Y-DNA of the British Monarchy

A review on the occasion of the birth of the Prince of Cambridge

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Abstract

A review was made of existing genetic genealogy findings that infer characteristics of the Y-DNA of members of the British Monarchy. Nine (9) sustained Y-DNA lineages since the year 927 CE were noted as dynastic groups. Haplogroup and haplotype characteristics of three of the dynasties were presented with two more dynasties noted as testable but unpublished. Cultural and geographical origins of these dynasties were considered as context for their DNA haplogroups. Specimen candidates for further testing were identified noting that some will require Ancient DNA (aDNA) recovery and analysis.

Introduction

Genetic genealogy using Y-DNA focuses on the portion of the Y-chromosome which passes from father to son with only rare mutations. While many think of the throne of the British monarchy being passed in the same way, that crown has undergone some 'non-linear' transitions over its long history. Counting those transitions which yielded adult heirs to the throne, there have been nine (9) different Y-DNA dynasties in the 1,086 years since Aethelstan became the first King of England in 927 CE.³

Exclusions. Note that in counting the Y-DNA dynasties, we have ignored disputed claimants with no meaningful rule such as Bonnie Prince Charlie, Lady Jane Grey, and Louis VIII of France. Also excluded were three (3) potential dynasties which reached the throne but were not sustained with an heir:

- King William III of Orange (1650-1702), husband of Queen Mary II (1662-1694)
- King Philip II of Spain (1527-1598), husband of Queen Mary I (1516-1558)
- King Stephen of Blois (1092-1154)

Applicability. Thanks to affordable commercial DNA testing, members of the general public can obtain their own Y-DNA heritage and compare themselves to published findings. While matches to royal lineages may be uncommon, the prospect of making such a fascinating connection can serve as a catalyst for individual testing. Collectively such tests add to the breadth of our understanding of human Y-DNA and benefit the scientific community.

aDNA. In addition to commercial DNA tests, the field of *Ancient DNA* (aDNA) testing of human remains is starting to make significant contributions to genetic genealogy. While MtDNA results are much more easily obtained, Y-DNA extractions from aDNA samples have been performed successfully.¹⁰ Where royal genealogies are concerned, aDNA holds special potential because the location of royal graves are often recorded by history. Further, aDNA extraction from royal mausoleums and cathedral tombs may yield more molecular material than do remains from field graves.



Fig. 1: List of British Monarchs and Patriarchs 1603-2013 Mountbatten, Windsor, Hannover, and Stuart dynasties with their monarchs and major patriarchs

1. Mountbatten Heirs

Media observers refer to the current royal family as 'The House of Windsor' but the three generations of current royal heirs will probably be known in the future as the Mountbatten dynasty:

- Charles, Prince of Wales and heir apparent (b. 1948)
- Prince William, Duke of Cambridge (b. 1982)
- Prince George of Cambridge (b. 2013)

All these Mountbatten heirs trace their Y-DNA from Prince Philip Mountbatten, Duke of Edinburgh (b. 1921 Greece). Prince Philip descends maternally from Queen Victoria (1819-1901) and Prince Louis of Battenberg (1854-1921). Phillip's Y-DNA lineage, however, is traced to King Christian III of Denmark (1503-1559) and further back to the medieval House of Oldenburg: John II of Oldenburg, Germany (1272-1301).

House of Oldenburg. The House of Oldenburg is one of Europe's most prolific lineages with branches that include:

- the current King Harald V of Norway (b. 1937)
- the current Queen Margarethe II of Denmark (b. 1940)
- Prince George Oldenburg of Denmark (1653-1708), husband of British Queen Anne (1665-1714)
- Nicholas II of Russia (1868-1918), the last Romanov Tsar²

Because Prince Philip is also a matrilineal cousin to Tsar Nicholas II's wife, he should have both Y-DNA and MtDNA matches for members of the last Tsar's family. When remains thought to belong to that family were discovered in Russia, Philip personally contributed a DNA sample which helped verify their authenticity.¹



Fig. 2: Shared Patrilineal Descent of Romanovs and Mountbattens

Both Tsar Nicholas II and Prince Philip, Duke of Edinburgh were paternally descended from Frederik I, King of Denmark and Norway 1523-1533.

Figure 2 illustrates how Prince Philip, Duke of Edinburgh and Tsar Nicholas II of Russia are patrilineal 11th cousins, once removed with a known TMRCA of 450 years.¹⁶ In terms of the potential difference in their STR allele values, their relationship is 26 DNA generations apart (26 x 17 alleles = 442 potential mutation events). With an average Y-STR mutation rate of 0.0024, we would expect to see only a single allele difference between the two men over 17 markers.¹⁹

Based on the Y-STR results released in the Romanov studies, the Mountbatten Y-DNA signature can be inferred from the Tsar's results shown in Figure 3.¹⁸ This Y-DNA signature was classified as part of the Atlantic Modal Haplotype (AMH) cluster within haplogroup R1b. Unfortunately, with only 17 STR values published, we can only make a low resolution assessment. For this paper, a comparison was made between the Tsar's results and the latest modal values for R1b-L21²¹ and R1b-U106²² but no clear distinction was found. The precision of the Mountbatten / Oldenburg lineage could be improved with a new round of SNP testing and publication of the existing samples from Prince Philip and living Romanov descendants.

Source		Dyna	isty	DYS 393	DYS 390	DYS 19	DYS 391	DYS 385a	DYS 385b	DYS 426	DYS 388	DYS 439	DYS 389-I	DYS 392	DYS 389-II	1
Tsar Nicholas II o	sar Nicholas II of Russia Mountbatten		13	24	14	10	11	14			11	13	13	29		
Coburg descenda 1819-1861	nt of Prince Al	bert Wind	sor	13	24	14	11	11	14	12	12	11	13	13	29	
Ducal Descendan II	t of King Charl	es Stuart		13	24	14	11	11	14	12	12	12	13	13	29	
R1b-L21 Project N 8/7/2013 n=1997)	Aodal (Calcula	ted R1b-	d R1b-L21		24	14	11	11	14	12	12	12	13	13	29	
R1b-U106 Project Modal (Calculated 8/7/2013 n=443)		R1b-	U106	13	23	14	11	11	14	12	12	12	13	13	29	
					-								_			
Dynasty	DYS 458	DYS 459a	DYS 459b	DYS 455	DYS 454	DYS 447	DYS 437	DYS 448	GATAH4	DYS 456	DYS 438	DYS 635	Diff	erence		
Dynasty Mountbatten	DYS 458 17	DYS 459a	DYS 459b -	DYS 455 -	DYS 454 -	DYS 447	DYS 437	DYS 448 19	GATAH4 12	DYS 456 16	DYS 438	DYS 635 24	Diff f Mou	erence rom htbatten	Markers Observed Ur	Pct
Dynasty Mountbatten Windsor	DYS 458 17 18	DYS 459a - 9	DYS 459b - 9	DYS 455 - 11	DYS 454 - 11	DYS 447 - 25	DYS 437 15 15	DYS 448 19 19	GATAH4 12 11	DYS 456 16 18	DYS 438 12 12	DYS 635 24 -	Diff f Mour	erence rom ntbatten	Markers Diserved Ur 16	Pct Jnmatcl 31%
Dynasty Mountbatten Windsor Stuart	DYS 458 17 18 17	DYS 459a - 9 9	DYS 459b - 9 9	DYS 455 - 11 11	DYS 454 - 11 11	DYS 447 - 25 25	DYS 437 15 15 15	DYS 448 19 19 19	GATAH4 12 11 10	DYS 456 16 18 15	DYS 438 12 12 12	DYS 635 24 - 23	Diff Mout	erence rom htbatten 5 6	Markers Diserved Ur 16 17	Pet Jnmatel 31% 35%
Dynasty Mountbatten Windsor Stuart R1b-L21	DYS 458 17 18 17 17 17	DYS 459a - 9 9 9	DYS 459b - 9 9 10	DYS 455 - 11 11 11	DYS 454 - 11 11 11	DYS 447 - 25 25 25	DYS 437 15 15 15 15 15	DYS 448 19 19 19 19	GATAH4 12 11 10 11	DYS 456 16 18 15 16	DYS 438 12 12 12 12 12	DYS 635 24 - 23 23	Diff f Mour	erence rom 1tbatten 5 6 4	Markers Dbserved Ur 16 17 17 17	Pet Inmatel 31% 35% 24%

Fig. 3: Royal Y-STR Test Results

Comparison of Y-STR allele values for the three royal lineages with publically available results plus comparison of Mountbatten with major R1b modals.

2. House of Windsor

The Windsor dynasty began with the crowning of King Edward VII (1841-1910) in 1901 and culminates with its fifth monarch, the current Queen Elizabeth II (b. 1926). The family surname was changed from 'Saxe-Coburg and Gotha' to 'Windsor' when King George V (1865-1936) renounced his Germany territories and titles during World War I. This Y-DNA lineage came from Prince Albert of Saxe-Coburg and Gotha (1819-1861) who was the husband of Queen Victoria (1819-1901). The paternal Windsor DNA line continues back to Franz Josias (Germany 1697-1764); John, Elector of Saxony (1468-1532); and further to Dietrich I of Wettin, Germany (916-976).¹⁶

House of Wettin. There are numerous royal lineages from the House of Wettin. The Y-DNA signature for the House of Wettin is characterized as Haplogroup R1b-U106 with the additional SNP Z305+ (Figure 5). This finding comes from tests of two descendants of Prince Franz Herzong von Sachsen-Coburg-Saalfeld (1750-1806).⁸ Figure 4 illustrates the genealogy connection between a Coburg Prince and the Windsor Monarchs. The test participant is a second cousin, twice removed to King George VI (1895-1952) with a known TMRCA of 166 years.



Fig. 4: Shared Patrilineal Descent of Coburg Princes with Windsor Monarchs

Illustration of the genealogical relationship between a Coburg Prince who has taken a Y-DNA test and the Windsor line of monarchs.

3. House of Hannover

The Hannoverians are best known to Americans for King George III (1738-1820) on whom much of the Declaration of Independence (1776) was focused. This lineage came to the throne when Parliament searched far and wide for a new monarch based on religious preference. They found a German-speaking grandson of King James I (1566-1625) through two maternal lines who was dubbed King George I (1660-1727). This dynasty put five (5) members on the throne and traces back to George of Brunswick, Germany (1582-1641).

There is not a Y-DNA signature publically identified for the Hannoverian lineage. However, there are a number of living persons whose genealogies link them to this lineage. For instance, the living male descendants of Ernst August von Hannover (1914-1987) are good candidates for testing.¹⁶



Fig. 5: Notional Phylogenetic SNP Tree

A phylogenetic tree of the key SNP differences identified with British Y-DNA lineages based on currently available information.

4. Stuart

The Stuart line of monarchs were among the most controversial in their own time. Although their matriarch, Mary Queen of Scots (1542-1567), was beheaded, her son King James I (1566-1625) unified the Scottish and English crowns in 1603. Despite the English Civil War and a twelve-year interregnum, a total of six (6) monarchs were crowned from the paternity of Henry Stuart, Lord Darnley of Scotland (1545-1567). This Y-DNA linage can be traced further back to Robert II of Scotland (1316-1390), Walter FitzAlan (1106-1177) and Alan FitzFlaad (1070-1114) who came from Brittany, France as a knight in Norman service. Because Brittany was settled (and named) by displaced Celts from Britain in the 5th century, this lineage is thought to be anciently Celtic.

Although the Stuart line of British monarchs ended with the death of Queen Anne in 1714, there are several living Dukes and other Peers who are patrilinealy descended from King Charles II (1630-1685).¹² Thus, the Stuarts could easily return to the throne if a female Mountbatten heiress were to marry a Stuart male in the future. The recent birth of a male Prince Cambridge, however, makes the possibility of returning a Stuart to the throne unlikely for the 21st century.

Thanks to an energetic DNA project ¹² and the participation of many Stuart / Stewart descendants, the Stuart Y-DNA signature is the best-studied of all the British monarchs. Figures 3 and 5 include test result highlights for the Stuarts based on an identified ducal descendant of King Charles II.²⁰ Their Y-DNA is characterized as part of haplogroup R1b-L21 with the key SNP mutation L745. This R1b-L21 result is consistent with the Celtic attribution of the Stuart's 11th century patriarch.



Tudor and Plantagenet dynasties with their monarchs and major patriarchs

5. The Tudors

The Tudors are best known for King Henry VIII (1491-1547) and his daughter, Queen Elizabeth I (1533-1603). This dynasty provided five (5) English monarchs and is the only royal male line attributed to Celtic Wales. Henry VIII's father, Henry Tudor (1457-1509), began the dynasty in 1485 by winning the crown in battle for the Lancastrians and closing the War of the Roses by marrying Elizabeth of York (1465-1503). Henry Tudor's paternal ancestors are believed to descend from Ednyfed Fychan (1170-1246) of Wales. ¹⁶

A Tudor Y-DNA signature has not been identified and there are no documented descendants after the 17th century. If a signature can be identified, however, there may be numerous living matches because the 'Tudor' surname is still common where the royal Tudors originated on the Isle of Angelsey in Wales. There is at least one person of Welsh descent and surname who claims paternal descent from Henry VIII's ancestor, Ednyfed Fychan. It is also reputed that Mary Boleyn's first son, Henry Carey (1526-1596), was an illegitimate son of Henry VIII and may have had descendants that survived but faded from historical records. Carey's remains lie in Westminster Abbey while Henry VIII's remains lie in St George's Chapel at Windsor Castle so the potential for aDNA to reveal this Y-DNA signature is tantalizing.

6. Plantagenets

The Plantagenets are perhaps best known for King Edward I [Longshanks] (1239-1307) as portrayed in the movie *Braveheart* (1995). The Plantagenets are sometimes subdivided into the Lancastrian and Yorkist factions who fought the bloody War of the Roses over succession. But all of the fourteen (14) monarchs of this group were paternally descended from King Henry II (1133-1189) who was born in France and brought Ireland and England under the same crown. Although his mother was a granddaughter of William the Conqueror (1028-1087) and daughter of English King Henry I (1068-1135), Henry II's Y-DNA came from his father Count Geoffrey V of Anjou (1113-1151) and further back from Geoffrey Ferole II, Count of Gastinois, France (1000-1046).

Plantagenet DNA characterization has been in the news this past year with an announcement of findings (without data) that MtDNA evidence supports the identification of a body discovered in Leicestershire as being the remains King Richard III (1452-1485).⁹ Researchers have identified four (4) surviving male descendants of Henry Somerset, 5th Duke of Beaufort (1744-1803) who should be Y-DNA matches for Richard III and all Plantagenet kings. Unfortunately, those results have not been published and were refused for this paper.⁷

There have also been news stories about an Australian man named Simon Abney-Hastings, 15th Earl of Loudun (b. 1972), who might have been heir to the British crown from George Plantagent, Duke of Clarence (1449-1478) under an alternative succession.⁴ However, that lineage has seven (7) maternal descents and so does not have any Plantagenet Y-DNA preserved.

If a confirming Plantagenet aDNA sample is needed, investigators might consider King Henry III (1312-1377) who was interred in a chest tomb inside Westminster Abbey, London.¹⁵ Or perhaps the royal tomb of King Henry IV (1366-1413) at Canterbury Cathedral should be considered. Unlike many of his kinsmen, Henry IV died of natural causes and was buried with great care by his widow.⁵



Fig. 7: List of British Monarchs and Patriarchs 927-1154

Blois, Norman, Wessex, and Knýtlinga dynasties with their monarchs and major patriarchs

7. House of Normandy

The House of Normandy was seated with the successful invasion of England in 1066 by William I [the Conqueror] (1028-1087). This dynasty introduced French language and martial skills into the Anglo-Saxon culture of England. To put it in modern terms, these Normans were the high tech gurus of the 11th century with innovations like the Domesday Book, elaborate castles, and combined-arms warfare. Yet for all the territorial gains of William the Conqueror, his dynasty did not last long – only three (3) monarchs over 69 years. William's Y-DNA came from his Viking ancestor Robert I [Rollo] (846-931) who was probably born in Denmark and became Duke of Normandy, France in about the year 900.

There are no patrilineal descendants of William the Conqueror who survived past the 12th century.¹⁶ Nor are there any modern DNA test results that have been linked to his paternal ancestors. William I and Henry I were both buried in abbeys but their remains were destroyed in subsequent centuries. There may be a chance for an aDNA test, however, as some of the bones of William II (1056-1100) are believed to be in a mortuary chest in Winchester Cathedral.¹⁴

8. House of Wessex

Aethelstan (893-939) was the first person since Roman times to unify all of England under one king in the year 927. While it is common today to refer to persons from the British Isles as 'Anglo-Saxons', it has actually been 947 years since the last true Anglo-Saxon king, Harold Godwinson (1022-1066), was defeated by William the Conqueror. From Aethelstan to Godwinson, the 'West Saxon' or Wessex dynasty provided a total of ten (10) rulers from the Y-DNA lineage of Egbert, King of Wessex (770 – 839) who was born in what is today Oxfordshire, England. Today's English language derives principally from Wessex ancestors who came to Britain from northern Germany between the 4th and 8th centuries.

Although Harold Godwinson perished, there were likely fourteen (14) or more sons or nephews carrying the Godwinson Y-DNA living in the year 1081. However, these individuals receded from history and we simply don't know how to identify any Wessex Y-DNA carriers from traditional genealogy. Since Harold's body is believed to be buried near the battlefield of Hastings, aDNA may yet enable comparison of the Wessex dynasty with living individuals who have been tested. Bones of earlier Wessex Kings are claimed to be inside Winchester Cathedral as well. There is also a new effort to examine remains that might belong to King Alfred the Great (849-899) at Hyde Abbey, Winchester.¹⁷

9. House of Knýtlinga

Viking forces operated in England from 793 to 1075 with frequent battles against the House of Wessex. A Viking-based dynasty called Knýtlinga was established in 1013 and is best known for King Canute (985-1035) who subdued the Anglo-Saxons; coined his own money; and also ruled over Denmark, Norway, and parts of Sweden. However, Canute's sons all died within seven years of their father so that power in England was reclaimed by the Anglo-Saxons of Wessex.

Canute's Y-DNA line came from Harthacnu I, King of Denmark (880-936). Although Harthacnu I's descendants continued to serve as members of Scandanavian royal families, as far as we can tell, this Y-DNA line 'daughtered-out' with no patrilineal descendants that can be tested today. Thus, aDNA is the only means currently feasible for identifying this Y-DNA lineage. There is one identified source, however, as the bones of Canute himself are said to be preserved in Winchester Cathedral.

Summary

In the past 1,086 years since Aethelstan became the first King of England, there have been nine (9) sustained Y-DNA dynasties. Three (3) of these lineages have publically available Y-DNA characterizations that anyone can compare themselves to with a commercial genetic genealogy test. Two (2) of the royal dynasties have living Y-DNA descendants but test results have not been published. The remaining four (4) lineages are unlikely to have genealogically-identifiable living descendants. Thus aDNA testing of royal remains will be needed in order to identify their characteristics and draw new genealogical and historical insights.

Geographically, only one (1) of these dynasties (Wessex) originates in England before the 10th century and another in Wales. Six (6) of these dynasties converge on Germany and Denmark (and Wessex would make a seventh if one considers its origins prior to the 7th century). Two (2) more of the dynasties originate in France. Culturally, two (2) of these dynasties are Celtic in origin, two (2) French, and five (5) Germanic.

Speculative Haplogrouping of Untested Dynasties. Based on the royal test results available, the overall Y-DNA results from Europe, and the geographical convergence of many of these lineages on Denmark and Germany, it is hypothesized that the Normandy, Wessex, and Knýtlinga dynasties will be found to come from the R1b-U106 haplogroup. The Tudor line is likely to resemble the Stuart line and come from haplogroup R1b-L21. The Plantagenets are a bit more difficult to predict as some speculate that they are

related to the Carpetian kings of France and descended from Roman citizens in the haplogroup J2 or G2. However, early sources attribute them as Germanic Franks¹³ and thus more likely to be another branch of R1b-U106.

Dynasty	First Monarch	Last	Patriarch	Geographic	Y-DNA	Comments
		Monarch		Origin	Haplogroup	
Mountbatten	TBD. Charles,	-	John II of	Germany	R1b	Prince Philip Mountbatten of
	Prince of Wales		Oldenburg			Greece had to renounce all
	(b. 1948) heir		(1272-1301)			other titles and any personal
	apparent					claim in order to marry Queen
						Elizabeth II and have his
						children reach the throne.
Windsor	King Edward	Queen	Dietrich I of	Germany	R1b-U106-	Paternally founded by Queen
	VII (1841-1910)	Elizabeth II	Wettin (916-		Z305	Victoria's husband, Prince
		(b. 1926)	976)			Albert. Known for 'The King's
						Speech', the abdication of
						Edward VIII for love as well as
						the long-serving Queen
						Elizabeth II.
Hannover	King George I	Queen	George of	Germany	TBD	To find a protestant heir,
	(1660-1727)	Victoria	Brunswick			Parliament went overseas for
		(1819-1901)	(1582-1641)			a great-grandson of King
						James I through 2 maternal
						lines.
Stuart	King James I	Queen Anne	Alan FitzFlaad	France	R1b-L21-	Norman knights who became
	(1566-1625)	(1665-1714)	(1070-1114)		L745	Stewards of Scotland and
						then obtained the throne when
						no Tudor heirs survived.
						Removed by Parliament
						because of religious conflicts.
Tudor	King Henry VII	Queen	Ednyfed	Wales	Need aDNA	Took advantage of an
	(1457-1509)	Elizabeth I	Fychan (1170-			unpopular King to settle the
		(1533-1603)	1246)			War of the Roses and win the
						throne in battle.
Plantagenet	King Henry II	King Richard	Geoffrey	France	TBD	Expanded the kingdom to
	(1133-1189)	III (1452-	Ferole II of			Scotland, Wales, and Ireland.
		1485)	Gastinois			Thought to be related to
			(1000-1046)			Capetian Kings of France.
Norman	King William I	King Henry I	Robert I	Denmark	Need aDNA	Viking group who settled in
	[the Conqueror]	(1068-1135)	[Rollo], Duke			Normandy, France for several
	(1028-1087)					

Dynasty	First Monarch	Last	Patriarch	Geographic	Y-DNA	Comments
		Monarch		Origin	Haplogroup	
			of Normandy (846-931)			generations and then expanded to Britain.
Wessex	King Aethelstan (893-939)	Harold Godwinson (1022-1066)	Egbert, King of Wessex (770-839)	England	Need aDNA	Wessex emerged as the strongest military kingdom in a violent era.
Knýtlinga	King Sweyn Forkbeard (960-1014)	King Harthacnut II (1018-1042)	Harthacnut I, King of Denmark (880-936)	Denmark	Need aDNA	Vikings ruled parts of England for almost 100 years and King Canute briefly subjected all Anglo-Saxon kingdoms.

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References

1. Coble, Michael D., Loreille, Odile M., Wadhams, Mark J., Edson, Suni M., Maynard, Kerry, Meyer, Carna E., Niederstätter, Harald, Berger, Cordula, Berger, Burkhard, Falsetti, Anthony B., Gill, Peter, Parson, Walther, Finelli, Louis N.. Mystery Solved: The Identification of the Two Missing Romanov Children Using DNA Analysis. PLoS ONE. 2009;4(3):e4838. DOI:10.1371/journal.pone.0004838.

HTTP://WWW.PLOSONE.ORG/ARTICLE/INFO:DOI/10.1371/JOURNAL.PONE.0004838

2. Pike, John, Holstein-Gottorp-Romanov Oldenburg-Romanov Romanov-Holstein-Gottorp, GlobalSecurity.org, Modified Sept 7, 2011.

HTTP://WWW.GLOBALSECURITY.ORG/MILITARY/WORLD/RUSSIA/CZAR-ROMANOV-HOLSTEIN-GOTTORP.HTM

3. Wikipedia, List of English monarchs, Retrieved 22 July 2013

HTTP://EN.WIKIPEDIA.ORG/W/INDEX.PHP?TITLE=LIST_OF_ENGLISH_MONARCHS&OLDID=565374775

4. Wikipedia, Alternative successions of the English crown, Revised 18 July 2013, Retrieved 22 July 2013. http://en.wikipedia.org/wiki/alternative_successions_of_the_english_crown

5. Wikipedia, Henry IV of England, Revised: 17 July 2013, Retrieved 22 July 2013. http://en.wikipedia.org/wiki/henry_iv_of_england

6. Wade, Nicholas, Tracing a Royal Y Chromosome, The New York Times, 12 February 2013, New York edition page D6.

HTTP://WWW.NYTIMES.COM/2013/02/12/SCIENCE/MORE-DNA-TESTS-TO-CONFIRM-SKELETON-IS-RICHARD-IIIS.HTML?SMID=PL-SHARE

7. Schürer, Kevin, The Genealogy [of living descendants of King Edward III], University of Leicester, 4 February 2013, Retrieved 23 July, 2013.

HTTP://WWW2.LE.AC.UK/OFFICES/PRESS/MEDIA-CENTRE/RICHARD-III/PRESS-CONFERENCE-4-FEBRUARY/PRESENTATIONS-BY-SPEAKERS-AT-THE-PRESS-CONFERENCE-MONDAY-4-FEBRUARY-1/POWERPOINTS/KS.PPTX

8. Little, Brad Michael, The King's Son (The Evidence), 2nd Edition published 14 April 2012. http://www.the-kings-son.com/royal_haplogroup

9. Buckley, Richard et al, The king in the car park: new light on the death and burial of Richard III in the Grey Friars church, Leicester, in 1485, Antiquity 87 (2013), pg 519-538 http://ANTIQUITY.AC.UK/ANT/087/0519/ANT0870519.PDF

10. Haak, Wolfgang, Balanovsky, Oleg, Sanchez, Juan J., Koshel, Sergey, Zaporozhchenko, Valery, Adler, Christina J., Der Sarkissian, Clio S. I., Brandt, Guido, Schwarz, Carolin, Nicklisch, Nicole, Dresely, Veit, Fritsch, Barbara, Balanovska, Elena, Villems, Richard, Meller, Harald, Alt, Kurt W., Cooper, Alan. Ancient DNA from European Early Neolithic Farmers Reveals Their Near Eastern Affinities. PLoS Biology. 2010;8 (11):e1000536. DOI:10.1371/journal.pbio.1000536.

HTTP://WWW.NCBI.NLM.NIH.GOV/PMC/ARTICLES/PMC2976717/

11. Wikipedia, List of British Monarchs, Revised 24 July 2013. Retrieved 24 July 2013. http://en.wikipedia.org/w/index.php?title=List_of_British_Monarchs&oldid=565593586

12. Stuart, William et al, Descendants of the High Stewards of Scotland [DNA Project], Retrieved 24 July 2013.

HTTP://WWW.FAMILYTREEDNA.COM/PUBLIC/STUART/

13. Baldwin, Stewart, Robert the Strong, Updated 26 July 2008, Retrieved 24 July 2013 http://SBALDW.HOME.MINDSPRING.COM/HPROJECT/PROV/ROBER100.HTM

14. Find A Grave Memorial, King William II (1056-1100), Record added 1 January 2001. http://www.FINDAGRAVE.COM/CGI-BIN/FG.CGI?PAGE=GR&GRID=1947

15. Wikipedia, Westminster Abbey Burials and Memorials, Updated 24 July 2013, Retrieved 24 July 2013. http://en.wikipedia.org/w/index.php?title=westMinster_Abbey_Burials_And_Memorials&Oldid=565642517

16. van de Pas, Leo, Leo's Genealogics Website

HTTP://WWW.GENEALOGICS.ORG

17. Cohen, Tamara, Have we now found Alfred the Great? Archaeologists exhume unmarked grave, The Daily Mail Online, Published 26 March 2013, Updated 27 March 2013, Retrieved 24 July 2013.

HTTP://WWW.DAILYMAIL.CO.UK/SCIENCETECH/ARTICLE-2299467/HAVE-ALFRED-GREAT-ARCHAEOLOGISTS-EXHUME-UNMARKED-GRAVE.HTML

 Rogaev, E. I., Grigorenko, A. P., Moliaka, Y. K., Faskhutdinova, G., Goltsov, A., Lahti, A., Hildebrandt, C., Kittler, E. L. W., Morozova, I.. Genomic identification in the historical case of the Nicholas II royal family. Proceedings of the National Academy of Sciences. 2009 2009 ;106(13):5258-5263. DOI:10.1073/pnas.0811190106.

HTTP://WWW.PNAS.ORG/CONTENT/106/13/5258.LONG

19. Dupuy BM, Stenersen M, Egeland T, Olaisen B. Y-chromosomal microsatellite mutation rates: differences in mutation rate between and within loci. Hum Mutat. 2004 Feb;23(2):117-24. PubMed PMID:14722915.

HTTP://WWW.NCBI.NLM.NIH.GOV/PUBMED/14722915

20. Barrett, Jim, Powell Surname DNA Project, [Includes a kit for a ducal descendant of King Charles II of England.]

HTTP://JPBDNA.COM/POWELL-SURNAME-DNA-PROJECT.HTM

21. Stevens, Richard, et al, R-L21 Plus Project [DNA Project] HTTP://WWW.FAMILYTREEDNA.COM/PUBLIC/R-L21/

22. Moore, Charles, et al, R1b-U106 Y-DNA Haplogroup [DNA Project] http://www.familytreedna.com/PUBLIC/U106