

BY AN OLD HYDROGRAPHER

'As it Was'

In 2004 the Royal Netherlands Navy for the third time in 75 years named one of two newly constructed hydrographic survey ships *Snellius*. Willebrord Snel van Royen (lat. Snellius) was professor of mathematics at the University of Leiden at the beginning of the seventeenth century. Though his broad scientific knowledge and interest covered several disciplines, a direct link between Snellius and the activities of the hydrographic surveyor exists in that he was the first geodesist to determine a position by resection: two angles between three objects measured by sextant to establish a fix. This remained the principle of position fixing for all those years and within the Dutch Hydrographic service every position thus obtained was called 'a Snellius'.

In the ancient town of Oudewater, 11 kilometres east of Gouda, a plaque on the front of an old building (at present a Chinese restaurant) reminds us that there was born Rudolph Snel van Royen, who in 1575 married Machteld Cornelisdochter. Rudolph studied Greek, Latin, Hebrew and mathematics and was appointed extraordinary professor in mathematics at Leiden University in 1581. The couple's house stood in Pieterskerkhof, where their son Willebrord was born in 1581. It was not unusual in those days for a professor and his wife to take in lodgers and the Snel van Royen family housed twenty-two students.

Looking at the life of young Willebrord one should be aware of the circumstances in which he lived. In the first half of the sixteenth century the Habsburg Empire of Charles V covered the main part of Western Europe, including The Low Countries, The Seventeen Netherlands Provinces. In 1555 Charles passed on the Spanish throne, including The Netherlands, to his son Philip II. Serious tax disputes and the rise of Protestantism led the Low Countries to oppose Spanish domination in a struggle that lasted from 1568 to 1648, later called the Eighty Years' War for Independence. It included guerrilla-like skirmishes and sometimes even heavy battles; towns were besieged, taken and liberated and citizens were slaughtered. In the meantime, in those areas where there was no fighting life went on. In 1602 the East India Company was established, overseas trade prospered and discoveries were made. In 1587 seven Northern Provinces declared their independence, whilst the Southern Netherlands remained under Austrian control.

In 1574 Leiden was besieged by the Spaniards, but was liberated in 1575. It was in that year that Leiden University was founded, the first in the Northern Provinces. Young Willebrord, raised in an academic environment, entered the University of Leiden at the age of ten. There were no rules for admission, although a young man should be able to understand Latin. However, in 1596, when six boys from Leiden who were not yet fourteen years old asked for admission, it was decided that from then on a check should be made to ensure that boy entrants were sufficiently educated.

Willebrord began reading law but soon changed to mathematics. At the age of nineteen he got permission to teach mathematics and astronomy. Soon afterwards he went abroad and came into contact with the German Kepler and the Dane Tycho Brahe, who instructed him in astronomical observations. In 1608 he married Maria de Lange, daughter of the Burgomaster of Schoonhoven. From their marriage eighteen children were born, of whom only a girl and two boys survived their parents. In 1609 Willebrord was again permitted to lecture on mathematics and astronomy, publishing on pure and applied mathematics, geodesy, astronomy and navigation. In his important work *Eratosthenes Batavus Snellius* describes his method of measuring the length of the arc of the meridian by triangulation, between Alkmaar and Bergen-op-Zoom. He was not the first to measure the arc of the meridian in order to derive from it the earth dimensions. He was, however, the first to do so by triangulation. In 1613 he succeeded his father as extraordinary professor, two years later to become ordinary professor. From 1617 on, as part of his chair in Physics he taught optics and became known for his Law of Refraction. Snellius died in 1626 at the age of forty-six. Both he and his wife, who died a year later, were buried in the Pieterskerk in Leiden. In Oudewater we find Snellius honoured in the carillon of St. Michael's church, where the largest of 51 bells, weighing nearly 1,000kg, is named Willebrord.

This short introduction to his life and work serves to show why the name Snellius has been used to name three Dutch Survey ships over a period of 75 years.

The Netherlands Hydrographic Service being badly in need of a new survey ship for its extensive work in the East Indies enjoyed the new construction of such a vessel in 1929. They named her *Willebrord Snellius*. Instead of joining the fleet in the East Indies in survey work, the ship was made available for an oceanographic expedition in the eastern part of the Indies. The Netherlands Hydrographer Captain J. H. L. Luymes, the first initiator of this project, was secretary of the organising committee. The expedition was carried out in the same part of the Archipelago as the previous Dutch Siboga expedition of 1899-1900. Whereas the *Snellius* expedition covered geology and physical oceanography, the main subject of the Siboga expedition had been biology. The *Snellius* expedition covered 34,000 nautical miles, collecting 9,000 seawater and 300 bottom samples. HNIMS

Willebrord Snellius then carried out surveys in different parts of the Archipelago between 1931 and 1939, including Banka, Billiton and the south coast of Borneo, western Celebes and New Guinea. In 1942 the ship was sunk as a barrier in the entrance of Surabaya harbour. When after World War II the Hydrographic Service was set up again, two identical ships were designed for surveys in The Netherlands New Guinea: *Snellius* and

- Luymes. HNIMS *Snellius* served eight years in New Guinea. She also took part in an Anglo-Dutch Oceanographic programme in the

North Atlantic (NAVADO), carried out hydrographic and oceanographic surveys in Surinam, joined the military oceanographic operations (MILOR) in the Baltic, Azores and Northern Atlantic and finally did survey work in North Sea deep-water routes. During her lifetime she covered 440,000 miles. From 1973 to 1976 Snellius served as a depot ship for Dutch submarines operating from Faslane, Scotland. In 1977 she was rescued from the breakerâ€™s yard and at present she is in the care of an organisation called Friends of the Royal Navy, whose volunteers are working hard to return the ship into her original state to be converted as a museum ship.

In December 2003 commissioning occurred of the third *Snellius*, to be followed six months later by her sister ship *Luymes*. These are not only the most advanced platforms for hydrographic data collecting and processing but also an example of the modern way the Navy runs this type of ship. They carry a standard crew numbering eighteen (including five for survey work) but for special missions accommodation for 24 more is available. And deserving of special mention is their colour: grey.

Although there will certainly be other fields within which the name of Snellius is remembered, two examples should be mentioned which have a direct link with mathematics. In 1940 students of the geodetic faculty of Delft Technical University, admiring the work of Snellius and considering him a founder of geodesy, set up their Geodetic Society Snellius. And, finally, at Leiden University in March 2004 the renovated building of the I-Group, accommodating automation, computer sciences and mathematics, was also named Snellius.

Further Reading

Haasbroek N. D. â€™ Gemma Frisius, Tycho Brahe and Snellius, and their triangulations â€™ Delft (1968)

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