ORIGINAL ARTICLE
DOI: https://doi.org/10.30932/1992-3252-2024-22-1-15

World of Transport and Transportation, 2024,
Vol. 22, Iss. 1 (110), pp. 265–275

Academician V. N. Obraztsov in the History of Moscow Institute of Transport Engineers (dedicated to the 150th birth anniversary)

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ABSTRACT

The article is dedicated to the anniversary of Academician Vladimir Nikolaevich Obraztsov, who largely contributed to organisation of domestic transport science and founded a scientific school of designing railway stations and transport junctions, and who was a leading specialist in the field of railway operation, a prominent public figure, and a Professor at MIIT. The professional and creative activity of a talented educator and scientist is closely connected to the history of the country's largest transport university – Moscow Institute of Transport Engineers (MIIT), now Russian University of Transport. The stages of a scientist's professional path are examined using materials from the institute's newspaper «Stalinets». V. N. Obraztsov had worked at MIIT for almost 50 years, created a scientific school, trained dozens of students and was the head of the country's first department of stations and junctions.

Keywords: V. N. Obraztsov, Moscow Institute of Transport Engineers, workers' faculty, design of railway stations and transport junctions, Russian University of Transport.

For citation: Gorbunov, A. A., Fedyakin, A. V., Tantsevova, A. V. Academician V. N. Obraztsov in the History of Moscow Institute of Transport Engineers (dedicated to the 150th birth anniversary). World of Transport and Transportation, 2024, Vol. 22, Iss. 1 (110), pp. 265–275. DOI: https://doi.org/10.30932/1992-3252-2024-22-1-15.

The original text of the article in Russian is published in the first part of the issue.
Текст статьи на русском языке публикуется в первой части данного выпуска.

June 18, 2024, marks the 150th anniversary of the birth of Academician Vladimir Nikolaevich Obraztsov (1874–1949), one of those who largely contributed to organisation of domestic transport science, a founder of a scientific school of designing railway stations and transport junctions, a leading specialist in the field of railway operation, a prominent public figure, Professor at Moscow Institute of Transport Engineers (MIIT).

The professional and scientific activities of the talented educator and scientist are closely connected to the history of the country's largest transport university, which is MIIT University (now Russian University of Transport). V. N. Obraztsov had worked at the educational institution for almost 50 years. He began his teaching career in the pre-revolutionary period, at Imperial Moscow Engineering School (IMIU) and continued it at MIIT. Here he created a scientific school, trained dozens of students and was the head of the country's first department of stations and junctions.

A unique historical source with which it is possible to recreate individual stages of a scientist's path within the walls of MIIT is the institute's newspaper «Stalinets», published since 1924 (until 1931 – «Krasny Puteets», «Student transportnik», «Dzerzhinets»)[1]. Its pages reflect educational, scientific and social activities of the institute. The newspaper's materials are being introduced into scientific circulation for the first time and make it possible to recreate individual pages of the life of the outstanding scientist V. N. Obraztsov, his pedagogical and scientific activities at the institute.

V. N. Obraztsov began his scientific and pedagogical activities at IMIU (since 1913 – Moscow Institute of Railway Engineers) in 1901, when, at the invitation of Professor K. Yu. Tseglinsky, he became a part-time assistant lecturer at the department of railways. This was the beginning of a long creative and professional journey for an educator and a scientist. Little information has been preserved about the pre-revolutionary period of V. N. Obraztsov's pedagogical work. By the time V. N. Obraztsov joined IMIU, a qualified team of professors and teachers had already been formed there. Among them there were merited Professors F. E. Maksimenko, S. M. Solovyov and L. D. Proskuryakov and many others, who through selfless work contributed to development of the educational institution and provided training of highly qualified railway specialists [1, P. 13]. Until 1905, IMIU had a course system, after which it was replaced by a subject system that was preserved when the school was transformed into an institute.

A significant achievement in the field of engineering sciences during the Soviet period was creation of a scientifically rationale theory for design of railway stations and junctions. In 1919, a relevant specialised department was created for the first time in the country at Moscow Institute of Railway Engineers (MIIPS). V. N. Obraztsov was elected head and Professor of the department of stations and junctions [1, P. 94]. The department immediately launched scientific work to formulate a theory and search for methods for designing stations and junctions. Later, researchers at the department also dealt with the problems of combining different modes of transport: railway, water, road, air transport [1, P. 95].

Data on wages in the first years of Soviet power have been preserved. Social security for teaching staff was not at a high level see rapidly growing prices and lack of food. Thus, on December 5, 1918, V. N. Obraztsov's official salary, as a supernumerary teacher, was of 1888 rubles 6 kopecks [2, P. 100].

In the 1920s, V. N. Obraztsov worked a lot on issues of vocational technical education. The discrepancy between the old system of teaching in higher educational institutions and the new socio-economic tasks in the country required new solutions and restructuring of the entire personnel training system. The pace of development of the country's national economy urgently required a maximum increase in the number of students and a reduction in study time to a minimum.

Professor V. N. Obraztsov organised the workers' faculty («rabfak») at MIIPS, which was opened in 1919 [3]. At the workers' faculty, disciplines focused on transport were studied; not only were young people trained for entering the institute, but also they received professional technical training, which made it possible to be employed in transport industry [4, P. 11]. The First All-Russian Methodological Conference of Workers' Faculties was held under the chairmanship of V. N. Obraztsov. He was one of developers of workers' faculties programs, which

[1] Today the newspaper is published under the name «Transport Engineer».

were approved at the 2nd and 3rd congresses of workers' faculties [5].

In 1924, V. N. Obraztsov published materials in which he highlighted the experience of reorganising the educational framework at MIIPS, the experience of a new teaching method at Moscow Mining Academy. They were published in the first issue of «Materials on the Reform of Higher Education» of the scientific and engineering section of the State Academic Council of the People's Commissariat for Education [6]. In them, he reflected the discrepancy between the old system of teaching in higher educational engineering institutions of the country and the new conditions of building the Soviet state. The higher school faced the task of starting to train «…an organisational engineer on the one hand, and an engineer with a sufficiently high theoretical training in his specialty on the other» [1, P. 26]. The Professor pointed out that at MIIPS back in 1922, «on the initiative of a group of professors and the academic student section, the Board created the so-called Planning Commission for development of the curriculum and teaching methods» [6, P. 1]. He was the founder of a new teaching methodology for transport engineers. In the learning process, V. N. Obraztsov was guided by the principle of minimum costs with high quality of training, so that every cost of training would produce a productive result. He proposed considering the features of the composition of students, the level of their general educational background, and practical interests of students [7, P. 253]. V. N. Obraztsov recommended studying most subjects during practical classes with exercises. He also proposed replacing the system of classes from subject-based to course-based. The results of the commission's work were reflected in the new MIIPS curriculum and an explanatory note to it, adopted by the Faculty Council and approved by the State Academic Council of the People's Commissariat for Education as a normal curriculum [State Academic Council Bulletin No. 3, September 1923) [6, P. 4].

The year of 1924 was the beginning of a new stage in the history of the institute and the life of the scientist. In the autumn, MIIPS merged with the Higher Technical Courses of the NKPS, which led to a change in the organisational structure of the higher educational institution and its renaming to MIIT. To more successfully carry out reforms at the institute, representatives of both educational institutions were included in its Board, and A. B. Khalatov, a member of the NKPS Board, was appointed chairman. From behalf of MIIPS, the Board of the Institute included Professors E. A. Gibshman, V. N. Obraztsov and student A. A. Zhukov, from the Higher Technical Courses – V. I. Ledovskoy, Professor V. I. Rudnev and student G. M. Borisov [4, P. 12].

After the merger, the following faculties were organised: 1) faculty of civil engineering [construction] with two departments: a) of railway construction, b) of engineering structures; 2) water faculty with two branches: a) river and b) sea branch; 3) faculty of operations; 4) faculty of traction; 5) faculty of electrical engineering [4, P. 11]. MIIT began to operate faculties that trained specialists for various sectors of the country's transport system. A specially created commission developed curricula for each specialty of the institute, and also determined the relationship between general education, general engineering and special disciplines [1, P. 30]. Particular attention was paid to projects that led to obtaining diploma and which were carried out based on the tasks of the NKPS, State Planning Committee and other government agencies. MIIT professors and teachers regularly took part in production meetings of the NKPS and gave lectures on transport and production.

Due to the scientific and organisational activities of Professor V. N. Obraztsov, Ph.D. studies were opened at MIIT giving start to training of highly qualified technical personnel. It was he who first raised the question of training Ph. D. students at a transport university at a meeting of the Provisional Board of the Scientific Research Institute, which took place at MIIT on November 12, 1925 [7, P. 259]. As a result, «the Board decided: to ask Glavnauka [science department] to assign 20 Ph.D. students to the research institute, counting 4 people per Section, i.e. per group of MIIT scientists who were specialists in certain areas of science» [7, P. 259].

In accordance with the regulations on the procedure for training scientists at universities and research institutions of the USSR People's Commissariat of Education, in the autumn of 1925, a Research Institute (RI) was created at MIIT, headed by Professor F. E. Maksimenko. According to the temporary Regulations on the MIIT RI, approved on March 5, 1926, its tasks were: «a) organising scientific and technical research in the field of transport, b) studying other

issues from a scientific point of view, if necessary, c) along with this, training of scientists for higher education institutions and transport from among those who graduated from Moscow Institute of Transport Engineers and Leningrad Institute of Transport Engineers, as well as from among persons coming from the transport industry who have demonstrated abilities for scientific activity and are taking an active part in development of transport science and technology» [4, P. 116]. The opening of Ph.D. studies at the MIIT RI brought scientific activity closer to practical work on railway topics [2, P. 107].

In 1926, 5 sections were formed within the structure of the MIIT RI: 1) of materials and structures, 2) of hydraulic engineering, 3) of track and road construction, with 5 subsections, 4) of traction, 5) of operations and economics, with 5 subsections. At the Research institute, V. N. Obraztsov worked in the Section of Operations and Economics and was involved in development of the scientific topic «Moscow junction» [4, P. 124]. Subsequently, Vladimir N. Obraztsov took a direct part in the design work on reconstruction of Moscow junction. The project was based on his idea of integrated marshalling yards. Professor V. N. Obraztsov proposed to connect the ring of the Circular Railway by diameter by deeply introducing a connecting branch going underneath the entire city [8, P. 21]. Thus, the issue of servicing Moscow railway junction was resolved.

In the 1920s, several scientific works by V. N. Obraztsov were published on the problem of development of Moscow transport junction. Among them were: «On bringing cargo trains deeper inside Moscow» (Bulletin of the NKPS, 1920); «Rearrangement of Moscow junction of Moscow – Kazan Railway» (Zheleznodorozhnoe delo, 1925, No. 12), in 1926 – «Moscow junction and the main ideas of its reconstruction» (Proceedings of the 22nd Deliberative Congress of Representatives of the USSR Railway Operation Services, 1926) and others [9, P. 10].

According to data for 1929, at MIIT V. N. Obraztsov taught the following disciplines: «Local Roads» (special subject, Faculty of Civil Engineering) [4, P. 50]; «Large stations and junctions» (special subject, Faculty of Operations); «Local roads. General course» (special subject, Faculty of Operations) [4, P. 50]. He actively worked with young researchers and developed student science. The institute's newspaper «Dzerzhinets» published in 1928 a note under the heading «About the Institute» about Obraztsov's leadership of the technical student circle at the Faculty of Operations. The newspaper reported that the dean's office «decided to organise two circles: railway one and trackless one. The following professors were appointed to the initiative bureau of the Trackless Circle: Obraztsov V. N. and Krynin D. P.» [10].

A separate page in the history of MIIT is publication of scientific works of the institute. «Proceedings» and «Izvestia» [News] had been published since pre-revolutionary times. The results of research by the teaching staff were published on their pages. The first collection of scientific works of the university was published in September 1907 under the title «Izvestia of Imperial Moscow Engineering School». The scientific issue was published by decision of the School Council and consisted of two sections: 1) official and 2) unofficial. Starting from the first issue, V. N. Obraztsov also published his works in Izvestia. One of his first works in Izvestia was devoted to issues of transport economics [11].

The scientific collection was published until 1916, then there was a ten-year break. The publication of the edition was resumed in March 1926 under the title «Proceedings of Moscow Institute of Transport Engineers» [11]. In the preface to the first issue of Proceedings, the editorial board defined the purpose of the scientific publication: «While there is a sufficient amount of popular literature, there is a lack of a publication in which representatives of science working on transport problems could publish the results of their work. Aware of this gap, MIIT hopes to at least partially fill it by issuing periodic collections called «Proceedings of MIIT,» on the pages of which the Institute's staff will have the opportunity to publish their work» [4, P. 129]. The works of Professor V. N. Obraztsov were regularly published in the «Proceedings» of MIIT: «Overpass tunnels in design of junctions and stations», [4, P. 129] «Technique for designing stations» [12], «Standard station of V–III classes with gradual development» [13], «Railway in the city» [14], etc.

Industrialisation and rapid development of industry in the country in the late 1920s – 1930s put on the agenda the problem of industrial transport and its design in connection with the technological process of enterprises. The issues of choosing the most rational mode of transport «to save public funds» were considered especially deeply [5]. During this period, V. N. Obraztsov

carried out active practical work, advised several large industrial transport projects: Magnitogorsk plant, Dneprostroy, Kuznetsk plant, Balkhash, Dzhezkazgan plants, etc. V. N. Obraztsov did a lot for development of transport, city planning and design of metro in Moscow. He dealt with reconstruction of the Southern Coast of Crimea and reconstruction of transport at the resorts of the Caucasian Mineral Waters [5]. The scientific knowledge and practical experience of V. N. Obraztsov were highly valued at the NKPS. Thus, L. M. Kaganovich more than once invited him to conduct scientific examination. When discussing the work of railway transport in the Central Committee of the All-Union Communist Party of Bolsheviks, V. N. Obraztsov was invited to a meeting where the question was raised «about the need to unite all transport research institutes in order to ensure comprehensiveness of the solution of scientific problems, turning the institutes into a true centre of advanced scientific thought of railwaymen» [8, P. 23].

In the 1930s, MIIT was the largest transport higher educational institution, the scientific and technical support of the NKPS and the entire transport industry of the country. The institute's newspaper «Stalinets» wrote about the great scientific potential of the institute and its capabilities for helping transport. Thus, in the newspaper materials for 1934 it was noted that more than 600 professors and teachers work at MIIT, among them «such large forces as Prof. Mityushin (track), Prof. Zemblinov and Prof. Obraztsov (operations), Prof. Oppepheim, Prof. Gibshman and others. With such large forces and with a team of students of 4000 people MIIT can and should provide great power to transport. A number of professors at MIIT have already taken the path of concrete assistance to transport. For example, the department of Prof. Obraztsov is working on the problem of reconstructing Tula junction» [16].

In the early 1930s, several major tasks for reconstruction of socialist transport were solved by the Scientific Research Sector (SRS) of MIIT, which became the scientific centre of the institute. It was headed by Professor V. N. Obraztsov. The high achievements of scientists working in the sector were discussed in the article «From the SRS report» in the newspaper «Stalinets» for 1932 [17]. In particular, about the work of the department, also headed by V. N. Obraztsov, it was noted: «…The department «Stations and hubs», with active participation of the most prominent professors and associate professors of our institute, namely Obraztsov, Gibshman, Nikitin, is developing a research task that is extremely relevant for railway transport – placement of cargo stations in Moscow railway junction from the point of view of its reconstruction…» [17]. The work of Ph.D. students of the department was also highlighted separately. So, for example, the following was written about V. N. Obraztsov's student: «Ph.D. student S. P. Buzanov completed and submitted for publication to SRS a research work on the history of stations and junctions on the USSR network. This work, for the first time in the history of development of the discipline «Stations and junctions,» provides a social and class analysis of development of stations. A few station diagrams from this work were used in construction of the greatest Moscow – Donbass supermainline» [17].

In 1932–1933, two research teams created from among students, Ph.D. students and university professors, worked under the scientific guidance of Professor V. N. Obraztsov and his disciple Professor S. V. Zemblinov. The teams were engaged in development of scientific projects for reconstruction of the largest stations and junctions of railways of the Soviet Union (Moscow, Leningrad, junctions of Donbass and Kuzbass, Yaroslavl, Kirov, Kupyansk and several others) [9, pp. 10–11]. We read on the pages of the newspaper «Stalinets» about the assault «to reconstruct the railway junctions of the most important and most intensively built Moscow – Donbass railway» and about the team led by Professor S. V. Zemblinov, which drew up projects «for reconstruction and rationalisation of the following junctions: Lozovaya, Slavyansk, Popasnaya, Rodinovo, Kupyansk, Southern Railways, Liski – South-Eastern, Elets – Uzlovaya, Kashira, Ozherelye, Lugansk along the line of the new Moscow – Donbass railway» [18]. All projects were worked out at local technical meetings and agreed upon by the railway directorates.

In May 1933, MIIT and the Central Directorate of Technical Propaganda (Tsutekhprop) of the NKPS organised a team under the leadership of Prof. V. N. Obraztsov, consisting of 11 Ph.D. students from MIIT SRS, a group of fourth-year graduates of station specialty and several professors and associate professors. We read about the tasks assigned to the team in the materials of the newspaper «Stalinets»: «the first

is the study of the work of the most important junctions of the Southern and Ekaterininskaya railways, the work of in-plant transport, the largest giants (KhTZ, Makeevka Metallurgical Plant, Dneproges with the plant, mines, Dnepropetrovsk metallurgical plants); the second is carrying out technical work at the junctions, giving lectures for engineers by professors, conducting reports and conversations among the masses of railway workers with the help of Ph.D. students and graduate students, familiarising themselves with the state of technical work at the junction and holding methodological conferences» [19].

The team worked for 18 days. We read about the results in the note: «As a result of clear leadership, especially from the head Prof. Obraztsov, and the correct balance of forces, the team conducted 11 lectures by professors, 20 reports and conversations by Ph.D. students and 9 by graduate students. In total, 40 lectures and reports were held on the following issues: reconstruction of large junctions; mechanisation of humps; standard mechanised warehouse; analysis of operational meters; routing and specialisation of trains; track arrangement; automatic blocking; automatic coupler, etc.» [19]. The experience of V. N. Obraztsov's team showed how important it is for future engineers and scientists to organise such trips, within the framework of which the technical horizons of Ph.D. students and graduate students are significantly expanded. The combination of such scientific and production excursions with technical work at the junctions was closely linked to production tasks. The Department of stations and junctions of MIIT provided extensive assistance to transport in subsequent years. Thus, in the note «Our help is real» for 1934, V. N. Obraztsov indicated that he was taking upon himself «the development of a memorandum on the issue of transferring the Circular Railway… At the request of the Circular Railway, a draft memorandum on this issue was drawn up» [20].

Professor V. N. Obraztsov was recognised as the «Best Worker» of the Institute and in 1933, the Department of stations and junctions», under his leadership, provided scientific and technical assistance to Kursk Railway by examining the project for development of Tula railway junction. A corresponding note was published about this in the institute newspaper «Stalinets». The head of the department, Professor V. N. Obraztsov, having studied the project, invited the entire department and students to go to Tula to get acquainted with the area, the city and the state of industry. As a result of analysing available materials, the department recognised the project drawn up by Kursk Railway as untenable. He did not consider the development of the city and its layout, did not provide amenities to serve the developing industry, did not take into account

the development of Tula II station, etc. As the author of the note wrote, «The department, solving the problem of Tula junction, considered all these shortcomings. Scheme proposed by the department represented by prof. Obraztsov for development of Tula junction was reviewed by the Scientific and Engineering Council of the Operational Directorate of the NKPS and did not meet any objections, and the department's proposal to turn station Tula I to the passenger only station, and station Tula II – into the commodity-administrative body, was adopted by the Scientific and Engineering Council» [21].

The article «Red Banner Department «Station and Junctions» highlighted the participation of MIIT departments in socialist competition in transport. The author of the note was the head of the department, Professor V. N. Obraztsov, party organiser Buzanov and trade union organiser Nikitin. Among the achievements, the following works of the department were noted: «…The conclusion of the department on Tula junction has already been accepted by the Scientific and Engineering Council of the Operational Directorate of the NKPS. From the scientific work carried out by the department, personally with the participation of V. N. Obraztsov the following was emphasised: «…The work of V. N. Obraztsov was put into print: «Railway junctions in urban planning». Professor Obraztsov gave 3 lectures on the transport encyclopaedia to Ph.D. students, participated in examination of Metrostroy and took an active part in organising the building transport fleet of Metrostroy» [22]. From public work the following was indicated: «Prof. Obraztsov and Associate Professor Buzanov took patronage over the Komsomol brigades, who receive great assistance in their studies and work, etc.» [22].

In January 1934, a production meeting of the 6th group of the 4th year of the Operations Faculty was held, with participation of the head of the institute, dedicated to summing up the work of the Komsomol brigade named after the 15th anniversary of the Komsomol on the actual design of Moscow-Tovarnaya station. At the meeting, the work done by the students was highly appreciated, in particular, it was stated that «it was possible to increase the capacity of trains per day to 350 pairs» [23]. Professor V. N. Obraztsov also took part in this meeting and noted «that the team of Komsomol members working on the project will understand theoretical issues even more deeply and seriously» [23].

Professor V. N. Obraztsov was at the forefront of development of all major scientific topics dealt with by the department of stations and junctions». In 1933, his major work «Railway Stations» was published, which became the scientific basis for a whole series of textbooks on the discipline «Stations and Junctions»: Part I appeared in 1935 (authors – V. N. Obraztsov, V. D. Nikitin, S. P. Buzanov), part 2 in 1938 (authors – V. N. Obraztsov, V. D. Nikitin, M. V. Senkovsky, N. R. Yushchenko) and part 3 in 1949 (authors – V. N. Obraztsov, V. D. Nikitin, F. I. Shaulsky, S. P. Buzanov) [24, P. 107].

The assessment of the scientific activity of the head of the department of stations and junctions, Professor V. N. Obraztsov, was given in the photo note «Under the leadership of the party – in step with the working class» [25] in the institute's newspaper: «[Professor Obraztsov]… has over 50 scientific works, leads the preparation of Ph.D. studies and develops major problematic issues of railway transport. He has been awarded several times for his exceptional energetic intensive work. Public organisations and the directorate of the institute filed a petition with the Central Committee of the Railway NKPS and Council of People's Commissars of the RSFSR on awarding V. N. Obraztsov the title of Honoured Scientist. In addition, the employees under the leadership of Prof. Obraztsov and Prof. Zemblinov were involved in technical propaganda work, as a result of which, according to understated estimates, transport had a saving of 4,5 million rubles» [25].

Another article «Scientific personnel of MIIT» in the newspaper «Stalinets» reported about training of highly qualified personnel in the system of postgraduate professional education of the university, about the successful scientific work of V. N. Obraztsov with Ph.D. students. It was noted that in 1938–1939, under the scientific guidance of V. N. Obraztsov, Buzanov, Zemblinov, and Nikitin defended their dissertations and received the academic degree of D.Sc. (Eng); Shaulsky and Kyazumov became Ph.D. (Eng) [26]. Noting the achievements of MIIT in training qualified personnel for the country's transport industry, the Central Department for Personnel Training of the NKPS, in its order dated January 25, 1934, noted the outstanding work of the best part of the university's teaching staff. Professor V. N. Obraztsov was among those who received a cash prize of 1000 rubles [27].

The teaching activities of V. N. Obraztsov were actively covered in various materials of the institute's newspaper «Stalinets». So, in 1932 he was included in the list of the best professors at MIIT. This is described in the note «The Best of the Best,» which characterises the scientist as follows: «Head of the department of stations and junctions. A major researcher in railway transport. He has about 50 scientific papers in the field of design of railway junctions. He performs work as directed by the deputy People's Commissar of Railways Comrade Blagonravov on design of stations on Moscow–Donbass railway and a number of other large junctions. He is an active member of Mossovet section. He is awarded with the Great Soviet Encyclopaedia» [28].

In 1934, patronage of professors over students became widespread at MIIT, Professor V. N. Obraztsov took an active part in it. The note «Concrete Patronage» highlights his work with five Komsomol members of the 6th group of the Operations Faculty. The author of the note indicates how actively this work was going on, citing Professor V. N. Obraztsov himself, who repeated to the students: «You must squeeze out of me everything that I know, so that there is nothing left, and I must help you in this» [29]. Professor V. N. Obraztsov took a responsible approach to his patronage, «I was in the hostel twice, once I got acquainted with everyday life, and another time I had a technical conversation» with students [29]. He «took upon himself the obligation to acquaint Komsomol members with foreign technology and culture of the countries in which he was, and in every possible way to contribute to broadening the horizons of the relevant Komsomol members. Excursions, viewings of productions and films together with prof. Obraztsov are scheduled each day off» [29].

The institute's newspaper «Stalinets» actively covered the social activities of V. N. Obraztsov. In 1934, he was elected a member of the All-Russian Central Executive Committee of the RSFSR, in 1935 – a deputy of Moscow Council, in 1937 – a deputy of the Supreme Soviet of the USSR of the 1st – 2nd convocations (elected from the Rtishchevsky electoral district of Saratov region). Thus, in the note «Professor Obraztsov is a candidate for the council in the Rtishchevsky electoral district» [30] it was written: «The head of the department of stations and junctions, order bearer, Professor Vladimir Nikolaevich Obraztsov is one of the oldest employees of our institute. 36 years of work at our institute is a huge journey of a remarkable scientist who devoted more than half of his life to education of young specialists» [30].

V. N. Obraztsov himself recalled this period of his life: «Soon I went to my Rtishchevsky electoral district in Saratov region. I visited railway stations (after all, first, I am a railwayman), state and collective farms, cities and towns, schools, shops, hospitals, cultural centres, orphanages. I got to know the lives of my constituents, their needs and aspirations, their vital interests. So, I'm going through my notes relating to my parliamentary activities, looking through my correspondence, which amounted to about 2000 letters this year, and remembering these past months. What voters wrote to me about! There seems to be not a single issue in the personal, public and state spheres that would not interest them. They share all their thoughts and experiences, achievements and failures with the deputy, whom they consider, judging by their enormous trust, to be family and friends…» [8, pp. 27–28].

In 1935, V. N. Obraztsov headed the newly created Research Institute of Railway Transport. The scientist's contribution to development of the country's transport industry was highly assessed, and in the same year V. N. Obraztsov was awarded the Order of Lenin. Since 1939, Vladimir Nikolaevich Obraztsov has been a full member of the USSR Academy of Sciences, who organised and permanently headed the section on scientific development of transport problems [31]. Academician V. N. Obraztsov based the activities of the section he led on the problems of the scientific system in development of the

network and operation of all types of transport. In subsequent years, the scientist clarified the principles he developed as applied to individual economic regions of the Soviet Union [9, P. 11].

The activities of V. N. Obraztsov also continued fruitfully at the Operations Faculty of MIIT, which trained engineers in organising cargo work, mechanising loading and unloading operations, managing passenger transportation and designing stations and junctions. All these divisions were of great importance in the work of the railways. To maximise the effect of using transport technology, to ensure uninterrupted traffic, to build new railways and reconstruct old ones, transport needed qualified personnel. During the period from 1917 to 1940, 9377 people graduated from MIIT. The institute employed 36 professors, 127 associate professors, 105 assistant lecturers and lecturers. The professors of the institute included the deputy of the Supreme Soviet of the USSR, Academician-order bearer V. N. Obraztsov, order-bearers professors B. N. Vedenisov, G. M. Shakhunyants, V. L. Nikolai, A. N. Babichkov, professors, D.Sc. (Eng) G. K. Evgrafov, I. R. Prokofiev, V. D. Zernov, N. T. Mityushin and others [32].

At the beginning of the Great Patriotic War, in October 1941, V. N. Obraztsov left for the Urals for evacuation. Here he works in the transport commission of the USSR Academy of Sciences, which studied changes in the size of cargo turnover, established the necessary transit and carrying capacity, and linked railway transport with inter-factory and intra-factory transport [33]. The newspaper «Gudok» for 1942 reported the following about the activities of V. N. Obraztsov during this period: «The Academician spent most of his time at production sites, examining the technological process, giving advice on projects for development of junctions, checking the directions of cargo flows and proposing measures to increase carrying capacity … Recently, a group of leading Soviet scientists, led by the President of the USSR Academy of Sciences, Komarov, completed an outstanding work – «On development of the national economy of the Urals in conditions of war», in which theoretical problems immediately received practical resolution. As a result…of implementation of the measures planned by scientists, the Urals increases the supply of the front, raises production and transportation of weapons, ammunition, raw materials and fuel for defence factories. The work of scientists strengthens the country's military power…» [33]. For this work, in 1942, nineteen scientists, including Academician V. N. Obraztsov, received the Stalin Prize of 1st degree.

During the Great Patriotic War, MIIT was also evacuated. The scientific activities of its departments underwent changes. At some departments, groups were organised to design the reconstruction of destroyed bridges, buildings, and railway tracks in territory captured by the enemy. The scientific development of these problems was carried out by Academician V. N. Obraztsov and Professor B. N. Vedenisov [2, P. 160]. For many years of outstanding work in the field of science and technology, Academician V. N. Obraztsov was awarded the Stalin Prize of 2nd degree on March 22, 1943 [3]. V. N. Obraztsov contributed the received prizes to the country's defence fund. In 1943, V. N. Obraztsov was awarded the title of General Director of traffic of the first rank [9, P. 12]. In 1946, he was elected deputy of the Supreme Soviet of the USSR.

In the post-war period at MIIT, Academician V. N. Obraztsov developed the theory of transport transit and carrying capacity. As part of the five-year plan for reconstruction and development of the national economy in 1946–1950, MIIT scientists were tasked with achieving the unconditional implementation of this plan and the immediate transfer of completed work into production [34].

In June 1949, Academician V. N. Obraztsov celebrated his anniversary. The newspaper «Stalinets» published a photo note «V. N. Obraztsov. To the 75th anniversary of birth». It emphasised the scientist's long professional path, during which, over 50 years of scientific activity, he wrote about 300 scientific papers [35]. By a decree of the Presidium of the Supreme Soviet of the USSR dated July 30, 1949, MIIT professors, Academician V. N. Obraztsov, and corresponding member of the USSR Academy of Sciences, B. N. Vedenisov, were awarded the Order of Lenin [36].

V. N. Obraztsov died on November 28, 1949, after a serious and long illness. The news of his death at MIIT was met with great sadness. In issue No. 30 of the newspaper «Stalinets» for 1949, obituaries from the Ministry of Railways, the party committee and the MIIT directorate, as well as memoirs of the scientist's students and colleagues were published. Professor V. D. Nikitin

recalled his joint work with V. N. Obraztsov: «For the first time I managed to listen to V. N. Obraztsov's lectures back in 1922, then in 1924 and 1925. Even then, he amazed with the breadth of his views, enormous erudition and, most importantly, uncontrollable ebullient energy and passion in solving major transport issues. Later, during more than twenty years of joint work at the department of stations and junctions, I never ceased to be amazed by his persistence and passion, deep patriotism and enormous energy in all types of his diverse activities. Vladimir Nikolaevich's latest works in the field of complex theory of various modes of transport summarise a long period of his fruitful scientific activity and are a synthesis of many particular problems that he solved on his life path» [37].

Professor G. P. Grinevich wrote: «I first met Vladimir Nikolaevich in 1928, while a student at MIIT. The very first acquaintance with Vladimir Nikolaevich, who was already one of the leading transport scientists at that time, struck me with the warmth and caring that were characteristic of him in his relationships with students. Vladimir Nikolaevich closely monitored the formation of each student, noticed the individual, special features in each of them, skilfully developing in students a love of knowledge and research, carefully directing the creative thought of students to solve the most important problems facing socialist transport» [38]. D.Sc. (Eng) F. I. Shaulsky recalled his twenty years of work together with V. N. Obraztsov: «He was an outstanding and versatile scientist – a deep expert in all modes of transport. V. N. Obraztsov was a talented design engineer. Despite his colossal knowledge, he always studied: at stations he had conversations with switchmen and train assemblers, at factories – with workers and foremen, drawing from them advanced experience. These conversations were so intimate that the image of Vladimir Nikolaevich was forever preserved in memory» [39]. Exceptional efficiency, enthusiasm, honesty, responsiveness, and integrity have always been the hallmarks of Professor V. N. Obraztsov. Possessing enormous erudition in such a complex and multifaceted area as the country's transport, encyclopaedic knowledge and rich practical experience, V. N. Obraztsov skilfully passed on this knowledge to his students, workmates and students [5].

In 1949, to perpetuate the memory of Academician V. N. Obraztsov, the Leningrad Institute of Railway Engineers (now Emperor Alexander I St. Petersburg State Transport University) was named after him. In honour of the talented scientist, in December 1949, by the decision of the Executive Committee of Moscow City Council of Workers' Deputies, Bakhmetyevskaya Street was renamed Obraztsova Street. Streets in other cities of the country were named in honour of V. N. Obraztsov, including in Chelyabinsk, Rtishchevo, Irkutsk, etc. In memory of the 100th anniversary of the birth of V. N. Obraztsov, Moscow Council decided to install a memorial plaque on the house, where Vladimir Nikolaevich lived.

The government highly appreciated V. N. Obraztsov's contribution to transport science, awarding him the title of State Prize laureate twice; for outstanding services he was awarded three Orders of Lenin, the Order of the Patriotic War, I degree, two Orders of the Red Banner of Labour, the Order of the Red Star and medals [31]. V. N. Obraztsov gave almost 50 years of his life to MIIT. The memory of the scientist, the first Academician in transport science, is carefully preserved within the walls of the university to this day. Academician V. N. Obraztsov will forever remain in memory as an excellent teacher and educator of domestic engineering personnel, the founder of the science of designing railway stations and junctions.

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Article received 27.02.2024, approved 25.03.2024, accepted 27.03.2024