



# U.S. 24¢ Purple 1870-75

## Progress Report on a Philatelic Enigma

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IAP Symposium London, 2017

*Image courtesy Siegel Auction Galleries*

# Can printings be identified?

**All 24¢ stamps printed from one plate, but:**

- Printed by two companies in different years
- Both companies used similar fugitive inks
- Both printed on virtually identical paper
- Distribution of printings overlapped in time
- Postal records do not list printing sources

***A philatelic mystery for 122 years***

# 1869 Pictorial Issue



1869  
National Bank Note Co.

## Public disdain for designs

- Subjects seen as trite
- Bi-color values seen as garish
- Complaints about small size
- Complaints about gum adherence

*Image courtesy Siegel Auction Galleries*

# Origin of the 24¢ Purple



1870 Die Proof  
National Bank Note Co.

**National BN Co. provided new designs  
in September 1869**

- Heads of distinguished Americans
- One third larger than 1869 issue
- Improved gum
- No additional expense to P.O.

**New stamps issued in April 1870**

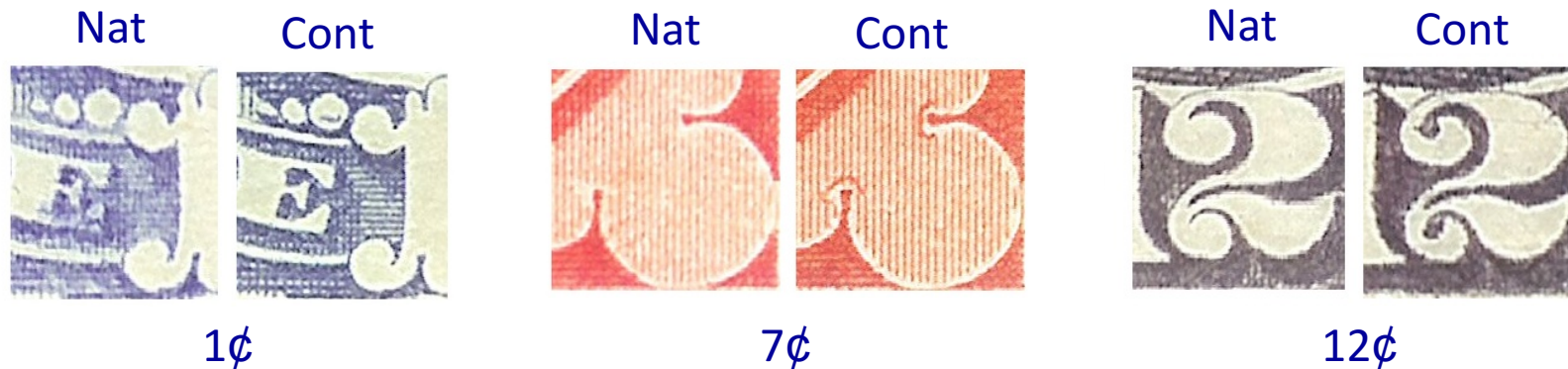
*Image courtesy Siegel Auction Galleries*

# Change in Contractors

## National BN Co. contract expired on 30 April 1873

- Continental BN Co. awarded four-year contract effective 1 May
- Cost per 1,000 sheets reduced from 27¢ to 15¢
- Post Office required issuance of same designs
- National's dies, transfer rolls and plates given to Continental

## Continental added "secret marks" to 11 dies



*Images courtesy U.S. Philatelic Classics Society*

# Continental Plates

No new plates were made for 24¢, 30¢ or 90¢ stamps

- National had made only one plate for each of these values
- Dies for these values display “secret marks,” but...
- No 24¢, 30¢ or 90¢ stamps with “secret marks” have been seen

## Die proofs



Nat, 1870



Cont, 1873

**24¢ “secret mark”**  
Four rays of the lower right  
star were deepened

# The Color Challenge

National Bank Note Co., Grilled



Produced for a short time in 1870; current shades vary widely

*Images courtesy Siegel Auction Galleries*

# Printer Undetermined



*Images courtesy Siegel Auction Galleries*



# Does it matter?



Faultless, well centered  
“normal” paper, no grill  
2009 auction price: \$2,500

*Courtesy Siegel Auction Galleries*



Faults, poorly centered  
ribbed paper  
Sold privately: \$250,000

*Courtesy The Philatelic Foundation*

# Analytical Tools

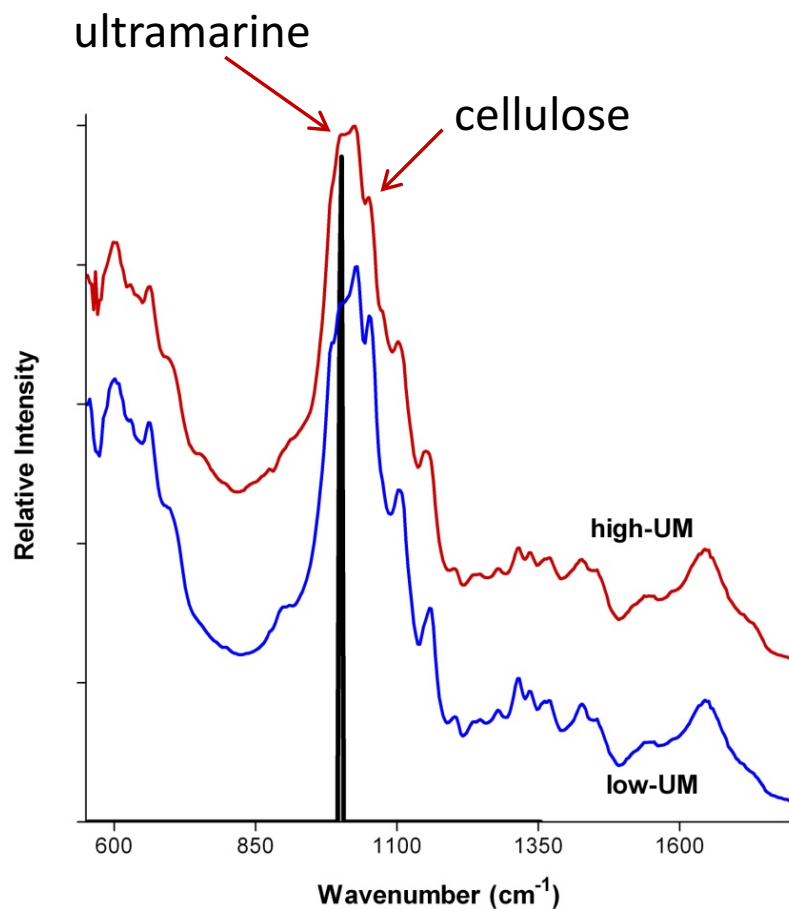
## **XRF X-ray Fluorescence**

- Primary X-ray beam excites individual element
- Secondary X-ray emitted by the excitation
- Energy of emission identifies individual element

## **FTIR Fourier Transform Infrared Spectroscopy**

- Infrared radiation excites individual molecules
- Each molecule has its own energy-absorption spectrum
- Comparing absorption to reference spectra identifies molecule

# Fourier-Transform IR Results



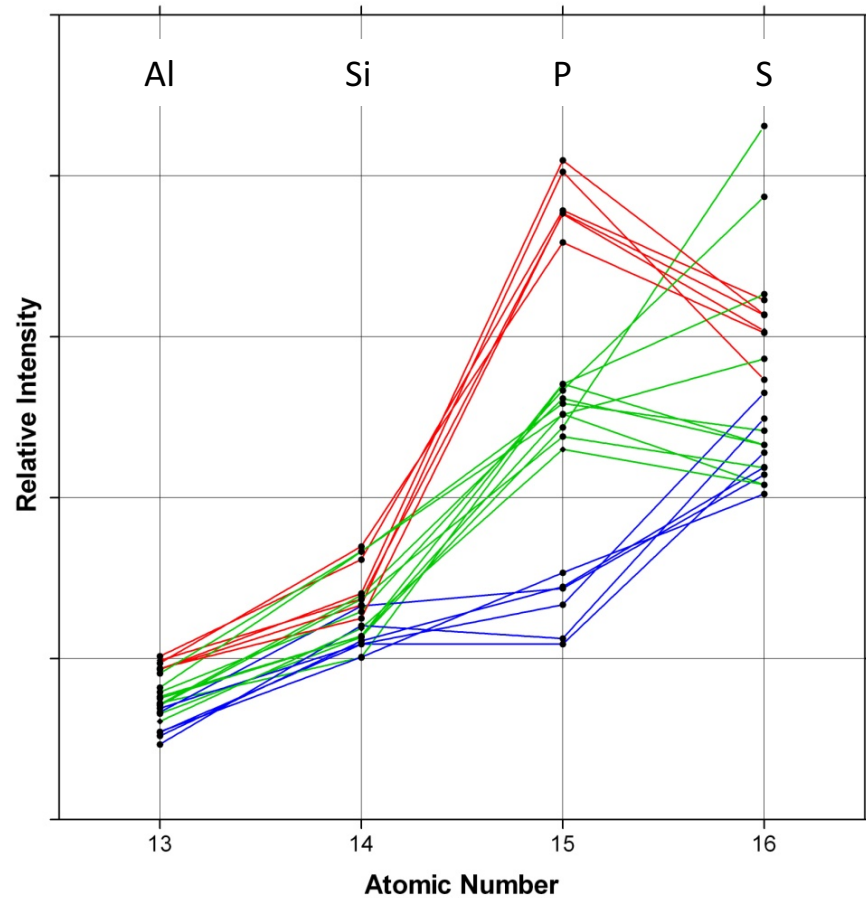
## UM: Ultramarine



- Synthetic form of lazurite (*lapis lazuli*)
- First fabricated in 19<sup>th</sup> Century
- Common printing-ink pigment
- Used in previous U.S. stamps

High UM: 1 cover, 5 stamps  
Low UM: 3 covers, 24 stamps

# X-Ray Fluorescence Results



- Phosphorus concentrations define three groups.
- All high UM stamps are in the middle Phosphorus group.
- Two covers from mid-1873 are in the middle Phosphorus group. (*National stamps*)
- Origins of the high and low Phosphorus stamps unknown.

# Chemical Groups

Hi UM, Medium Phosphorus



Low UM, Medium Phosphorus



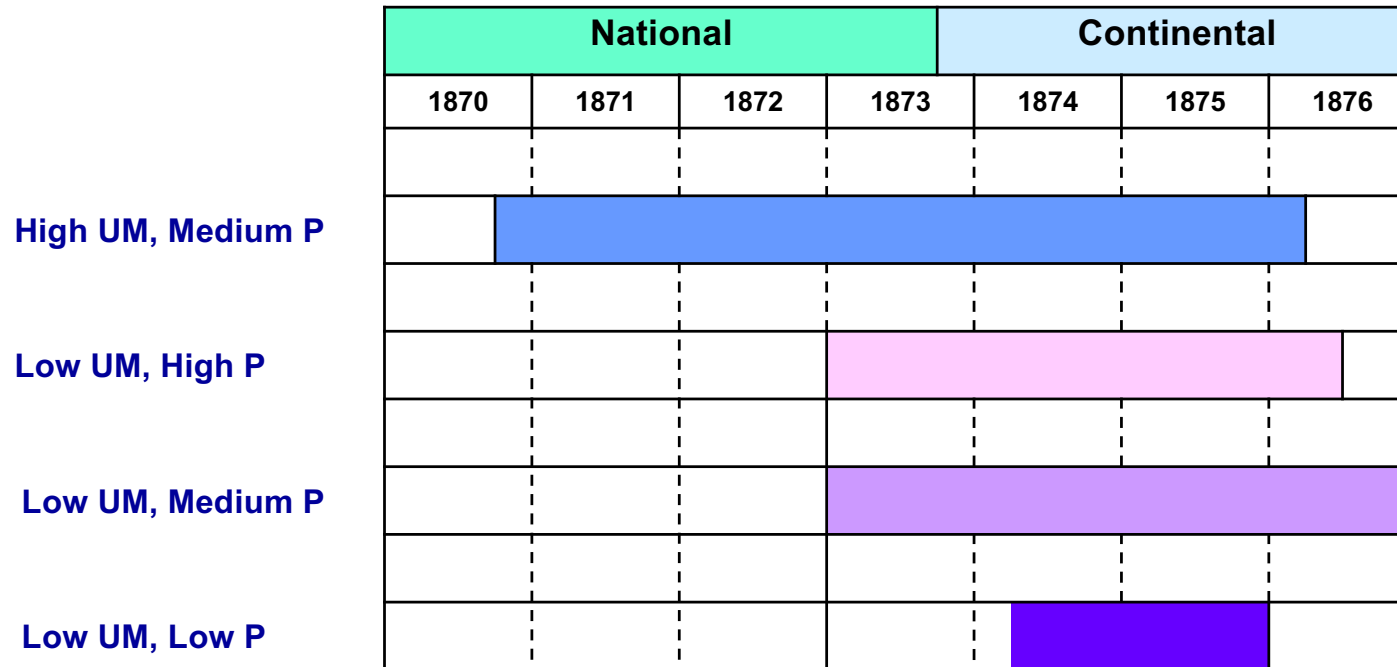
Low UM, High Phosphorus



Low UM, Low Phosphorus



# Periods of Use



# Tentative Conclusion

**It is probable that only low-ultramarine, low-phosphorus stamps were printed by the Continental Bank Note Co.**

- All stamps in the “high-ultramarine, mid-Phosphorus” category were printed by the National Bank Note Co.
- Given that all of Continental's 24¢ stamps could have been printed in one day, they likely came from a single ink batch.
- The conclusion can be disproved by finding a cover dated before October 1873 that bears a low-ultramarine, low-phosphorus stamp.

# Next Tasks...

- Evaluate more low-ultramarine, low-phosphorus stamps.
- Evaluate at least three on-cover examples from every year in the 1870-76 period.
- Obtain FTIR analyses of the Caspary block.
- Identify the phosphorus-bearing pigment.



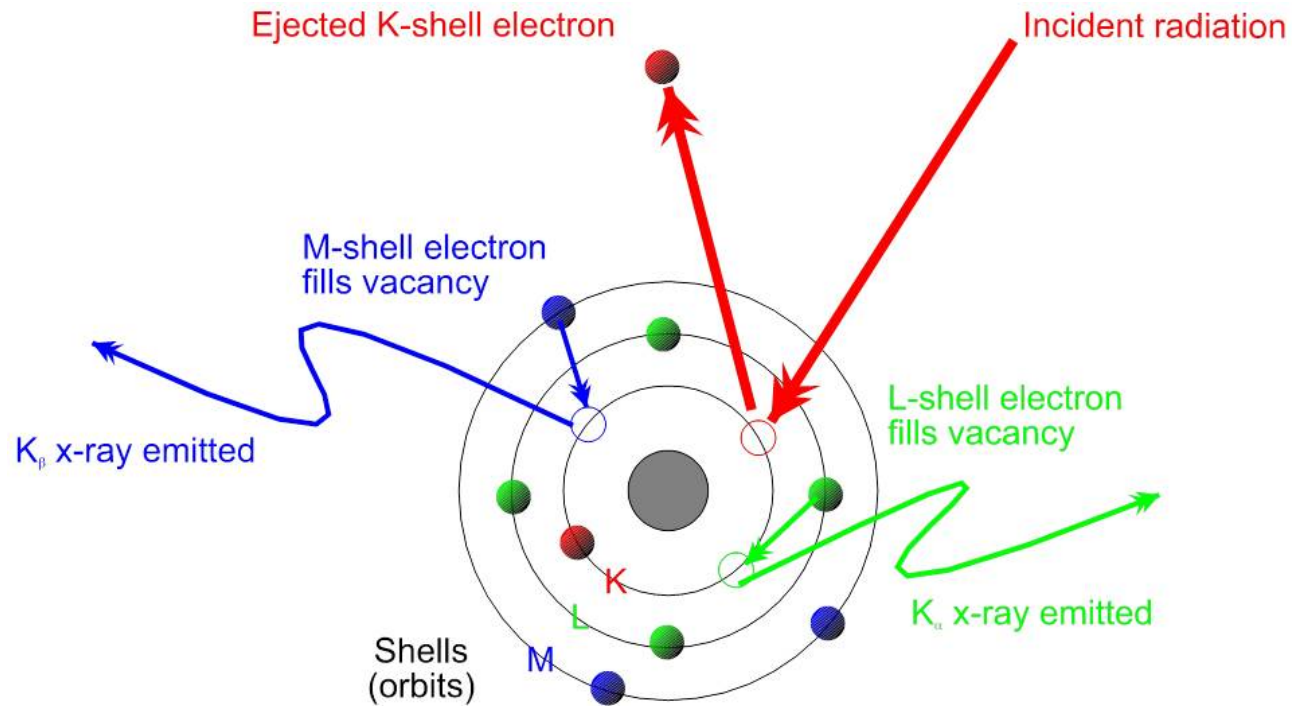
**The Caspary Block**

*Courtesy The Philatelic Foundation*



# Extra Slides

# How XRF Works



Courtesy the Bruker Corp.

# How FTIR Works

