

R & S \$1 1935A Experimentals

By Jamie Yakes

In the summer of 1944, the Treasury Department conducted a test utilizing \$1 silver certificates with red Rs and Ss printed on the faces (Fig. 1). The R paper was normal currency paper used as a control, and the S paper was experimental currency paper that contained melamine resin, a chemical compound added to

improvising, and developing protocol as they went along.

Testing with Melamine Paper

Currency paper is actually cloth composed of linen and cotton fibers. Although more durable than wood-pulp paper, those fibers are fragile and will fracture as they swell and shrink from being wetted and dried and stretched and folded. New, stiff currency paper eventually will become a limp rag much like a pair of well-worn blue jeans.

In the early 1940s, the Treasury tested papers containing resins, such as melamine-formaldehyde, to develop a paper with a high *wet-strength*, or tendency to retain a greater percentage of its dry strength when wet. Melamine resins are one of many additives used in papermaking to enhance the wet strength of papers regularly exposed to moisture, such as wallpaper, food packaging papers, cleaning towelettes, and facial tissue.¹ They are a family of nitrogen-based organic compounds with active sites that promote crosslinking when exposed to certain kinds of compounds. When mixed with the paper pulp during processing,

the resin bonded with the cellulose fibers during drying, which reinforces the paper's structure and provided water-resistant properties.

By 1943, Treasury's studies with melamine-treated paper had shown promising results. Writing to the Bureau of Engraving and Printing in 1943, Bourdon Scribner, a division chief at the National Bureau of Standards, described the paper as exhibiting greater bursting and tensile strength, improved stretch and folding endurance, better resistance to crumpling, and increased wet strength.² Compared to regular currency paper, Scribner found melamine paper more durable for circulation.



Figure 1. R and S 1935A \$1 Silver Certificates issued by the Treasury in 1944. (Courtesy of Heritage Auction Galleries).

increase the paper's durability. They issued the notes to the Chicago Federal Reserve Bank for distribution within that Federal Reserve district. Problems plagued the experiment from the start, and Treasury officials ended it within two years.

In that time, Treasury never received a significant quantity of notes to determine the benefits of melamine paper. The real problem was that they had never developed a sound protocol for conducting these types of paper experiments on a large scale. They lacked the manpower and resources to adequately distribute and redeem the notes and possessed no technical team capable of judging the results. This was true of prior experiments conducted in the 1930s and 1940s. In 1944, they were simply

Alvin Hall, who as director of the BEP was the man tasked with turning the paper into finished currency, felt differently. He considered melamine paper inferior to regular paper because of its tendency to inhibit distribution of moisture in the sheet during wetting that preceded intaglio printing.³ Intaglio printing in the 1940s required moistened sheets for printing so the paper fibers would **enter the** grooves on the plate and bind the ink. Unless the sheet is uniformly wet, pressure will be unevenly distributed throughout the sheet and yield an imperfect impression from the plate.

The R & S Experiment

In light of his concerns, early in 1944 Hall informed William Broughton, chief of the Public Debt Service, that Crane and Company, the BEP's paper supplier, had produced a suitable melamine-treated currency paper.⁴ In March, the BEP received 536,000 sheets of standard 75% linen and 25% cotton paper with 1.5% melamine resin, and also 1% titanium dioxide, an additive that improved opacity.⁵ Treasury officials decided to print and number the paper as finished notes, and circulate them alongside control notes printed on regular, untreated paper. For a period of time, the Treasury would analyze redeemed notes to determine how the experimental paper fared compared to regular paper qualities such as appearance and strength.

The R and S experiment was the only time the BEP coded experimental notes. They hadn't used identifying marks on previous experiments, such as the \$1 Series of 1928 XYZ, 1935 ABC, and 1935A XYZ notes, and instead used serial number blocks separate from those being used for mainstream production.⁶ This complicated sorting the notes from normal notes, as the absence of a distinct mark made the experimental notes difficult to identify. Officials wanted to avoid complicating the current experiment. Furthermore, because the test would be conducted at the height of World War II, Hall recognized that labor shortages at the Treasury Department and Federal Reserve Banks may interfere with sorting, so he suggested coded notes to facilitate that task.⁷

Broughton proposed using an overprinted "R" for the *regular*, or control notes,

and an overprinted "S" for the *special*, or experimental, notes.⁸ The letters were approximately five millimeters tall and three millimeters wide, and of a font similar to that used for state names in the title blocks on Series of 1929 National Bank Notes (Figs. 2a and 2b).



Figures 2a and 2b. Closeups of the R and S showing proximity to the Treasury seal.

The BEP overprinted them in red ink in a separate process after applying the seals and serial numbers and placed them to the lower-right of the treasury seal, so the letters would be unaffected by punch cancelations made during redemption and easily noticed by sorters.⁹ Additionally, the special marks allowed the BEP to number the notes with current serial number blocks.

The BEP printed and numbered both paper lots as Series of 1935A \$1 Silver Certificates in the spring of 1944. On June 14, Hall notified Broughton that 1,184,000 notes of each type had been prepared for shipment, with serial numbers S70884001C–S72068000C for the Rs and S73884001C–S75068000C for the Ss.¹⁰ In addition, they numbered 12,000 stars for each type: serials ★91176001A–★91188000A for Rs, and ★091118001A–★09120000A for Ss. The treasurer received the notes on June 20.¹¹

Issuing and Redeeming the Notes

Treasury officials decided to issue the notes through the Federal Reserve Bank of Chicago, which would distribute the notes to its branches to issue to commercial banks in the district. The idea was that most of the notes would circulate within the Chicago Federal Reserve district and when redeemed would get returned to Chicago. On June 16, Broughton notified Chicago they would be receiving 296 packages of each type and instructed them to issue the notes in equal quantities to ensure even distribution.¹² Otto Netterstrom, vice president at the bank, confirmed receipt of the notes within a few days, and later informed Broughton that all the notes had been issued as requested by the 29th (Fig. 3).¹³

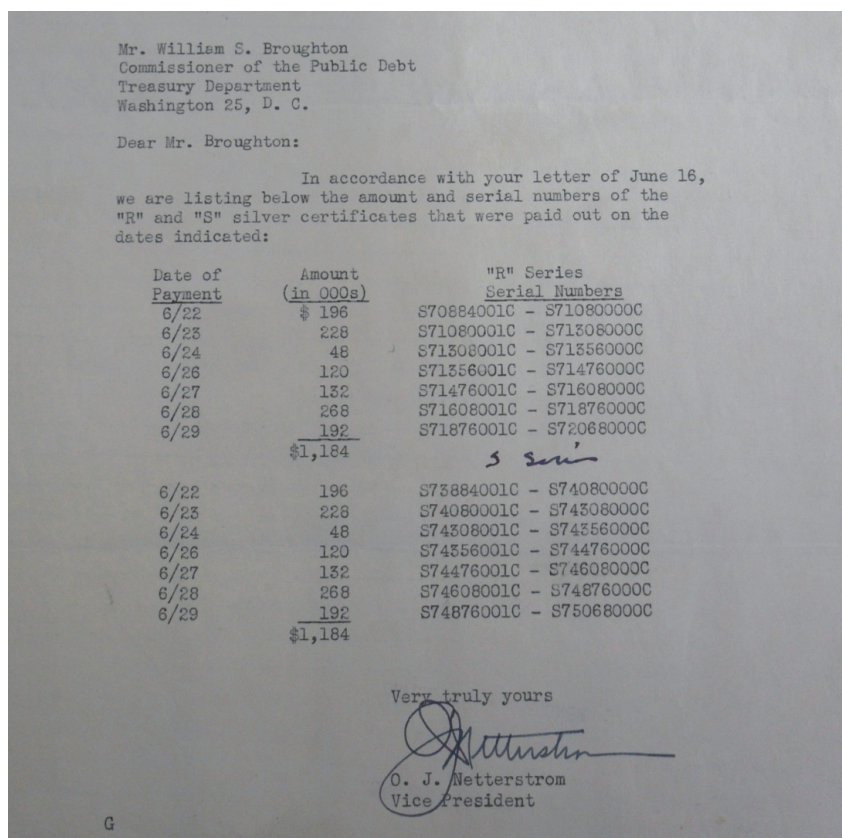


Figure 3. Letter from Netterstrom to Broughton listing exactly when the R and S notes were issued from the Chicago Federal Reserve Bank. (See Note 13.)

The Treasury soon began receiving inquiries about the notes. In one instance, a manager at the St. Louis Federal Reserve Bank wrote to Treasury Undersecretary Douglas Bell about the significance of the notes and whether they required special handling.¹⁴ In response, in

early July the Treasury issued the following statement by private wire to each Federal Reserve bank, and later as a public press statement: "The Secretary of the Treasury stated today that in order to test certain technical aspects of distinctive currency paper, two lots of \$1 silver certificates, marked with red letters R and S, are being issued in regular course. The red letters will facilitate identification of the bills following their redemption as unfit."^{15,16}

As the notes circulated more widely and Chicago's branch banks started redeeming them and sending them to Chicago, problems immediately became apparent. Originally, Treasury directed Chicago to have their sorting division separate unfit R and S notes with other \$1 silver certificates and send them to the Treasury's Division of Loans and Currency (DLC).¹⁷ DLC employees would then sort R and S notes from other \$1 silver certificates and forward them to the appropriate department for examination. DLC soon became overwhelmed by the volume, however, and was forced to hold aside entire packages of unsorted \$1s, which created backlogs and subsequent delays in accounting for redeemed notes.¹⁸

By October, the sorting problem became serious enough for DLC that Broughton pushed the burden onto Chicago. He relieved DLC employees of the task, and ordered Netterstrom to have his sorters separate R and S notes from other \$1s and send the types in separate packages to the DLC.¹⁹ Netterstrom argued this would hamper his operations because it required an additional sort after first sorting by class and denomination, but reluctantly agreed, hoping it would be necessary only for a short time.²⁰

Two months later, redeeming R and S notes was still taxing Chicago's sorting division and DLC. Hall and Broughton decided to lessen the workload for Chicago by having them sort

unfit R and S notes only during the first six working days of each month.²¹ Unsurprisingly, Netterstrom happily complied.²²

Sorting of R and S notes continued in that manner into 1946. In May, Hall recognized none had been received since February, presumably because the banks had ceased sorting them, and suggested to Public Debt Commissioner Edwin Kilby to discontinue the test.²³ Kilby, who became commissioner in 1946, agreed, and in July informed Netterstrom to immediately cease sorting at all Chicago district reserve banks.²⁴

Perspective

The R and S experiment lasted nearly two years, during which the Treasury received 114,000 Rs and 95,000 Ss redeemed by the reserve banks, less than 10% of each type placed into circulation.²⁵ Contributing to these low numbers likely was the Treasury's frequent changing of the redemption process, and, as inferred by Hall, the banks' premature halting of sorting the notes. The public was another factor: Enthralled by the novelty of the red R and S, they saved the notes in droves.²⁶

For all the Treasury's efforts, results from the R and S experiment were inconclusive. Gustav Justusson, assistant chief of the DLC, in a general summary of the experiment he wrote in 1947, ambiguously stated that technical problems during the production of R and S notes terminated further development of the paper.²⁷ Frank Uhler, chief of the BEP's Office of Research and Development Engineering, responded to a public inquiry in 1955 that the special paper adapted poorly to the wet intaglio process.²⁸ Uhler's comment affirmed Hall's concern from 1943 and pointedly explained why the Treasury never utilized the paper past experimental stages: The water-resistant properties imparted by the addition of melamine resin interfered with the integral wetting steps that preceded intaglio printing.

Treasury coded the R and S notes to make them easily identifiable for reserve bank and treasury employees, a lesson learned from previous experiments. Sorting personnel still had difficulties separating the notes, and over the course of the experiment those problems caused headaches for Treasury and officials at the

Chicago Federal Reserve Bank. Ultimately, the paper's unsuitable condition for intaglio plate printing negated its usefulness to the BEP. A lasting hallmark of this failed experiment is the striking contrast of the red R and S against the bold, blue treasury seal.

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Notes

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