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EFFECTIVE RESISTANCE OF THE SCIENTIFIC COMMUNITY TO SCIENTIFIC INNOVATIONS: THE CASE OF THEORETICAL GEOGRAPHY IN THE (POST) USSR[1]

The scientific community can effectively oppose scientific innovations. At a particular phase of its development, it no longer requires them. They pose a risk to it. We shall refer to this condition as the "Scientific Society in Status Quo' (SS-SQ). The response of SS-SQ to a scientific innovation is influenced more by the potential threats to its stability than by its cognitive value and level of development. The concept of the "implicit bunker of normal science" has been utilized to comprehend the collective response of the scientific community to new scientific developments. Military activity significantly influences the advancement of science and technology, a trend that the author elucidates in the proposed terms. Prior to the war, the formation of an SS-SQ in the country indicated potential; however, the onset of the war revealed its total ineffectiveness and lack of value to both the state and society. This type of situation is frequently observed across various fields of scientific advancement. It is essential to identify a viable solution to the issue that has emerged. This solution is inherently individual. The author, a geographer, presents an example illustrating the evolution of geographical science. During the 1970s, significant transformations took place in the global scenery of geography. Innovative research directions have

[1] Стаття публікується в порядку дискусії. Точка зору автора не у всьому збігається з позицією редакційної колегії журналу.

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emerged, significantly transforming its image and associated with concepts of "new," "humanistic," and "radical" geography. In Soviet geographical science, the adoption of these scientific innovations was notably inconsistent. A narrative has emerged in post-Soviet geographical science regarding a "golden age of scientific development in the USSR". The shortcomings of the USSR during its later stages can be attributed, in part, to the decline in the effectiveness of Soviet science once it shifted its focus inward. Scientific publications have started to be generated in substantial volumes, and bibliometric indicators are showing significant improvements, suggesting an extraordinary advancement in scienti-fic research that is, in reality, not present.

Keywords: *scientific novelty, scientific community in a state of status quo, implicit bunker of normal science, geographical science, the impact of war on the development of science, science of science.*

The relevance of the research. The advancement of science is intricate. The challenges we face are not merely relics of a bygone era. The influence of the Catholic Church on the advancement of science and the resolution of numerous constraints related to scientific knowledge in this specific context is noteworthy. Contemporary researchers have not observed any specific findings. However, they occasionally face a scenario in which a scientific community emerges, claiming that all future advancements will be confined to the prevailing paradigm. Wars play a crucial role in this type of transformation. The consequences of war can extend beyond specific territories or groups of individuals, impacting the prevailing paradigms within various scientific disciplines as well. Before and after the war, numerous domains of scientific endeavour can vary significantly. This has been consistently evidenced throughout the history of science.

The scientific community in the post-Soviet space frequently approaches scientific innovations with considerable caution or even hostility. A creator of a scientific innovation may find themselves marginalized within the scientific community or gain recognition as "a visionary ahead of their time." This does not imply that the innovator possesses genius comparable to that of Leonardo da Vinci; instead, it highlights that an unproductive standard of functioning prevails within the scientific community, which is primarily focused on stifling scientific innovations.

The rejection is less about the inherent nature of the scientific innovation and more about the resistance to such advancements within the scientific community, which often halts progress and views itself as the apex of scientific achievement. Our discussion focuses specifically on Soviet and post-Soviet science, rather than global science. PhD students, initially seen as innovators, transition into roles as professors and organizational directors, often viewing the innovations brought forth by emerging generations of scientists as a challenge to their established status and security within the scientific hierarchy. The prevailing stagnation of scientific personnel in post-Soviet science ensures the inefficacy of the scientific community's operations.

One approach to modernizing science is to transform the perception of scientific innovations. Emerging scientific concepts should not be held to a higher standard of substantiation than the prevailing perspectives within the scientific community. The prevailing scientific concepts frequently represent an entrenched practice that exhibits numerous deficiencies. To comprehend this thesis, it is essential to become acquainted with the philosophy of fallibilism [1—10].

Scientists in the post-Soviet era should not overlook the lessons learned from Soviet science, where its proponents pledged their commitment to Marxism-Leninism, asserting that substantial scientific advancements could only be realized through this framework. However, following 1991, there was a notable shift away from Marxism-Leninism and its perceived "genius," influenced not solely by external factors. The scientific community has developed a strong adherence to its principles and exhibits a robust stance against any perspectives that challenge its prevailing beliefs. The decline of Soviet science serves as a poignant illustration of the potential costs associated with prevailing scientific perspectives and the fervent collective commitment to them.

The focus of this study is the collective response of the scientific geographical community in the USSR and post-Soviet states to significant theoretical and methodological innovations in global science that fundamentally transformed the approach to scientific geographical research, particularly in theoretical geography, which emerged as a considerable challenge. This generated significant tension within the scientific geographical community of the USSR. The process of making decisions about innovations in foreign science was intricate. A conflict between generations occurred. The collapse of the state was also included.

The active involvement of Russian geographers in the "scientific justification" of the Russian Federation's aggression against Ukraine offers substantial new insights into the underlying reasons for the outright dismissal of metageographical reflection [11]. This narrative highlight concerning aspects of the scientific community's willingness to align with the criminal activity of its governing body. This is carried out not with ill intent, but rather as part of a standard procedure.

This article aims to present the findings of a study regarding the collective behavior of the scientific geographical community in the USSR and post-Soviet states, particularly in relation to the emergence of scientific innovations globally.

An analysis has been conducted on the inconsistency and selectivity in the response to foreign scientific innovations. The outcome of this widespread response from the (post)Soviet scientific community is the prevalence of a somewhat outdated perception of what scientific geographical research entails. The pattern is illustrated with two examples.

Research methods and sources of information. The primary research method employed is participant observation. This work draws upon the author's extensive experience in metageography and the development of various theoretical and methodological advancements in the field of geographical science. The initial report on metageography was presented by the author in 1978 at the Moscow branch of the USSR Geographical Society. The author has observed the Soviet and post-Soviet scientific community for a duration of approximately 50 years [12].

The approach of scientometric research holds significant value. The author undertook a study of the citation system to address several issues clearly. The scientometric results of this study were clarifying in nature; therefore, they are not included in the article.

The research also benefited greatly from comparative analysis. Since 1985, the author has accumulated extensive experience working in various countries, including South Africa, the USA, China, Hong Kong, Germany, Poland, the Czech Republic, and others. This experience is crucial for comprehending the intricacies of scientific communities operating within diverse sociocultural contexts. It facilitates an assessment of the evolution of geographical science and the perception of scientific innovations within the Soviet and post-Soviet geographical community, while also considering analogous experiences in numerous other countries globally.

Only a few of the publications has been included in the bibliography, reflecting the article's limited scope.

Evaluation of studies and scholarly articles. The concept of "innovation" serves as a fundamental element that facilitates the publication of texts. Multiple strategies regarding the topic are currently being recognized. The analysis performed with the term "innovation" facilitated the identification of clusters of publications related to this subject:

• Enhancing the effectiveness of scientific research. Frequently, these publications exhibit a high degree of abstraction, asserting a sense of universality [15].

• Research on the implementation of scientific innovations in the People's Republic of China, featuring instances of significant and efficient restructuring of scientific practices [16—19]. This may represent a distinctive experience influenced by the nuances of the Chinese mentality and the dynamics of interaction among the state, society, and individuals. The analysis of the specifics of Chinese culture is largely lacking in these works, with authors primarily concentrating on the formal aspects of the scientific reforms being implemented. This conclusion is also informed by personal experience: from 1985 to 1987, the author contributed to the reform of higher geographical education in the People's Republic of China, which had been adversely affected by the "Cultural Revolution" [20].

• Transforming scientific practices within specific nations. This subject holds significance for numerous nations, particularly Ukraine. The actions of the Russian Federation have generated significant new insights and prompted essential reforms. An active discussion is underway regarding various issues related to the reform of Ukrainian science, including those associated with innovations and the prevailing attitudes towards them [21—23].

• Clarification of terminology and its relevance to particular innovations. This publication examines various innovations that result in significant transformations within specific activities. Such innovations may result in detrimental outcomes for the system [24, 25].

• The application of artificial intelligence (AI) in scientific research. A variety of questions emerge, with the primary inquiry being the extent to which we can place our trust in AI. [26]. A systematic discussion has been initiated regarding the application of AI in contemporary scientific research, led by experts from China. "As a journal dedicated to bridging data-driven science of science research and the broader research ecosystem, we are thrilled to announce a special topic focused on the theme 'AI for Science of Science' " [27]. "We invite researchers, practitioners, and thought leaders to contribute original research articles, data papers, opinions, and reviews that explore the following topics" [28].

A number of scientific journals are specifically focused on the subject of innovations, notably the International Journal of Innovation Science (IJIS) [29]. This journal asserts its commitment to addressing all matters pertaining to innovations and aims to offer comprehensive solutions. I thoroughly reviewed multiple articles from this journal; however, I was unable to find the answers to my inquiries within them.

In my view, a significant limitation of numerous studies concerning innovations in science is their overly general nature. While engaging with various publications, one tends to align with the innovator, empathizing with their challenges and expressing discontent towards any hindrances they encounter. However, when innovation is introduced in your workplace and in real time, the perspective shifts significantly: it is easy to assert that the scientific innovation presented today is "unsubstantiated," "lacks novelty," and to question the credibility of its author, labeling them as "dubious and irresponsible," suggesting that they have no affiliation with our field and show little regard for its advancement. The issue at hand is that a scientist may embrace innovators from the past or those from different scientific disciplines yet hinder advancements within their own area of expertise.

The resolution to the issue is found in the methodical examination of particular scientific fields through the lens of the science of science. It is essential to comprehend the specific scientific community in question and the challenges they face in understanding scientific innovations.

I currently lack knowledge of any comprehensive studies that specifically examine Soviet and post-Soviet geographical science regarding the perception of scientific innovations. Since 1991, there has been a notable absence of significant discourse regarding the modernization of the post-Soviet scientific geographical community and its emancipation from lingering "Sovietisms." In modern geographical science, there is a notable lack of emphasis on scientific innovations and the processes through which they are suppressed by the scientific community.

This situation arises from a lack of adequate metascientific culture within the scientific geographical society, coupled with the existence of several "inconvenient" questions that, when addressed, can lead to conflicts with the scientific community. The post-Soviet scientific geographical community has not engaged in discussions regarding innovation and instead relies on "top-down" directives, which are consistently issued in the Russian Federation, thereby implicating geographers in war crimes [30].

The scientific endeavors of post-Soviet geographers reflect a transition from the prevalence of diverse scientific paradigms, as conceptualized by Thomas Kuhn, to a state-bureaucratic paradigm [11]. Consequently, the resolution to the challenge of a productive strategy for scientific innovations is effectively supplanted by the execution of "recommendations" from the government. There are notable instances of scientific compliance and the rationalization of directives from higher authorities, as demonstrated by Russian geographers, who consistently align themselves with the interests of their assertive state. The transformation process within the scientific geographical community remains largely unexamined.

Research findings. The notion of "the Scientific Society in Status Quo". The scientific community has the capacity to maintain resistance to scientific innovations for an extended period. At a certain stage, it clearly does not require scientific innovations, as it perceives no value in them. All potential research avenues have been thoroughly explored; any new advancements are perceived as threats, leading to efforts aimed at their suppression.

The current condition of the scientific community is not merely a curiosity or coincidence; it is a natural outcome of a well-defined evolution. We shall define it as "scientific society in a state of status quo" and refer to it using the abbreviation SS-SQ.

The reaction of SS-SQ to a scientific novelty is determined not so much by its cognitive value and level of development in strict accordance with the requirements for scientific knowledge in epistemology, but rather by the threats to the stability of SS-SQ. It represents a consistently irrational response. A significant contradiction emerges between scientific and cognitive activities, as scientific endeavors increasingly lack cognitive frameworks and focus exclusively on reproducing the prevailing paradigm. However, this does not concern SS-SQ, as it views such a standard as entirely normal.

The concept of an "the implicit bunker of normal science." The current framework of concepts and terminology within the science of science is inadequate for a comprehensive scientific explanation of the active and effective resistance exhibited by the scientific community towards novel ideas. This phenomenon exhibits remarkable persistence and complexity. A significant amount of data exists concerning numerous instances of categorical and highly irrational denial of scientific innovations, particularly within the scientific community.

The intentional disregard for scientific innovations is often attributed to two factors: a) a new generation will emerge that views the scientific innovation as entirely commonplace, and b) there are individuals who are considered to be "ahead of their time." This approach lacks credibility, as it fails to provide clarity on the actual circumstances in the field of science. The volume of these cases is too significant to attribute solely to factors such as the conservatism of the majority and the exceptional abilities of a select few. It is essential to introduce new concepts to articulate the phenomenon of the scientific community's effectiveness in undermining scientific innovations.

A novel concept that elucidates the resistance of the scientific community to innovations is the "implicit bunker of normal science." I do not claim for an authorship of this term; however, I am not familiar with any publications that utilize it. The implicit bunker of normal science refers to a contradictory and speculative framework of reflection that enables proponents of normal science to uphold the status quo, which they regard as an ultimate objective and value. To maintain the current state of affairs, representatives of normal science are prepared to undertake extensive intellectual efforts within their scientific domain. Depending on the specifics of the state and society, this system of reflection may also entail repressive measures against individuals who seek to alter the status quo and promote scientific advancement.

By "normal science," I refer to the scientific community, scientific organizations, and the prevailing system of knowledge that asserts its scientific status, effectively "stopping time" within their domain of research. The prevailing state of scientific advancement is regarded by normal scientists as definitive, suggesting that it necessitates no amendments and offers a thorough explanation of the subject of study. A normal scientist primarily requires adequate funding from state budgets and private investors to advance their work. His cognitive interests are thoroughly fulfilled.

The concept of the implicit bunker within normal science highlights a prevailing mindset among the scientific community that is disconnected from the emerging challenges of reality. This includes the evolving requirements for scientific explanations regarding research subjects, governmental conditions, and societal dynamics. This concept illustrates the mindset of the scientific community, which has achieved a level of self-sufficiency. Repre-

sentatives of established scientific disciplines frequently claim that their contributions hold significant value and warrant careful consideration, including a preference for minimal disruption from emerging scientific innovations. They view the creators of scientific innovations as unethical individuals and novices, evidently breaching the established behavioral standards of the scientific community recognized in normal science.

This concept defines the defensive response of the scientific community. The emergence of such a state within the scientific community indicates a significant contradiction between scientific and cognitive activities, wherein the latter effectively comes to a halt. The scientific community consistently reproduces established results and is capable of doing so indefinitely, owing to the prevailing influence of the dominant paradigm.

To comprehend the underlying framework of normal science, it is essential to reflect on the writings of Franz Kafka. This world presents a striking array of contradictions and surreal elements, characterized by unexpected sequences, connections of arguments and facts, and illogical relationships between the declarative and actual activities of the scientific community. Science positions itself as the pinnacle of rationality; however, the normal scientific community often presents contradictions to this assertion. The underlying assumptions of normal science serve as evidence of the illogical behaviors exhibited by many scientists.

The scientific community's reluctance to embrace the development of the science of science stems from the understanding that the subject of study may evolve into a framework of worldview characterized as the "implicit bunker of normal science." Consequently, metascientific reflection is frequently viewed in a limited manner, confining it solely to the history of the specific science and various methodological concerns. The standard scientific community requires no additional elements. It firmly opposes the advancement of any innovations specifically associated with scientific research, as they represent a significant threat to the field.

Transforming the cognitive framework of geographical science during the 1970s and 1980s: the evolution of innovations in global science and their reception in the (post)USSR. The 1970s marked a significant period in the evolution of global geographical science, characterized by the emergence of several innovative research directions and the introduction of specialists equipped to undertake such investigations. The prior standard concerning regional geography has become outdated. I had the opportunity to begin my studies in geography at that particular time. Among the key scientific innovations, the following should be highlighted:

• *The "New" geography serves as a prime illustration of the evolution of geographical science, encompassing not only the regional description of specific areas but also a rigorous scientific examination of spatial patterns*. The roots of this

field can be traced to the early 20th century, with its establishment as a field of research occurring in the late 1960s. The primary figures in its advancement were Anglo-Saxon geographers who set the benchmark for "new geography" as a scientific field. William Bunge stands out as a leading figure of this era, exemplifying the characteristics of a scientific revolutionary [31—37]. The most important studies conducted by Western geographers in this field have been translated into Russian, with essential commentary provided in the Marxist-Leninist perspective [38—40]. The translations were executed by skilled geographers who evidently appreciated this scientific innovation. Noteworthy is Veniamin Gokhman from the Institute of Geography of the USSR Academy of Sciences, whose contributions to the advancement of theoretical and methodological innovations in Soviet geographical science were substantial.

• *The emergence of "humanistic" geography represents an unforeseen avenue in the realm of scientific geographical research.* The foundation is rooted in phenomenology and analogous philosophical teachings as articulated in Western science [41—61]. The study was carried out at the convergence of psychology, philosophy, and geographical science. The human habitat developed as a dynamic system, with its perception significantly influenced by the social and cultural specifics of individuals. This innovative approach has introduced numerous new concepts into the field of geographical science. In contrast to "new" geography, it did not achieve recognition within Soviet geographical science for several reasons, chiefly because of its distinct association with phenomenology, which was viewed as a "bourgeois" philosophy. The decision has been rendered. A significant issue was the rudimentary perception of humans in Soviet geographical science, primarily viewed as a component of "labor resources." In the context of Soviet geographical science, it is important to note that there was no distinct field recognized as "Human Geography." The focus was on social and economic geography, with a clear predominance of economic geography, which did not require a systematic examination of human factors.

• *"Radical" geography. The social instability experienced by European states and the USA during this period catalyzed a robust advancement in research within Western geographical science, characterized by its distinctly social focus.* Their foundation comprised a complex interplay of philosophical and social strategies designed to establish a "fair society." This approach extended beyond mere political declarations. A novel theme has emerged, one that had not previously been contemplated by geographers. William Bunge was the most notable figure in the field of "radical" geography [62—68]. He thoughtfully reevaluated his previous groundbreaking scientific contributions and introduced an entirely innovative methodology for advancing geographical science. This approach in Soviet science was viewed as confrontational, stemming from the conflicts between the rigid Soviet interpretation of Marxism and the diverse Western perspectives on Marxism, Maoism, and various other radical

philosophical and social theories. The engagement with pressing social issues was notably absent among Soviet geographers, as they operated within the framework of the state and primarily represented its interests. The experience of Soviet geographers was characterized not by a nation known as the USSR, but by manipulated Soviet statistics. Soviet geographers analyzed the data and demonstrated the "remarkable successes" that this state had accomplished.

Amid the changing environment of global science, the Soviet geographical community initiated a transformation, albeit gradually and with a measured approach. The self-satisfied Marxist-Leninist geographical science of the USSR, at the height of its development, faced an unprecedented challenge. For an extended period, the unfamiliarity with foreign languages and the total disinterest in the scientific advancements of other nations, particularly those in the developed West, benefited Soviet geographers.

Theoretical geography in the Soviet context. The most engaged response from Soviet experts to Western innovations pertained to "new" geography. A cohort of dedicated advocates for "Theoretical Geography" emerged, referred to as "New Geography" in Soviet terminology. During that period, I was a student at the Faculty of Geography at Simferopol State University, and I can affirm that a generational conflict existed. For the geography faculty professors, innovations of this nature were perceived as extraordinary, whereas for me, they were entirely routine.

A notable aspect of Soviet proponents of "Theoretical Geography" was their clearly elitist metropolitan character. The majority of individuals were affiliated with the Institute of Geography at the USSR Academy of Sciences and the Faculty of Geography at Moscow State University. As is often the case, the others chose to remain silent, awaiting the decisions of those in authority.

Among the proponents of this Western scientific innovation, B.B. Rodoman and his affiliated group of advocates distinctly emerged [69—71]. This phenomenon presents a compelling case for examination within the realm of the science of science. This scientific group operated similarly to a sect, characterized by an unquestionable leader and fervently dedicated individuals who exhibited disdain and superiority towards others, asserting that they held a unique truth.

It is evident that the cohort of "scientific revolutionaries" has remained largely consistent over time. During the 1970s, B.B. Rodoman was approximately 45 to 50 years of age, while his devoted supporters ranged from 23 to 25 years old. The leader of this esteemed group reached the age of 92, and his youthful supporters evolved into professors and senior researchers over 70 years of age at prominent scientific institutions in Moscow.

I did not belong to this group; however, I maintained regular communication with its members. Communication occurred during the "Seminar on New Research Methods in Economic Geography." In the totalitarian USSR, it

served as a platform for engaging in discussions about the most intriguing scientific inquiries. The seminar was conducted by Veniamin Gokhman at the Moscow branch of the USSR Geographical Society.

I have consistently found the semantic contradiction to be fascinating. The phenomenon involved the rearticulation of concepts from "new" geography, frequently featured in Western scientific literature, within the framework of Soviet theoretical geography. This process resulted in an "absence of analogs," which was subsequently showcased as Soviet scientific accomplishments, even during the period of Putin's influence on science.

My assertion that "I have encountered similar content previously, and not merely on one occasion," elicited significant backlash. I tend to cease communication when confronted with raised voices, yet I retain my knowledge and understanding. References to foreign literature in the publications of proponents of Soviet theoretical geography were infrequently made. Soviet geographers, lacking familiarity with Western scientific literature, might view the contributions of Moscow experts in "Theoretical Geography" as groundbreaking research. However, from my perspective, it was not considered plagiarism, but instead a form of paraphrasing. Modern computer programs utilizing AI are capable of efficiently and accurately rephrasing a given text expression in multiple ways. In the 1970s and 1980s, the Moscow proponents of theoretical geography engaged in a specific practice: they would take concepts articulated in Western geographical science and translate them into Russian, yielding a "unique" outcome. Given the insular nature of the scientific community, this type of scientific activity was embraced as a form of innovation.

The contradiction within this group of "theoretical" geographers is evident in their nearly total lack of evolution, despite their vocal assertions regarding the direction of geographical science. Following over two decades, the assertions made by these theorists have become regarded in (post)Soviet geographical science as entirely commonplace. The engagement of the (post) Soviet geographical community with original Western publications did not come to fruition, a conclusion that can be confidently drawn from the analysis of citations in publications. The Soviet geographers evaluated the "new" geography that emerged in Western science through translated publications. The fundamental structure of Soviet geographical science remained intact, maintaining its "unparalleled" achievements up until 1991.

The examination of the progression of a cohort of Soviet proponents of theoretical geography presents a compelling illustration of how the discontented graduate students of 1970s Moscow evolved into passionate supporters of the controversial Putin regime, becoming lifelong certified experts who offer "scientific justification" for various state initiatives.

An exemplary case of this is V.A. Shuper [71]. A former graduate student, initially limited to discussing Walter Christaller's central place theory,

has evolved into a recognized authority on Russian affairs, addressing global issues alongside prominent figures associated with Putinism. Such texts are likely to disappear from libraries in the post-Putin era. It is important to highlight that shortly after February 24, 2022, access to the publications of a significant number of Moscow geographers in the database known as "Truth" was restricted [72]. The rationale behind this is significant: following the onset of the full-scale war, the scientific justification presented by Russian scientists appears highly objectionable.

One of the challenges facing post-Soviet science is the evident predominance of the principle of insufficient staff rotation. V.A. Shuper was born in the year 1953. He dedicated no less than 90 % of his career to one institute (the Institute of Geography of the USSR Academy of Sciences and subsequently the Russian Academy of Sciences) [73], progressing from a graduate student to a leading research fellow. The institute in question, recognized as a prominent scientific organization in Russia, offers scientific justification for decisions made at the highest levels of the Russian government. The issue is that certain scientists persist in their active engagement in scientific work and continue to publish their findings in journals indexed in the Web of Science and Scopus databases.

The Siberian Scientific School established by Viktor Sochava. A notable instance of theoretical advancement in geographical science during the 1970s is the distinctly Soviet concept of geosystems. This innovation is linked to the scientific legacy of Academician V.B. Sochava (1905—1978) [74—78]. The concept is rooted in an innovative and effective idea conceived by V.B. Sochava, who proved to be both a skilled scientist and a successful figure in the Soviet academic environment, ultimately achieving the status of academician of the Academy of Sciences of the USSR. In Soviet science, several geographical organizations developed, operating under this scientific methodology and establishing a "regional" alliance linked to Siberian geographers.

Following the passing of the influential leader of the scientific school, geographers commenced their work adhering to the accepted standards of normal science, which impeded the advancement of the scientific school. Confirmation of this is provided by International Scientific Conference "Geosystem Theory: History and Modernity," commemorating the 120th anniversary of the birth of the distinguished Soviet geographer and geobotanist Academician V.B. Sochava (1905—1978), is scheduled to take place from June 16 to 18, 2025, at the V.B. Sochava Institute of Geography of the Siberian Branch of the Russian Academy of Sciences [79].

This is a rare example of a scientific school exemplifies a comprehensive scientific framework: the V.B. Sochava Institute of Geography, part of the Siberian Branch of the Russian Academy of Sciences [80]; various scientific councils authorized to confer PhD and Professors degrees to proponents of

this approach; a robust recruitment of graduate students engaged in research rooted in longstanding traditions; and the scientific journal "Geography and Natural Resources," overseen by advocates of the geosystem concept [81]. This journal, indexed in various databases such as Scopus, releases new articles in each issue that closely resemble research from 30—40 years prior. In this condition, a scientific innovation from fifty years ago can persist indefinitely, given the essential scientific infrastructure for its preservation. The extensive infrastructural capabilities contribute to a continuous rise in the number of professionals who formally align with the standards of this scientific school.

An implicit bunker of normal science can be present in a scientist even during the initial phases of creating a scientific innovation. A scientific innovation arises, led by a prominent figure, potentially giving rise to a scientific school poised for significant development ahead. The specifics of the novelty may involve various implementations at a mass scientific level. Geographical research presents significant opportunities in this area, particularly regarding the study of Siberia and its extensive, underdeveloped regions. This scientific innovation holds significant potential; however, it also encompasses an underlying foundation of established scientific principles. Once a scientific school has been established around an innovative and fruitful idea, the subsequent research tends to replicate previous studies, showing little distinction from work carried out many years prior. The distinctions may solely pertain to the utilization of more sophisticated scientific instruments and digital mapping techniques.

I have presented two instances of scientific innovations along with their eventual outcomes. In the initial instance, the scientific novelty transformed into a collective and nearly cult-like endeavor. Individuals have matured amidst the continuous recurrence of identical content. The emergence of a new chapter in Russian history, linked to Putinism, has prompted numerous advocates of "Theoretical geography" to methodically and assuredly pursue the expansion of the Russian state, while former Soviet dissident graduate students have transitioned into roles as Putinist professors. The second case demonstrates a highly successful and comprehensive advancement of the scientific school. It has the potential to sustain the standard of scientific activity established by V.B. Sochava over an extended period. Both examples share a notable characteristic: the lack of advancement in scientific innovation. The growth in scientometric indicators is notable and substantial in both instances. The leading advocates of the geosystem concept possess the ability to attain any Scopus metrics due to their robust infrastructural capabilities. However, in cognitive terms, there is no change, as the novelty from fifty years ago continues to repeat itself consistently.

Conclusions. 1. The scientific community can effectively oppose scientific innovations. At a particular phase of its development, it does not require

them whatsoever. Scientific innovations pose a risk to it, and it takes all necessary measures to hinder their implementation. The current condition of the scientific community, which emerges as a consequence of its precisely delineated evolution, is referred to as the "Scientific Society in Status Quo" (SS-SQ).

2. The response of SS-SQ to a scientific novelty is influenced less by its cognitive value and developmental level in alignment with the standards set by epistemology, and more by the potential threats to the stability of SS-SQ. It represents a consistently irrational response of SS-SQ.

3. To comprehend the collective response of the scientific community to new scientific developments, it is beneficial to employ the concept of the "implicit bunker of normal science."

4. A primary factor contributing to the effective suppression of scientific innovations is the insufficiency or total inadequacy of the metascientific reflection embraced within the scientific community. The primary reason for this is the scientific community's intention to impede the advancement of science. The current level is regarded as highly comfortable, requiring no substantial modifications. SS-SQ, by actively suppressing accurate metascientific reflection, can further effectively uphold the existing status quo.

5. The successful endurance of a scientific innovation within the parameters of SS-SQ can be characterized as a scientific revolution. This process has consistently demonstrated a lack of rationality throughout the history of science. The survival and advancement of a scientific innovation rely on numerous unpredictable factors, although the likelihood of success is quite limited due to the presence of SS-SQ.

6. While SS-SQ can be sustained indefinitely, the war highlights its utter ineffectiveness and irrelevance for both the state and society, particularly in a critical context. The exploration of innovative methodologies for conducting scientific research commences. During these periods, SS-SQ operates with restricted capabilities.

7. Scientific novelties can take on various forms and, as a result, may be interpreted differently by the scientific community. Resistance to scientific novelties is most prominently observed within the domain of science studies. This area of expertise presents a challenge to SS-SQ. The scientific community is intentionally suppressing such innovations. The approaches to suppression are influenced by the particular characteristics of the era, cultural context, and the scientific community involved.

8. In the 1970s, significant transformations took place in the field of global geographical science. Innovative research directions have emerged, significantly transforming the field of geographical science. They are associated with "new," "humanistic," and "radical" geography. It can be argued that this was a breakthrough towards modern, human-centered, and socially innovative geography, as well as an exceptionally fruitful period in the development

of global geographical science. In Soviet geographical science, the adoption of these fundamental scientific innovations occurred inconsistently and with considerable delay, largely due to the prevailing conservatism within the geographical community. The achievements of global geographical science were often overlooked due to the restrictive nature of the scientific community in the USSR. Consequently, by the end of the 1980s, the scientific geographical community in the USSR appeared rather anachronistic. This situation arose due to the complacency within the Soviet geographical community and its assertion of exclusivity. Following 1991, the lack of adoption of scientific innovations resulted in a noticeable gap in post-Soviet geographical science compared to global standards. In the process of reforming Ukrainian geographical science, it is essential to fully consider this aspect.

9. Certain innovations in Anglo-Saxon geographical science were incorporated into Soviet science through the formation of restricted scientific groups. The focus of the group members transitioned from promoting scientific innovation to a clear distinction from others. This phenomenon is distinctly representative of the Moscow-centered evolution of science within the USSR. An example is presented. For numerous years, the expert group in Moscow, under the leadership of B.B. Rodoman, has consistently emphasized the same scientific theses. Former radical graduate students have evolved into retired professors, yet their scientific concepts have remained unchanged. This illustrates a scenario of scientific advancement that emphasizes the pursuit of prestigious acknowledgment within the national scientific community, rather than focusing on cognitive functions.

10. A noteworthy illustration of the evolution of a scientific innovation in Soviet and post-Soviet geographical science is the concept of geosystems, linked to the contributions of V.B. Sochava. This is undoubtedly a productive innovation, providing an exceptionally vivid example of the manifestation of the implicit bunker of normal science. For many years, there has been a continuous reiteration of the same scientific methodologies. In this condition, a scientific innovation that lost its novelty decades ago can be maintained indefinitely. This exemplifies a quintessential occurrence of standard scientific practice. The cognitive potential of this type of scientific innovation can be characterized as significantly limited. A disconnect exists between scientific activity and cognitive activity. Scientometric indicators are increasing; however, there appears to be a lack of genuine cognitive engagement within the scientific community.

11. In post-Soviet geographical science, a narrative has emerged regarding the "golden age of scientific development in the USSR," which is partially linked to the decline of geographical sciences following 1991. The comparison between what "was" and what "has become" has led to the emergence of the concept of a "lost golden age" within a defined context. However, it is es-

sential to compare it with the developments occurring in contemporary global geographical science, rather than with a totalitarian regime that disintegrated 34 years ago into 15 separate entities. There was no period of ideal scientific prosperity; instead, there existed a geographical science that supported an aggressive totalitarian regime, which ultimately experienced a total collapse. There is nothing to take pride in or to find joy in. An international-scale misstep.

12. A variety of regional conflicts characterized the development following the Soviet era. At a particular stage, wars themselves evolve into a defining characteristic. The Russian scientific community engaged actively and assuredly in the execution of its nation's assertive policy. This situation is significantly altering the surroundings and necessitates careful consideration from the scientific community regarding the current developments. Ukraine is encountering major obstacles. A significant number of individuals are compelled to vacate their residences. Landscapes shaped by human activity over centuries have experienced enormous depopulation. New forms of environmental pollution have arisen. A fresh domain of research has been established. This demands a methodical reevaluation of the standards governing scientific geographical research and a thorough expert discussion on emerging challenges. A crucial aspect of this is the deliberate consideration of scientific studies related to attitudes toward scientific innovations. The role of science studies experts in identifying issues and formulating solutions is highly important. To resolve the issue, it is crucial to perform a thorough analysis of the experiences within the global scientific community in managing similar crisis situations.

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УСПІШНИЙ СПРОТИВ НАУКОВОГО СПІВТОВАРИСТВА НАУКОВИМ ІННОВАЦІЯМ (НА ПРИКЛАДІ ТЕОРЕТИЧНОЇ ГЕОГРАФІЇ В (ПОСТ) СРСР)

Наукове співтовариство може дуже успішно чинити спротив науковим новинкам. На певному етапі своєї еволюції воно взагалі не потребує їх, бо вони стають для нього загрозою. Тому наукове співтовариство робить усе можливе, щоб не дати науковим новинкам розвинутися. Таке становище не є курйозом чи випадковістю. Визначимо цей стан як «наукове товариство в стані статус кво» (*Scientific Society in Status Quo*, *SS-SQ*). Реакція *SS-SQ* на наукову новинку визначається не стільки її когнітивною цінністю та рівнем розробленості, скільки загрозами для його стабільності. Для розуміння масової реакції наукового співтовариства на наукові новинки використано поняття «імпліцитний бункер нормальної науки». Основною причиною негативної реакції наукового співтовариства на новинки є прагнення зупинити розвиток науки, оскільки поточний рівень розвитку воно розглядає як максимально комфортний. На розвиток науки і техніки радикально впливає військова активність, і цю тенденцію розкрито автором у запропонованих термінах. Якщо до війни в країні було сформовано *SS-SQ*, то початок війни показує його повну безпорадність і безглуздість для держави та суспільства. Починається пошук нових форм проведення наукових досліджень. У такі періоди *SS-SQ* має обмежені функції. З подібною ситуацією періодично стикаються в найрізноманітніших напрямках розвитку науки. Це відбувається також у різних країнах світу. Важливо знайти ефективне рішення виниклої проблеми, яке завжди має індивідуальний характер. Автор є географом і наводить приклад розвитку географічної науки. У 1970-х рр. у світовій географічній науці відбулися драматичні зміни. З'явилися принципово нові напрями досліджень, які назавжди змінили її образ і пов'язані з «новою», «гуманістичною» та «радикальною» географією. У радянській географічній науці ці наукові новинки були

засвоєні дуже непослідовно. У пострадянській географічній науці сформувався міф про «золоту добу розвитку науки в СРСР», частково пов'язаний з тим, що після 1991 р. становище географічної науки дедалі погіршилося. В результаті порівняння того, що «було» і що «стало» в замкненому просторі, з'явилась ідея «втраченої золотої доби». Але цей міф не відображає реалії географічної науки в СРСР. Порівнювати треба з тим, що відбувається в сучасній світовій географічній науці, а не в тоталітарній державі. Невдачі СРСР (на пізніх стадіях його розвитку) частково пов'язані з тим, що радянська наука перестала бути ефективною, щойно почала працювати сама на себе, що показано в статті на прикладах формування наукової групи, яка стала розвиватися за принципом релігійної секти, і великої наукової школи, яка пішла шляхом безкінечних повторів. Наукові публікації почали виходити в індустріальних кількостях, наукометричні показники стрімко покращуються, засвідчуючи безпрецедентний «прогрес» наукових досліджень, якого насправді немає.

Ключові слова: *наукова новинка, наукове співтовариство в стані статус кво, імпліцитний бункер нормальної науки, географічна наука, вплив війни на розвиток науки, наукознавство.*