

THE BEGINNINGS OF TECHNICAL EDUCATION IN TRANSYLVANIA

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Abstract: *This paper presents the first attempts of higher education in the historical province of Transylvania, starting with Nicola OLAHUS, undertaking preceded in Moldova by the attempt to establish the Superior School of Cotnari. In the time of Stephen BATHORY, King of Poland, on May 12th, 1581 a decree is issued establishing a University in Cluj, as a creation of the Jesuits. Later on, in 1662, Prince Gabriel BETHLEN inaugurates a new University in Alba Iulia, which can later be found only at the rank of highschool.*

In 1698 it is reopened the University of Cluj, in order to regain Transylvania, which was lost to Catholicism during Calvinist princes. Due to its Latin teaching the university managed to attract more young promising Romanians. The presence of the Habsburgs in Transylvania determined the University of Cluj to have a German cultural spirit. In a phase of Jesuit decline, that lead to Papal Bull of 1773, through which this order is abolished, the University decedes to the rank of highschool. After 1784 in Transylvania the first forms of manufacturing organization appear. The loss of Silesia in 1764 determines in Austria a more scientifically exploitation of deposits, therefore mining schools are founded.

The industrial development made necessary the organization of technical education and in the mid-nineteenth century the School of Arts and Crafts in Iasi appeared (1840), and also another one started its activity in Bucharest (1852), and until 1905 both supplied 1150 graduates. In Transylvania a greater attention is given to these schools just towards the late nineteenth century, they evolved from the vocational level to the intermediate one. These schools functioned in Cluj, Oradea, Brasov, Targu Mures, Cîsnădie.

The University of Cluj reopens for the 3rd time on November 10th 1872. This is the period when the foundations of technical education are set through the opening of a vocational school on July 27th 1884, to which joined the superior school of industrial design, and this new form of industrial school reestablishes its educational program of 4 years. Through the law of July 9th 1901, in Romania are adopted regulations for the technical schools. After 1918, these regulations extend to the school in Cluj. Subsequently, the Council of Transylvania decided to organize industrial superior schools, which opens on February 1st 1920. In the same year came into being in Cluj the School for conductors of public works, with the speciality roads and bridges, at the same time with the schools from Chisinau and Chernivtsi.

This paper illustrates the developing of the networks of vocational schools, trade and occupational, as well as their schooling capacities. The school authorities in Cluj recognized the possibilities and changed the name into the Middle technical school that later became the Technique conductors school. This becomes the only school with an electromechanical profile in Romania, being the precursor of the Polytechnic Institute, of the Technical University of today.

1. Introduction

The past is the only integral reality, but in the same time a gap that feels like an

infinite abyss, which warns that it always has to be researched so as not to become an enemy of the present. Man started learning since immemorial time, feeling that education is our assistant, because wherever we would be, what we have learned is beside us.

Everywhere across the Middle Ages, by the light of eclipses, it is recorded a time when humanity stays in the shadow of utopia and magic, when the school is barely present. At the time when Europe should have reached concrete history, taking the place of Rome, she was wheezing under successive conquests, under the atrocity of murderous dynasties that left blood epic and ballad characters hiding in the shadow of forests rustling with magic superstitions. But, this Europe subjected to invasions, has protected its Chronicles and manuscripts like a priceless treasure, source of mysterious powers. No matter how restricted it was then the audience for books, the painted letters had prepared the uproar of the army of sculptors which afterwards lasted within the cathedrals. The first engineering school could not be taught but on the scaffolding, in the language of the wall, while the breath of stone pushed the world towards the wakefulness of open books, science coming out of her confidential confinement scattering out in the four winds and nothing could any longer prevent the contamination with knowledge and education.

The first universities appeared, people became questions knots and arguments, and at this crossroads in time, the book takes on that magic offensive charge that allowed the foreseeing of the future.

2. The first forms of higher education

The attempts of establishing some forms of higher education in Transylvania starts in 1567 and were inspired by previous attempts of Moldavian voivode Iacob Heraclid, who tried to establish Cotnari Higher School with the support of German reformist scholars, almost at the same time with Nicholae Olahus' attempts to found a high school in Tarnavia (Sîmbăta, 1566). At that time, Nicholae Olahus was a remarkable personality, being the primary Archbishop of Hungary, but also one of the founders of the Hungarian educational system.

During this period Prince Ioan SIGISMUND, who had passed to the new Calvinist law, realizing the importance of school in the western countries reform, invited the reputed French philosopher Petrus Ramus from Sorbonne to come to Transylvania and organize a University. For various reasons, the French scholar was unable to accept the invitation, which was then addressed to the swiss professor Celi from Basel.

The New Academy starts its activity at Sebes, and had the purpose of spreading Calvinist doctrine among the Romanian population, just like in the schools of Lugoj and Caransebes, subsequently founded, based on the model of Fagaras, which already functioned for nearly a century, at the initiative of Princess Susana Lorantfy.

Sebes, but also Orăștie, developed as centers of Calvinist culture, "more or less" camouflated, as Onisifor Ghibu said. Thus, in Sebeș it is printed in 1579, the Metropolitan Gennady Slavonic Catholicity, bearing the trade mark of Prince Cristofor

Bathory, at Alba a Gospel, and in 1582 appeared the famous Orăștie Palie. Although he had followers, Joan Sigismund's plan failed, the satisfaction reverted to his rival and successor, Ștefan Báthory, who was also King of Poland. He decreed on May 12th, 1581, the establishment of a University in Cluj, but not with a reformed character, but a Catholic one

The New University was in fact a creation of the Jesuits and had three faculties: theology, philosophy and law. The University was organized by the monk and diplomat Antonio Possevino, from Mantua (Italy), who arrived at Cluj accompanied by 32 monks. Given that they were from the very beginning hostile to Evangelical Protestants, Reformed and especially Unitarians, powerful conflicts emerged. Therefore, the Diet of Cluj have strongly protested in 1581 against the Jesuits, so that later on Mihai Viteazu came to their defense. He provided, on December 31st, 1599, the right over the real estate which they owned in Cluj, but in 1605 the Jesuits are banished from the city, the school is demolished and the goods are confiscated by the state. It was only in 1693, when Jesuits returned in Cluj with full rights, by virtue of King Leopold.

It is interesting to note the fact that Petrascu, the son of Mihai Viteazu, learned Latin at the Jesuit College from Cluj, between 1595-1600. About the Calvinist school from Cluj is also known that on September 15th, 1699, Stanca, the daughter of seneschal Preda from Țara Românească, that became after marriage Bethlen and then Haller, gives the important amount of 566 florin to the Calvinist church and school. With this amount, the school redeems its printing house on condition that from its annual income, 500 florins to be spent for repairs to the Kogalniceanu Street Calvinist Church.

In 1662 Prince Gavril Bethlen announced the Diet that a new university will be build on the ruins of the old Jesuit university, but in the end it was placed in Alba Iulia. This school, which continued the tradition of an older one, is opened by Bethlen in 1629, with the help of a German poet and professor, Martin Opitz, and according to the habit of the time, it was structured into three faculties: theology, philosophy and linguistics, the head of those being German scholars from the Universities of Heidelberg and Herborn, noting that Professor Alstedt had Comenius as students at Herborn. Henry Alstedt (Alstedtius) pursued an exceptional activity in Alba Iulia, printing textbooks, in Latin, for students' use and that were republished numerous times. Philosophically, he argued for the spreading of the reform among the Eastern Orthodox priests, being in closely connected with Ciril Lucaris, Patriarch of Constantinopl.

During time the University of Alba Iulia decaded to the rank of high school, in 1658 it was moved to Aiud and subsequently was closed in 1704.

In 1698 the University of Cluj was reopened with the stated purpose of the recovery of Transylvania, lost to Catholicism in the time of Calvinist princes. The University, strongly supported materially by Vienna, is entrusted to the Jesuits loyal to the House of Habsburg. Convincing some Romanian clergy leaders to unite with Rome through Jesuit influence made the University attract more and more young Romanian, Latin being the language of instruction. Moreover, among the Jesuits teachers were also

Romanian mentors, such as: Andrei Illia, Antonie Musca, George Buitul, Vasile Dobra and so on. The Jesuits have had significant merits in the introduction of the Latin alphabet amongst Romanian and even typed a Romanian spelling book, in 1744, at Cluj.

After 1579 the Jesuits established a brewery, very close to an old agricultural school, which operated even since the eleventh century under the abbot of the monastery. Its ruins can be excavated in the existing perimeter of the University of Agricultural Sciences and Veterinary Medicine, founded in 1869 at the insistence of "*Asociației agricole ardelenne*" (Transylvanian agricultural Association).

The presence of the Habsburgs in Transylvania determined the University of Cluj to have a German cultural spirit and inspired the baron Samuel Brukenthal to request, in 1761, from Empress Maria Theresa the approval to open a German Lutheran University in Sibiu. This request was rejected in a phase of Jesuit decline, that led to the Papal Bull of 1773, through which this order was dissolved. In the same year the University of Cluj was closed and reopened by Maria Tereza, who added to the three existing specializations, surgery, having Professor Ioan Molnar Piuaru as oculist. But the Empress's action was not sustainable, the University decided to the rank of high school, which perpetuated the Piarist high school.

However, a third reopening of the University of Cluj took place on November 10th, 1872. It is worth noticing, however, that man is a speaking being and the one that studies thinks silently and lucky for us there are those who don't speak and do more than they say.

Ever since the beginning of time there has been a subtle bond between the school and the politics of the time, practice that had not spared Transylvania. Following history, we felt that politics is not the most subtle science but the most profitable one. This is how man is the only bipedal being capable of helping others in need move forward, but he is also the only bipedal able to stop another, even if the latter had kept on moving forward. So, only the stop decides the end of the road and not the road itself.

Such a philosophy is also met in the destiny of Transylvania school, but we must clearly realize that the way someone accepts his fate could be more important than destiny itself.

3. The economic life of Cluj

This was influenced by the progress of manufacturing industries from Germany, France, Moravia, Bohemia, England, Austria, Venice and Poland, even since the sixteenth and seventeenth centuries, grace to the commercial relations with these countries. Centuries in a row Cluj had an economy based on guilds, organized according to the renowned medieval system, but towards the end of the eighteenth century, manufactories appear, as a form of transition to industry itself. Between 1784-1798 a manufacturing workshop for repairing agricultural machinery is reported, but the first real manufacturing appears in 1791, on the production of wax. During the first part of the XIXth century there are mentioned 22 manufacturing workshops, being

remarked a "car factory" founded in 1840 by Peter Rajka, where also worked as an apprentice, Ștefan Micle. Because most of the workshops were located into the city center, respective in the area of the Piarist high school many of these were closed over time, due to pollution of the central area. The fine tile, cigarettes, alcohol, vinegar, silk, machine tools, wool, wax, oil, sugar, hats, carts or paper mill manufactures were soon confronted with the lack of qualified personnel on the emergence of real competition. Following history, we understand that the evolution of technical education reflects the development of the production in industry, especially of those related to technical science. All over, technical higher education was started along with the development of mechanized industry, which ascendancy involves higher knowledge to those required until then. We understand the origin and the beginnings of technical education in Transylvania closely related to the socio-economic development of the Provinces of Romania and of the Romanian provinces as a whole.

In 1699 Transylvania came under the rule of the House of Habsburg, and the effect was the shift towards the systematic exploitation of deposits, along with the development of the metal working industry. After 1764, when Austria loses Silezia, the exploitation of metalliferous ore (gold, silver, iron) or others (salt, coal) is increasingly done more scientifically and it is based on a very ancient tradition. When it comes to tradition, we must note that blast furnace, built at Ghelar, with a millenary age that is now in a London museum, and the cart with wooden line and railway switchgear, that operated as early as the fourteenth century in Brad, is certified by the Museum of communications of Berlin as the oldest known rail transportation in the world. Mining is practiced even since the Daco-Roman era, and at Baia Mare the mining beginnings are recorded from 1329. The first furnaces (with charcoal) operated at Orăștie in 1718, Bocșa in 1719 or near Hunedoara in 1750, followed by Reșita, Vlăhița and Calan. At 1748 in Zlatna there was a large gold ore processing station, and in the same year it was established in Baia Mare the *Superior Mining Office*.

We should note that these mines, in addition to the local working man there were foreign specialists that came from Bohemia, Tyrol and Hanover, and for their children, mining schools were established.

All industry was developed, therefore at Cugir and Nădgar where pot furnaces were built (1850), the first steam engine was met at Zlatna in 1838, manufacturing machinery workshops for the industry of paper, of sugar, of glass and of others, appeared in Arad and Cluj. In this respect, in Cluj, Constantin Ivanovich and Peter Rajka stood out. The latter had studies at the Polytechnic of Vienna and was ranked as a valuable inventor, prize winner of a technical exhibition held in 1866 in Vienna, exceeding the Austrian and American agricultural equipment manufacturers. At only 11 years after the first achievements in the field, two Martin furnaces operated at Resita (1876), and steel production in 1890 amounted to 58,910 tons. Also in Resita functioned two Bessemer converters since 1868, and the modern furnaces at Hunedoara began their activity in 1882. An important moment for Cluj was the railway connection in 1870 as well as the start of mining in Sorecani in 1880, the latter opened a new energetic perspective. The first methane gas well came into operation at Sărmășel in 1909, being ranked the fourth in the world after the criterion of gas purity

and flow. The first gas pipeline (Sărmășel –Turda- Ocna Mureș-) was inaugurated in 1911.

Taking into consideration this sequence of events, several Romanian, Hungarian and German engineers (V.Lazăr, S. Pop, H. Bock, O. Phleps, G. Strompel, S. Vitalis, etc.) questioned Transylvania energy resources identification as well as their increasingly widespread use.

It is obvious that in a feudal economy, technical education in Transylvania hasn't surpassed its early forms, even though the beginnings were made by the 1777 school regulations, known as the "Ratio Educationis". However, young people in Transylvania studied technique abroad in Vienna or Budapest, Paris or Prague, Krakow and Zurich, Grand or Freiburg. Thus, at the Polytechnic of Vienna (founded in 1797) even Gheorghe Lazar followed some courses, between 1806-1809, who, after establishing *Sfântul Sava* School (1818) thought there boundary engineering? Just like in Transylvania, in Bucharest, Gheorghe Lazar had disputes on the language of instruction, where the school was dominated by Phanariot teachers such as Veniamin of Lesbos, which believed that science should be taught only in Greek. Stefan Micle, from Cluj, after an apprenticeship in Cluj studied engineering in Vienna and got to teach at *Academia Mihaileană* in Iasi.

The two Brothers Ioan and Romul Baiulescu in Brasov, with their engineering degree from Vienna, respectively Paris, upon their returned home they organized the railways, engineer Tiberiu Eremia (born in Brasov in 1875), who studied at the Polytechnic in Zurich, set the foundation of the concrete buildings in Romania. Engineer Radu Pascu (obtained his diploma at Leoben) through his geological exploration revealed strategic mineral resources. He was joined by the expert that built the best roads of the time - engineer *Aurel Diaconovici of Bocșa Montană*, which studied in Graz and Vienna. From the long list of engineers we can't miss Joe Puscariu of Săcele (graduated in Zürich), Valeriu Puscariu of Sohodolul Făgărașului or the graduate from Freiburg, Virgil Tacit.

In 1856, 44 students studying in Vienna were Romanian, including 6 at the Polytechnic, and in 1867 of more than the 100 Romanian students, 9 were studying engineering.

The proeminent figures of Transylvania forty-eighters generation as well as Avram Iancu, George Barițiu and Simion Bărnuțiu, or the publicist and physician Paul Vasici, had militated for the practicing of professions based on a specialized education. These concerns are continued by other Romanian intellectuals such as Vasile Bașoă (1836-1908) or The President of Astra, Bartolomeu Baiulescu (1831-1909).

The Boom era of the industrial development in Romanian provinces imposed naturally the need for technical education organization and the Administration had taken a series of measures starting with the mid-nineteenth century, thus determining the foudation of the Arts and Crafts School in Iasi (1840) and of the School of Arts and Crafts in Bucharest (1852), which from their establishment till 1905 gave together 1150 graduates (500 from Iasi and 650 from Bucharest).

4. The first Romanian universities

The Foundation of modern universities in Romania, in Iasi in 1860 and Bucharest in 1864, had a strong influence on Romanian intellectuals from Transylvania. Due to the impossibility to work in Romanian schools, many of this headed to Bucharest and Iasi. The Gheorghe Lazar example is known to all, and in 1860 half of the professors of Iasi University were from Transylvania. Simion Bărnuțiu was rector of Iasi university, while August Treboniu Laurean was Dean of the Faculty of Letters in Bucharest, and one of those who followed him, Professor Ioan Bogdan led the same Faculty for 21 years (from 1898 to 1919). Al Papiu Ilarian, after an academic career in Iasi, became Minister of Justice in the time of Cuza, while George Barițiu and Ioan Bianu were presidents of the Romanian Academy and Timotei Cipariu, its vice president. At that time, Professor Grigore Silași PhD was fired from the Department of Romanian Language and Literature at the University of Cluj.

In Transylvania more attention is payed to technical schools only towards the end of the century, when they slowly evolve from the vocational to medium level. In this context in Cluj functioned "*Sunday schools*" and in Maramures and Banat several secondary schools, which are later found in Oradea, Brasov, Targu Mures or Cisnădie. Mining technical education was attested in Baia Mare since 1864, when a 3 years mining school was founded. This was moved in 1873 to Baia Sprie, but information about the evolution of this school are available even now, due to the news articles written by one of the oldest miners teachers - Professor Paul Socol from Baia Mare. During this period, it also begins the city systematization with the foreign and local experts help, and in 1832, it is recorded the creation of the function of "city engineer". Afterwards, in 1833 a urbanistic Commission was formed, which in 1838 ruled the alignment of the houses as well as their numbering, in 1839.

History reminds us that the „*Petițiunea națională de la Blaj*”(Blaj National Petition) adopted in 1848, required under Article 13 the establishment of technical institutions as a goal of society and culture in Transylvania. Basically, only on July 27th, 1848, was founded in Cluj, a technical school with three departments: architecture, carpentry and mechanics.

With the defeat of the 1848 revolution and the establishment of absolutist regime, Cluj loses importance and principality capital moved to Sibiu. Under a liberal regime, Cluj recovers from apathy, but the dualist regime brought great harm to both Transylvania, that loses its autonomy and to its institutions, that were eliminated, as well as to the nationalities of the empire. At that time, began on May 7th, 1894, the Memorandum process with lasting consequences.

After the revolution of 1848, the Piarist Academic College, the Reformed College and the Unitarian one became upper secondary schools that were attended by hundreds of Romanian students. In 1850 it was recorded the establishment within the Roman Catholic secondary school of the Romanian literature departament, in which taught also Professor Ioan Fekete Negruțiu and the first elementary school that had as instruction language Romanian functioned since 1853.

The establishment, in 1851, of the Chamber of Commerce and Industry of Cluj contributed to the economic stimulation and the legislation adopted in 1881 and 1900 led to the transformation of some workshops or manufactures into veritable factories. The inauguration of the railway station in 1870 and of the Cluj-Teiuş line, which was later extended to Brasov, had a very important role in Cluj economic life. We have to mention that in 1893 a urban steam train was introduced, linking town hall and the railway station and later on ensured the contact with Manastur having a ramification all the way to Saint Peter's Church.

In parallel with industrial development, occurred after 1858 the first financial institutions, and in 1886 the first Romanian bank was founded, *Economul*. An important role in the development of technical education was played by Cluj Chamber of Commerce and Industry established on January 19th, 1851, by order of the Transylvania civil and military governor, Ludovic de Wohlgenuth, published in German, Hungarian and Romanian. The first president of the Chamber was Samuel Dietrich, a tough merchant, that along with the vice president Peter Rajka and the secretary Josef Posch laid the foundations of the modern economic development, canceling the medieval privileges of the guilds and taking into account the need for technical education

During 1851-1918, the Chamber of Commerce and Industry often intervened besides the Austrian and Hungarian government for general upgrading of the economic life. Thus, the old measurement system is replaced by the metric one, but its greatest merit is the Oradea - Brasov railway modernization. The Chamber initiated the first bank in Cluj, and in 1858 the telegraph network was expanded. Subsequently, together with the Industrialists Reunion in Cluj, it laid the foundation of the apprentice school and of the industrial city school. In 1868 the Chamber founded the Superior Commercial School, which became in 1885 "Academia Comerciala" (The Commercial Academy) at the same time setting up with Cluj industrialists the Industrial Museum and Industrial Corporation in 1896.

Among the time's performance, we note that Manastur became "intra muros" in 1895, the sewage was completed in 1887 and in the following year the water station was built, fact that allowed the introduction of running water in the city center in 1892. In 1871 the city was illuminated with gas, shifting to electric illumination in 1906 and a statistics from 1907 showed that 120 streets were paved.

Asociația Muzeului Ardelean (Erdely Museum Egylet) played an important role in the city cultural activities. This association appeared in 1855 on the initiative of Count Imre Miko, being a true academic institution with a great library and own publications (Erdely Museum etc). Under this aegis, on September 23rd, 1859, an important museum was opened, that housed many valuable collections that totaled nearly 32,000 pieces. Since 1903, the museum functioned in the current location of the National Museum of Transylvanian History (on Constantin Daicoviciu street).

A remarkable moment in the cultural life of Cluj was the opening in 1872 of the University with 4 Faculties, noting that at the Faculty of Philosophy and Letters there existed the Romanian language and literature department.

5. The way to higher technical education in Cluj-Napoca

At the end of the previous century there were established in Cluj three museums: the Tehnology Museum in 1848, the Memorial Museum and the „*Societății Carpatine*” Museum. This is also the period when the foundations of technical education through Vocational School opened on July 27th, 1884, with material support from the Chamber of Commerce and the Hungarian Ministry of industry and trade, and on December 26th of the same year, a technology museum was opened. Along side this functioned a higher school of industrial design and a in its new form the industrial school reestablishes its education program for a period of 4 years. Its graduted were allowed to practice, after a period of one year of apprenticeship, when they could acquire the status of foremen and open their own workshops. Because both the school and the museum lacked their own building on April 6th, 1895, the Hungarian nationalized the two institutions and Cluj municipality buys for 18,500 florins the area from the current Gheorghe Barițiu Street, no. 26-28, where on September 30th, 1896, was layed the cornerstone of the school, which was inaugurated on March 26th, 1899.

Also during this period appeared the workshops, which preceeded "Armătura" factory, then based in Bucharest, where the company "Moritz Pidvisocher" produced even since 1868 gas lighting fittings and accessories for metal construction. The Cluj branch of "Armătura" company can be found on February 1st, 1919, uder the name "Vadasz Ienöd" – the Enterprise for fittings and electricity, which since in 1922 is called "Electrohidro".

We must take into account the fact that this firm, in 1889, was involved in providing metal building materials for the international exhibition in Paris. For this it won “*Diploma comemorativă a Expoziției Universale de la Paris*” (Diploma of the Universal Exhibition in Paris) alongside the 272 medals won by other technical products. The Outstanding balance of this success was made by Prince George Bibescu at the Romanian Athenaeum, on March 23rd (April 7th) 1890, which stressed that the exhibits of the 698 Romanian participants had created a great impression, but it all happened a century ago. In Romania, the Law of July 9th, 1901, adopted a legislative rule that regarded technical schools, which after 1918 Union extended to the school in Cluj, taken over by the Romanian State on April 5th 1919. On this occasion the Transylvania Council decided to organize the new industrial higher education facility, which opened its doors on February 1st, 1920. This decision was followed by the adapting of new school to the characteristics of similar schools in Bucharest and Iasi, in the context of the 1901 law.

Based on the experience gained by the schools in Bucharest, a new institutional form for the technical schools was applieed, and in the fall of 1920 was founded in Cluj the School for public works conductors, with a specific in roads and bridges, along with the schools from Chernivtsi Chisinau. Their graduates had the right to be comprised in the technical staff, which was equivalent to a higher recognition of the profession.

The authorities of the Time, recognizing the school's potential, changed the name of the institution in *Școala medie tehnică* (Middle Technical School) and finally becomes *Școala de conductori tehnici* (Technique conductors School), becoming the only school in the field in Romania and the precursor of the Polytechnic Institute and of the Technical University of today.

Conclusions

Analyzing the facts, it appears that after the 1918 Union Authorities perspective over technical-applicative education changed, observation made by the Minister C. Angelescu, which shows that during 1922-1926 there were established 170 technical-applicative schools. Besides this, between 1919 -1928 there were created 350 vocational and arts and crafts schools, so that from 119 schools in 1919 it reached 469 in 1928, of which 434 belonged to the State. Also in 1928, the school had 60,000 students, of which more than 8,000 had a scholarship and were in boarding schools. This is how it began the path to today's polytechnic school in Cluj-Napoca, which prepared engineers that became conspicuous and appreciated on all continents. Even though we admire engineering and especially what we understand, technical education makes us realize that we do not reach the truth following the same paths and that we're curious to the extent of our culture. If the wish to know arises from doubt, the creative desire is earned through effort and dedication that builds the strength to endure difficulties with dignity, but also defeat, a force that can sometimes be the greater than victory. And the engineer knows that during the night is nice to believe in light.

Bibliography

1. **Bordeianu M., Vladcovschi P.** *Invățământul românesc în date*, Iași, 1979.
2. **Colan H.** *Din istoricul învățământului tehnic în Cluj*. In: „Institutul Politehnic din Cluj. Anuar” 1948-1968, p.7-17.
3. **Colan H., Mihailescu T.** *Inceputurile și dezvoltarea învățământului tehnic în Cluj*. In: Institutul Politehnic din Cluj, 1948-1973. Itinerar istoric, realizări, perspective. Cluj, 1974
4. **Ghibu O.** *Universitatea Daciei Superioare*, București, 1929.
5. **Ghibu O.** *La a douăzecea aniversare a Universității „Daciei Superioare”*, Cluj, 1939.
6. **Ghibu O.** *Statistica învățământului din Ardeal 1919-1921*. In: „Societatea de mâine”, 1925, 2, p.219-222.
7. **Pascu St.** *Istoria învățământului în România, vol.1. De la origini până la 1821*. București, 1983.
8. *Istoria învățământului din România. Compendiu*. București, 1983.
9. **Mirel M., Ardos A.** *Date privind începuturile învățământului profesional în Transilvania*. In: „Acta Musei Napocensis”, 1967, p.215-235.
10. **Munteanu R.** *Condiționări și raportări istorice între civilizație și energetică*. Cluj-Napoca, 1996 (în colaborare).
11. **Munteanu R.** *Universitatea Tehnică din Cluj-Napoca – Școala și timpul*. Cluj-Napoca, 1998.
12. **Nistor I.S.** *Istoria învățământului tehnic din Cluj-Napoca*, ediția a II-a, Cluj-Napoca, 2004.
13. **Munteanu R.** *O cronologie a învățământului tehnic la Cluj-Napoca*, Anuarul Filialei din Cluj-Napoca a A.Ș.T.R., 2005, pag. 7–16.