

Forensic Biology/DNA Laboratory

Forensic & Analytical Science Service
 PO Box 162 Lidcombe, NSW 1825
 NSWPATH-FASSDNA@health.nsw.gov.au



Health
 Pathology

In the matter of: Special Commission of Inquiry into LGBTIQ hate crimes – alleged murder of Ernest Allan HEAD

Date: 27th September 2023

Name: David BRUCE

Occupation: Senior Forensic Biologist, Forensic Biology/DNA at NSW Health Pathology Forensic & Analytical Science Service

Address: C/- 480 Weeroona Road, Lidcombe NSW 2141

- 1 This statement made by me accurately sets out the evidence that I would be prepared, if necessary, to give in court as a witness. The statement is true to the best of my knowledge and belief and I make it knowing that, if it is tendered in evidence, I will be liable to prosecution if I have wilfully stated in it anything that I know to be false, or do not believe to be true.
- 2 My scientific qualifications are Bachelor of Science from the University of Sydney, a Postgraduate Diploma in Clinical Science from Riverina College of Advanced Education and a Doctor of Philosophy from the Open University, United Kingdom.
- 3 The questions contained in the letter from the Special Commission of Inquiry into LGBTIQ hate crimes, dated 27th September 2023, together with my response, are set out below.

Please outline the differences between the testing conducted previously which identified a Group O secretor profile, and the DNA testing conducted recently by FASS?

- 4 The testing carried out on the cigarette butts in 1976 targeted blood group protein components in the saliva recovered from the cigarette butts. It used antibodies raised against these components as a detection method (blood group serology). The testing carried out in 2023 was on the tobacco fragments from these cigarette butts and attempted to recover DNA from these samples.

Is the deceased, Ernest Head, able to be excluded as Individual A?



- 5 A reference DNA profile from Ernest Allen HEAD is not available for comparison with the Individual 'A' DNA profile. Without this reference DNA profile it is unable to be determined whether the Individual 'A' DNA profile may have originated from Ernest Allen HEAD.

Is the sex of Individual A able to be determined, and how accurately?

- 6 The PowerPlex 21 DNA profiling kit contains an area (locus) which indicates the sex of the donor of the profile. This locus produces an X and Y allele peak (targeted pieces of DNA at each locus) in the profile if the sample is from a male individual and only an X allele peak if it originates from a female individual. The DNA profile recovered from the cigarette butt, item 2, is a very weak partial profile consistent with originating from a very low template amount of DNA (low quantity of DNA in the sample). In these circumstances, it is not unusual for information in the DNA profile to be absent due to a process called 'drop out' where DNA alleles at different loci have failed to amplify. Therefore, although only an X allele was recovered from the cigarette butt, the possibility of drop out of a Y allele cannot be excluded; therefore, the sex of this sample cannot be categorically determined.

The Inquiry has a person of interest in relation to the death of Mr Head. A DNA profile from that person is not available. Would a DNA profile from a relative of the person of interest be sufficient to include or exclude the person of interest as Individual A? If so, which familial relations would be sufficiently proximate for that purpose?

- 7 Due to the limited information available from the weak partial DNA profile recovered, it would only possibly be of use for familial comparison with a first degree biological relative such as parent/child, and for exclusion purposes only. In addition, because the DNA profile recovered from the cigarette butt is very partial it would not provide strong statistical evidence of relatedness in any familial comparison. A possible sibling relationship would not be useful due to the random inheritance of DNA from each parent which can produce very dissimilar DNA profiles in biological siblings. Familial comparisons with more distant relatives (e.g. nephews, cousins etc.) would not be informative. Assuming that the DNA profile originates from a male individual, if a Y-STR profile (DNA profile recovered from the Y chromosome only) were able to be recovered from the sample, this could be compared with possible relatives from the same paternal line but would only provide evidence of possible relatedness.

Signature: _____

Date: 27th September 2023