THREE ASSISTANTS ON BOLTZMANN

ABSTRACT. The three demi-articles presented here would give a brief biographical account of Ludwig Boltzmann’s life plus some details about his Vienna laboratories first in the 1860’s in the Erdberg and second in Türkenstrasse from 1894. Josef Nabl’s account discusses J. J. Thomson’s Laboratory in Cambridge, which allows a provisional comparison between two different largely contemporary institutes. Nabl’s second letter also mentions Lord Kelvin’s late rejection of the kinetic gas theory of Maxwell and Boltzmann, rejection which on top of the negative attitude of Mach, Zermelo, and Poincaré probably did not benefit Boltzmann’s state of mind and may have contributed to the extreme character of Boltzmann’s anti-philosophical counterattack starting in 1903.

1. A BIOGRAPHICAL SKETCH BY GUSTAV JÄGER

Ludwig Boltzmann was the most significant physicist which the old Austria brought forth. Indeed, he was one of the most significant scientists in the world. In order to judge his greatness as a whole one must be a physicist of equal stature, a great psychologist, and a warm-hearted man. Since I am not on his level, I must apologize for the weakness of my attempt to describe Boltzmann’s life. ... But since whatever we learn about great beings is worth the effort I will proceed. ...

Ludwig Eduard Boltzmann was born in the night between Shrove Tuesday and Ash Wednesday on February 20, 1844 in house #97 on the main street of ward three in Vienna. Meanwhile, a masked ball was taking place in the popular tavern downstairs. It was this contrast between a mother’s pain upstairs and unrestrained pleasure below which Boltzmann laughing would often give as the cause for his own sudden temperamental swings between high happiness and deep depression.

His father was a government finance [tax] official and his grandfather, who was a clockmaker, had come from Berlin to Vienna. All three male Boltzmanns had the first name of “Ludwig”. Young Ludwig’s father was Protestant and his mother, Katharina neé Pauernfeind, was Catholic, but all three children were raised as Roman Catholics.

Soon after his birth the family moved to Salzburg and later to Linz. Two years after Ludwig a brother, Albert, was born, and some years later.
a sister, Hedwig. Ludwig’s father, who had become finance commissar in Linz, died prematurely, that is, when his eldest son was only fifteen. His mother and her children stayed in Linz while young Ludwig finished Gymnasium, but meanwhile his younger brother, Albert, died from a lung infection.

Boltzmann was a hardworking and pious pupil. He went regularly to communion and confession. As a result of such holy practice, probably because of strict fasting, he once even fainted. He was always academically first in his class. Only once was he second. He then worked harder until he became first again where he stayed. He would later criticize such ambition. He blamed his extreme shortsightedness and how much it had hindered him later on having forced himself to work so long under bad lighting. One only had tallow candles at that time. He also disapproved of ranking pupils by their location in the classroom, since it leads to wrong or exaggerated striving, which has less to do with really learning a lot than with overtaking and surpassing one’s rivals.

In middle school his inclination toward the natural sciences already stood out. Through his own efforts he collected a large number of plants. He also collected bugs and butterflies. This predilection reappeared later in an even stronger form after he became professor of experimental physics in Graz. He put together a large collection of butterflies there which he himself had caught and prepared which also included caterpillars. He also retained his interest in botany and was known among experts for his ability to identify plants.

After he received his graduation certificate from the Linz Gymnasium in 1863 he entered the University of Vienna where he devoted himself to the study of physics and mathematics. His main science teachers were the mathematician Petzval, the physicist von Ettinghausen, and especially Josef Stefan. The memorial address he gave when his statue was unveiled shows how much he valued Stefan. How close the student was with his teacher is revealed by the following words:

While still a student and having a trusted relation with Stefan he put a copy of Maxwell’s treatises in my hand, and since at that time I didn’t even know one word of English, he also gave me an English grammar. My father, however, had already left me an English lexicon.

(Boltzmann 1925, 96)

It was in this way by studying Maxwell’s works that Boltzmann learned English, a language which he later mastered well-enough to give lectures using it in America. In his own words:

I felt terrified during the first lecture, but more relaxed during the second, but when I heard that the students could understand me well, that they even found my presentation very clear and lucid, I then felt completely at home. I cannot express my thanks enough to Miss