

OLM 1.2. The water-clock

Regulation is the single most important key concept of this book that we illustrated with the regulation of water level in an open vessel in Ch1.3.1. Here we provide another physical example of the same principle originating from antic Rome.

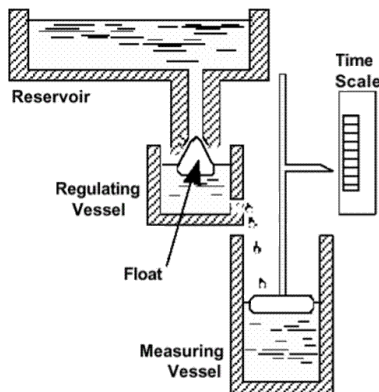


Figure 1.2.1: Regulation in the water-clock

The most precise device measuring the lapse of time was the water-clock until as late as the 17th century. The water level in, and thus the flow of water out of the regulating vessel was constant, because the floating valve opened the way for the inflow of water at decreasing water level and closed it when the water level increased. The scale and the pointer fitted on a cork-board showed the amount of water in the measuring vessel, and thus the time elapsed since it was last emptied. More complex devices could empty the measuring vessel automatically when it was full.

Figure 1.2.1 is a schematic representation of a water-clock. The core of the water-clock is a regulating vessel in which the water level is regulated by a wedge-shaped valve. It is worthwhile to compare the working mechanism of the water-clock with the self-regulation described in TBox 1.2.

Figure 1.4 (and Figure 1.2.2 below) is a generalization of these mechanisms: regulation is provided by the feed-back between the state of the systems and its change.

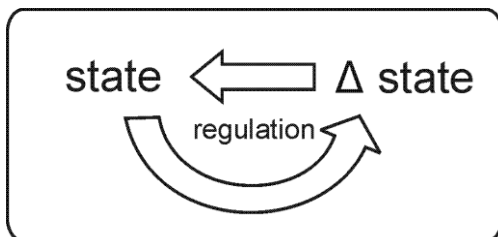


Figure 1.2.2: Self-regulation in general