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**Academician of the All-Ukrainian Academy of Sciences Petro Mykhaylovych
Suprunenko: Life and activity**

Abstract. *The article updates the most significant information about the outstanding scientist-mechanic and railwayman of the first third of the 20th century Academician of the All-Ukrainian Academy of Sciences Petro Mykhaylovych Suprunenko (1893–1938). It is proven that his activities in the field of railway development are a significant contribution to the development of world science and technology. The main scientific works of the scientist and engineer are devoted to important problems of transport mechanics. He paid special attention to locomotive and wagon construction (he was a wagon designer). Wagons were built on the basis of a large amount of experimental material, which at one time received significant public resonance and scientific and technical recognition. It is emphasized that P. M. Suprunenko was one of the first railway engineers who proposed a scientific analysis of the interaction of the track with the rolling stock of railways. The article notes that today P. M. Suprunenko is mentioned very little, only fragments of his biography are described, only some of his scientific works are characterized. In the Institute of Transport Mechanics of the All-Ukrainian Academy of Sciences headed by him, the following research was successfully developed under his leadership: methodological problems of transport mechanics were highlighted in order to comprehensively solve the tasks of modernization of the railway industry; research of non-stationary dynamic processes of interaction of rolling stock (train) with the track system (especially the study of the resonance phenomenon); research of the theory of calculations of locomotive traction on railway tracks in order to optimize elements of*



transport mechanics and increase their efficiency, etc. The article describes in detail each of these areas of research by P. M. Suprunenko. In general, his research focused on problems of railway transport. In the field of train traction theory, P. M. Suprunenko created a number of new methods for graphical integration of differential equations of train motion, paid significant attention to improving existing ones and creating new devices designed to measure the characteristics of various processes occurring in rolling stock and tracks. The scientist's achievements in the initial period of railway transport construction in Ukraine, especially on the South-Western Railways, are confirmed. The article shows that the role of P. M. Suprunenko was in his scientific work as an "idea generator" and a leading theorist in combination with engineering activities.

Keywords: history of railway transport in Ukraine; problems of transport mechanics; track management; mobile railway warehouse; victims of Stalinism

Introduction.

Petro Mykhaylovych Suprunenko, graduate of the Kyiv Polytechnic Institute, later head of the department of this Institute, actively worked in the field of transport mechanics, railway transport (locomotive and wagon construction). In particular, he was a designer of wagons and a teacher. But the name and scientific achievements of Petro Suprunenko are almost forgotten today. Despite the current growth of scientific interest in the personalities of Ukrainian railway engineers, the personality of Petro Suprunenko, who made a discovery of international significance in the field of experimental research on the dynamics of a four-axle wagon, is not often mentioned in scientific publications. In the context of the modern struggle of the Ukrainian people for independence, the introduction into scientific circulation of the biography of one of the active railway engineers, who made a significant contribution to the development of transport mechanics, is extremely relevant.

Analysis of Research and Publications.

In modern newspaper and magazine publications, and individual scientific works, only fragments of the biography and individual areas of scientific activity of Petro Suprunenko are mentioned. Thus, S. M. Pankova in her article "Institute of Transport Mechanics of the Academy of Sciences of the Ukrainian SSR: History and Fate" (1991) restores, based on documentary sources, one of the unknown pages of the activities of the All-Ukrainian Academy of Sciences (AUAS) (*Ukrainian Academy of Sciences, from 1918 to 1921; All-Ukrainian Academy of Sciences, from 1921 to 1936; Academy of Sciences of the UkrSSR from 1936 to 1991; Academy of Sciences of Ukraine from 1991 to 1993; National Academy of Sciences of Ukraine, since 1994*) – the Institute of Transport Mechanics and the fate of its employees (Pankova, 1991, pp. 94–100). This institute, under the leadership of Academician P. M. Suprunenko, solved complex technical issues, mainly in the field of railway transport. P. M. Suprunenko and his subordinate Institute focused much attention on the issues of traction, track and

operation. The fate of the scientific Institute, the names of scientists, including P. M. Suprunenko, is one of the pages of the past of the All-Ukrainian Academy of Sciences. The employees of the Museum of the History of Kyiv managed to restore it. They display the Institute's materials in the Museum at an exhibition in memory of the victims of mass repressions. They reflect the situation that developed in pre-war science, during the years of the so-called “cult of personality of J. V. Stalin.” These facts indicate that not only individuals, but also entire scientific institutions must be rehabilitated.

Lyubov Sukhoterina, a modern historian of science and technology from Odessa, emphasizes the terrible pages of the history of the Ukrainian people. In her article “The Fate of Petro Mykhaylovych Suprunenko – as an Example of the Fate of a Ukrainian Scientist in the Conditions of Stalinist Totalitarianism” (2001), she objectively examined the pages of the history of P. M. Suprunenko’s activities, which were silenced and forgotten for a long time (Sukhoterina, 2001, pp. 71–75). The author of the article concludes that the fate of the prominent Ukrainian Academician P. M. Suprunenko indicates that the terror unleashed by the then totalitarian system against the best representatives of Ukrainian science stopped for many years and decades the development of certain areas of technical sciences, and railway transport in particular.

Modern historians of science and technology also wrote about P. M. Suprunenko (Vlasenko, 2007; Lokun, 2007; Azarova, 2015).

The purpose of the article is to reveal the role and contribution of P. Suprunenko to the development of railway transport as an outstanding scientist and engineer, public and educational figure at the beginning of the 20th century. Among the key tasks is the analysis of the subject matter and content of his engineering publications.

Research Methods.

The research methodology is based on the principles of historicism, objectivity and systematicity. With their help, it was possible to clarify the conditions in which the views were formed and the public and educational activities of P. M. Suprunenko were implemented. Analytical, synthetic, logical, retrospective, historical and biographical and other general scientific methods were also applied. They made it possible to determine the areas of activity of the scientist and engineer, to analyze the content of part of his creative heritage.

The principle of historicism made it possible to consider the formation of the scientific heritage as a historical final process that took place in time, in specific conditions and circumstances. After all, the principle of historicism is always applied to the consideration of phenomena that have a beginning and an end, and also studies the connection between certain phenomena in space and time in the context of the development of a single and gradual world-historical process.

The principle of scientificity contributed to the elucidation of the cause-and-effect relationship between the phenomena and processes of the studied period in the context

of the development of historical events and facts. After all, it is the principle of scientificity that makes it possible to familiarize contemporaries with the events of the past, and also shows the prospects for the development of science.

Currently, the figure, activities, and creative legacy of P. Suprunenko remain little known. A comprehensive study of his life and achievements has not yet been carried out, and most of his works remain out of scientific circulation.

Results and Discussion.

Petro Mykhaylovych Suprunenko was born in Kremenchuk on June 18, 1893. In 1919, he graduated from the Mechanical Department of the Kyiv Polytechnic Institute. He began his career at the South-Western Railways in the technical department of the traction service. His professional activities were diverse. He held the following positions: design technician, design engineer, head of the technical group and department. He gained extensive experience as a railway transport engineer. At the same time, he did not shy away from pedagogical work - from the 1920s to the mid-1930s he worked as a teacher at the Kyiv Polytechnic Institute, the Kyiv Institute of National Economy, and also at the Kyiv Railway Institute. Petro Mykhaylovych grew from assistant to professor. In the same years, he was the head of the department of steam locomotives and wagons at the Kyiv Polytechnic Institute.

Simultaneously with teaching at various universities, in 1926 P. M. Suprunenko began working in the transport section of the Institute of Transport Mechanics of the All-Ukrainian Academy of Sciences. After receiving the title of professor in 1929, he became the head of the Cabinet of Transport Mechanics (CTM) at this academic institute. In 1934, he was elected as an Academician of the All-Ukrainian Academy of Sciences. In 1934, the CTM, thanks to his efforts, was transformed into the Institute of Transport Mechanics of All-Ukrainian Academy of Sciences (ITM). Petro Mykhaylovych held the position of director of this institute until his arrest and liquidation of the institute in 1937. P. M. Suprunenko was convicted on unfounded charges and died in the camps in 1938. His brilliant engineering and scientific activities were achieved by special abilities, good education, which he received at the Kyiv Polytechnic Institute, and rich practical experience.

In 1924, 5 years after graduating from the university, P. M. Suprunenko published a monograph in Kyiv, which he defended as a dissertation on the topic "Theory of oscillations of the super-spring parts of steam locomotives in connection with smoothness of movement, safety of movement and pressure of wheels on rails". In his dissertation, Petro Mykhaylovych highlighted the issues of the influence of various factors on the movement of a steam locomotive, impacts and collisions at the joints of rails, and investigated the features of the movement of a steam locomotive on curved tracks. He also calculated the forces that arise due to inertia forces in parts of the steam distribution mechanism during the movement of the steam locomotive.

In 1926, P. M. Suprunenko published a textbook "Traction Calculations". This textbook was actively used by both students and railway engineers and technicians for

the purpose of practical calculations and design work. This textbook was so relevant that 6 years later, in 1932, it was published a second time under the title "General Theory of Train Traction". Finally, in 1934, P. M. Suprunenko published his fundamental monograph "Harmonic Oscillations of Railway Rolling Stock". This monograph was recommended as a textbook for students of higher technical educational institutions of railway transport.

The vast majority of research was conducted by P. M. Suprunenko himself, or by teams of employees of the ITM with his direct participation and under his scientific and organizational leadership. We characterize five of his main areas of research.

The study of methodological problems of transport mechanics is relevant to the entire spectrum of problems that were faced by scientific and technical workers in the industry at that time in connection with the gigantic plans for the modernization and industrialization of the national economy. The main factors and results of these studies, in our opinion, were: the objective conviction of the technical management and the public in the need for large material and intellectual investments in the field of scientific research and engineering education in the transport industry in general; the development of the engineering systems in the transport industry in general (Suprunenko, 1933). Without such an approach, which was developed by many scientists, including Academician P. M. Suprunenko, the impressive successes of transport, in particular railway transport, which the civilized world achieved in the last decades of the 20th century would not have been possible!

Research in the *second direction* should include theoretical analysis and experimental modeling of locomotive oscillations under resonance conditions, development of theoretical models of oscillations of the last cars in the train and their impact on the track system. These processes led to mechanical failures in the systems of locomotive mechanisms and cars (tanks, platforms) and had a detrimental effect on the condition of rails and other elements of the track system. In turn, this led to catastrophic consequences - ruptures of gas pipelines in locomotive water heaters with subsequent explosion of the boiler and the death of the locomotive crew.

In the second case, the violation of the condition of the rails, which was caused by the increased amplitudes of vibrations of the last cars of the train, especially in the state of resonance, could lead to ruptures of both the rails themselves, joints, sleeper reinforcements, and an increase in the interrail distances, which, in turn, led to derailments of trains and accidents with great material losses and numerous human casualties. It is obvious that the results of such studies were the spectra of the frequencies of resonant vibrations and their dependence on the structure of trains, the loading of individual cars, the methods and order of their coupling, the technical condition and profile of the railways, the speed of movement, temperature, weather, and other factors.

All this, as we can see, on the one hand, was aimed at increasing the reliability and safety of traffic, developing practical recommendations regarding train formation, loading of individual wagons, traffic regimes on individual railway sections, etc. On

the other hand, such development of objective methods for examining the condition of trains, tracks, transportation organization, analysis of traffic regimes, causes of accidents and disasters deprived the party-bureaucratic leadership of the voluntarist lever of pressure on technical workers to force them to carry out unrealistic, adventurous transportation plans, poorly (but quickly!) build new tracks, go beyond the permissible parameters of operation of rolling stock and railway equipment. Often, it did not allow these workers to be unjustifiably accused of sabotage in cases of accidents, while making it possible to conduct a more or less objective investigation of the circumstances of the case. Obviously, this political factor in an issue that at first glance appears to be entirely theoretical technical and engineering research had to be taken into account when assessing the work of the ITM and understanding why such a terrible fate befell its director and employees.

The third area of research occupies a large place, in terms of volume and importance, in the works of the CTM in general and P. M. Suprunenko in particular. The results of works in this area were published in two of his monographs, recommended as textbooks for the ITM and students of higher education institutions of railway transport. A detailed analysis of these studies is yet to be done. While giving a superficial analysis of these studies, it should be noted that the steam locomotives, used at that time as locomotives, had a very low efficiency factor (several percent!), which limited their power and traction capabilities. The increase in the power of steam locomotives did not lead to an increase in this factor. In the conditions of a massive increase in the volume of transportation, this factor was transformed from a purely technical one into a technical and economic one, determining, to a large extent, the cost price and deciding the rate of growth of the volume of transportation. In this regard, any attempts to increase the efficiency factor of steam locomotives had, at that time, great importance not only technical, but also economical, and in the conditions of a state-planned economy - also political. This includes studies that intersect with the second direction, namely the interaction of train rolling stock, primarily steam locomotives, with the track system, and in fact, with railway rails. In such interaction, the most important factor is the resistance force, which varies depending on the condition of the track, wheel treads, friction coefficients of wheels and rails, as well as the temperature of the external environment, which within the geographical boundaries of the USSR fluctuated in the range of 100–120 °C at different times of the year. On the other hand, this interaction also determines the force of adhesion of the locomotive to the track and, as a result, the traction force. Failure to take this factor into account led to large errors in traction calculations and, as a result, significant losses of fuel and train control efficiency. Coefficients of adhesion and friction also have a large impact on the quality of brakes, on which traffic safety directly depends.

Research in the *fourth direction* was largely aimed at improving the efficiency of energy use, which was obtained from burning coal (or other fuel) in the furnace of a steam locomotive. Combustion was very inefficient. Therefore, it was necessary to use expensive high-calorie coal, which led to an increase in the cost of transportation, took

away valuable raw materials from metallurgical and chemical industries, and increased the load on coal mines. The solution to this important national economical problem lay in the development of new schemes and modes of burning low-calorie coal in furnaces and increasing the efficiency of generation and use of heat and steam in water heaters of steam locomotives. The increase in the power of steam locomotives required an increase in pressure in the boilers, and this, in turn, affected the quality of heat transfer and steam generation. There were possible situations of overheating and damage to the pipelines in the boilers and, as a result, a locomotive accident, or even a train disaster. As we can see, P. M. Suprunenko's research in this area was aimed not only at increasing the efficiency of transport mechanics, but also to a certain extent - at increasing the safety of rolling stock operation and railway transportation in general. Solving these problems required the development of new approaches to thermodynamic calculations and modeling of combustion and heat transfer processes in complex systems of steam locomotive heat exchangers.

A very important approach to solving the problems of the transport industry, which dominated the works of the CTM and personally by P. M. Suprunenko, found its reflection in research in the *fifth direction* - optimization of the processes of managing the creation (formation) of trains, development of train schedules, reduction of car downtime and reduction of transportation costs.

It is obvious that from today's perspective these works seem too primitive and simple, but one must take into account the time of their implementation. The New Economic Policy ("NEP"), which in the late 1920s was suspended in favor of accelerated industrialization, collectivization, and the Cultural Revolution, clearly demonstrated the role of complex organizational and economic factors in increasing labor efficiency. But the times of "Stakhanov" methods in production and "Lysenko" in science were already coming... Soon all these "bourgeois-nationalist economical methods" would become arguments in the indictments... The time of the defeat of Soviet science was coming, and it began with Ukraine, with its outstanding scientists and leading creative collectives.

Thus, summarizing the results of this brief analysis, we can determine that:

- The Transport Mechanics Department, for a fairly long time of its existence (approximately 8 years), was engaged in solving *urgent problems* of transport, primarily railway transport, both in Ukraine and in the USSR in general. These problems did arise in practice, but within the limits and by the forces of the technical services of individual railways they could not be solved, they required general theoretical and experimental in-depth research, mathematical modeling and physical and technical simulation with the involvement of highly qualified scientific personnel. The creation of this structure within the Institute of Transport Mechanics of the All-Ukrainian Academy of Science provided the opportunity to focus specifically on the tasks of researching the dynamics of transport mechanics, which corresponded to the specifics of the scientific topic and the degree of complexity of the research;

- The staff of the CTM proved their scientific qualifications by solving complex scientific and technical tasks. The appointment of Professor P. M. Suprunenko as the head, and then as the director was not accidental, it was a recognition not only of the fact of his numerous scientific achievements, but also of the fact that he was at that time a leading scientist - a leader in the field of applied mechanics.;
- Scientific research at CTM focused on the problems of ensuring the reliability, safety and efficiency of railway transport - the main, as at that time (and still!), type of transportation in the former USSR. These directions were justified not only by the state of affairs at that time, but also by the trends in the development of the USSR economy, foreseen by the five-year industrialization plans;
- The role of P. M. Suprunenko was in his scientific work as an “idea generator” and leading theorist combined with engineering creativity. Personal creative abilities, good fundamental education and practical experience, as evidenced by his brilliant engineering and scientific career, helped him in creative growth and brought good results to the scientific team;
- The CTM (as well as the Institute of Transport Mechanics) was closely connected with the system of research, design and construction organizations and educational institutions. Thus, the first scientific conference on the dynamics and interaction of track and rolling stock, held in January 1935, was attended by representatives of 30 organizations from different regions of the USSR, with which the ITM maintained scientific relations. This fact determines the leading role of the Institute at that time in the field of the dynamics of transport mechanics and other issues.

Comparing the results of the presented analysis of the scientific directions of CTM (ITM) with the above-mentioned systemic factors of the development of science in transport mechanics, we come to the conclusion that there is a certain convergence of the requirements for the development of technical sciences in the field of transport engineering and operation with the directions of scientific research conducted in the Cabinet and Institute of Transport Mechanics of the All-Ukrainian Academy of Science under the leadership of Academician P. M. Suprunenko. According to the authors, this fact objectively confirms the usefulness and correctness of the creation and existence of this scientific structure precisely within the All-Ukrainian Academy of Science at that “critical” time, which can be characterized as a preparatory period for the transition to the system of the so-called “departmental science” (Yarema, 2007; Altenbach, Bogdanov, Bulat, Guz, & Nazarenko, 2023; Dunayevska & Yevtukhov, 2023; Starostenko & Kobolev, 2023).

The following question deserves the answer: why was the ITM team, led by the director, chosen as a victim of terror? Why was it necessary to destroy the structure itself and erase the fact of the existence of CTM (ITM) from the history of science? According to the authors, there could be several reasons for this. We have already talked about some of them earlier, and we can emphasize once again that there were no objective scientific reasons for the liquidation of ITM. Most likely, the reasons were

of a political nature - the fight against the so-called "Ukrainian nationalism", standard (in the wake of mass terror against the intelligentsia) accusations of "espionage and sabotage", "sabotage", etc., which covered up the actual reasons - the introduction of a command-and-administrative system of "departmental science" and the destruction of "inconvenient" scientists and organizations under the slogan "No man - no problem!"

In this regard, a second question arises – is it good or not to have “departmental science” and how should it relate to “academic” science? Again, systematically considering this issue, we can conclude that the existence of these two organizational “levels of abstraction” in the system of research, production and management of new knowledge is useful. The history of the development of science in the world, as well as in the USSR, has proven the correctness of this thesis. The problem lies in a different context – these “levels” should not dominate one over the other, not compete, but complement each other, having complementary, but still different tasks. Violation of this principle leads to negative consequences not only in a purely ambitious-personal, scientific-cognitive, or even economic sense, but also in a general civilizational context (as the bitter experience of the Soviet model of science convincingly proved!), which also became obvious at the turn of the millennium. The Soviet Union, as a civilizational geopolitical system, did not lose the "cold" war, the arms race, or even the economic competition. The chance to take a place in the ranks of world leaders in scientific and technological progress, appropriate to the material, financial and intellectual resources of the country and society, the achievements and traditions of Russian, Ukrainian and other scientific schools, and an accelerated transition to the civilizational phase of the information society was lost. To a large extent, the reason for this lies in the totalitarian form of the command-bureaucratic system, which also prevailed in Soviet science in the 1930s, and the consequences of which have not yet been eliminated.

The third question that arises when studying the life path and scientific heritage of P. M. Suprunenko relates to the socio-political and moral-ethical sphere and can be formulated as follows. How free is a scientist, engineer, technician from the obligations of participation in the socio-political life of his society, how free is he to stand aside from the so-called "politics"? The example of Academician Suprunenko shows that this is possible up to certain limits. Within the framework of authoritarian, totalitarian, and even quasi-democratic societies, a scientist, without losing his dignity as an intellectual, objectively cannot avoid such participation. A more or less talented, gifted and educated person has a heightened sense of justice, dignity and his own worldview, sets a bad (from the point of view of the totalitarian system) example for other members of society, is “inconvenient” and poses a threat. Even if a person is not engaged in “politics”, the latter will “engage” in it. Therefore, in the conditions of an information society, when the intelligentsia becomes not a “layer”, but a full-fledged productive force, the protection of freedom of creativity, personal, scientific dignity and other moral and ethical values of every person, especially artists of science, culture, education, had to become a serious priority of the state.

At the end of the article, we consider it appropriate to outline *some ways of further research into this problem*. First, a systematic analysis of P. M. Suprunenko's methods is needed when modeling and developing practical calculation methods (synthesis, analysis and design) of a transport mechanical system. Second, a detailed analysis of the specific results of each scientific work is needed. Special attention should be paid to assessing the place occupied by his works at the time, the role and influence of the results obtained on the further development of applied dynamics of transport mechanics. Third, it is necessary to investigate the scientific and ideological environment in which the scientist and engineer lived and worked, the legacy of which scientists he adopted and who continued his work, what fate befell his students and followers, what response Suprunenko's ideas found among scientists at the time, and how relevant they are in the present day.

Conclusions.

In science (fortunately rather than unfortunately!) history is made by individuals. They, as embryos – “centers of crystallization” create around themselves human structures, so to speak, of the “collective mind” of like-minded people, where a certain scientific ideology, or even a bright idea, finds its embodiment in life with the subsequent birth of an island, or even a continent, of new knowledge in the turbulent ocean of human intellect. This is, in fact, the sphere of human life where the infamous slogan “There are no irreplaceable people!” does not work. It is therefore not surprising that the destruction (physical, moral, spiritual or ideological – it makes no difference!) of such “centers” instead of pure and strong crystals leads to the rise of amorphous intellectual “mush”. And this, in turn, does not allow creating a strong human resource base of high-quality scientists, thereby ensuring a high level of research, development of relevant systems and technologies, destroys practical connections with industry, etc., just as the refusal of long-term investments in domestic science and the pursuit of so-called “fast money” lead to copying and application by industry and business structures of foreign technologies and further deepen the crisis in science and, in general, the intellectual sphere of the country. The circle closes, the country falls out of the ranks of highly developed countries and slides to the margins of the world economy and culture. The question of science may not even arise at all... Obviously, such a path is unacceptable for the largest country in Europe! Ukraine is a country with highly developed heavy industry, agriculture, transport infrastructure (built, by the way, with hard work, on the bones and blood of its people!) and large natural resources. As an example, we can only say that it has the world's largest reserves of iron ore, manganese, lithium, gallium, large reserves of coal, granites, etc. All this determines a certain “doom” of Ukraine for the development of the metallurgical, chemical, mining, machine-building, transport industries, it must be a center of large freight and passenger transportation, which is impossible without a developed modern transport infrastructure. In turn, all this puts before scientists and engineers of Ukraine important

and honorable tasks of further development of science and technology in the field of railway and other types of transport.

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Conflicts of interest.

The authors declare no conflict of interest.

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**Академік Всеукраїнської академії наук Петро Михайлович Супруненко:
Життя та діяльність**

Анотація. У статті актуалізовано найбільш значні відомості про видатного вченого-механіка і залізничника першої третини ХХ ст., академіка Всеукраїнської академії наук Петра Михайловича Супруненка (1893–1938). Доведено, що його діяльність у сфері розвитку залізничної справи є вагомим внеском у розвиток світової науки і техніки. Основні наукові праці вченого та інженера присвячені важливим проблемам транспортної механіки. Особлива увага приділялася ним паровозному і вагонному будівництву (був конструктором вагонів). Будувалися вагони на основі великої кількості експериментального матеріалу, які у свій час отримали значний суспільний резонанс і науково-технічне визнання. Наголошено, що П. М. Супруненко був одним з перших інженерів-залізничників, хто запропонував науковий аналіз взаємодії колії з рухомих складом залізниць. У статті зазначається, що сьогодні про П. М. Супруненка згадують дуже мало, описуються лише фрагменти його біографії, характеризуються тільки окремі його наукові праці. В очолюваному ним Інституті транспортної механіки Всеукраїнської академії наук за його керівництва успішно розвивалися наступні дослідження: висвітлювалися методологічні проблеми транспортної механіки з метою комплексного розв'язання завдань модернізації залізничної галузі; дослідження нестационарних динамічних процесів взаємодії рухомого складу (поїзда) з системою колії (особливо вивчення явища резонансу); дослідження теорії розрахунків тяги локомотивів на залізничних коліях з метою оптимізації елементів транспортної механіки та підвищення їх ефективності тощо. У статті детально характеризується кожен з цих напрямів досліджень П. М. Супруненка. Загалом його дослідження сконцентрувалися на проблемах залізничного транспорту. У галузі теорії тяги поїздів П. М. Супруненко створив низку нових методів графічного інтегрування диференціальних рівнянь руху поїздів, приділяв значну увагу вдосконаленню існуючих та створенню нових приладів, призначених для вимірювання характеристик різних процесів, що протікають в рухомих складі та колії. Підтверджено доробок вченого у початковому періоді будівництва залізничного транспорту в Україні, особливо на Південно–Західних залізницях. У статті показано, що роль П. М. Супруненка полягала в його науковій праці як «генератора ідей» та провідного теоретика в поєднанні з інженерною діяльністю.

Ключові слова: історія залізничного транспорту України; проблеми транспортної механіки; колійне господарство; рухомий залізничний склад; жертви сталінізму

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