

Sydney Declaration

18 May 2021



Background

Over the years, forensic science has seen fantastic developments, including technological breakthroughs that have been used to solve or prevent crimes and serious incidents. We have also seen many debates regarding the perceived effectiveness and reliability of forensic science. Most of the discussions have centred around technical or organisational aspects often aimed at short-term gains. A more profound reflection on the field of forensic science and its impact has rarely been explored. However, a sound understanding of the essence of forensic science, its purpose and its fundamental principles is needed for future improvements, including in education, training, research and development, and operational practices. The Sydney Declaration, meant to have been presented at the postponed 2020 meeting of the International Association of Forensic Sciences (IAFS) in Sydney, is the primary initial outcome of this fundamental reflection. We share this reflection and seek feedback from the international forensic science community.

The Sydney Declaration is comprised of a forensic science definition and seven principles that have been reproduced below.

Forensic Science Definition

Forensic science is a case-based (or multi case-based) research-oriented endeavour using the principles of science to study and understand traces – the remnants of past activities (such as an individual's presence and actions) – through their detection, recognition, examination and interpretation to understand anomalous events of public interest (e.g., crimes, litigations, security incidents).

Forensic Science Principles

Principle 1: Activity and presence produce traces that are fundamental vectors of information

A precondition for a forensic science investigation is that activities cannot occur without leaving traces. Sometimes they are left at the scene; sometimes they are taken away (Locard's exchange maxim). The nature of the activity influences the types of items that are exchanged, and how and where they are dispersed in the environment. This item(s), a remnant of the investigated activity, is the trace. The trace is a vector of information that is capable of being detected, examined and interpreted.

The traceability of human activities is rapidly changing in our digitalised (i.e., combined physical and digital) environment. The place of forensic science is therefore increasingly central to studying events of public interest, which are themselves in transformation.

Principle 2: Scene investigation is a scientific and diagnostic endeavour requiring scientific expertise

The goal of the scientific investigation at the scene is to infer (i.e., reasoning under uncertainty) the reconstruction of an event through the study of the surviving traces. The site of an event is where relevant traces can be recognised and characterised with respect to their relative position that may be indicative of sequence, orientation and interaction. This information combines to help understand a limited number of potential explanations relative to the traces that need further examination and interpretation in the reconstruction and identification processes. This complexity requires a trained mind with broad science knowledge and with powerful and proficient observation and detection skills that may be extended by various scientific tools.

Principle 3: Forensic science is case-based and reliant on scientific knowledge, investigative methodology and logical reasoning

Traces constitute signs and forensic science engages a scientific process to investigate and understand the meaning of these signs with their ambiguities, misperceptions and strengths. This engagement involves asking relevant questions (mostly context dependant), making observations, forming hypotheses and testing those hypotheses. This testing may include measurements facilitated by technology, but such tests are only an extension of the scientific process. The process is characterized by critical thinking, logical reasoning (deductive, inductive, abductive and analogical), problem solving and informed judgement. This approach is rendered ineffective – and perhaps even counterproductive – if it is not applied within a logical framework and using a well-understood investigative methodology.



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Principle 4: Forensic science is an assessment of findings in context due to time asymmetry.

In many instances, the quality of the trace resulting from an activity is such that it is incomplete, imperfect, and/or degraded by the passing of time, with such losses increasing uncertainty and often supporting only approximations concerning the past event under investigation. The ground truth remains in the past and is largely inaccessible. Forensic science can only be used to construct a model that is descriptive of a given scenario, explained by what is observed. The context is therefore essential. This is not a general model, but a specific retrodictive model that can only be inferential in nature. Forensic scientists cannot determine with certainty the definitive circumstances surrounding a trace, but only assess the relative value of associated findings under different plausible causes or scenarios. Such assessments should be unbiased and founded on scientific rigor and transparency.

Principle 5: Forensic science deals with a continuum of uncertainties.

Forensic science deals with a continuum of uncertainties that are present at every step of the process that starts with the generation of traces and moves through all the steps up to the communication of the findings and value to the intended recipient (whether reported in written documents or in oral form such as their presentation in Court). Research is needed to identify and quantify these uncertainties with the knowledge that uncertainty will never be eliminated.

Principle 6: Forensic science has multi-dimensional purposes and contributions

The purposes and contributions of forensic science are multi-dimensional. Through the systematic study of traces, forensic science (1) brings knowledge on crime, illicit markets and various mechanisms that cause harm or are of concern to society, (2) contributes to incident investigations, and (3) supports decision-making in legal proceedings. Forensic science provides the scientific basis for the practice of a variety of functions and professions related to crime, deviance and social response.

Principle 7: Forensic Science findings acquire meaning in context

Forensic scientists need to act ethically and with impartiality, transparency and independence to ensure that they remain true to their science and so that the information they provide for the potential resolution of the activity under investigation is useful and reliable regardless of who benefits from the information. Forensic scientists must defend their results and opinions as appropriate while acknowledging any plausible alternatives. When evaluating findings, at least two alternative propositions should be considered.

Contributors

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