

Soviet Colleges Before WWII: How Entrance Exams Were Conducted

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Abstract

This paper attempts to describe the system of college admissions that existed in Soviet Russia before the Second World War. The early post-revolutionary years saw a wholesale rejection of entrance exams. It proved necessary to return to them, however. The history of exams was part of a political battle, proving once again that mathematics education is closely connected with social and political history. During the pre-war years, certain ways of conducting exams became established, old exam problems returned and new ones appeared. Literature for students entering colleges reappeared, blossoming after the war. This paper is based on archival materials and the analysis of pre-war publications.

Keywords: Russia, higher educational institutions, entrance exams, problems

Introduction

This paper is devoted to an investigation of entrance exams to higher educational institutions in Soviet Russia after the revolution of 1917. In this respect, it continues the investigation begun in Karp (2022), which is devoted to the prerevolutionary period. The revolution brought radical changes to everything having to do with education. Suffice it to say that entrance exams were immediately abolished. Thus, the period examined here (roughly until the Second World War) splits naturally into two parts: first, when exams officially did not exist; and second, when they were again introduced.

It must be said that, while the topic of entrance exams found an extremely broad response in practical literature, so to speak, which was oriented toward preparation for these exams, curiously it has been almost completely uninvestigated in literature of a scholarly nature. Meanwhile, both before and, especially, after the WWII, these exams in many respects determined the unofficial curriculum – that which someone who wished to enter college actually had to learn.

The present paper, of course, does not pretend to exhaust the topic: its purpose is to initiate, rather than to conclude the investigation. In particular, we will not always attempt to trace the year-by-year changes in the procedure of selection for college, but will usually describe certain time intervals as relatively uniform. This paper relies first and foremost on archival materials preserved in St. Petersburg archives, and on publications from the period under investigation.

Right After the Revolution: General Organization

The Decree on the Unified Labor School of the Russian Socialist Federated Soviet Republic of 1918 states: “All exams – entrance, transition, and graduation – are

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abolished”¹ (Abakumov et al., 1974, p. 135). Also prohibited were mandatory homework assignments, as well as all forms of punishment. Such means of child restraint were to play no part in the new schools. “The foundation of school life must be productive labor,” which is closely connected with education that “illuminates all of surrounding life with the light of knowledge” (p. 135).

The Decree on the Rules of Admission to the Higher Educational Institutions of the RSFSR from August 2, 1918, signed by Lenin, declared:

1. Any individual, regardless of citizenship or gender, who has attained the age of 16, may enroll as a student at any higher educational institution without presenting a diploma, certificate, or proof of graduation from secondary or any other school.
2. Incoming students may not be requested to present credentials of any kind, except documentation certifying their identity and age (Abakumov et al. 1974, p. 403)

Transgressors of this decree were threatened with the revolutionary tribunal.

A question arose, however, as to who should then be admitted to colleges, not in theory, but in practice – since there might not be enough places for everyone. It was natural, shortly thereafter, to announce a class-based approach to student selection, according to which workers and peasants – who had the “right” class origins – were to be admitted first. It turned out, however, that it was not always possible to do this, since class origins could not replace basic knowledge, which colleges simply could not dispense with. Consequently, beginning in the fall of 1919, so-called *workers’ faculties* began to appear, which admitted students who were unprepared but had the right class origins, in order to pull them up to the requisite level; so that in the course of study there, students had to show somehow that they had learned something. The rules of admission to higher educational institutions in 1924 (Spravochnik, 1924) declare:

6. Individuals who have completed courses at workers’ faculties that appear on the list approved by the Main Professional Education Directorate who submit their documents to a college, in accordance with the allocation of the Main Professional Education Directorate’s Department of Workers’ Faculties and with a visa from Presidium of their Workers’ Faculty to the Admissions Committee of the college, are automatically enrolled (without testing or class status verification) as students at the college (pp. 56-57).

The main means of forming not only workers’ faculties but also the colleges themselves were recommendations or “commands,” to employ the term then in use. The same Rules explain (p. 57):

11. Vacancies remaining after the enrollment of workers’ faculties’ graduates are to be distributed in the following manner:
 - a) Central Committee of the Russian Communist Party25%
 - b) All-Union Central Council of Trade Unions.....30%
 - c) Central Committee of the Russian Communist Youth League.....15%
 - d) The working peasantry, the demobilized, and invalids of the Red Army and Navy.....15%

¹ All translations from Russian are by the author.

- e) Individuals who have successfully completed second-stage schools... and who exhibit special talents... based on reviews by school councils approved by the Gubernia Departments of Education.....15%
- f) Soviet Socialist Republics.....5%.

Naturally, the organizations named above did not select the individuals “commanded” to colleges and workers’ faculties in a centralized manner, but distributed the numbers they obtained among lower-level organizations. For example, the following telegram to a gubernia Komsomol regional committee (apparently, from the Petrograd region) has survived:

We have received 25 places for preparatory courses at the People's Commissariat of Public Health's Institute of Physical Culture. You are offered 4 places. You are invited to select comrades not younger than 18 years of age, with good literacy skills, who have graduated from elementary schools, and are entirely healthy. As far as possible, it is necessary that young women should be commanded... Maintenance of subsistence on-site is on the same basis as for those commanded to workers' faculties. (Gubkom VLKSM, 1922, p. 1)

A question arose, however, concerning the preparedness of the “commanded” students. The same Rules treat this question as follows:

- 7. All other individuals (who have not graduated from workers' faculties) who have submitted documents and are seeking enrollment are subject to preliminary testing within the scope of the curriculum of the workers' faculties in the Russian language, mathematics, physics, and social science. (Spravochnik, 1924, p. 57)

Admittedly, the decree on admissions committees “in specially exceptional cases” delegated to local admissions committees the right to release from testing “candidates who are particularly valuable in terms of their class origins, whose general preparation for attending college courses is not in doubt” (Spravochnik, 1924, p. 60). Still, exams could not be dispensed with entirely even in such cases.

Let us note, too, that the directory cited above was published in 1924, and college admissions for that year are characterized in this volume as significantly different “from the experience of class-based college recruitment accumulated by us over the past three years” (p. 46). The very reference to “three years” is significant. In other words, admissions during the years 1918-1920 are not included in this experience. Indeed, during the years of the Civil War, there was not time enough for everything, and many decrees remained decrees on paper only. We have found few archival materials pertaining to the procedures of these years, but, for example, files from the St. Petersburg Transport Institute give reason to doubt that everything always proceeded exactly as it was envisioned by the reformers. For example, the files contain numerous prerevolutionary documents attesting to education received; thus, these documents were asked for, without fear of the revolutionary tribunal (Institut, 1920). Tests were conducted in 1921, too; indeed, the surviving pages contain marks: 5 satisfactory, 5 unsatisfactory, 5 to preparatory courses, 15 total. Or, 12 satisfactory, 42 unsatisfactory, 26 to the preparatory trimester, 80 total (Institut, 1921, p. 6). Of course, these are clearly not the kind of

tests that existed before the revolution; but as tests for “commanded” students, they look too strict (we should note, too, that there were no graduates from workers’ faculties yet).

According to the same directory, after the end of the Civil War, a rapid increase in college admissions was observed: in 1922, 45000 students were admitted to colleges in Russia, and in 1923, 38000. Clearly, colleges were ordered to accept students without giving too much thought to the outcome. The directory observes, not without reason: “Overfilling leads to a drop in the quality of the specialists who graduate from colleges” (*Spravochnik*, 1924, p. 47). In 1924, the admissions plan provided for only 13500 individuals. In other words, selection was becoming far more rigid.

How Tests and Admissions Were Conducted

As has already been noted, tests were in fact not always conducted. Numerous petitions have survived from various “commanding” organizations requesting that one or another comrade be released from admissions tests, “in view of [the comrade’s] entire period of service” or “in view of the fact that working over the last three years in the organization, [the comrade] had no opportunity to study” (*Leningradsky universitet*, 1922, pp. 37, 42).

No less important is how tests were conducted. In this respect, the following guidelines are indicative (quoting from *Gubkom VLKSM*, 1922, p. 46):

The purpose of the verification interview is to determine whether the candidate actually possesses the range of necessary knowledge, on the one hand, and on the other, a general civic-political development that renders him sufficiently prepared for a course of scientific study at a higher technical educational institution.

In view of this, the verification test should by no means be given the character of a narrowly formal questioning with a complete failure of the student upon discovery of any deficiency in his knowledge of factual educational material. The interview must be accounted successful if genuine understanding and assimilation of the subject by the student is discovered either as a result of a series of leading questions or of his ability to use the scientific principles pertaining to it (theorems, formulas, and the like) in solving problems and representative exercises. This orientation toward testing, however, must not serve as the basis for a narrowing of the range of knowledge required of newly admitted students. This range is defined by the full courses of studies at workers’ faculties. As for the verification tests themselves, they are confined to the following subjects: elementary mathematics – algebra, geometry, trigonometry... Answers to questions, as well as the solving of problems, may be required by the Committee in written form, but these answers must be brief. The time allotted for their completion must not exceed 10-30 minutes.

The testing program (which existed alongside referrals to the workers’ faculties’ programs) opened opportunities for exhibiting flexibility (see, for example, *Spravochnik*, 1924, pp. 62-64). In principle, we see here the standard secondary

school program. There are, however, different ways of reading it. For example, it includes quadratic equations, but what is included is specifically the phrase “quadratic equations,” not elucidated in any way. Consequently, it is possible to take this to mean that students must merely know how to distinguish quadratic equations from linear ones. The phrase “sum of the angles of a triangle” appears in the geometry program, but with a clarification in parentheses: “experimentally,” in other words, without proof. Another item is the “Pythagorean theorem (graphically, using areas),” which is difficult to interpret otherwise than as permission to accept the explanation of a diagram for an answer, and so on. At the same time, the Program includes calculus – applying the derivative to the investigation of the increase and decrease of a function or the antiderivative. Analytic geometry is present as well.

What we have before us, therefore, is a program inspired by the international reform movement, which, of course, also exerted a considerable influence on all school programs of that time; but it is given in an easy version, as it were, although indeed schools at that time were also not especially demanding (Karp, 2010).

The Reform of 1926

Things were not going well, however. The “popular explanation of the college admissions procedure for 1926” (Khodorovsky, 1926) popularly explains:

In past years students entering colleges turned out to be poorly prepared. This caused disorder in the whole life of higher educational institutions. Poorly prepared students were not capable of learning what they were taught in colleges. In order to find some way out of this situation, professors and instructors at higher educational institutions became less demanding of students, and many things were not required by them at all. The consequence of this was that students graduating from higher educational institutions turned out to lack sufficient knowledge and to be poorly prepared for working in the profession for which they had been prepared in college. (p. 37)

Further, Khodorkovsky (deputy people’s commissar and head of the Main Professional Education Directorate) continues:

The People’s Commissariat for Education has long devoted the most serious attention to this side of the matter, but the results obtained until now have been inadequate. Organizations that sent young people to colleges in accordance with the allocation were least of all interested in the educational preparation of those whom they sent. During admissions for incoming students in 1926, particular attention will be paid to educational preparation. Who is not prepared will not be admitted to college, regardless of any recommendations, certifications, and so on. (pp. 37-38)

Indeed, new Rules of Admission were passed (Pravila priema, 1926), according to which all incoming students had to undergo testing. Even those who were admitted based on allocation, and their number was noticeably reduced and by Khodorkovsky’s estimate (1926) had to make up no more than half of admitted students, had to undergo testing (testing for workers’ faculty graduates, however,

took place at the workers' faculties, not at colleges). Furthermore, the Rules (1926, p. 18) deliberately specified that "commanding" organizations could send 50% more students than they were allotted "in the event that individuals sent by command prove unprepared for college work when they are tested."

These measures were undoubtedly painful for a certain part of the leadership, and there arose a desire to return to the former procedure. The well-known journalist Brontman (1930) earnestly explains that

Tests were established in general as a temporary measure. They offer no opportunity exactly and unmistakably to determine the incoming student's actual knowledge, while from a pedagogical point of view they are an extremely negative phenomenon (p. 35).

Brontman goes on to tell about the harm caused by exams to the mental health of the students. As a kind of compromise, Brontman (1930) writes about transferring testing from colleges to local departments of education, which is incomparably easier from an organizational point of view, in his opinion, and not detrimental to the mental health of incoming students (pp. 37-38). In keeping with such demands, in 1929 and 1930 not only workers' faculty graduates were exempted from entrance tests, but also those who graduated from nine-year schools during these years (p. 35).

The introduction of testing, of course, did not mean a rejection of the "class-based approach" and a loss of vigilance. On the contrary, the late 1920s are noted for trials against the old scientific and technical intelligentsia, and the struggle against ideological enemies was waged in colleges likely even more fervently than before. In 1930, A. Ya. Vyshinsky, who later became the prosecutor general of the USSR and conducted the big Stalinist trials, serving as head of the Main Professional Education Directorate at the time, but already presiding over several signal cases, wrote an article on "College Reform and Subversion" (Vyshinsky, 1930), in which not a little was said about the sinister designs of "Messrs. Professors," who exert all their powers to "preserve, under the guise of Soviet interests, at least the remnants, fragments, pieces of the old 'imperial' schools of higher learning demolished by the October Revolution" (p. 8). Consequently, it was necessary to struggle against naked academicism and against "agents and mercenaries of capitalist predators" in general.

As instructional letters to colleges stipulated: "In the current admissions, it is necessary thoroughly to investigate each incoming student both in terms of his social position and origin, and in terms of his civic-mindedness" (Tekhnologicheskii institut, 1930, p. 1). The already mentioned Brontman writes a great deal about the importance of the "further proletarianization of the student body of higher educational institutions," about the fact that in technical colleges workers and their children must constitute no less than 70% of admitted students, about the alarming decline in the share of women among college students, and so on (pp. 33-34). Nonetheless, it so happened that entrance tests returned to colleges to the fullest extent.

The Resolutions of the 1930s

No less important is how tests were conducted. In this respect, the following guidelines are indicative (quoting from Gubkom VLKSM, 1922, p. 46): Already in 1929, at a plenary meeting of the Central Committee of the All-Union Communist Party (Bolsheviks) substantial changes were enacted to approaches toward higher education, from its curricula to its system of governance (for example, elected college heads were replaced by appointed ones) (Abinder, 1930). Still, the main changes in education occurred later, after the resolutions on education passed by the Central Committee during the years 1931-1936. These resolutions radically altered the whole system of school education, both organizationally and methodologically. Post-revolutionary experiments were declared left-leaning perversions, and schools in many respects returned to prerevolutionary models, which had only recently been considered forever demolished (Karp, 2010).

Changes in schools (including increasing and increasingly rigid requirements) evidently could not but have an impact on colleges. Objectives and requirements were changing there as well. A resolution passed by the Central Executive Committee of the USSR included the following directive: "Entrance tests must be introduced for all students entering higher educational institutions, independently of their graduation from a workers' faculty, technical vocational school, etc., in mathematics, chemistry, physics, their native language, and social science" (Romanovsky 1935, p. 10). In this way, the discussion about conducting tests was closed.

At the Leningrad Technological Institute, the supervisors were reported as follows (Tekhnologicheskyy institut, 1932, p. 65):

The immediate realization of the Central Executive Committee's resolution on raising the requisite level of general theoretical preparation is running into an INSURMOUNTABLE OBSTACLE – the low level of knowledge of those entering the Institute, since the student body is being filled mainly from Workers' Faculties and secondary schools that are only beginning to restructure their work in line with the Central Committee's instructions concerning secondary schools. This restructuring will yield palpable results no sooner than in about two years

In any case, the restructuring was under way. Accordingly, the entrance tests that were being conducted were changing as well.

On Testing Procedures and Programs

The testing programs presented by Khodorkovsky (1926) differ significantly from the programs from 1924 cited above. They contain four sections: Arithmetic, Algebra, Geometry, and Trigonometry. Calculus and Analytic Geometry have vanished. About quadratic equations, we now read unambiguously: "Quadratic equations. General formula for solving them. Relationship between roots and coefficients." The comments that had accompanied section headings, mentioned above, have disappeared; now we simply read: "Pythagorean Theorem"; or "Sum

of the interior angles of a triangle” (pp. 40-41). Of course, just as during subsequent decades, much remains unstated, but is assumed to be known and defined from experience. Thus, for example, we read about solving elementary trigonometric equations, with the tacit assumption that everyone knows what such equations are.

The program of 1927 changes noticeably once again. Everything becomes more detailed and particularized. The Methodological Instructions published at that time (Glavprofobr, 1927) in fact state that the old program suffered from “the extreme compactness of the exposition, which gave rise to leeway in interpreting particular points and details.” This time, the same quadratic equations are treated as follows:

Formulating and solving second-degree equations with one unknown. The relation between the coefficients and the roots of a quadratic equation. The conditions for equal, real, and imaginary roots. Investigating the signs of roots. Biquadratic equations. Elementary equations with an unknown under the radical sign (Khodorovsky, 1927, p. 26).

Additional sections appear – for example, the fundamental construction problems in geometry or the tangent theorem in trigonometry. On the other hand, the solving of elementary trigonometric equations disappears, as do sections on exponential and logarithmic equations, computing the surface area and volume of parts of a sphere, the volume of a truncated pyramid. The methodological instructions cited above (Glavprofobr, 1927) explain that previously there had been a certain overloading of educational material. The “Pythagorean Theorem” section heading disappears. Its place is taken by: “Metrical relations in right, acute, and obtuse triangles (square of the side opposite a right, acute, and obtuse angle)” (p. 29). The style of the 1927 program was preserved subsequently as well (albeit with certain additions and changes). For example, the 1929 program points out that proving theorems not listed in the program is not required, or that for technical colleges and physics-mathematics university faculties, the program is augmented by the introduction of inverse trigonometric functions and formulas (with derivations) of the surface areas and volumes of a truncated pyramid and cone (Pravila, 1929, pp. 24-25). In the 1940 program, these questions are already included in the general text, and the solving of trigonometric equations is added (Pravila, 1940).

How the conducting of written tests was envisioned may be judged by the methodological instructions cited above (whose explicitly declared goal was in fact to achieve uniformity). It was proposed that problems and exercises be selected in such a way that the set as a whole would

- (a) be oriented ... toward a student who is average in development,
- (b) encompass the most important parts of the curriculum, (c) not include exercises and problems that require “special” astuteness, whose purpose is usually to “catch” students, not to identify their level of knowledge, (d) not be extremely extensive, and (e) not contain so-called “combined algebraic problems,” which were once widely used on maturity exams at men's gymnasiums. (p. 5)

The following is offered as an example of a suitable entrance test, to be completed in three hours:

- 1) One exercise on factoring a polynomial...
- 2) One exercise on solving a system of two second-degree equations with two unknowns of a type indicated in the program.
- 3) One problem on computing the volume or surface area of a figure; this problem must include trigonometric tasks and must be solved numerically using logarithms (p. 5).

An important comment follows:

It must be borne in mind above all that entrance tests must not turn into the old competitive exams, in which the examiner gave each smallest detail in the matriculant's work a plus or a minus in order subsequently to express this in a multi-point score. For us, only one thing is important: will the matriculant, given his level of mathematical development, be able to perform successfully in college? Therefore, the assessment of his work must be formulated as: satisfactory or not satisfactory (p. 6).

And it is further explained the errors in solutions to problems and exercises "which might be explained by the matriculant's absentmindedness," etc. (p. 7), cannot influence the assessment of his work in a negative manner.

About oral exams, the instructions are even more explicit:

The assessment of oral answers must be deeply individualized: that which the examiner will find it possible to assess as satisfactory in the answer of a worker or peasant, he will not always assess in this way in the case of a public servant or a member of the working intelligentsia (p. 9).

Even prior to this, examiners are advised to adapt the character of the questions and their outward form to the "material environment to which the matriculant belongs." The instructions specify that, on oral exams,

Under no circumstances should any questions be posed whose objective is not to determine the degree of the prospective student's development but rather to identify in him an especially developed inventiveness, an ability to orient himself quickly, or the possession of any extraordinary capacity for mathematical combination (p. 8).

The examiner's task is to establish whether the prospective student possesses:

- (a) a clear and firm grasp of the mathematical material within the scope of the established curriculum; (b) skills and abilities in applying mathematical formulas; (c) clear geometric conceptions (plane and spatial); and (d) familiarity with the methods of mathematical work (p. 8).

The same objectives, indeed, were pursued in conducting written exams. Note that the cited recommendations were subsequently repeated as well, for example, Glavprofobr (1929).

Certain Statistics Pertaining to Test Outcomes

The Central Committee's resolutions and other calls for reform were accompanied by publications about the unpreparedness of prospective students. For example, Abinder (1926) reported that at the Moscow Higher Technical School, of 1117 applicants who took the written exam in mathematics, 500 failed to pass. However, it also happened that horrors were told about Russian language and literature, while

about preparation in mathematics it was noted that it is somewhat better and that “at the physics-mathematics and engineering faculties, tests in mathematics yielded a satisfactory result” (Anosov, 1926, p. 58).

In time, certain improvements began to be noted. Already in 1927, the Admissions Committee of the Leningrad Polytechnic Institute, noting that 5133 applications had been submitted, that 4131 people had taken exams, and that 448 “general applicants” had been admitted, as well as 554 more people from workers’ faculties, and noting that comparisons with the previous year were difficult in view of the differing circumstances, nonetheless reports that, “Generally speaking, prospective students this year are better prepared than last year, and those who graduated from Leningrad schools are better prepared than students from the provinces” (Politekhnikhesky institut, 1927).

Remarks about improvements are found later on as well, but it should be borne in mind that they cannot always be completely trusted. Semenov (1930), uncovering the wiles of ideological enemies – in keeping with the spirit of the times – identifies a new type of subterfuge: “presenting students with lowered academic requirements, especially students actively involved in social service.” Thus, a certain professor allegedly reasoned as follows:

Today’s student... is completely incapable of study since his head is not adapted to mental labor. And why are workers dragged to colleges?... Students from among workers move on from one term to the next only because I, for example, even though I see that a student doesn’t understand a damn thing, nonetheless give him a passing grade (p. 15).

Examiners lived under the conditions of a certain reality, and no matter how much they were urged to be honest and objective, could embellish the picture that presented itself to them on exams.

We will confine ourselves to providing one table (Table 1) based on figures for the Leningrad Municipal Party Committee on the outcomes of the admissions campaign for the year 1935-1936 (Gorkom, 1935).

We can also add that, for example, specifically at entrance exams to the Mining Institute in arithmetic and algebra 13% applicants from Leningrad failed, while among applicants from other cities 18% failed. In geometry and trigonometry, the corresponding figures are 13% and 20%.

Table 1. Applicants by college

College	Applications submitted	Permitted to take Exams	Exams Taken	Accepted
Industrial	3235	2957	2712	1069
Mining	1984	1812	1066	1046
Chemical-Technological	2787	2353	2069	1084
Electrotechnical (a)	2580	2190	1860	1080
Electrotechnical (b)	1340	1060	960	800
Construction	4040	3470	864	560
Precision Mechanics	3153	2827	1420	1000
Industrial Transport	2750	2120	1770	1170

On Entrance Exam Problems

The introduction of mandatory tests led to the appearance of literature for prospective students. Thus, in Kiev, a certain Voronov (1928), taking advantage of the freedoms of a period that was in its last years, published a problem book at his own expense. He clearly included problems that he considered relatively difficult. For example, already the first section, "Quadratic Equations," contains only six items, but the last of them is the following: "Solve the equation:

$$\frac{a+1}{1-2a^3} = \frac{x}{2a^2-4a^5} - \frac{2a^2+1}{2a^2x} \quad (\text{p. 7}).$$

The book includes assignments which are not especially difficult, but which presuppose the knowledge of special techniques, such as, for example, № 35, which requires students to solve the following system of equations: $x^2 + xy + y^2 = 19(x-y)^2$; $x^2 - xy + y^2 = 7(x-y)$ (p. 9). Trigonometry includes inverse trigonometric functions, for example, № 151, in

which students are asked to solve the equation $\arcsin x + \arcsin \frac{x}{2} = \frac{\pi}{2}$ (p. 15).

Geometry includes relatively demanding problems both in plane geometry and in solid geometry. For example, № 180 requires students to find the area of the cross-section of a right square pyramid obtained by passing a plane through an edge of the pyramid's base that forms an angle β with the base, given that the dihedral angle at this edge is α , and the length of this edge is a (p. 18).

The author himself notes, however, that not all of the included problems appeared on exams in 1928, and that some were taken from exams of previous years (possibly from before the revolution). The problem books published by the Electrical-Machine-Building Institute (Zadachi, 1928) offer more accurate representations of what was actually going on. Here we usually see problems involving algebraic transformations, problems involving computations or simplifications of numerical expressions, for example:

$$\frac{9+4\sqrt{3}}{3\sqrt{3}-3} - \frac{3+\sqrt{3}}{3-\sqrt{3}} - \left(\frac{3}{\sqrt{3}} - \frac{\sqrt{9}}{\sqrt{3}} \right)^{-3} \quad (\text{p. 9}).$$

Noticeably less room is taken up by other algebraic topics, which are, however, also represented in the collection, such as progressions, word problems, logarithms, equations, and even combinatorics. The following problem may illustrate what we consider to be part of this last topic:

From among a certain number of candidates, three workers must be assigned to three different positions. If the number of candidates had been smaller by two, the number of possible ways of distributing the work would be reduced 10 times. How many candidates are there? (p. 15)

Geometry is represented by such problems as the following:

A cone whose generatrix is tilted toward its base at angle α is inscribed within a sphere with surface area P . Express the whole surface area of the cone in terms of the given data and compute the area for $P = 0.36178$ square

meters and $\alpha = 71^{\circ}25'74''$ (p. 18).

State-run publishing houses also started to publish handbooks for prospective students. The publisher “Enlightenment Worker” [“Rabotnik prosvescheniya”] issued a series of books under the rubric: “Prepare for Entering College.” The literature published as part of this series was varied. Minorsky’s handbook (1928) is in effect simply a geometry textbook, which contains exercises, of course, but exactly such as are customarily found in a textbook. The book by Shneider (1928) is also closer to a textbook (a handbook for independent study), but nonetheless contains many problems which are described as having been given on college entrance exams in 1927. Let us cite just two of these:

Solve the following system of equations:

$$\frac{8}{\sqrt{x-3}} - \frac{3}{\sqrt{y+3}} = 1, \quad \frac{4}{\sqrt{x-3}} + \frac{9}{\sqrt{y+3}} = 9 \quad (\text{p. 350})$$

Show that for real x the function $\frac{x^2 + x + 1}{x^2 + 1}$ cannot have values greater

than $\frac{1}{2}$ and less than $-\frac{1}{2}$ (p. 361)

Once again, we see problems that require a relatively high level of preparation.

As far as can be judged from the catalogues of the country’s largest libraries, publications devoted to college entrance exam problems were very few in number. It is clear that materials were accumulating, as was evidenced by the large editions of handbooks for prospective students published after the war. But it is more natural to regard this as part of the next stage in the development of entrance exams.

Discussion and Conclusion

Politicians and educators of the post-revolutionary period had the best intentions: to put an end to inequality in education once and for all, and to admit everyone to college, or if this could not be done (and the fact that it could not be done became clear rather quickly), then to admit those who were previously educationally disadvantaged and had the right class origins. This, again, proved altogether impossible, and although it is naive to think that lessons may be directly drawn from history, this should nonetheless be borne in mind by those who today, too, dream about simple ways of achieving equality in education. It became necessary to carry out reforms in colleges even before the Great Break of 1929, which set the country on the path of building heavy industry and militarization, to which end the whole system of education had to be radically changed.

The struggle for a “class-based approach” or, more broadly, for state power over colleges continued unabated subsequently as well: admission through workers’ faculties (a term that now referred to something different from what it had referred to in the 1920s) survived into later periods, and democratic governance in colleges, which was destroyed at the end of the 1920s and replaced by one-man management and the vertical of power, was never reinstated under the Soviet government. The unfairness of the Soviet exam system (in the sense of rejecting the equality of the applicants independently of their origins was part of its foundation (it was concealed, as we have seen, behind the demand for an individualized approach).

The industry of entrance exam preparation was destroyed initially to a small extent by the beginning of the First World War, and then definitively by the revolution. The government attempted not to allow it to be reborn, whence the numerous stipulations that problems must not test for ingenuity, but must be of the most common variety – aimed at computing something that everyone has been taught.

It turned out, however, that in spite of everything, everyone was taught in different ways, and colleges’ requirements and possibilities for selection turned out to be different as well. In addition, the traditions and problems of prerevolutionary exams did not just disappear over the years when officially there were no exams. Therefore, on pre-war entrance tests one could see problems which, even if they were not particularly intricate, nonetheless exceeded ordinary school problems in difficulty, so to speak. Even computational, purely technical problems were still not altogether simple (although, of course, judgments about them cannot be made from the point of view of today, when such things are almost not taught).

The college preparation industry, however, was far from being reborn before the war. There were, of course, courses for prospective students, which usually played the same role as workers’ faculties. It may be supposed that private lessons also existed, although evidence of them is scanty. But as for literature pertaining to exam preparation, not much of it appeared, as has already been noted (it may be supposed that there was a deliberate decision behind this). At the same time, of course, attention to difficult problems was growing (as testified, for example, by the appearance of olympiads) and corresponding materials accumulated. The next important steps were taken already after the Second World War.

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