Isaac Beeckman
1588-1637

Beeckman was born on 10 December 1588 in Middelburg (capital of the province of Zeeland). His father came from the southern Netherlands. For religious reasons he had fled from Turnhout to London, from where he had moved to Middelburg in 1585. There he had married a daughter of another immigrant from the southern provinces. Isaac Beeckman was their first child and he grew up in a milieu of immigrants.

His father was a well-to-do candle-maker, who could afford to send his son first to the Latin school in Arnemuiden (near Middelburg) and then to Leiden to study theology (1608-1611). In Leiden Isaac Beeckman also studied mathematics with the Ramist philosopher Rudolph Snel. Because of dogmatic differences between his father and the leading theologians and ministers in Zeeland, Isaac Beeckman could not find a place as a minister, so in the end he decided to become a candle-maker like his father. From 1612 to 1616 he worked as such in the town of Zierikzee. He also repaired waterworks in breweries and gardens of wealthy regents. Being dissatisfied with his way of life, he handed over his shop to his assistant in 1616 and went back to Middelburg to study medicine. In 1618 he took his degree in medicine at the French university of Caen with some *Theses de febre tertiana intermittente*.

Since his stay at the grammar school in Arnemuiden, Beeckman had kept a diary, his so-called *Journal*. This miscellaneous collection of notes contains remarks pertaining to his personal life, the weather and the milieu in which he lived, but also so to medicine, logic, music, physics and mathematics. From this *Journal* it is clear that already in Zierikzee Beeckman had developed a mechanistic philosophy of nature, in which atomism, a modern principle of inertia and a drive for a mathematical formulation of natural philosophy are the main ingredients. Only in the corollaries to his thesis Beeckman published some of these ideas.

Shortly after returning from Caen to the Netherlands, Beeckman went to the city of Breda, where he happened to meet a young French officer in the Dutch army, René Descartes. In November and December 1618 they discussed several topics in mathematics and mechanics. The next year, Beeckman became a teacher at the grammar school (or Latin school) in Utrecht. In April 1620 Beeckman

married Cateline de Cerf from Middelburg, who bore him several children. In December 1620 Beeckman moved to Rotterdam. There he became assistant to his brother Jacob, who was the principal of the local grammar school. Beeckman very much liked the practical minded atmosphere in Rotterdam. Together with some craftsmen and a physician he founded a Collegium Mechanicum, in which he discussed all kinds of practical problems. Nevertheless, conflicts within the Dutch Reformed Church forced Beeckman in 1627 to accept the offer to become the principal of the grammar school in nearby Dordrecht. In Dordrecht, Beeckman opened his lessons with an inaugural lecture (unpublished) on his so-called "philosophia physico-mathematica".

By this time Beeckman had a fully developed mechanical philosophy. He started from the assumption that no explanation in physics was acceptable that did not allow for a picturable model; therefore he rejected the concept of impetus and opted for the idea that motion that is not interrupted or deflected, will always continue in the state it is in. Beeckman also rejected the Aristotelian matter theory and opted for atomism, though he was aware of the problems involved in the concept of perfectly hard atoms which nevertheless are able to bounce back after collisions. Starting from these ideas, Beeckman was able to give mechanistic explanations of many different physical phenomena, including the tides, the propagation of sound, musical harmonies and the movement of the planets. Problems in hydrostatics Beeckman explained with the concept of air pressure; magnetism was explained by recourse to a model of particles streaming through and around the magnet; and differences in the properties of substances with the same chemical composition were explained by means of different arrangements of the individual particles (more or less like the later concept of isomery). All of this Beeckman had discovered by himself. Only the law of free falling bodies was the result of the cooperation between Beeckman and Descartes, in which Beeckman provided the physical intuition and Descartes the mathematical methods.

In Dordrecht Beeckman became a well respected intellectual, who participated in cultural circles and did experimental research in his simple laboratory and in the observatory on the roof of his school. He also established several international contacts, for instance with Mersenne and Gassendi, with whom he corresponded on his natural philosophy. The relationship with Descartes however, cooled down

considerably after 1631 when Descartes got the impression—unfounded as it was—that Beeckman was boasting about being Descartes's teacher. In the 1630s Beeckman spent considerable time learning the art of grinding lenses. Around 1635 he was also on a committee to investigate Galileo's proposal of determining longitude by observation of the satellites of Jupiter.

Beeckman died of tuberculosis on 19 May 1637. His natural shyness and his irresoluteness had prevented him from publishing his ideas during his lifetime. Only seven years after his death his younger brother Abraham published a selection of the entries in the *Journal*, but that was too late to have a direct impact on the development of science. If it had not been for Cornelis de Waard, who in 1905 discovered Beeckman's supposedly lost *Journal* and subsequently published it, Beeckman would have remained a shadowy figure in the background of the Scientific Revolution.

Primary works

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[K.v.B.]