



February 28, 2003  
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IPS FI 11191-03

Report to: Mr. John Cobb  
831 Crescent Avenue  
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Sample identification: Three samples and three references

Date received: February 24, 2003

Test requested: EDS Analysis and Fiber Identification

Purchase Order: None rendered (Paid cash Feb 24, 2003)

### **Analysis of Baseball Cards and Postcards**

Several samples of baseball cards were brought in on February 24, 2003 to date the composition of the paper furnish. Some postcards were brought in with dated postmarks and three of these were selected to be included as possible reference standards. The postcards were sampled first and prepared on glass microscope slides. A few fibers from each of the three baseball cards were carefully removed from two of the corners of each card. These fibers were prepared on glass slides and also affixed to a carbon stub for energy dispersive spectroscopy analysis.

### Fiber Identification

The fiber identification results for the card samples are listed in Table 1.

Table 1. Fiber Identification Results

<b>Postcard References</b>	<b>Fiber Evaluation</b>
Bull Dog - Cincinnati: postmark 1906	Mix of softwood bleached sulfite fibers - [Spruce and/or Hemlock], and hardwood bleached sulfite fibers - <u>Populus</u> spp. with a trace of cotton fiber
W. Virginia: postmark 1905	Mix of softwood groundwood fibers and softwood unbleached sulfite fibers
German Postcard: postmark 1908	Mix of softwood groundwood fibers and softwood unbleached sulfite fibers
<b>Baseball Cards</b>	<b>Fiber Evaluation</b>
Piedmont 350 New York: Knight, NY	Mix of softwood bleached sulfite fibers and hardwood bleached sulfite fibers with a trace of cotton fiber
Piedmont 150 Honus Wagner, Pittsburgh	Mix of mostly hardwood bleached soda/kraft fibers and softwood bleached sulfite fibers along with some hardwood bleached sulfite fibers and some softwood mechanical fibers - appears to be groundwood
Piedmont 350-460 Huggins, Cincinnati	Mix of mostly hardwood bleached soda/kraft fibers and some softwood bleached sulfite fibers

### Energy Dispersive Spectroscopy

Energy dispersive spectroscopy (EDS) was run on several fibers from each sample. EDS detects inorganic elements – sodium and above on the Periodic Table. The EDS spectra and the associated semiquantitative results are enclosed. The spectra and semiquantitative percentages show the relative amounts of the detected elements (not the total composition of the samples) and are indicative of various pigment types used in paper. The copper and zinc peaks on the spectra are due to the sample holder of the instrument and can be disregarded.

The presence of titanium in the EDS analysis of paper would be indicative of titanium dioxide pigment. In reviewing the EDS spectra of the "Honus Wagner" card, no titanium or other component was detected that would exclude the paper from being available in the earlier part of the 1900s. The high silica content is unusual but could be due to the dirt/stain on the card.

The "Knight, NY" card had elemental distributions somewhat similar to the West Virginia postcard. These elements indicate clay may be a high percentage of the sample and are also consistent with that present in papers of the early 1900s.

The "Huggins – Cincinnati" card also had consistent elemental content for that era but the high calcium peak, indicative of calcium carbonate, was unusual but certainly possible.

### Summary

All of the reference postcards and the three baseball cards were checked under long and short wave ultraviolet (UV) light. All samples were negative for UV fluorescence which is consistent with all paper produced before 1950.

In the fiber comparisons, the "Piedmont 150 Knight New York" card had a fiber composition very similar to the Bull Dog postcard of 1906. The "Honus Wagner" card had fiber components that were known to be used in papermaking in the early 1900s. No fiber types were detected that would exclude the paper from that era. This was also true of the "Huggins, Cincinnati" card. In the "Honus Wagner" and the "Huggins, Cincinnati" cards we observed the hardwood as bleached soda/kraft. Actually, the soda pulp would have been the type used in that era, but the staining reactions of soda and

kraft pulp are so similar that we were unable to separate this pulp type under the microscope. The other two postcards – West Virginia 1905 and Germany 1908 – had fiber types available in the early 1900s, but they did not compare with the baseball cards.

We do not have the expertise to comment about the printing of the cards.

If you have any questions concerning this work, please do not hesitate to contact us.

Signed Walter J. Rantanen  
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WJR/alf  
Enclosures

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