

The Urge for Realism. Meteorology in Dutch Landscape Painting in the 17th Century *

Franz Ossing

Geologically speaking, the Netherlands make up the western portion of the North German Basin, a structure that stretches from Poland west over the Rhine as far as Belgium. Like all basins, its surface is characterised by lowlands. Sedimentation from the cold and warm sections of the Quaternary Period formed the upper layers of the North German Basin over the last 2.6 million years. Its current formation has been taking place for some 200,000 years; it has experienced an interglacial (the Eemian) and glacial (the Weichselian glacial) period with a frequent switch from an arctic, permafrost climate to warmer conditions. This section of the current landscape of Holland was marked by the glacial expansion of the Scandinavian ice sheet during an ice advance – the Drenthe glaciation – which took place some 140,000 years ago in the second-to-last (Saalian) ice age. The geographical region obtained its current appearance – the subject of the exhibition – in the Holocene, that is over the last 11,700 years, at the end of the last cold phase. To this day, the region of Northwestern Europe makes its mark thanks to the resulting characteristics, which include highmoors, terminal moraines with hills that still reach altitudes of 100 metres to this day, flat landscapes with meandering rivers and streams, forests, soil rich in nutrients, and - as a consequence of development - meadows and fields. The broad scope typical of Dutch landscape painting in the 17th century is also a consequence of these geographical conditions. ¹

The other characteristic of these paintings – considered revolutionary in the history of art, and rightly so – is the natural realism in the works of the Dutch masters. Never before in the history of painting had artists attempted to approximate reality with such attention to detail. Clarification is critical here in order to avoid misunderstanding: This was not about painters depicting the landscape in a linear manner. Their works of art – be they landscapes, still life or genre pictures – are masterful compositions whose individual elements are perfectly coordinated to one another. Each individual element – landscape, clouds, flowers, interiors, buildings – is realistic in and of itself, that is, it represents nature. Nonetheless, they are components of a composed image. A landscape painting is therefore not a realistic reflection of the situation, but rather a composed portrayal of the environment, a "contrived reality". ²

Another astonishing fact: Since the beginning of the 17th century, skies and clouds gained increasing importance in paintings; in the 1650s, these meteorological phenomena occupied up to three quarters of the canvas. Furthermore, Michael North notes that landscape painting accounts for about two thirds of the work of the Dutch masters up to the mid-seventeenth century. ³

Three lines of inquiry result from these observations: Why did this orientation towards the real take place in this Holland of the 17th century? How did the depiction of the landscape come to gain such prevalence? And, finally: Why did meteorological phenomena receive such emphasis in landscape paintings?

Arnheim and Nimwegen

The eastern section of the central Netherlands forms the border to the Westphalian bay. The most important cities in the region, Arnheim and Nimwegen, are located here. These two sites were of central importance to trade and transport as early as the 17th century. For this reason, it is no wonder that both cities feature in many landscape paintings. This presents the opportunity to examine paintings of both locations in light of the above-mentioned questions.

Jan van Goyen (1596–1656) and Salomon van Ruysdael (1600/03–1670) visited Arnheim and

* Expanded and corrected version from: "Der Himmel so weit. Landschaftsdarstellungen der Niederrheinlande / De Hemel zo wijd. Landschappen langs de Rijn van Düsseldorf tot Rhenen", [Exhibition Catalogue](#), Museum Schloss Moyland Foundation, Van der Grinten Collection, Joseph Beuys Archive of the State of North-Rhine Westphalia, Bedburg-Hau 2014, Kerber Verlag, Bielefeld, ISBN 978-3-86678-999-9; 288 pages, bilingual: German/Dutch.; pp.32-43

The numbering of images follows that of the catalogue and thus begins with Fig. No. 4.

Nimwegen multiple times. Both portrayed the cities in a clearly recognizable manner – though with the artistic freedom required by such image composition. ⁴ Along with the topography, meteorological conditions are harmoniously depicted as part of the complete work in their paintings.



Fig. 4: Jan van Goyen, "View of Arnheim", 1646, canvas, 90.9 x 106.5 cm, Gemäldegalerie, Staatl. Museen zu Berlin SMB, Cat. No. 865D, Photo: Jörg P. Anders

Jan van Goyen's image depicts the city of Arnheim from the northwest (cf. Fig. 4). The view extends approximately into the southeasterly direction over the Grote Kerk (St. Eusebius), almost parallel to the branch of the Rhine known here as the Nederrijn. The sails of the windmill are oriented to the east. The sails of the boats on the river also indicate a light wind from the east. The depicted weather conditions could be interpreted as follows: The wind is light and blows from the east. In our latitudes, an easterly wind with low wind speeds goes hand in hand with high-pressure conditions. That stated, the influence of high pressure is not very strong in this case, as the clouds make clear. In areas of pronounced high pressure, subsiding air movements dominate. This tends to lead to dissolving of clouds. In our painting, however, we see distinct cumulus clouds ⁵ (*cumulus mediocris*, *cumulus congestus*), which indicates a certain instability in the atmospheric stratification. Therefore, the painting depicts a weather situation under the influence of a weak ridge of high pressure. The clouds, arranged in horizontal strips out to the horizon, are thus the underside of further cumulus clouds in the distance.

However, this interpretation has its limits: As demonstrated by the lighting of the clouds and the shadows cast by figures and buildings, the sun is shining on the scene from the left – from the east, that is. As a result, it is possible to restrict the time of day to the first half of the morning. In the depicted scenario, the ground would not yet have been heated enough to enable moderate to strong cumulus formation.



Fig. 5: Arnhem, the Netherlands: Google Earth view with the marking of the Grote Kerk (St. Eusebius) and the course of the Lower Rhine; the yellow indicates the approximate location of van Goyen; screenshot (M): F. Ossing

Salomon van Ruysdael located the point of his view of the river somewhat further west-northwest (cf. Fig. 6). As can be deduced from the Grote Kerk and the Basilica of St. Walburg, the view goes along the river in an east-northeasterly direction.



Fig. 6: Salomon van Ruysdael, "River Landscape near Arnhem", 1642, canvas, 117.7 x 167.8 cm, Gemäldegalerie, Staatl. Museen zu Berlin SMB, Cat. No. 957, Photo: Jörg P. Anders

The depicted crossing of troop units ⁶ by ferry takes place without problems in the beautiful weather: The Nederrijn flows quietly, and there are no weather-related high waters. Visibility is also good; the ferryman's trumpet signal must be more a matter of custom than of necessity. Calm summer weather with a light easterly to south-easterly breeze dominates, as demonstrated by the sails and flags of the ships.

The sun appears to shine onto the scene from the direction of the viewer's perspective of the painting – from a westerly direction, that is. This indicates that it is afternoon. The looming white cumulus cloud in the right section of the image thus fits the scene. Afternoon represents the high point in the development of these cumulus (convective) clouds over the course of the day. Below these clouds are grey stratocumulus clouds.

The views of the city of Nimwegen, south of Arnhem, are also masterful designs in terms of their composition. In Jan van Goyen's Berlin painting (Fig. 7), the view runs along the Waal in an easterly direction. As indicated by the sails of the ships and the windmill sails, there is a weak to moderate wind from the northeast. The orientation of the cloud banks also fits the direction of the wind; the clouds indicate a movement to the south-southwest.

Such a weather situation is common to our latitudes after the passage of a warm front and before the approaching, subsequent cold front. In this section of a low-pressure region, called a warm sector, the air mass can be layered sufficiently unstable in order to enable the development of such vertical cumulus clouds as the ones that dominate van Goyen's painting. Mid-level clouds are often in the form of altocumulus clouds; in Germany, these are known colloquially as "sheep clouds." Van Goyen hints at these in the cloud layer above the cumuli.



Fig. 7: Jan van Goyen, "View of Nimwegen", 1649, oak, 67.7 x 97.8 cm, Gemäldegalerie, Staatl. Museen zu Berlin SMB, Cat. No. 865E, Photo: Jörg P. Anders



Fig. 7a: Photo of the weather situation depicted in Fig. 7: cumulus clouds with overlying, mid-altitude altocumulus clouds in the evening (Cu con, ac, maritime polar air; Berlin, 06/06/2001, 20:30 CEST, SE, Photo: F.Ossing)



Fig. 8: Nimwegen, the Netherlands; Google Earth view with markings of the current Valkhof Park and the course of the Waal; the yellow point indicates the approximate location of van Goyen in Fig. 9; screenshot (M): F. Ossing

The comparison with a painting of van Goyen in the LVR-Landesmuseum Bonn reveals a different situation (cf. Fig. 9). The location on the northern shore of the Waal is almost the same as in the Berlin painting and the view is again to the east, although shifted a little more to the south than in the Berlin painting. The depicted weather in this case consists of a warm and humid air mass. The air appears to be still; there are cumulus clouds in the sky that are sufficiently dense to absorb the sunlight as it passes through the clouds, thus making them appear grey. The relatively high humidity in the air enables the clouds to shoot upwards – the heat released during the condensation of the water vapour into cloud droplets provides the energy required for this. Van Goyen's masterful tonal painting serves in this case the realistic depiction of such a weather situation.



Fig. 9: Jan van Goyen: "The Valkhof in Nimwegen", 1638, oil on canvas, 98 x 132 cm, LVR-LandesMuseum Bonn, Inv. No. GK 86

Salomon van Ruysdael's depiction (Fig. 10) of the same scenery – a ferry crossing at the same location – demonstrates an interesting meteorological discrepancy. The sails of the ships clearly indicate a north-easterly wind; the same is true for the sails of the windmill in the right portion of the picture. The clouds in the painting on the other hand imply a movement from south to north in the depicted stratocumulus clouds. It is rather unlikely that the wind on the ground moves in the opposite direction of the upper wind. Van Ruysdael's preferred subjects are quiet summer weather scenes, often in the early morning. In most cases, the image of the clouds is accurate. Here, however, the clouds are depicted realistically, but they do not fit the wind direction.



Fig. 10: Salomon van Ruysdael: "Ferry by Nijmegen" ("Crossing by Nijmegen"), 1647, oil on canvas, 70 x 89 cm, LVR-LandesMuseum Bonn, Inv. No. 38.17

For all the realism in the presentation, it should be kept in mind that the Dutch artists of the Golden Age did not want a direct reproduction of the objects of their paintings. Jan van Goyen and Salomon van Ruysdael did not paint landscape portraits according to nature; they created masterful image compositions. The topography is not depicted as realistic veduta, and the depiction of the sky does not follow pure physical law. What it comes down to for the painters of the Golden Age is a contrived reality that generates in the viewer the sensation of the real. The question remains as to where this change of direction towards the real comes from.

The Urge for Reality

The instructions to the painters set down in the Dutch *Schilderboek* in the 17th century demand – without exception – the realistic portrayal of nature or painted objects in general. What is astonishing about this is not the detailed formulation of, for example, how one must paint the sky, but the demand as such that one must follow nature. This urge for the real arose as a result

of the society of the United Provinces and its historical context.

A distinct society of citizens developed in Holland in the 17th century, a society that had - in contrast to its main competitors Spain, France and England, which were feudal in nature - no ruler, who embodied all state authority. The court and the church played a comparably minor role. This social structure developed an incredible dynamic that enabled the United Provinces to become a superpower quickly. Around 1640, the Dutch navy had 35,000 ships; in 1650 Holland had the largest (and most modern) trading fleet in the world. Its war fleet was double the size of the English and French fleets together. Accordingly, an oligarchy of rich citizens, nobles, merchants, large-scale farmers and ship-owners developed a corresponding self-confidence.⁷ They became the primary customers of the painters. For the first time, a free market for artwork developed, and this influenced the content of the images: "The Dutch painter paints his environment as it is and is paid for this."⁸

The answer to the question why the tastes at the time developed this yearning for reality results from what one would call "zeitgeist" today. The 17th century marked the beginning of the modern sciences. We find ourselves at the interface between religiously dominated science *before* and secularly determined science *after* the 17th century – and this affects more than just the natural sciences. The Christian view of the world at the time set too strict limits for the new secular knowledge. Scientists such as Galileo Galilei, Johannes Kepler, Isaac Newton or Christiaan Huygens created a new view of things with their insights.

This also explains why up to three quarters of the canvas is devoted to the weather. The worsening in the climate that set in at the end of the 16th century has become known as the "Little Ice Age". It seems reasonable to suggest that in a nation that was so dependent on the weather, the objective view of reality was marked by the changing climate.⁹

Of course, there is no linear connection between the natural sciences and the artistic depiction of nature. The inner association between art and sciences lies in the fact that both are areas of creative, human engagements with oneself and with nature.¹⁰ The artists and scientists of the 17th century, too, commonly felt this connection, since they were influenced by their time in the same manner. A newly developing citizen's society like that of Holland in the 17th century – not dominated by clergy or nobility – was able to adopt the new world-view quickly. In this sense, the new, sober view of the world and the artistic reproduction of nature combined in the fictional realities of Dutch picture composition.

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Footnotes:

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² Exhibition Cat. Berlin 2001; Ossing/Brauer 2006; cf. the works at: < <http://bib.gfz-potsdam.de/pub/wegezurkunst/>>.

³ North 2001, p. 100–103, pp. 120–122.

⁴ cf. Collection Cat. Berlin-Dahlem 1975, p. 182: "Van Goyen did not depict the view of the city objectively as veduta."

⁵ The identification of the clouds follows the guidelines of the World Meteorological Organization (WMO 1956, 1987).

⁶ cf. Collection Cat. Berlin-Dahlem 1975, p. 382: "Evidently, the painting depicts the embarkation of soldiers."

⁷ cf. Schulze 1994, here p. 81f., cf. North 2001, p. 55f.

⁸ North 2001, here p. 6.

⁹ North 2001, here p. 41.

¹⁰ cf. here Fischer 2005, passim.