

Current Genealogy Practice

- Computer Tools & DNA Tests

Friday Lunch Discussion Club

Feb 16, 2018

R.E. (Bob) Butler

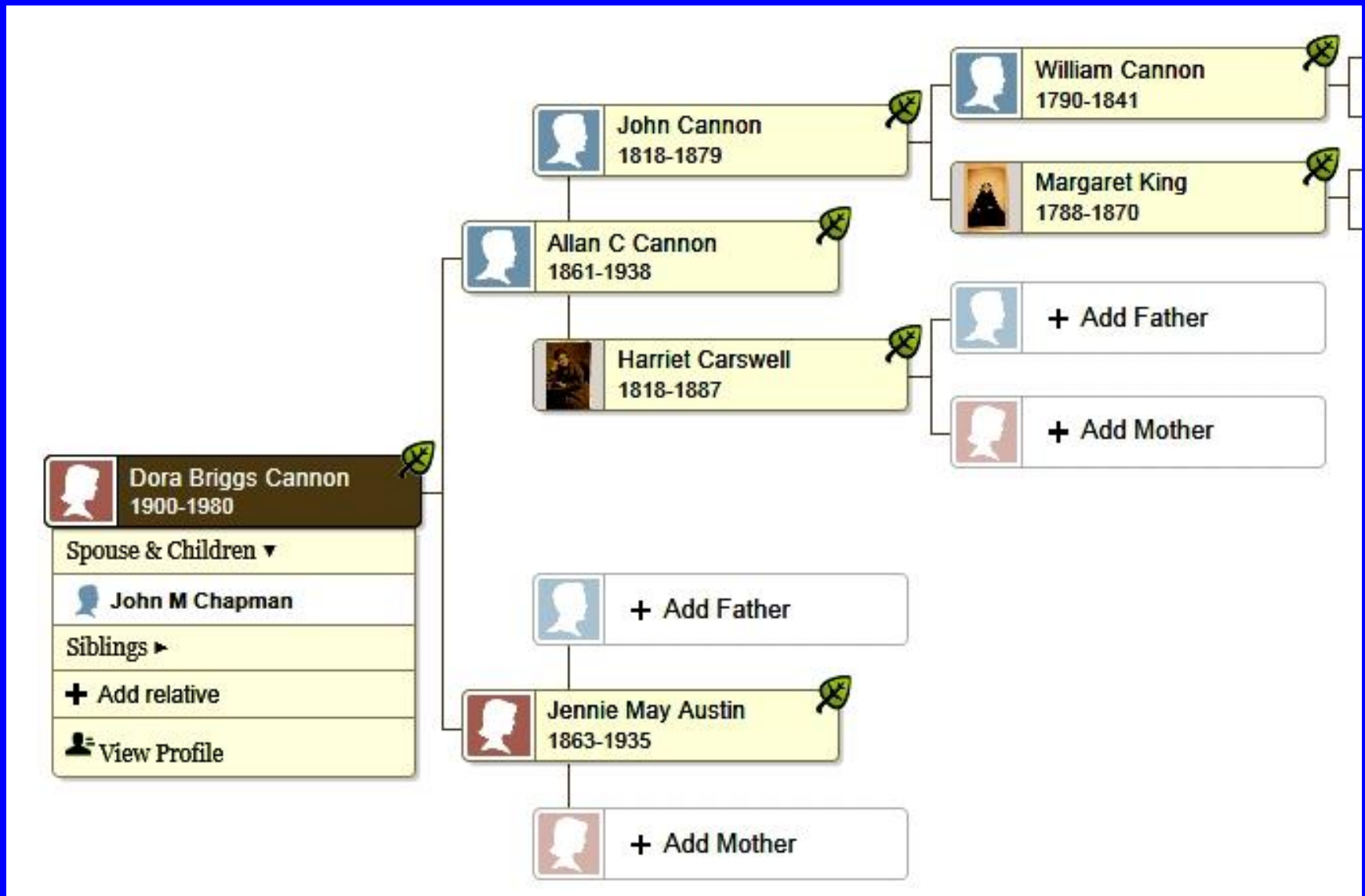
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Computer Tools for Genealogy

- ◆ Genealogy Objectives
- ◆ On line Services & Sources
- ◆ PC Programs
- ◆ Recommendations

Genealogy Objectives

- Pedigree (Ancestor) Chart



Genealogy Objectives

- Individual & Family Info



Margaret King

BIRTH ABT 1788 • Glasgow, Scotland

DEATH 25 JUL 1870 • Beachburg, Renfrew, Ontario, Canada

maternal grandmother of wife of 2nd great-uncle

LIFESTORY

FACTS

GALLERY

HINTS 1

Facts

SHOW

ADD

Name and gender

1788

(AGE)

Birth

abt 1788 • Glasgow, Scotland

Calculated from date of death and age on gravestone.

4 Sources

1813

25

Marriage

15 Nov 1813 • Barony, Lanark, Scotland

Date 15 Nov, 1815 from family bible of Mrs. Mills. (Mrs. Mills was probably Marion "Minnie" Cobb, daughter of Margaret Dilkes Cannon, grand daughter of Margaret King, wife of Thomas Mills.)

William Cannon (1790-1841)

1 Source

1852

64

Residence

1852 • Westmeath, Renfrew, Ontario, Canada

Living with children Gilbert, William, Janet and Mary, and granddaughter Marion Cobb.

Sources

ADD

Ancestry Sources



1851 Census of Canada
East, Canada West, New
Brunswick, and Nova Scotia



1861 Census of Canada



Ontario, Canada Census
Index, 1871



Ontario, Canada, Deaths,
1869-1938, 1943, and
Deaths Overseas, 1939-
1947



Scotland, Select Marriages,
1561-1910

Family

ADD

Parents



John King



+ Add Mother

Spouse & Children



William Cannon
1790-1841



William Cannon 1816-1893



John Cannon 1818-1879



Margaret Dilkes Cannon
1820-1857



Janet Cannon 1822-1895

Genealogy Objectives

◆ Build Family Tree

- Where did I come from?
- Who are my cousins?
- Legacy for your children.

◆ Publish

- Record your family's accomplishments.
- Help other researchers.

◆ Contact Distant Relatives

- Shared information
- Travel Interest

◆ Cost

Family Tree Location

- On PC or On-line ?






	On Personal Computer	On the Internet
	<u>PC Genealogy Programs</u>	<u>On-Line Genealogy Services</u>
<u>Features</u>		
Searching Records or Other Trees	From Tree & browser	From Tree
Hint System	Possibly while on-line	Yes, Even when logged off
Common Ancestors from DNA	Manual tree searching	Part of hint system
<u>Documenting sources</u>	<u>Manual or Web copying</u>	<u>Attaching records more efficient</u>
Graphs and Reports	Very Good	Very Limited
Publication	Separate – When?	Automatic - Incremental
Contacting Distant Relatives	Identify common individuals	Identify and Contact
<u>Others Find & Contact you</u>	<u>No</u>	<u>Yes</u>
Privacy	Yes	Private or Public (not living people)
Backup	User File Copy	Automatic by Service Company
Cost	One Time Cdn\$40 to 100	Ongoing - Cdn\$10 to \$25/month
Access after stop paying	Complete	Very Limited

On-Line Genealogy Services

Jan 2018

<http://genealogy-search-review.toptenreviews.com/>

<http://www.exploringlifemysteries.com/myheritage-vs-ancestry-vs-findmypast/>






Top Ten Reviews - Ranking	Gold Award	2	3	4	5
					
Company	Ancestry	MyHeritage	FamilySearch	Archives	Findmypast
Top Ten Reviews - Rating	9.8	9.3	8.7	7.0	6.8
Exploring Lifes Mysteries - Rank	1	2		-	3
Searchable Records	20 Billion	7 Billion	15 Billion	7.4 Billion	1.6 Billion - UK
Countries Documented	200	200	134	7	6
Canadian Record Sets	1420	17 (2 BMD)	Many		Few
Hint System	Good	Slow, Trees			Yes
Family Trees On-Line	> 34 million	39 million	Many - Shared	Yes	Yes
Customers, excluding DNA	2.6 million paid	90 million regist.			
DNA Testing	AncestryDNA	MyHeritageDNA	No	AncestryDNA	FamilyTreeDNA
Cost Canadian \$/year					
- Worldwide/Premium	\$264	\$239	Free	1/3 Ancestry?	\$272
	2 weeks free	trees free (250)			pay as you go
	monthly rates	only annual			other starters

PC Genealogy Programs

Jan 2018

<http://www.toptenreviews.com/software/home/best-genealogy-software>

<http://thegenealogyguide.com/best-genealogy-software-programs-your-top-5>

Top Ten Ranking	Gold Award	2	3	6	9
					
	Legacy Family Tree	Family Historian	Family Tree Maker	RootsMagic	MyHeritage
Top Ten Rating	9.7	9	8.9	8.3	6.8
Program Version	Legacy 9	FH 6.2	FTM 2017	RM 7.5	FT Builder 8.0
Genealogy Guide Ranking	1	2	3 (FTM2014)	4	
Features for Stand Alone Use	Fully Featured	Fully Featured	Fully Featured	Fully Featured	
Charts & Reports	45	34	37	39	16
Tree Synch	Family Search	Family Search	Ancestry (Full tree)	Ancestry (Indiv)	MyHeritage
Web Hints (Number of Hints - Canadian Test - J. A. Gemmill, born 1888, Ontario.)					
Ancestry	-	-	8 Rec + 6 Tr	8 Rec + 6 Tr	-
MyHeritage	1 Record + 3 Trees	1 Rec + 3 Tr	-	1 Rec + 3 Tr	1 Rec + 1 Tr + MyH
Family Search	0	-	4 Tr	6 R	-
Findmypast (mainly UK)	1 Rec	1 Rec	-	1 Rec	-
Genealogy Bank (mainly USA)	0	-	-	-	-
Cost Full Version - US \$	40	50	80	30	Free
	Free basic version	30 day trial		Free basic version	
Main Reason to Choose	Charts & Reports	Ease of Use ?	Sync Ancestry Research	Research Indiv sync Anc.	Sync MyHeritage

Recommended Computer Tools & Services

- ◆ **Low Cost Starter – PC program, free Internet sources**
 - Never on-line: Legacy
 - Some day on-line: Family Tree Maker or Roots Magic
- ◆ **Mid Cost Starter – Ancestry, no PC Program**
 - Local Ancestry Subscription & Free Internet
- ◆ **Most Capable – Both PC & Ancestry - Synchronized**
 - Ancestry World Wide Subscription,
Family Tree Maker & Free Internet.

DNA

Introduction

DNA Tests for Genealogy

- now routine

- ◆ DNA Basics

- ◆ DNA Ancestor Chart

- ◆ 3 Types of DNA Tests

- ◆ Autosomal DNA Tests

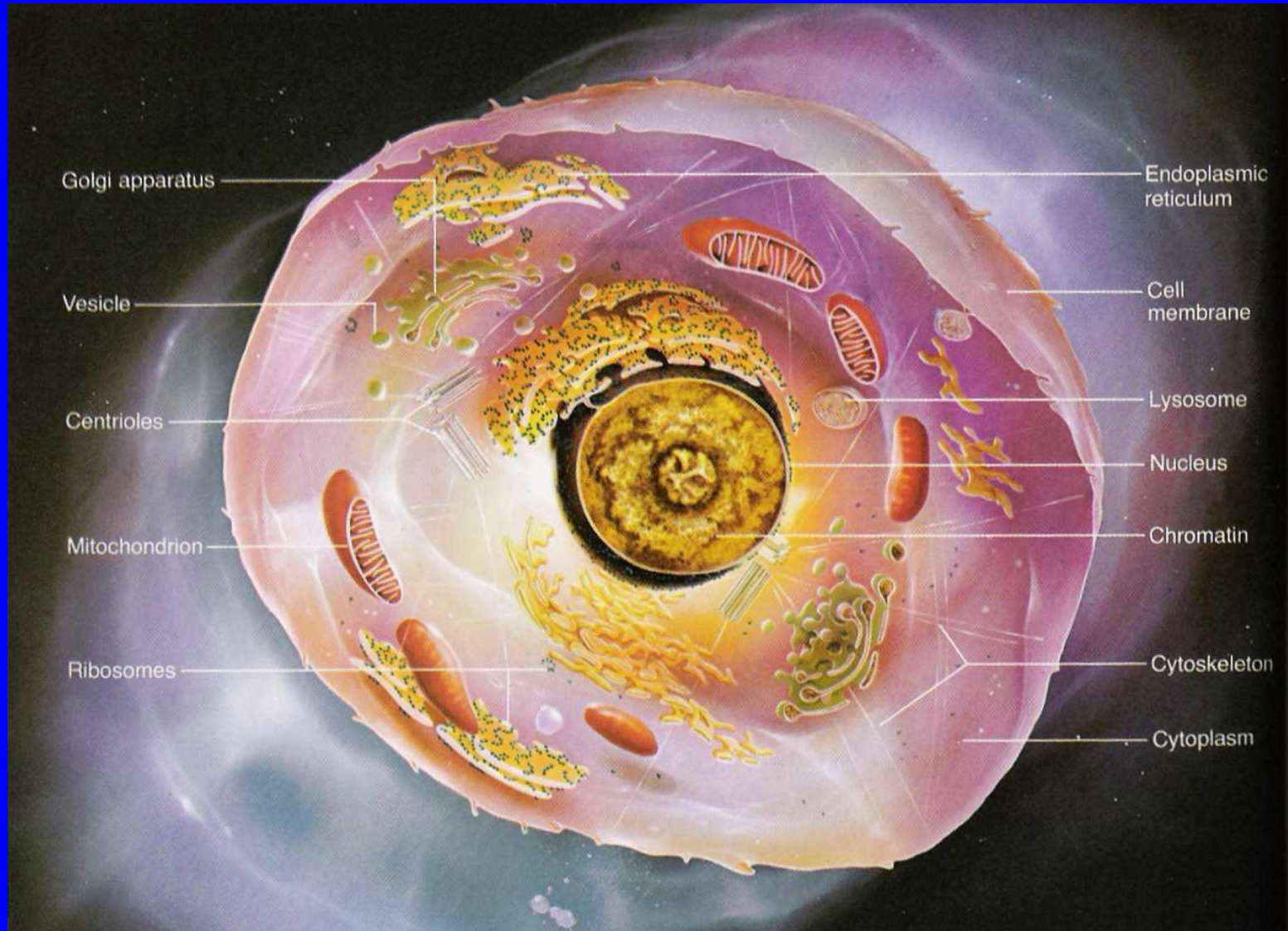
 - Ethnicity Reports

 - Genealogy Matches

 - Comparison of Testing Companies

Human Cell DNA

Nuclear and Mitochondrial



Chomosomes and Base Pairs

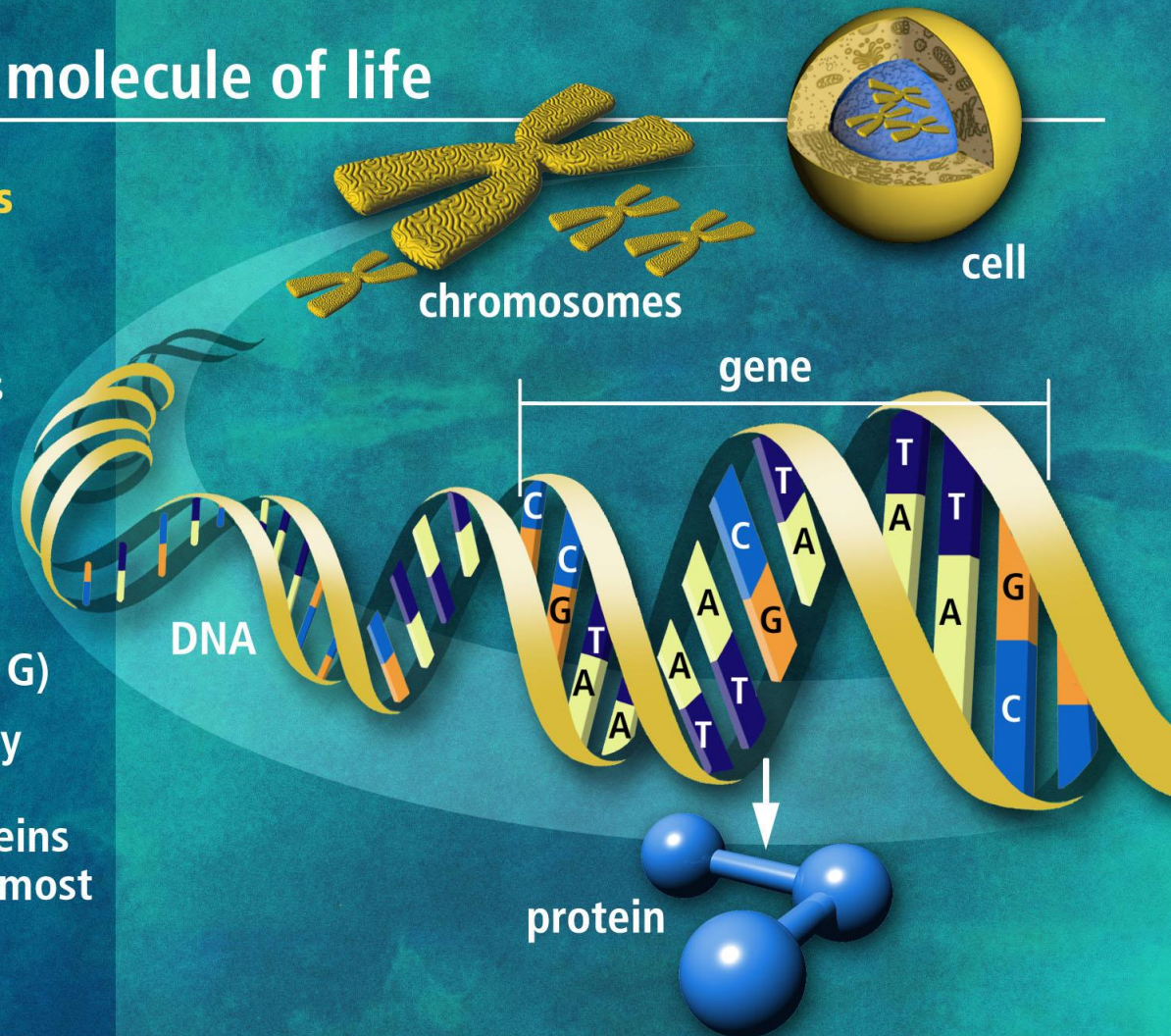
Double Helix with Bases A,T,C,G

DNA the molecule of life

Trillions of cells

Each cell:

- 46 human chromosomes
- 2 meters of DNA
- 3 billion DNA subunits (the bases: A, T, C, G)
- Approximately 30,000 genes code for proteins that perform most life functions



Autosomal DNA Measurements

SNPs (pronounced SNIPS)

- ◆ Base pairs = Nucleotide pairs
 - » 3 billion for each set of 23 chromosomes
- ◆ Single Nucleotide Polymorphisms (SNPs)
 - » 10 million for each set of 23 chromosomes
 - » 0.33% of genome
- ◆ SNPs Measured for Genealogy Purposes
 - » 600 to 960 thousand for each set of 23 chromosomes
 - » 6 to 9.6% of SNPs.

Sample Raw DNA Data

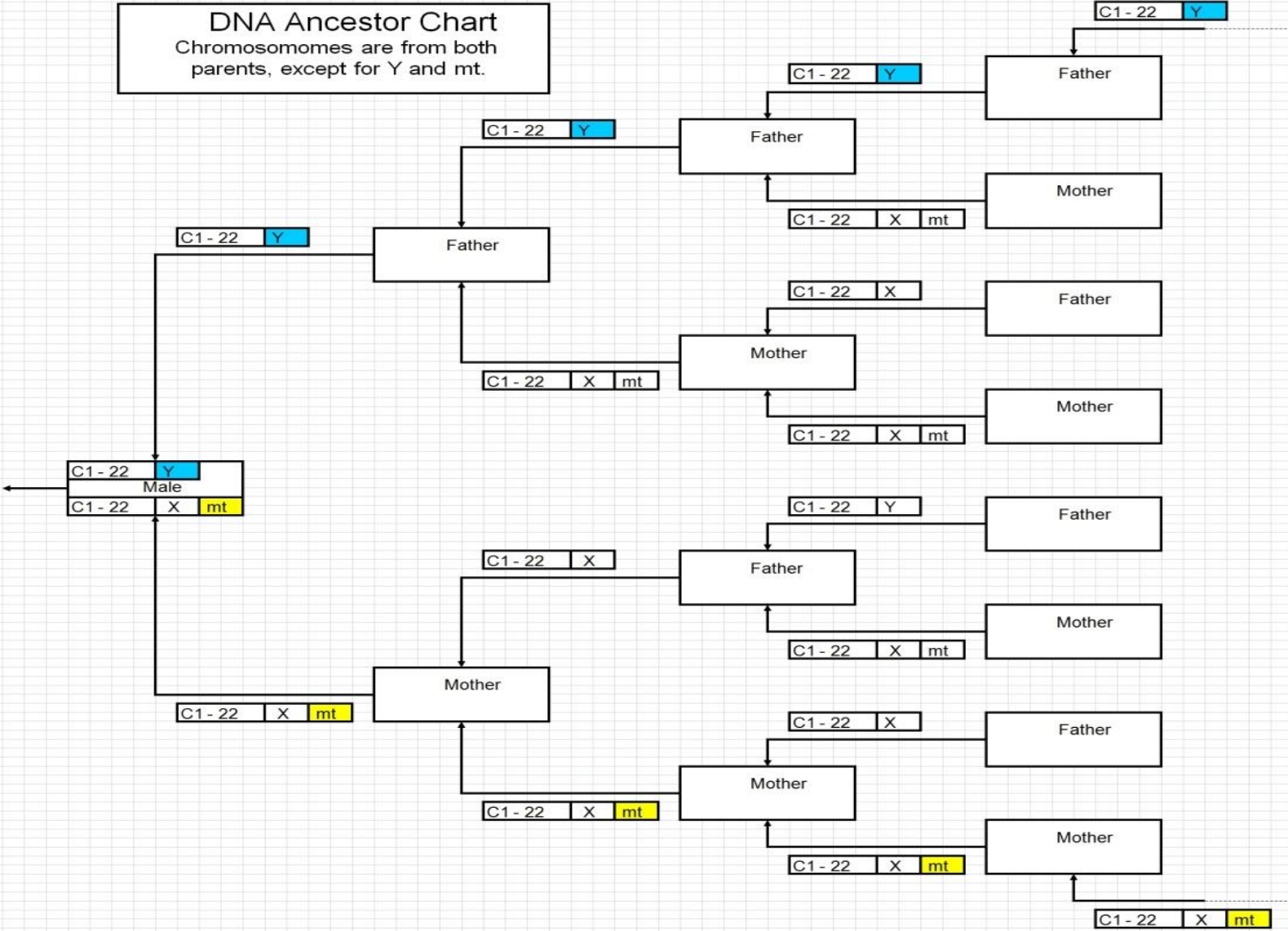
Both chromosomes measured at the same time.

```
# This data file generated by 23andMe at: Sat Jun 29 13:46:20 2013
# Each line corresponds to a single SNP. For each SNP, we provide its identifier
# (an rsid or an internal id), its location on the reference human genome, and the
# genotype call oriented with respect to the plus strand on the human reference sequence.
#
```

# rsid	chromosome	position	genotype
rs4477212	1	82154	AA
rs3094315	1	752566	AG
rs3131972	1	752721	AG
Rs12124819	1	776546	AG
Rs11240777	1	798959	AG
rs6681049	1	800007	CC
rs4970383	1	838555	AC

```
.... 960,000 rows of data. .... 24 MB
```

DNA Ancestor Chart
 Chromosomes are from both parents, except for Y and mt.



3 Types of DNA Tests

◆ Y Chromosome Test

- Men inherit from fathers
- Most extensive test - perfect match
- Surname Studies
- Kinship 5 gens +

◆ Mitochondrial DNA Test

- Everyone inherits from mothers
- Most extensive test - perfect match
- Maternal Groups
- Kinship 22 gens +

◆ Autosomal DNA Test – All chromosomes

- Everyone inherits from all ancestors
- Routine test – many matches
- Ethnicity Estimates
- Kinship 1 to 5 gens +

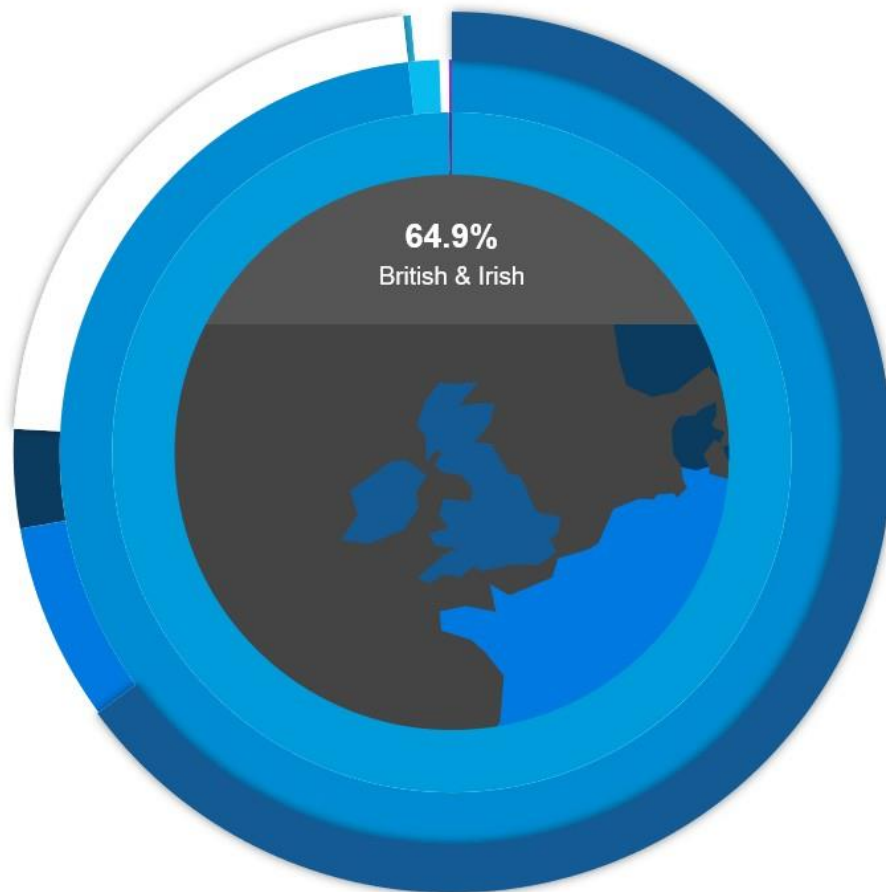
Autosomal Ethnicity Estimates

- 23andMe

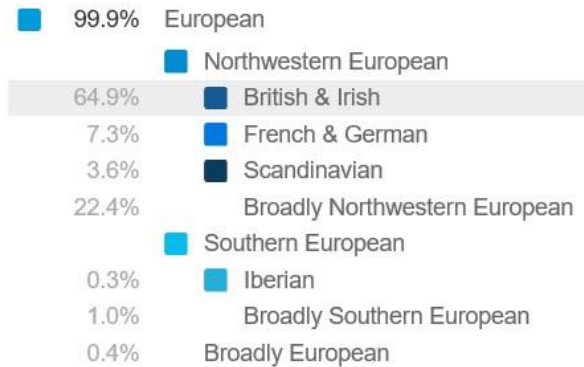
Map View



Sub-regional Resolution



Ancestry Composition tells you what percent of your DNA comes from each of 31 populations worldwide. This analysis includes DNA you received from all of your recent ancestors, on both sides of your family. The results reflect where your ancestors lived before the widespread migrations of the past few hundred years.







100% Robert Ewart Butler

[show all populations](#)

Autosomal Ethnicity Estimates

- same person, different companies

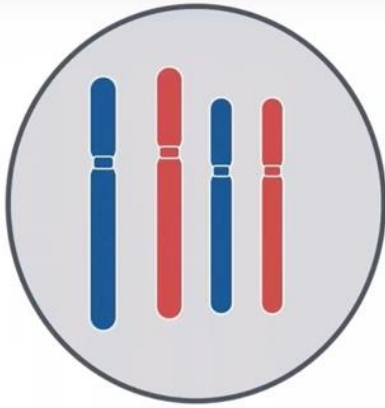
	Great Great Grandparents					
	Number	%				
English	11	68.8				11.4
Scottish	2	12.5				0
British	13	81.3			40	11.4
Irish	2	12.5			19	0
British & Irish	15	93.8	67.5	69	59	11.4
Northwest & Central Europe	1	6.3	19.6	17	29	88.6
German & Franch			7.5			
Scandinavian			3.7		6	0
South & East Europe			1.6	11	2	0
European Jewish					4	0
Total	16	100.0	99.9	97	100	100

Autosomal DNA Inheritance

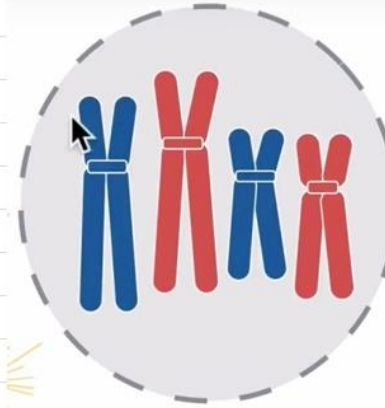
Meiosis – Formation of Sperm & Egg

<https://www.youtube.com/watch?v=16enC385R0w>

A. Two Copies of Each Chromosome



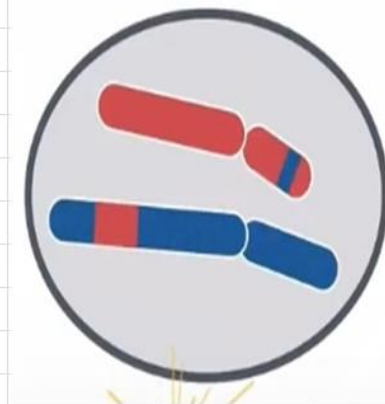
B. Chromosomes Duplicated



C. Chromosome Crossover

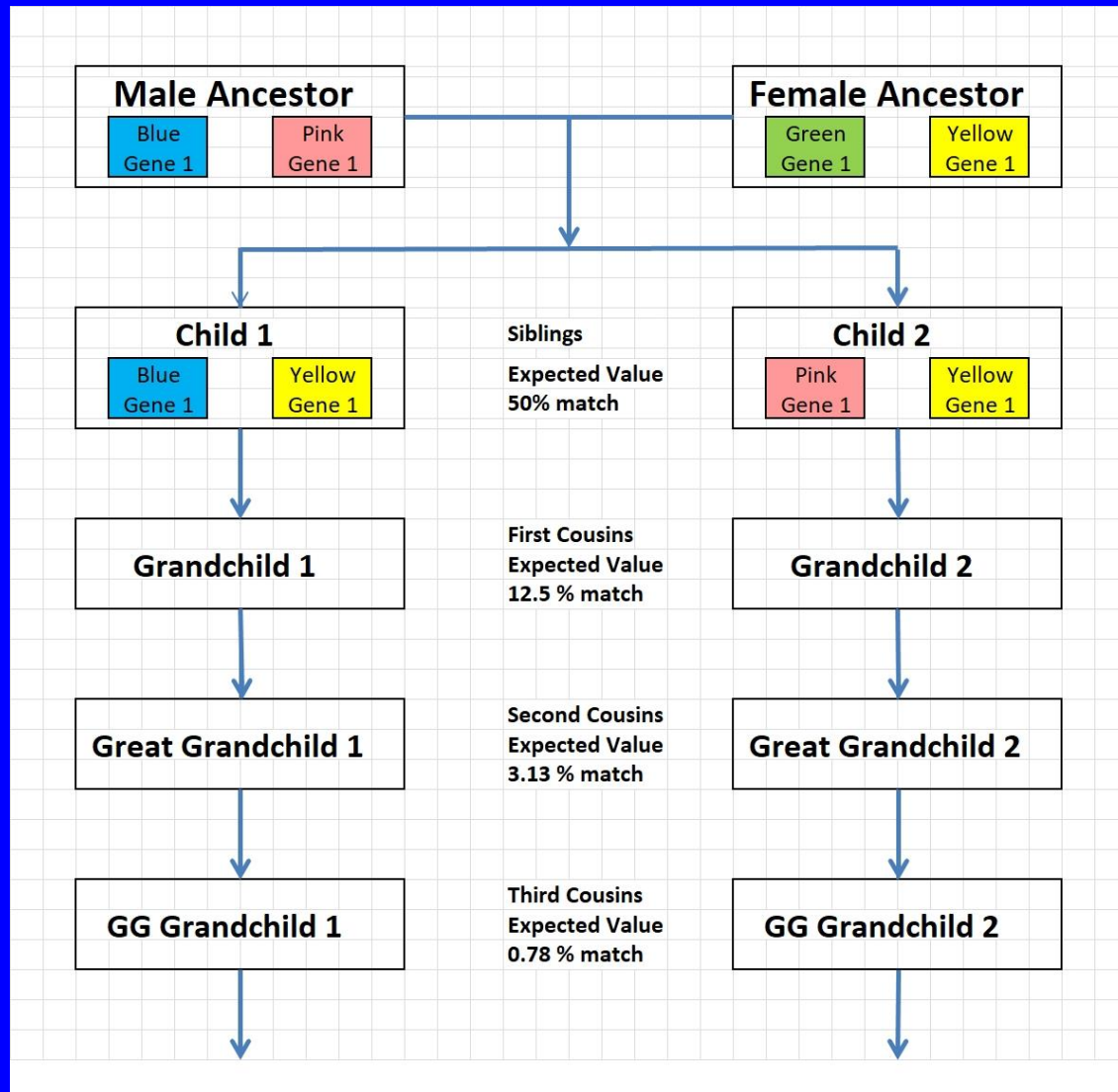


D. One of Four Sperm



Autosomal DNA Inheritance

Expected % Match vs Kinship



Autosomal DNA Matches

centiMorgan Match vs Kinship

Relationship	Expected Average DNA %	Expected Average DNA cM	Measured Average DNA cM *	Common Ancestors	Gens Back To Common Ancestors	Common Ancestor Possible Birth Year
Parent	50	3400	3487			
Sibling	50	3400		Parents	1	1940
Sibling (Excluding Doubles)	37.5	2550	2629	Parents	1	1940
Nephew or Niece	25	1700	1750	Parents/Grandparents	1.5	
Uncle or Aunt	25	1700	1750	Parents/Grandparents	1.5	
First Cousin	12.5	850	874	Grandparents	2	1910
First Cousin once removed	6.25	425	439		2.5	
Second Cousin	3.13	213	233	Great Grandparents	3	1880
Second Cousin once removed	1.56	106	123		3.5	
Third Cousin	0.78	53	74	GG Grandparents	4	1850
Third Cousin once removed	0.39	27	48		4.5	
Fourth Cousin	0.19	13	35	GGG Grands	5	1820
Fourth Cousin once removed	0.1	7	28		5.5	
Fifith Cousin	unreliable	3	25	GGGG Grandparents	6	1790

* Shared cM Project

Autosomal DNA Matches

- FamilyTreeDNA

	Name	Match Date	Relationship Range	Shared Centimorgans	Longest Block
<input type="checkbox"/>	 Ms. Trish Short Lewis   	03/11/2016	2nd Cousin - 4th Cousin	108	35
<input type="checkbox"/>	 Noreen Grice   	03/11/2016	2nd Cousin - 4th Cousin	84	45
<input type="checkbox"/>	 georgine cleem-whalen   	03/22/2016	2nd Cousin - 4th Cousin	82	19
<input type="checkbox"/>	 Eric Dennis   	03/11/2016	2nd Cousin - 4th Cousin	69	31

Autosomal DNA Matches

- Ancestry.ca - Common Ancestors

Shared Ancestor Hint

^ HIDE DETAILS

According to your family trees, it looks like you have a shared ancestor. Review the info below to confirm the relationship. You can take this opportunity to [get in touch](#), share stories and photos, or just say hello.



Shared Ancestor Hint

William Tooms
2nd Great-Grandfather



&



Caroline Greenfield
2nd Great-Grandmother



Amy Tooms
Great-Grandmother



Winifred May Knapton
Grandmother



Leonard Ewart Butler
Father



Robert Ewart Butler
Self



Mary Ann Tooms
Great-Grand aunt



Charles Wilford Horsfield
1st Cousin (2x removed)



Keith Charles Horsfield
2nd Cousin (1x removed)



Private
3rd Cousin








A.T.
3rd Cousin (1x removed)

Autosomal DNA Matches

Jan 2018






- same person, different companies

					
Number of Customers	3 million	700 thousand	6 million	1 million	
Number of Matches					
Minimum Match cM	7	9 (13 actual)	6	12 (13 actual)	7 (9.1 at 2000)
Total Matches found	1220	322	18,621	2616	2000
Anonymous Matches	188				
Matches >= 20 cM	384	86	538	143	87
Matches with known cousins	4	3	> 40	1	7 (from Ancestry)
- including GEDmatch	11	10	>40	8	
Matches common ancestor hints	n/a	n/a	33	n/a	n/a
Genealogy (REB Rating - British & Irish)	3/10	4/10	8/10	2/10	
- including GEDmatch	5/10	6/10	8.5/10	4/10	
- including extra tests		6.5/10			

DNA Testing Companies

Jan 2018

https://isogg.org/wiki/Autosomal_DNA_testing_comparison_chart

					
Medical Reports	Health & Traits	n/a	n/a	n/a	n/a
Population Genetic Research	n/a	n/a	n/a	Worldwide	n/a
Person Ancestry/Ethnicity (ISOGG Rating)	7/10	3.5/10	4.5/10	2.5/10	4/10
Genealogy (REB Rating - British & Irish)	3/10	4/10	8/10	n/a	2/10
Genealogy, with GEDmatch	5/10	6/10	8.5/10	n/a	4/10
Genealogy, extra Tests	n/a	6.5/10	n/a	n/a	n/a
Number of Customers	3 million	700 thousand	6 million	230 thousand	1 million
Autosomal DNA Test Cost					
Cost	CDN \$103	US \$79	CDN \$149	US \$199.95	US \$69
Cost including medical reports	CDN \$199				
Shipping	+ CDN \$19.95	+ US \$12.99	+ CDN \$19.95	+ US \$10	+ US \$12
Main Reason to Choose	Health & Trait Report Personal Ancestry	DNA Studies Extra Tests	Genealogy Matches	Population Research	-

Genetic Non-Discrimination Act

Bill S-201 Royal Assent May 2017

This enactment prohibits any person from requiring an individual to undergo a genetic test or disclose the results of a genetic test as a condition of providing goods or services to, entering into or continuing a contract or agreement with, or offering specific conditions in a contract or agreement with, the individual.

Genealogy Sources & Resources

◆ Ottawa Genealogy Societies

- Ontario Genealogical Society (OGS Ottawa)
- British Isles Family History Society of Greater Ottawa (BIFHSGO)

Both have special interest groups, and offer conferences with papers, workshops, research rooms & vendors

◆ On Line Resources

- GEDmatch & Vendors – webinars, papers
- International Society of Genetic Genealogy (ISOGG)

Presentation Summary

◆ Genealogy Objectives

- Public or Private

◆ On line Services & Sources

- Research - Full Service or Low Cost

◆ PC Programs

- Backup & Reports - Synchronized with On-Line Services

◆ DNA Tests for Genealogy

- Autosomal tests to search for common ancestors
- Health (23&Me), Ancestor Hints (Ancestry), DNA Analysis (FT DNA)
- Your Raw DNA data is part of your legacy to your descendants.

◆ Backup Slides

Chromosomes, Base Pairs, Genes & SNPs measured



King Richard III ?

Mitochondrial DNA – U of Leicester

The DNA results showed a perfect whole-mitochondrial genome match between Skeleton 1 of the Greyfriars site and Michael Ibsen and a single base difference (mutation) with Wendy Duldig. This was not at all unexpected given the number of generations between them and is consistent with all three of them being related in the genealogical time span.

mtDNA Match Assessment

Generations to most recent common ancestor

Testing Level	Matching Level	Generations to Common Ancestor	
		50% Confidence Interval	95% Confidence Interval
mtDNA	HVR1	52 (about 1,300 years)	— NA*
mtDNAPlus	HVR1 & HVR2	28 (about 700 years)	— NA*
mtFullSequence	HVR1, HVR2, & Coding Region	5 (about 125 years)	22 (about 550 years)

* The range of generations to a common ancestor at this level is too broad to calculate a 95% confidence period.

King Richard III ?

Y Chromosome - U of Leicester

Genealogical information showed that all five living male-line relatives of Richard III were descended from Henry Somerset, the 5th Duke of Beaufort and the Y chromosome data for four out of the five male-line relatives showed a match consistent with them being related as expected.

However, one of the five had a very different Y chromosome type indicating that a false-paternity had occurred within the last few generations. The Y chromosome type of the Skeleton 1 did not match any of the living male-line relatives showing that a false-paternity event (or events) had also occurred somewhere in the 19 generations between Richard III and Henry Somerset, 5th Duke of Beaufort.

Y DNA Match Assessment

Generations to most recent common ancestor

Time to Most Recent Common Ancestor (MRCA)

Number of matching markers	Probability that the MRCA was not more than this number of generations ago		
	50%	90%	95%
10 of 10	16.5	56	72
11 of 12	17	39	47
12 of 12	7	23	29
23 of 25	11	23	27
24 of 25	7	16	20
25 of 25	3	10	13
35 of 37	6	12	14
36 of 37	4	8	10
37 of 37	2 to 3	5	7
65 of 67	6	12	14
66 of 67	4	8	9
67 of 67	2	4	6
107 of 111	7	11	13
108 of 111	5	10	11
109 of 111	4	8	9
110 of 111	2	6	7
111 of 111	1	3 to 4	5

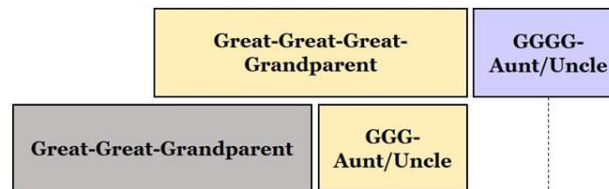
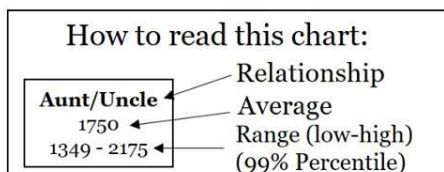
Shared cM Project

Match Averages

The Shared cM Project – Version 3.0
August 2017

For MUCH more information (including histograms and company breakdowns) see: goo.gl/Z1EcJQ

Blaine T. Bettinger
www.TheGeneticGenealogist.com
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Half GG-Aunt/Uncle 187 12 - 383	Great-Grandparent 881 464 - 1486						Great-Great Aunt/Uncle 427 191 - 885	Other Relationships			
Half Great-Aunt/Uncle 432 125 - 765	Grandparent 1766 1156 - 2311					Great Aunt/Uncle 914 251 - 2108	6C 21 0 - 86				
	Half Aunt/Uncle 891 500 - 1446	Parent 3487 3330 - 3720			Aunt/Uncle 1750 1349 - 2175		6C1R 16 0 - 72				
Half 3c 61 0 - 178	Half 2c 117 9 - 397	Half 1C 457 137 - 856	Half-Sibling 1783 1317 - 2312	Sibling 2629 2209 - 3384	SELF	1C 874 553 - 1225	2c 233 46 - 515	3c 74 0 - 217	4c 35 0 - 127	5c 25 0 - 94	6C2R 17 0 - 75
Half 3c1R 42 0 - 165	Half 2c1R 73 0 - 341	Half 1C1R 226 57 - 530	Half Niece/Nephew 891 500 - 1446	Niece/Nephew 1750 1349 - 2175	Child 3487 3330 - 3720	1C1R 439 141 - 851	2c1R 123 0 - 316	3C1R 48 0 - 173	4C1R 28 0 - 117	5C1R 21 0 - 79	7C 13 0 - 57
Half 3c2R 34 0 - 96	Half 2c2R 61 0 - 353	Half 1C2R 145 37 - 360	Half Great Niece/Nephew 432 125 - 765	Great-Niece/Nephew 910 251 - 2108	Grandchild 1766 1156 - 2311	1C2R 229 43 - 531	2c2R 74 0 - 261	3C2R 35 0 - 116	4C2R 22 0 - 109	5C2R 17 0 - 43	7C1R 13 0 - 53
Half 3c3R	Half 2c3R	Half 1C3R 87 0 - 191	Half GG Niece/Nephew 187 12 - 383	Great-Great-Niece/Nephew 427 191 - 885	Great-Grandchild 881 464 - 1486	1C3R 123 0 - 283	2c3R 57 0 - 139	3C3R 22 0 - 69	4C3R 29 0 - 82	5C3R 11 0 - 44	8C 12 0 - 50

Minimum was automatically set to 0 cM for relationships more distant than Half 2C, and averages were determined only for submissions in which DNA was shared

Shared cM Project

3rd Cousin Once Removed Histogram

The Shared cM Project – Version 3.0 (August 2017)

Relationship

#

Min

Average

Max

Histogram

3C1R
(Cluster #8)

1736

0

48

173

