



NPL Research
'ANILINE VIOLET' AND SYNTHETIC INKS
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Canada Scott 245, the \$1 *Chateau de Ramezay, Montreal* stamp of the 1938 Pictorial Issue¹ is color-listed *dull violet*. A color variety of that stamp, 245i, is listed as *aniline violet*.² Not being familiar with the latter “color,” I wondered about its attributes and how it came to be used in printing this stamp. I decided to explore this and, in the process, discovered an interesting, but largely unwritten, part of the history of stamp production.



Scott 245



245i Aniline Variety

SYNTHETIC ORGANIC INKS

Prior to the Industrial Revolution, most pigments and dyes³ were of natural origin, made from minerals or biological matter. The range of available colors, however, was technologically limited, production control was inconsistent, and processing was expensive. Certain colors, because of their cost and complexity, came to be associated with wealth.

Because of the expense of certain natural-based colors, efforts were devoted to finding equivalent but less-costly substitutes. Advances in organic chemistry greatly expanded the range of affordable colors. The first synthetic organic dye was discovered in 1856 by William Perkin who, while trying to synthesize quinine, found an intense purple-colored solution as a by-product which subsequently proved to be an effective dye for textiles. The dye was first called *aniline purple*; chemists later called it *mauveine*.

¹ The Chateau de Ramezay was built in 1703 by the French Governor of Montreal, Claude de Ramezay. It became the official residence of the British Governor when Canada was ceded to the British in 1763. It is now a museum.

² The Scott standard catalog does not list the color variety; it is, however, listed in the *Unitrade Specialized Catalogue*.

³ Technically, a pigment is insoluble in its vehicle; a dye is either a liquid or is soluble in its vehicle.

Anilines, as a class, comprise the reds and those colors that contain red [purples, browns and oranges]. The early aniline dyes were highly popular and eagerly sought after because they were inexpensive and produced fast-drying, bright colors.^{4,5} Anilines had wide uses, including the making of printing inks.⁶ However, those anilines were notoriously soluble as well as prone to atmospheric reaction, and lacked color fastness. Fading and uneven color consistencies [streaks] were constant problems. Aniline inks deeply penetrate the paper fibers, unlike ordinary ink which clings to the surface, and the color will show on the back of the stamp in varying degrees. A case in point: During World War I, the Bureau of Engraving and Printing was unable to acquire the finer, high-quality synthetic inks then produced in Germany. Consequently, the Bureau had to substitute inferior-quality aniline inks to print some of the Washington-Franklin series, namely the 2-, 3-, and 12-cent, single-line watermark, gauge 10 perforations [U.S. Scott 425, 426, and 434a]. Because of the suffusion of ink through the stamp paper, these stamps are called “pink backs.”⁷



Subsequent advances in color science greatly improved the stability of synthetic organic pigments and dyes. Improved attributes included: color fastness, tinting strength, limited fugitive dispersion and reduced reaction to other chemicals. These improvements led to higher production costs, but the overall cost and production complexity was still substantially less than producing the equivalent color from natural sources.

CANADIAN BANK NOTE COMPANY, LTD

A review of the philatelic literature disclosed that a number of post-1900 Canadian stamps could have been printed with aniline ink.⁸ Yet, the only stamp currently catalog-listed as such is 245i. Obviously, based on the catalog identification, people were aware of this ink variety. Did this knowledge derive from official notification by the Canadian Post Office Department or the stamp’s printer? Or, did this knowledge originate by way of collectors observing unambiguous shade differences? If the latter was the source, was it officially confirmed by the former? And, who determined it was an aniline ink? Was that based on the

⁴ Upon the death of Prince Albert, Queen Victoria adopted a clothing color scheme emphasizing dark purple.

⁵ It appears that a significant part of the limited-issue 1903 Roosevelt Small Die Proof sets was printed with aniline inks, most likely because of the brighter colors they produced.

⁶ Philatelically speaking, aniline is not a color “shade,” it is an ink variety.

⁷ Interestingly, the 1899 USPOD stamp printing contract with the American Bank Note Company explicitly prohibited the use of aniline inks.

⁸ These are: 2-cent King Edward VII; 2-cent red Admiral [sheet, coil, and War Tax stamps]; \$1 Chateau de Ramezay; and the 4-cent Queen Elizabeth II-Karsh Portrait. Various references.

color showing on the back of the stamp? However acquired, this knowledge was not widely disseminated for the historical record.⁹

Canada's 1938 Pictorial Issue was printed by the Canadian Banknote Company. A total of 2,210,000 \$1 *Chateau de Ramezay, Montreal* stamps were intaglio-printed from a single plate number. I have not found a source specifying the number of *aniline violet* stamps printed from within this total or whether the ink variety was printed before, after or concurrently with the primary color.

In a letter to CBNC, I inquired whether printing records of the *Chateau de Ramezay, Montreal* stamp existed in their files. I was hoping that such records might: [1] confirm the supplemental use of aniline ink, [2] specify the timing of its use, and [3] suggest reasons for its use for this stamp. In reply, CBNC concluded that there was very little in the archival record. "Our only record in existence is [a] ... copy of our index cards of our die proofs and our Ink Room does not have any record of the formula used at that time."

Nonetheless, a CBNC chemist wrote it was likely that the primary *dull violet* color was ink formulated from *PV 19*, a standard color indexing referring to "quinacridone pigment violet number 19." Quinacridones, which range from deep red to violet in color, are a family of high performance synthetic organic pigments with exceptional color brightness, and great tinting strength and color fastness. The chemist ventured that the color variety, *aniline violet*, was *mauveine*, an ink made from the aniline dye described above.¹⁰

A RATIONALE FOR USING ANILINE INK

The colors of Canada Scott 245 and 245i are visually different to the eye. The latter is considerably bolder and brighter. I strongly suspect they are chemically different as well. Moreover, the stamp's color showing through on the back of 245i is consistent with a determining characteristic of aniline ink. A number of reasons may explain the use of the aniline *mauveine* in printing 245i, but all are conjectural at this point. No known references exist relative to this question.

First, the deep penetration of aniline ink adds a security feature [intended or otherwise], namely, making it difficult to re-use a \$1 face value stamp by washing out a cancellation. Anilines lack color fastness and any washing would likely fade the stamp's color and any accompanying abrading [rubbing] would physically damage the stamp. Perhaps a more likely reason for the use of *mauveine* was to reduce the cost of printing the *Chateau de Ramezay, Montreal* stamps. Or, maybe *PV 19* was in short supply, unavailable, or had become prohibitively expensive. Finally, the *mauveine* may have been added to the ink mix to "thin" the *PV 19* to be able to properly wipe the plate prior to printing. Mixing *mauveine* with *PV 19* was mentioned by both the CBNC chemist and a recently-retired Company

⁹ Robson Lowe wrote that 245i was printed with a suffused fugitive dye "erroneously called 'aniline.'" *The Encyclopedia of British Empire Postage Stamps, 1639-1952, Vol. 5: The Empire in North America*, 1973.

¹⁰ Chemically, quinacridone is C₂₀H₁₂N₂O₂. Mauveine is C₂₆H₂₃N₄⁺X⁻ [the actual structure of *mauveine* was not definitive until 1994].

printer. The former speculating such an action as a cost-reduction measure; the latter citing the need to sustain printing efficiency. Both also mentioned the possibility that the two inks could have been mixed together to develop a proprietary CBNC color that would be difficult to copy without knowing the formula, but this seems remote given that the stamp exists in two different colors.

CONCLUSIONS

Like most research, this paper started with a question. In this case, the question arose from simply browsing a stamp catalog searching for interesting varieties. And, like most research, this article found far more than meets the eye. Research reduces uncertainty and is an open challenge to become better informed – to know, learn, and understand. Research can add an additional dimension to a collection by providing a better appreciation of what you have. Research also offers the chance to re-assess what and how you collect. Perhaps your collecting has gotten stale or you realize that you can't collect "everything." Research is consistent with the idea that collecting less is more. It changes the dynamic of a collection and makes it more defined and manageable. You can be more careful and discerning. Each new item added to the collection now has a pedigree supported by research.

Curiosity, almost by necessity, leads to more exploring, even after the initial research question has been answered. Not all collectors would be interested in the research question posed in this article, but other questions might light that spark in you.

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