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### On the perspective in and dating of Munch's *Screaming Clouds* – comments on the article by Fikke *et al.*, 2017

Fikke *et al.* (2017) convincingly show that the clouds in the background of Edvard Munch's famous paintings *Despair* (1892–1894) and *The Scream* (1893–1910) may well be the rare 'mother-of-pearl clouds' which can appear in winter at high latitudes approximately 30–60min both before sunrise and after sunset. We would like to add here a few comments on the direction of view and the dating of the celestial observation which inspired Munch.

The composition, which depicts people on a street in the foreground with the Oslo fjord and some buildings behind them, exhibits a very similar perspective across all paintings in the so-called *Scream* series, namely *Despair*, *The Scream*, and *Anxiety* (1892–1910). A text by Munch next to a drawing shows that the placement of the sky background above the city centre of Oslo is neither arbitrary nor fabricated: *I was walking along / the road with two / friends – when the sun / went down / The Sky suddenly / turned blood-red / I paused, leaned / against the fence tired / to death – above the / blue-black fjord and city / blood in flaming tongues hovered...* (citing the English translation by Francesca M. Nichols of Munch's handwritten Norwegian text on MM T 2367, a drawing with literary sketch, obtained from the Munch Museum, shown in Figure 1; similar translations in Olson *et al.*, 2004; Fikke *et al.*, 2017); the dating of this quotation to 'Nice, 22 January 1892' by Heller (1972) was doubted by Tøjner and Gundersen (2013); the drawing shows the above situation, like in *Despair* but in grey, plus red cloud layers very similar to those in *Anxiety*.

Fikke *et al.* (2017) could not fix the year of Munch's observation: in the three winters before the *Scream* series, 1889/90, 1890/1891, and 1891/1892, Munch was in France; mother-of-pearl clouds were logged at Christiania observatory in several winters from February 1871 to January 1892 – Fikke *et al.* (2017): *it may well be that Munch had seen such clouds at some other winter occasion before 1889.*



Figure 1. Drawing with literary sketch MM T 2367, obtained from the Munch Museum with Munch's handwritten Norwegian text. (© Munch Museum, included here with their permission.) The red cloud layers are very similar to those in *Anxiety*. The English translation is included in the main text of this article.

We will first discuss whether the direction of view on Munch's works is consistent with mother-of-pearl clouds shortly after a winter sunset, namely towards the southwest – this is not considered in Fikke *et al.* (2017). Bohm-Duchen (2001) argued that the scene painted by Munch is seen from the Valhallveien street in the Ekeberg Hill quarter of Oslo (a plaque is placed there to indicate that this location offers the view from *The Scream*). The direction towards the background (the fjord with Oslo centre) is due west to northwest. This azimuthal range for sunset at Oslo would yield a date in spring or autumn. The two reports on mother-of-pearl clouds by the Christiania (Oslo) observatory, where Fikke *et al.* (2017) cite the direction, both give southwest, for January 1887 and 1890 (i.e. sunset direction). However, Fikke *et al.* (2017) mention a range from south-southwest to west-northwest for the 22 December 2014 sighting after sunset in Norway, and Störmer (1932) wrote, for January 1890: *The sky towards W which was now covered with these mother-of-pearl clouds.* Obviously, the azimuthal range of mother-of-pearl clouds can be wider, and Munch's painting implies that the specific clouds would extend into the southwestern section; then, the situation is also consistent with a winter phenomenon, which is more likely.

Olson *et al.* (2004) present more quotes from Munch (brackets added by us): *the first Scream [the paintings Despair from 1892–94] ... Kiss [1897] ... Melancholy [1891–96] ... For these a number of rough sketches*

*had already – in 1885–89 – been done in that I had written texts for them – more correctly said, these are illustrations of some memoirs from 1884.* Olson *et al.* show a drawing from the Munch Museum (MM T 126-10) and note that the view presented there is not from the Valhallveien street, but from the nearby Mosseveien street towards the Hovedø peninsula, which is due southwest. However, the background in that drawing does not show any structures in the sky, so it may be doubtful whether this sketch is the initial study of the first version of *Despair*, which Munch called 'The first Scream' (MM T 126-10 is probably from 1889 to about 1892, M. Bruteig, pers. comm.). Olson *et al.* (2004) then argue that Munch would have painted in *The Scream* a deeply red sunset caused by atmospheric dust loading after the Krakatao volcanic eruption of 11 August 1883. However, as also pointed out by Fikke *et al.* (2017), Munch's text about the *Scream* series shows that he has drawn a rare sighting, for him a unique experience, not a gradually increasing phenomenon visible for weeks; Munch saw it only after sunset, while red clouds (plus a red sun) due to volcanic dust would also be seen before and during sunset; the wavelike forms of the clouds and the pastel colors in the *Scream* series are typical of mother-of-pearl clouds. Could the formation of mother-of-pearl clouds in 1884 have been facilitated by condensation on volcanic dust in the stratosphere from the 1883 Krakatao explosion?

Either way, the above quotations from Munch show that he was impressed by an extraordinary celestial phenomenon in 1884. This does not mean that it was a sunset reddened by volcanic dust, but it could well be mother-of-pearl clouds. Fikke *et al.* (2017) give examples for that year: *the first observation of such clouds outside Norway was made by the astronomer C. Piazzzi Smyth on 11 December 1884 and Störmer has already seen such clouds ... in 1884 at the age of 10 (Störmer, 1932) – while we did not find such a statement in Störmer (1932), we found in Störmer (1948): mother-of-pearl clouds ... have also been seen in Great Britain in 1884, 1885, and later ... I remember when I was a boy about 10 years old I saw these phenomena in my native town of Skien, in Norway, during a strong föhn wind, in the year 1884; Skien is just 136km southwest of Oslo; given that Carl Störmer was born on 3 September 1874, his first observation was probably at the end of 1884, a year after the 'volcanic winter'.*

Our questions are as follows: is Störmer's observing date in 1884 more precisely known (maybe also 11 December)? Are there

records from the Christiania (Oslo) observatory for the end of 1884, the year indicated also by Munch? And: what is the typical to maximal azimuthal range of mother-of-pearl clouds? Are more of Munch's detailed textual descriptions (Munch: *I had written texts for them*) known for the *Scream* series and/or his observations? While Munch mentioned *a number of rough sketches ... in 1885–89* in relation to the *Scream* series, no other studies prior to this series are known – in addition to MM T 2367 and maybe MM T 126-10 (M. Bruteig, pers. comm.).

The feature of mother-of-pearl clouds induced different feelings for Störmer (*very beautiful and marvelous appearances*) and Munch (*I stayed / behind quaking / with Angst – / and I felt as though a / vast endless / scream passed through nature*, again from Munch Museum MM T 2367). The artist used the key experience of this real observation in different works as a background – expressing a

certain mood which obviously was evoked by this transcendent *scream through nature*; in the *Melancholy* series (1891–1896, also based on 1884 memoirs as mentioned by Munch) and at least one variant of his Nietzsche portraits (1906), we may also see mother-of-pearl clouds.

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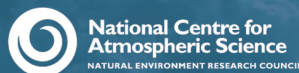
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