Simon Stevin
1548-1620

Stevin was born in 1548 as the illegitimate son of a wealthy citizen of Bruges, Antheunis Stevin. Little is known about his education and the beginning of his career. In Antwerp and Bruges he earned a living as a bookkeeper and a cashier. In 1581 Stevin went to the province of Holland, which had been in revolt against the Spanish king for some time. We do not know why Stevin left the southern Netherlands; it is improbable that he did so for religious reasons, since later on he proved to be remarkably indifferent to religious matters. Stevin settled in Leiden and although he also matriculated at the university in 1583, he really started a career as an engineer and a practical mathematician.

By this time, Stevin's first books had already been published. His *Tafelen van Interest* (Tables of Interest), in which he set out the rules of single and compound interest and gave tables for rapid computations (things kept secret by banking houses up to that time), as well as his *Problemata Geometrica* (Geometrical Problems) had come from the press in Antwerp in 1582 and 1583 respectively. But because Antwerp had been recaptured by the Spanish troops in 1585, Stevin's next books had to be published elsewhere. His book *De Thiende* (The Dime), which contains his introduction of what are usually called decimal fractions, was published in 1585 in Leiden.

More important were the books Stevin published in 1586: *Beghinselen der Weeghconst* (The Elements of the Art of Weighing), *De Weeghdaet* (The Practice of Weighing) and *Beghinselen des Waterwichts* (Elements of Hydrostatics). In these works, he resumed and continued the work of Archimedes. In hydrostatics, Stevin established the Archimedean Principle in a more elementary and therefore satisfactory manner than Archimedes himself had done. In addition, Stevin was the first to evaluate the forces which a liquid by its weight exercises on the bottom and the walls of the enclosing vessel. It was however his demonstration of the law of inclined planes that he was most proud of. He used the wreath of spheres as a special mark (together with the self-assured maxim 'Wonder is no wonder') on his instruments and as a vignet in his books (See p. 18). The wreath of spheres also appealed to other sentiments of Stevin. By using the mental experiment of a wreath of spheres Stevin could demonstrate the law without requiring any previous knowledge and as such it

demonstrates an important characteristic of his scientific achievements. It appeals only to the intuition and is intelligible to anyone using his common sense. According to Stevin, the practice of science should be open to anyone with enough intelligence to follow an argument. For the same reason, he stimulated the use of the vernacular instead of the more common Latin. *De Beghinselen der Weeghconst* contains an introduction in which Stevin praises the Dutch language as ideally suited for scientific purposes; he even states that in the so-called 'Wijsentijt', the age of the Sages, long before the times of the ancient Greeks, Dutch was spoken all over the world. From 1586 onwards Stevin always wrote his books in Dutch. He coined new Dutch equivalents for technical Latin terms whenever this was necessary. Some of these words (such as 'wiskunde' for mathematics) are still in use.

Stevin earned a living as an engineer. Several patents for technical inventions were granted to him by the States-General and the States of Holland, most of these inventions pertaining to dredging and draining the countryside. For the improvement of the water-mill (a windmill for pumping water) he went into a partnership with a burgomaster of Delft, Johan Cornets de Groot, father of Hugo Grotius. Together they built a number of watermills all over Holland. In 1591 Stevin was sent to the Polish city of Gdansk in order to advise the city magistrates on deepening the local harbor (also important for Dutch merchants). He showed his interest in navigation also by writing a short treatise *De Havenvinding* (1599), on the subject of determining longitude. Stevins expertise in military engineering was shown by his *Stercktenbouwing* (The Art of Fortification, 1594).

By this time, Stevin had entered into the service of Prince Maurice of Nassau, stadholder of Holland and commander-in-chief of the States Army. Officially his appointment as quartermaster in the army dates from 1604 (he kept this position until his death). But already long before Maurice held Stevin in great esteem. He frequently sat on committees charged with the investigation of matters of defense and navigation and Maurice entrusted him with the organization of a school for military engineers that was established in Leiden in 1600 (Stevin did not become a lecturer or professor at this so-called Duytsche mathematique, where teaching was done in Dutch). But most important of all, Maurice asked Stevin to be his tutor in mathematics and related sciences. As Maurice's tutor, Stevin composed several textbooks, in which he not only summarized what others had written

but also added his own inventions and innovations. All his textbooks were published in a huge comprehensive edition as his *Wisconstighe Ghedachtenissen* (Mathematical Memoirs, 1605-1608). Besides mathematics and mechanics, these *Wisconstighe Ghedachtenissen* contain treatises on the theory of music, bookkeeping, optics, astronomy and geography. In the book on astronomy, *De Hemelloop* (1608), Stevin showed himself in favor of the Copernican system, establishing himself as one of the very first Copernicans in Holland.

Most of his life Stevin remained a bachelor. Only in 1616, at the age of 62, did he marry, to Catherina Cray (who cannot have been much older than 25). They had two sons and two daughters who seem to have been born before Stevin was officially married to Catherine. Stevin died in March or early April 1620, probably in The Hague, where he had bought a house in 1612.

Primary works

Tafelen van Interest (Antwerp, 1582); *Problematum geometricorum libri V* (Antwerp, 1583); *Dialectike ofte Bewysconst* (Leiden, 1585); *De Thiende leerende door onghehoorde lichticheyt allen rekeningen onder den menschen noodich vallende afveerdighen door heele ghetalen sonder ghebrokenen* (Leiden, 1585); *L'Arithmetique* (Leiden, 1585); *La Pratique d'Arithmetique* (Leiden, 1585); *De Beghinselen der Weeghconst* (Leiden, 1586); *De Weeghdaet* (Leiden, 1586); *De Beghinselen des Waterwichts* (Leiden, 1586); *Vita Politica. Het Burgherlick Leven* (Leiden, 1590); *Appendice Algebraique* (Leiden, 1594; supplement to *L'Arithmetique*); *De Stercktenbouwing* (Leiden, 1594); *De Havenwinding* (Leiden, 1599); *Wisconstighe Ghedachtenissen*, 2 vols (Leiden, 1605-1608); *Castrametatio. Dat is Legermeting* (Rotterdam, 1617); *Nieuwe Maniere van Sterctebou, door Spilsluysen* (Rotterdam, 1617); *Oeuvres mathematiques* (Leiden, 1634); *Materiae politicae. Burgherlicke stoffen* (Leiden, 1649); *Verrechting van Domeine mette Contrerolle en ander behouften van dien* (Leiden, 1649); *Van de Spiegeling der Singconst* and *Van de molens*, ed. by D. Bierens de Haan (Amsterdam, 1884); *The Principal Works of Simon Stevin*, 5 vols (Amsterdam, 1955-1968).

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[K.v.B.]