
Joan Roget and the catalan telescope - Pelling

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Data de publicació: 02-03-2014

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The idea for a telescope did not come out of the blue: rumours of both refractive and reflective optical devices to achieve distant vision had circulated for hundreds of years, often in dubious magical contexts. For example, Europe had recently been set abuzz by Johannes Cambilhom's sensational pamphlet *Discoverie of the Most Secret and Subtile Practises of the Jesuites* (1608), which described the Society of Jesus' 'bawdy adventures with innocent girls, its vast stores of buried treasure, its arsenals of weaponry', along with a 'looking glasse of astrology', a 'celestiall or rather devilish glasse' supposedly used by the Catholic French king 'to see playnly what-soever his Maiestie desired to know'.

Even so, beneath all the early Renaissance propaganda, mythology and imaginings lurked a strand of genuine creative puzzlement: if you could make magnifying glasses and spectacles, then surely it must be possible to construct optical devices to solve other social needs. Though both convex and concave lenses were widely available as early as 1450, even the cleverest optical experimenters of the day, such as the Neapolitan Giovanni Battista della Porta (1535-1615), were apparently unable to arrange them to form a simple telescope. Probably the biggest hindrance was the confused theory of the time, which believed human vision to happen not in the retina at the back of the eye but somehow right at the front of the eye.

Despite all the false starts and false claims, by 1608 somebody had finally worked out a way of combining lenses in a tube to build the first real telescope. But who was it? Earlier historians thought it was a Dutchman, while more recent historians have suggested various Italians. Yet surprising new evidence presented here points towards someone from the fiercest enemy of Dutch Protestants – Spain.

In the autumn of 1608, the Netherlands had been at war for over four decades. Seven Protestant northern provinces rebelled against a Catholic monarch, Philip II, who lived in Spain. Terms of a truce (which would subsequently hold for twelve years) were slowly being ground out, with the leading French delegate Pierre Jeannin deftly mediating between the two sides' impossible demands. Consequently, The Hague was crammed full of diplomats and observers from all those European countries with a stake in the outcome.

On September 25th, 1608, 'a humble, very religious and God-fearing man' entered this gossip-fuelled political bear-pit: spectacle-maker Hans Lipperhey of Middelburg, a coastal town with a large glassworks, had come to the city to demonstrate his secret new invention to the Dutch leader Prince Maurice of Nassau. The prince in turn showed it to the leaders of the other provinces, and also to the greatly amazed Spanish commander-in-chief Ambrogio Spinola, who remarked: 'From now on I could no longer be safe, for you will see me from afar.'

Rumours of the new device quickly reached others in The Hague; Pierre Jeannin asked Lipperhey to build some for him, but the quiet spectacle-maker had already been instructed to refuse all offers. The story of his invention rapidly appeared in news-sheets, and from there spread across Europe, reaching Spain, France, and Italy by the end of the year. Right from the start it was appreciated that this could be used to view the heavens. As one news-sheet said, 'Even the stars which ordinarily are invisible to our sight and our eyes, because of their smallness and the weakness

of our eyes, can be seen by means of this instrument.'

On October 2nd, 1608, Lipperhey submitted his application for a patent, and four days later received a generous 900-guilder commission to build three pairs of rock-crystal-lens binoculars. However, on October 14th the Committee of Councillors of Zeeland interviewed an unidentified 'young man ... who has demonstrated the same with a similar instrument'. And on October 17th, yet another spectacle maker, Jacob Metius of Alkmaar, was given 100 guilders when he independently put in his own patent application for a telescope.

It might seem that one of these three must have been the actual inventor and the other two merely copiers; but more Dutch spectacle-makers staked their claims of having produced similar devices earlier. In 1634, Johannes Sachariassen somewhat unreliably asserted that around 1590 his father Zacharias Janssen had built, apparently at the age of two, both a telescope and a microscope, though on a different occasion he remarked that his father had copied the design in 1604 after examining a telescope owned by an Italian and marked 'Anno 190' (presumably 1590).

Telescopes copying this basic design soon began to appear all over Holland. With no prospect of ever controlling the spread of the idea, the Dutch authorities reluctantly turned down both Lipperhey's and Metius' patent applications.

Telescopes rapidly diffused through Europe; by April 1609 they could be bought in Paris, and by May they were seen in Milan. In Padua, Galileo Galilei built low-power spyglasses to sell to merchants in the nearby ports. Then, realizing its huge potential for observing celestial objects, he refined its design until he had a precision instrument capable of magnifying as much as thirty times.

This revealed many new features of the skies to Galileo's eyes, such as the phases of Venus just as Copernicus' controversial heliocentric theory had predicted; four-mile-high lunar mountains; and Jupiter's moons. Galileo even observed Neptune more than two hundred years before it was officially discovered, though he did not realise it was a planet. He published his results in a flurry of books, eager to gain credit for his discoveries and insights, even though some of his conclusions, such as the sun's supposed influence over the tides, were quite wrong; and he engaged in furious debates, particularly with a group of Jesuit scientists.

However, for the Church, Psalm 103's statement that '[My God] has founded the Earth upon its own bases: it shall not be moved for ever and ever' was no less unmoveable than the Earth itself. Galileo's repeated arguments for heliocentric theory placed him on a collision course with the Roman authorities. Finally, in 1633 at a trial in Rome, he was ordered to recant his heretical views. Several of his books were placed on the List of Prohibited Books, while he himself was placed under house arrest until his death in 1642. Though Galileo and his supporters believed that his Jesuit opponents had caused his downfall, he had never tried to moderate the combative manner in which he presented his ideas. For example, the way one of his books placed the words of the current pope into the mouth of a simple-minded and confused proponent of earth-centred cosmology may have had more influence over the trial's outcome than any Jesuit.

The arrival of the telescope led people across Europe to look afresh at science and the assumptions behind it. Compound microscopes too were now being constructed – Galileo built one in 1624 – pushing the boundaries of the viewable at the opposite end of the scale. These radical extensions to the senses helped create a whole new kind of empirical science, one where anyone had the power to wonder, observe, think, predict, test – a world where potentially everyone could be a scientist.

Because the telescope had enabled this whole revolution, inventors outside the Netherlands now stepped forward to grab its glory for themselves and their homeland. For Naples, Giovanni Battista della Porta claimed, not completely accurately, to have described the telescope in his 1593 book *De Refractione*. The Florentine Rafael Gualterotti said that he had built his own modest spyglass around 1590. For Spain, a book by the Milanese Girolamo Sirtori related how in 1609 he had met an ageing spectacle maker called Roget in Gerona, the real 'first inventor' of the telescope. Sirtori also asserted that an unknown 'genius' had ordered a set of convex and concave lenses from the Dutchman Hans Lipperhey and that it was the curious way in which this mysterious person held them up to check them that had alerted Lipperhey to the fact that something new was being devised.

Which of all these people had really invented the telescope? Though a matter of great interest and debate at the time, the mass of conflicting claims and counterclaims remained unresolved for centuries, with no consensus even about what had happened in the Netherlands. What was needed was a Dutch-speaking historian to grind patiently through all the state documentation there, to gain a better understanding of what had happened behind the scenes.

In 1906, Cornelis de Waard did precisely this in his book *De Uitvinding der Verrekijzers*. Yet the most intriguing mention

he found was from Germany, in Simon Marius' 1614 book *Mundus Iovialis*. This described an unknown Dutchman at the 1608 Frankfurt Fair claiming to be the inventor of the telescope, offering a working instrument to the German nobleman John Philip Fuchs. Concerned both by its cracked lens and by the high asking price, Fuchs turned him down before approaching his friend Simon Marius to try to build his own. Having surveyed all the evidence he could find, de Waard concluded that, though the telescope emerged in the Netherlands in 1608, it had probably originally been devised in northern Italy around 1590-1600 by Rafael Gualterotti, possibly with some help or inspiration from Della Porta's books.

However, because few people read de Waard's Dutch-language book, accounts of the telescope's early history continued to be incomplete or just plain wrong until 1977, when Albert van Helden translated and extended de Waard's work as *The Invention of the Telescope*. Though this followed de Waard's basic evidential template, van Helden concluded that Della Porta probably, and Gualterotti possibly, had invented the spyglass without even realizing it; the spectacle lenses available at the time were so weak that what had been built was just a plaything, a telescopic toy.

Even so, both de Waard's and van Helden's accounts remain unsatisfying, partly because they have no convincing mechanism linking Italy to Holland, and partly because they fit evidence such as the Dutchman at the Frankfurt Fair only awkwardly.

Recently, in her book *Galileo's Glassworks*, van Helden's colleague Eileen Reeves pointed out that though Della Porta had indeed described, in an extremely elliptical fashion, something broadly similar to a telescope, a careful reading shows that this relied not on two lenses like the Dutch design, but on a combination of a curved mirror and a lens. This would seem to make Della Porta's claim to inventorship untenable. She similarly cast doubt on Gualterotti's claims, for, though he did use both hollow tubes (*cerbottana*) and single lenses to look at the sky, he did not arrange them together in a telescope-like form.

What this means is that, though Italians had had a love-affair with lenses for centuries, there appears to be no link between that whole cultural milieu and the Dutch telescope: no 'smoking gun'. Given the eagerness other Italian inventors displayed when staking their claims, this silence is a bit odd.

Whereas most of the players in this drama were claiming the glory for themselves, it is noticeable that the testimony of only one person – Girolamo Sirtori – instead lauds somebody else, hitherto unknown: a 'withered old man' in Gerona whom he names as the spectacle-maker Roget of Burgundy, along with Roget's Barcelonan nephews.

Did Sirtori invent Roget and his family, or did they actually exist? What we would need here is a Spanish version of Cornelis de Waard: a historian with a particular interest in spectacle-making and Spanish history, and the quiet persistence to search the relevant archives, patiently building up a picture of Roget and his family.

Telescope historians have considered Roget too marginal to pursue: but when the Barcelonan optometrist Dr José María Simón de Guilleuma (1886-1965), an optical instrument collector and amateur historian, read Sirtori's description of this alleged telescope maker, he felt compelled to see what he could uncover in the archives.

In the register of deaths of Rodez Cathedral in Aveyron, Simón de Guilleuma found that Juana Roget of Malaville, wife of Juan Roget, died on August 7th, 1614. As the following death register is missing, he predicted that Juan Roget himself died between 1617 and 1624, and probably after 1618 when Sirtori's book was published.

Furthermore, he discovered that Juan Roget's parents Ramón Roget (who was a cloth carder) and Juana Roget came from Angoulême; and that his brother Pedro Roget worked in Barcelona by the Plaza del Blat, later called Plaza del Angel, at its junction with Calle de la Platería. When Pedro Roget's Catalan wife Catalina Isern died in her hometown of Condal, five children survived her: a girl, also called Catalina, and four boys. Pedro was an unsuccessful student, Miguel joined the Dominican Order, and Juan and Magín both became master spectacle makers like their father and uncle.

In short, the whole family of spectacle-makers Sirtori documented did indeed exist; and at exactly the places and dates he described.

But Simón de Guilleuma didn't stop there. Guessing that Juan Roget must have actually sold some of his telescopes, he broadened his search to include inventories of goods from deaths in Barcelona around this period that mentioned an *ullera*, which originally meant 'eyeglass', but was later used for 'telescope'.

The earliest came on April 10th, 1593, when Don Pedro de Carolona passed down una ullera larga guarnida de lautó ('a long eyeglass/telescope decorated with brass') to his wife Doña María de Cardona y Eril. When she died on December 13th, 1596, the same object was inherited by their son Enrique de Cardona. Simón de Guilleuma was intrigued by the notary's careful description and inferred that, as it would probably have been kept in an arquillita (small lockable casket) with other objects such as letters, it could have been no longer than 20cm.

Furthermore, in the effects of the Catalanian merchant Jaime Galvany, sold at auction on September 5th, 1608, for five sueldos, we find una ollera de larga vista ('an eyeglass/telescope for long sight'). And similarly, in the inventory of Marseille-born merchant Honorato Graner, compiled after his death in Barcelona on August 6th, 1613, there is mentioned una ullera de llauna per mirar de lluny ('a metal eyeglass/telescope for seeing far away').

Tantalizingly, this is the point where Simón de Guilleuma's researches stopped: he was seventy-three years old, and had presumably been following this slenderest of research leads for years, if not decades. He announced his findings in 1959 on the most transient of media, a late-night radio broadcast on Radio Barcelona. It is hardly surprising that few historians of the telescope have heard of him. I only happened to stumble upon an obscure 1959 reference to his paper on the Internet.

Of course, many elements of doubt remain. The 'long eyeglass/telescope decorated with brass' of 1593/1596 might well have instead been a magnifying lens with a long handle, like the relic of the Aragonese Saint José de Calasanz held in the Church of San Pantaleone and San Giuseppe Calasanzio. But on balance, I do think that the 1608 Barcelonan 'eyeglass/telescope for long sight' sounds, just as Simón de Guilleuma wrote, like a Roget telescope.

Four centuries later, there is little chance that historians will now all suddenly agree on a single version of events. Even at the time, I think it was clear that all the Dutch claimants were lying, misleading, misremembering and concealing to various degrees. When you can pick and choose whichever parts of such evidence you want to believe, many parallel narratives become possible.

However, I suspect that if you add Simón de Guilleuma's findings to Sirtori's and Marius' accounts, a brand-new story about the birth of the telescope emerges, one which ties up many of the loose ends left dangling by previous histories.

Girolamo Sirtori's claim that by 1609 Juan Roget's lens-cutting instruments were rusted away and that his telescope-making days were over would be consistent with Don Pedro de Carolona's 1593 eyeglass/telescope's having been one of Roget's. This is what Simón de Guilleuma believed. But the Barcelonan auction of Jaime Galvany's goods in September 1608 intrigues me more. If we accept Simón de Guilleuma's idea that what was for sale there was indeed a Roget telescope, I think we can reconstruct a plausible sequence for the key events.

In 1608, the Frankfurt autumn fair ran from early September until the end of the month, and was generally considered the best opportunity in the European calendar to offer rare goods at a high price. So let us first assume that our enterprising buyer at the auction takes this Roget telescope on a fast ride to Frankfurt, unfortunately cracking one of the lenses in the process.

When the merchant arrives there, he finds it hard to get anyone's attention. He has no way in to the right circles. It is at this point that he runs into a twenty-year-old Dutchman called Zacharias Janssen, a travelling eyeglass salesman. The merchant agrees to let Janssen try to sell it to his high-end contacts at the fair, and that the pair of them will split the profits.

Janssen puts the word out that he has an unusual device for sale, and manages to set up a meeting with the rich nobleman John Philip Fuchs. With his salesman patter in full flow, he claims to be its inventor, and names an extortionate price. But there is something about this young man and his broken lens that doesn't ring true, so Fuchs turns down his offer.

The salesman takes the telescope back to the merchant: though it is intriguing, nobody here wants it for the kind of price the merchant thinks it is worth. The two men part, with the merchant – let us presume this is the Marseille-born Honorato Graner, who was to leave a similar telescope in 1613, and whose accent the inexperienced Janssen could easily mistake for Italian – going back to Barcelona.

The Dutchman, however, has other ideas; he plans to replicate the merchant's telescope for himself, and so rides at speed back to Middelburg. Though he doesn't yet know the precise combination of lenses he will need, he is sure that he will be able to work it out if he orders a range of them from Hans Lipperhey's shop. Yet at the moment when Lipperhey passes the set of lenses across, Janssen cannot resist the temptation to line them up, to find out whether he

is going to be rich – and with that one over-eager act, the cat is out of the bag.

The race, though the young salesman fails to realize it, is now on. Both he and Lipperhey have the same basic secret, but the spectacle-maker is far better placed to build an actual telescope. And so while Janssen is slowly constructing his own device as best he can, Lipperhey sprints ahead, showing a spyglass to Prince Maurice on September 25th, and putting in his patent application a week later. Though Janssen finally demonstrates his own telescope on October 14th, he has missed the boat – the whole history of the 'Dutch telescope' has already begun without him.

If this sequence is correct, it vindicates Sirtori's account in almost every detail, while also explaining various odd features from other sources such as the cracked lens. In fact, Simón de Guilleuma's research makes Sirtori seem less a claimed parent to the telescope than its first investigative journalist.

But even so, one aspect of Sirtori's account doesn't quite ring true: of all the places in Europe that he could have travelled to, the fact that he chose the town where Juan Roget just happened to live was probably no coincidence. My best guess is that Janssen felt cheated by the turn of events, and that some tiny detail he let slip to Sirtori was sufficient to steer the Italian in the right direction.

Perhaps, if modern historians now pick up the threads of evidence around the Roget family in Barcelona, Gerona and Aveyron, a fuller picture will emerge. The history of the telescope may indeed turn out, as Simón de Guilleuma believed, to have started not with a set of curious coincidences in the Netherlands but with a single founding genius in Catalonia. For the last 400 years, might astronomers have really been seeing the skies through Spanish eyes?

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