



AFP
AUSTRALIAN FEDERAL POLICE

**THE EXAMINATION OF PHOTOGRAPHS DEPICTING
HAIRS/FIBRES ON THE HAND OF THE DECEASED,
John Alan RUSSELL.**

BY

Elizabeth Mary BROOKS

Senior Forensic Scientist

<i>CONTENTS</i>	<i>PAGE</i>
1. CUSTODY OF ITEMS	2
2. EXAMINATION, RESULTS	2
3. CONCLUSIONS	3
4. REFERENCES	3
5. HAIR APPENDIX	4

**REFERENCE NUMBER: L1401157
PROMIS 5607455**

19 May 2014

Page 1 of 4



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025 (Accreditation Number: 10821).

Signed:

[Redacted Signature]

Signature witnessed by:

[Redacted Signature]


1. CUSTODY OF ITEMS

- 1.1 The following items were received by me within Australian Federal Police (AFP) Forensics, Weston, ACT on the dates indicated:

Date Received	AFP Item Number and Description
2 May 2014	<u>L1401157 Item 1</u> 2 x original photographs of deceased RUSSELL.

2. EXAMINATION & RESULTS

- 2.1 The purpose of my examination was to determine, as far as possible, the nature of the material located on the hand of the deceased, **John Alan RUSSELL** from two original photographs. The photographs were sub itemised as Item 1-1 being the overview of the upper body and hand of **RUSSELL**; and Item 1-2 being a photograph primarily of the hand of the deceased, **RUSSELL**. These images (Items 1-1 and 1-2) were reviewed by Kate Griffiths, Dr Jane Hemmings and myself.
- 2.2 I have examined and reviewed the two photographs, at a maximum magnification of 50x stereo microscopic level. While differing microscopic techniques and higher magnification were applied the physical resolution of the two photographs was the limiting factor where higher magnification, for example, resulting in a blurring of the image rather than a clarification.
- 2.3 Consultation with forensic fibre experts from the Australian Federal Police Chemical Criminalistics group, Kate Griffiths and Dr Jane Hemmings, indicated that the appearance of the material located on the hand of **RUSSELL** was not consistent with fibres and agreement obtained that they were most likely hairs.
- 2.4 Item 1-1 is an overview of **RUSSELL's** upper body that shows the deceased lying face down on what appears to be rocks with one arm outstretched above the head and crossing over the other arm that is also outstretched but beneath the chest. The hand of the latter arm is side on, palm down and on the upper back of the hand just below the index finger is a clump of visually brown material, most likely to be hairs. In this photograph the deceased appears to have visually brown coloured scalp hair.
- Examination of Item 1-2, is a more detailed photograph of **RUSSELL's** hand, showing more clearly where the clump of possible hairs was located on the back/upper side of the deceased's hand. These hairs appeared to be unremarkable in that they were also visually brown.
- 2.5 There is a significant body of research devoted to the transfer and persistence of hairs and fibres on garments. Whilst acknowledging that hairs and fibres are different, research shows that their transfer and persistence behaviours are comparable, see references.

Signed: Signature witnessed by: 

Reference 4-5 deals with transfer and persistence of fibres in open-air conditions (see references in Section 4) and Reference 4-6 specifically deals with persistence of fibres on skin in open air conditions. In this paper the authors concluded that

"fibres can persist on skin which has been exposed to the elements for two weeks"where "little rainfall and wind velocity up to 6.7mxs-1 affect fibre persistence only to a small degree", "high amounts of precipitation result in high fibre losses" (pp.2).

Furthermore, the authors concluded that...

"the probability of finding fibres originating from the offenders clothing on the skin of a homicide victim is very high, even when the corpse has been exposed to the elements for several days" (pp2.).

3. CONCLUSIONS

- 3.1 In my opinion the material located on the hand of the deceased, **RUSSELL**, is most likely to be a clump of visually brown coloured hairs.
- 3.2 Stereo microscopy of the photographs indicated that the deceased had visually brown head hair and the hairs located on his hand also appeared to be visually brown. As such, these hairs are unremarkable in that they could have come from the deceased's own scalp.
- 3.3 As to the possibility that these hairs could have remained in situ on the deceased's hand during the interval between his death and his discovery some 10 hours later, research indicates that this kind of persistence is possible.
- 3.4 It is not possible from the two [2] photographs to determine the time or the method by which the hairs were transferred to **RUSSELL's** hand. However, once transferred to the skin on the hand research indicates persistence is possible. Krauss W and Hildebrand U, (1996) found that fibres persisted on skin for up to 11 days under open-air conditions where wind velocity and precipitation were recorded as low.

Thus by obtaining weather records of wind speed and precipitation for the time period between death and discovery of **John Alan RUSSELL** may provide an indication of the probability of the hairs remaining in situ. The inference here is necessarily speculative, however it remains possible that under low wind and rain conditions there is some support for the hairs located on the deceased's hand to have remained in situ post the fall and impact.

4. REFERENCES:

- 4.1 Boehme A, Brooks E, McNaught, I and Robertson J, 2009. **The Persistence of Animal Hairs in a Forensic Context**. Australian Journal of Forensic Sciences, 41(2): 1-14.
- 4.2 Dachs J, 2001. **The Transfer and Persistence of Human Scalp Hair**. Thesis Publication, University of Canberra.
- 4.3 Deedrick DW, 2000. **Hairs, Fibres, Crime, and Evidence**. *Forensic Science Communications*; 2 (3).

Signed

[REDACTED]

Signature witnessed by:

[REDACTED]

- 4.4 Gaudette BD & Tessarolo AA, 1987. **Secondary Transfer of Human Scalp Hair.** *Journal of Forensic Sciences, JFSCA*; 32 (5): 1241-1253.
Robertson J & Somerset H, 1987. **The Persistence of Hairs on Clothing.** *Canadian Society of Forensic Science Journal*; 20: 240
- 4.5 Krauss W and Hildebrand U, 1995. **Fibre persistence on garments under open-air conditions.** European Fibre Group Meeting (Linkoping, Sweden) 1995:32-36.
- 4.6 Krauss W and Hildebrand U, 1996. **Fibre persistence on skin under open-air conditions.** International Symposium on the Forensic Examination of Trace Evidence in Transition (San Antonio, Texas USA), June 24-28, 1996.

5. HAIR APPENDIX

Protocol for Hair Examination

- 5.1 The **known** (from a known source) sample(s) is (are) examined and five (or more) hairs are selected to represent the range of hair lengths and colours present. These hairs are placed on microscope slides in semi-permanent mountant, normally one complete hair to each slide. Features such as the profile or shape of the hair, length, colour and condition of the root and tip are then observed using a stereomicroscope and recorded. Using a comparison compound light microscope, detailed microscopic features may be recorded. An important part of this process is to study the variation in features along the length of each hair shaft.
- 5.2 It is not always possible to adequately describe the features or variation present in a single hair using discontinuous classifications. A record sheet or features list is used to ensure systematic and thorough examination but use is also made of written descriptions where appropriate.
- 5.3 After completing an examination of the known hair sample(s), each recovered or questioned hair is examined separately in the same way as the known hair samples(s).
- 5.4 Unless hairs have been excluded at the stereomicroscopic stage, each questioned hair is compared with one or more **known** hairs. These are selected on the basis of possessing similar features to the questioned hair. The comparison process involves looking for differences as well as features in common and comparing the pattern of features along the length of the hair shafts being compared.
- 5.5 It is unlikely that a **questioned** and **known** hair will be indistinguishable for all features **along their entire length**. In order to conclude two hairs could have had a common origin, these hairs should show the same degree of variation and be indistinguishable at several points along their respective lengths. Any differences should be explicable in the forensic context.
- 5.6 Microscopic examination can exclude hairs as having come from an individual. A conclusion that a hair or hairs could have come from an individual, an inclusion, does not usually mean that this would be the only person from whom the hair(s) could have originated. The strength of inclusion cannot be given a statistical estimate and can only be evaluated on a case by case basis.

Signed

Signature witnessed by