# The Raasay Meeting
# &
# The Cambridge Workshop

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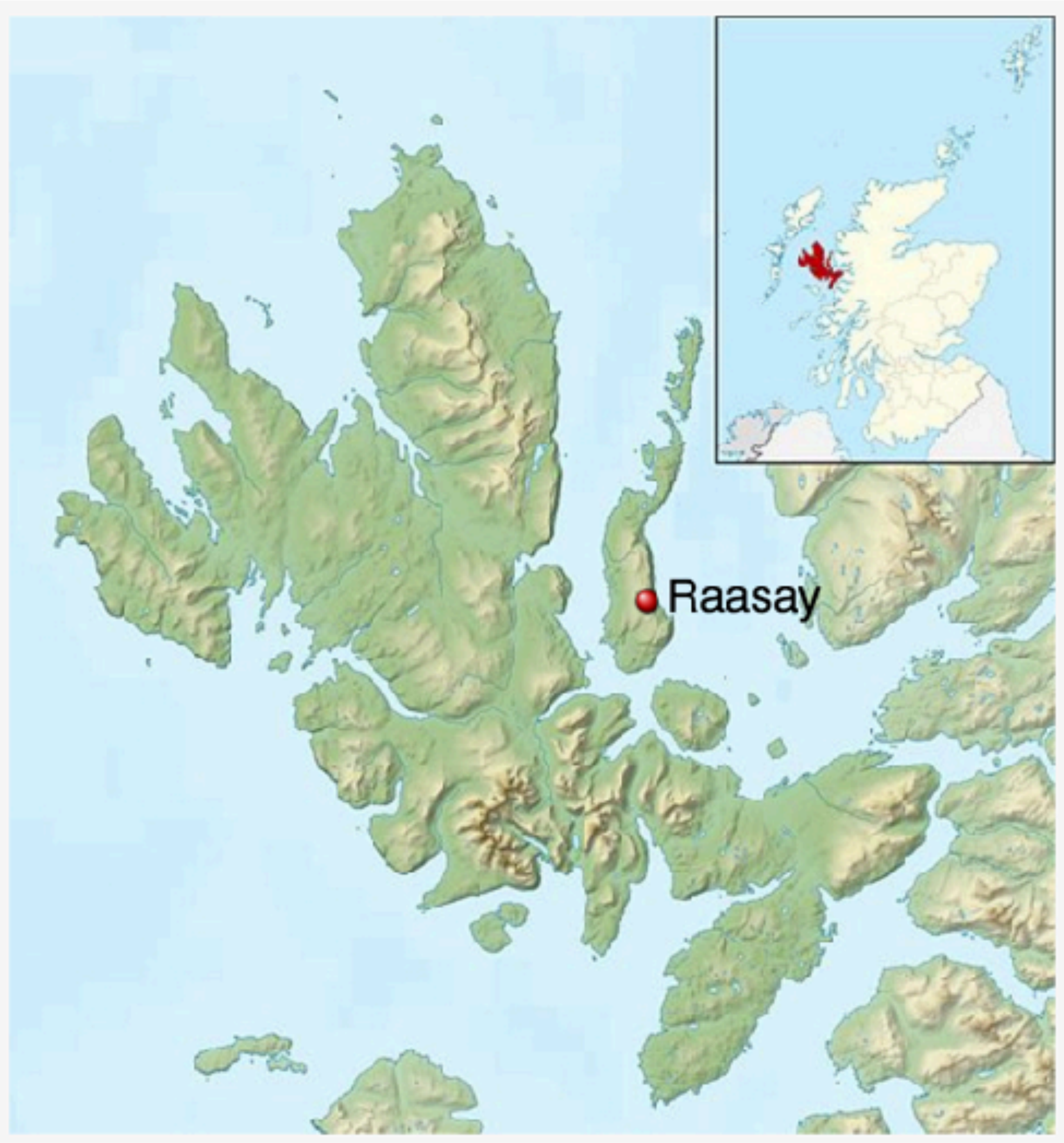
University of St Andrews

27 September 2016
ADRC-S Annual Retreat

- The Raasay Meeting
  - Historical record linkage on the Isle of Skye: A colloquium for historians and computer scientists
  - 27 - 30 August 2016
- The Cambridge Workshop
  - Data Linkage: Techniques, Challenges and Applications
  - 12 - 16 September 2016

# Raasay

- Small isle
- "The size c n of 161."
- Part of a d nd transcribe



# The Mechanical Demographer

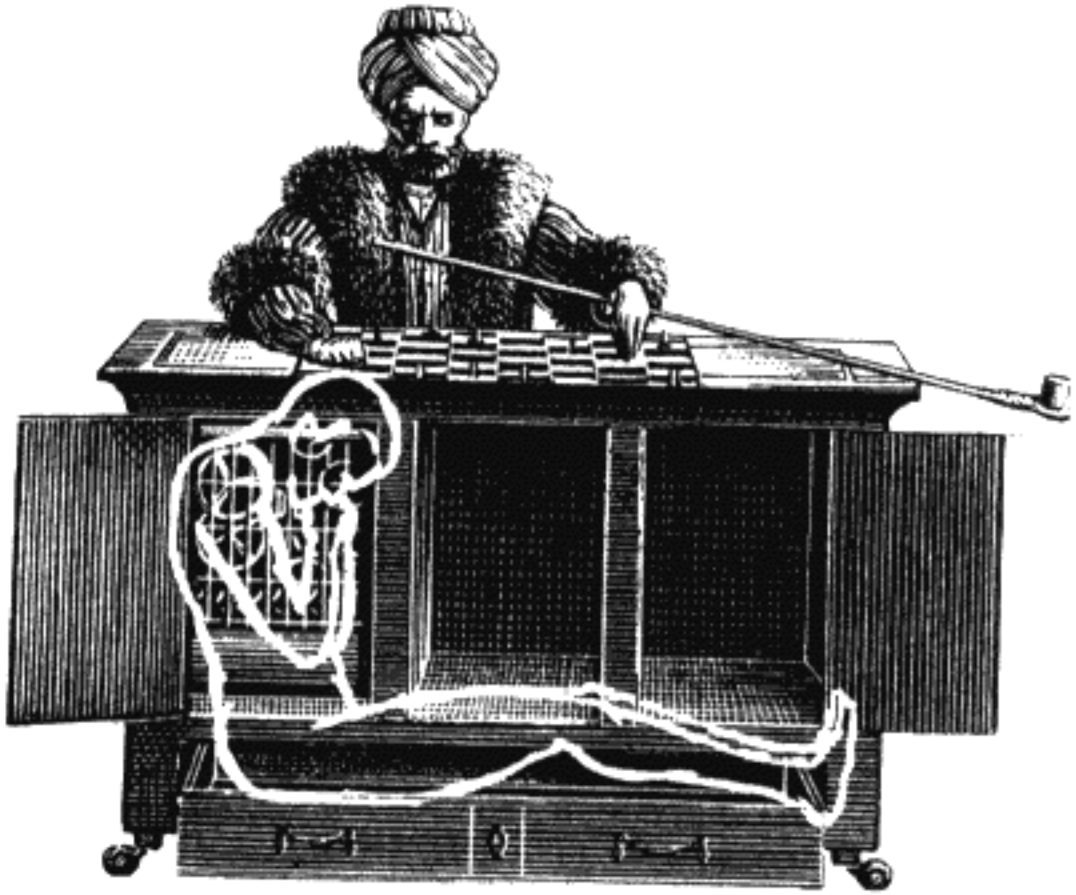


Plate 3.

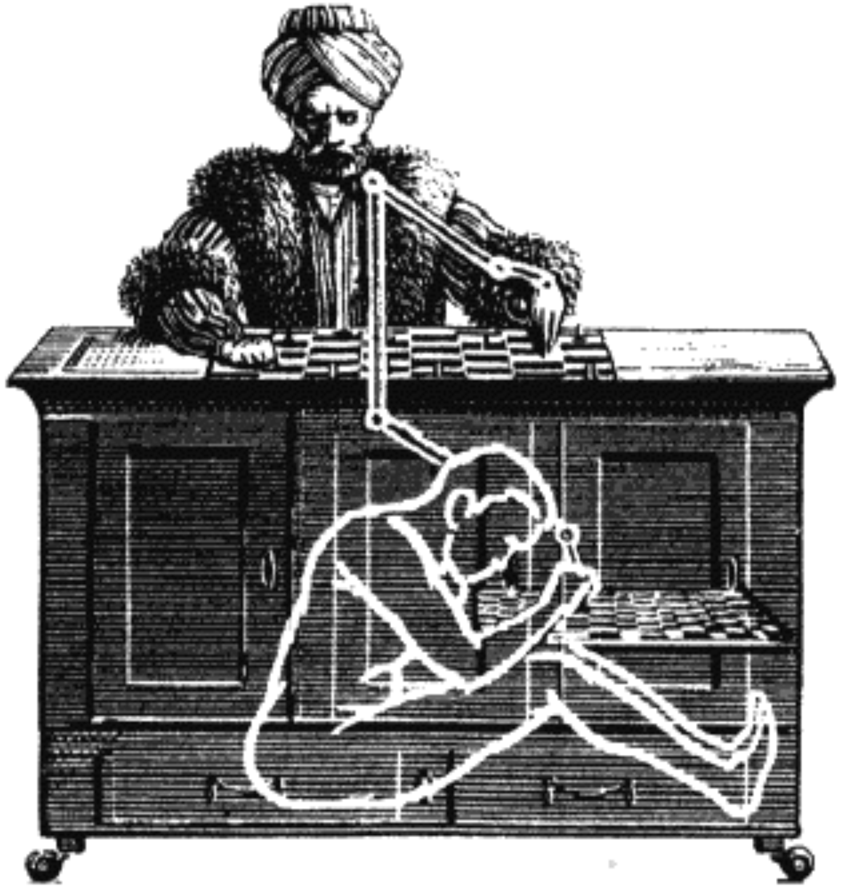


Plate 4.

# Raasay - Participants

- Peter Christen
- Graham Kirby, Al Dearle, Tom Dalton, Özgür Akgün
- Chris Dibben
- Diego Ramiro
- Eilidh Garrett, Christine Jones, Lee Williamson
- Julia Jenning
- Alasdair Gray, Ahmad Al-Sadeeqi

# Raasay - Angles

- Computer Science
    - Statistical Linkage
    - Rule-based Linkage
    - Synthesising Data & Error Injection
- Historical demography
    - How they do linkage "by hand"

# Statistical Linkage

- Similarity metrics
- Calculate between pairs of records
- *Blocking* to avoid exhaustive calculation of all pairs
- Link if highly similar, non-link if highly dissimilar
- In the middle, clerical review

# Statistical Linkage

- Downsides: a lot of things to tweak
  - Blocking
  - Fields to use
  - Similarity metric
  - Local decisions, only looking at a pair
- Upsides: computation speed

# Statistical Linkage

- Advanced techniques
- Clustering based approaches
    - Instead of the simple threshold technique
- Multiple sources
- Privacy preserving

# Rule-based Linkage

- If a condition holds, designate a link
- Tony Wrigley started compiling rules in 1973 in his book "Identifying people in the past"
- Automated discovery of rules: rule mining
- Upside: Easier to describe why a link is made

# Synthesising Data

- Mainly for evaluating linkage techniques
- Real data lacks "ground truth" for linkage evaluation
- Statistically validated

# Error Injection

- Synthesised data is error-free
- No missing data, typos, transcription errors
- Everybody wants a error-rate vs linkage-quality plot
- Even with real data

# Linkage "by hand"

- Not really by hand, they use a similar process
- Normalisation, database queries
- They focus on family structures, starting from censuses

# Using linked data

- Age specific marital fertility rates
  - In the1880s young women in Skye were having a very large number of babies
  - >550 births per 1000 married woman per year
- Who are the front runners on certain behaviours?
- Richer people get married in England
- Use the ratio of household / number of servant as a way of partitioning the population

# Orkney - Julia Jennings

- Very focused, very detailed
- 6 northernmost islands in Orkney
- Started ~15 years ago
- Digitised historical maps, archaeological surveys, etc
- Aerial photos: down to sheep tracks
- Finished linking BMD within parishes, and C to C.
    - Not C to BDM yet
- Economic indicators (price of barley) vs timing of death

# Identifiers

- How to refer to individual records and people on records
- Consistently, across different research groups
- Alasdair Gray: Common scheme for identifiers

- Al Dearle on infrastructure
- Graham Kirby on identifying (encoding) multiple causes of death from a free form string
- Tom on synthesising data
- Ahmad on evaluating linkage algorithms
- Özgür on Combinatorial Optimisation

# Upcoming

- November meeting in St Andrews
    - Working Together: CS + Historians
- Explorathon (European Researchers' Night)
    - September 30th in St Andrews
- SICSA DEMOfest
    - November 11th in Glasgow

# Cambridge Workshop

- Administrative Data Linkage
  - Germany, Netherlands, US
- Researchers (CS/Statistics/Applications)
- Tool developers
- Data suppliers
- http://www.newton.ac.uk/event/dlaw02