

A brief outline of the historical chronology of the use in painting of the pigment "Titanium White"

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1. The discovery of "Titanium White".

Titanium white is produced from the minerals anatase and rutile and the pigment that provides the color, titanium dioxide, was first discovered in **1821**, although modern technology, required for mass production, was not available until to 1916.

It is erroneously claimed that titanium white was invented by Dr. Auguste J. Rossi.

In fact, Rossi moved to America where he became a chemical consultant for the Titanium Alloy Manufacturing Company: it's correct to say that many patents are due to him, including those on Titanium, Titanium Oxide and Titanium White. The first patents date back to **1898**, and the **official date of the legal deposit of the patent for the Titanium White color for mass production dates back to 1913**.

It is therefore necessary to distinguish the realization of the Titanium White pigment from its subsequent patenting for industrial production which took place starting from 1916 when both the Titanium Pigment Corporation of Niagara Falls, New York, and the Titan Company AS in Norway began the mass production of the pigment.

It is therefore scientifically proven that the use of Titanium White in paintings is prior the implementation of the patents.

In fact, there is evidence of the **use of Titanium White in the production of ceramic and porcelain objects already in the centuries before the patenting**.

An off-white titanium pigment has been used in the porcelain industry since the 1790s, as described in the book *The Sevres Porcelain Manufactory: Alexandre Brongniart and the Triumph of Art and Industry, 1800-1847*; it was also in use in the royal factories of St. Petersburg, Berlin and Meissen at the same time.

The whiteness of titanium increased during the nineteenth century and **the implementation of patent formulas led to the mass industrial production of Titanium White** for artists, but

previously an industrial grade was produced in large quantities for use in the production of sinks, washbasins, porcelain tiles etc. and artists could also have used it if they wanted to, as in fact the Impressionists did because they were more inclined to experimentation.

In fact, **it's historically proven the use of Titanium White by artists already from the 1800s** as demonstrated:

- by the **discovery of the pigment on Camille Pissarro's easel of the 1890s** mixed with other whites, in particular lead white and zinc white;
- by the works of **Cézanne** (died 1906) who used such a compound white;
- by the **presence of the pigment in the painting "Oriental Cafe on the Riva degli Schiavoni" of 1882 by John Singer Sargent.**

In conclusion, **the wrong consideration that Titanium White is present only in paintings made starting from the 1920s derives from the "confusion" and "misunderstanding" that this dating concerns only the mass production of the manufacturing industry**, while as demonstrated by the study of the art historian Patricia Railing, specialized in the Russian avant-garde, **Titanium White was already present in artistic productions of various kinds from before the realization of the patents.**

2. The presence of Titanium White in paintings: historical and science facts.

Below is a summary of the historical "facts" concerning the realization and use of Titanium White as a pigment in the period **from 1795 to 1920**. The chronological study was carried out by the art historian Patricia Railing and the information are available online:

- <https://painterspalettes.net/titanium-white/>
- <https://patriciarailingwrites.net>

1795: Titanium was discovered by Klaproth in 1795 and isolated by Liebig in 1831 who obtained it from rutile. Its TiO_2 dioxide, which is found as a mineral (rutile), is a white solid that turns yellow on heating. With the name of "Titanium White" it is used in painting and for the production of enamels.

1887: Hippolye Boulenger et Cie., Faïencerie, in Choisy-le-Roi, is commissioned to produce two-thirds of the white ceramic tiles that would be installed on the walls of the Paris metro by 1902. It is said that their whiteness is due to the tiles having been made with Titanium White.

1890: *Titanium whites used by early artists* - Composite Titanium White was found on the outdoor easel of Camille Pissarro. This composite white consists of a small amount of Titanium White mixed with barytes and china clay (kaolin), the very components of porcelain paste or glaze. It was discovered in the analyzes carried out by Laurette Thomas of ArtAnalysis, Paris, 2005, and is the first document of this pigment on a painter's easel. Pissarro, who was a friend of many Impressionist painters, died in 1903 so the pigment could date back from the 1890s. That a ceramic pigment had passed to the easel of a French Impressionist painter makes up part of the history of pigments since antiquity, the migrating of pigments from one art to another was anything but unusual. And the fact that so many of the new 19th century metallic pigments had originated in the ceramics industry – the chromes among the most outstanding – makes it surprising that so little of the history of Titanium White ceramic pigments has been published. All this was before a new industry sprang up around 1910: the industrial manufacturing of titanium oxide white.

1900: Louis Franchet displays 250 ceramic pieces at the Universal Exhibition in Paris, many of which were decorated with coloured titanium glazes.

1910: Experiments for the industrial production of Titanium White began in Norway with the Titan Co, and in Niagara Falls, New York, with Titan Pigment Corporation.

1915:

- in a painting by Liubov Popova, *Tray, Bowl, Fruit*, 1915, is identified a **composite white (Zinc white, white Lead, Titanium White)**. The composite white pigment was used for the ground and for the individual elements visible to the eye. Not containing ceramic ingredients such as china clay, this composite white was prepared with artists' pigments – zinc white and white lead – to which a small amount of Titanium White was added. This development of a new painter's pigment is another phenomenon which has been little researched.

- **The French government had been promoting the discovery of a white pigment since the late 18th century which would take the place of white lead**, a pigment that was toxic to workers in the production process, and to artists in the dust from powders. Zinc white had become popular in the 19th century but it did not have the whiteness or density of the lead pigment, so to mix these two pigments and add a small amount of Titanium White both brightened the mixed pigment and gave it opacity. It is hard to say when various mixed white pigments first appeared on the painter's palette, but it could certainly have been amongst the French Impressionists, a few examples of which are known from the 1890s.

1919: Despite their satisfaction, both the Norwegian and the Niagara Falls chemists were dismayed that their pigments were only “relatively pure” or “substantially white”, and it was not until 1919 that they had achieved their goal of a true white pigment. In Norway it was manufactured in their large plant which had been built between 1916 and 1917. Titanium White was now a thoroughly industrialised product produced on a large scale – some eight tons a week by 1922.

1920: Norwegian Titanium White, called KRONOS, appears on the market in France and elsewhere.

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