliarova Olga E. — DSc in Philosophy, Leading Researcher, Institute of Philosophy of Russian Academy of Sciences, Moscow, Russia (e-mail: olgastoliarova@mail.ru). ORCID: 0000-0002-0033-5906

Сведения об авторе:
Столярова Ольга Евгеньевна — доктор философских наук, ведущий научный сотрудник, Институт философии Российской академии наук, Москва, Россия (e-mail: olgastoliarova@mail.ru). ORCID: 0000-0002-0033-5906