


Analytical Philately Tools and Possibilities

- **Problem**
- **Approach**
- **Equipment**
- **Experiments**
 - Classic Lions
 - Meched Provisional
- **Results**
- **Conclusion**



K. Joe Youssefi
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Problem

Worldwide Philately Flounders

While High End Items and Philately of a Few Countries Flourish

- Questionable Material
 - Extensive Amount of Manipulated Items
 - Wide Variety of Reprints and Forgeries
 - Limited documentation of Above
- Limited Active and Recognized Certification Experts
 - Many have Retired
 - Most Have Limited Range of Expertise
- High Burden of Certification
 - Delays can reach multiple months
 - Cost can be Substantial and Discouraging
- Influential Members Damage Philately
 - Declare Items as Forgeries, to “Steal” them from Dealers & Auctions
 - Declare Items (Some Certified) as Forgeries at Major Stamp Shows
 - Spread Rumors Regarding Certification Experts
- Reputation of Philately is Degraded

Approach

How Can We Turn Around This Regression in Philately?

[We can not change socio-economic trends]

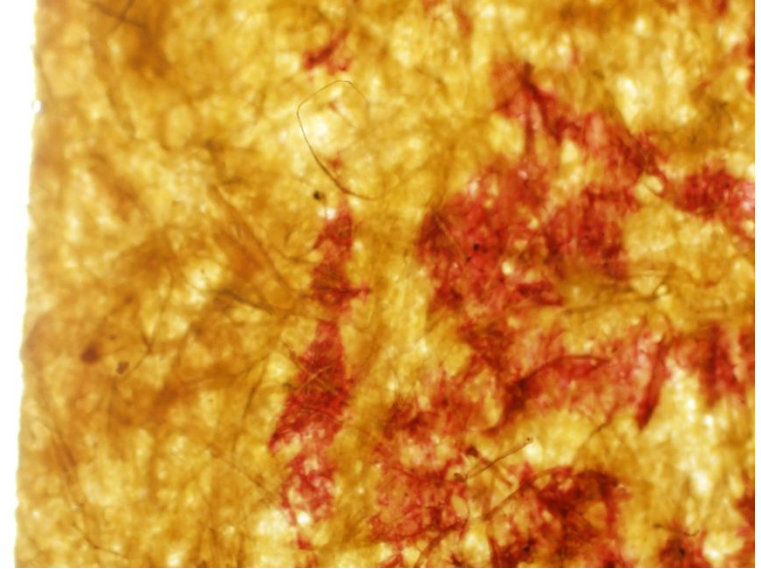
- 1. Encourage and Expand Certification Expertise**
- 2. Create Additional Certification Committees**
- 3. Enable and Encourage More Members to Exhibit**
- 4. Encourage More Members to Publish**
- 5. Put an End to the Personal Assaults Against Philately**
- 6. Incorporate Technology to Complement and Enhance the Existing Expertise**

Equipment

- **Standard: Micrometer; Microscope; Scanner; etc.**
- ❖ **Light Microscope (Olympus, Model Number BX46)**
 - ❖ **Dr. Sarah Estrada, Affiliated Dermatology, Scottsdale, AZ**
- **Video Spectral Comparator (VSC 6000)**
- **X-ray Fluorescence Analyzer (Bruker Tracer III-SD)**
- **Fourier Transform Infrared Spectroscopy (FT-IR)**
 - **Tom Lera, National Postal Museum Labs, Washington DC**

Light Microscope

Olympus BX46



- **UIS2 optical system**
- **High color reproductivity LED light source**
- **Koehler illumination for transmitted light**
- **Light intensity manager switch**
- **Fixed reverse coded quintuple nosepiece**
- **Up to 400X magnification**
- **15mm focus stroke**
- **1 μ m fine focusing knob**



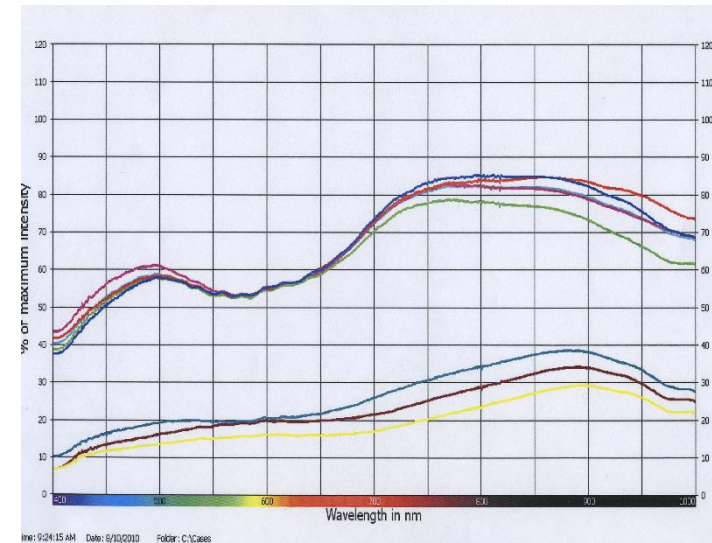
40X Paper & Ink

Lion Stamp
1 Kran Red
Yellow Paper

Video Spectral Comparator

VSC 6000

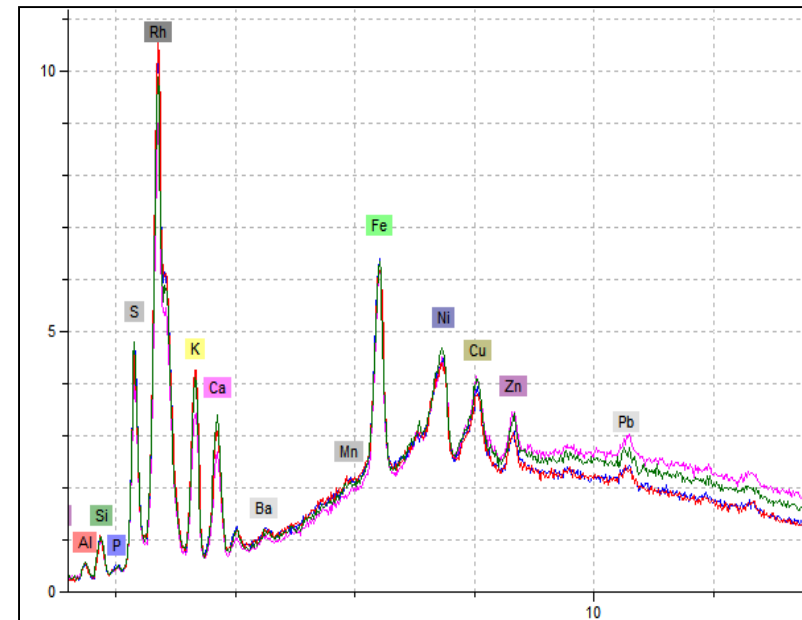
- Video Spectral Comparator performs optical examination of a surface.
- Manufactured by Foster and Freeman, Ltd. Evesham, Worchestershire, UK.
- Located at the Smithsonian National Postal Museum (NPM) in Washington, DC.
- Allows examination of samples in the visible and near-infrared regions of the spectrum carried out with incident and transmitted UV, visible and infrared illumination from 400 – 1000 nm.
- Geometric evaluation can also be performed.



X-ray Fluorescence Analyzer

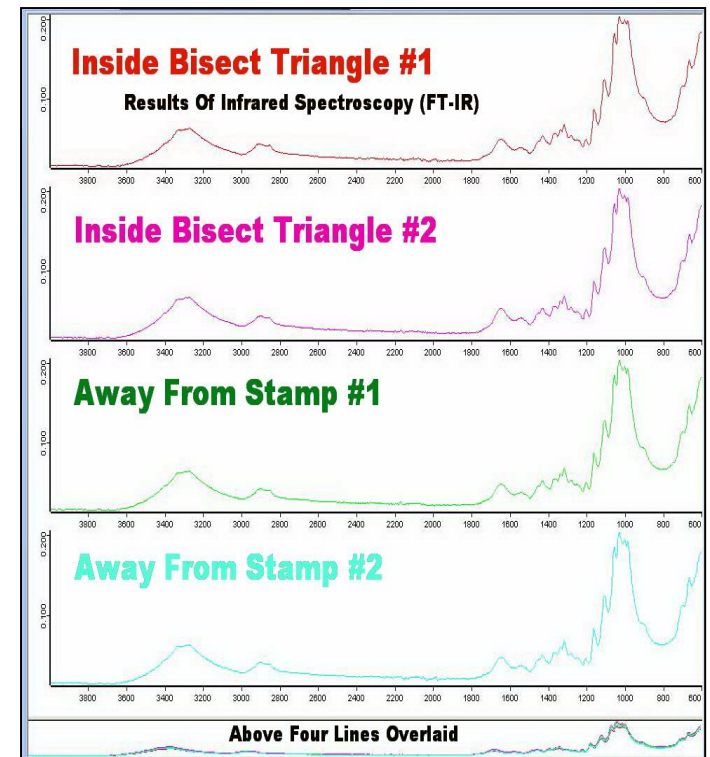
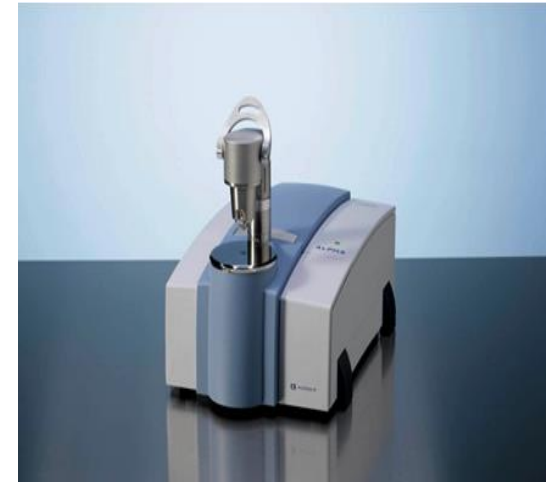
Bruker Tracer III-SD

- Bruker Handheld Tracer III-SD X-ray Fluorescence Analyzer
- Located at the Smithsonian National Postal Museum (NPM) in Washington, DC.
- Uses an x-ray tube of a thin Rh target; voltage 0.1-45kV; beam current 2-25 μ A; and 10mm² silicon drift detector with a resolution of 145keV used for this analysis.
- Provides distribution of basic elements in the sample with nondestructive analysis
- Spot size of 0.5 cm²



Fourier Transform Infrared Spectroscopy (FT-IR)

- Another instrument at the NPM
- Bruker ALPHA FT-IR Spectrometer with a Platinum-diamond ATR sample analysis module.
- Data collected over a spectral range of $7,500 - 350 \text{ cm}^{-1}$ at 4 cm^{-1} spectral resolution.
- Spectrometer incorporates a KBr beamsplitter, an integrated Deuterated Triglycine Sulfate (DTGS) detector, and a Silicon Carbide (SiC) globar infrared source.
- Uses a non-destructive method for in-situ analysis of stamps, controlling the optical path by mirror fiber optics.



Experiments - Classic Persia (Lions)

1. Ink characteristics of "yek-sad-adad" manual-overprint
(6 stamps)
2. Ink analysis of Bagheri stamps new color reporting
(6 stamps & 3 references)
3. Evaluate postal doc. (paper, ink, postmark);
compare with references.
4. Paper evaluation of diagonally ribbed paper
(4 stamps)
5. Ink analysis of 1 kran re-engraved color error
(& 1 reference)
6. Analysis of 1 Toman copper bronze variety
(& 1 reference)
7. Ink analysis of 5 Kran bronze
(2 stamps)
8. Ink analysis of 5 Kran gold bronze
(3 stamps)

Experiments - Meched Postmaster Provisional

- 1. Establish baseline: Meched and Gaoudan cover**
- 2. Evaluate cover to Manchester (paper, postmark, ink, other)**
- 3. Evaluate postcard to Belgium**
- 4. Evaluate envelope cutout**
- 5. Evaluate paper types [wove; wove with watermark; meshed; meshed with W/M]**
- 6. Compare ink in frame versus ink in signet (black, violet, blue, and red)**
- 7. Evaluate signature ink (red and violet); check florescent versus non-florescent types**
- 8. Evaluate postmark inks (postal use versus CTO)**
- 9. Evaluate "broken heh" stamp; characteristics and ink versus reference**
- 10. Evaluate ink in printed-on-the-back stamps**
- 11. Characterize forgeries Group I (Type 1 - 4) and Group II (Type 1 - 4) Paper, Ink, Initial, & postmark**

Sample Results - Classic Lions

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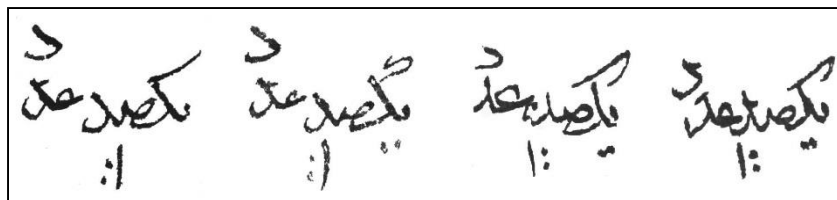
Objective was to Determine Equipment Capabilities and Limitations; not to Derive Final Conclusions.

Results L1

L1 - Ink characteristics of "yek-sad-adad" manual overprint

Difficult to certify:

- Approximately 40 Exist
- Various writing formats
- Varying levels of fading
- Four denominations



Courtesy M. Sadri

Approach : Analyze overprint ink with VSC 6000



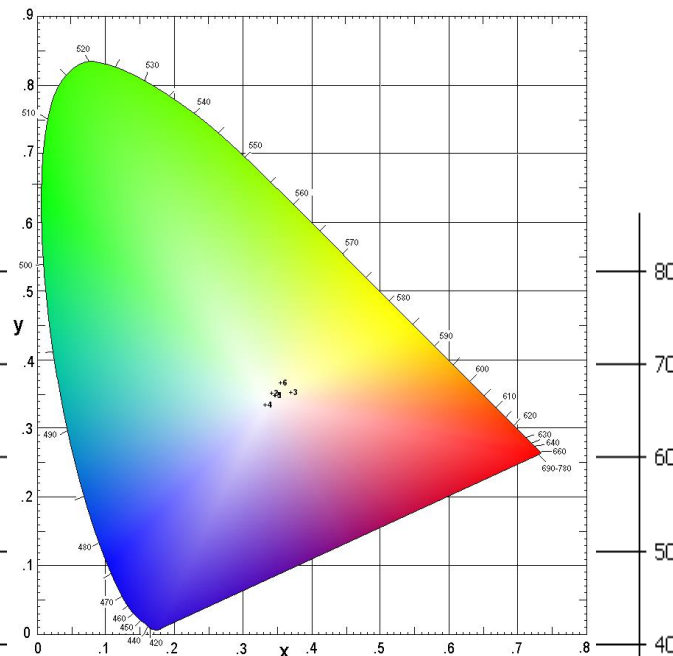
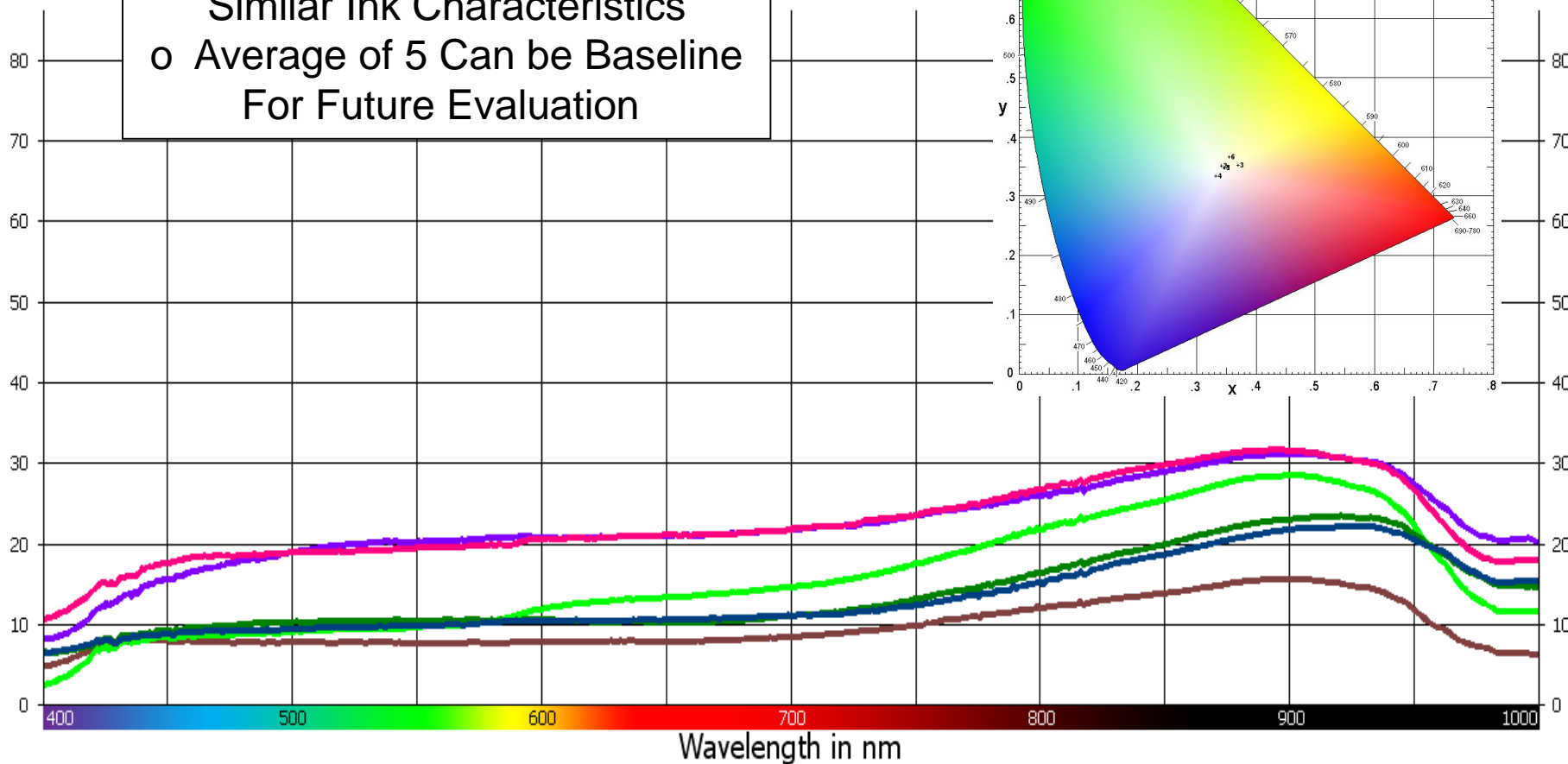
Results L1

L1 - Ink characteristics of "yek-sad-adad" manual overprint

VSC 6000 Data

- o 5 of 6 Overprints Demonstrate Similar Ink Characteristics
- o Average of 5 Can be Baseline For Future Evaluation

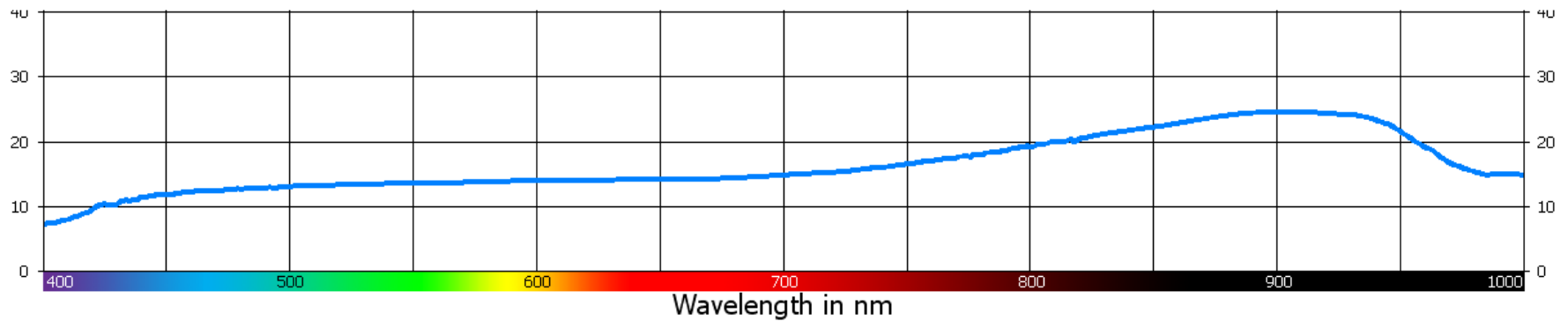
% of maximum intensity



Results L1

L1 - Ink characteristics of "yek-sad-adad" manual overprint

Average-of-5
Reference
For Future Evaluation
Of Yek-Sad-Adad



Results L6

L6 - Analysis of 1 Toman Copper Bronze Variety



- 1 Toman Red Bronze on Blue paper (P28) is one of most sought after stamps of Iran; 7 unused and approx. 80 used copies known.
- Possible variety with color of Copper Bronze has been observed.
- Is this a real color variety, or possibly a manipulated item?

Results L6

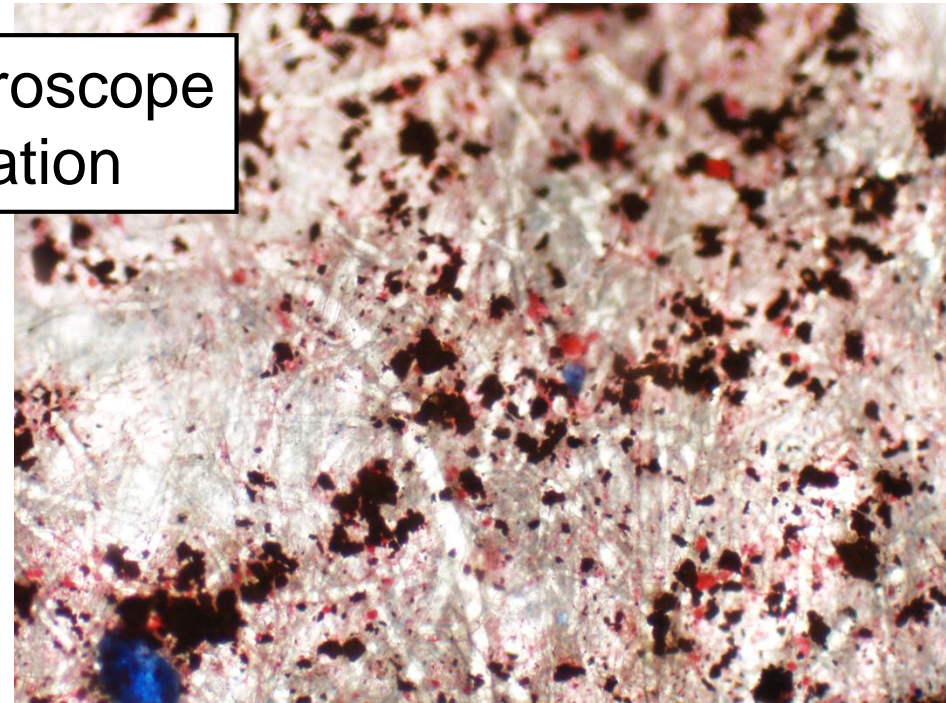
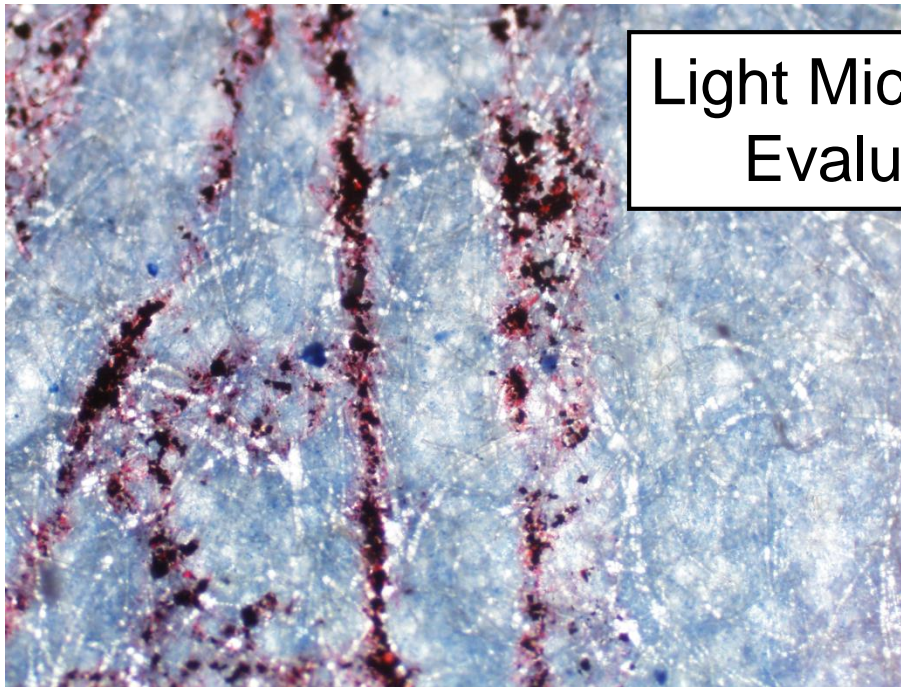
L6 - Analysis of 1 Toman Copper Bronze Variety

Is 1 Toman Copper Bronze a color variety, or a manipulated item?

Paper and Ink Variation



Light Microscope
Evaluation

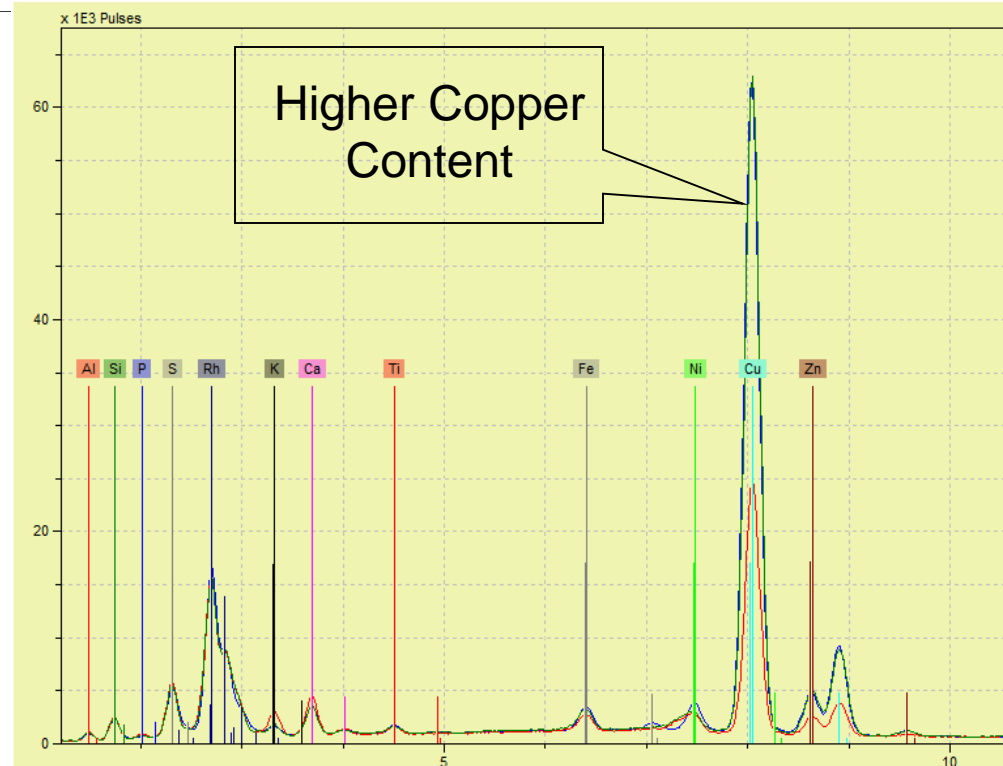
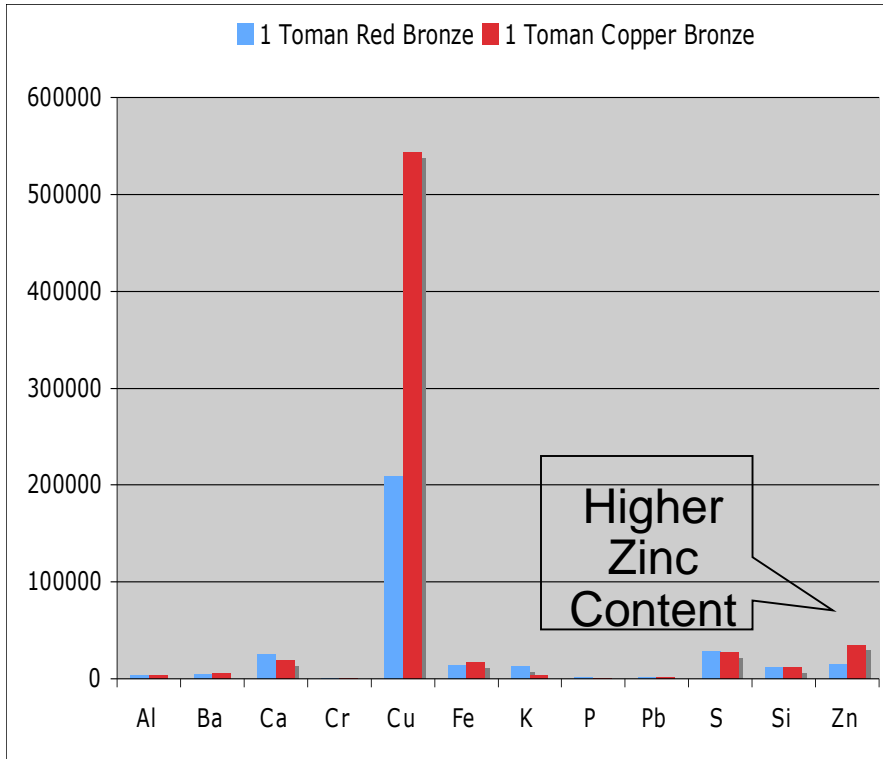


Results L6

L6 - Analysis of 1 Toman Copper Bronze Variety

Is 1 Toman Copper Bronze a true variety?

XRF Analysis



Results L6

L6 - Analysis of 1 Toman Copper Bronze Variety

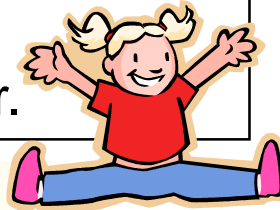
Is 1 Toman Copper Bronze
a true variety?

Printed with the same cliché

YES - Paper is different

YES - Ink is different

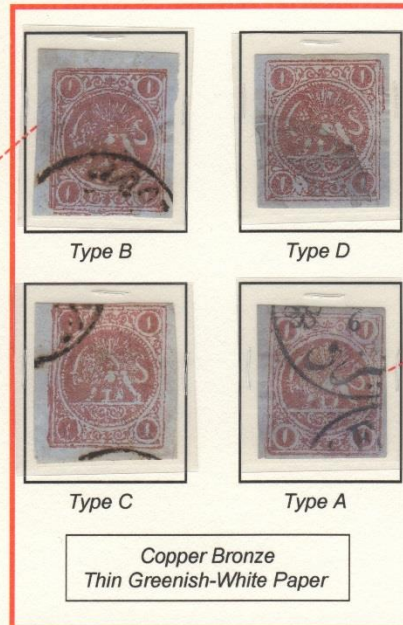
Conclusion: Paper and Ink Analysis
Indicate Copper Bronze
Is a True Variety
of 1 Toman Red Bronze.
Six (6) copies observed so far.



* - New Reporting



40X Paper & Ink



Type B

Type D

Type C

Type A

Copper Bronze
Thin Greenish-White Paper



40X Paper & Ink

Certified set
Youssefi
Classic Exhibit

Conclusion

**It has been Demonstrated that
Advanced Tools and Technology
Can be Incorporated to
Substantially Enhance Our Existing
Philatelic Knowledge.**