25 August 2023

Special Commission of Inquiry into LGBTIQ hate crimes: Expert report on death of Scott Miller

Introduction

My full name is Claude Patrick ROUX. My date of birth is [redacted]1965. I hold a B.Sc. and a Ph.D. in Forensic Science from the University of Lausanne, Switzerland. I am a Distinguished Professor of Forensic Science employed by the University of Technology, Sydney (UTS) in the Faculty of Science. I am the current Director of the UTS Centre for Forensic Science. I have 33 years of experience in practising forensic science, in particular the forensic examination microtraces.

This statement made by me accurately sets out the evidence which I would be prepared 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 shall be liable to prosecution if I have wilfully stated in it anything which I know to be false or do not believe to be true. I acknowledge for the purpose of Rule 31.23 of the Uniform Civil Procedure Rules 2005 that I have read the Expert Witness Code of Conduct in Schedule 7 to the said rules and agree to be bound by it.

The following Item in relation to this case was delivered by Detective Natalie PAYNE to my assistant Dr Dayanne MOZANER BORDIN at UTS on 1 August 2023:

- Exhibit X0000542512: A small piece of debris which was located in Mr Scott MILLER's right hand.

I have been asked by Kate LOCKERY, Solicitor Assisting the Inquiry to conduct an examination of this item and prepare a written report in relation to the same from the perspective of a forensic scientist. In particular, I have been asked to:

1. Outline the examinations I conducted in relation to the debris, and detail the examination protocol and techniques used.
2. Provide my opinion as to the nature of the debris, and specifically whether metals are present in the content of the sample, and, if metals are present, identify the type of metal.
3. Provide my opinion on the likely provenance of the debris, referring to any maps, crime scene photographs or information about the surrounding area, including whether it is likely to have come from a fence or other object located at the crime scene.

1. Examination Protocol and Techniques Used

The examination protocol included both optical examination and chemical analyses of the debris. These analyses were undertaken with the assistance of Dr Dayanne MOZANER BORDIN, Analytical Chemist and Lecturer at UTS. The description of each procedure is presented below:

1.1 Optical Examination

The debris was visually examined with and without magnification, including using Stereo Microscopy and Compound Microscopy (up to 100X magnification). Optical examination provides information about the appearance and surface characteristics of the debris, and guide subsequent analyses.

1.2 Chemical Examination

The debris was chemically characterised by two techniques, respectively providing information about its molecular and elemental compositions:

1.2.1 Fourier Transform Infrared Spectroscopy (FTIR)

This technique enables the preliminary determination of the debris chemical composition and molecular structures. A small fragment (0.5mm) of the debris was used to perform this analysis. Through the interaction of infrared radiation with the debris sample, spectral patterns emerge highlighting the presence of certain functional groups.

1.2.2 Laser Ablation-Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS)

This technique was used to determine the elemental composition of the debris. The procedure involved using a 2.50 mm section of the debris placed on the glass slide and utilizing laser ablation to vaporize the sample. The resulting vapor was then transferred into the ICP-MS instrument, enabling the identification of elemental metal ions. The examination focused on the following metals: Aluminum (Al), Chromium (Cr), Iron (Fe), Nickel (Ni), Copper (Cu), Zinc (Zn), Cadmium (Cd), Lead (Pb) and Titanium (Ti).

2. Nature of the Debris

The optical examination shows hat that the debris is a multilayered fragment of trapezoidal shape, measuring approximately 6 x 4 mm. Representative photos are shown in Figures 1 to 3. Three layers are visible, with the following respective appearances and approximate sizes:

1. Grey/brown, rusty, 0.1-0.2 mm
2. White/light 0.3 mm
3. Grey/brown, rusty, 0.1-0.2 mm

The chemical examination shows the presence of metals within the debris, predominantly Iron (Fe), constituting approximately 52% of the composition, followed by Zinc (Zn) at 47%, while the remaining 1% comprised small amounts of Lead (Pb) and Chromium (Cr).

The chemical examination also indicates the potential presence of a small amount of organic material on the rear side of the fragment. Only inorganic material is detected on the front side.

Further examination such as X-ray Diffraction (XRD) and Scanning Electron Microscopy (SEM) may provide deeper insights into the fragment's material and surface characteristics.

3. Likely Provenance of the Debris

It is important to exercise caution in interpreting these results, considering the temporal aspect of the specimen (spanning 20 years) and the potential presence of blood and environmental contaminations at the scene.

The results indicate that the debris is a small fragment of man-made and primarily metallic origin. The metal composition and the multilayered morphology support the proposition that the debris comes from a coated metallic object, possibly galvanized steel.

Galvanized steel, is a common application where both iron and zinc are present in the product. The main purpose of galvanizing is to provide a protective zinc layer on the surface of the steel to prevent rust and corrosion, and the amounts utilized of both elements can be adjusted to meet the specific needs of the industry and environment. Galvanized steel can be further coated or painted to meet additional protection.

Without access to comparison materials, it is impossible to determine the likely provenance of the debris in relation to the scene information. However, the brief available to me, including the photos, indicates the relevance of a metallic fence and the presence of machinery and shipping containers in the vicinity of the scene. These items should be given further consideration as possible provenance for the debris Exhibit X0000542512.

It should be noted that the presence of this debris in Mr Scott MILLER's right hand does not necessarily mean a direct contact between his hand and a metallic object meeting the described characteristics (direct transfer). It could also be explained by a contact between his hand and another surface (for example, the ground) on which the fragment was previously present (secondary transfer).

Distinguished Professor Claude Roux
Director, Centre for Forensic Science
President, International Association of Forensic Sciences

Figures

Figure 1: Exhibit X0000542512 debris, front side

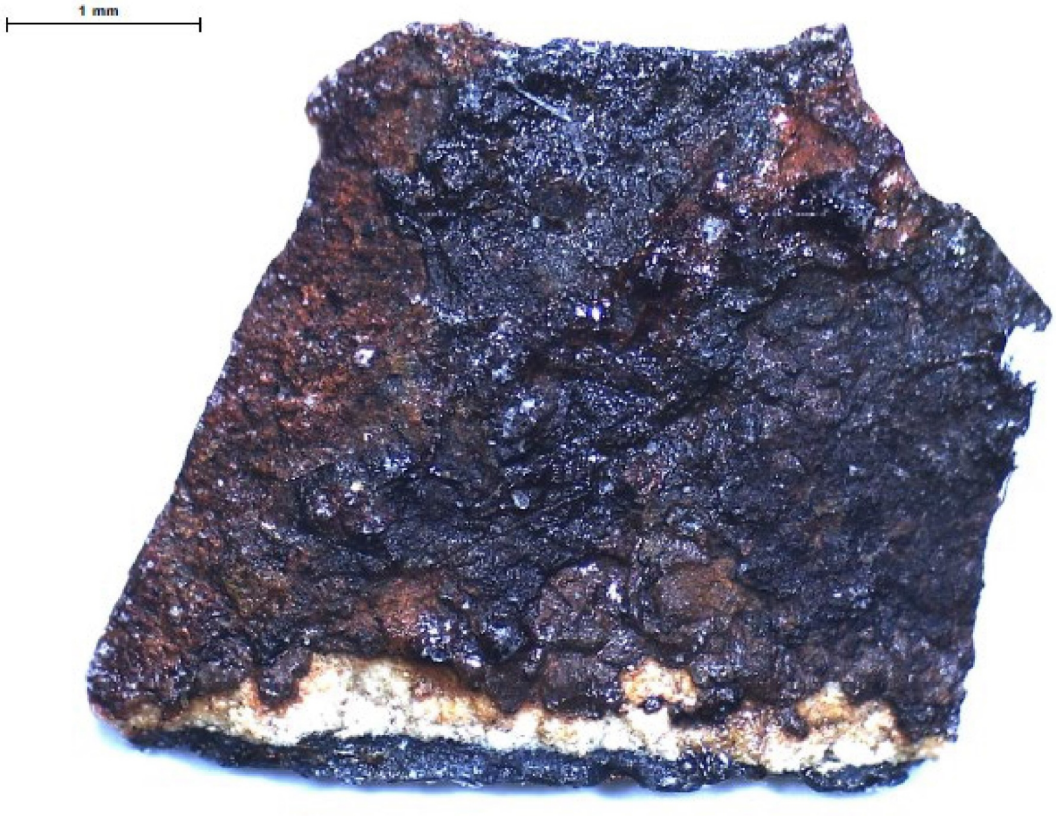

Figure 2: Exhibit X0000542512 debris, rear side

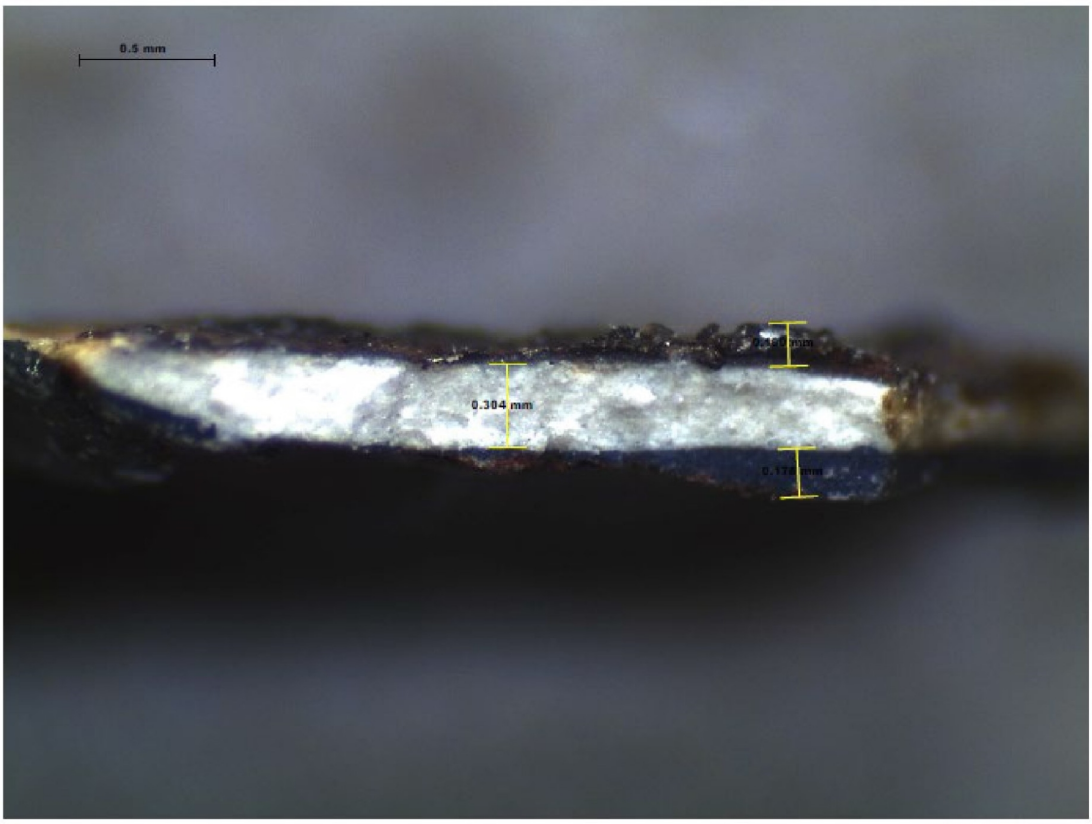

Figure 3: Exhibit X0000542512 debris, edge showing three layers