History of Czech Technical University in Prague

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April 25, 2024

Simple problem

What is value of this fraction?

$$\frac{1\ 234\ 567\ 890}{1234567891^2 - 1234567890 \times 1234567892}$$

Beginnings of CTU

The history of CTU begins in 1707,

when Christian Joseph Willenberg (1655 - 1731) requested permission from **Emperor Leopold I** to start a college of engineering in Prague.

It was called then

Institute of Engineering Education.

Leopold's son, Emperor Joseph I., who succeeded his father on Habsburg throne, responded to this request on 18th January 1707 with a decree in which he ordered the Czech general Estates to found an engineering school in Prague.

Development in Europe

- At that time, as different countries of Europe began their expanded voyages across the globe in search of raw materials.
- It was becoming clear that
  - factories had to be built,
  - machines designed and mechanisms invented
    to power these machines.

Technical Education

- But actually,
  technical education arose and developed slowly compared to classical schools,
  i.e. universities and grammar schools.
- The first technical schools were
  - **mining schools**
  - **military technical schools for civil engineers.**

Technical schools vs Traditional schools

- It was becoming clear at that time

  that institutions for instructing students
  on the engineering and "useful arts"
  had to be established apart from the institutions

  that offered **courses in the traditional disciplines** such
  as
  theology, metaphysics, moral, politics, grammar, rhetoric or logic.

Royal Society 17th Century

- Already, **the Royal Society of London for Improving Natural Knowledge** had been formed **in 1663** in England to address the necessity of having to

  "to complete the knowledge about the matters of nature and to improve all of the useful arts, manufacturing processes, mechanical proceedings, machines and inventions by experiments."

The Foundator of CTU in Prague

- Coming back to the particular history of CTU to its foundator **Christian Joseph Willenberg** (1655 - 1731) who was **a native of Silesia:**
- It would be ten years for him before he was able to receive sufficient financial support to open his school.

1717

- **In 1707** the emperor complied with his wishes and issued an edict called **"Rescript of Joseph I." instructing the Czech estates to initiate education of engineering disciplines.**
- The foundation charter says :

  *" The aforesaid **Willenberg** is allowed **to instruct and teach twelve persons** of whom six come from the rank of the estates, four from the rank of knights and two from the rank of the townsfolk...." .*
- However owing to certain unfavourable circumstances this meritorious act started being put into practice as late as in 1717.

First students and succesors

- **So his first class was taking place in his flat and had only twelve students.**
- However, the number of students grew rapidly and reached more than 200 in 1779.

- Willenberg's successor was

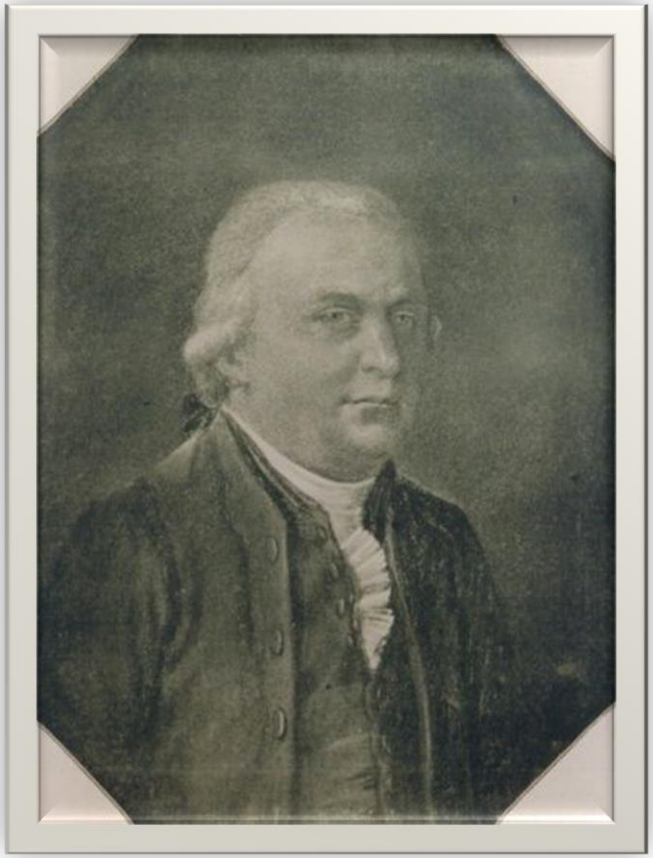
  Jan (Johann) Ferdinand Schor,

  author of the textbook on mathematical sciences taught at the Institute.

Professors of the Institute

Johann Ferdinand Schor

Franz Anton Herget



3rd Professor Franz Anton Herget

- The third Professor of the Institute of Engineering was

  Franz Anton Herget,

  who was particulary well-known

  for his lectures on practical applications

  of mechanics and applied mathematics,

  in the period 1767 – 1800.

First graduates

- The first graduates worked mainly as army officers.
- This is obvious from the range and bias of the engineering department in the period in which it was headed by Ch. J. Willenberg and J. F. Schor.
- But when the engineering department was headed by F. A. Herget, the positive impact of extensive educational reforms became evident. The department lost its military character and became an educational centre.

Next Development

- In 1776 the Empress Maria Theresa permitted Herget to use workshops, offices and a garden at the former Jesuit college – the Klementinum - for lectures and tutorials.
- In 1786 the engineering school moved from the Klementinum to Dominican Street (since 1870 called Husova St.) into the building of the former St. Wenceslav seminary.
- A lecture hall, workshops, a machinery room and a mathematical museum were there at the school´s disposal.

F. J. Gerstner and Polytechnic

- In 1803 after the approbation of the Emperor Francis I., the school was turned into a polytechnic named "The Czech Polytechnic Institute of the Estates".
- Why a polytechnic ? Because a little earlier in 1745 was established what would become the prototype of the technical college L'Ecole Polytechnique de Paris.
- Other polytechnics quickly opened all over Europe during the early part of the nineteenth century. In each of these institutions the focus was on the "useful" or practical disciplines.
- This emphasis was both the catalyst and the result of the industrial revolution which would inevitably also be known as "the age of engineering."
- The demand of the age was not for skills in a single science, but for multiple applied sciences and skills, hence the institutional designation of "polytechnic--" from the Greek words "poly" meaning many, and "technic" meaning arts.

Prague Polytechnic, First in Central Europe

- **The Prague new polytechnic, first in Central Europe,** based by Gerstner on the model of the shortly before established **l´École Polytechnique de Paris, was opened on October 11, 1806.**
- At that time Prague Polytechnic was the only school of higher technical education in the Austrian empire.
- The Polytechnic, however, continued to be a constituent (by Imperial decree of 1787) of the Prague University and
  not did not become legally independent until 1815.

Franz Joseph Gerstner

- F. J. Gerstner, astronomer, professor of mathematics and mechanics, scientist in the field of the theory of wave motion, organizer of scientific life and industry in Bohemia, was probably one of the most outstanding personalities connected to this school in the 19th century.
- **His work focused on applied mechanics, hydrodynamics and river transportation.**
-
- He helped to build the first iron works and first steam engine in Czech lands.
- **In 1807, he suggested the construction of a horse-drawn railway between České Budějovice and Linz.**

- This railway was later actually built between 1827 and 1829 by his son František Antonín Gerstner.

Franz Joseph Gerstner (1756 – 1836)

Between České Budějovice and Linz (South Bohemia)
do Lince (Upper Austria).

- The founder of the Prague's polytechnic school, 1806 as l'Ecole polytechnique in Paris.
- He suggested first construction of a horse-drawn railway. koňskou dráhu v Rakousku.
- The founder of wave theory.

Gerstner' Wave Theory

- **1802 Gerstner was the first, who formulated elements of wave theory.**
- He described in his observations the movement of water drops in circles. The drop on the top of wave moves in the direction of wave and water in the lowest point of wave moves in opposit direction.
- **He experimented on the South Bohemian ponds.**
- **This theory has today many applications** in the different environments:

  water (ocean waves),

  earth (seismic waves - earthquake),

  electromagnetic field (radio waves),

  air (sound waves) etc.
- The studium was not easy, because for instance ocean waves are not exact sinusoidal or other pure mathematical curves.

The Accurate Mechanic Joseph Božek

- His closest colleague Josef Božek, a very experienced and accurate mechanic,
- established mechanical workshops for students,
- produced models of machines for educational purposes and
- built **a self-propelled road vehicle powered by steam.**
- **In June 1817 Božek launched a steam boat** on one of the branches of the river Vltava.

Christian Doppler

- But the most famous is probably Christian Doppler, **Professor of mathematics and practical geometry**

  from 1837 to 1847.
- His most notable work was called

  „*On the coloured light of the binary stars and some other stars of the heavens*” (1842).

  In this work, Doppler postulated his principle (later coined the Doppler effect) that the observed frequency of a wave depends on the relative speed of the source and the observer, and he tried to use this concept for explaining the colour of binary stars.

  This effect was verified in 1845, and is routinely used in many fields of human activities, including physics, astronomy, medicine, meteorology and transformation.

Doppler, the Foundator of Physical Institute in Vienna

- **In Doppler's time in Prague as a professor he published over 50 articles on mathematics, physics and astronomy.**
- In 1847 he left Prague for the professorship of mathematics, physics, and mechanics at the Academy of Mines and Forests in Schemnitz, and **in 1849 he moved to Vienna.**
- What interrupted Doppler's research in Prague was possibly the revolutionary incidents of March 1848,
- and that would be why he went to Vienna.

Some administrative changements

- **In 1863,** Prague Polytechnic was transformed into a technical university headed by a rector. At that time the studies were **divided into 4 specialisations: Mechanical Engineering, Chemistry, Civil Engineering and Architecture.**
- **In 1869** the lasting disputes between the Czech and German members of the academic staff led to a split of the Prague Polytechnic **into two independent colleges.**

To use the Professional Title „Engineer".

- After the Prague Polytechnic was put under the state administration in 1875,
- significant changes occurred in 1878.
- A system of two state exams was introduced and graduates obtained the right to use the professional title "engineer".
- Students passed these exams for the first time in 1880 and this system was practiced until 1950. In 1879 the name of the Czech part of the Prague Polytechnic was changed to „Imperial and Royal Czech Technical University in Prague“.

From 1920

- After the disintegration of the Austro-Hungarian Empire,

  the name of the school was changed in 1920 to the Czech Technical University in Prague,
- which united seven schools, including the School of Chemical Technology, the School of Agriculture and Forestry, and the School of Business.
- These three above mentioned schools developed into independent universities in the early 1950's.

Famous People

- We can name here some other famous people related to CTU :
- František Křižík, inventor, electrical engineer and entrepreneur
- Vladimir Prelog, chemist and Nobel Prize winner
- Emil Weyr, mathematician
- George Klir, computer and systems scientist
- Simon Wiesenthal, Nazi hunter

We could name much more famous scientists related to CTU. Some earned impressive awards.

World War II and later

- During the last three quarters of the last century, the developments in technology in the Czechoslovak Republic were slowed down compared to other parts of the world.
- The reason is that during World War II when Czechoslovakia was occupied by the Nazis, the Czech Technical University similarly as all Czech universities was closed-down and lectures were not resumed until the end of the war in May 1945.
- Then communist regime also slowed it down because of a stagnating economy and a political oppression. Hundreds of students and scores of lectures and researchers were kicked out from the universities and research institutes.
- In spite of this, graduates and staff members of the Czech Technical University created numerous remarkable engineering and architectural works, developed noteworthy technologies, mechanical and electrical equipment, and achieved notable scientific accomplishments and inventions.

The Last Half of 20th Century

- In the course of the last half century, the Czech Technical University in Prague has undergone several reorganization.
- **After 1960, CTU had four faculties: of civil engineering, mechanical engineering, electrical engineering, and a forerunner of the present faculty of nuclear science and physical engineering.**
  The faculty of architecture was founded **in 1976**, the faculty of transportation science **in 1993**, faculty of biomedical engineering **in 2005,** and faculty of information technology **in 2009**.
- **CTU now is one of the largest universities in the Czech Republic, and the first technical one.**