

SCIENCE. DISCOURSES. ROLES

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Abstract. The paper aims to trace the change in the public discourse regarding science and the roles assigned to the sphere of science under the impact of this change. On the one hand, science is a specialized field that develops within a specific context and framework. On the other hand, it is an important part of the social structure, a feature that requires its interaction with other spheres and its striving for legitimization in various contexts. The field of science is characterized by objectivity and credibility, but is put to instrumental uses in the course of social interaction. The paper examines the mechanisms of interaction and functioning of science in three areas of interaction: “science-politics”, “science-media” and “science-society”; it discusses the positioning of science in central, intermediate or peripheral roles within these three areas. Changing conceptions of science also reflect broader social transformations that challenge traditional conceptions of truth and rationality and impose new ways of understanding the role of science in society.

Keywords: science; roles of science; development of social conceptions of science; public understanding of science

It is believed that the spread of fake news, the politicization of science and the feeling that science involves bad practices and conflicts of interest in scientific research are some of the basic factors creating preconditions for growing negative attitudes towards this sphere. In fact, the question of public trust in science is complex and requires tracing the growth of social perceptions of science and its role, in various contexts. The main goal of this article is to examine the attitude towards science in the framework of its interaction with politics, the media and citizens, and to trace the changes taking place in the function of science under the impact of circumstances across various periods.

In Modernity, the sphere of science is a particular field characterized by specialization and concretization (Weber 2022). It upholds rationality and objectivity; does not impose extreme stances; offers impartial information and reliable knowledge about the forms, functions and effects on living conditions of events, processes and phenomena, thereby serving to shape a stance on the issues. Scientists value curiosity, informed and critical thinking. The acquisition of knowledge is a process based on persistent effort; here lies the difference between the scientist and the

dilettante; the purpose of this effort being to acquire new knowledge. Development and progress of science open the path to new conditions and problems and hence to new efforts and goals for understanding and orientation in the practical sphere. According to Weber, scientific advances are the most important part of the process of intellectualization and disenchantment of the world, but they “do not, therefore, *indicate* an increased and general knowledge of the conditions under which one lives” (Weber 2022, p. 118). Rather, the interaction between the scientific sphere and the public is manifest in the established belief that knowledge is accessible and events, processes and regularities are manageable. Thus, the specialized sphere of science becomes a part of everyday life. What becomes democratically disseminated is not so much scientific knowledge as such, in its particular areas, content and depth, but rather the idea of the accessibility of this knowledge in everyday life to all people.

It may be said that this creates conditions for the empowerment of science. The legitimacy of its sphere is linked to utilitarian and pragmatic considerations. Its use in other spheres (everyday life, politics) is presumed to occur in an order of values that are alien to science: the order of assessments, not facts. This allows using science for the public defense of various value stances, while at the same time opening the area of science to various external influences. Weber detected such influence in the dependency of science on political rule, in terms of the funding of scientific production, which leads to its bureaucratization (Weber 2022).

Science and the state

Other authors (Tchalakov, Mileva & Atanasov 2021; Tchalakov, Mileva & Popravko 2021) focus on the interdependence between trust in institutions and trust in science, which is due to the key role played by science in building the social reality of the nation state. In seeking to understand the growing skepticism and paranoid suspiciousness towards vaccines in modern societies, the authors Tchalakov, Mileva, Atanasov, Popravko (2021) view trust in science through the prism of trust in institutions, referring to the thesis of L. Boltanski (Boltanski 2014) and M. Kivinen (Kivinen 2002) as to the place of science in democratic Western states and in Communist countries. In their analysis, they argue that mistrust in science is linked to mistrust in the state and stems from the incapacity of both to maintain the social reality they have created and uphold, the “system of preliminarily established chains of cause and effect that permits forecasting events or at least registering them” (Tchalakov, Mileva & Atanasov 2021, p. 26). Such a system was established with the emergence of the nation state. It even lies at its foundation, and is validated in people’s perceptions through the authority of modern law and modern science. Through the instruments of mass education and the early media, sustainable notions were established regarding an irrevocable order that exists equally in the rules imposed by state institutions and in the order of society and nature affirmed

by science. An important factor here, according to the authors, is that this order is a product of human, not divine, intervention, which has created conditions for the undermining of this order starting from the late 19th and early 20th century. Shortcomings in the functioning of institutions, and the existence of natural regularities of which science is as yet ignorant, unforeseen industrial breakdowns and inexplicable wars and cataclysms occurring in the 20th century destroyed confidence in the established social order and opened the door to belief in the possible existence of a hidden, more authentic reality that actually determines events (in the discourse of conspiracy theories). The authors accept Boltanski's idea that, with the emergence of the genre of detective and spy novels, the scientific methods proclaimed in the media and education in the late 19th century gained even greater popularity (Tchalakov, Mileva & Atanasov 2021, pp. 23-25). This contributed both to the science's democratization and to growing skepticism about its potential.

Science played a significant role in the construction of nation states with democratic governance but also of the Communist states. In the former, science (the modern natural and social sciences, through the promise of industrial development) along with modern law become instrumental. Science is clearly delimited from religion, which the democratic nation state restricts "to a sphere of functioning that has no, and cannot have any, crossing point with reality, because the state assigns to it care for the souls, considered to be part of the inner world of man" (Tchalakov, Mileva & Popravko 2021, p. 177). In the Communist countries, science assumes an even more important role, gaining full monopoly, given the absence of law and religion as social regulators. This absence leads to an additional strengthening of the role of science, „whereby the 'scientific' Marxist-Leninist philosophy becomes the foundation of the natural and social sciences, and the 'scientific communism' established by them as a political theory sets the framework of state governance" (Tchalakov, Mileva & Popravko 2021, p. 182) and is assumed to be a basic factor of social progress (Bauer, Petkova, Boyadjieva & Gornev 2006).

In the framework of both state systems, the predictability of social reality is shaken by processes that are not amenable to the management either of science or of the government, contrary to preliminary expectations. Such a development creates the need for a narrative that differs from what institutions and science had expected and promised; it damages their authority both in the democratic and in the Communist nation states, which came with the "promise of an even more stable social order" (Tchalakov, Mileva & Popravko 2021, p. 171). This had an effect on social attitudes and gradually led to increased weakening of the trust in institutions and science, in their actual capacity to influence events; along with this, it led to the rise of conspiracy theories, together with increasing trust in "the family, friends and religion as typically 'premodern', dating from before the nation state, mainstays in the individual's life" (Tchalakov, Mileva, & Atanasov 2021, p. 29). In this respect, the impact upon the sphere of science and the de-

crease of trust in science (registered in social surveys) are even more prominent in the East European countries due to the specific processes described in the two types of countries. In a comparative perspective, a substantial role is played in the latter type by the absence of a public environment that would allow for a constructive public debate on science (characteristic for democratic countries), given the functions of the mass information media in various ideological contexts (Bauer, Petkova, Boyadjieva&Gornev 2006).

In the limited public sphere of the Communist bloc countries, the positive role of science was not brought up to public discussion but was presumed by the government. After the democratic changes in the early 1990s, the governance mechanism that had maintained a positive perception of science broke down. The sphere of science was now expected to participate actively in public debate and to legitimate itself as socially useful in the context of a problematic construction of democracy, globalization, disinformation and sustainable public attitudes which synchronize their trust in science and the government amidst a weakening of ties between the two. After the democratic changes, the public conversation about the significance of science after the democratic changes in Bulgaria was set and conducted (albeit unstably) within the framework of the model of the public understanding of sciences prevailing in the democratic countries. The growing proximity to that model in Bulgaria developed after the formation of a public environment after 1989 and through the developments in public discourse about science and technology typical for the last quarter of the 20th century, where “science was presented in its positive role for social development, but increasingly with the potential for unforeseen and problematic consequences for the environment and for society“ (Bauer, Petkova, Boyadjieva&Gornev 2006, p. 122).

The development of public discourse

In his article entitled “The Evolution of Public Understanding of Science: Discourse and Comparative Evidence”, Martin Bauer (2009) distinguishes three stages in the development of public discourse on the public understanding of science. These stages, albeit put in chronological order by the author, are not marked by completion and do not exclude one another but rather expand the boundaries of a rather artificial discussion between the broad public, scientific institutions, the market and science policies (Bauer 2009). According to Bauer, the discussion goes on in a framework that in fact shifts the focus from science to social limitations, assigns inappropriate roles to science, and implies the application of science to achieving goals in areas and realities alien to its specificity. Ultimately, the three conceptions shape the development of public policies and of public discourse on science, in addressing problems, shortcomings and remedies without making significant headway with regard to the basic goal of shortening the distance between science and society and achieving better mutual relations between the two.

The public understanding of science has been traced through the implementation of three programs: Science Literacy (1960s – 1980s), Public Understanding of Science (1985 – 1990s) and Science-in-Society (1990s – to the present). These projects have addressed three different sets of problems: the broad public's insufficient understanding of facts established by science; the public's insufficient understanding of the sphere of science; and an insufficient understanding of the public on the part of scientists. The relevant deficits identified in these frameworks are: a knowledge deficit on the part of the public; a deficit of public support for science; and a deficit of public trust in expertise (Bauer 2009).

According to the concept of Science Literacy, public skepticism towards the sphere of science would be overcome through a focus on science education in educational institutions. Efforts here are centered on measuring scientific literacy as well as the political use of science. Public Understanding of Science requires the involvement of mass information media and achieving a change in the attitude to science through positive media coverage. In this program, efforts are aimed at disseminating larger and more positive scientific information; in a media context, this means using advertising and PR instruments; in fact, “the issue becomes one of ‘sexing up’ evidence. The public is the consumer who is be seduced. In this log, there is little difference between scientific news and washing powder” (Bauer 2009, p. 225). In the context of public communication and public opinion, shaped through “publicly manifested” opinions by the media (Habermas 1995), the Science-in-Society program turns to society, offering public deliberation and participation¹. Here efforts aim at improving the communication skills of scientists and enhancing scientists' attention to public opinion in order to restore public trust in science. Science and science policy are being opened to the public. Attractive events are organized to make science understandable to a broad public; the interaction between society, market, and technologies is intensified; a more pragmatic, economically useful approach in science is better appreciated; and the discussions become oriented to the effectiveness of public participation in science policies and the inevitable reexamination of the topical issues raised in previous conceptions (Bauer 2009).

The concept of citizen science makes the boundaries of science even more permeable. Citizen science aims to improve the public's understanding by providing non-professionals with access to and participation in scientific research, creating conditions for joint production of knowledge by scientists and citizens. It expands the production of knowledge beyond scientific institutions by actively including the public at large in research activity “following the norms and values of institutional science” (Strasser, Haklay 2018, p. 33). According to the observations presented in *Citizen Science: Expertise, Democracy, and Public Participation*, the impact of citizen science is much more visible as regards expanding the boundaries of research topics, orienting the focus of research interest to socially useful topics, at the expense of the economic approach; it creates tension between, on the one

hand, those who strive to turn citizens into scientists and, on the other hand, those who hope to change the meaning of science by allowing non-professionals to take part and contribute to scientific knowledge. Citizen science is least able to influence possible negative attitudes towards science or to increase public trust in science because those who engage in cooperation already have a positive attitude to and curiosity about science. Ultimately, “the impact of citizen science on attitudes towards science, depends on whose attitudes precisely we focus on” (Strasser & Haklay 2018, p. 64).

In fact, the efforts to increase public interest in science raise additional questions that practically shift the focus from the sphere of science as such and multiply discourses, including discourses about the population’s factual knowledge, about the ways of adequately and objectively measuring that knowledge, but also about the disputable justification of taking into account public opinion when making political decisions; about the medicalization of science news (Bauer, Petkova, Boyadjieva&Gornev 2006; Bauer 2009); about the effectiveness of public participation (Bauer 2009). Thus, the topics of science are used in various contexts for achieving goals beyond those of science: political, media-related, economic goals.

The context of the postmodern knowledge society

In emphasizing that skepticism towards science is a resource that should be encouraged (in view of the growing interaction between science and business and the development of science according to the logic of the market), Bauer seeks proof of a change in the public’s attention to science. Based on mass media monitoring in the British Press (1946 – 1992) and large-scale comparisons for scientific literacy, attitudes and interest, in the context of Europe’s transition to an information society, he shows that the public’s understanding of science is not a constant magnitude and is not influenced much by actions within the three conceptions presented above. Bauer reveals the importance of some quite different factors influencing attitudes towards science.

According to him, in the context of the information society, most information does not support positive attitudes towards science, and “familiarity might breed (some) contempt [or at least a sceptical loyalty]” (Bauer 2009, p. 231). In information societies, the interest in and attitude towards science vary depending on the degree of social-economic development and are characterized by inter-generational dynamics. People are generally more knowledgeable of science because education is the key driver of scientific literacy and economic development, but “below a certain level, knowledge drives positive attitudes, beyond that point, knowledge drives skeptical attitudes towards science” (Bauer 2009, p. 230). While education and scientific literacy in less economically developed countries lead to positive attitudes towards and even an “ideological” support for science, in the wealthier countries more knowledge means greater skepticism regarding the potential of science. More

skeptical attitudes are typical for those who adopt a more pragmatic approach to scientific activity, taking its consequences into consideration.

Moreover, the intensive supply of science news does not necessarily mean a positive presentation of science. News that place science in a negative light are not always related to skepticism about science but rather to the mixing of science with other areas (for instance, biotechnologies), which elicit more negative attitudes. Science news is not necessarily the best liked part of the information stream (Bauer 2009). The presentation of science in the public sphere is instrumentalized, used according to the specificity of the area of communicated news. “Science faces three public arenas with epistemic autonomy: the structures of government, the massmedia and everyday conversations. Scientific activities are sometimes centre stage, but mostly not... Their functions vary, but primarily they modulate and synchronize public attention, contribute topics to everyday conversations, and provide orientation and meaning” (Bauer, Petkova, Boyadjieva & Gornev 2006, pp. 100 – 101).

Without denying the importance that interaction with society has for science, Bauer insists on the need for greater depth in considering this interaction. Public opinion is a crucial feature of scientific operations and a condition of science continuity, but the science-society relationship should be viewed in context and “cannot be accounted for as mutual deficits. First and foremost, relationships are characterised by relative distance and quality of conversations” (Bauer 2009, p. 235).

The latest research insists on changing the approach to the concept of disinformation and post-truth so that it would reflect the changes taking place in social practices and approaches to science. Post-truth is defined as a set of circumstances under which the objective facts have less weight than emotions and personal convictions in the formation of public opinion (Oxford English Dictionary 2016); it simultaneously presents and shapes the present state of things, gradually changing social practices. Some researchers (Rommelteit 2021; Pellizzoni 2021; Petrova 2024) believe the post-truth situation creates conditions not only for the erosion of public opinion but also for deadening it in its hitherto familiar shape. As a result of the domination of social networks in the media context, “the citizen is taken out of the scene and replaced by the consumer of content, whose individual preferences may be changed according to an algorithm” (Petrova 2024, pp. 120 – 121).

One must not approach the concept of post-truth only as something that describes only present-day social changes. In forcefully raising the question as to “who has a privileged right to knowledge and reality, once it is recognised that any knowledge or piece of evidence is partial, perspectival, and always to some extent shaped and limited by human interest and perspective” (Rommelteit 2021, p. 2), post-truth succeeds in touching upon all spheres of social reality. Moreover, “post-truth concerns the statute of reality” (Pellizzoni 2021, p. 66). It indicates changes

in the position of science in society and in politics. It evidences an expansion of the existing boundaries through the undermining of the collective resource of a shared meaning, perception and understanding of truth. Post-truth simultaneously indicates and brings about changes in the established meanings, practices, processes and social notions of science and politics. It manifests itself as an intensification of the processes, practices and institutions of modernity, thereby changing their meanings and qualities (Rommetveit 2021). It is an anti-system trend provoked, fueled and suffered at the political, scientific-technological and everyday levels, which is presented as an already mainstream capacity to criticize and question legitimacy. However, it is also related to a significant change in the public's understanding of risk: a movement from the perception of risk within the boundaries of insecurity (a situation that requires caution and control), to its perception as an opportunity and as imagination that allows for multiple interpretations in thought and action. There follows a gradual change, evident in the permeability of knowledge to the (deemed possible) collective meanings and boundaries of interpretations and behavior. The ongoing intensification processes, strongly fueled by the social media, reformulate the connection between knowledge and power, and have at least three dimensions: "further weakening of collective meanings, blurring of boundaries, and the politics of time" (Rommetveit 2021, p. 19).

Conclusion

A key conclusion from the analysis is that both politics and science change their collective meaning and significance, and assume new roles for social development: ranging from structure-defining (in the development of the nation state) to structure-supporting (in the interaction science-society-media-market-technologies) to one of the many possible interpretations of social reality; here, underlying the skepticism toward science is a change in the status of science.

The study of public perceptions of science analyzes the problem in three perspectives: that of the interaction between science and the state; that of the development of public discourse on science; and in the context of the postmodern knowledge society. Research traces the change taking place in the functions of science within the framework of its interaction with politics, the media and citizens. This field of scientific research is characterized by objectivity, rationality, and validity, and functions authentically in a specific context but is also instrumentalized in the framework of social interaction, a trend leading to the use of science in various contexts, such as those of politics, the media and everyday life, often with disregard for the specificity of science as such. The interaction of science and society requires paying attention to the context, to the quality of information, and to the role of science within specific social practices. The development of science in a historical context reveals science's interaction with the state, where political and social instrumentalization often effaces the distinguishing features of scientific activity. The

politicization of science, the growth of fake news, and the public's associating science with bad practices and conflicts of interest undoubtedly create preconditions for growing negative attitudes towards science, but skepticism towards it is a result both of its confusion with other areas and with various social-economic contexts, and also of a change of the social environment and practices². Thus, changes in the understanding of science reflect a broader social transformation that challenge traditional conceptions of truth, rationality and objectivity, offer multiple valid ways of interpreting reality, ways that may exist simultaneously and impose new ways of thinking about and understanding science and its role in society.

NOTES

1. Science in-and-of Society, Declaration on Science and the Use of Scientific Knowledge and the Science Agenda: Framework for Action, UNESCO, 1999. This includes the concept of citizen science.
2. A dimension of the politicizing of science through disinformation and fake news can be traced along the growing popularity of conspiracy theories disseminated in the new media. According to Petrova (Petrova 2024, pp. 136 – 137), analysis of conspiracy theories allows tracing the public battles over “truth”. Inasmuch as trust in science and in official knowledge is strongly shaken, it remains unclear who is to assess what is true and self-evident. Such an assessment should take into account multiple actors and forms of knowledge; thus, along with radical approaches to the analysis of conspiracy theories, those theories may be seen as a borderline area that maintains the epistemological authority of science.

REFERENCES

WEBER, M., 2022. *Dve lektsii: Politikata kato prizvanie. Naukata kato prizvanie*. Sofia: Iztok – Zapad [in Bulgarian].

PETROVA, S., 2024. *Novi medii i postistina*. Blagoevgrad: Izdatelski kompleks N. Rilski [in Bulgarian].

HABERMAS, J., 1995. *Strukturni izmenenia na publichnostta*. Sofia: TsID [in Bulgarian].

TCHALAKOV, I.; MILEVA, B.; ATANASOV, D., 2021. Vaccination hesitancy: mistrust in medical science or mistrust in the state institutions. *Sociological Problems*, Special Issue 54, pp. 5 – 33. ISSN 0324-1572. [in Bulgarian].

TCHALAKOV, I.; MILEVA, B.; POPRAVKO, I., 2021. Nation-state and knowledge in late modernity: “hidden reality”, paranoia, and conspirative theories. The nation-state perspective problem of sociological expertise. *Sociological Problems*, Special Issue 54, pp. 162 – 199. ISSN 0324-1572. [in Bulgarian]

BAUER, M.W.; PETKOVA, K.; BOYADJIEVA, P.; GORNEV, G., 2006. Long-term trends in the representations of science across the iron curtain: Britain and Bulgaria, 1946 – 1995. *Social Studies of Science*, vol. 36, no. 1, pp. 99 – 131. ISSN 0306-3127 DOI: 10.1177/0306312705053349

BAUER, M. W., 2009. The evolution of public understanding of science – discourse and comparative evidence. *Science, technology and society*, vol. 14, no. 2, pp. 221 – 240. ISSN 0971-7218. DOI: 10.1177/097172180901400202.

PELLIZZONI, L., 2021. Post-truth or pre-emptive truth? In: ROMMETVEIT, K. (Ed.). *Post-Truth Imaginations: New Starting Points for Critique of Politics and Technoscience*. pp. 65 – 85. Routledge. <https://doi.org/10.4324/9780429053061>.

ROMMETVEIT, K., 2021. Introduction. Post-truth – another fork in modernity's path. In: ROMMETVEIT, K. (ed.). *Post-Truth Imaginations: New Starting Points for Critique of Politics and Technoscience*. pp. 1 – 30. Routledge. <https://doi.org/10.4324/9780429053061>.

STRASSER, B., HAKLAY, M., 2018. Citizen science: expertise, democracy, and public participation. Swiss science council. Available at: https://www.swir.ch/images/stories/pdf/de/Policy_Analysis_SSC_1_2018_Citizen_Science_WEB.pdf. [Viewed 2024-7-8].

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