



CSI Adelaide: Who Killed The Somerton Man

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Introduction: History

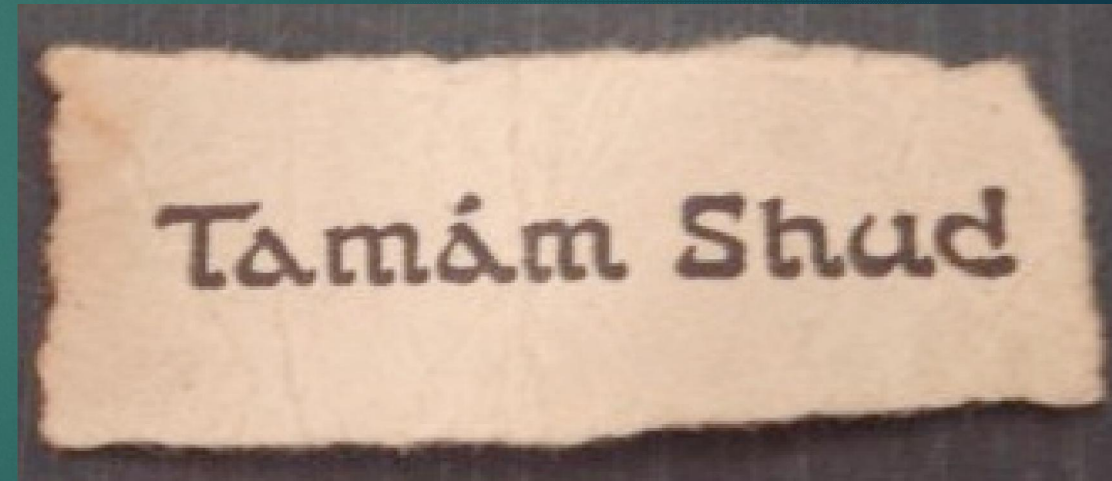
- ▶ Who:
 - ▶ Unidentified Man
- ▶ Time of discovery:
 - ▶ Body found at 6:30am on the 1st of December 1948
- ▶ Location:
 - ▶ Somerton Beach, South Australia
- ▶ Cause of death:
 - ▶ Unknown



<Source: www.sapolicehistory.org>

Introduction: Evidence

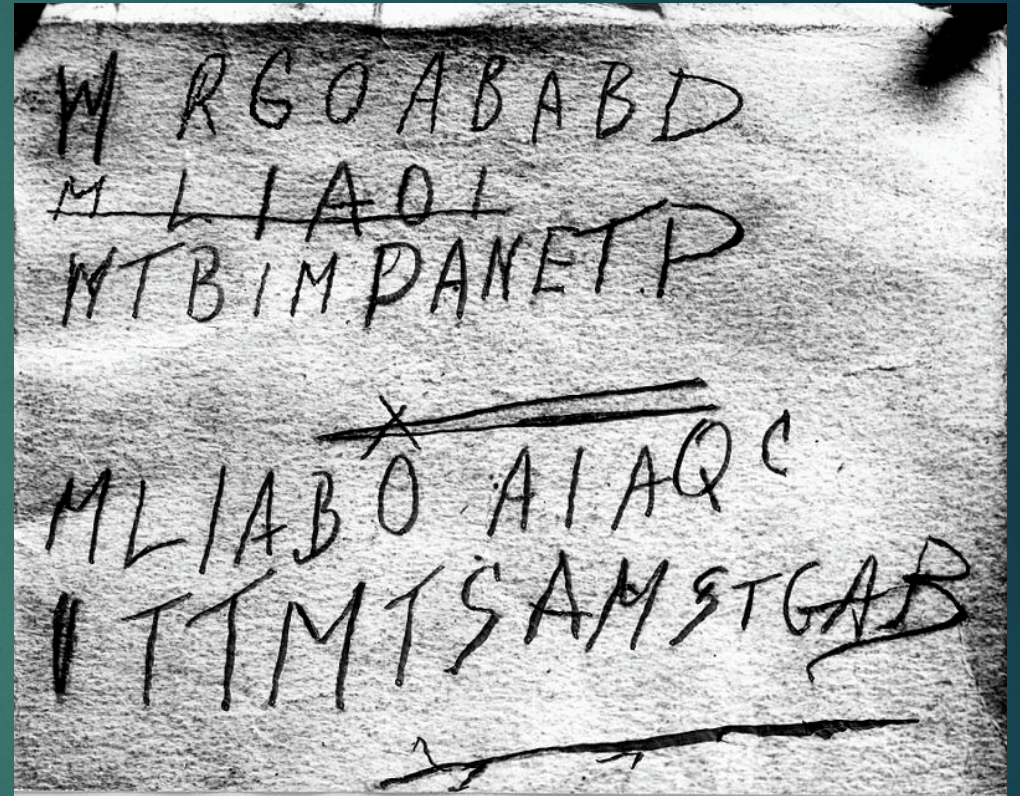
- ▶ A scrap of paper
 - ▶ Found in Man's trousers pocket
 - ▶ "Tamám Shud" translates to 'finished' in English
 - ▶ Proved to be part of the 'Rubaiyat of Omar Khayyam' book.



<Source: www.smithsonianmag.com/history/the-body-on-somerton-beach>

Introduction: Evidence

- ▶ Mysterious Code
- ▶ WRGOABABD
MLIAOI
WTBIMPANETP
MLIABO AIAQC
ITTMTSAMSTGAB



<Source: www.sapolicehistory.org>

Introduction: Project Aims

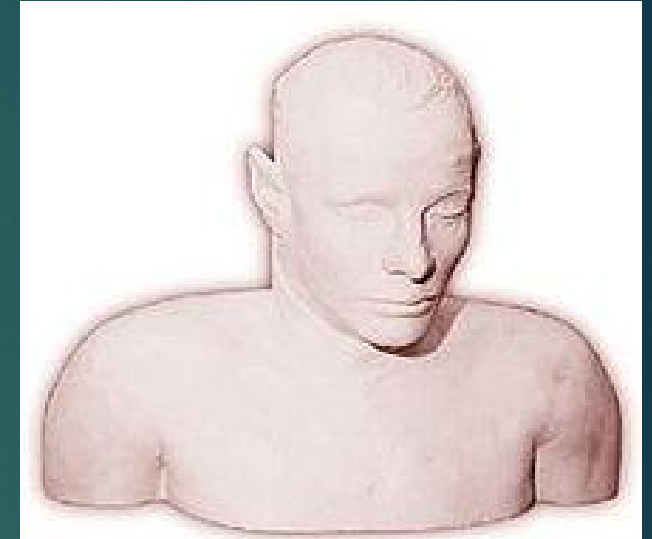
- ▶ To eliminate various possibilities, in relation to the mysterious code
- ▶ To perform mass spectrometry on the victims hair, to discover what elements are present within the hair
- ▶ To analyse how robust DNA can be, performing identification to error rate

Previous Study: Professional Attempts

- ▶ SA police:
 - ▶ Started investigation
- ▶ Australian Navy:
 - ▶ Stated “Neither a code nor a cipher”
- ▶ Australian Defence Force:
 - ▶ Attempted to crack the code
 - ▶ Cryptographers defined code as ‘unable to crack’

Previous Study: Honours Project 2009-2015

- ▶ Letter frequency analysis
- ▶ Initial letter and sentence letter probabilities
- ▶ Different cypher techniques
- ▶ Pattern matching
- ▶ 3D generated reconstruction
- ▶ Mass spectrometer data hair analysis

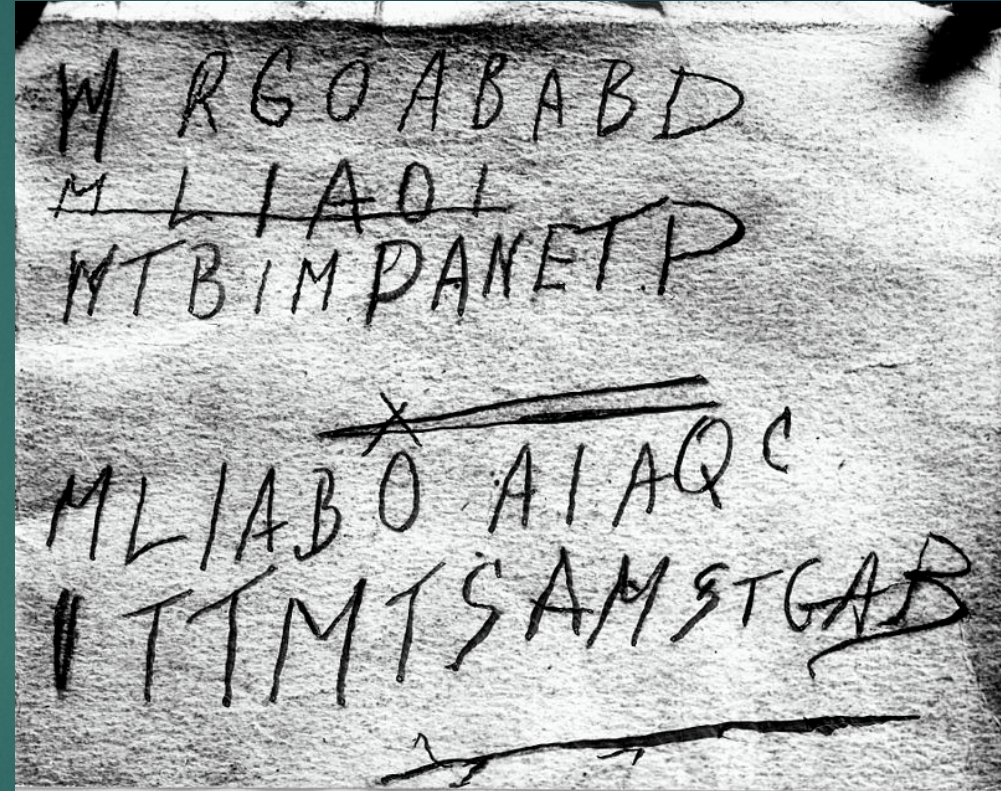


<Source: www.sapolicehistory.org>

Specific Tasks:

Task 1: Letters

- ▶ Mysterious code
- ▶ Using previous studies, it is being assumed that each letter, is the first letter of a word
- ▶ Letters could be a collective object
- ▶ E.g. (Horse names, Australian City's, SA street names, Rubaiyat of Omar Khayyam' book, beach names etc.)

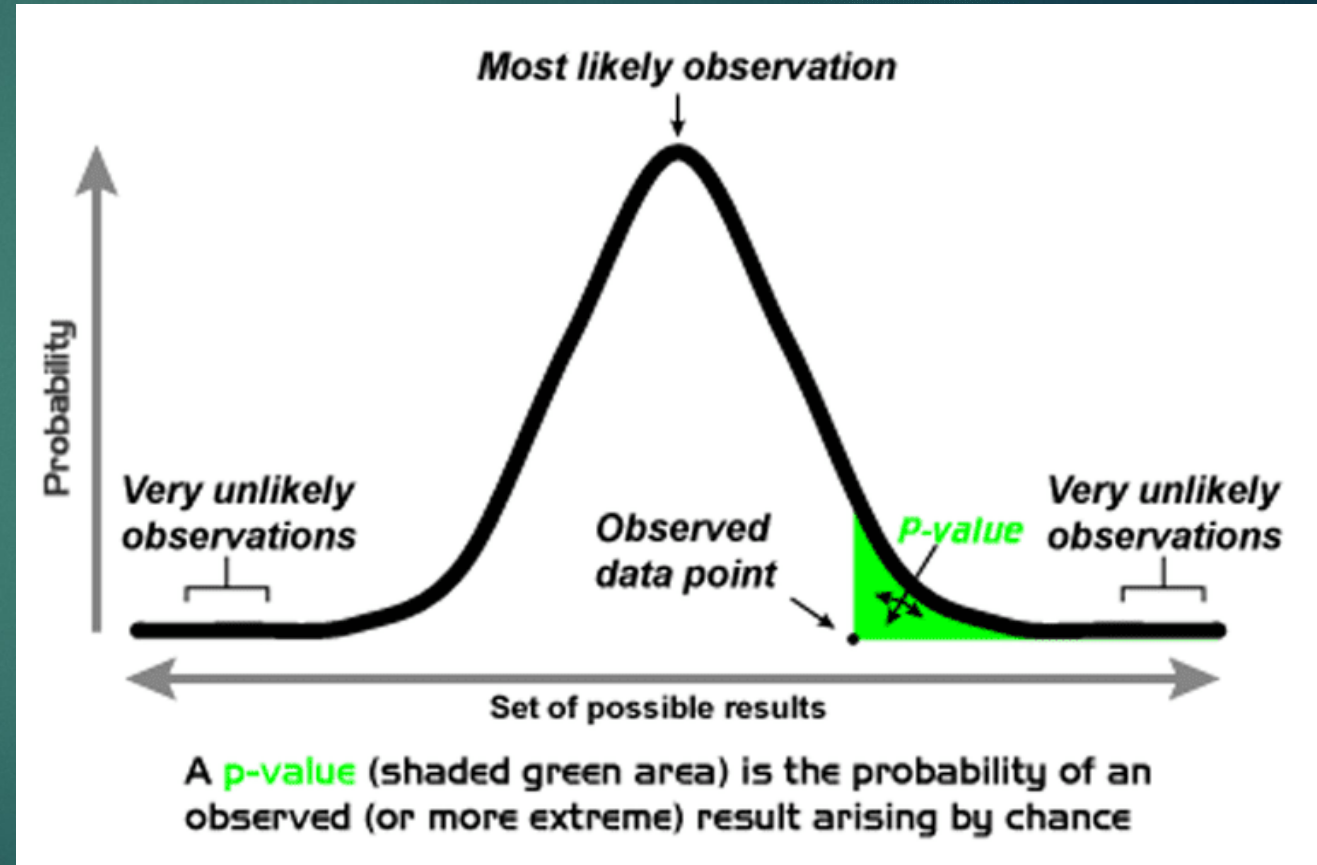


<Source: www.sapolicehistory.org>

Specific Tasks:

Task 1: Letters (Method)

- ▶ Specific Test
- ▶ P-value
- ▶ Hypothesis test
 - ▶ H_0 : The group of letters are not horse names
 - ▶ H_1 : The group of letters are horse names



<Source: www.thoughtco.com/definition-of-p-value-1148041>

Specific Tasks:

Task 2: Mass Spectrometer

- ▶ Laser Ablation Mass Spectrometry (LAMS)
- ▶ Measures the different isotopic signatures of the sample
- ▶ Laser burns the sample and records different elements
- ▶ The sample being used, is the shaft of the hair
- ▶ Traces the hair length

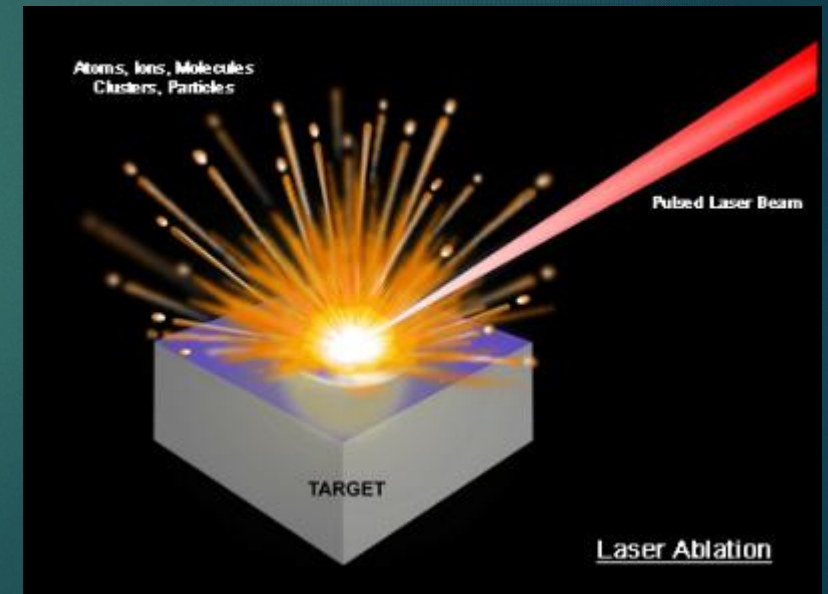


<Source: www.kwipped.com/laboratory/mass-spectrometers>

Specific Tasks:

Task 2: Mass Spectrometer (Method)

- ▶ High strontium in Adelaide
- ▶ Using six controlled samples of modern day hair
 - ▶ Get few controlled samples that have left Adelaide recently
- ▶ The laser will burn the hair and will record different elements in the hair.
 - ▶ Quartz slide will be used
- ▶ Compared with Somerton's man hair



<Source: www.datech-scientific.co.uk/laser-ablation/what-is-libs>

Specific Tasks:

Task 3: DNA

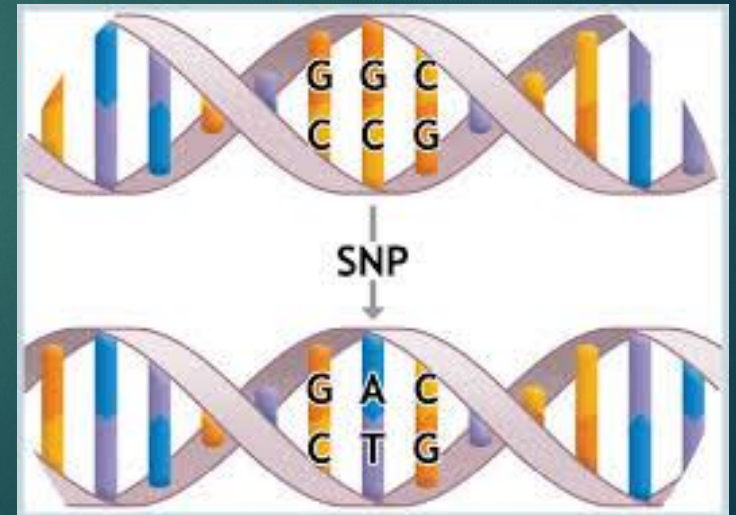
- ▶ DNA (Deoxyribonucleic Acid)
 - ▶ Approximately 2 billion bits of information
- ▶ Single Nucleotide Polymorphism (SNP)
 - ▶ Consequences
 - ▶ Genetic similarity



Specific Tasks:

Task 3: DNA (Method)

- ▶ Send DNA samples to get tested
- ▶ Degrade the DNA samples
 - ▶ Remove SNPs randomly
- ▶ Check for false positives and false negatives
- ▶ How many SNPs can be removed, before the DNA is unidentifiable



<Source: www.socmucimm.org/single-nucleotide-polymorphism>

Project Management: Task Allocation

Task	Allocation
Proposal Seminar	Together
Project Management	Ashley
Task 1: Letters	Together
Task 2: Mass Spectrometer	Together
Task 3: DNA	Together
Exhibition Poster	Together
Final Seminar	Together
Project Exhibition	Together
Honours Thesis/Final Report	Together
YouTube Video	Jiawei

Project Management: Budget

Item	Quantity	Cost
Pure Quartz Slide	2	\$40 each
DNA Genetic Testing + Shipping	2	\$200 each
	Total Cost	\$480
	Total Budget	\$500

Project Management: Risk Management

Risk	Likelihood	Rating	Risk Estimation
1. Bugs in code	Likely	Moderate	High
2. Communication failure	Unlikely	Moderate	Medium
3. Data loss	Rare	Major	Medium
4. Illness/absent	Unlikely	Minor	Low
5. Misunderstanding project tasks	Rare	Minor	Low
6. Task completion time delay	Likely	Moderate	High
7. Human Ethics not approved	Unlikely	Moderate	Medium

Project Management: Milestones

Semester 1	Milestones	Semester 2	Milestones
Week 1	Literature Search Training	Week 1	Review
Break	Proposal Seminar Presentation	Week 7	Complete Task 3: DNA
Week 6	Complete Task 1: Letters	Week 8	Complete Project Poster
Week 11	Complete Task 2: Mass Spectrometer	Week 12	Project Exhibition
Week 12	Thesis Draft	Week 12	Thesis
		Week 13	Final Seminar

References

- ▶ Author unknown (1949). "Tamam Shud", The Advertiser, 10 June 1949, p. 2
- ▶ Author unknown (1948). "Dead Man Found Lying on Somerton Beach", The News, 1 December 1948, p. 1
- ▶ Maguire, S. (2005). "Death riddle of a man with no name", The Advertiser, 9 March 2005, p. 28
- ▶ Author unknown (1948). "Dead Man Found Lying on Somerton Beach", The News, vol. 51, no. 7902, pp. 1.
- ▶ L. Griffith and P. Varsos. (2013). Semester B Final Report 2013 – Cipher Cracking . Available: <http://www.adelaidenow.com.au/news/south-australia/somerton-man-mystery-new-details-revealed-of-jo-thomson-nurse-in-the-case/news-story/4c6bccbd2318584ad0cc6daaf3d8abd4>
- ▶ Inside Story, presented by Stuart Littlemore, ABC TV, screened at 8 pm, Thursday, August 24th, 1978
- ▶ "SNP" Available: <https://www.23andme.com/en-int/gen101/snps/>