

**Exhumation and Analysis of Human Skeletal Remains from Beneath the Anne Randall Ledger  
Stone, St. Luke's Historic Church, Smithfield, VA**

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The Smithsonian's Skeletal Biology Program began working with the Bridger Family Association descendant group during the exhumation of their ancestor from the chancel of St. Luke's Church, near Smithfield, Virginia, in 2007. The goal of this project was to confirm the final resting place of Joseph Bridger and learn more about his life. He emigrated from England around 1654 and became one of the wealthiest Englishmen in Virginia. Yet, aspects of his experience and health are not well documented. His skeletal remains provide one of the few sources of information about his life. Records show that Joseph (d. 1686), along with his relative by marriage, Anne Randall (d. 1696), were originally buried at Whitmarsh Plantation, but their remains and grave ledger stones were moved to the chancel of St. Luke's in 1894 (Thomas 1907:51). The 2006 St. Luke's archaeological recovery focused on Joseph's burial vault and confirmed secondary reburial of only a fraction of his skeleton (Owsley et al. 2009). Although

uncertain, it was considered possible that the remainder was left at Whitemarsh. In 2020, archaeological exploration of the Bridger Family cemetery in connection with a property transfer excavated 25 burials for reinterment of any found remains in a new burial vault at St. Luke's Church, including the original side-by-side graves of Joseph Bridger and Anne Randall (Burial Features 40 and 41, respectively) (Outlaw, Owsley and Clemons 2021). Excavation of these graves confirmed that no bones or teeth remained, reflecting complete removal of the remains of these two individuals in 1894. This situation was puzzling, and Bridger family members questioned whether Joseph Bridger's missing bones might have been combined with the skeleton of Anne during the late 19<sup>th</sup>-century transport from Whitemarsh to St. Luke's about two miles distant. The family's interest in ruling out this possibility led to the 2023 investigation of Anne Randall's grave inside St. Luke's. The objective was to determine whether Anne Randall's remains were present under the ledger stone within the chancel and find the missing bones of Joseph Bridger.

In advance of the exhumation on 23 January 2023, Hogg Funeral Home and St. Luke's removed the floor pavers on the south side of Anne Randall's Belgium black limestone ledger stone (inscribed "Here lyeth the Body of Anne Randall") to provide access to the crypt below (Figure 1). Visible were embedded heating pipes installed in the subfloor in the 1950s. The addition of these pipes required reconstruction of the church floor, an event that almost certainly impacted the skeletal remains of both Joseph Bridger and Anne Randall, potentially contributing to the loss and incomplete recovery of the skeleton of Joseph Bridger in 2007.



Figure 1. Ledger stone of Anne Randall, St. Luke's Church, with heating pipes visible in the open pit next to the burial chamber.

Debris cleared from the accessible large crypt under the ledger stone allowed visual and physical access to its contents, which included a smaller rectangular brick vault with internal dimensions measuring 16” by 8” (Figure 2). The brick chamber was open on top and highly decayed pieces of wood were visible inside (Figure 3). Removing the largest pieces of wood exposed human bones.



Figure 2. The interior vault with the upper course of bricks partially removed to facilitate access. Degraded pieces of lid and side panels of a wooden box are visible.



Figure 3. Repurposed 18<sup>th</sup>-century bricks were used to fabricate the small chamber containing the tight-fitting wooden box.

Within the west end of the brick box were fragments of a cranial vault, as well as pieces of wood with up-right nails. The vertical walls of wood fit snugly within the brick compartment. Forty-nine machine-cut nails (c. 1820-1900) were present and directly associated with the wood along with three early wire nails (post-1850). These nails were used to construct the wooden box. Four poorly preserved hand-wrought nails were also recovered and likely were used in the construction of Anne's 1696 coffin and inadvertently transported with her bones from Whitmarsh to St. Luke's in 1894.

The skeletal elements were carefully removed from the brick chamber and decayed wooden box a piece at a time. The bones were extremely fragile, soft, and damp with adhering dirt. Brushite, a calcium-phosphate degradation product, had partially replaced the bone. Within this specific context, this powdery, grey-white crystalline mineral somewhat resembles adipocere. Its presence reflects the damp conditions of the burial chamber. Removal of the chamber's contents continued to the bottom of the wooden box. No complete bones were recovered, and skeletal representation was minimal, even less than was the case for Joseph Bridger's skeleton. Representation was limited to the cranial vault, a partial right femur diaphysis, and a few other postcranial bone fragments. Joseph Bridger's bones were less friable, better preserved, and slightly more elements were represented.

An unexpected material recovered with the human remains was a poorly preserved piece of paper that encapsulated a clump of dirt and fragments of bone (Figure 4). The paper was directly associated with degraded bone and appeared to have been wrapped around these broken pieces. A small remnant of the thin paper showed printed lettering characteristic of newsprint.



Figure 4. Degraded newsprint, adhering soil, rust-colored iron residue, and encapsulated bone as viewed at the time of recovery.

## Cranial Bones

Recovered from the crypt were multiple pieces of a cranial vault with adhering soil. The largest piece was a portion of the calotte that included the left and right parietals and frontal bone. Faint, green staining was observed on the left parietal. This discoloration likely reflects contact with a copper alloy pin used to secure a shroud or covering for the head. An articulating piece of right parietal was also present. Two articulating pieces of left parietal and occipital represented the second largest bone piece. Also present were partial left and right temporals including the petrous portions. No bones of the midface or teeth were recovered.

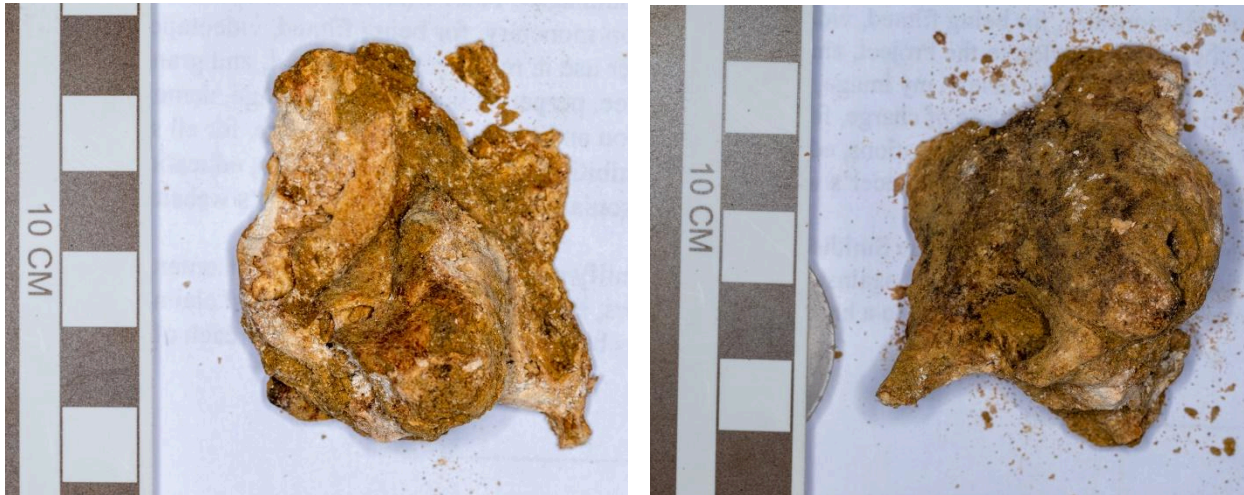


Figure 5. Interior (left) and external views of the left temporal bone. A sample of this denser bone was selected for stable isotope and elemental analysis.

Approximately two-thirds of the right femur was recovered. It was poorly preserved. Several smaller bone fragments representing the tibia and other, smaller diaphyses were also removed from the decayed burial container. Siding these pieces was uncertain. The smaller long bone could have been an ulna or possibly a clavicle based on dimensions of the shaft and curvature of the bone. One small bone fragment had an arc, possibly representing the greater sciatic notch of an innominate. The piece was so small and poorly preserved that this assessment was not definite.

## **Laboratory Analysis**

All recovered bones were transferred to the NMNH on January 24, 2023. The cranial bone pieces and partial right femur required further cleaning in the lab as nearly all had powdery, grey/white brushite formation. Dirt containing shards of wood and at least one nail fragment had adhered to the outer table of the cranial bones. Surface removal of soil allowed more detailed anatomical observation.

The bones and soil were moist, and unavoidable drying of the bone contributed to exfoliation of the outer cortex. No measurements, not even the diameter of the middle right femur, could be taken.

Present for examination were pieces of cranium, a fragment of the left innominate, a partial right femur diaphysis, and small, long bone fragments, mostly from the right tibia (Figures 6 and 7).



Figure 6. Layout of bone recovered from the chancel crypt of Anne Randall.



Figure 7. External view of the recovered cranial bones. Features indicative of a female sex include a lack of development of the glabellar region, nondescript temporal lines, no supramastoid crest development, slight development of the right nuchal ridge, and small mastoid processes.

Cranial piece 1 (bag label): Material in this bag included dirt and three cranial vault fragments that articulate along postmortem breaks, revealing a partial frontal sinus. The dirt adhering to the frontal bone pieces was removed. Flecks of brushite crystals were also present, but their removal would have damaged the bone. Collectively, the three pieces measure roughly 52 mm across by 40 mm transverse. No direct articulation with the more superior frontal bone was possible due to missing areas of cranial bone. These pieces represented the region of glabella. There was no development of the brow ridge and the frontal sinus chambers were small, features consistent with female identification.

Cranial piece 2 (bag label): In this bag was a large clump of hardened clay soil containing a deposit of brushite, suggesting that bone was present. This piece was excavated in the lab to determine the existence and shape of the bone. The outer cortex could be defined but the opposing surface was cancellous. The thickness of this piece indicated origin not from the cranium, but the pelvis. This bone represented a small portion of the left innominate, an identification based on a sharp rim (border) and a small section of the acetabulum. Anatomical features matched the left ischium.

Cranial piece 3 (bag label): Like the right side, a portion of the left parietal had separated from the larger section of the calotte. This piece represented the more lateral aspect of the left parietal and

included occipital bone immediately at the left lambdoid suture. The suture for the temporal squamous was partially visible. The lambdoid suture was visible ectocranially but obliterated endocranially. This piece measured 120 mm anterior-posterior by 77 mm superior-inferior. A small piece of the occipital bone had broken off but was present and articulated with this piece to form the inferior left occipital near asterion. The lateral edge of the nuchal ridge was present and slightly defined.

Three oval-shaped areas of faint, green, copper alloy stains were evident on the frontal and left parietal bones of the cranial vault. One was located antero-laterally on the separated left parietal and adjacent frontal (Figure 8). This discolored area lacked a clearly defined border but measured approximately 36 mm (superior-inferior [S-I]) by 23 mm (anterior-posterior [A-P]). A second stain was in the right mid frontal about 6 mm anterior and parallel to the right mid coronal suture. This stain measured 29 mm transverse by 17 mm A-P. A third, diffuse stain was located on the posterior left parietal and adjacent occipital superior to asterion beginning approximately 10 mm anterior to the lambdoid suture.



Figure 8. Anterior left frontal and parietal showing faint green copper alloy staining.

Cranial piece 4 (bag label). This bag contained the lateral right parietal and a small portion of the occipital bone. This piece articulated with the large calotte piece along an irregular, postmortem break. Most of the anterior suture for the squamous temporal was present. On the posterior aspect of this piece there was also a small section of right lambdoid suture that was visible ectocranially, but not internally. This piece had a maximum length of 111 mm (anterior-posterior) by 59 mm (superior-inferior).

A fourth copper alloy stain was located on the lower posterior right parietal about 26 mm above the posterior squamosal suture. This defined elliptical stain was dark in color with well-preserved bone; it measured 23 mm (S-I) by 12 mm (A-P). It was also likely a shroud pin stain. The bone was relatively thin with a segment of suture evident only on the ectocranial surface. There were moderate-sized meningeal depressions.

The left temporal was present and mostly complete (Figure 4). Its small mastoid process was consistent with a female identification. The right temporal bone was represented by the petrous portion with the squamous temporal missing. The supramastoid crest was undefined, and consistent with a female identification. Chalky, crystalline brushite had replaced much of the bone.

In the postcranial skeleton, approximately two-thirds of the right femur was recovered (Figure 9). The represented section of right femur was poorly preserved and friable with extensive cortical bone exfoliation. It was missing the proximal end above the lesser trochanter including the femoral head. The distal third of the bone was also missing due to postmortem breakage.



Figure 9. Antero-medial view of the upper half of the right femur with an enthesophyte extension (far right) projecting from the lesser trochanter.

In addition to the poorly preserved but intact diaphysis of the right femur, there were multiple, long bone shaft fragments of a right tibia. The largest fragment was about 10 cm in length and 2.1 cm across. These fragments had extensive exfoliation of the outer cortex with brushite formation on the external surface and inside the medullary cavity. A small fragment measured 5.0 cm in length by 1.5 cm across and may have represented an ulna based on shaft dimensions and shape.

## Stable Isotope and Inductively Coupled Plasma Mass Spectrometry Analyses

Stable isotope analyses were completed on the better-preserved left petrous temporal sent on February 2, 2022, to the University of Georgia Center for Applied Isotope Studies by St. Luke’s Historic Church & Museum. Requested tests included carbon, nitrogen, oxygen, and strontium isotopes, and ICP-MS elemental testing for incorporated lead. This bone was photographed at St Luke’s prior to sampling (Figure 4).

A portion of the petrous bone was removed and cleaned using a wire brush. It was then washed in an ultrasonic bath and after cleaning, the sample bone was dried and gently crushed into small fragments. The crushed bone was treated with diluted 1N acetic acid to remove absorbed and secondary carbonates. Periodic evacuation insured that evolved carbon dioxide was removed from the interior of the sample fragments, and that fresh acid was allowed to reach interior micro-surfaces. The chemically cleaned sample was then reacted under vacuum with 100% H<sub>3</sub>PO<sub>4</sub> to release carbon dioxide from bioapatite. The residue was filtered, rinsed with deionized water, and under a slightly acid condition (pH=3) heated at 80°C for 6 hours to dissolve collagen and leave humic substances in the precipitate. The collagen solution was then filtered to isolate pure collagen through drying.

Using a stable isotope ratio mass spectrometer, <sup>13</sup>C/<sup>12</sup>C and <sup>15</sup>N/<sup>14</sup>N ratios of collagen were measured separately with respect to PDB and to atmospheric nitrogen, respectively. The sample <sup>13</sup>C/<sup>12</sup>C and <sup>18</sup>O/<sup>16</sup>O ratios of bioapatite were measured using a stable isotope ratio mass spectrometer with respect to PDB. Results are reported in Table 1.

**Table 1. Stable Isotope Results.**

UGA MS #	Sample ID	Material	δ <sup>13</sup> C ‰	δ <sup>18</sup> O ‰	δ <sup>13</sup> C ‰	δ <sup>15</sup> N ‰	C/N	Collagen, %	C, %w	N, %w
63270	St. Luke's	bone	-12.0	-4.6	-17.0	11.7	3.3	9.4	43.3	15.6

A sample from this petrous temporal bone was also analyzed with inductively coupled plasma mass spectrometry (ICP-MS) to assess heavy metal content. Elements of particular interest are Arsenic (As), which was at times administered as a form of medicinal treatment, and Lead (Pb), which some individuals inadvertently ingested using pewter and lead-glazed wares. In the historical Mid-Atlantic, high Pb levels generally indicate access to such vessels because of high socioeconomic status, or through domestic labor performed as an indentured servant or enslaved person. The amount of As detected for

Anne Randall is low (Table 2) and does not provide evidence for treatment of health conditions using this element. However, Anne’s Pb value of 81.2 ppm is relatively high and indicates access to culinary wares containing lead over the course of her life (Table 2). In contrast, her in-law, Joseph Bridger has an even higher value of 149 ppm.

**Table 2. ICP-MS Results.**

UGAMS #	Sample ID	Material	Plasma Chem Lab ID	As (ppm)	Pb (ppm)
63270	St. Luke's	bone	PCS0350_0812	0.72	81.17

### Discussion and Conclusion

No complete bones were recovered, and skeletal representation is minimal, even less than was the case for the skeleton of Joseph Bridger. Representation was limited to a partial cranial vault, incomplete right femur diaphysis, and a few other fragments of postcranial bones. Bones recovered from under Joseph Bridger’s adjacent ledger stone were less friable and better preserved. However, there was no indication that his remains were placed in a wooden box which was then bricked in place.

There are no documents describing the 1894 or 1950s remodeling of the church chancel. The Archaeological & Cultural Solution, Inc. excavation of Anne’s grave at the Bridger Cemetery at White Marsh found no bones or artifacts, indicating that all recoverable materials were moved to St. Luke’s in 1894. “Evidently, the undertakers planned for a full coffin, as they constructed a 2.6’ wide interior brick vault, open at the top to the base of the stone and of unknown length. With so little to rebury, they (the 1894 brick masons) decided to construct a small (8” by 16” interior dimension) brick crypt along the interior south wall of the vault.” (A. Outlaw, correspondence 13 October 2023). The interior chamber contained poorly preserved bones of an older woman, pieces of a wooden box held together by machine cut and early wire nails. Perhaps the poor condition of the recovered bones was the reason why Anne’s bones were boxed separately. Brick work used to make the smaller crypt within the larger chamber included repurposed bricks dating to the 18<sup>th</sup>-century.

Laboratory examination assessed whether the recovered newspaper artifact dated to the 1894 or 1950s disturbance of Anne Randall’s grave. Newsprint from the *Virginia Gazette* dated 1897 and 1913 and the 1956 *Smithfield Times* along with typeface from the *Richmond Planet*, 1894, *Alexandria Gazette*, 1895, and the *Richmond News Leader*, 1955, were examined. Samples of text were photographed and compared which including tracing out letters and evaluating column widths. The different samples are similar, but details of the type revealed greater consistency with 1950s newsprint (Appendix 1). During

the installation of the floor heating pipes, some pieces of bone were removed from the box, wrapped, and returned.

Written histories of women are rare, and their experiences were diverse. Family, mothering, working, and aging were altered for women across their lives as they shifted into new roles and landscapes. This is especially true for women in early colonial America, whose lives shaped and supported a new and growing population, economy, and culture. Their postmortem lives and burials also had the possibility of being altered. Such was the case for Anne Randall, whose remains were moved from the cemetery at Whitemarsh to St. Luke's when the remains of her relative by marriage, Joseph Bridger, were exhumed for honorific burial in St. Luke's Church chancel.

The 2023 excavation inside Historic St. Luke's Church clarified the postmortem history of both Joseph Bridger and Anne Randall. In the Owsley et al. (2009) report generated from the St. Luke's exhumation of Joseph Bridger in 2006 the following was stated:

The remains [of J. Bridger] are well-preserved but highly fragmented and incomplete with less than 20 percent of the skeleton recovered. This percentage represents the portion transferred to St. Luke's Church. Most of the remains were left in situ at the original burial site. The recovered bones also show exhumation and reinterment damage incurred in 1894.

The possibility that some bones of Joseph Bridger remained at Whitemarsh was proven incorrect by the 2020 archaeological investigation of the original burial site. Excavation of the original grave confirmed that no bones or teeth remained in situ, reflecting complete removal of the preserved remains of Joseph Bridger. The adjacent, original burial site of Anne Randall was also excavated, confirming her complete removal in 1894.

The possibility that the bones of Joseph and Anne may have been commingled during transport to St. Luke's led to the investigation of Anne Randall's crypt inside St. Luke's. As this report describes, bones found under Anne's ledger stone were contained in a similar fashion to Joseph's and had been placed inside a small, rectangular, brick chamber. The bones identified as representative of Anne Randall were more poorly preserved than those of Joseph, with even less representation. No commingling of the two sets of remains was noted. The removal of the chancel floor during the 1950s likely affected Anne's bones in a minor way. Degraded newspaper from the 1950s indicates some wrapping of pieces of bone which were then returned to the wooden container.

Exhumation of the remains of Anne Randall provided an opportunity to gain additional information about the life and death of one colonial woman for whom little is known. The lives of 17-century women were invariably underreported, and from a bioarchaeological perspective, Anne (d. 1696) is one of only three 17<sup>th</sup>-century women in Virginia whose identifications are secure, the others

being Temperance Flowerdew Yeardley (d. 1628), and Elizabeth Drummond (d. 1699). Anne Randall was married to Hester Pitt Bridger's uncle, Hester being the wife of Joseph Bridger (Thomas 1907:53). Janet Ross (correspondence December 13, 2022) has been investigating Anne's family. This research has not yet revealed whether Anne was born in England or Virginia. The isotope data suggest European origin. Her birth date is estimated at approximately 1630 to 1635 and during her lifetime she had four husbands, Robert Watson, Henry Pitt, James Powell, and Robert Randall. There are no reported children from any of these marriages.

Despite poor preservation of the bone, those recovered from underneath the ledger stone of Anne Randall are consistent in size and morphology with a female. An enthesophyte projection on the right femur lesser trochanter and obliteration of cranial sutures reflect advanced age. Greenish discolorations on the outer table of the cranial vault suggest the presence of at least four shroud pins.

Stable carbon ( $\delta^{13}\text{C}$ ) isotope values derived from bone collagen and apatite suggest immigration from England. Temperate  $\text{C}^3$  plants predominate in European diets versus long-term or American-born residents who consumed a diet based on maize, a  $\text{C}^4$  tropical cultigen (Ubelaker and Owsley 2003). The stable carbon isotope values noted for this female (Table 1) are consistent with a diet still rich in temperate cultigens such as wheat, barley, and rye, but not as negative as those recently immigrated with more negative  $\delta^{13}\text{C}$  values (i.e., -18‰ to -20‰, France 2014). Based on a growing and extensive database of isotopic values from the Colonial Chesapeake, recently arrived 17<sup>th</sup>-century European immigrants to the Chesapeake region have carbon stable isotope values of -19‰ or less. Diets high in tropical plant species such as maize, sorghum, millet, or sugar cane have more positive  $\delta^{13}\text{C}$  values (i.e., -10‰ to -14‰). The slight dietary shift to more positive carbon values (i.e., Anne's carbon collagen value of -17‰) indicates movement from northwestern Europe into the Mid-Atlantic region where maize was more of a dietary staple.

The Pb value obtained from ICP-MS analyses indicates access to dining vessels containing lead. While not much is known specifically about Anne Randall, her familial association with Joseph Bridger, a wealthy individual of the time, suggests a high socioeconomic standard.

Her style of burial denotes status within both family and community. Her burial was marked with a ledger stone; few contemporaries received this acknowledgement. This is especially notable given she was childless throughout her multiple marriages. The presence of a ledger stone was likely the reason she was moved along with her relative by marriage, Joseph Bridger, to St. Luke's Church. Although no written records of her life may remain, recognition of her death is as notable as that of her recorded relative and contemporary, Joseph Bridger.

## **Acknowledgments**

The Bridger Family Association is a very active group with great interest in their family history. Members have conducted extensive genealogical and historical research, have sponsored an archaeological excavation of Joseph Bridger's home, worked in concert with St. Luke's Church, the oldest Anglican Church in North America where Joseph was reburied, and authorized burial excavations to obtain osteological and genetic information. A driving force behind this project was the hope of recovering additional cranial bones that could be united with the previously recovered superior cranial vault and mandible of Joseph Bridger (Owsley et al. 2009). If recovered, the objective was to restore Bridger's skull, which would allow completion of a forensic facial reconstruction as there are no surviving portraits of this prominent man. His appearance in life remains a mystery.

This investigation was skillfully coordinated and completed by Archaeological & Cultural Solutions, Inc., under the direction of Alain Outlaw. The Bridger Family requested and sponsored this inquiry. Multiple family members were at St. Luke's during the exhumation including Jean Birdsong Tomes, Merry Outlaw, Elaine Powell, Janet Ross, Bill Carrell, Margaret Gunn, Bonnie Bridger-Mittelmaier, William Hodsen, Tracy Tomes, and Cameron and James Bridger.

We gratefully thank Historic St. Luke's and Executive Director Todd Balance for their patience and collaboration. Stable isotope and trace element analyses were completed by Alexander Cherkinsky of the Center for Applied Isotope Studies and Sarah Jantzi of the Cais Plasma Chem Laboratory, respectively, University of Georgia.

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## Appendix 1

### St. Luke's Church Newspaper Initial Analysis

Andrew Ramsey

Photography and microscopic photography were performed on a fragment of newspaper found in contact with human remains recovered from St. Luke's Church to clarify movement and disturbance of the remains since their initial burial. Letters visible on the newspaper after photography were cross referenced with Virginia newsprint from the 1890's and 1950's which correspond with the two events that could have affected bone preservation. The most legible letters and numbers, and the ones used for comparison, were T, h, i, s, c, o, t, g, m, and 4.

From this comparative analysis, it is difficult to determine the date of the newspaper based on the surviving type. Referenced newspapers from both time periods included typeface that is similar to the typeface represented on the excavated newspaper fragment. The only notable difference between the two time periods was the spacing in the two lower legs of the letter "h" which seem to be more similar between the St. Luke's sample and samples from the 1950's.



Figure SEQ Figure \\* ARABIC 1:  
Macrophotography of the newsprint



Figure SEQ Figure \\* ARABIC 2: Microscopic photography  
of the newsprint stitched together from multiple exposures.



Figure 3: Typeface sample from original.

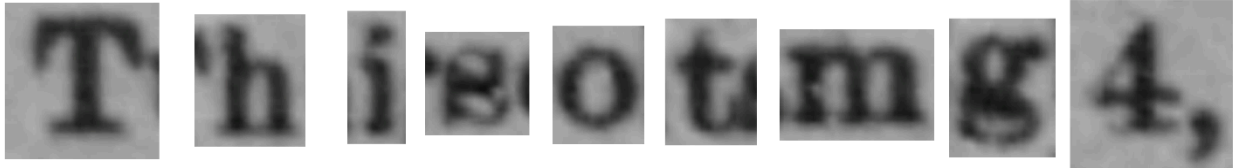


Figure 4: Typeface sample from the Richmond Planet, 1894.

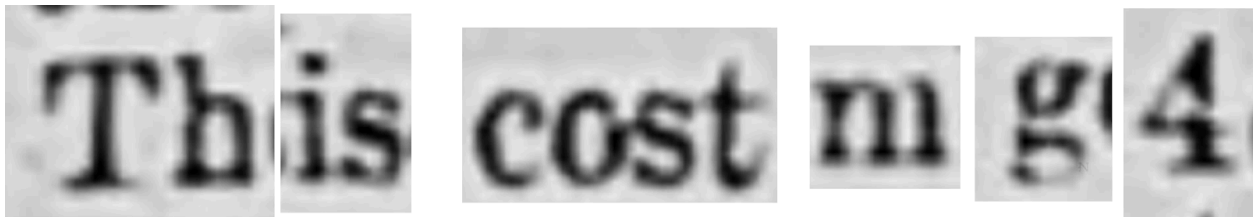


Figure 5: Typeface sample from the Alexandria Gazette, 1895.

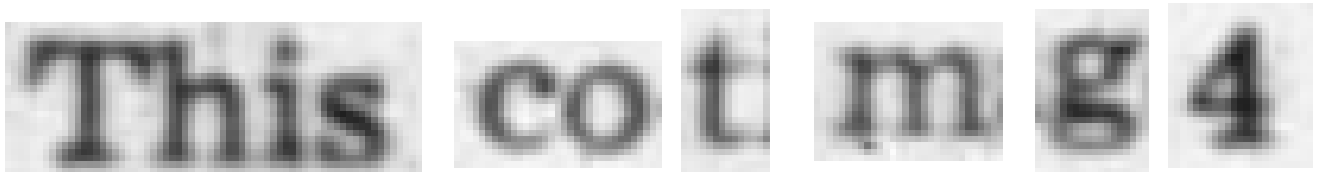


Figure 6: Typeface sample from Richmond News Leader, 1955.

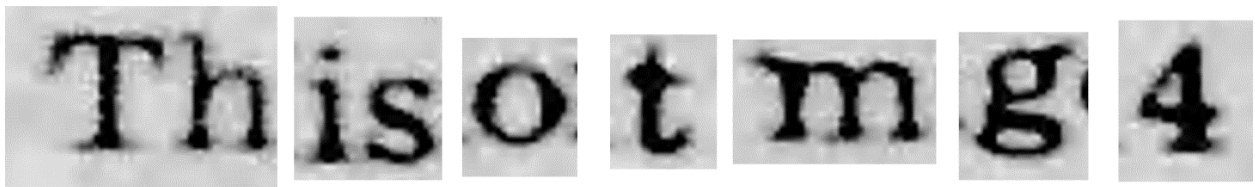


Figure 7: Typeface sample from The Virginia Gazette, 1956.