Forensic Biology/DNA Laboratory
Forensic & Analytical Science Service
PO Box 162 Lidcombe, NSW 1825
ABN 49 382 586 535
[redacted]

NSW GOVERNMENT | Health Pathology

Expert Certificate

Section 177 Evidence Act 1995

RE: Alleged Murder and Manslaughter of Gerard CUTHBERT

FASS Reference Number: FS810407
Police Reference Number: E968858490

(1) I, Michele Anne Franco, am employed at the Forensic Biology/DNA Laboratory of the NSW Health Pathology Forensic & Analytical Science Service, Joseph Street, Lidcombe.

(2) My scientific qualifications are a Bachelor of Science from the University of New South Wales and Master of Science Management from the University of Technology Sydney and I have specialised knowledge based on my training, study and experience.

(3) I acknowledge that I:

(i) have read the Expert Witness Code of Conduct in Schedule 7 of the NSW Uniform Civil Procedure Rules 2005; and

(ii) agree to be bound by the Code.

(4) Based on my specialised knowledge I can report as follows:

I have been asked to prepare this statement outlining the opportunities for forensic testing which might have been available if the exhibits from this case were able to be located and the kind of information that may have been able to be obtained from such testing to assist any investigation into Mr Cuthbert's death.

This statement was prepared using a copy of the notes made by the biologist (Annette Henry) at the time of the examination in 1981. These notes were obtained from the file kept in microfiche and reproduced in black and white. At the time of the examination, cameras were not available for taking photographs of items in the laboratory.

Background information

FASS has not retained any of the exhibits for this matter or sub-samples from the exhibits.

When this case was submitted for testing, long term storage of DNA samples did not occur. Reference samples received in the laboratory prior to 1986 were not stored. Extracts from the samples were entirely consumed in testing at this time. Therefore no submitted reference samples or sample extracts were retained in this matter.

DNA testing technology has improved dramatically over time in both capabilities and sensitivity. While modern technology is far superior, historic casework provides challenges not encountered in routine contempory forensic casework. Original testing targeted the samples most-likely to recover useful information, meaning that options for further testing could be limited or sub-optimal areas may need to be targeted. Exhibit handling practices were also less developed in the 1980s, as DNA contamination was not a consideration.

DNA does degrade over time, but the severity of the degradation is based on a number of factors which can damage DNA including (but not limited to):

- storage environmental conditions. Elevated heat, moisture levels and/or UV exposure will all damage DNA.
- microbial effects
- packaging. Non-breathable packaging, such as plastic, would encourage adverse environmental storage conditions and microbial effects.
- amount of DNA originally deposited. The more DNA originally deposited, the more likely that some suitable quality DNA remains for modern testing procedures. There are high yield DNA sources, such as blood and semen, which are typically targeted for testing in historic casework. Sperm (the cellular component of semen) also has relatively strong cellular walls, which increases the likelihood of long-term preservation.

These factors that affect the integrity of DNA on an exhibit make the chance of success when testing historic case exhibits unpredictable. The DNA may remain highly stable or highly damaged, which directly affects the chance of obtaining DNA results. Without testing the samples, I cannot determine with any certainty the likelihood that DNA testing would have obtained useable DNA profiles.

DNA testing options and database capabilities

There are different DNA testing options available that did not exist when this case was originally submitted. FASS currently has the capability to perform the following DNA typing processes:

- 'Routine' DNA testing (autosomal DNA testing). FASS uses a DNA typing kit that tests one sex determining area and another 20 areas of DNA that vary widely between individuals in the population.
- Y-STR testing. This testing targets DNA on the Y-chromosome, which is only from males.
- Mitochondrial DNA testing. This testing is typically used on compromised samples where autosomal DNA testing is unsuccessful. It is mostly used in unknown remains investigations.

If DNA profiles were recovered using any of these testing options, they can either be directly compared to known reference samples ('direct' matching) or uploaded onto a searchable

DNA database. Database searching compares a recovered unknown profile against a pool of person reference profiles or DNA profiles developed from other casework. This can potentially lead to profile matches that can help develop investigative leads for a case. Each of autosomal, Y-STR and mitochondrial testing have their own DNA database for searching purposes. As all DNA is inherited from parental lines, it is also possible to perform familial searching using databases to potentially identify close relatives to the unknown DNA profile recovered.

Cigarette butts x 2 (item 8)

Positive tests for the presence of the enzyme amylase, indicated that saliva was present on the cigarette butts (item 8). Both cigarette butts were noted as "cut up for grouping" which indicated that they were likely to be entirely consumed in the original testing.

The handkerchief (item 9)

The handkerchief (item 9) was stained with semen and human blood.

Original laboratory testing determined that the semen contained on the handkerchief could not have originated from Gerald CUTHBERT. Due to this bodily fluid originating from an unidentified individual and semen's relative stability, any remnant semen-stained areas on the handkerchief would have been targeted for DNA testing using current methodology.

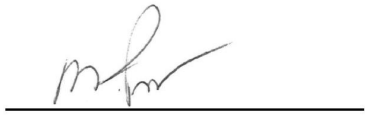
It appears that the identified blood stains were consumed in the initial testing.

Other testing on unstained areas of the handkerchief could also have been tested for trace DNA (typically looking for skin cells). As trace is typically a low yield DNA source, this would not be the first targeting option for further DNA testing.

The sock (item 11)

The sock (item 11) was stained with human blood. Not all the stained areas were removed for blood grouping tests. The blood on areas 1 and 2 of the sock was consistent with originating from Gerald CUTHBERT and different to FRANKS and CORBETT. Although the test results were consistent with Gerald CUTHBERT, the discriminating power of this testing is low. This means that a significant percentage of the population would share the same blood groups as Gerald CUTHBERT.

If the sock was available, DNA testing could be conducted on the remaining bloodstains. This could be performed to determine if there was DNA from a different individual on the sock, or confirm the match to Gerald CUTHBERT with a higher level of statistical significance.



Reported By: Michele Franco

Date: 3rd March, 2023