An Introduction to Genetic Genealogy

David A. Pike

dapike@math.mun.ca

Presented To:

Family History Society of Newfoundland and Labrador

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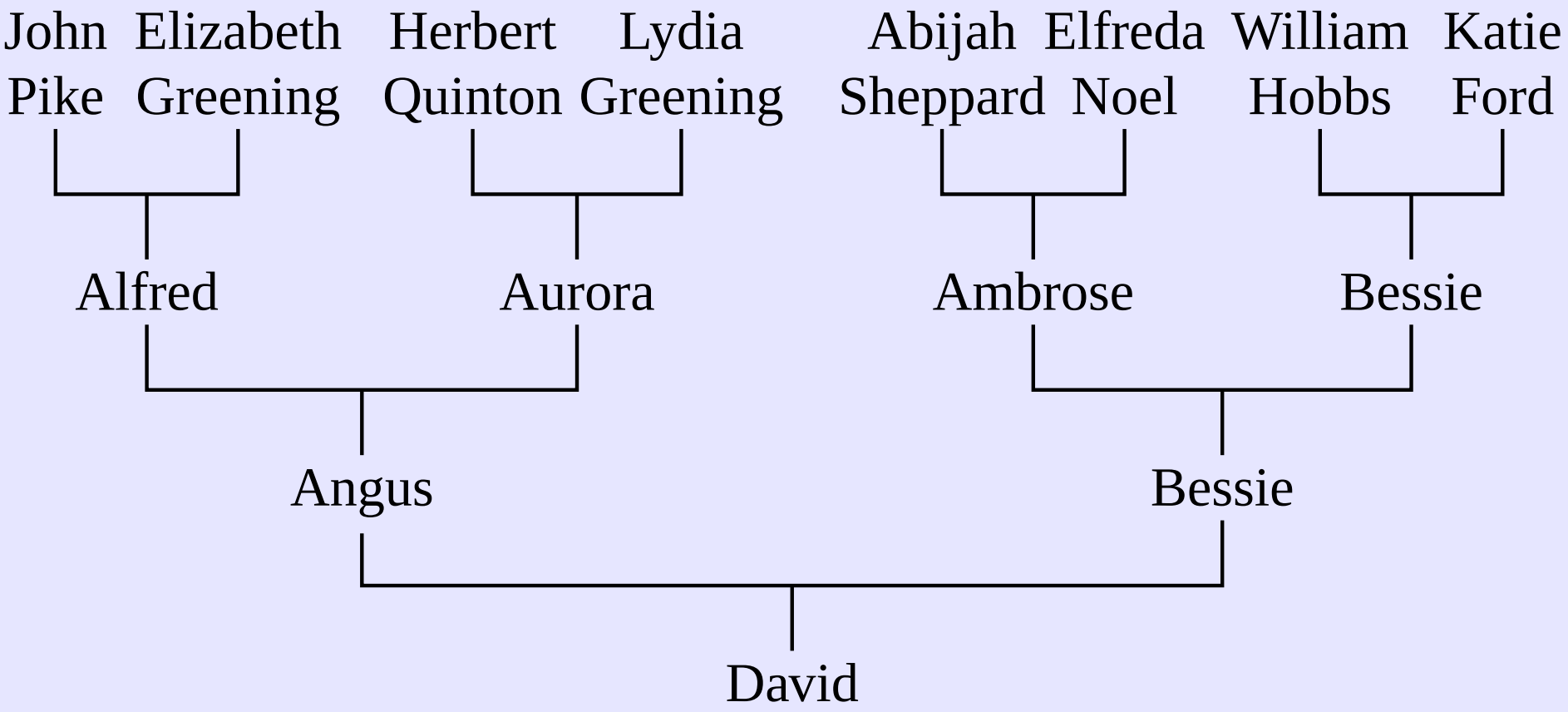
Overview

- Genetic Genealogy
  - using genetic analysis as a genealogical tool
  - relies on two special types of DNA
    (one for direct male line and one for direct female line)
- Some of my experiences with genetic genealogy
  - Pike Surname DNA Project
    - started in summer of 2004
    - currently has 24 participants (2 from Newfoundland)
  - my direct female line (English Harbour, Trinity Bay)
- Other information and resources

My Pedigree – Where I got my DNA



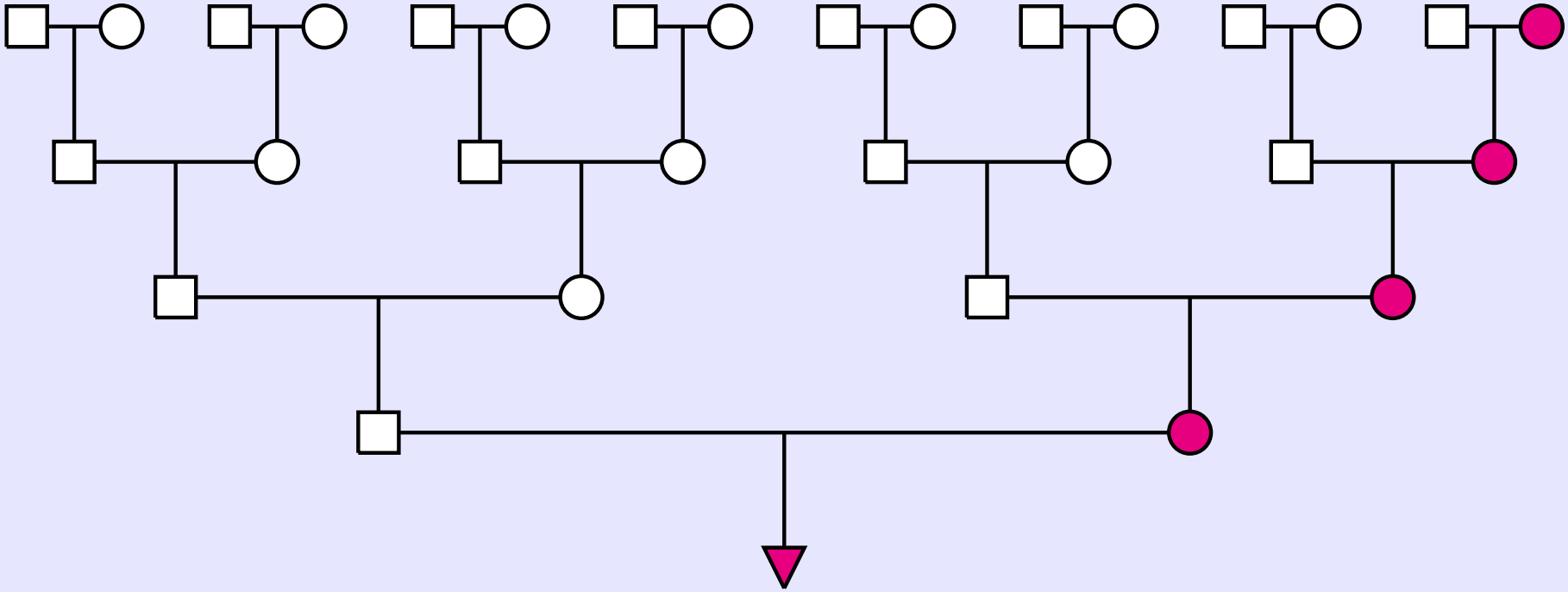
Two Special Types of DNA

- mtDNA (mitochondrial DNA)
  - Everybody has mtDNA.
  - It is inherited from one's mother.

- Y-DNA (the Y chromosome)
  - Only males possess Y-DNA.
  - It is inherited from one's father.

What makes these types of DNA special is that they do not undergo the mixing that happens to most DNA at conception.

Inheritance of mtDNA

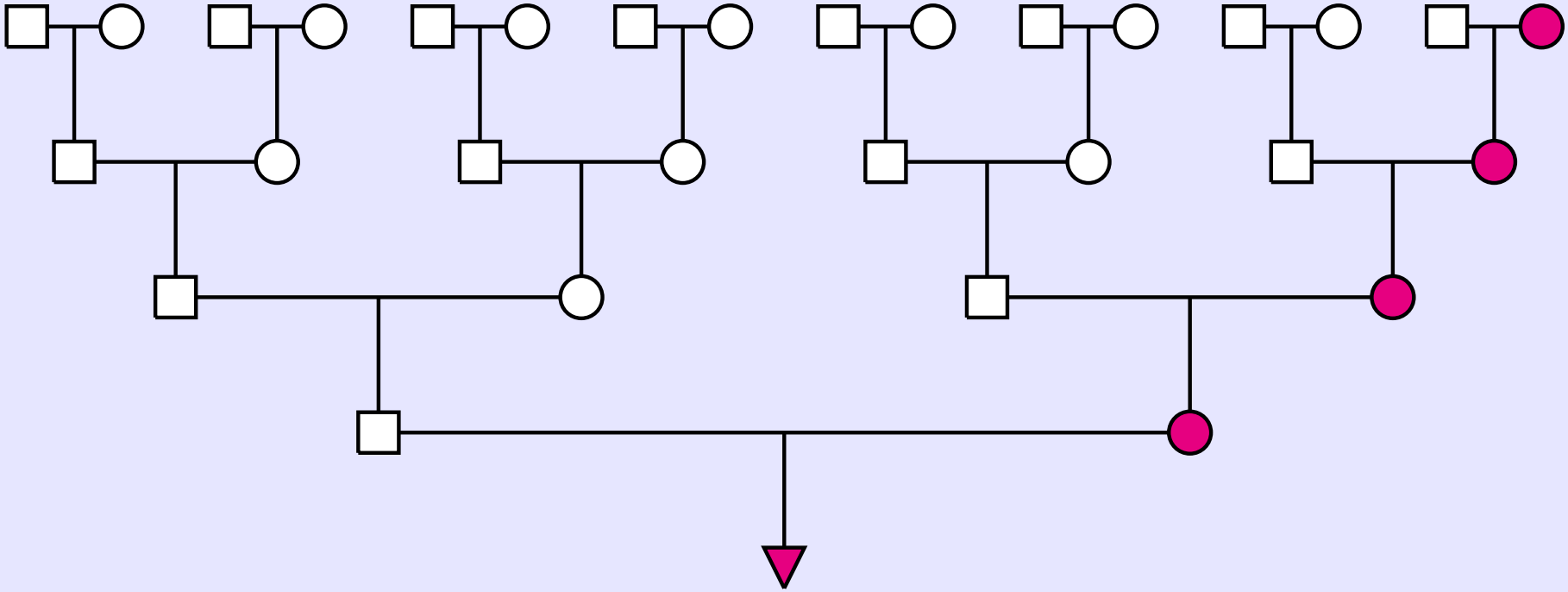


□ Male

○ Female

▽ Either Male or Female

Inheritance of mtDNA



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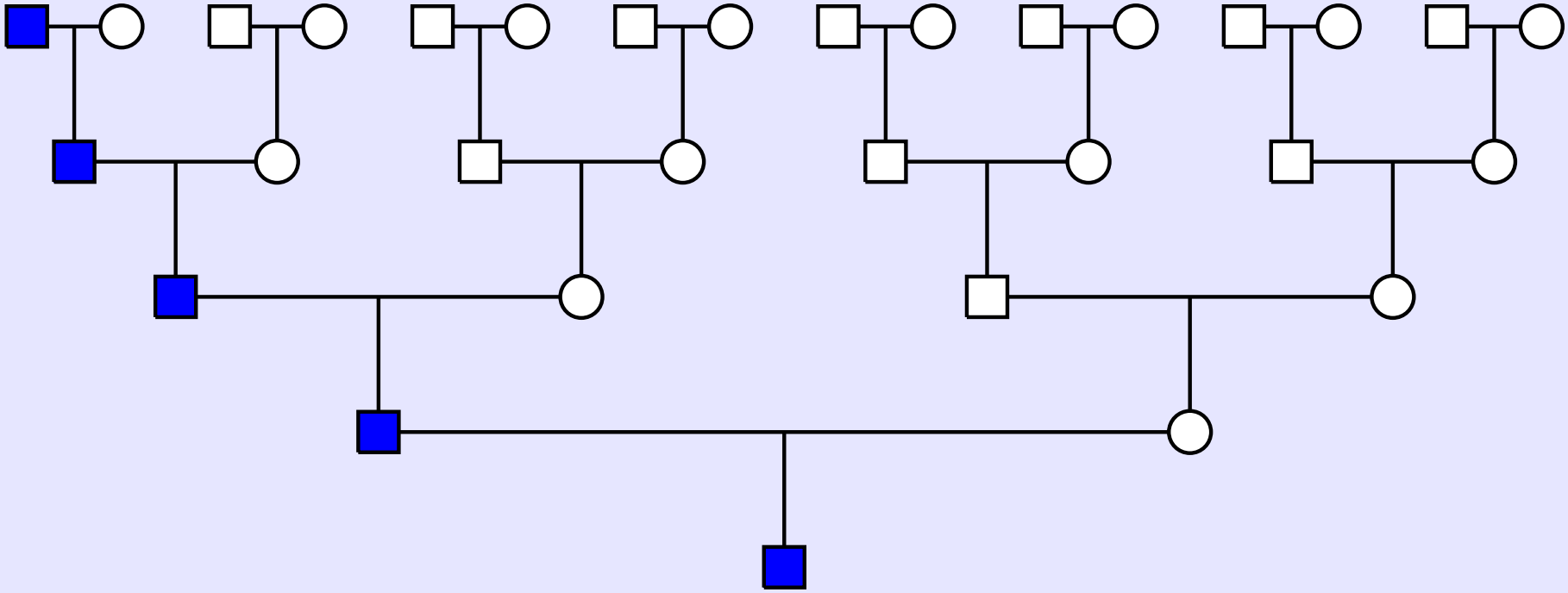
mtDNA analysis applies only to the direct female line.

Inheritance of Y-DNA



Male

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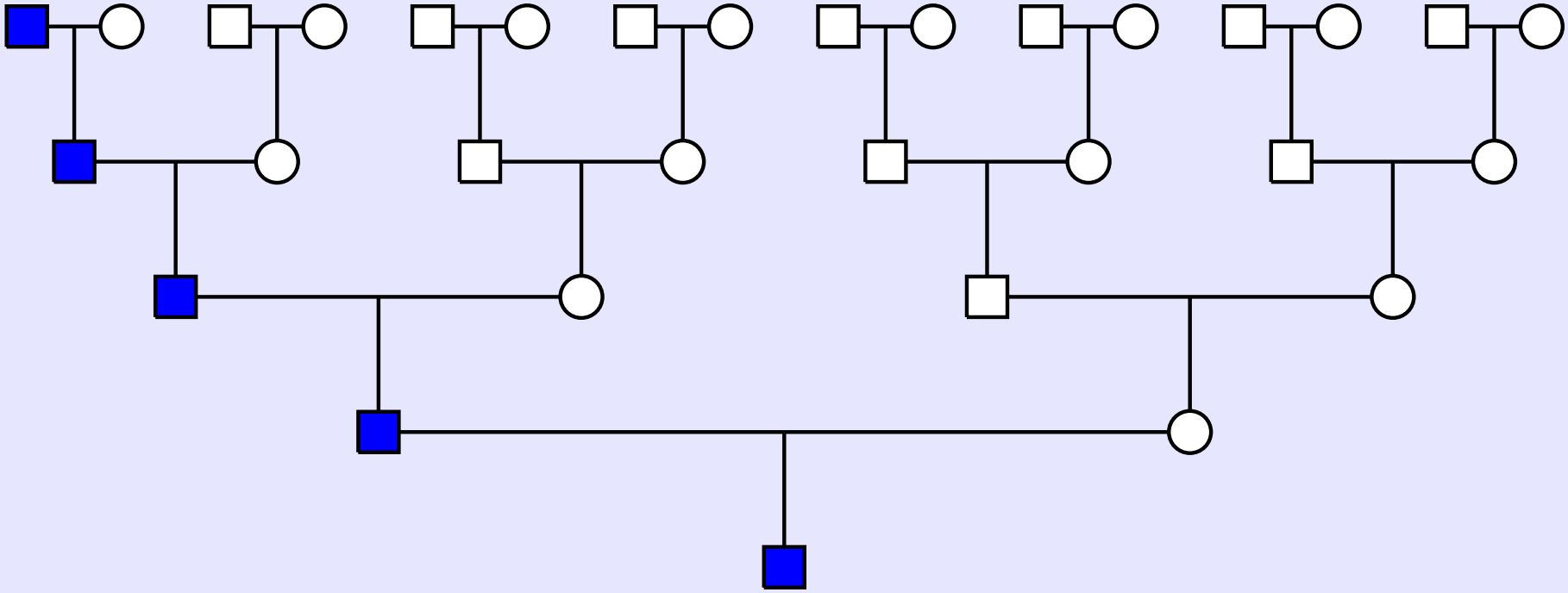
Inheritance of Y-DNA



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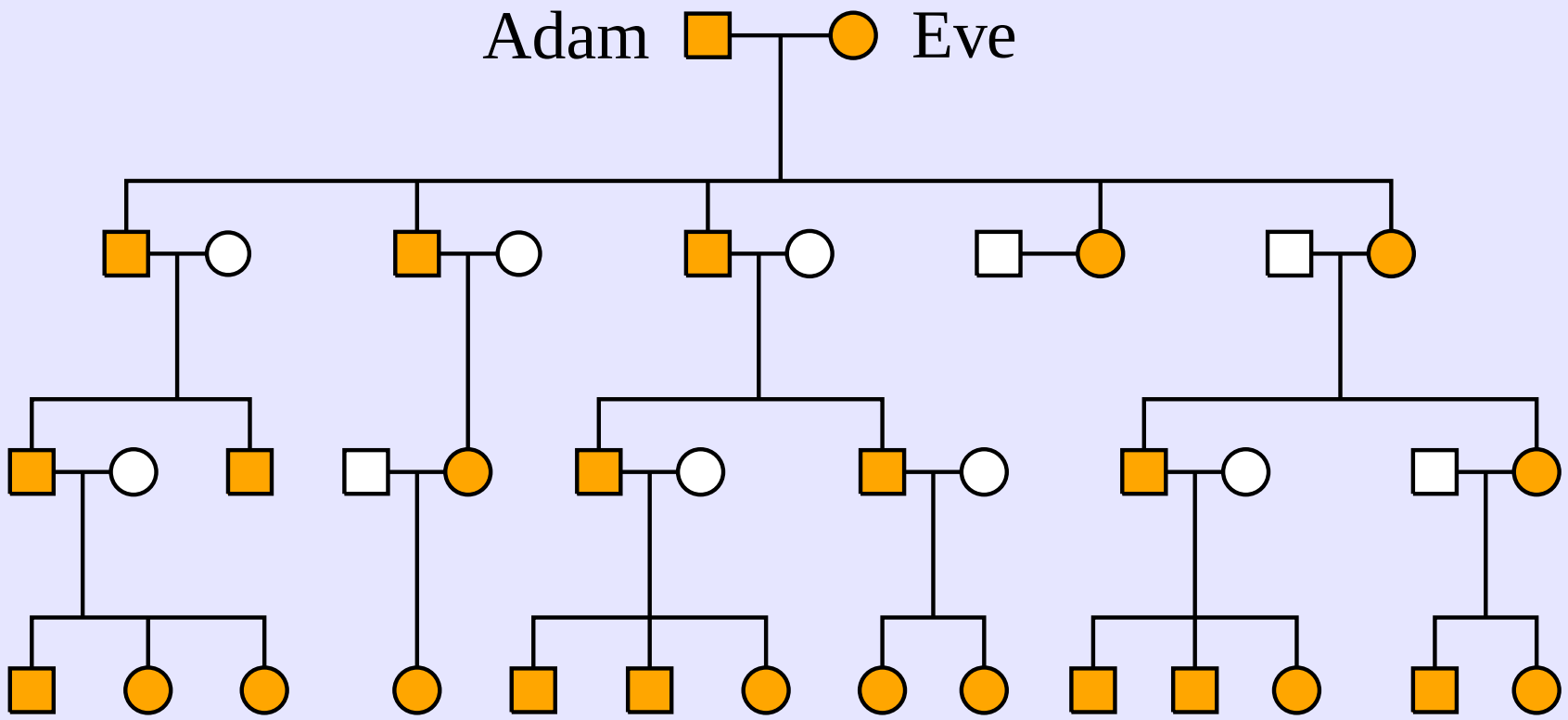
Inheritance of Y-DNA is usually accompanied by surname inheritance.

A Hypothetical Family Tree

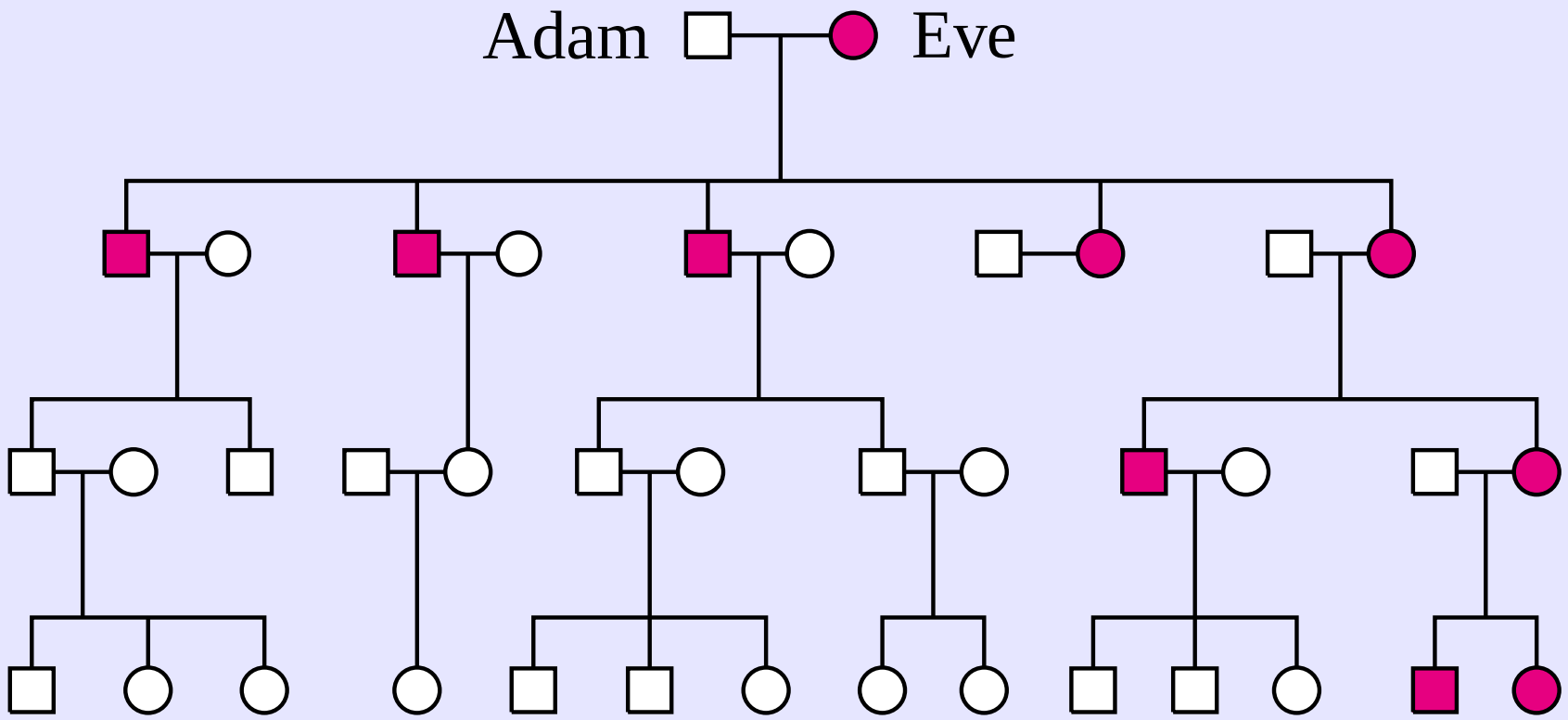


Male

Female

Adam, Eve, and their descendants.

Inheritance of mtDNA

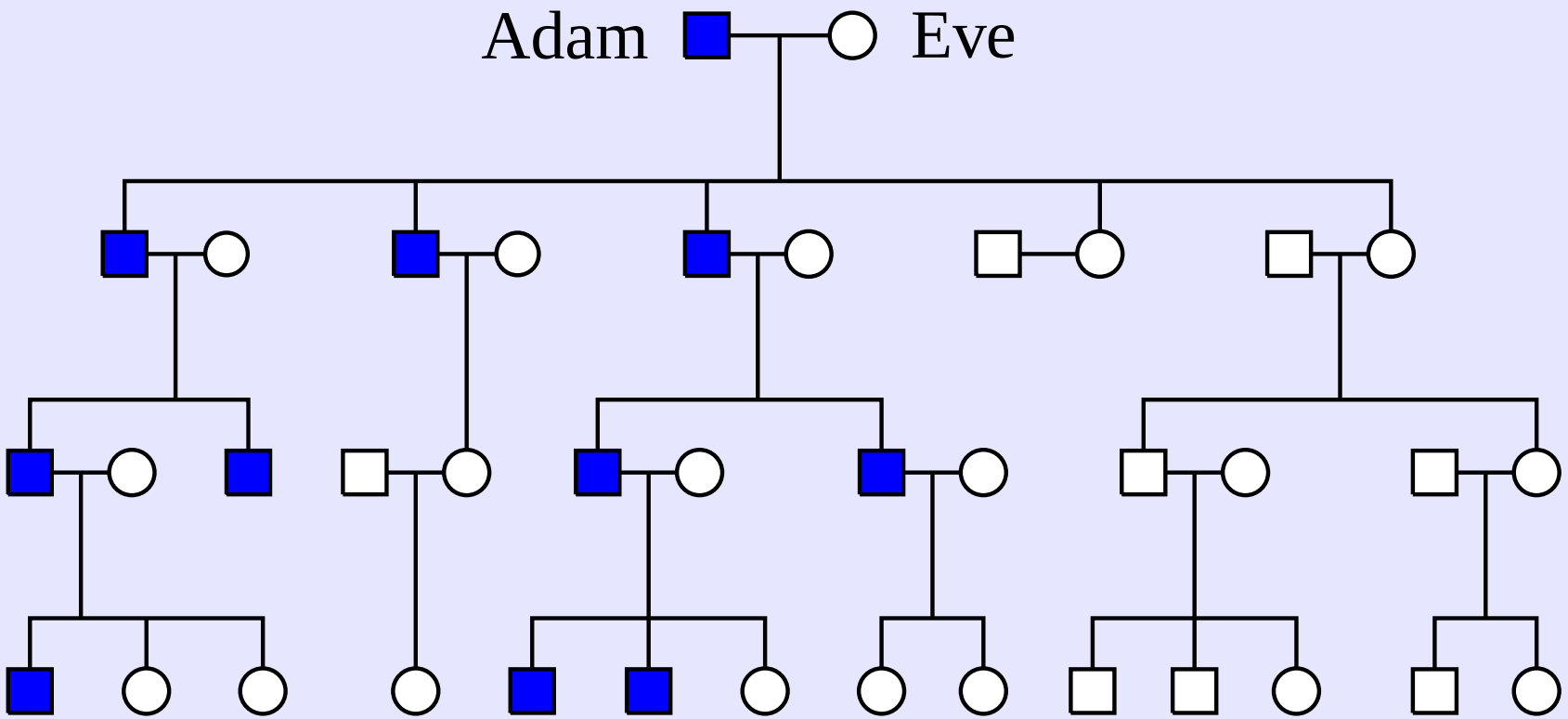


Male

Female

People that have inherited their mtDNA from Eve.

Inheritance of Y-DNA



Male

Female

People that have inherited their Y-DNA from Adam.

The Connection Between Y-DNA & Genealogy

A son's Y-DNA is virtually the same as his father's Y-DNA (except for occasional but rare mutations).

Therefore they share a common Y-DNA signature.

So will any other male relatives that have a direct paternal ancestor in common.

The Real Benefit

This allows men to compare their Y-DNA signatures as a means of determining if they have a common forefather.

Different signatures imply unrelated paternal lineages.

Matching signatures imply a common forefather,
but his identity is not revealed.

Some Pike Examples

- Are all of the Pike families in Newfoundland related?

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  I suspect not.

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  Here are partial Y-DNA signatures for two Pikes with no known relationship, but both with Carbonear roots:

DAP	13	25	14	11	11	14	12	12	11	14	13	30
PSP	13	25	14	11	11	14	12	12	10	14	13	30

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- Are the Pikes of Newfoundland related to the earliest Pikes in North America?

RAP	13	23	14	10	14	14	11	14	11	12	11	28	16	8	9	8	11	23	16	20	27	12	14	15	16

REP	13	25	15	10	11	14	12	10	10	14	11	33	15	9	10	11	11	25	14	19	33	12	14	14	17

Robert Pike, arrived in Maryland in March 1633/34
John Pike, arrived in Massachusetts in June 1635

Some Pike Examples

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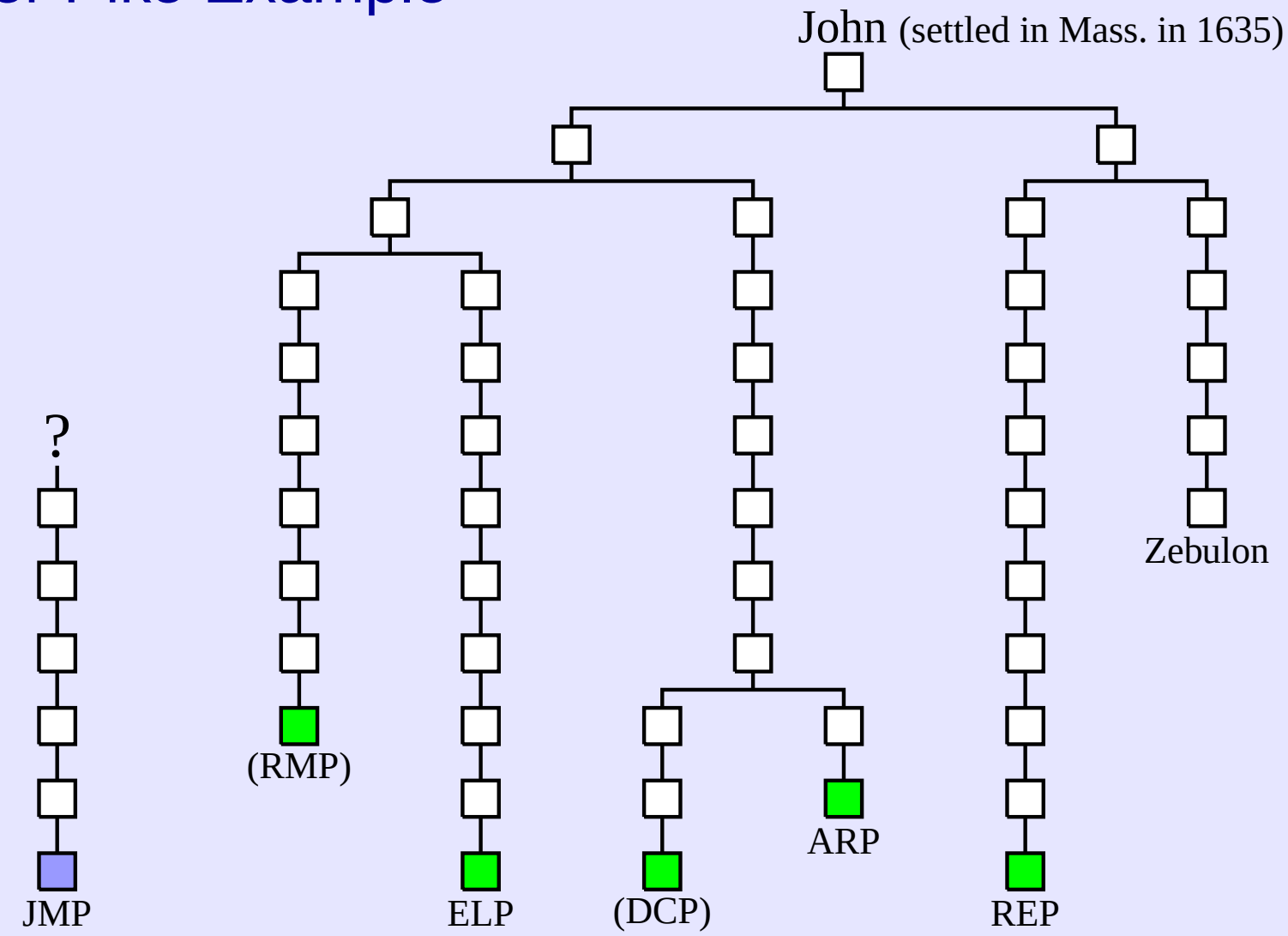
  None have yet been found.

  The hope is to eventually find genetic matches with other Pikes who happen to know where their ancestors resided (be it in England, Ireland, etc.).

Another Pike Example



REP, etc.	13	25	15	10	11	14	12	10	10	14	11	33	15	9	10	11	11	25	14	19	33	12	14	14	17
JMP	13	24	15	10	11	14	12	10	10	14	11	33	15	9	10	11	11	25	14	19	33	12	14	14	17

Other Types of Questions

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- What if a male ancestor was adopted or illegitimate?

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- Three brothers settled ...
- What if a male ancestor was adopted or illegitimate?
- What about ethnic background?
  Is my paternal line aboriginal in origin?

mtDNA and Maternal Ancestry

My mtDNA signature:

126C,169T,294T,304C,519C, 073G,152C,263G,309.1C,315.1C

HVR1 Mutations HVR2 Mutations

This should also be the signature for Martha, wife of Barnet Beston, who was resident in English Harbour, Trinity Bay when the local church records began in the 1750s.

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Q: How can people who are genetically related discover that they're related and make contact?

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Matching User ID KNA9C using Standard Comparison.

Check the boxes of the individuals you want to compare and then click the underlined word "COMPARE" at the top of the column

Check All - Clear All

Compare	User ID	Pedigree	Haplogroup	HVR1 Mutations	HVR1 Mutational Difference	HVR2 Mutations	HVR2 Mutational Difference
☐	UY8W4		T2	126C,294T,304C,519C	-1	073G,152C,263G,309.1C,315.1C	0
☐	KNA9C		T2	126C,169T,294T,304C,519C	0	073G,152C,263G,309.1C,315.1C	0
☐	YZXFK	Show	T2	126C,294T,304C,519C	-1	Not Tested	
☐	YHSRC		T2	126C,294T,304C,519C	-1	Not Tested	
☐	666H3		T	126C,294T,304C,519C	-1	Not Tested	
☐	PJ72T		Unknown	126C,294T,304C,519C	-1	Not Tested	
☐	QY5E2		T2	126C,294T,304C,519C	-1	Not Tested	
☐	FKXZ8		T2	126C,294T,304C,519C	-1	Not Tested	

8 match(es) found.

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Getting Tested

The test itself is simple and painless.

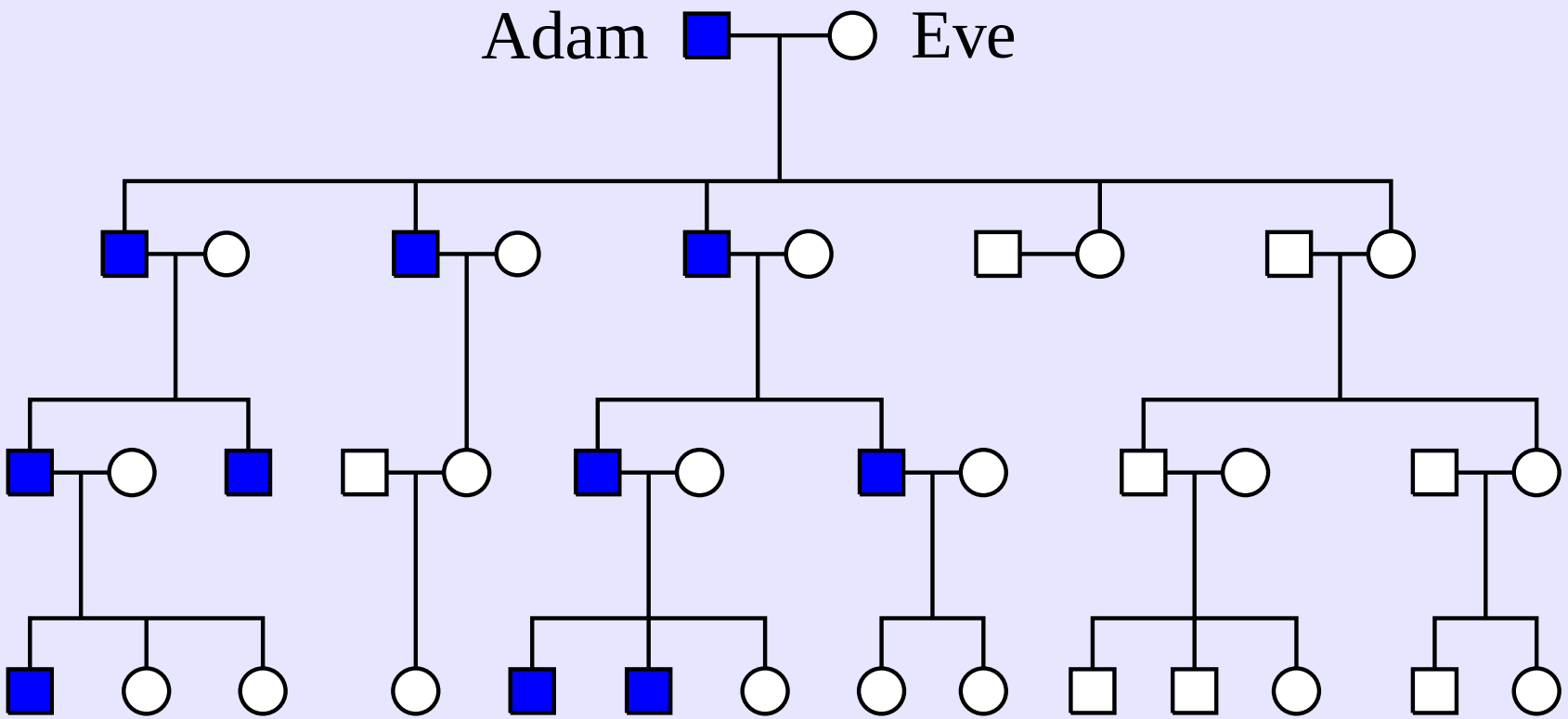
DNA Projects

If a suitable project exists, joining it may help to identify useful genetic matches.

Most surname-based projects focus on Y-DNA analysis.

mtDNA does not lend itself to surname-based projects. However, a number of geographical projects (e.g. Azores, Puerto Rico, Shetland Islands) are underway.

Inheritance of Y-DNA



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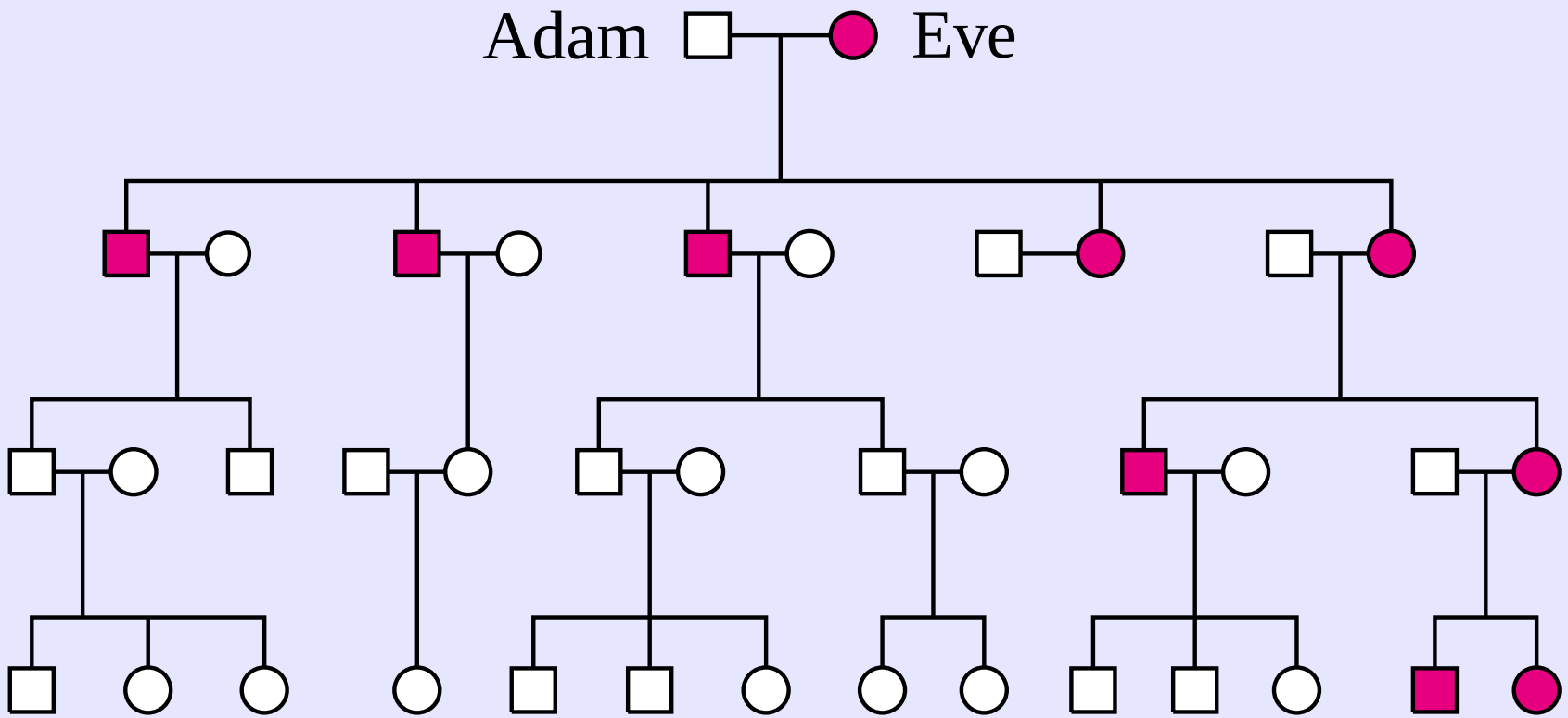
People that have inherited their Y-DNA from Adam.

Inheritance of mtDNA



Male

Female

People that have inherited their mtDNA from Eve.

Resources & Related Stuff

- International Society of Genetic Genealogy
  - Free membership and newbie discussion forum
  - www.isogg.org
- www.worldfamilies.net
  - Has links to many surname and geographical projects
  - Offers assistance for creating new projects
- National Geographic Society Genographic Project
  - Five-year project, started in April 2005
  - Goals are to track ancient human migrations
  - Participants are provided with low-resolution signatures
  - www.nationalgeographic.com