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Avercamp's Skies

Revised and extended contribution to the symposium "IJspret - De winters van Hendrick Avercamp", Rijksmuseum, 14-01-2010

Hendrick Avercamp (Amsterdam 1585-1634 Kampen) was the undoubted master in painting ice scenes. His pictures set the standard for the depiction of life on ice in Dutch landscape painting of the 17th century. *Winter landscape with skaters* (Fig. 1) shown in a monographic exhibition at the Rijksmuseum in Amsterdam and the National Gallery of Art in Washington during the Winter of 2009-2010 is a wonderful example of his skills.[1] Persons from all social strata are involved in all kinds of activities imaginable on ice: skaters zoom along, children throw snow balls, the inevitable colf players aim at their target, peasants look for additional food to fight the then commonplace hunger in winter by using bird traps, water is carried in buckets from a hole sawn or hacked into the ice .... Leisure and every day chores are found closely together and entangled intimately in the essence of a winter in the Netherlands during the Little Ice Age.

Fig. 1: *Hendrick Avercamp: "Winterlandschap met schaatsers (Winter landscape with skaters)", c.1608, oil on panel, 77.3 x 131.9 cm, Rijksmuseum Amsterdam* (click to enlarge)

The Little Ice Age covers a time period from the 16th to the 19th century where temperatures were considerably lower than today's average. Winters were longer and harsher than during

[1]Hendrik Avercamp: "Ijspret", Rijksmuseum Amsterdam 20.11.2009 – 15.02.2010; Washington DC., National Gallery of Art 21.03.2010 – 05.07.2010.

previous centuries, and life was affected strongly by this climate phenomenon. It is, therefore, no wonder that in a country such as the Dutch Republic climate and weather became a theme in society: this nation of seamen, peasants, dyke builders and tradesmen of course experienced the dramatic change to severe and long winter periods, even when the Little Ice Age was not a permafrost era and warm summers also took place.

In fact, there is no direct linear correlation between this climatic change and the depiction of weather and climate in the paintings of these centuries (North 2001; Gemäldegalerie Berlin 2001). But on the other hand, since Pieter Breughel in the mid Sixteenth Century, there is no doubt that these paintings are connected to the change in climate.

Hendrick Avercamp of course was familiar with the paintings and prints by Breughel and his Flemish followers in Amsterdam: Gillis van Coninxloo, Hans Bol and David Vinckboons. But Avercamp went further. He has to be regarded as the painter who turned the scenes on ice into a genre of its own. Belonging to the first generation of Dutch landscape painters, Avercamp was also one of the pioneers in depicting the skies over his country.

In his early paintings, which were very much influenced by the Flemish landscape tradition, he tended to screen the horizon with a castle or other buildings. However, around 1609 he started to allow the distant view to play an unconcealed role. Also the horizon was lowered and the wide expanse of ice appears to stretch to infinity. This, in turn, gave the atmosphere a larger impact in the paintings. Avercamp paid close attention to the atmosphere and the mood the cold evoked. Most of Avercamp's ice scenes glow with the pale sunlight of a freezing winter's day. It never snows in his paintings, and the fallen snow with the sun on it is white. In the shadows the colours fade from yellow to ochre tints. Since he usually painted the ice free of snow we see smooth and gleaming surfaces that reflect the colours of the immediate vicinity.

Thus, Avercamp proves himself to be as much an astute observer of nature and people as his followers in Dutch landscape paintings were. Consequently, the skies of this master can be attributed to distinct weather situations that are typical for this part of Europe.

The weather of Avercamp

Avercamp's ice scenes often depict extended areas of ice with some haze. With few exceptions, situations of calm weather with more or less uniform skies prevail. Dutch flags can frequently be seen but they usually are not flying in a strong breeze. These uniform skies, however, make it possible to determine the weather situation with a stable atmosphere and low wind speeds. We can assume that Avercamp experienced the deteriorating climate of the so-called Little Ice Age (LIA). In winter, a sharp blowing wind would indeed prevent people from enjoying an afternoon skating or playing colf. With air humidity being high over such vast areas of ice or cold water, the windchill would surely create an uncomfortable environment for outdoor activities and compel people to stay indoors. It is, thus, not surprising that Avercamp depicted weather in a calm or at least with low winds which is favourable for outdoor activities, be it work or fun.

Weather conditions with slow windspeeds occur in the northern mid-latitudes typically near the centre of an area of high air pressure. Depending on the origin of the air mass, often haze or fog is present, in particular over stretches of open water or ice where the humidity of the air is sufficiently high. Frequently in winterly highs, a temperature inversion is found aloft, i.e. the temperature in the upper layer increases instead of decreasing. Provided that humidity is high enough this frequently creates a layer of fog above, a so-called *stratus* cloud.[2] This cloud and a hazy layer below may persist for days and weeks if it is not literally mixed up by wind-induced air turbulence.

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[2] All cloud designations, their sub-types and accompanying phenomena are according to the "International Cloud Atlas," Vol. II, World Meteorological Organization WMO (Geneva, 1987) and are set in *cursive type* here

In his painting *Ice skating in a village* (Fig.2) Avercamp shows us such a cold and humid high pressure area in winter.We see a large expanse of ice that stretches from the fore-ground into the painting's background thus creating a sense of depth. People of a village skate and play colf but also pursue a working day's activities. In the upper centre left we see a Dutch flag flapping slowly from the mast of a small boat indicating low wind speed. The air is hazy due to the humidity over this stretch of ice. This also contributes to the imagination of depth in the painting. The windmill at the centre-right of the painting seems to have its wing tips protruding into the low laying stratus cloud above.

Fig. 2: *Hendrick Avercamp: "Schaatsenrijden in een dorp (Ice skating in a village)", c.1610, oil on panel, 35.7 x 70.4 cm, Mauritshuis Den Haag, Inv.Nr. 785, on long-term loan from the Rijksmuseum Amsterdam, Inv.Nr. SK-A-1320,* (click to enlarge)

The photo in Fig. 3 which was taken in a winterly continental polar air mass shows a comparable weather situation.

Fig.3: *Fog aloft (stratus) and haze in the ground layer. This sky matches the atmosphere in Avercamp's painting in Fig. 1 (*click to enlarge, *Photo: F. Ossing)*

Waterfowl under High Cirrus Clouds

In mid-latitudes weather is characterized by a consecution of high pressure zones and low pressure systems. The latter typically follow a scheme in which first warm air is advected which then is replaced by colder air. When warm air approaches we first see high flying single *cirrus* clouds ("feather clouds") which then develop into a thin layer, i.e. a veil of high stratiform clouds (*cirrostratus*). Air pressure drops continuously. The clouds subsequently thicken into a grey mid-level layer (*altostratus*) and a following precipitation area with thick layer clouds (*nimbostratus*) that gives continuous rain. This rainfall indicates the passage of the warm front, i.e. the border between the colder air in front and the warmer air approaching. The air pressure stops falling at this point, and the following sector of warm air usually shows fair weather with typically some "sheep clouds" (*altocumuli*). Subsequently, colder air comes in pushing the lighter warm air upwards causing precipitation in showers. Pressure begins to rise after the passage of this cold front. The colder air mass shows heap clouds (*cumuli*) or even thunderstorms (*cumulonimbi*) in the vicinity of the cold front.

The approach of a warm air mass is characterized by low wind speeds or even calms. Water fowl favour this type of weather for flying in their well-known V-formation as this stable air with its low wind speeds does not possess any significant atmospheric turbulence.

In his paintings and drawings, Hendrick Avercamp frequently shows the calm atmospheric conditions of an approaching warm front. In the drawing *Ice scene with a hunter showing an otter* (Fig. 4) we can identify the high cirrostratus layer and the following altostratus. The scenario here is at sunset. Following the laws of atmospheric optics, the higher cirrostratus is still white to a pale violet as it is still fully illuminated by the low sun while the altostratus one level lower is already tinted red because it receives less light of shorter wavelengths (i.e. blue) and a proportionally larger part of light with longer wavelenghts (i.e. red).

Fig. 4: *Hendrick Avercamp: "Ijsgezicht mit jager die een otter toont (Ice scene with a hunter showing an otter)", pen, black and grey ink, brush and watercolour, over a sketch in graphite or black chalk, 20.1 x 33.5 cm, Rijksmuseum Amsterdam* (click to enlarge)

The red, white and blue Dutch flag on the house at the left margin in the drawing is just hanging – there is virtually no wind. The calm and stable atmosphere is also indicated by a large V-formation of water birds that can be seen over the hat of the colf player that is prominently placed in the right foreground.

Fig. 5 shows this actual type of weather. The photo was taken shortly after the sun went down so the upper cirrostratus clouds are still in sunlight while the altostratus and altocumulus clouds appear already dark. There was no wind at all.

Fig. 5: *This sky with a layer of cirrostratus aloft, some altostratus/altocumuli below, indicates a stable warm air mass. (Cs fib, Ac tr pe, 20. 04. 1974, Berlin, NW, 18:25 CET, photo: F. Ossing;* click to enlarge*)*

A Rare Avercamp Sky

As already mentioned, Hendrick Avercamp almost invariably painted or drew calm and stable weather conditions with stratiform clouds. But like most of his contemporary or subsequent Dutch masters, he must have had a keen view of the constantly changing atmospheric circumstances. His painting *Enjoying the Ice* (Fig. 6) which was done c.1610-20 shows a layer cloud with cumuliform heaps which meteorologically can be identified as a *stratocumulus* near sunset. This is not a typical Avercamp cloud.

Light passing through the atmosphere is scattered, reflected, or absorbed. When the sun is low its radiation has to travel a longer distance through the atmosphere which leads to the extinction of the rays. This extinction depends upon the wavelength of the radiation: waves with shorter lengths are absorbed more strongly. Much of the short waves, the violet, blue, and green light are scattered and that only the longer waves reach an observer on the ground. Thus, the light becomes more reddish, as is painted correctly by Avercamp in nearly all of his paintings and drawings.

Fig. 6: *Hendrick Avercamp: "Ijsvermak (Enjoying the Ice)", c. 1610-20, oil on panel, 25.4 x 37.5 cm; Rijksmuseum Amsterdam (click to enlarge)*

Here, however, we do not see Avercamp's more or less uniformly stratified clouds. There is a layer from which flat cumuliform protuberances evolve. *Stratocumulus* is the most frequent of all cloud types which appears under the most different meteorological conditions. The cloud depicted here often forms in almost neutral atmospheric conditions where there is not sufficient heat energy to form cumuli. However, when condensation takes place to form cloud droplets this also sets free small amounts of perceptible heat which lead to the heap-like (or convective) form on the upper side of the cloud – the typical appearance of a stratocumulus cloud (Fig. 7).

Fig. 7: *Stratocumulus sky in winter, sub-polar air mass xP (Sc str pe, St fra, 29.12.2000, Coesfeld-Goxel, 12:00 CET, N, photo: F.Ossing,* click to enlarge)

How High the Sky

In Dutch landscape painting from the 1600s to the 1650s the horizon becomes lower and lower so that finally up to three quarters of the canvas is covered by the sky and the clouds. Avercamp is no exception: his early paintings show a high horizon and a small sky with layered clouds while the later compositions invert this relation completely.

There seem to be many reasons for this phenomenon. One reason, as mentioned above, is the fact that one of the origins of Dutch painting was the Flemish tradition of landscapes with a high horizon. Avercamp was one of the first generation of Dutch painters that intensively went out into nature and made sketches in preparation of paintings, prints and drawings. With the low horizon over the Dutch countryside it is logical that this apparently "realistic" view seeped into the painting. The other reason is very simple: a vertically towering cumulus sky like the ones painted by Jacob van Ruisdael and Jan van Goyen needs its place on the canvas.

But there remains the question why these paintings were in such demand. We have to remember that in the Dutch Republic for the first time in history we see a flourishing free market for paintings. It were the rich tradesmen, the prosperous peasants, the entrepeneurs on ships and soil that coined the demands for paintings (Gemäldegalerie Berlin 2001, North 2001) thus forming a kind of mass taste. Obviously, patriotic pride was one of the reasons for the development of Dutch landscape painting as is indicated by the Dutch flags flying virtually on every painting in the early years. This patriotism became more subtle and less evident in the course of time. But why then would the skies become so important in the landscapes so that one should rather speak of skyscapes? It seems suggestive that this is related to the dramatic change of climate that this nation with its weather-related activities experienced (Ossing 2001). Everyday's life was affected in every way by the Little Ice Age and this is mirrored by the paintings even though they cannot serve as climate proxy data.

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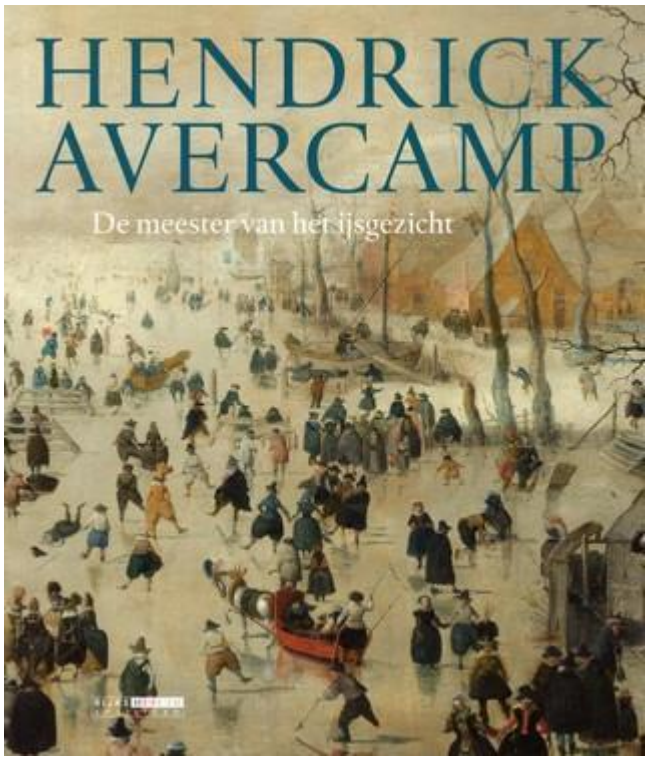

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