ON EDUCATIONAL PROCESS IN TECHNICAL RAILWAY SCHOOLS

In view of the fact that the reform of the educational process in our country stands on the line and concerns, of course, technical railway schools, I, as a former student of a technical school in Penza and having done a lot in practice on architecture and road construction, would like to point out the defects that the setting up of the educational process in these schools suffers, and so to promote, as far as it is in my power, possible improvements in this field.

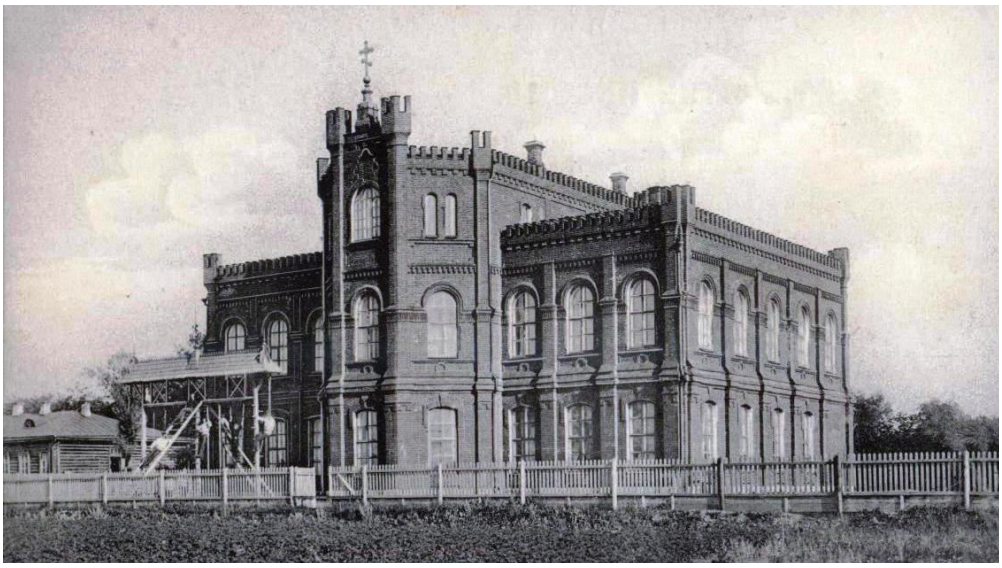
The theoretical course in technical railway schools is three years long. At the end of it there should be a two-year practical training period on the railway or highway, or at the factory, and only then the technicians hold exams for the certificate.

In most cases, during this practice the technician has to face independent work, and very rarely there are such leaders who would assume the role of teachers: usually young people are immediately required to do the job. Therefore, the school should train technicians more or less prepared for productive practical activities.

I quote the most important, essential shortcomings of the educational process in technical railway schools. The building arts and railway business, these most important subjects, are taught according to a very concise program, while absolutely insignificant time is given to practical lessons on these subjects.

It is known that technicians, when leaving the schools, expect, for example, the position of road masters, but they have no idea about repairing the railway tracks: lifting, straightening, laying switches, etc. Young people will have to be maintenance foremen to supervise the construction works, and they do not know how to make breakdowns, measurements, do not distinguish between different types of rocks, do not distinguish cement from lime. As for geodetic surveys, measurements and planning, this kind of work – alpha and omega of all construction and road works – is almost unknown to the technicians in their application.

In the transition from the second year to the third year in the railway technical schools, only one month's practical training period is carried



Technical railway school, Lipetsk region, Yelets (1905).

out, but it is usually conducted very superficially and does not achieve the goal: but at the end of the course the technician hardly distinguishes one tool from another, and as for the control of these tools, then it is completely inaccessible to him. It is good, if the head, interested in development of a young specialist, will meet the young man, but, in fact, it is not uncommon that the technician, from the first days, when confronted face to face with independent work (e.g. in the zemstvo), demonstrates all the shortcomings of school preparation.

The same can be said about preparing for formation of quotations or cost sheets to produce one or another kind of construction work. Cost sheets are drawn up on the basis of a special guide – Building regulation – this book for a construction technician remains a kind of gospel for a lifetime, which one cannot do without. And this guidance is not even introduced at school to the students.

It should be said about teaching of applied mechanics (steam locomotives, steam engines, etc.), that it is imperfect, and moreover – pathetic, since it does not go hand-in-hand with practice. Having entered a position on a steam locomotive or steamer, the technician does not know how to handle the machine: where to put oil, what and where to unscrew, how to feed the boiler with water, how to heat, etc., not to mention the correction of even insignificant damages of the machine.

Of course, all the listed defects in the educational process of railway technical schools may be weakened or completely destroyed by appropriate measures. For this, in my opinion, it is necessary:

1. To provide students with the opportunity, during one-year classes or summer vacations, to work on the railway for repair of roads and buildings as simple workers and craftsmen, but not at all «sergeants» with their hands behind their backs, who follow the work and are often the object of ridicule outsiders, since for one worker, it happens, they are observed by two: artel foreman and a technician-trainee. To this, the authorities, at whose disposal the technician is sent, should be supervised to ensure that young people thoroughly absorb all sorts of practical work (earth, stone, roofing, plastering, etc.), and to make it a duty not to keep trainees for several years at their offices solely as draftsmen, copyists or timekeepers for call-over of workers, as is often done now. At the same time, it would be highly desirable to give the trainee possible material support, so that more people would be able to devote themselves to the art of building, and the profession of machinists should be provided to trainee locksmiths who successfully work as locomotive workers.

2. The practice of geodetic work should be given the most important place: each student must do all the breakdowns, measurements, make a plan and a longitudinal profile of the terrain, selecting the relief surface of the earth where cross-section surveys are required; on longitudinal profiles and widths project a new roadbed, count earthworks and draw up a complete project for construction, for example, of a highway section with a bridge or a pipe.

Practical classes in groups, when one produces any survey, and all the others only look in turn at the telescope or in the goniometer, should be considered as falling short of aim. Everyone must do the work himself from start to finish. Detailed familiarization of students should be made to observe the speed of water flow in the river, with the definition of the horizon of high waters, river basins and gullies, both in kind and by geographical maps, and the simplest way to calculate the holes for bridges and pipes.

Is it a crime, in fact, due to ignorance, to spend people's money unproductively on building bridges of excessive length where it is not required at all? There were, for example, cases that a bridge was built across a river as 15–20 fathoms of length, whereas, taking into account the area of the basin of this river and calculating the amount of water flowing into construction during downpours or the most abundant flood, in this place it would be possible to confine ourselves to a bridge of only 5 fathoms.

3. During the stay in the school, technicians should make one or two projects (with cost sheets) for construction of a building (e.g. schools or hospitals), of course, in accordance with the corresponding paragraphs of Building regulation and according to existing prices in the given locality on materials and work force. A thorough familiarization with drafting of as-built estimates is also required.

4. During the theoretical course, it is necessary to devote more time to a detailed acquaintance with building materials both in the museum of the school, and also in different

Technical railway school in Penza.

buildings, as well as with all kinds of production: foundry, mechanical, pottery, brick etc., with a description production, at least reduced projects (with estimates) for equipment, and not be limited to visits to a private plant or to railroad workshops for a superficial inspection and, moreover, only two or three times during the whole study period.

5. In order to sufficiently consolidate the knowledge of the course of applied mechanics, it is necessary at the end of the training sessions, except for the passage of locksmith and general mechanical practical training period, alternately in all workshops of the railway workshops, to participate in mandatory driving of the locomotive as a third person. During the same work in the locomotive and car workshops it is deemed necessary to cancel the privileged position of technicians in front of ordinary locksmiths, to assign them a certain daily fee and to establish strict control over the work of trainees. At present, they receive an insignificant reward and usually do not go to work in the workshops.

6. The program of student work on carpentry and locksmith's craftsmanship should be reduced to a minimum and, in exchange for the samples, to learn them to do things that have an application in life, furniture, parts of machines, and so on.

7. Beginning with the second year, students should be distinguished by specialties: the construction class and the mechanical class. Clearly, then each of these branches will have much more time to study its chosen specialty.

The above list does not cover all that is desirable to know for a young technician emerging on the journey, take at least the first aid for injuries and bruises. Often it happens that during the work it is required to make a bandage to someone, and the technician being nearby has no idea about it.

It is possible that eliminating the aforementioned shortcomings in the educational process in railway and technical schools will require some lengthening of the theoretical course, but before that we should not stop, keeping in mind that then the technicians will come to life fully prepared for practical activities.

Within the precincts of the school, one must first of all care to develop a desire for classes, to try to inspire students with respect for their work and the importance of their forthcoming activities after graduating from the school. Then each of young people, entering the practice, will himself with interest take on any living and practical matter.

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