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Yugoslav science during the Cold War (1945–1960): socio-economic and ideological impacts of a geopolitical shift

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Two ideological views on science dominated the Cold War era: one of a free and apolitical science, and the other emphasizing partisanship in science, associated with the Western and Eastern Blocs, respectively. This study offers a specific perspective of important elements belonging to these scientific positions, as it reveals their entanglement with geopolitical and socio-economic processes of the (semi)peripheral Yugoslav socialist system during the Cold War period. After the Second World War, and before its break with the USSR in 1948, Yugoslavia tended to emulate Soviet ideology in all aspects of society, including science. In the period following this break, the Yugoslav socialist regime, at least initially, leaned heavily toward the Western Bloc. By comparing Yugoslav science before and after the break with the USSR, this study provides insight into the consequences of the geopolitical shift and socio-economic transition of the Yugoslav socialist system, primarily in terms of the model of scientific organization, financing, and scientific discourse. Exposed to the dynamics of decentralization and, to a larger extent than before, market forces, Yugoslav socialism after the break with the USSR adopted a specific form, namely Socialist Self-Management. Herein, I show that this led to the emergence of novel organizational and discursive tendencies in Yugoslav science, which were compatible with certain aspects of the perspective of science as 'pure', autonomous, and apolitical.

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Introduction

During the Cold War period of intense geopolitical and ideological conflict between the United States (US) and the Soviet Union (USSR), science held an immensely important position in both blocs (Graham, 1993; Leslie, 1993; Pollock, 2006; Wolfe, 2013). In accordance with the Manichean approach that dominated international relations, science in the Cold War was characterized by two dominant ideological views.

One involved the concepts of autonomous, value-neutral and apolitical scientific endeavors (e.g., Polanyi, [1962]2000; Merton, [1938]1973), prevalent in the US and among its allies. Mutually different philosophical positions, diverse regarding certain questions about the nature and role of science in society, as well as not always necessarily directly connected with Cold War (e.g., Merton), nevertheless found their place in the Cold War ideological struggle for the soul of science and its representation (see e.g., Wolfe, 2018; Aronova, 2012). In this struggle it was asserted, and not only by philosophers and scientists (see e.g., Kartman, 1945), that the only way of preserving the integrity of science is the exclusion of “communist science”, as well as the negation of its scientific character, which was more than often denoted as ideological, and consequently as pseudo-scientific (see e.g., Popper, [1945]2011; Kartman, 1945).

The other was that of the Soviet Bloc, which emphasized “partisanship” in science, or class-conscious science (e.g., Lenin, [1909]1977; Rubinstein, [1931]1971). According to this perspective, the idea that science can and should be independent in relation to society whose part it itself is—is not sustainable. In a capitalist society which is intertwined with opposed class interests, the science is essentially in the service of the particular interest of “the ruling class”—“the bourgeoisie”, whose final goal is the preservation of the existing order of inequality. In order for this to be changed one needs the class-conscious science: science that is, according to this view, in service of the working class (e.g., Lenin, [1909]1977). According to Marx, if the working class is led by its own objective interest, it strives for classless society (Marx, [1848]1986). Therefore, it is necessary, for the science to correspond with general social interest, that it is in the service of the interests of working class (e.g., Lukacs, 1971).

In reality, both blocs, however, deviated significantly from their stated viewpoints on the nature and role of science. Science in the USSR, for example, was frequently influenced by the Bolshevik state apparatus (Krementsov, 1997; Gerowitch, 2002; Pollock, 2006), which failed to adequately articulate working-class interests in the USSR (e.g., Bettelheim, 1976; 1978; 1996). Moreover, owing to research on the nature and role of science in the West, attention is now increasingly being called to the ideological function of the discourse on free and apolitical scientific research, as well as the use of science by the Western Bloc during the Cold War (Greenberg, 1999; Reich (2005); Krige, 2006; Wolfe, 2018).

The nature and role of science in the context of the transition of the Yugoslav regime following its break with the USSR provide fertile ground for research on the two ideological perspectives during the Cold War. In this analysis, I will not address the concept of ideology solely through an ideology-critique prism, which views ideology as false consciousness, but rather in conjunction with an ideology-theoretical approach, which provides an analysis of the mechanisms, processes, and structures that enable the hegemony of certain ideas (Gramsci, 1980; Rehmann, 2015).

In this regard, I present basic ideological insights regarding science in Yugoslavia before and after its break with the USSR¹, with particular focus on the developments in the Yugoslav socialist system following its separation from the USSR. These insights allow us to trace the emergence of specific elements in line with the autonomous science perspective and their impact on

the dominant scientific discourse, scientific organization, and financing in socialist Yugoslavia. In this way, I hope to create space for further consideration and contextualization of Yugoslav “socialist science” during the Cold War, as well as to investigate a different—(semi)peripheral—perspective on the nature and role of both “autonomous” and “partisan” ideological positions on science during the Cold War.

At the end of the Second World War in Southeast Europe, after the anti-fascist partisan movement led by the communists, with Josip Broz Tito at the helm and alongside allied forces, defeated the Nazis and abolished the monarchy, Yugoslavia initiated the construction of a new, socialist, system. This system was built on the foundations laid by the Popular front with the general support and assistance of the USSR, whose socio-political model was emulated by Yugoslavia (Petranović, 1980, pp. 376–398; Životić, 2015, pp. 11–17). Unlike other satellite states in the Eastern bloc, Yugoslavia was positioned as an independent center of communist power, much to the displeasure of Stalin, the leader of the Soviet Union’s at that time. In 1948, an international crisis caused Yugoslavia to leave the Eastern bloc after the USSR accused it, among other things, of reintroducing capitalism and nationalist tendencies (Bakić, 2011, p. 25; Čalić, 2013; IB Resolution²).

The West viewed “Tito as the greatest dissident of the new era”, assessing that he “made a dent in the monolith of the communist unity by standing up to Stalin” (Bogdanović, 2013, pp. 147–148). Therefore, despite the ruling socialist ideology in Yugoslavia, the US decided to aid the war-ravaged and devastated country under the threat of attack by the USSR (Jakovina, 2002, p. 32; Čalić, 2013, pp. 228, 236). These circumstances led to Yugoslavia opening up to the Western Bloc (Bogetić, 2000; Jakovina, 2003). To maintain its socialist ideology oriented toward workers’ control while exposed to the dynamics of decentralization and, to a greater degree than before, market forces, the Yugoslav socialist system evolved into a specific form—that of Socialist Self-Management (Čalić, 2013, p. 238).

This situation introduced novel approaches to the organization and financing of science in Yugoslavia, altering official views on the nature and role of science and scientists. I explore the effects of the geopolitical shift of socialist Yugoslavia, after its break with the Eastern Bloc, toward the Western Bloc. I analyze the impacts of socio-economic changes that followed on Yugoslav science, caused by Yugoslavia’s shift from a planned to a (controlled and incomplete) market economy, in terms of the scientific organization model, financing, and official scientific discourse. Through the comparison of science perspectives in Yugoslavia prior to the Tito-Stalin split in 1948 and after, I show that novel elements in Yugoslav “socialist science” were compatible with certain aspects of the perspective representing science as ‘pure’, autonomous, or apolitical. Considering the context of the Cold War struggle for hegemony and the dominant ideological perspectives of science during this period, I find the case of Yugoslav science useful as an additional, (semi)peripheral example of these viewpoints, entangled with the international position, as well as structural and political changes of the Yugoslav socialist system.

Through mapping the ideological changes in Yugoslav science after the break with USSR, blurred lines and merging between “autonomous” and “partisanship” representations of science are emphasized in this article, despite their proclaimed sharp opposition during the Cold War. Thus the space for research of the nature of these concepts within specificities of geopolitical and socio-economic context of Yugoslavia is opened. Although it is doubtlessly connected with relation of main actors in this period—USA and USSR—the ideological framework of Yugoslav science is, first of all, a consequence of the specific way of adaptation of Yugoslav state to Cold War, as well as of the need for a greater

independence in this turbulent time. Through analysis of the dynamics of relation between science and ideology in the case of Yugoslavia, the elements of state or party intervention are imposed as a key factor in formation, but also limitation of both scientific freedom and scientific partisanship. On the basis of insights during research, I try to answer the question regarding the existence of the need for additional and deeper investigation of the relation between science, ideology and state in various socio-political contexts during the period of the Cold War.

Yugoslav science prior to the Tito-Stalin split

I begin with an analysis of the aspiring organizational and financial model, as well as the official stand on the nature and role of science in Yugoslavia before its break with the USSR. The period in question is one in which the ideology of Soviet science held hegemony. Nominally, the Soviet perspective insisted on the importance of political and economic conditions for scientific development, planning principles, the unity of theory and practice, as well as the class-conscious character of science, specifically its partisanship (e.g., Lenin, [1909]1977; Bukharin, [1931]1971; Graham, 1967). Only after science is openly placed in the service of the working class (proletariat) can its social function be associated with “universality”. For Marxists in general, the interests of the proletariat correspond to “universality”, i.e., the general interest of society, to which science cannot fully contribute as long as it serves the capital under the guise of “autonomy” (Marx, [1856]1969; Marx, [1848]1986). In the USSR, partisanship in science, on a practical level, implied the influence of party politics on scientific activity (Krementsov, 1997; Gerovitch, 2002; Pollock, 2006). However, several critics on the left argued that certain Bolshevik party decisions, in reality, were not always aligned with the objective interests of the working class (e.g., Cliff, 1963; Goldman, 1996), which was also shown by academic researchers (e.g., Bettelheim, 1976, 1978, 1996; Graham, 1996).

Soviet model of scientific organization for a war-ravaged country. After the Second World War, Yugoslavia was an economically and culturally underdeveloped, war-ravaged, and poverty-stricken country with a weak foundation for industrialization. Thus, industrialization, as well as educating the population became “the people’s task” (Bilandžić, 1985, pp. 112-114; Čalić, 2013, pp. 227-233). “The inherited backwardness was best illustrated by the number of illiterate inhabitants, which was 44.6 % before the war, and 56.4% among the female population, according to the 1931 census” (Bondžić, 2018, p. 201). The insistence on modernization in society also had an ideological dimension; it was a crucial requirement for building and further developing socialist relationships in Yugoslav society, which the country was striving for at the time. The first five-year plan reflected the Communist Party of Yugoslavia’s (CPY) attempt to reinforce the concept of communist modernization (Obradović, 1994, p. 41), with science playing an important role in general social development (Ristić, 2013: 342, 349, 350). The task of scientific institutions was to “produce Marxist scientific youth who would master the knowledge and technological and technical procedures for the achievement of the plan for early industrialization and electrification of the country, in addition to other plans” (Bondžić, 2018, p. 203). The ruling system’s political ideology dictated a dominant perspective in society in terms of the nature, role, and desired model for organizing and financing science.

Up until the break with the USSR, authorities and scientists in Yugoslavia propagated the Soviet approach to scientific³ and socio-political issues, opposing “various deficiencies” inherent in what they deemed to be “bourgeois science”. This view was

reflected in Tito’s speech delivered in 1947, on the occasion of him being named an honorary member of Yugoslav Academy of Sciences and Arts in Zagreb, Croatia (JAZU). Among other things, Tito noted that scientists in the past were oftentimes exploited, just like other workers. As an example, he mentioned Yugoslav-American inventor Nikola Tesla “whose scientific findings enriched many American and other capitalists enormously, [but who] died as a poor man without any means” (Tito, 1959, p. 209). He stated that in a socialist society, scientists enjoy “limitless possibilities” for their work, as well as respect and care from the people, who hold power and thus the means of production in such a system (Tito, 1959, p. 209). Tito concluded that in Yugoslavia, “as it has already been accomplished in the USSR, science [...] is becoming the people’s property because the people benefit from its results” (Tito, 1959, p. 210).

Before Yugoslavia ceased political and scientific cooperation⁴ with the USSR, its preferred model of scientific organization was that of the USSR. This was evident in early 1948 at the founding meeting of the Yugoslav Council of Academies, where the Council was tasked with “leading and supervising scientific and artistic institutions across the country. To coordinate this work, a Council of Academies should be formed as part of the federal government.” The Council was “the advisory organ of the federal government regarding scientific and artistic work of federal importance, a coordinating structure for scientific and artistic work of all three academies (Serbian, Slovenian, and Croatian), a body that represents our country in international scientific and artistic organizations.” It was also decided that “[t]he Council would communicate directly with the Presidency of the Government, and that its budget would be part of the Government’s budget...” (Korolija, 2017, pp. 1162-1163; Meeting of the delegates of Yugoslav republics’ academies, 1948; CIA Report, 1954).

The institution to assume such a role in the USSR was the Academy of Sciences of the Soviet Union. From a hierarchical point of view, the Academy was a key scientific institution under the direct jurisdiction of the Council of People’s Commissars (effectively the Soviet government). Universities and other institutions served as mediators between the Academy of Sciences and social life, while scientific work was mostly planned and supervised by the Academy. Such a centralized and planned organization aimed to coordinate scientific institutions and enhance the compatibility and cooperation of ‘pure’ science and praxis (Guins, 1953; Graham, 1967; Korolija, 2017, p. 1163). Therefore, it is not surprising that publications such as *The Academy of Sciences of the Soviet Union* (1945), which promoted the Soviet model of scientific organization and partisanship in science, were translated, published, and distributed in Yugoslavia at the time. During this period, scientific activity in Yugoslavia was “funded directly from the federal and budgets of federal republics” (Blagojević, 1982, p. 316).

The Soviet approach to scientific issues in Yugoslavia during this period was also evident in the discourse that dominated public discussions on the topic, especially in journals of scientific and propagandist nature (see e.g., Miloradović, 2012; Duančić, 2019; Bondžić, 2010).

Promoting the concept of Soviet science. After the war and before the break with the USSR, the *Journal of the Society for Cultural Cooperation of Yugoslavia and the USSR*⁵ (*Yugoslavia-USSR*) was published in Yugoslavia, as an important tool for the establishment of Soviet ideological hegemony. (Miloradović, 2012, pp. 201–217). This journal represented “the most effective and most permanent” product of the work of the *Society for Cultural Cooperation of Yugoslavia and the USSR*. It was issued

from November 1945 to June 1949 (Miloradović, 2012, p. 208). The journal featured propaganda articles glorifying the achievements and ideas of the Soviet way of life, including its military, economy, science, and culture. As this study also examines scientific changes in the context of dominant economic tendencies, I present the prevailing economic perspective at the time, which was also propagated through this journal.

In line with its ideological role, the journal presented the Soviet economic model, specifically the *principle of planning*, as one of the “most important economic laws in the development of the socialist mode of production” (Nikolin, 1948, p. 8). A clear example of the glorification of planned economy is an article⁶ criticizing, one might even say mocking, the discovery of “free planning” by the then-ruling Labor Party in Great Britain (Strumilin, 1947, p. 4). The topic this text deals with is the decision of the UK Labor government to nationalize only hard coal mines and English banks, while as for the rest of economy it chose to focus itself on studying of it, making of “the prognosis for the future” and creating of economy plans, as well as appealing the employers to fulfill them. From the standpoint of Marxist-Leninist view on the economy this was evaluated as a naive political idea, because it is based on the presumption that capitalists shall act against their own objective private interest for the sake of the general interest of the society and the workers. According to Marxism-Leninism the interests of workers and capitalists are economically opposed. That is why those who advocate the interests of the working class, according to this perspective, require nationalization and state planning within the economy (see Lenin, 1918). In accordance with this position Vlado Begović, a prominent Yugoslav political figure and president of the Federal Planning Commission of Yugoslavia, presented the view that a “[s]tate economic plan is the basic element for managing the economy” (Begović, 1946, p. 14).

When it comes to the concept of a planned economy, it is important to note that at this time, it was given substantial consideration in the context of scientific activity in Yugoslavia and its connection with the economy. Accordingly, the documents of the Committee for Schools and Science within the Government of Yugoslavia from 1947 state the following:

“The ever-increasing demand and necessity of planned management raises the issue of planning in the field of scientific work, planning scientific institutions, coordinating their work, closer connection with the tasks of the economy and building the country, as well as planning of cadres.” [Establishment of the Committee for Scientific Institutions, 1947]

Moreover, based on the Decree of the Committee for Scientific Institutions, Universities, and Higher Education Institutions passed in 1947, the Committee was established “for the purpose of planning scientific work, as well as establishing a unified management of scientific institutions, universities, and higher education institutions and planned education of senior professional cadres...” (Decree of the Committee for Scientific Institutions, Universities, and Higher Education Institutions, 1947).

Returning to the journal *Yugoslavia-USSR* (1946), I refer to an article⁷ by Yugoslav professor Đurđe Bošković about Soviet scientists, who had spent some time in the Federal People’s Republic of Yugoslavia (FPRY), and whose work “demonstrated how far science had progressed in the USSR”, compared to the science that was “independent of society.” Bošković saw this as one more reason for Yugoslav science to become “the most reliable instrument in the service of life, society, man – science in which theory and practice merge into a condensed and indivisible whole...” (Bošković, 1946, p. 40). The stance was clear:

Yugoslavia must emulate the USSR’s “Leninist-Stalinist” model of science. The model’s stated objective was to blur the line between theory and practice, specifically “pure” and “applied” science, and bring about its synthesis in the general interest – that of the working class. The Marxists (see e.g., Bernal, [1954]1971), who linked this division within science to Western view on its nature and role in society, most often have seen it as artificial, especially from the standpoint of history of science; which is not an attitude reserved only for the theory of Marxist orientation (see e.g., Gooday, 2012). From the way how dynamics of the relation between science and society in socialist society was understood, within the scope of applied sciences, there emerges an idea about the need of planning the research of scientific topics relevant for concrete needs of the existing society, and not “only” the focusing on application of already existing “pure” science in practice (see e.g., Graham, 1964).

The extent to which Yugoslavia attempted to emulate this model and the position of science it aspired to achieve is evidenced by the position presented by communist thinker and chairman of the Committee for Science and Education of the FPRY Government Boris Zihlerl, likewise published in the journal *Yugoslavia-USSR* (1948). In his praise for Lenin, Zihlerl emphasized his enormous contribution to social sciences, as his “teachings and works erased” the division between exact (natural) sciences and inexact (social) sciences, “demonstrating” that social phenomena can also be studied with exactness, with revolutionary social practice serving as “the scientific criterion that confirms or rejects the propositions of social science” (Zihlerl, 1948, p. 4). More precisely, Marxism, according to this perspective, is a social science

“whose objectivity stems from its class character; it is the science of the most revolutionary class in history, a class that is not only not interested in maintaining itself as a class but one that is fighting for the abolition of itself as a class, for the abolition of classes and class differences as such, and the establishment of a classless communist society.” [Zihlerl, 1948, p. 6]

In this context, Zihlerl points out that Lenin “indicated that in a class society, where hostile classes with different interests and different worldviews stand against each other, science cannot stand above classes, and that thus there is no such thing as a classless, impartial, nonpartisan, ‘objective’ science” (Zihlerl, 1948, p. 4).

Thereby, *partisanship* in science represents the basic conceptual difference between the class-positioned perspective and the so called autonomous, value-neutral scientific elements that dominated through the ideology of science perspective associated with the Western bloc in that period. Emphasizing the impossibility of apolitical science in a society (and about a society) marked by conflicting class interests implies that, from a Marxist standpoint, the discourse on independent science was more of a false consciousness than a genuine desire for true objectivity. (Bernal, 1939; Lukacs, 1971; Korolija, 2020)

However, the Marxist perspective didn’t negate the possibility of scientific objectivity. Marx alone “seems to claim something like scientific objectivity for his own theory” (Railton, 1984, p. 813). Marxist critique of science in bourgeois societies is based on the premise that ruling ideas in class organized capitalist society are always the ideas of the ruling class. Thus, the function of dominant ideas within the system of social inequality is reflected in the fact that the interest of the ruling class which, from the Marxist point of view, is always a particular interest, is represented as common interest. That is why the ideas of a ruling class are seen as universal, rational and valid. According to Marx “modern industry [...] makes science a productive force

distinct from labor and presses it into the service of capital” (Marx, [1867]1967, p. 361). In bourgeois society, in the final instance, the science also reflects dominant material relationships (see e.g., Marx, [1846]1974). In this way it represents particular interests – only the interests of the ruling class, which implies that it cannot entirely be in the service of true objectivity, which for Marxists is always universal, that is in relation with general interest of society (e.g., Marx, ([1848]1986); Lukacs, 1971).

This means that the class oriented science is in the service of the interests of the largest part of the society—the working class. According to this perspective, true objectivity is achieved not only by examination, but also by placing science at the service of working-class interest, i.e., the class which strives to destroy class established social relations and to abolish itself, all with the goal of creating a classless society, which according to Marxist theory represents the general social interest. In this way, through connecting with social universality, and not to particularity, the universal character of science and the scientific objectivity, according to Marxists, become possible (e.g., Marx, ([1848]1986); Lenin, ([1909]1977); Bernal, 1952; Bernal, 1953; Lukacs, 1971).

Researchers noted that in the USSR “[t]he special connection [...] between Marxist philosophy and science [...] allowed for the expansion of Marxism into the natural sciences, both theoretically and institutionally” (Aronova, 2011, p. 179). A similar connection is observed in Yugoslav natural science journals published before the break with the USSR. Accordingly, the first two issues of the Yugoslav popular science journal *Priroda (Nature)* (February 1945), re-launched after the war by the Steering Committee of the Croatian Natural History Society, were clearly critical of the notion of “science for science’s sake”. The journal’s ideological character was described as being close to the “People’s Government”, while the journal’s founders (“our anti-fascist-natural-scientist”) advocated for the connection between science and social practice.

The journal *Nauka i priroda (Science and Nature)* was founded by natural science societies and researchers and was aimed at “all those” who wanted “to complete and enlighten their knowledge of the natural sciences with a materialistic understanding and interpretation” (Editorial staff, 1950, p. 713). Apart from presenting achievements in the natural sciences, the journal made it known that its task was to clarify the role that “science plays in the construction of socialism and the achievement of the five-year plan” (Editorial staff, 1950, p. 713). An article⁸ in this journal discusses Lenin’s criticism of “idealistic deviations” in the interpretation of recent scientific findings (seemingly incompatible with materialism), warning the reader that a “good natural scientist” does not necessarily make a “good philosopher”. In addition, there were warnings about “relativism” and the “traps of anti-scientific tendencies” that lie in wait for “inconsistent materialists” (i.e., those who are not dialectical materialists) (Maksimov, 1949, pp. 243–244).

There was furthermore a tendency to shape humanities and social sciences following the Marxist-Leninist paradigm. This is evidenced by brochures from the *Science and Society* series, which were published in Yugoslavia in 1946 and promoted a Marxist-Leninist outlook on social science and philosophy, as well as their role in society. Accordingly, in there one finds criticism of the attempt by “some scholastics or mechanists to turn philosophy into empty, detached reasoning, with nothing in common with human practice...” (Pavlov, 1946, p. 64).

Despite Yugoslavia’s relative autonomy in comparison to other countries of the Soviet Bloc, it nevertheless aspired to follow the Soviet model of scientific organization, financing, and views on nature and the role of science in society. This was viewed as a sharp criticism of autonomous science and the continuous

emphasis of the necessity and advantages of the principles of planning, partisanship, unity of theory and practice, and a highly centralized organization—which Yugoslav officials, as well as some scientists, saw as important traits of Soviet science. Nevertheless, as Tito and Stalin ceased cooperation in 1948, the Yugoslav scientific sphere also faced significant consequences.

Although, if looked at formally, the process of implementation of the socialist system according to Soviet principles lasted during a relatively short period, the mechanisms and effects of this process were rather noticeable in Yugoslav society in a longer period, even after 1952, when a different socio-political system was officially established—the Socialist Self-Management (see e.g., Kuljić, 1998).

Structural and ideological shifts in Yugoslav science after the break with the USSR

Following the sudden, bitter, and tumultuous break with the USSR, resulting in an exceedingly hostile relationship with the entire Eastern Bloc, Yugoslav foreign policy underwent critical changes, notably, an opening to the West (Bogetić, 2000; Jakovina, 2003). Despite this shift, Yugoslavia maintained its own socialist ideology (which differed from that of the USSR) (Jović, 2003, pp. 130–131; Bakić, 2011, p. 26; Čalić, 2013, pp. 234–252), and accordingly, science in Yugoslavia remained under the dominant influence of socialist ideas (e.g., Najbar-Agičić, 2013). Despite the fact that Yugoslavia never abandoned socialist ideology, the geopolitical shift towards West contributed, to a certain extent, to the strengthening of “the pragmatic course of Yugoslav foreign politics” (Kuljić, 1998: 258), which was reflected in internal socio-political and cultural circumstances in the country. Herein, I analyze the emergence of novel scientific tendencies in Yugoslavia as well as their certain compatibility with concepts as ‘pure’ science, autonomous science, or apolitical science, associated with the representation of the Western ideological perspective during the Cold War. The intention of this work is not to exclusively point out the changes and imply their (in) congruence with Marxist-Leninist ideological assumptions regarding science, but also to discuss the importance of certain geopolitical and socio-political dynamics when these changes are at issue.

To better comprehend changes in the official ideas governing Yugoslav science and its organization and financing in the Cold War context, I begin with a summary of the basic assumptions of ideas of ‘pure’, autonomous, or apolitical science. This view holds that science should be independent of society, because the pursuit of knowledge is its most fundamental value and goal, whereas the insistence on planning and centralization subordinates science to the state (e.g., Polanyi, [1962]2000; Merton, [1938]1973). According to sociologist Robert Merton, the scientific ethos, autonomy, and validity of scientific knowledge are all interconnected in such a way that “freer scientific communities who have institutionalized ideals of ‘pure’ science are more likely to produce true knowledge” (Panofsky, 2010, p. 142). In other words, a scientist must be “free to do good science” (Krige, 2006, p. 146). This is not how the West viewed scientists in the USSR, which was characterized as a totalitarian system in the western Cold War discourse. This ideological demarcation was often used, ostensibly for professional reasons, to discriminate against scientists of communist affiliation in the West (see Krige, 2006, pp. 115–153). The concept of a “party line” was presented as a “key factor that distinguished Western from totalitarian science” (Wolfe, 2018, p. 32). Because political demarcation was transferred to the level of ‘pure’ professionalism, the idea that intellectual merit, rather than political preferences, was the deciding factor in selecting scientific projects – this could have been

considered a determinant of American science during the Cold War, although reality was somewhat different (Wang, 2002; Krige, 2006; Aronova, 2012; Wolfe, 2018).

The split with Stalin in 1948 initiated the process of ideological transformation in Yugoslavia, whose important developments occurred in the early 1950s with the inauguration of the new ruling paradigm – that of Socialist Self-Management (Jović, 2003, pp. 130–131; Čalić, 2013, pp. 238–242). After the break, the USSR went from being a socialist ideal (celebrated in all social spheres as the opposing force to the capitalist West) to an example of “state capitalism”, under which the working class was “far worse off than in most backward capitalist countries” (Tito according to Rajak, 2011, p. 25).⁹

Weakening of the Soviet organization model in Yugoslav science. The novel tendencies that emerged after the break with Stalin brought about structural changes in Yugoslav society, but also problems on multiple levels. Importantly, changes at the economic level had a significant impact on science. Decentralization of the economy began even before the formal introduction of “workers’ self-management” (Šetinc, 1978, p. 25). As early as 1952, at the Sixth Congress of the CPY,¹⁰ there were open appeals to weaken the state influence on Yugoslavia’s economic system in favor of a freer market. The involvement of Boris Kidrič, the President of the Economic Council of the Government of Yugoslavia and member of the Secretariat of the Executive Committee of the Central Committee of the LCY, is particularly noteworthy in this sense. According to him, “the new economic system should be based on objective economic laws and avoid administrative suppression of those laws to the greatest extent possible” (Kidrič, 1952, p. 130). Socialist Self-Management in Yugoslavia was closely intertwined with calls for less state interference in the economy, in contrast to an important element of Marxist economic theory – the planned economy. The Yugoslav leader, Josip Broz Tito, speaking of workers’ self-management at the Sixth Congress of the CPY in 1952, stated that “true democratic management begins where state control over economic affairs through its apparatus ends” (Tito according to Šetinc, 1978, p. 25).

The extent to which market reform in Yugoslavia was pursued, even though “it supported dynamics that generated social inequalities” (Lebowitz, 2012, p. 165) is evident in Tito’s later criticism of the reform: “certain forces and exaggerated idealization of the effect of the law of value and free supply and demand” (Tito, 1958, p. 56) are to blame for the population’s lack of supplies: “Here, one forgets that planned socialist production necessitates more or less planned distribution of products, greater control of the market and prices” (Tito, 1958, p. 56). According to Leon Geršković, a prominent Yugoslav jurist and participant in the drafting of all of Yugoslavia’s constitutions from 1946 to 1974, the contradiction between “planned economic management and the unrestrained market mechanism characterizes the whole economic mechanism in Yugoslavia” (Geršković, 1958, p. 20).

This socio-economic transformation of the Yugoslav system brought about changes in the financing of scientific research. “[F]ollowing the enactment of the Federal Law on the Organization of Scientific Work in 1957 and the establishment of the Federal, Republic, and Provincial Funds for Scientific Work, the process of establishing a more direct relationship between science and the users of its services began” (Blagojević, 1982, p. 316). Although scientific activity was still government-funded, science began to be supported “through special social funds or direct contracting with economic actors and other users” (Blagojević, 1982, p. 316). In other words, novel socio-economic tendencies arose within Yugoslavia, with further integration into the market economy,

which influenced science, bringing about changes in terms of financing that were in line with the economic turn.

Moreover, these tendencies led to the weakening of centralization in the very model of scientific organization. A good example of this was the substantially reduced role of the Council of the Academy of Sciences in the management and supervision of scientific activity. At the meeting of the delegates of Yugoslav Academies in 1959, it was decided that the Yugoslav Council of Academies would terminate its role as the leader and supervisor of scientific and artistic work in the country, and cease being the advisor to the federal government regarding scientific issues. This meant that the Council lost its position¹¹ defined by the above-mentioned founding meeting. Thus, the Council was left with the role of a representative at international events and loose coordination between the Yugoslav republics’ Academies. They were also, to an overwhelming degree, responsible for their own funding. At this meeting, it was decided that for the financing of scientific activities, the Council must address the federal council in charge of scientific work. Hence, the federal budget would cease to directly finance scientific activities (a reversal of the decision previously made at the founding meeting of the Council in 1948), shifting the financial burden to the republics’ Academies (Korolija, 2017, p. 1167–1168; Meeting of the delegates of Yugoslav republics’ academies, 1959).

On the basis of the effects of socio-economic changes in scientific sphere, in terms of organization, which to a great extent (still) remained in accord with Soviet principles of centralization and planning, one may notice that in the case of Yugoslav science the process of decentralization in organizational sphere have matched the new impulses of deregulation in economic sphere. Decentralization, which in itself is not necessarily opposed to socialist theoretical principles (see e.g., Supek, 1971), but also not opposed to ideological representation of the values of Western science, here is related to introduction of economic deregulation. In this way the science in Yugoslavia, in structural sense, due to geopolitical shift of Yugoslavia in 1948, demonstrate the socialist adaptation to geopolitical and socio-economic, socio-political processes, which in the given period of Cold War is more in accord with proclaimed values of the Western bloc.

Change in the official discourse of Yugoslav science. Geopolitical and societal dynamics after the break with the USSR likewise influenced the nature of the dominant scientific discourse in Yugoslavia, which was mainly defined by the Cold War context. On a theoretical level, the concept of more autonomous science was propagated (Ristić, 2013), which marked certain deviation from the thereto dominant view that science must be in a close bond with the realities of society. Structural changes in Yugoslavia’s economy were brought about *by request* from the West (Bogetić, 2000, pp. 14, 15, 90, *italics added*),¹² in the context of weakening the planned economy and introducing a market economy, which in ideal-typical sense is linked to liberal ideology (Hunt, 1981). These correlated with changes in certain aspects of science. At first, these changes were structurally relatively subtle and occurred at a slower pace. However, in the speeches of Yugoslav party officials and ideologues, these changes were considerably more explicit and could be detected shortly after the break with the USSR. This was evidenced by the party’s dissatisfaction with Yugoslav (scientific) publications, due to the inclusion of translations of articles authored in Russian, etc. In accordance with some new political changes that took place in 1948, journals had to be directed toward a more local perspective (Duančić, 2019, p. 69).

At the Third Plenum of the Central Committee of CPY held at the end of 1949, the Party’s leadership demanded that in

ideological and scientific activity focus be placed on the study of the so-called Yugoslav experience. This was accompanied by a softer stance on the part of the Party leadership toward academic workers, subjects of “bourgeois” ideology, who, before the break with the USSR, were seen as a major problem and obstacle to the construction of socialism. Such an approach now became “sectarian”. (Petranović, 1988, p. 319) In this context, Milovan Đilas,¹³ an important party official and ideologist, in 1949 asserted that it was “necessary to vigorously suppress the wrong, sectarian attitude toward old experts and old scientific and teaching staff” (Đilas, 1985, p. 312). At issue is a certain weakening of the idea of philosophical struggle understood necessarily as class struggle in theory by Marxists-Leninists see e.g., Lenin, ([1909]1977). In the same speech, Đilas criticized the USSR’s administrative apparatus, as well as the exaggerated planning in education and science (Đilas, 1985, pp. 288-289).

The insistence on weakening of centralization and other elements of the Marxist-Leninist ideological line in science is likewise reflected in Đilas’s view of the role of the Ministry of Science and Culture (MSC)¹⁴ and the Committees for Science and Culture, asserted also in 1949. According to him, “[t]he MSC should limit its activities to solely federal educational, cultural, and scientific matters and the appropriate federal institutions” (Đilas, 1985: 308), as well as general supervision of republics’ institutions, convening conferences, etc, while “[e]verything else should be left to the republics” (Đilas, 1985, p. 308). In other words, Đilas was in favor of ridding the MSC of the role of “administrative and bureaucratic leadership.” Đilas believed that this would help the development of science and culture by “reducing bureaucratization.” The Third Plenum of the Central Committee of CPY marked an undeniable formal ideological break with the cultural model of the USSR (Dimić, 1988, pp. 241-245). Thus, in the eyes of Yugoslav authorities, the organizational model of the USSR went from being the most efficient organizational model to the most ineffective one shortly after the break.

That same year (1949), a party official and key Yugoslav ideologist Edvard Kardelj¹⁵ (in his acceptance speech to the Slovenian Academy of Sciences) talked about the “anti-scientific” tendencies of the USSR, which “turned science into bureaucracy lackeys” (Kardelj, 1950, p. 4). Such criticism of Soviet bureaucracy (and its attitude towards science) was characteristic not only of the opposing camp during the Cold War (e.g., Polanyi’s criticism) but also of political organizations whose criticism of Stalin’s regime remained affirmative of Lenin’s teachings (e.g., Trotskyist organizations). In accordance with this it seems that changes within socialist Yugoslav science, especially in the context of the critique of USSR, represent an attempt of overcoming what was often emphasized as one of the main negative aspects of Soviet science, which prevents its scientific development—the extremely bureaucratic system of USSR.

Bošković (1981) noted that Kardelj declared science to be autonomous from the state apparatus. This is particularly evident in Kardelj’s words that “true science in our country cannot serve anybody or anything other than truth and progress, and such a role of science is especially useful for our people’s, socialist state” (Kardelj, 1950, p. 6). Kardelj’s speech represents a negation of Soviet science in stating that:

“we can talk about partisanship in science only in the sense of its social, class determination of human knowledge. In contrast to that, however, the creators of the pragmatist concept of ‘partisanship’ declare as truth all that in their short-sightedness they consider useful for a certain political tactic and socio-economic practice, while in reality confusing their desires and needs for objective truth.” [Kardelj, 1950, p. 4]

In other words, Kardelj (1950) rejected partisanship in science as a perspective in which science is part of the “state apparatus”. Accordingly, Bošković (1981) wondered whether Kardelj “generally rejected the concept of partisanship by specifying the conditionality of knowledge in this way” (Bošković, 1981, p. 3).

Kardelj criticized the cult of Soviet science (in the first place Soviet social science), which he referred to in his speech as the “theory of Soviet science’s leading role”. In this regard, he stated as early as 1949 that “recently, some people have crossed the threshold of ridiculous trying to justify that role” (Kardelj, 1950, p. 5). Kardelj went on to elaborate (1950) on his remark by claiming that the authors of this theory do not present concrete results of Soviet (social) science, but only refer to “some kind of right of inheritance”, by which he means “that only the leading cadres of the USSR are able to provide for the whole world the final and conclusive determinations of certain social phenomena, anywhere on the globe” (Kardelj, 1950, p. 5).

At the same time, Kardelj’s speech declared that the road to freedom of intellectual creativity was paved in Yugoslavia:

“We feel that our scientific workers must be free in their work. Particularly because without differing opinions, scientific discussion, critique, and verification of theoretical positions in practice, there will be no progress, nor will there be a successful struggle against reactionary concepts and dogmatism in science. Our scientists must address scientific issues courageously and without awe in the face of petrified dogmas.” [Kardelj, 1950, p. 6]

This marked the beginning of a new relationship between science and creativity in Yugoslavia in general (Dimić, 1988, p. 255; Kašić, 1989, p. 210).

The freedom of scientific creativity in Yugoslavia, conditionally speaking, proclaimed after the break with the USSR, was a result of the country’s political choices and decisions. Similar observations were made on American scientific freedom during the Cold War, which “had to be constructed and maintained through a series of political choices” (Wolfe, 2018, p. 2). In this sense, when analyzing the nature of science in Yugoslavia, it is necessary, at least roughly, to contextualize the aforementioned processes of shaping Yugoslav science towards greater autonomy after the break with the USSR. This should be done while keeping in mind that the entanglement of politics and science is a feature of the Cold War in general (see Solovey, 2001; Oreskes and Krige, 2014 (eds), Aronova, Turchetti (2016)), and not unique to socialist systems.

The proclaimed change in the social position of science that Kardelj announced is Titoist, i.e., an ideological break in the sphere where a political showdown between Yugoslav leadership and the USSR was taking place. The “official line” character of this anti-Soviet speech was evident, as it was published in multiple places, including the scientific journal *Science and Nature* in 1950.

Đilas (1951) continued to criticize the ideology of the USSR while advocating for “socialist democracy”, which he primarily opposed to “bureaucratism”. He compared Soviet ideology to dogmatism, emphasizing its lack of scientific and dialectical rigor, and argued that its subjects are “those who learned Marxism from Stalin rather than [learning about] the process of transforming reality from Marx himself...” (Đilas, 1951, p. 6). Moreover, he appeared to believe that scientists in Yugoslavia do not need to be Marxists, because science is a progressive social force in and of itself thanks to the unrestrained materialism, even when scientists

“know nothing about Marx, nothing about dialectics, nor are they even willing to completely abide by quotations as such. Moreover, in the fight against religion, mysticism,

idealism, vulgarity, non-science [...] they are our allies in action! But not allies in the usual, political sense. For, we will win even without these allies. It's not about that! It is simply about an easier or a more difficult victory, and essentially: about the development of science, breaking down all of those barriers that impede or may impede its development, which for us in a concrete situation is identical to inhibiting the development of socialism.” (Đilas, 1951, pp. 14 -15)

Marx and Engels, as well as Lenin, criticized this particular view of scientists and science as inconsistently materialistic and non-dialectical, claiming that such a position eventually leads to a politically reactionary, i.e., idealist philosophical camp (Marx, [1846]1969; Engels, [1877]1947; Lenin, [1909]1977). Prior to the Second World War, it was precisely the CPY that criticized heterodox scientists and philosophers who considered themselves Marxist-Leninists and expressed views in a similar spirit, deeming them to be revisionists (Kovačević, 1989).

Issue no. 10 of the journal *Science and Nature* (1949) featured a speech by renowned Yugoslav communist and the Minister of Science, Rodoljub Čolaković, delivered at the first Congress of Yugoslav mathematicians and physicists, at the time when the break with the USSR began to be felt in all areas. In contrast to its former unity with the USSR, socialist Yugoslavia now displayed a distinctively unique interest in “our way of building of socialism” (Čolaković, 1949, p. 574). Despite Čolaković’s emphasis on the role of science in building a socialist society and his insistence on the connection between science and practice, his views on science, such as the one that “major scientific and cultural issues cannot be solved by any administrative measures” (Čolaković, 1949, p. 573), demonstrate the abandoning of the idea of Soviet science and orientation toward greater autonomy in science. As for the journal *Science and Nature*, one could clearly see in the letter by the editorial staff to readers in 1954 that it was subject to certain ideological change. In the address, the role of science in building society is no longer stressed, with the propagation and popularization of natural sciences becoming the journal’s only task. In the same year, the journal became an organ of various scientific societies, “independently published and distributed...”, while the new editorial board was made up of these societies’ members (Editorial staff, 1954, p. 50).

However, in an announcement made in 1959 (multi-issue volume 1–10), the journal’s editorial board informed its readers and subscribers (from whom the publication partially funded itself) that the journal, “due to the reduction of subsidies after 1956 and their subsequent complete removal, had to be published irregularly at first, before temporarily ceasing publishing...” (Editorial board, 1959) This occurred precisely during the aforementioned processes of decentralization in the model of scientific organization and increased autonomy in financing, and after the state loosened control over the economy. These types of difficulties often revealed systemic problems with Yugoslav form of Socialist Self-Management. According to Rudi Supek (1971), a Yugoslav Praxis¹⁶ theorist, the issue was not decentralization as such, but rather an unrestrained market economy, which only intensified class tensions in society, created an insufficiently functional economy, etc. In other words, according to Supek (1971), not only was there a weakening of the “centralized administrative planned economy in Yugoslavia, but also of every *development planning concept* (regardless of whether it was implemented “from above” or “from below”)” (Supek, 1971, p. 354).

Novel Yugoslav approach to science. In 1952, the journal *Pogledi (Views)* was launched “to meet the need to address issues in social

and natural sciences, particularly those that affect the creation of a complete scientific worldview and the building of socialist culture more directly” (Editorial staff, 1952, p. 1). The journal incorporated and promoted a Marxist humanist approach to scientific and philosophical issues. Criticizing the “phenomenological and positivist interpretation of reality” as well as the “purely pragmatist attitude to truth, morality, and individual freedom,” the editorial staff concluded that these were negative tendencies, corresponding only to “undemocratic and inhumane social practices” and appearing not only in the context of “decadent bourgeois philosophy but also in Soviet revisionism of Marxism” (Editorial staff, 1952, pp. 1–2).

In contrast to the “authoritarian” and “ideologically discriminatory” approach, the journal’s editorial staff promoted “open dialog” and “battle of ideas”. The fact that this approach to scientific issues was essentially consistent with the new official state line was demonstrated by the Resolution of the Sixth Congress of CPY, which was also reported on in *Views*, owing to its relevance for schools and scientific institutions: “The Congress also points out that preventing a clash of opinions could only hinder the development of science and culture” (Editorial staff, 1952: 65). Another issue of the journal confirmed that “there is no doubt that our entire social development, and thus activities at the highest scientific research and teaching institutions, is heading toward greater autonomy...” (Editorial staff, 1953, p. 285).

An example of the continuation of this process in Yugoslavia in social sciences was the establishment of the Sociology Group at the Faculty of Philosophy in Belgrade in 1959, as this department was frequently marked by tensions with “dogmatic Marxism”, for which sociology was often viewed as a “bourgeois” and reactionary discipline (Bogdanović, 1990, p. 23). Another similar case was that of sociology in the USSR, where the situation began to change after Stalin’s death (Weinberg, 1974; Osipov, 2009).

In accordance with these ideological conditions in scientific and cultural spheres it is useful to consider the case of psychoanalysis too, which “generally speaking [...] did not fare well in most of the Marxist-Leninist world” for historical as well as ideological reasons (Savelli, 2013, p. 262). “Western radical and politically engaged psychoanalysis generally existed on the social and political margins” (Antic, 2022, pp. 7–8). Savelli (2013) points out that psychoanalysis in Yugoslavia, in which there was greater intellectual freedom than in the rest of Eastern Europe, despite all obstacles that it encountered, nevertheless managed to inform the psychiatric practice to a larger extent (for example in relation to social problems of alcoholism and suicide). Regarding the examination of the specificity of Yugoslav psychiatry as related to East-West division, it is worth mentioning that it was the profession which incorporated the influence of Marxism, that is of Communist ideology. But, a partial Westernization of the discipline occurred too, and in following years there were also some anti-colonial tendencies - as such it also had an active role in these processes (Antic, 2022). On the other hand, an important aspect of it, which was also very noticeable, was the aspiration to actively participate in modernization processes both of its own profession and of society in general, with the aim of revolutionizing the consciousness of individuals, but also of the family and social relationships in general within Yugoslav society, and in a wider sense to act in the direction of progressive, humanistic, creative values (Antic, 2022).

The specificity of Yugoslav science, initiated by the break-up with USSR and by the initial firm turn towards the West, is also well attested by the case of Yugoslav biology. Before the break-up, Yugoslav biology, following its role model – USSR, had a tendency to conform itself with Michurin’s biology and the Lisenko’s doctrine. However, due to the change of geopolitical circumstances in 1948, the process of de-Stalinization in Yugoslav

biology begun. The particularity of this process may be seen in the fact that Yugoslav michurinists had opted not for rejection of Michurinist biology, labeling it as Stalinist deviation, but “carefully weighed its political and ideological implications, trying to negotiate the Stalinist origins of Michurinist biology with political and ideological reconfiguration in post-Stalinist Yugoslavia.” (Duančić, 2020, p. 159). As for this topic there was no Party directive from above, but there were, besides “negotiations within a scientific community”, also “negotiations of the scientific community with the party”, which didn’t show any particular interest for that situation (Duančić, 2020). During the 1950s an intensification of scientific research appeared in Yugoslavia, as well as greater possibilities for cooperation and visits of young scientists in institutes in the West. This “proved to be more important for the withering of Michurinist biology than the Yugoslav political and ideological distancing from the Soviet Union” (Duančić, 2020, p. 187). In this way, within the socialist system with more freedom than in the Eastern bloc, the popularization of Michurinist biology in Yugoslavia, which during Cold War represents the first socialist state renegade from USSR, was finished only around 1956 (Duančić, 2020).

After Stalin’s death, there were some improvements in the relationship between the USSR and Yugoslavia, albeit this relationship was subject to numerous changes in the years and decades to follow. However, despite the USSR’s desire to return Yugoslavia to the “socialist camp”, this did not happen (Dimić, 2014, pp.10–19). This initial short-term normalization of the relationship between the USSR and Yugoslavia had no significant ideological consequences for the official scientific discourse in Yugoslavia, as evidenced by Tito’s speech, delivered at the Seventh Congress of the LCY, in which he once again emphasized the positive effects that reduced bureaucratic interference had on scientific work.

“The gradual liquidation of bureaucratic interference in anything and everything has liberated our scientists, artists, cultural workers, and pedagogues from former bureaucratic impediments and provided them with an opportunity for unhindered creative work.” [Tito, 1958, p. 80]

A good indicator that dominantly socialist science in Yugoslavia continued to open to the West was the fact that, during that time, the US Information Agency of the American Embassy in Belgrade, Yugoslavia, published the journal *Nauka i tehnika* (*Science and Technology*) (1957–1958) in Serbo-Croatian language. This monthly publication covered advances in American science, medicine, technology, and economy. An important factor in Yugoslavia’s ideological positioning at the time was the development of the policy of *non-alignment*, in which Yugoslav president Tito played a key role (Rajak, 2011, pp. 107–108).

Milentije Popović (1960), a prominent Yugoslav official, once Minister of Foreign Trade and Finance and President of the Federal Council for Scientific Research, confirmed Yugoslavia’s official deviation from Soviet scientific principles, claiming the impossibility of Soviet-style planning in science. Providing an example of using science to solve problems related to corn production, Popović stated:

“Therefore, we can - and we must - use a program to direct scientific and research efforts towards solving the *corn problem*, but we cannot plan what we will, what we should (and whether we should) discover” [Popović, 1960, p. 8].

Popović goes on to state that he aims to overcome one-sidedness and find a middle way between “free science” and “planned science” - viewpoints he believed only seem to be opposed (see Popović, 1960, pp. 9–16). He undoubtedly introduced the elements of “free science” into the Yugoslav

scientific discourse, which clashed with certain aspects of the perspective of Soviet scientific activity, particularly in his emphasis on the importance of freedom of scientific work and his understanding of the nature of “pure science” (see Popović, 1960, pp. 8–9). Popović further deviated from the idea of Soviet “planned science” later in the text, when he tackled the specific problems of organizing scientific work in manufacturing, agriculture, etc., in Yugoslavia at that time, claiming that these organizational forms “cannot be predefined” (Popović, 1960, p. 54). Popović distinguished between two ways of financing in Yugoslavia: the first phase, characterized by full budget financing of scientific institutions, “which lasted for several years after the liberation” (Popović, 1960, p. 56) and coincided with the period of the highly centralized model of scientific organization in Yugoslavia; and the second phase, which began after the break with the USSR and aligned the organization of science in Yugoslavia with market logic.

“In this regard, it is planned that, in principle, scientific and research organizations be as independent in their work as economic organizations, and that the method of distribution of scientific institutions’ income be aligned with the system of economic organizations, with the exception that scientific institutions will return the entire amount of contributions to their funds.” [Popović, 1960, p. 59]¹⁷

In Kardelj’s acceptance speech to the Serbian Academy of Sciences and Arts given on February 22nd, 1960, in which he talks about social sciences and their importance for the continuing development of a “self-managed socialist society”, he stressed at the very beginning that science

“should not be a servant to a certain political practice or certain ruling ideological notion. It sets its own tasks and goals, based on the needs and tasks generated by living social praxis, current human realities, and the development of science itself.” [Kardelj, 1981, p. 7]

Kardelj’s entire speech was riddled with references supporting the idea of free science, independent of political influences, but also a science that “must not become a mere abstraction”, which is a real threat if one “loses sight of people’s praxis”, because “the end result of the multifaceted process of scientific research finds application in people’s praxis” (Kardelj, 1981, p. 10). One gains the impression that Kardelj attempted to connect the perspectives of an autonomous and socially engaged science in his address. Looking into this connection, however, it appears that it comes down to the role of science in society being to encourage certain institutions to carry out socially relevant research (Kardelj, 1981, p. 10), which is a practice that is also present (with some differences) in “bourgeois” societies.

The connection between US’s economic demands and the change of the discourse about the nature and the role of science in Yugoslavia refers to the context of Cold War struggle for ideological hegemony i.e., the soul of socialist science. In this case the process, created through geopolitical shift towards West goes in the direction of an attempt of “limitation” of socialism in science, which points out to instrumental function of ideal-typical Cold War representation of Western science when semi-peripheral country such as Yugoslavia is at issue. However, the fact that Yugoslav system nevertheless retains socialist ideology not only mitigated this process, but these changes, with the help of Party control and its officials, are articulated in such a way (as far as it was possible) to remain in accordance with basic Marxist postulates, understood in a much broader sense than in USSR. Bearing in mind Savelli’s (2018) analytical categories of ideology “by design”, “where professional knowledge was theoretically guided by ideological considerations” (Savelli, 2018, p. 2) and

ideology “by default”, that is, “events and knowledge” shaped “by the fact that they unfolded” in a certain ideological context, “but were not necessarily guided by that ideology” (Savelli, 2018, p. 2), it is necessary to investigate what does their use tells about the process of establishing the ideological frame of Yugoslav science. In the context of geopolitical shift, Yugoslavia, alongside with its socialist science, found itself in Western, ideologically hostile bloc, thus facing its socio-economic demands. The changes concerning the view on nature and the role of science in Yugoslav society can be seen, in this context, as partially informed through liberal-democratic ideology “by default”. Nevertheless, regarding these scientific changes, the internal control and the tendency toward socialist articulation of the discourse implemented by Yugoslav Communist Party, as a conductor of the process, at least nominally, imposed socialism “by design”.

The discussion about the position and the role of Yugoslav science in the context of relation between the science and the state, can be seen also as a confirmation of Forman’s (1987) and Kevles’ (1990) insight of how the changes of science-state relationships during the Cold War weren’t “just” intellectual in their nature, but were also political. In practice, in both of the blocs proclaimed model of science, either “autonomous” or “partisan”, did not exist. Nevertheless, socio-economic demands and pressures for the purpose of the domination of bloc’s ideologies were in fact Yugoslav reality. In this way, the specificity of the ideology of Yugoslav science was to a great extent the result of the process of formation and adaptation of Yugoslav state to Cold War, its effects on politics and culture, as well as the Yugoslav need for bigger independence, which was framed by a specific variant of socialist ideology.

Through the combination of critical approach to ideology and theoretical-ideological approach, and in the context of Cold War struggle for hegemony, the instrumental character of these different representations of the role and nature of science in society in the service of spreading of proclaimed ideological principles of politically opposed blocs is implied in this work. Through consideration of “autonomous” and “partisan” ideological scientific perspectives, as well as their mutual interaction, in the context of Yugoslav geopolitical and socio-economic dynamics one can also notice the tension between mentioned scientific Cold War views on science, which, in Yugoslav case, was resolved though certain deviations from Soviet idea of science. Although differences, it is unquestionable, within scientific practice in the context of the Cold War were overemphasized, especially if bearing in mind obvious bloc deviations from discursive principles in practice, the case of science in Yugoslavia points out to certain real i.e., practical differences, expressed foremost on the level of financing and organization of science, but also articulated within official discourse about nature and role of science in society. Through researching Cold War ideology of science in Yugoslavia, this work points out to the fact that dominant differences, in their core, between Soviet and Western idea about science are, in case of Yugoslavia, basically in direct connection with various economic dynamics, that is, the Soviet idea of planned, centralized economy as opposed to the idea of market economy. In this sense, if (in)compatibility of these two views on science in the context of one society is considered, it seems that it is necessary to start from more fundamental dealing with socio-economic dynamics within concrete social conditions. In other words, the case of science in Yugoslavia that we have discussed in this work shows us that we have to take into consideration, in a greater extent, the possibility that in relations between these two scientific perspectives there are not only philosophical questions, but also socio-economic processes.

It is necessary to pose the question of what does the relationship between science and state, on the example of science

in (semi)peripheral Yugoslavia during Cold War also tells about the nature and role of science in this ideological context in general? The confirmation of the extent in which the Cold War science was related to the state can be also seen on the example of socialist Yugoslav science. However, for its specificity in relation to bloc science one is supposed to look firstly in ideological dissidence from USSR, as well as in a rather distinct geopolitical shift towards Western bloc by ruling Yugoslav party and state structures, immediately after the break with Stalin. The very fact that changes in ideological understanding of the nature and role of science in Yugoslav society were initiated by Party officials, and essentially carried out through the principle “from above downwards” informed the ideological framework of Yugoslav science even when it implied advocating larger autonomy of science in socialist Yugoslav society. This does not mean that scientists had no freedom at all in their work (e.g., Duančić, 2020), but that this scientific freedom, just as the scientific partisanship, was formed and limited *essentially* by state projects and needs regarding the nature and role of science in a concrete society, which was formed, just as the science itself, in the Cold War climate. The state, and not the society (or working class) and its fundamental needs, is the one which in final instance created the ideological framework of the science during Cold War, its “autonomy” as well as its “partisanship”. Consequently, socio-economic and ideological impacts of a geopolitical shift of Yugoslav science makes it necessary to enter more deeply and in a more interdisciplinary way into attempts of examining and defining what Forman (1987) would call “true path” of science, as well as noticing of the importance of historical dynamics regarding the changes in relation to the nature and role of science in society (e.g., Kevles, 1990). At issue here is a need for differentiating the elements of system and separating the concrete structure, which in the final instance limits (most often led by its own interests) the freedom and social engagement of science. While taking this into account, it is necessary to analyze reasons for (dis)agreement and (im)possibility of applying the concepts of “autonomous” and “partisan” science in practice, (according to their basic proclaimed principles), and to derive them from broader and more clearly differentiated historical, sociological and philosophical analysis of the relationship between state, science and society during Cold War.

Conclusion and outlook

In the context of two dominant ideological views on science during the Cold War, I examined changes in Yugoslav science after its break with the USSR, in terms of the organization model, financing, and scientific discourse. Through comparison of the governing standpoints on science in Yugoslavia prior to the Tito-Stalin split in 1948 and after it, I show the compatibility of these changes with certain aspects of the perspective of science as autonomous and apolitical. Market forces and their control, as well as (de)centralization, (de)bureaucratization, and changes in the international position of Yugoslavia in the Cold War context proved to be elements of particular importance in this analysis. Understanding their relation to Yugoslav science allows us not only to position it more clearly during the Cold War, but also to better comprehend the nature of the ideological framework that supported various dynamics of de-Stalinization of specific scientific issues in Yugoslavia.¹⁸ These elements are still structurally and politically relevant to date. They underline science as an activity woven into social processes. In accordance, these insights could be useful for a better understanding of today’s dynamics between science and society.

By contextualizing the nature of these changes in Yugoslav science, while presenting the dominant ideological views on

science during the Cold War and considering how both sides deviated from their proclaimed principles, the question arises as to what these changes can tell us about the nature and role of “autonomous” and “partisan” perspectives of science during this period? Bearing in mind the importance of the Yugoslav geopolitical shift for the issues dealt with in this study, it seems that for a more complete insight into the nature and roles of these views it is necessary to approach them in the context of the struggle for ideological hegemony during the Cold War. Judging by the examples provided by Yugoslav science in this era, the analysis is incomplete without considering the socio-economic changes and contradictions of the society in question. For Yugoslavia, this was embedded in the case of a socialist country that after 1948 turned to the Western Bloc. These unusual Cold War circumstances made Yugoslav science in this period an interesting case for research.

It is evident that the earlier simplified ideas of science in the West and the East are mostly mundane today (Kojevnikov, 2004, p. 46; Aronova, 2011, pp. 198–199), and that science in both blocs was politicized. However, this study suggests, though Yugoslav science was socialist, that it is possible to observe some objective changes in terms of the scientific organization model and financing, as well as in the official and dominant discourse of Yugoslav science. Those changes were in accordance with the ideas associated with Western science and occurred after the geopolitical shift towards the West. Perhaps a more thorough analysis of the practical and cultural factors that influenced certain aspects of science in Yugoslavia would allow us to draw a broader picture of the relationship between science and ideology in the Cold War? This would require expanding this research with additional and more detailed examples of concrete scientific practice. In this regard, in the future, I see the need for further research into the roles and positions of science that are not limited to the Cold War’s major actors. I believe that the specificities of certain (semi) peripheral societies’ experiences during this period would be fruitful to gain novel insight into this subject.

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Notes

- When dealing with the USSR in this study, the reference framework involves the USSR up until Stalin’s death (1953).
- The Resolution of the Information Bureau of the Communist and Workers’ Parties concerning the state of affairs in the Communist Party of Yugoslavia, passed on June 28th, 1948.
- A good example of a Soviet view of science, propagated by scientist, is the publication of Yugoslav biologist Vojin Gligić: Borci za bolju berbu i žetvu (Fighters for a better harvest, 1945).
- For scientific cooperation of Yugoslavia and the USSR see Bondžić 2010.
- Časopis društva za kulturnu saradnju Jugoslavije i SSSR-a (Journal of the Society for Cultural Cooperation of Yugoslavia and the USSR)
- O uslovima socijalističkog planiranja (On the conditions of socialist planning)
- Sovjetska nauka kroz sovjetske naučnike (Soviet Science through the lens of Soviet scientists)
- Lenjin i prirodne nauke (Lenin and natural sciences)
- For criticism of the USSR see also The Congress of the Union of Communists of Yugoslavia, 1952, pp. 260–273.
- At the Sixth Congress, Communist Party of Yugoslavia (CPY) changed its name to the League of Communists of Yugoslavia (LCY). It modified its role to adapt the Party to new conditions in society – “Socialist Self-Management” (for more on this see Šetinc 1978), sometimes referred to as “workers’ self-management”.
- Position that was established following the model of the Academy of Sciences in the Soviet Union.
- For more detail about the effects of the Yugoslav economic reform after the break with the USSR from a Western perspective see: CIA Report The Fiat-Soviet Auto

- Plant and Communist Economic Reforms, The Yugoslav Economic Reform, pp. 43–47, (March 4th 1967).
- Milovan Đilas (1911–1995) is probably most famous for his dissident Cold War engagement and the book *The New Class* (1957). However, during the period described in this segment, Đilas occupied very high positions in the party, including the ideologically immensely important position at the helm of AGITPROP (Party organ in charge of agitation and propaganda) (Dimić, 1988; Bogdanović, 2013).
 - For more on the MSC see Bondžić, 2004: 144–148.
 - The pre-war Slovenian communist Edvard Kardelj (1910–1979) evolved into a key ideologue of the Titoist system of Socialist Self-Management after Yugoslavia’s break with the USSR. Through his political and ideological work, Kardelj critically shaped the new socio-political system of Yugoslavia (Jović, 2003).
 - Praxis was a Marxist humanist journal (1964–1974) and dissident circle of philosophers and social scientists in Yugoslavia.
 - With regard to these tendencies, a CIA report from the early 1970s on science in Yugoslavia is particularly revealing. I observe that the CIA noted Yugoslav propensity toward politics along the lines of Popović’s ideas: “The government’s policy since the 1960s has been to reduce state funding of scientific research and technical development and to increase the contribution of the end users of research and development. The goal is for research organizations to become self-supporting by independently earning and controlling their income, primarily through contracts, and by using part of the income for their own expansion and development.” CIA Report: National Intelligence Survey 21; Yugoslavia; Science, p. 4 (April 1973).
 - e.g., de-Stalinization of biology (Duančić, 2020)

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Author contributions

MK conceived the study, conducted the research, analyzed the data, and wrote the manuscript.

Competing interests

The author declares no competing interests.

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Ethical approval was not required as the study did not involve human participants.

Informed consent

This article does not contain any studies with human participants performed by the author.

Additional information

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