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Course

Date

The Effect of Technological and Scientific Advances on Nineteenth–Century French Painting

(Extract, MLA Style, American English)

The marriage of art and science is epitomized in the exhibitions of the nineteenth century. The first one, the Great Exhibition of 1951, was essentially a celebration of British scientific and colonial achievements. The French followed suit and, between 1855 and 1900, there were five *Expositions Universelles* in Paris. These exhibitions aimed to show the best of French achievements in science, industry and the fine arts although, ironically, some of the most famous works – by Pissarro, Cézanne, Manet, Monet and Courbet – were rejected by the selection committee for the 1867 *Exposition* (Tholozany, n.d.). The most important scientific and technological developments that affected French painting in the nineteenth century were those of the invention of the squeezable metal tube in 1841, premixed and synthetic paints, and photography.

In 1839, the first photograph (the daguerreotype, named after its inventor Paul Daguerre) became known to the public at large. The initial reaction of artists was that photography posed a threat to the artist. Paul Delaroche may or may not have said, “From today painting is dead,” but it is easy to understand why artists would have felt threatened. For example, artists were often commissioned by the wealthy to paint portraits. Why hire an artist for a portrait when a photograph represents the sitter so much better?

But, on the other hand, the photograph freed the painter from the task of recreating as well as possible what could be seen. Impressionism and neo-impressionism, for example, may be thought of as forms of artistic expression which are not limited by the objectivity of the

camera. So, in a sense, photography gave the artist new freedom. This freedom of expression leads later to surrealism and cubism and the various other “isms” that abounded in the twentieth century.

In any case, the photograph was fundamentally flawed. Color photography would only become a threat at the close of the nineteenth century when, in 1891, Lippmann announced his success at fixing colors on a photographic plate, by which time the public had grown used to seeing art as free expression unbounded by the exact nature of the object portrayed.

Early color photography took time finding its feet. One of the most prominent physicists of the nineteenth century, James Clerk Maxwell (1857), showed that, by rapidly rotating discs painted with different colors, the individual colors would be imperceptible to the naked eye. This article would have been studied by the prominent artists of the time and had a significant effect on Seurat. The first color photograph of a tartan ribbon, which was made in accordance with Maxwell’s theory using triple projection, was taken by Thomas Sutton in 1861 (fig. 1). This rarity is not likely to have posed much of a threat to the artists of



Fig. 1. Sutton, Thomas. *Tartan Ribbon*. 1861, National Media Museum in Bradford. “James Clerk Maxwell Foundation.”

[www.clerkmaxwellfoundation.org/html/first\\_colour\\_photographic\\_image.html](http://www.clerkmaxwellfoundation.org/html/first_colour_photographic_image.html).

the time.

Another physicist, who influenced Seurat and others, was Hermann von Helmholtz. Helmholtz invented the ophthalmoscope in 1851, which permitted the doctor to examine the interior of the eye and, along with Thomas Young, he developed the three-color theory according to which the retina contains three different receptors for color. Seurat was experimenting with optics: trying to see how the eye blends colors to make new ones thereby removing the painter's need to physically create those colors on canvas. The technique was also a means by which the artist could flaunt his mastery, not in the dramatic way that the Romantics, like Delacroix, might pack a heroic scene with color, but by forcing the observer to recognize the detail of the work and reflect on the process that was needed to create it. The principle depended on the artist not mixing the colors on the palette but using his "scientific" knowledge of color to create the mixture in the eye of the observer. *The Circus*, for example, is composed of only five colors: red, brown, yellow, blue, and white (fig. 2).

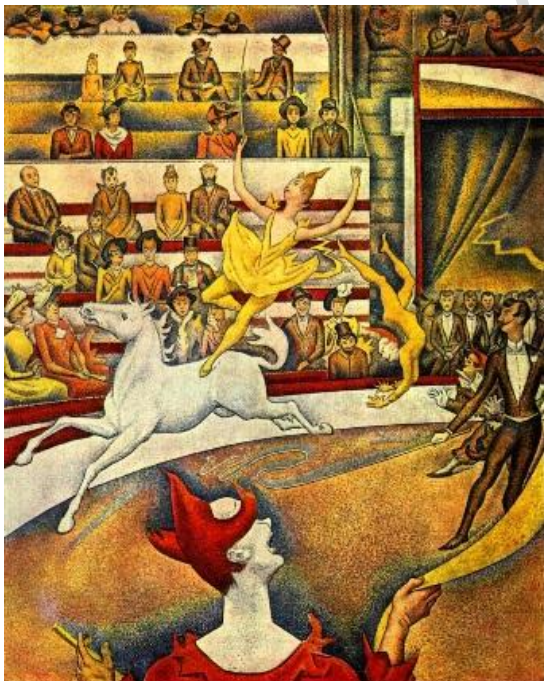


Fig. 2. Seurat, Georges. *The Circus*. 1891, Musée d'Orsay. "The Circus." *Artble*, 2022.

[www.artble.com/artists/georges\\_seurat/paintings/the\\_circus](http://www.artble.com/artists/georges_seurat/paintings/the_circus)

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Works Cited

- Maxwell, J. C. (1857). Experiments on Colour, as perceived by the Eye, with Remarks on Colour-Blindness. *Earth and Environmental Science Transactions of The Royal Society of Edinburgh*, 21(2), 275–298. <https://doi.org/10.1017/S0080456800032117>
- Tholozany, P. de. (n.d.). *Paris: Capital of the 19th Century* [Brown University Library for Digital Scholarship]. Retrieved April 15, 2017, from <http://library.brown.edu/cds/paris/worldfairs.html#de1855>

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