

1.1 Introduction

You see the tombstone of Ludwig Boltzmann on the "Zentralfriedhof" in Wien.

The text $S = k \log W$ on his tombstone is a symbol with several aspects:

- It is the central formula of the statistical mechanics developed by Boltzmann
- The consequences of Boltzmann's new theory bothered so many colleagues; the argument was so severe that Boltzmann committed suicide. Especially two aspects of his statistical approach in thermodynamics were attacked:
- A statistical approach assumes the existence of many equivalent smallest particles, i.e. of atoms. But this was not accepted generally in the middle of the 19. Century.
- By claiming the dominance of the statistical character of thermodynamics as also
- In Darwin's Evolution Theory in the Biology and
- Later on in Quantum mechanics
- The aimed and ordered world of a god leaded society was questioned.
- e.g. Max Planck did not accepted statistical thermodynamics due to this reason
- Due to similar reasons Einstein did not accept the interpretation of quantum mechanics: "God does not dice!"
- From today's point of view: "Order generated by chaos \Rightarrow Synergy"

