



Reconstructing Family Trees from Public Records

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Background

- **Digitising Scotland project**
 - Transcribe vital events records 1855-1973
 - births
 - deaths
 - marriages
 - Link records to form family tree(s)

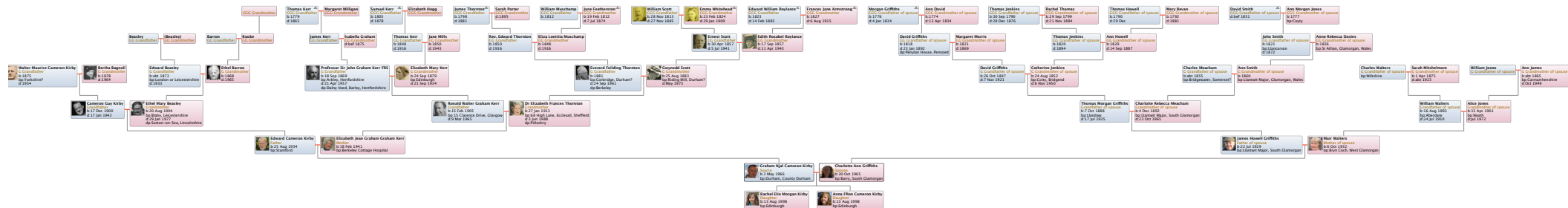


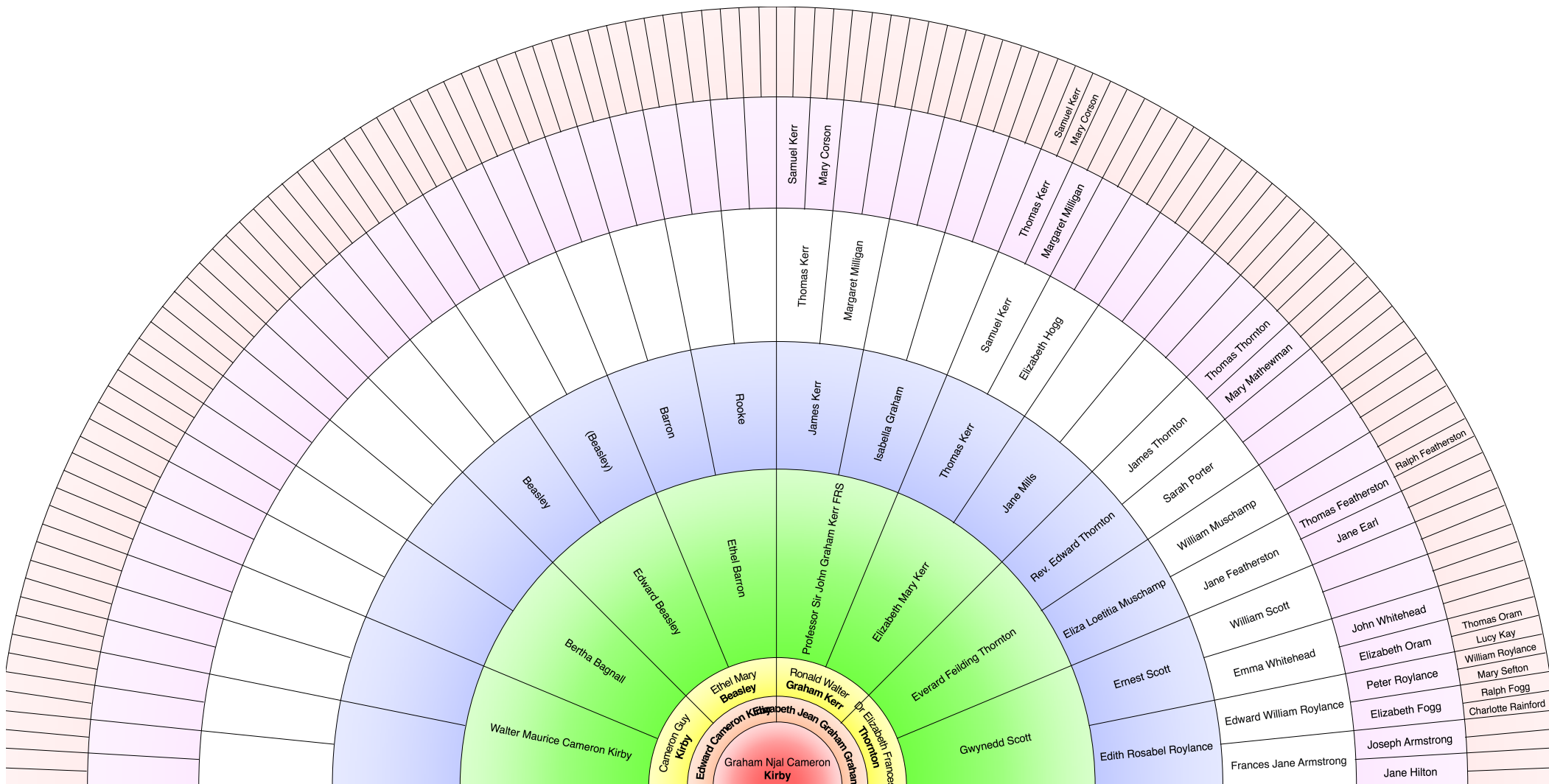
Why?

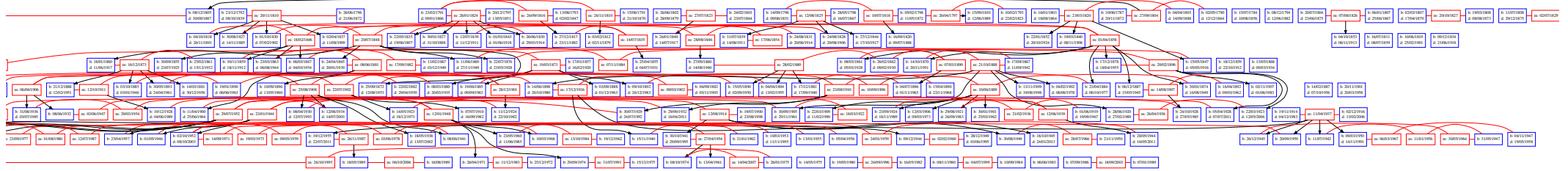
- To produce resource for further research
 - patterns of migration within Scotland
 - social mobility
 - impact of developing welfare state
 - impact of industrialisation
 - distributions of occupations
 - long-term impacts of serious viruses
 - genetic influences on disease
 - effects of occupation on health
 - ...











Scottish Public Records

	Records	Estimated Size
Births	14 million	1.9 GB
Deaths	11 million	2.3 GB
Marriages	4.2 million	0.8 GB

- About 18 million individuals



Problem: Data Acquisition



18 68. BIRTHS in the Central of District in the Borough of Glasgow

(1.) (2.) (3.) (4.) (5.) (6.)

No.	Name and Surname.	When and Where Born.	Sex.	Name, Surname, & Rank or Profession of Father. Name, and Maiden Surname of Mother. Date and Place of Marriage.	Signature and Qualification of Informant, and Residence, if out of the House in which the Birth occurred.	When and Where Registered, and Signature of Registrar.
1360	Charles Rennie	1868	M.	William McIntosh	W. McIntosh	1868
	McIntosh	June		Police Clerk	Father	June 25th
		Eleventh			Present	at Glasgow
		11th 15m A.M.		Margaret McIntosh		Archd Hood
				M. S. Rennie		Asst. Registrar
		7th Parson Street				
		Glasgow		1862 August 4th Glasgow		
1361	Rose Ann	1868	F.	William Caldwell	Mary Caldwell	1868
	Caldwell	May		Iron Moulder	mother	June 25th
		Thirtieth				at Glasgow
		1st 10m A.M.		Mary Caldwell		Archd Hood
				M. S. McCaffrey		Asst. Registrar
		12 North Street				
		Glasgow		1866 January 8th Glasgow		
1362	Walter Dalgliesh	1868	M.	Walter Dalgliesh Jackson	W. B. Jackson	1868
	Jackson	June		Railway Clerk	Father	June 26th
		Eighteenth			Present	at Glasgow
		11am P.M.		Jane Jackson		Archd Hood
				M. S. Dunlop		Asst. Registrar
		68 North St. Mungie				
		Spec. Glasgow		1864 June 15th Glasgow		

B

Thomson Davidson Registrar

BIRTHS in the Central of District in the 1868

(1.) (2.) (3.) (4.)

No.	Name and Surname.	When and Where Born.	Sex.	Name, Surname, & Rank or Profession of Father. Name, and Maiden Surname of Mother. Date and Place of Marriage.	
1360	Charles Rennie	1868	M	William McIntosh	
	McIntosh	June		Police Clerk	
		Perth			
		11 h 15 m A.M.		Margaret McIntosh	
				M. S. Rennie	
		70 Parson Street			
		Glasgow		1862 August 4 th Glasgow	
	Rose Ann	1868	F	William Caldwell	
	Caldwell	May		Iron Moulder	
		21 1/2 10			



Birth Record - What we get

- From the transcription process we get a record like this:
- 356|JENNER|MARY|F|||||1866|
COULTHARD|||19|4||JAMES|0|WRITER IN
NAVY DOCKYARD|MARGARET|0||25|11|
1843|||||||
- Birth record 356 for Mary Jenner...



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1880. MARRIAGES in the District of Hamilton in the County of Fawcote

No.	When, Where, and How Married.	Signatures of Parties. Rank or Profession whether Single or Widowed, and Relationship (if any).	Age.	Usual Residence.	Name, Surname, and Rank or Profession of Father. Name, and Maiden Surname of Mother.	If a regular Marriage, Signatures of officiating Minister and Witnesses. If irregular, Date of Conviction, Decree of Declarator, or Sheriff's Warrant.	When & Where Registered, and Signature of Registrar.
123	1880. on the <u>Third</u> day of <u>August</u> at <u>85 Row-traders</u> <u>Hamilton</u>	<u>Signed,</u> <u>James Keir Hardie</u> <u>Miners-Secretary</u> <u>Bachelor</u>	<u>23</u>	<u>Row-traders</u> <u>Hamilton</u>	<u>William Kithen</u> <u>Coal Miner</u> <u>Edwards</u> <u>Hamilton</u> <u>Mary Hardie</u> <u>M. S. Kerr</u>	<u>Signed,</u> <u>George Bell</u> <u>E. W. Minister</u> <u>Edw. W. McManis</u> <u>W. R. Minister</u> <u>(Signed)</u>	1880. <u>August 6th</u> <u>at Hamilton</u>
	<u>After Banns</u> <u>according to the form</u> <u>of the United Presbyterian</u> <u>Church and Evangelical</u> <u>Union, Church</u>	<u>Signed,</u> <u>Lillias Wilson</u> <u>Dressmaker</u> <u>(Spinster)</u>	<u>17</u>	<u>Row-traders</u> <u>Hamilton</u>	<u>Duncan Wilson</u> <u>Coal Miner</u> <u>Sarah Wilson</u> <u>M. S. Miller</u>	<u>William Hillan</u> <u>Witness</u> <u>Andrew Forrest</u> <u>Russell</u> <u>Witness</u>	<u>William Hillan</u> <u>Post-Registrar.</u> <u>M</u>
124	1880. on the <u>Fifth</u> day of <u>August</u> at <u>Quart House</u> <u>Hamilton</u>	<u>Signed,</u> <u>James Bladen</u> <u>his & wife</u> <u>H. M. Hamilton</u> <u>Coal Miner</u> <u>Bachelor</u>	<u>34</u>	<u>25 Whitehill</u> <u>Road</u> <u>Burnbank</u> <u>Hamilton</u>	<u>James Bladen</u> <u>Coal Miner</u> <u>Mary Bladen</u> <u>M. S. Wood</u> <u>(both deceased)</u>	<u>Signed,</u> <u>Henry M. Hamilton</u> <u>Minister at Hamilton</u>	1880. <u>August 9th</u> <u>at Hamilton</u>
	<u>After Publication</u> <u>according to the form</u> <u>of the Church of</u> <u>Scotland</u>	<u>Signed,</u> <u>Margaret Watson</u> <u>her & mate</u> <u>H. M. Hamilton</u> <u>(widow)</u>	<u>34</u>	<u>25 Whitehill</u> <u>Road</u> <u>Burnbank</u> <u>Hamilton</u>	<u>James Docherty</u> <u>Coal Miner</u> <u>Mary Docherty</u> <u>M. S. Robertson</u> <u>(both deceased)</u>	<u>Signed,</u> <u>James Docherty</u> <u>Witness</u> <u>Margaret M. Docherty</u> <u>her mate & witness</u> <u>H. M. Hamilton</u> <u>Witness</u>	<u>William Peter</u> <u>Post-Registrar.</u> <u>M</u>

William M. M. M.

Registrar.

1880. MARRIAGES in the District of Stann

No.	When, Where, and How Married.	Signatures of Parties. Rank or Profession whether Single or Widowed, and Relationship (if any).	Age.	
123	1880.	<i>Signed,</i>		<i>23</i>
	on the <i>Third</i>	<i>James Keith Hardie</i>	<i>23</i>	<i>1</i>
	day of <i>August</i>			<i>2</i>
	at <i>85 Corn Market</i>	<i>Miners' Secretary</i>		<i>3</i>
	<i>Hamilton</i>	<i>Bachelor</i>		
	<i>After Banns</i>	<i>Signed,</i>	<i>86</i>	<i>4</i>
	according to the Form	<i>Lilias Wilson</i>	<i>17</i>	<i>5</i>
	of the United Presbyterian			
	Church and Evangelical Union, Church	<i>Dressmaker</i> <i>(Spinster)</i>		



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1880. DEATHS in the District of St. Mary in the Burgh of Dundee

No.	Name and Surname. Rank or Profession, and whether Single, Married, or Widowed.	When and Where Died.	Sex.	Age.	Name, Surname, & Rank or Profession of Father. Name, and Maiden Surname of Mother.	Cause of Death, Duration of Disease, and Medical Attendant by whom certified.	Signature & Qualification of Informant, and Residence, if not of the House in which the Death occurred.	When and where Registered, and Signature of Registrar.
139	George McIntosh Railway Guard.	1880, February sixteenth. Found at Edinburgh Inverkeithing.	Male	43 Years	George McIntosh, Master.	Accidentally Drowned from Fall of Railway Train and portion of Glasgow Bridge into the River Tay, on December 28, 1879. Not certified.	Geo McIntosh Father, 121 Hawthill.	1880, February 17 th At Dundee.
	Married to Isabella Butters.	About 8h. A.M. No. 25 Hawthill, Dundee.			Martha McIntosh, Mrs. J. McCarlane (Deceased.)			Wm. Anderson, Registrar.
	James McIntosh Watchmaker (Journeyman) (Legitimate) Married to Elizabeth McMaster.	1880, February sixteenth. 8h. 20m. P.M. 179 Lochee Road Dundee.	Male	20 Years	Robert McIntosh, Household Labourer.	Consumption. 6 Months.	Robert McIntosh Father, 1 South Mid Street, Lochee. (Present.)	1880, February 17 th At Dundee.
	David Jobson Gen. Merchant.	1880, February seventeenth. Found in River Tay, about 10h. A.M. No. 3 Kirkie Place, Dundee.	Male	41 Years	David Jobson, House Merchant. (Deceased.) Mary Jobson, Mrs. J. Gordon (Deceased.)	Accidentally Drowned from Fall of Railway Train and portion of Glasgow Bridge into the River Tay, on December 28, 1879. Not certified.	James Jobson Brother, 10 Wellington Terrace, Broughty Ferry.	1880, February 17 th At Dundee.

D

Wm. Anderson, Registrar.

	Married to	Quardec.		
	Elizabeth McMaster			
	David	1880.	Mo.	41
	JOHNSON.	February		years.
		seventeenth.		
141	Oil Merchant.	found in Liverpool,		
		about 10.30 A.M.		
	Married to	No. 3 - 3rd Lie		
	Mary Watson Miller	Place, Quardec.		



Problem: Classification

- cerebral haemorrhage
- cancer of colon
- heart failure
- effusion on the brain caused by excessive drinking and exposure to cold
- drowned by a smack on boat having been culpably negligently or recklessly navigated or steered by Angus McPherson boatman, Portree
- drowning possibly through his falling asleep or getting insensible through liquor on the sea shore at low water and being afterwards covered by the sea on the tide flowing



Problem: Tree Reconstruction

- From the set of certificates, need to work out:
 - how many people there were
 - what were the relationships between them



Problem: Tree Reconstruction

- Match up information on certificates
 - may be ambiguous
 - bits may be missing
 - mistakes
 - people moving to or away from Scotland



Problem: Tree Reconstruction

- Birth Certificate 3826756
 - Jane Smith, born 1/3/1889
- Marriage Certificate 573734
 - Janet Smyth, born 11/3/1889
- How many people?



Problem: Scale

- Even assuming you can decide, there are a lot of possible pairs to match...
 - 3 people mentioned on a birth certificate
 - 6 on a marriage certificate
- $3 \times 14 \text{ million} \times 6 \times 4 \text{ million} = 10^{15}$
- If we could check a pair in a microsecond this would take 32 years
- Also need to check births against births & deaths, deaths against deaths, births, marriages, ...



Problem: Evaluating Correctness

- How do you know whether the reconstructed tree is correct?
- In general, you can't
 - the whole point of doing this automatically is that we don't have time for experts to do it
 - but can get experts to look at some parts
- For intended research purposes, doesn't matter as long as it's reasonably close



Problem:

Understanding Results

- Sometimes we won't be able to make good automatic matching decisions
 - need to record this uncertainty and let researchers know about it
- How to present this in a way that's easy to understand?
 - multiple possible family trees for a given person



Links

- digitisingscotland.cs.st-andrews.ac.uk
- www.scotlandspeople.gov.uk
- alan.dearle@st-andrews.ac.uk
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