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V.P. Engelhardt – 180 anniversary of birth

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The article is devoted to Vasily Pavlovich Engelhardt, founder Engelhardt Astronomical Observatory in Kazan. The family history, science and cultural activities of Engelhardt are described.

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1 Introduction

In 2008, it was the celebration of the 180th anniversary of the birth of Vasily Pavlovich von Engelhardt, a famous astronomer and public figure who has made a major contribution to world science, history and culture.

Engelhardt V.P. was born on 17/30 July, 1828. He was descended from von Engelhardt aristocratic origin. His great grandfather, Engelhardt Vasily Andreyevich was married to Martha Alexandrovna, who was a sister of His Serene Highness Prince Potemkin. Vasily Pavlovich's parents were part of the upper strata of St Petersburg society and he met many learned men in their house. He became friends with the great Russian Composer Mikhail Glinka and was a life-long follower and admirer of his talented career. Young Engelhardt graduated from the Imperial School of Jurisprudence and was in government service for 6 years. He was fond of literature, music, history and he traveled widely.

He was attracted to astronomy and studied this science on his own. He decided to dedicate himself to a favorite cause. Engelhardt left Russia and moved to Germany, where he built a private Astronomical Observatory and equipped it with modern telescopes. Vasily Pavlovich said that he had chosen "Dresden, because the climate was much milder than in Russia", and because "that city had great potential for science and art". He carried out his first training in astronomical observations under the direction of the German astronomer Karl Christian Bruns (1830–1881) in 1875–1876 in the small pavilion, which had been built by him in Pilnitz, near Dresden. The acquaintance and friendship with Leipzig astronomer Bruns was very successful for the novice observer Engelhardt. Professor Bruns had been a director of the new University Observatory since 1860 which had been built to replace the old Astronomical tower in

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Plissenburg. The modern tools of the Leipzig Observatory included 215 mm equatorial, 167 mm meridian Pistor circle, Bruns' great practical experience in astronomical observations and calculations and his friendly attitude to Engelhardt V.P., were of particular importance for the astronomical activity of Vasily Pavlovich. He carried out the observations for testing the chronometers with a sextant and estimating latitude location in Pilnitz. The Observatory was constructed by him in Dresden in 1877. It consisted of a tower with 204 mm Grubb equatorial, 51 mm Cook nocturnal, pendulum clock and knoblich chronometer. The positions determining of 1879 year Brozen comet, which had been made in this tower in April–May 1879 were published in the "Astronomische Nachrichten" journal accompanied by Professor Bruns letter, September 10, 1879. This study was the first published work of of Engelhardt V.P.

Vasily decided to settle down in Dresden in 1879 and he became the owner of plot (Liebig st., 1). On the outskirts of the city, he built a villa and established the garden around it, and the Observatory was built near the villa.

The great popularity of Engelhardt's astronomical observations was gained by his researches, which were carried out in the New Observatory's territory from 1880 to 1897 years. The first observations were made on February 3, 1880 with the nocturnal. The North Star was an observation object for investigating and setting the instruments. Sometimes Professor Bruns took part in observations too. Bruns died at the age of 51 and Engelhardt was sorry about Bruns untimely death. Many biographers have mentioned Bruns cordiality and willingness to help many astronomers in the organization of observational studies and works.

The New Observatory in Dresden was the tower with revolving dome and meridian hall, and it was joined with the dwelling by wide passage, which could be a place for observations too, because the walls consisted of opening mirror windows. The tower is divided into three floors. 12 inch (306 mm) equatorial of Grubb is situated on the massive stone pillar at a height of 12 metres above the ground. Repsold filar micrometer was set on the eye-piece telescope ending in Hamburg. Micrometer reading accuracy is small second parts of arc. 136 mm and 38 mm auxiliary detectors, Thiede clock, and. Fyusa register from Berlin were under the telescope. The portable tools, small tubes and other things were on the ground and middle floors of the tower. The walls were decorated with star maps, types of observatories, astronomical themes pictures and with "Raphael clock" copies. Meridian hall joined the ground floor; Bamberg nocturnal from Berlin with broken tubing at 68 mm in diameter was on the separate pillar at a height of 4 m in the meridian hall. There were also Knoblik sidereal clocks, chronometers and barometers. Observatory and tools were lighted up by gas. The Observatory is connected to a telephone and telegraph with living room. Engelhardt set up another small Comet Observatory on the villa's roof for the observing comets and variable stars.

Engelhardt V.P. began astronomical observations when he was 50 years old. He wrote to his friend "I had become interested in astronomy since youth. In summer I took a celestial map, lantern and went to Paklonnaya Hill where there was an open sky view, and I could study the constellations. I made a pavilion with a small astronomical instrument in Pilnitz and I practiced there. Then I arranged a small Observatory in rented garden in Dresden and studied diligently. Later I built an Observatory equipped with better instruments and tools and I continued observing for 20 years. I didn't leave Dresden so that there was no gap in studying the parts

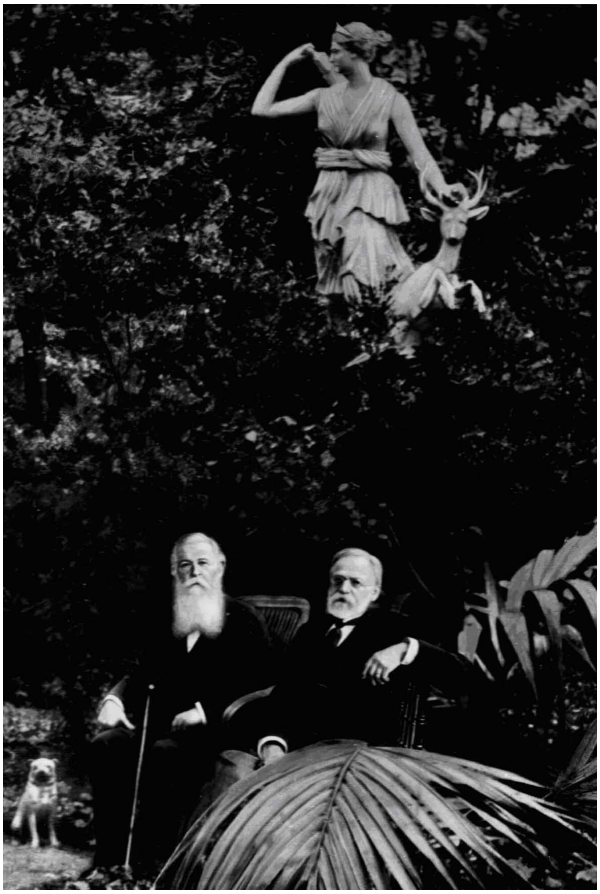


Figure 1 Engelhardt, V.P. and Dubyago, D.I. in Dresden Engelhardt observatory.

of the sky which are visible in the summer or winter only. I worked so diligently to avoid missing clear nights..."

First of all Engelhardt set up the observatory to study the comets and minor planets. He made 400 observations of more than 50 comets and about 500 observations of 70 minor planets from 1879 to 1894. He continued with these observations as part of his astronomical work. Since 1883, Engelhardt had begun to observe nebulae and star clusters to determine their exact position. He was also involved in describing their appearance; however the Dresden atmosphere was not favorable for this work. Engelhardt produced 350 measurements of coordinates difference with 80 stars for comparison and he made a catalogue, which included 100 nebulae. Later he increased the catalogue to 421 nebulae.

In 1886, Engelhardt accepted the proposal of Pulkovo Observatory director O.V. Struve and started to observe the stars using Bradley catalog (829 stars), which had annual proper motion less than 0.1 second. It was necessary to ascertain the number of stars, which had strong and now remote satellites. This could provide with material

for physical connection deciding or proper motion of pairs component. Engelhardt observed all stars from the Pulkovo list, he made estimates of its brightness, measured the position angles and double distances. Danish astronomer Lan observed the same stars, and noted in his works, which were published in "Astronomische Nachrichten", that "Engelhardt" stars could be important in studies of proper motions of faint stars.

In addition to these great systematic works, Engelhardt made a lot of different micrometric measurements. From 1881–1885, he made 104 observations of phenomena in Jupiter satellites system, and then from 1887–1890 he made bindings of Saturn satellites to its ring and to each other. Engelhardt always responded to the requests from different astronomical institutions and individuals. He observed outbreaks of new stars, not missing any interesting astronomical phenomenon. Engelhardt published the results of his observations in "Astronomishe Nachrichten" and some of them in "Bulletin astronomiqe". For three years, until the end of 1883, observations of about 150 comets close on 300 observations of planets; observations of many eclipses of Jupiter satellites, stars and other things were published in various astronomical journals. He also made the determination of nebulae and positions of double stars on the equatorial. It should be noted, that all astronomical observations, which were produced in the Observatory, were made by Engelhardt only, because there was no assistant in the Observatory. The importance of Engelhardt's observations is clear for people, who are familiar with works of practical astronomy.

If one takes into account that each astronomical observation and calculation requires much work, so it is necessary to recognize the importance of observatory activity and we wonder the energy of is founder. Engelhardt was in the Observatory until the early morning in any weather, busy with the observations. This new astronomical institute quickly acquired a good reputation in the astronomical world.

There was no doubt that Engelhardt working in Germany had direct contacts with German, Austrian and other European astronomers, such as Shnauder M., Tempel E. observer of nebulae, Abetti A., Seeliger G., and many others. Johann Paliza (1848–1925), an employee of the Viennese Astronomical Observatory took a special place in this group; he was known as the "Catcher of minor planets". Engelhard sent his positional observations of comets and minor planets to the Viennese Observatory. The value of his observations for defining of ephemeris elements was very important. In 1886, Paliza asked Engelhardt V.P. to "nickname" the No 263 asteroid. It was named as Engelhardt Dresden. Paliza visited Engelhardt several times in the Dresden Observatory, they exchanged correspondences, and kept a friendly relationship for many years.

The acquaintance between Engelhardt V.P. and Dubyago P.I., the young doctor of astronomy from St.Pefersbing, arose from their devotion to astronomy. Afterwards Dubyago was appointed professor of astronomy at the Kazan State University and director of the Observatory, and then he became rector of Kazan University.

In 1883 Engelhardt changed the observation program and switched over to the double stars and nebulae observations using 12-inch equatorial. He approached carefully an investigation/calibration of tools errors. The Observatory premises and telescopes were always in perfect order and he had no assistant to process the observations and data. So Engelhardt resorted to the help of calculators. At first, there were astronomers-assistance from German AO, later, total processing of large observational material was produced in Russia under the leadership of Dubyago D.I.

Engelhardt collected his numerical observations in three large volumes of about 700 pages each and entitled as "Observations astronomiques faites par B. d'Engelghardt clans fon observatoire a Dresden". The first volume was out in 1886, and last one in 1895. This scientific achievement was appreciated by the astronomical community. June 22, 1887, Kiel University awarded Engelhardt the first academic's degree – PhD – honoris causa. Engelhardt sent the first volume of his observations in Kazan in April, 1887, with a request for review and an opinion about this work. At the meeting of physical-mathematical faculty of Kazan University, Dubyago submitted the first volume of "Observations" (Engelghardt, V.P. (1897)) on awarding Engelhardt astronomy doctor's degree without test and defense of a thesis. Dubyago concluded his speech with the following words: "He didn't often comment in astronomical literature on the appearance of so extensive, accurate collection of observational material, like a real work of Engelhardt". Professor Dubyago's proposal was adopted by the faculty in the meeting of 24 August unanimously and resolved: "to elevate Engelhardt V.P. to astronomy doctor's degree for scientific services. International recognition of Engelhardt scientific services was the reason for electing him as a corresponding member of St Petersburg Academy of Sciences".

In 1891, Engelhardt set up a new program, the observation of nebulae. He wrote to Dubyago that "He needed other 200 nebulae to compete with Scoenfeld and Schulz, who had 500, each". On the occasion of the third volume "Observations" Dubyago sent a memorandum to the Ministry of Engelhardt had been advanced the rank of active state councilor and was awarded the order of Stanislav first degree, which was sent him through the Kazan University.

But Engelhardt's strength had started to fail him and he thought frequently about the future of his telescopes. Engelhardt's loyalties went over to the Kazan State University.

In the summer of 1897, Engelhardt notified officially the transfer of his instruments, laboratory apparatuses and astronomical library in the gift of the Kazan Observatory. Kazan University accepted this generous gift gratefully. News of this spread throughout the astronomical world and the Russian Emperor Nicholas II expressed his thanks to Engelhardt.

The last astronomical observation was made by Engelhardt V.P. on January 7, 1897; it was the Perrine comet position. The data were published in "Astronomische Nachrichten" journal, which was out of print in January 29 of that year. On October 7, 1897, Journal editor Professor Kreutz G. signed up the publication of issue, where Engelhardt informed astronomers around the world that he would be ending his astronomical observation work and that he had transferred his instrument collection to Kazan Astronomical Observatory.

In March 1899, the laying of the foundation stone of the Observatory was carried out in the presence of astronomers, university authorities and the clergy.

September 21, 1901, marked the grand opening of the New Observatory of Kazan University. A special train conveyed a large group of guests from Kazan. The opening of a New Observatory was a significant event for the international scientific community. Dubyago D.I. described in detail the opening act in the letter to Engelhardt. In his reply, Engelhardt V.P. wrote "I heartily thank you for your friendship and for everything, for your work to realize my dream – the rebirth of my Dresden Observatory. I worked in primative conditions, I had just excellent tools. And now a real

astronomical palazzo has been erected in Kazan forest with your help! I am sure that you have established a good scientific foundation too and the new Observatory will thrive. I sincerely thank you for your friendship, which I highly appreciated and I shake you by the hand!"

Engelhardt received many letters with greetings and congratulations. Information about the opening of the New Observatory appeared in many journals. He was cheerful and energetic, as if this event had given him new strength: "How wonderful it would be if I could make one more observation in your Observatory. I still could work. I am weak, but I have no pain. And happiness in life consists in work. Nobody can live without it".

The New Observatory in Kazan was called the Engelhardt Observatory (EAO). It received this name officially in October, 1903. At a meeting of Kazan University council it was agreed unanimously "to continue to name the new Observatory as "Engelhardt Observatory of Imperial Kazan University"" and to put there a marble bust of Engelhardt V.P. EAO published for the first time in international astronomical journal in 1903 by a note in "Astronomishe Nachrichten" No 3895 about the observation of 1903. 1comet. For the first time, "Engelhardt average time" term was used. ("Kazan" had always used previously.)

Engelhardt V.P. realized that he could not visit Engelhardt Observatory in his lifetime, but he dreamt to go there for "eternal peace" and to be buried with his close friend and surrounded by "his loved instruments". So in 1906, the burial vault was built. on an artificial hill on the edge of a large clearing. The burial vault was made in "Byzantine style" and to this day it delights ..delights vistors to the Observatory with the elegant austerity of its form. It honestly fulfilled its astronomical designation, the crypt is deep in the earth under the column, where the two friends Engelhardt and Dubyago would be buried.

Engelhardt V.P. died on May 17, 1915 during the first World War. It was not possible to perform his last will and transfer his remains to Kazan. He lies in a quiet Dresden cemetery and his place in the crypt under the "South Mira" in Kazan, next to his friend Dubyago, who died in 1918 remains empty. The Engelhardt Astronomical Observatory is the best memorial to the famous astronomer and a fine man.

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