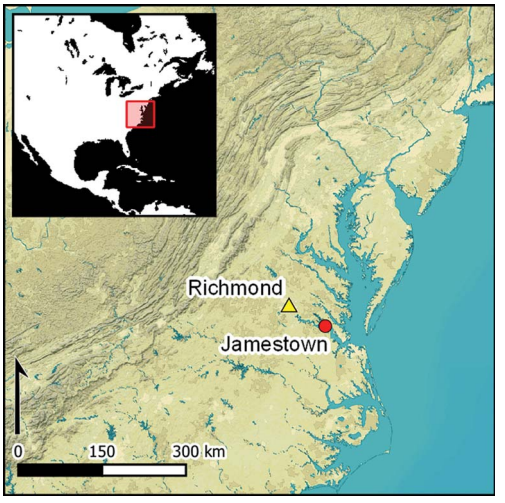
Antiquity 2024 Vol. 98 (400): 1040–1054
https://doi.org/10.15184/aqy.2024.75

Research Article

Historical and archaeogenomic identification of high-status Englishmen at Jamestown, Virginia

Douglas W. Owsley[1,†], Karin S. Bruwelheide[1,*,†], Éadaoin Harney[2,3,4,5,†], Swapan Mallick[3,6,7], Nadin Rohland[3], Iñigo Olalde[5,8,9], Kathryn G. Barca[1], Andrew J. Ramsey[1], Deborah A. Hull-Walski[1], William M. Kelso[10], Jamie E. May[10], Nasreen Broomandkhoshbacht[3,6], Matthew Ferry[3,6], Ann Marie Lawson[3,6], Megan Michel[3,6], Jonas Oppenheimer[3,6], Kristin Stewardson[3,6], Fatma Zalzala[3,6], Vicki E. Simon[1], David M. Givens[10], Michael D. Lavin[10] & David E. Reich[3,4,5,6,7]

[1] Department of Anthropology, National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA; [2] Department of Organismic and Evolutionary Biology, Harvard University, Cambridge, USA; [3] Department of Genetics, Harvard Medical School, Boston, USA; [4] The Max Planck-Harvard Research Center for the Archaeoscience of the Ancient Mediterranean, Cambridge, USA; [5] Department of Human Evolutionary Biology, Harvard University, Cambridge, USA; [6] Howard Hughes Medical Institute, Harvard Medical School, Boston, USA; [7] Broad Institute of MIT and Harvard, Cambridge, USA; [8] Ikerbasque-Basque Foundation of Science, 48009 Bilboa, Spain; [9] BIOMICs Research Group, Department of Zoology and Animal Cell Biology, University of the Basque Country UPV/EHU, 01006 Vitoria-Gasteiz, Spain; [10] Jamestown Rediscovery (Preservation Virginia), Williamsburg, USA
* Author for correspondence ✉ bruwelka@si.edu
† These authors contributed equally to this article.



The authors report on ancient DNA data from two human skeletons buried within the chancel of the 1608–1616 church at the North American colonial settlement of Jamestown, Virginia. Available archaeological, osteological and documentary evidence suggest that these individuals are Sir Ferdinando Wenman and Captain William West, kinsmen of the colony's first Governor, Thomas West, Third Baron De La Warr. Genomic analyses of the skeletons identify unexpected maternal relatedness as both carried the mitochondrial haplogroup H10e. In this unusual case, aDNA prompted further historical research that led to the discovery of illegitimacy in the West family, an aspect of identity omitted, likely intentionally, from genealogical records.

Keywords: North America, seventeenth century, aDNA, mtDNA, genealogy, illegitimacy

Received: 21 December 2022; Revised: 12 October 2023; Accepted: 5 December 2023

Introduction

In 1994, Jamestown Rediscovery archaeologists uncovered buried evidence of the 1607 James Fort (Figure 1). Preserved within this early North American English settlement, known as Jamestown or James City, are the material remains of the beliefs and rituals maintained by the immigrants that arrived in the colony, including evidence of their early churches. Excavations from 2010–2019 uncovered remnants of the 1608 church, which was the settlement's second, and the overlapping foundations of the subsequent third, fourth and fifth churches, built around 1617, 1647 and 1680 (post Bacon's Rebellion), respectively (Givens *et al.* 2016, 2020; Kelso 2017). Within the bounds of these structures, human remains have been encountered and recent research is expanding our understanding of the lives of these individuals.

The detailed integrative approach to the study of the human remains recovered from Jamestown merges various data sources, culminating in bio-histories for individual skeletons that sometimes align with records of deceased immigrants. As an example, the skeleton of an adult male buried outside of James Fort in a coffin with a captain's leading staff is believed to be Bartholomew Gosnold, champion of the Virginia colony venture, whose death and burial following a brief illness were documented in August 1607 (Kelso 2006). In other cases, the context of the bones and burials—as well as associated artefacts and signs of trauma—parallel historic references to Jamestown events and their unnamed victims. These include a female whose skeleton bears the marks of survival cannibalism, aligning with purported violent events that occurred at the settlement during the winter of 1609–1610 (Horn *et al.* 2013; Kelso 2017).

In 2013, four aligned graves were excavated from the chancel area of the 1608 church, centrally located within James Fort. Burial within the chancel, the eastern part of an Anglican church, signifies the high status of these four individuals (Seeman 2010). Cross-referencing historical information on ranking colonists whose deaths coincide with the brief use of the church (*c.* 1608–1616) with osteological and archaeological data, identified these men as Reverend Robert Hunt (1569–1608), Captain Gabriel Archer (1575–1609), Sir Ferdinando Wenman (also spelled Weyman or Wainmen) (1576–1610) and Captain William West (about 1586–1610) (McCartney 2007; Remington 2014; Givens *et al.* 2016; Kelso 2017).

This study reports on the ancient DNA (aDNA) analysis of two of these skeletons, believed to be Sir Ferdinando Wenman and Captain William West. Both are suspected kinsmen of the Jamestown colony's first Governor, Thomas West, Third Baron De La Warr. Initially, the study sought to retrieve Y-chromosome DNA of the West lineage through Captain William West, who bore the family surname. The intent of this approach was to secure reference data for comparison with remains that may be uncovered in the future corresponding with the identity of Thomas West, who died at sea in 1618 during his return voyage to the colony. His burial location is unknown, although it might be Jamestown (Kelso 2017). Before Captain West's Y-chromosome DNA could be used in this regard, his parentage needed to be confirmed, as it was not clearly defined in the documentary record. Therefore, the study also had the objective of exploring the familial relationship between William West and Wenman, whose well-documented genealogy shows him to be a cousin of Thomas West.

Owing to poor bone preservation, it was not certain that this study would recover DNA and yield results. However, analysis of this burial pair demonstrates that aDNA can clarify

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

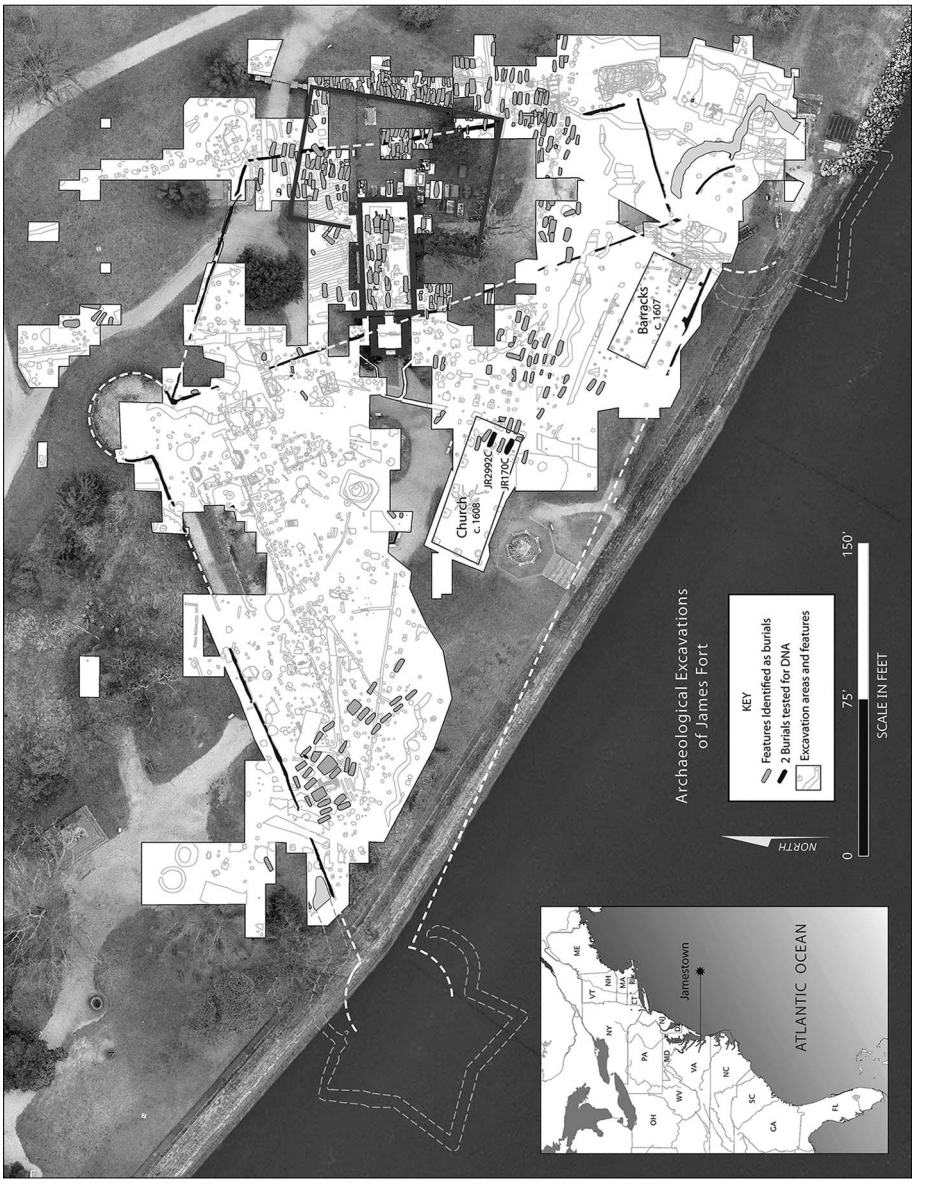


Figure 1. Map of Jamestown Island (North America) showing the triangular palisade of James Fort and the 1608 church containing burials in the chancel (JR170C and JR2992C highlighted) (figure by Jamie E. May, Jamestown Rediscovery (Preservation Virginia)).

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

interpretations of identity even for poorly preserved remains. In fact, the aDNA proved to be a critical component in identifying illegitimacy for one of the men and explained why so little was recorded for this presumably high-status individual. At the same time, the significance of the genomic data would not have been realised without a multidisciplinary approach to the identification. This study demonstrates the use of aDNA in such investigations of archaeological remains, and underscores the role of kinship in colonial settlement, particularly within the context of late-sixteenth- to early-seventeenth-century cultural norms.

Individuals JR2992C and JR170C

Of the four individuals buried in the chancel area of Jamestown's 1608 church (Figure 2), two (JR2992C and JR170C) had a matching coffin style, in this case a rarely used anthropomorphic form. Similarities in shape and the high quality of the nails used for their construction suggested that the same skilled carpenter built both coffins within a relatively brief period. This evidence, and the estimated ages at death for the two men (see online supplementary material (OSM) section 1), match with what is known about Sir Ferdinando Wenman and Captain William West (Givens *et al.* 2016; Kelso 2017).

Wenman (JR2992C), the first English knight to die in America, was a first cousin of Thomas West. Wenman was related both by blood and marriage to highly prominent families in England during the Elizabethan period (Remington 2014). In contrast, the lineage for Captain William West (JR170C) is obscure. He is referenced in one account as Thomas West's nephew, in a second as a "kinsman" (Kelso 2017: 175), and, based on a genealogical review, seemed more likely to be his uncle (Remington 2014). Wenman came to Virginia in June 1610 as a 34-year-old experienced military officer and investor in the Virginia Company. He arrived with Thomas West and Captain William West, who was a man estimated to be in his early 20s. By July or August of 1610, Wenman was dead. Captain West died in a conflict with Native Americans around the same time. Their formal interments in the church chancel were likely personally directed by Thomas West.

Although the life of Sir Ferdinando Wenman is relatively well documented, almost all that is known of Captain West comes from George Percy's '*A Trewe Relacyon*'—a first-hand account of the events that took place at Jamestown between the Bermuda shipwreck of the *Sea Venture* in 1609 and his departure from Virginia in 1612 (Tyler 1922). Percy first mentions William West on 9 August 1610 when he was to signal a raid against local Indigenous groups by firing his pistol into the air. Thomas West later (no date specified) travelled up-river to the falls near modern-day Richmond, Virginia, to construct a fort. Thomas West survived this journey but among those Percy recorded as dead was "his Kinsman Capte: William Weste" (Tyler 1922: 274–5).

The skeleton identified as JR170C is that of a male in his early twenties. Of note was the unusually high level of lead within the bones—126.8 parts per million, as measured by inductively coupled plasma mass spectrometry (ICP-MS) (Little *et al.* 2014)—the second highest of the four men buried in the chancel, with Wenman having the highest (Table S2). Lead exposure has been used as a marker of economic and social status during the colonial period; individuals who consumed food served on costly pewter and lead-glazed wares also ingested microscopic fragments of this glaze, leading to an accumulation of the heavy

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

Figure 2. The four aligned graves in the chancel area of the 1608 Jamestown church (c. 1608–1616). Shared coffin style and orientation contribute to the possible identification of the second (JR2992C) and fourth (JR170C) individuals from the left as members of the prominent West family. Image's left is directional north (photograph by Donald E. Hurlbert, Smithsonian Institution).

metal in their bones (Aufderheide *et al.* 1981, 1985; Aufderheide 1989). Also found with JR170C were remnants of an elaborate silver-fringed and spangled silk military sash, an article of clothing signifying the rank of captain (Givens *et al.* 2016; Kelso 2017).

William West's specific relationship to Thomas West and to Ferdinando Wenman was unclear. William could not have been Thomas's nephew as none of his brothers were old enough to have had a child of William's age. He was not a brother and did not appear to be a cousin as Thomas's father, also called Thomas, the second Barron De La Warr, had only three sisters listed in the heraldic visitation from the period, and none were identified as mother to William (Rylands 1913; Tyler 1924). His identification as a kinsman to Governor Thomas West thus denotes a relationship that was known at the time but has since been obscured by history.

Ancient DNA analysis

Genomic data were generated from the petrous portion of a temporal bone from JR2992C and a mandibular molar from JR170C (see OSM section 2, Table S3). Both skeletons exhibit relatively poor DNA preservation, with a total of 76 449 of the roughly 1.2 million targeted autosomal single nucleotide polymorphism (SNP) positions sequenced for individual

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

JR2992C, and only 12 657 targeted SNPs sequenced for individual JR170C (Table 1). Despite poor DNA preservation, coverage was sufficient to assign both individuals to mitochondrial haplogroup H10e (Table S4; Weissenstiner *et al.* 2016). The mitochondrial lineage H is commonly observed in much of west Eurasia, occurring at the highest frequencies in present-day Western Europe, where it accounts for more than 40 per cent of all mitochondrial DNA (mtDNA) lineages (Torroni *et al.* 2006; Brotherton *et al.* 2013). Within this lineage, the relatively rare haplogroup H10e has been observed in Europe in multiple ancient individuals, including two medieval individuals from Finland (Carvalho *et al.* 2016; Översti *et al.* 2019).

Crude Y-chromosome haplogroup assignments were obtained (Table S5), with JR2992C assigned to haplogroup I1 and JR170C assigned to haplogroup F. Although haplogroup I falls within the more basal haplogroup F, there was sufficient resolution (based on alleles observed at SNPs CTS7593 and PF3660) to confidently exclude the possibility that JR170C would also be assigned to this more specific haplogroup if more information were available. These results indicated that the two individuals did not share a recent paternal line ancestor (e.g. a father or paternal grandfather or great-grandfather).

Despite low coverage across the nuclear genome for these two individuals, the autosomal data were sufficient to conclude that they were unlikely to be first-degree relatives (Olalde *et al.* 2019). The inferred relatedness coefficient of 0.12 was most consistent with a third-degree relationship (such as that shared by first cousins). However, the 95% confidence interval associated with this estimate was very large (-0.049–0.280) and it is possible that the men had no close genetic relationship, although their shared mtDNA haplogroup means it is more probable that they did.

When the genomes of JR2992C and JR170C were projected onto a Principal Components Analysis (PCA) plot, a format that is commonly used to localise west Eurasian ancestry, the Jamestown men clustered with those having known British ancestry (Figure 3). Large 95% confidence intervals were also observed around these inferred positions, however, particularly for individual JR170C. Therefore, based on the small amount of autosomal DNA data that could be obtained from these two men, caution is advised when interpreting the results of any additional analyses performed on these genetic data.

Deciphering the familial relationship between JR2992C and JR170C

While DNA preservation of JR2992C and JR170C was too poor to use genome-wide data to conclusively ascertain whether the two individuals shared a close genetic relationship (Olalde *et al.* 2019), the assignment of both individuals to mitochondrial haplogroup H10e sheds light on the possible nature of kinship between them. Mitochondrial DNA is inherited along the maternal line, meaning that individuals with a shared mitochondrial haplogroup are related through their maternal ancestors at some point in the past. Haplogroup H10e emerged between 5700 and 7000 years ago (Behar *et al.* 2012; Carvalho 2014) and therefore the timing of the most recent shared maternal ancestor cannot be determined through analysis of the mtDNA alone. Yet these two men were buried close to each other in the 1608 church chancel and historical comments refer to them as kinsmen. Haplogroup H10e is

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

Table 1. Ancient DNA sample information.

Individual ID	Lab ID	Skeletal element sampled	Coverage on autosomal targets	SNPs hit on autosomal targets	Sex	mtDNA haplogroup	mtDNA match to consensus rate (%)	Y-chromosome haplogroup*	Damage rate in first nucleotide on sequences overlapping 1240k targets
JR2992C	I2096	petrous	0.069	76 449	M	H10e	97.95 ± 0.98	I1	0.260
JR170C	I4652	second molar	0.011	12 657	M	H10e	99.75 ± 0.13	F	0.112

*Y-chromosome haplogroup calls made for individuals with less than 100 000 SNPs should be interpreted with extreme caution due to low coverage.

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

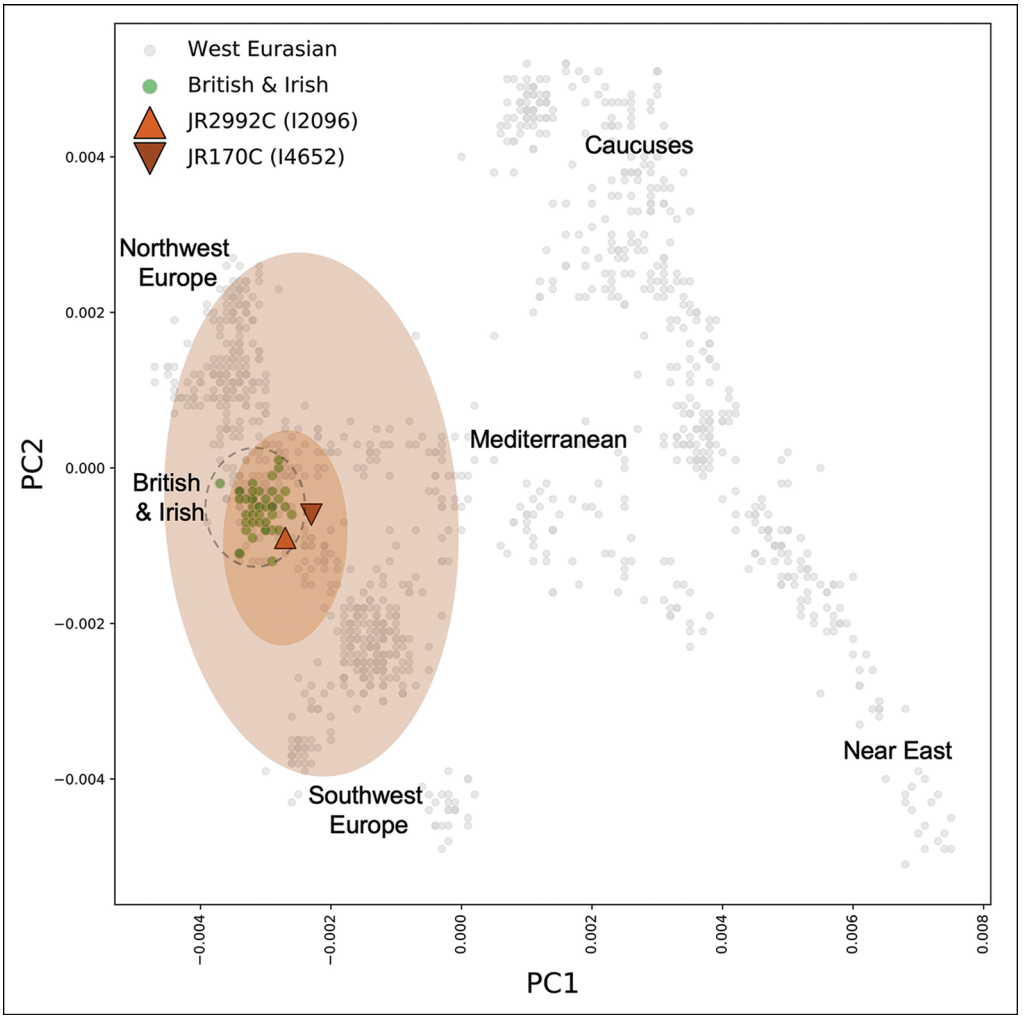


Figure 3. Broadly Western European ancestry detected in JR2992C and JR170C. Principal component analysis of 1320 present-day individuals from 66 populations from Europe and the Near East from the Human Origins dataset. All present-day individuals are shown in grey. The two Jamestown individuals of European ancestry (JR2992C and JR170C) are projected (figure by Éadaoin Harney).

also comparatively rare in the United Kingdom, having been found in only two of 3594 individuals in a recent study referencing both modern and historic DNA data (Fleskes *et al.* 2019). Given that one of the Jamestown individuals carried H10e, the probability that the other would also carry it if they were not close maternal relatives would be 0.056% (i.e. two in 3594). This is such a small probability that it can be concluded with some certainty that they are close maternal relatives.

Based on his surname, it was originally hypothesised that Ferdinando Wenman and Captain West were related through a shared paternal connection that extended back to William West (the elder), First Baron De La Warr—a connection that would not have involved a

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

shared maternal lineage. Historical and genealogical research established that William West the elder was born about 1532 and died in 1595 without leaving a known will or any testamentary evidence for a son named William (Remington 2014). William the elder was married twice: he married Elizabeth Strange *c.* 1554, then Anne Swift after 1579. William and Elizabeth Strange had three daughters, Jane, Mary and Elizabeth, and one son, his heir, Thomas West (Figure 4). If the elder William had a surviving son named William, he would have been born to the second wife, Anne. And yet, Anne and the elder William had no recorded children. In addition, Captain William West's year of birth appears to have been around 1586, based on suspected matriculation into Cambridge University in 1598 at the age of 12 (Remington 2014). If this year of birth is valid, then Anne would have been more than 50 years old, typically past childbearing age.

Historical research revealed that, before leaving for Virginia in 1610, Captain West left a nuncupative (oral) will that was proved in 1616 in the Prerogative Court of Canterbury, which handled the wills of larger English estates at the time. William bequeathed his possessions to Mary Blount (Blunt), wife of Richard Blount and daughter of William West the elder. Whatever the parentage of Captain West, it seems clear that Anne Swift West did not have a close relationship with him after her second husband, William West the elder, died, although Mary Blount may have. The will, and especially the genomic evidence, has renewed historical and genealogical research focused on the life histories of William West the elder's daughters and their progeny.

Married daughters Jane West Wenman and Mary West Blount had multiple recorded births (Figure 4). Furthermore, Mary had a baby born about the same time that William West the younger seems to have been born. The youngest daughter, Elizabeth West, had no recorded marriage or children. Thus the available genealogical information failed to identify William's mother.

Resolution of William's maternity was eventually found in a court pleading from 1616, *Blount v. Abbott* (on file in The National Archives of the UK n.d.). It states that Captain West had been raised by Mary Blount on behalf of her unmarried, deceased sister, Elizabeth. This information explains William's choice for naming Mary Blount as the beneficiary of his will. When Elizabeth died as a resident in her father's household, she left her jewels to the young William for his care. After the death of William the elder, his second wife, Anne Swift, took custody of the jewels. After Anne's death, the jewels moved into the estate of her third husband. Following Captain West's death, his aunt, caregiver and will beneficiary Mary Blount attempted to recover the inheritance. Two excerpts from *Blount v. Abbott* clarify these complex relationships.

Excerpt 1: Speaking about Elizabeth West and her relationship to William West:

> "And soe being possessed & lying in extremetie of sickness, being the sickness where so she shorlie after dyed and having one onely Cozen or friend (named the said William West) to whom she much desired to have or command the said jewells, chaynes and ornaments, for his better maintenance and preferment in living, he being then very young did by way of bequest or last will verballie Commit the said jewelles, Chanis, and ornaments, to one William West the elder to and for the use, behoofe & maintenance of the said William West the younger."

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

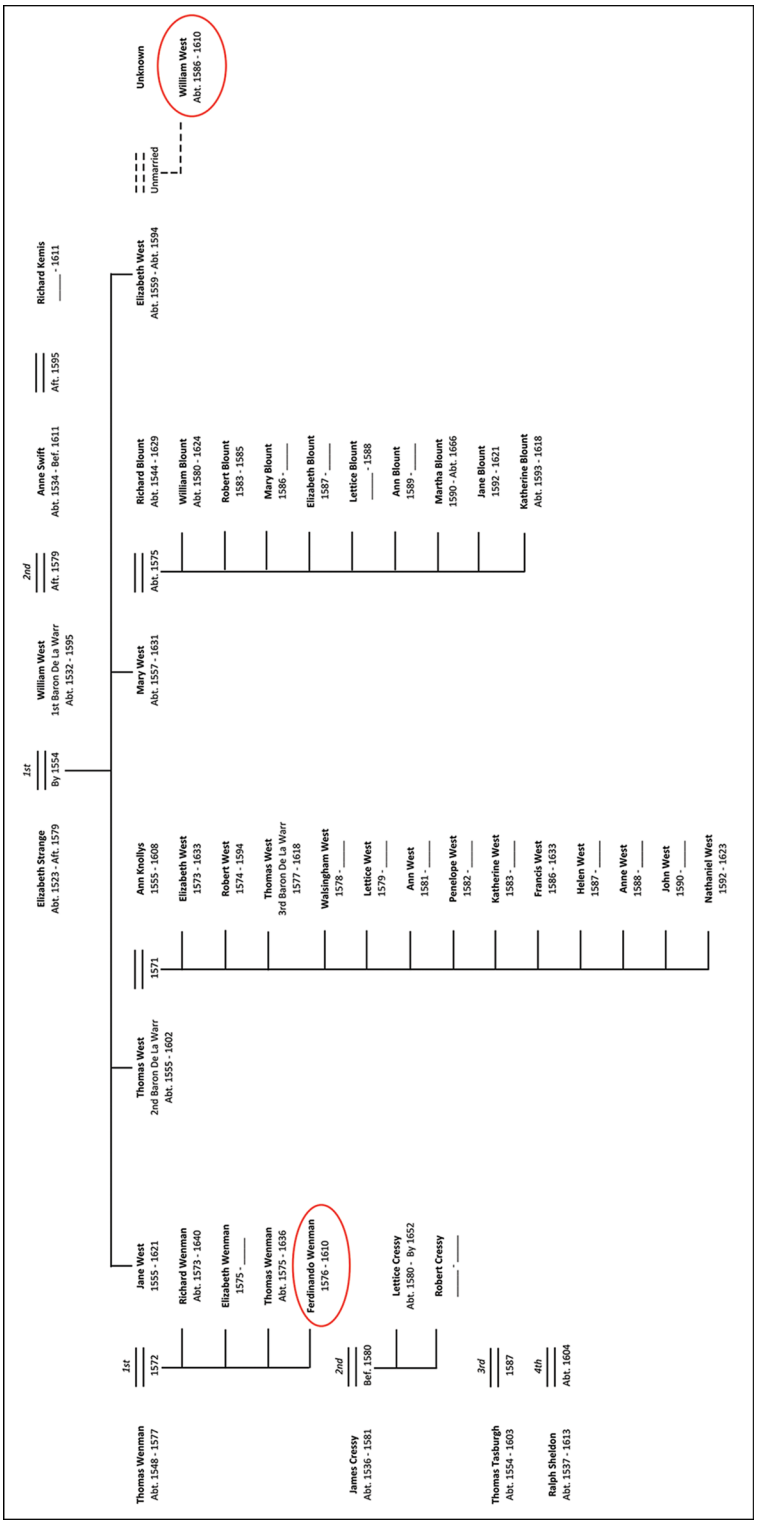


Figure 4. Three generations of the family tree of William West, First Baron De La Warr (figure by Deborah A. Hull-Walski & Andrew J. Ramsey, Smithsonian Institution).

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

Excerpt 2: The oratrix, Mary West Blount, had cared for William West:

> "William West the younger made his last will and testeament and thereby made your said oratrix executrix & died, after whose decease your said Oratrix lawfullie proved the said will according to his majesties…lawes of his Realme, and during the life of the said William West the younger did maintaine him in …meate, drink, apparel, and other necessearyes by reason the said William West the elder did neglect to performe the trust in him reposed by the said Elizabeth."

Despite the record stating that William the younger (i.e. Captain West) was the cousin of Elizabeth, there is no known family relationship indicating that this was literal. Instead, the statement that William (who was a small child at the time) was her "one onely Cozen or friend" seems to indicate in sanitised, non-incriminating language that William was, in fact, her child. The coded language and absence of formal documentary recognition of Captain West as her son supports the illegitimate nature of his birth. It also explains why Elizabeth never married, as bearing a child out of wedlock would have likely rendered her unmarriageable, isolated her socially and caused her considerable shame (Macfarlane 1980). This predicament could also explain why William was given his first name and kept the West surname.

Studies of illegitimacy in preindustrial England document a peak in its occurrence during the late sixteenth century and early seventeenth centuries, a period of converging socio-economic factors and high mortality from recurrent plagues (Cummins *et al.* 2016). While studies of illegitimacy show higher rates (often biased based on available records) in communities experiencing poverty and immigration (Scott & Duncan 1997), this study reveals its occurrence within a prominent English family of this era. What can be learned from this case?

The study shows that identifying illegitimacy in families of wealth can be difficult as these relationships were often excluded from recorded lineages. The poor had less choice or motivation to hide such births as aid was often sought from the church or court. Harsher treatments and attitudes related to illegitimate birth were rendered to the poor as a result. As Walter King summarises in his review of punishment for bastardy in early seventeenth-century England "…it was pauper bastardy and not bastardy per se which was so intolerable" (1978: 134). Parents or families (aunts, uncles or grandparents) financially able to care for the illegitimate child suffered less, although the stigma of birth outside of marriage remained for both family and child. The court case cited above demonstrates that even the wealthy were not immune to the economic implications of illegitimacy, however, and it seems fitting that Captain West's story ends in a dispute over property linked to his care in childhood.

Another commonality in cases of illegitimacy is noteworthy: departure from one's natal community. Parents of illegitimate children often moved from the community of birth to hide the child's status (Low 1989). The adult Captain West likely understood the personal advantages of leaving England and partaking in the Jamestown venture. Since he arrived accompanied by two older cousins, it can be assumed that Captain West's family also likely encouraged his departure to a place offering greater economic and social opportunities.

The extent to which illegitimacy affected Captain West during his brief life remains mostly unknown but his narrative, as revealed through genetics and archival research, documents one

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

prominent seventeenth-century English family's actions, if not attitudes, towards illegitimacy. The West family had the economic means to care for Elizabeth and her child and chose to do so. Elizabeth remained part of her father's household until her death. Afterwards, care for William was assumed by his maternal aunt. Although his grandfather neglected to provide for him as his mother wished, West was able to receive an education followed by military service. Military service was a common option for younger sons and distant relations of landed families who were often promised smaller portions of their family's estates. They sometimes entered the military or made investments into other ventures to better secure their standards of living. For both Captain West and Ferdinando Wenman, their connections to the West family helped them to obtain positions in the new colony under their cousin, Governor Thomas West. Although their prospects were cut short, both received burials in places of honour within the church at Jamestown. Such an honour would likely not have been extended to Captain West in England.

Conclusion

This study is the first to demonstrate that aDNA can be used as a tool in identifying not only ancestry but historical cases of illegitimacy in high-status, seventeenth-century families. Based on the results of the aDNA analysis, extensive genealogical and historical research helped to untangle the relationship between Captain William West and Ferdinando Wenman, particularly along their maternal line. Court records insinuate that Captain West was the illegitimate son of Elizabeth, the unmarried daughter of William West the elder, First Baron De La Warr. Jane, Mary and Elizabeth, as daughters of Elizabeth Strange, would have shared the same mitochondrial haplogroup. Ferdinando Wenman and Captain West, as children of Elizabeth Strange's daughters, would also share that same mitochondrial haplogroup.

The aDNA data reported for these two men reveals a previously unrecorded aspect of identity for one, and alters initial perceptions held by researchers regarding his parentage. Despite the study's failure to secure precise paternal reference data for the West lineage, the DNA findings are appreciated for the clarity they provide to identification, especially within the context of other types of data (i.e. archaeology, skeletal biology, chemical analysis, genealogy and historical primary source documents). This study further reinforces the need for multidisciplinary approaches to better answer questions of not only who was involved in colonisation, but possibly, why.

Ethical considerations

The genetic work was conducted in accordance with guidelines for the ethical analysis of ancient DNA (Alpaslan-Roodenberg *et al.* 2021). The bioarchaeological investigation at Jamestown was conducted in coordination with the Virginia Department of Historic Resources and in accordance with Section 10.1-2305 of the Code of Virginia regarding the excavation of human remains from archaeological contexts. This study was planned with Preservation Virginia and consultations occurred with both Preservation Virginia and the Colonial National Historical Park during its implementation. Bioarchaeological research

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

at Jamestown is supported and endorsed by the Jamestowne Society, which represents genealogical descendants of the colonists to Virginia.

Acknowledgements

This work has benefitted from a dedicated research team of numerous individuals, with special thanks to those from Jamestown Rediscovery. Christine France of the Smithsonian's Museum Conservation Institute provided analytical support and help with interpreting the stable isotope data. ICP-MS testing of lead values in bone was conducted by Nicole Little, Smithsonian's Museum Conservation Institute. Smithsonian genealogists were assisted by Kelsey Falquero.

Funding statement

This research was sponsored by the Rice Family Foundation, with special thanks to Edward Rice; the Jamestowne Society under Governor Thomas B. Leitch and Executive Director Bonnie Hofmeyer; and the Kathryn Nell Harrison Foundation. Ancestry.com sponsored genealogical research on Ferdinando Wenman and William West by Gordon L. Remington of Progenealogists as arranged by Brock Bierman. Éadaoin Harney was supported by a grant from The Max Planck-Harvard Research Center for the Archaeoscience of the Ancient Mediterranean. The genetic analysis was also supported by grants from the National Institutes of Health (GM100233 and HG012287), the John Templeton Foundation (grant 61220), the Allen Discovery Center program, a Paul G. Allen Frontiers Group advised program of the Paul G. Allen Family Foundation, and by the HHMI.

Data availability

The aligned sequences are available through the European Nucleotide Archive under accession number PRJEB75332. Genotype datasets used in the analysis are available at https://reich.hms.harvard.edu/datasets.

Supplementary material

To view supplementary material for this article, please visit https://doi.org/10.15184/aqy.2024.75.

References

Alpaslan-Roodenberg, S. *et al.* 2021. Ethics of DNA research on human remains: five globally applicable guidelines. *Nature* 599: 41–46. https://doi.org/10.1038/s41586-021-04008-x

Aufderheide, A.C. 1989. Chemical analysis of skeletal remains, in M.Y. İşcan & K.A.R. Kennedy (ed.) *Reconstruction of life from the skeleton*: 237–60. New York: Alan R. Liss.

Aufderheide, A.C., F.D. Neiman, L.E. Wittmers Jr & G. Rapp. 1981. Lead in bone II: skeletal-lead content as an indicator of lifetime lead ingestion and the social correlates in an archaeological population. *American Journal of Physical Anthropology* 55: 285–91. https://doi.org/10.1002/ajpa.1330550304

Aufderheide, A.C., J.L. Angel, J.O. Kelley, M.A. Outlaw, G. Rapp Jr & L.E. Wittmers Jr. 1985. Lead in bone III: prediction of social correlates from skeletal lead content in four Colonial American populations (Catoctin

Furnace, College Landing, Governor's Land, and Irene Mound). *American Journal of Physical Anthropology* 66: 353–61. https://doi.org/10.1002/ajpa.1330660402

Behar, D.M. *et al.* 2012. A "Copernican" reassessment of the human mitochondrial DNA tree from its root. *American Journal of Human Genetics* 90: 675–84. https://doi.org/10.1016/j.ajhg.2012.03.002

Brotherton, P. *et al.* 2013. Neolithic mitochondrial haplogroup H genomes and the genetic origins of Europeans. *Nature Communications* 4. https://doi.org/10.1038/ncomms2656

Carvalho, A.F. 2014. *Bom Santo Cave (Lisbon) and the Middle Neolithic societies of southern Portugal*. Faro: Universidade do Algarve.

Carvalho, A.F. *et al.* 2016. The Bom Santo Cave (Lisbon, Portugal): catchment, diet, and patterns of mobility of a middle Neolithic population. *European Journal of Archaeology* 19: 187–214. https://doi.org/10.1179/1461957115Y.0000000014

Cummins, N., K. Morgan & C.Ó. Gráda. 2016. Living standards and plague in London, 1560–1665. *The Economic History Review* 69: 3–34. https://doi.org/10.1111/ehr.12098

Fleskes, R.E. *et al.* 2019. Ancient DNA and bioarchaeological perspectives on European and African diversity and relationships on the colonial Delaware frontier. *American Journal of Physical Anthropology* 170: 232–45. https://doi.org/10.1002/ajpa.23887

Givens, D., L. Fischer, J. Horn, W. Kelso, K. Bruwelheide & D. Owsley. 2016. *Holy Ground: archaeology, religion, and the first founders of Jamestown*. Jamestown: The Jamestown Rediscovery Foundation and Preservation Virginia.

Givens, D., M.A. Hartley, J. Horn & M. Lavin. 2020. *Church & state: the archaeology of the foundations of democracy* 1619–2019. Jamestown: The Jamestown Rediscovery Foundation and Preservation Virginia.

Horn, J., W. Kelso, D. Owsley & B. Straube. 2013. *Jane: starvation, cannibalism, and endurance at Jamestown*. Williamsburg: The Colonial Williamsburg Foundation and Preservation Virginia.

Kelso, W.M. 2006. *Jamestown: the buried truth*. Charlottesville: University of Virginia Press.

– 2017. *Jamestown: the truth revealed*. Charlottesville: University of Virginia Press.

King, W.J. 1978. Punishment for bastardy in early seventeenth-century England. *Albion: A Quarterly Journal Concerned with British Studies* 10(2): 130–51.

Little, N.C., V. Florey, I. Molina, D.W. Owsley & R.J. Speakman. 2014. Measuring heavy metal content in bone using portable x-ray fluorescence. *Open Journal of Archaeometry* 2: 19–21. https://doi.org/10.4081/arc.2014.5257

Low, B.S. 1989. Occupational status and reproductive behavior in nineteenth-century Sweden: Locknevi parish. *Social Biology* 36: 82–101. https://doi.org/10.1080/19485565.1989.9988721

Macfarlane, A. 1980. Illegitimacy and illegitimates in English history, in P. Laslett, K. Oosterveen & R.M. Smith (ed.) *Bastardy and its comparative history: studies in the history of illegitimacy and marital nonconformism in Britain, France, Germany, Sweden, North America, Jamaica, and Japan*: 71–85. Cambridge (MA): Harvard University Press.

McCartney, M.W. 2007. *Virginia immigrants and adventurers* 1607–1635*: a biographical dictionary*. Baltimore: Genealogical Publishing Company.

Olalde, I. *et al.* 2019. The genomic history of the Iberian Peninsula over the past 8000 years. *Science* 363: 1230–34. https://doi.org/10.1126/science.aav4040

Översti, S. *et al.* 2019. Human mitochondrial DNA lineages in Iron-Age Fennoscandia suggest incipient admixture and eastern introduction of farming-related maternal ancestry. *Scientific Reports* 9. https://doi.org/10.1038/s41598-019-51045-8

Remington, G.L. 2014. The life of Sir Ferdinando Weyman of Jamestown and Captain William West. Report by ProGenealogists for Ancestry.com.

Rylands, W.H. 1913. West, Lord Delaware, in W.H. Rylands (ed.) *Pedigrees from the Visitation of Hampshire: 1530, 1757, 1622 and 1634* (Publications of the Harleian Society 114): 58–59. London: Harleian Society.

Scott, S. & C.J. Duncan. 1997. Interacting factors affecting illegitimacy in preindustrial northern England. *Journal of Biosocial Science* 29: 151–69.

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press

Seeman, E.R. 2010. *Death in the New World, cross-cultural encounters 1492–1800*. Philadelphia: University of Pennsylvania Press.

The National Archives of the UK (TNA). n.d. C 3/260/77 *Blount v. Abbott*.

Torroni, A., A. Achilli, V. Macaulay, M. Richards & H.J. Bandelt. 2006. Harvesting the fruit of the human mtDNA tree. *Trends in Genetics* 22: 339–45. https://doi.org/10.1016/j.tig.2006.04.001

Tyler, L.G. (ed.) 1922. "A Trewe Relacyon:" Virginia from 1609 to 1612. *Tyler's Quarterly Historical and Genealogical Magazine* III(4): 259–82.

– 1924. The West family. *Tyler's Quarterly Historical and Genealogical Magazine* 6(1): 116–120.

Weissensteiner, H. *et al.* 2016. HaploGrep 2: mitochondrial haplogroup classification in the era of high-throughput sequencing. *Nucleic Acids Research* 44(W1): W58–W63. https://doi.org/10.1093/nar/gkw233

https://doi.org/10.15184/aqy.2024.75 Published online by Cambridge University Press