COLD CASE REVIEW – UK EXPERIENCE

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Introduction

In the UK, cold-case reinvestigations involve a fresh start based on original witness statements and other primary documentation, such as the pathologist's report. The expectation of progress is mainly based on physical evidence and increasingly on the reassessment of the crime in the light of behavioral and other information. Offenses are typically close-contact, sexually motivated homicide, rather than the fleeting or absent contact of gun crimes, where opportunities for physical evidence transfer are much less. Although reinterviewing witnesses is essential for investigative purposes, it is primarily used to confirm or deny hypotheses as to the sequence of events, rather than providing new eye-witness evidence. An advantage in the UK is the relatively small number of jurisdictions and police forces. There are 43 police forces for a population in excess of 50 million. There are also a very small number of forensic suppliers. These factors taken together enable the introduction of unified processes and procedures across the UK. They also facilitate the availability of national crime analysis systems and specialist support for cold cases via the UK National Crime and Operations Faculty (NCOF), a support service funded by the police service.

What is Forensic Science?

A clear understanding of the nature, potential, and usage of forensic science in case reviews is essential for effective outcome. Forensic science is the interpretation of scientific tests and observations in the context of an individual case. Literally, it is any science in the service of the courts and in cold cases there are no limitations to the usual services provided by a typical forensic laboratory; this includes pathology, fingerprints, and any scientific discipline that can assist.

There are some basic principles of forensic science that are particularly important in cold cases. One of these is Locard's principle: "every contact leaves a trace." What is sought in cold cases is to identify contact points between offender, scene(s), and the victim. This is often by reworking the original sequence of events in light of new behavioral, pathological, or forensic observations.

Science in Context

Forensic science is the interpretation of results in the context of the case circumstances, not the tests themselves. Forensic science is completely context-dependent, and failure to interpret findings in this manner is an abdication of the responsibility of the scientist. However, the probative value of the evidence is a matter for the court and it follows that if either the test result or the context changes, a new interpretation is required. In cold cases, both the results and the context may have to be revised as further work is undertaken. This cannot be done unless the scientist is close to the inquiry and there are good lines of communication.

Understanding and Using Physical Intelligence

The most important aspect of the work of forensic scientists is the provision of physical intelligence during the investigative phase, often before a suspect is identified. However, forensic scientists often consider their primary purpose to be the provision of evidence in court. Perhaps 90% of their observations can contribute to the investigative phase of an inquiry, a fact that is sadly lost on most scientists and many senior investigative officers (SIOs). Even their actual evidence is more likely to be used to eliminate suspects or negate hypotheses than be of use in a court case against a named individual. Forensic science can be used during an investigation to:

- clarify the sequence of events
- identify critical facts (particularly important in cold cases)
- provide elimination factors
- direct lines of inquiry, such as targeting house-to-house interviews
- assist in interview or crime-scene examination strategies.

It is vital then that the importance of integrating physical intelligence into the investigation is recognized and implemented in cold cases. Physical intelligence has the unique benefit that, after the offender has been identified, generally physical intelligence could be transformed to the physical evidence that is essential for a prosecution in cold cases. Intelligence detects cases but evidence is required for prosecution.

The National Crime and Operations Faculty

The NCOF is the body that supports cold-case investigations across the UK, although some UK forces

have their own specialist units. NCOF supports cold cases with behavioral profilers, crime analysts, and senior detectives but primarily through forensic science advisors who take an investigative overview. The NCOF has developed a template for reviews of physical evidence in case reviews, which is the major part of a case. This template is shown in Table 1. This work requires an extensive and detailed analysis of any materials that can be recovered and a reassessment of their potential. This may include extracts or samples retained in the laboratory, which could be analyzed by current techniques. In some cases possessions of the victim are returned to relatives and retained. This is an important source to investigate. It is common for exhibits to be recorded as destroyed when this is not the case; therefore, persistence and imagination can yield considerable benefits in this element of the review.

Universal Principles for Cold-Case Reviews

Make a fresh start This means a new team of officers who approach the crime completely fresh and are prepared to question every assumption. This avoids being contaminated by mindsets associated with the old inquiry, which may have been based on a single or incorrect hypothesis. Typically, the original documentation may indicate that events have been defined, actions taken, or suspects eliminated when this is not the case. To begin with, a reinvestigation from the finishing point of the old one is to build on sand. A fresh start also avoids the constraints arising from justifiable rejection of physical items in the original inquiry but which now could (and would) be analyzed successfully. DNA on items originally tested for blood grouping is the classic, but by no means only, example of this. Lack of understanding of the potential of physical evidence by police officers and poor knowledge of the investigative process and case context by scientists are barriers that only a fresh start to the case can overcome. The approach required is that of mature and self-critical teamwork in order to identify previously overlooked or new opportunities.

Table 1 National Crime and Operations Faculty template of physical evidence in cold-case reviews

Stage	*Typically includes*
1. Initial assessment	• Establishing previous and new lines of inquiry • Identification of investigative problems which require solutions
2. Physical evidence review	• Production of a detailed plan before commencing work • Fingerprint and exhibit review and retrieval • Identifying items originally examined, items not examined, and new items encountered • Establishing tentative sequence of events on the basis of available information and any new information (e.g., behavioral analysis) • Review and reinterpretation of all physical evidence, including pathology, scene, photographs, and videos
3. Identify what is known	• Draft a formal report based on physical evidence and its interpretation • Draft a formal forensic strategy identifying potential for case
4. Develop policies and tactics	• Prearrest policy for crime-scene investigation • Forensic search strategy • Interview strategy • Review of evidence postinterview

Crime assessment The work of the Federal Bureau of Investigation behavioral science unit at Quantico, USA, has led to improved understanding of areas such as victimology, attack and deposition methods in homicides, and the behavior of sexual offenders. A new inquiry will be in a much better position to undertake crime assessments taking behavioral aspects into account with the totality of forensic results, rather than crime-scene assessment, which is often limited to day 1 or 2 of the inquiry, and the immediate findings. Often the availability of a relatively trivial forensic test such as the presence or absence of alcohol will radically change the direction of an inquiry when set in context.

Use systematic processes Given the scope of any one inquiry and the potential for it to be revisited, it is essential that clear processes are followed and good discipline in recording progress, findings, and decisions is followed. The NCOF recommends a five-step process for cold-case reviews, which is outlined in Table 2.

Selection of Cases for Review

Many police forces will have a number of cold cases that could be reinvestigated and therefore cases will need to be selected and prioritized. Transparent selection criteria are required to inform relatives in those cases that are not selected for reinvestigation to explain why this is so. One method of achieving this is to use declared and published criteria agreed by a panel in advance of case selection. The panel might include one or more experienced senior investigating officers (SIOs), a crime-scene manager or crime-scene coordinator, a fingerprint expert, and a specialist advisor. A specialist advisor in this sense is a highly experienced forensic scientist who can take a forensic overview and is fully aware of the latest scientific developments. Selection criteria typically include:

Table 2 Stages in the cold-case review process recommended by the National Crime and Operations Faculty

Stage	*Typically requires*
1. Formal case assessment	• An independent assessment group covering a range of disciplines • May need an independent advisory group in high-profile or sensitive cases
2. Retrieval of items	• Documentation and exhibits in police forces • Documentation and exhibits in forensic laboratories • Bringing all documentation up to current standards • Materials recovered in laboratory analyses • Scene and postmortem examination photographs
3. Assess present potential	• Constant focus on case context and investigative problems • Information and intelligence (not just evidence) • Clarification of key events, timings, etc.
4. Obtain new information	• Use of lateral thinking • Assessment of items originally overlooked • Following previous processes to exhaustion • Reassessment of scene, motivation, and actions • Use of new techniques and technologies
5. Reevaluate	• A generalist rather than specialist scientist • Integration of all specialist evidence and intelligence • Focus on the needs of the investigation • Production of reports for interview and arrest strategies

- the nature of the crime (i.e., close contact)
- age of the crime
- present age of the probable offender
- availability of physical items and therefore potential
- potential impact of new technology, e.g., DNA
- miscarriages of justice or high-profile cases
- likelihood of successful prosecution.

It is important to realize that a large amount of reinterviewing witnesses and checking will still have to be done and therefore any review will require significant resources.

New Science and Technology

One of the major factors influencing cold-case reviews is development of new science and technology. This is not confined to forensic science but includes any relevant useful science technique or technology. Some examples include:

- the National Injuries Database
- new methods for fingerprint enhancement
- the national fingerprint identification system (NAFIS)
- new technology for comparing palm prints
- new and more sensitive DNA methods
- national DNA databases
- low copy number DNA analysis
- mitochondrial DNA sequencing
- familial DNA analysis
- behavioral and geographical profiling.

It must be stressed that it is rarely the science in isolation that leads to new breakthroughs. Most frequently, it is the appraisal of test results that leads to clarifying circumstances, directing resources, setting elimination criteria, pointing to a suspect, or assisting in interview strategies. However, most lost opportunities result from lack of thought, not lack of technology. The investigation of such a case is described below.

Case History of Lynette White: A Cold-Case Review and Miscarriage of Justice

Lynette White was a strikingly pretty teenage prostitute stabbed to death in the early hours of Valentine's Day 1988. She was murdered in a dingy apartment above a betting office in the seedy Butetown area of Cardiff, where she took punters. The apartment contained only a bed and had no electricity. A blanket covered the window, with the only source of light being a street lamp. Consequently, the apartment was dark and cold with a narrow exit route out and down the stairs to the street. Lynette was stabbed around 50 times in a frenzied attack with something like a large kitchen knife. Most of the wounds were concentrated on the breasts and throat. She had bled out in the confined space between the bed and the window, and after the attack her body had been dragged away from the wall by the ankles. Attempts were made to obtain the then nascent DNA evidence from her body, but this was unsuccessful, and blood-grouping evidence obtained from the scene turned out to be a red herring.

Initial inquiries focused on her lifestyle, in particular her pimp and his associates, with whom she had allegedly been in dispute. Eventually, five black males were charged with the murder and three were convicted in 1990, primarily on the evidence of police interviews and despite some alibi evidence. Two years later the Cardiff Three were released, with the court of appeal particularly criticizing the nature of the interview and confession evidence.

In early 1999 South Wales police decided to undertake a full review of the case. The Head of Physical

Evidence at NCOF, Dave Barclay, was appointed to undertake a full forensic review with the assistance of other NCOF services such as behavioral advice and crime analysis. An independent advisory panel was appointed to monitor the work on behalf of the community. This enabled religious, educational, and ethnic-minority groups to be represented and fully exposed to the process, including complete access to the police files.

In mid-1999 an experienced SIO, Bill Hacking, from a different police force was appointed to lead the investigative element of the review.

By then the physical evidence review had identified three general areas:

1. Existing opportunities. Attempts had been made throughout the 1990s as new DNA techniques were developed to obtain a profile from intimate swabs and from known contact areas, such as the socks and bottom of her jeans. Lynette's body was known to have been dragged away from the wall area. This attempt was unsuccessful because of swamping with her blood and pigment from jeans.
2. Disregarded items. The examples of disregarded items are a speck of blood on a cellophane wrapper from a condom packet and blood on the key ring to the apartment – both too small for analysis in 1988 and subsequently overlooked. The importance of the cellophane wrapper had not been fully appreciated; it had been removed from a full, closed packet of condoms, which was lying on the bed. Any fingermarks or blood from the offender would place him in the room at the time of the crime.
3. New opportunities. These opportunities arise from a complete reassessment of the case, including actions at the scene.

From the above it can be seen that any cold-case review should not just be a laboratory-based reassessment of items already submitted, and certainly not simply a "DNA review," as this will uncover only one category of opportunities.

A complete case assessment by a behavioral scientist and the forensic scientist working together, and a reenactment in the apartment at the same hour the crime was committed in the 1990s, provided new information. The police version, which involved more than five Afro-Caribbean males, the victim, and a female witness all being present and active during the crime, could not be true. There was an absence of physical evidence, including footwear marks in blood, which defied all logic. On the scene assessment alone, the original scenario and suspects could be discounted. DNA later confirmed this elimination of the "Cardiff Three."

The behavioral advice pointed toward a different motivation and suspect group – a young single male of white or Asian origin, following a dispute in the course of Lynette's work. A reenactment by the scientist undertaking known actions at the scene and then running from the house in conditions of complete darkness identified a number of possible contact points between offender and scene. These areas contacted by the scientist on the way out were marked and cross-referenced to the scene observations in the 1990s. Actual opportunities emerged following mapping of this sequence of events on to the original scene photographs, photographs of finger marks, and retained materials such as some sections of wallpaper.

As a result of this work, it became apparent that the offender might well have cut himself at the scene (not unusual with 50 stab wounds with an unguarded blade) and that one particular drop of blood which had run down the wall under the window did not fit the general pattern of blood staining. Although there was very considerable arterial and cast-off blood from Lynette at the scene, this particular drop had impacted the wall from a different angle. It appeared to be cast-off and was 1 m from the majority of the pattern. However, the area had not been sampled nor was the wallpaper retained. The scientist suggested removing the skirting board and a small amount of blood was found, protected, and painted over, in the crack between the skirting board and the wall.

Areas of contact on the exit route that were reexamined showed some evidence of edge detail in blood; the amount of blood, though minimal, did not diminish as would be expected if it were simply secondary transfer from Lynette. A small area of blood smear inside the apartment door had been overlooked, but mapping the areas contacted by the scientist by close examination of the scene photographs revealed it. The door had been painted over with gloss paint before returning the apartment to the owner in 1988, and also repainted subsequently. The paint was removed in the target area and a swab from the area removed for DNA analysis.

These three new opportunities, together with the fleck of blood on the cellophane which had been disregarded, and the socks and jeans were the subject of considerable and innovative DNA work at Forensic Alliance, a major UK supplier. All eventually gave either full or almost complete DNA profiles from the same unknown male.

While the work on the jeans and socks had already been planned, all the other opportunities were identified and reprioritized by the combination of behavioral information and physical-case assessment.

The DNA profile, which was obtained from the UK national DNA database system of 20 alleles giving a

match probability of around 1 billion, did not match any of the previous suspects and thus absolutely eliminated the Cardiff Three, as well as their colleagues and all other original suspects. However, there was no match on the national database and the source of the DNA remained unknown.

In an innovative attempt to identify the offender, the allele pattern of the DNA from the scene was compared to other nonmatching profiles on the basis that alleles are statistically similar between relatives, and that criminality runs in families. In late 2002, a voluntary intelligence sample was requested from Jeffrey Gafoor, a local security guard whose relative was on the database and had a similar familial pattern. He attempted suicide after providing the confirmatory buccal sample and in July 2003 pleaded guilty in court to the murder – 15 years after the crime.

Lynette White is an excellent example of the need to set physical evidence in context with the inquiry as a whole and to integrate the assessment process. Without that close integration and communication, valuable opportunities will be overlooked. It also provides a regrettable, but hopefully historic, illustration of the "making things fit your sole hypothesis" trap for investigators.

Managing Exhibits and Results

Exhibit tracking is an essential element of case reviews. This must use a common source of information, which describes the life history of all relevant items. The system should clearly show what has gone for analysis, when it went, why it went, when results were obtained, and where the item is stored. This is not only an aid to the review process but an essential part of the criminal justice process, should the review result in a trial. A schematic approach is useful to show items which still await analysis or results or which have been overlooked, as can be identified at a glance instead of plowing through page after page of laboratory documentation. The tracking system must be constantly refreshed and act as a definitive source of accurate information to the review team.

The Concept of Scenelines

Another concept, which is used to prevent anomalies in the logical thinking behind a hypothesis or sequence of events, is the sceneline. This was first developed at NCOF and involves plotting all the actual known significant facts and scientific inferences in relation to the crime against the proposed hypothesis developed by the investigators. This is analogous to a timeline, which is constructed (usually by commercial software such as I2) to test witness statements and express spatial relationships. The investigative hypothesis becomes a sceneline – a physical sequence of events on which every one of the actual events must lie, or be connected to by a provable logical inference. It follows that if factual events lie off the sceneline, then that hypothesis is wrong. This technique has proved particularly powerful in cold cases where there may be a considerable feeling that investigators "know" what happened, based on previous media coverage or work by the force. Often relatively small observations by the pathologist or overlooked laboratory results can completely disprove the initial hypothesis if it is tested in this way.

Conclusion

Effective cold-case reviews are based on:

- a structured approach which uncovers overlooked-opportunities and identifies new ones such as identification of contact points
- integration of science with the investigative process
- reevaluation of previous findings such as sequences of events in a more rigorous and constructively critical manner
- informed planning for key events such as interviews and searches
- use of management tools such as sceneline and exhibit-tracking software.

Crucially, it is not just about science but science in context, focused clearly on investigative problems and the needs of the criminal justice system.

See Also

Crime-scene Investigation and Examination: Collection and Chain of Evidence; Death-scene Investigation, United States of America; Major Incident Scene Management; Suspicious Deaths

Further Reading

Association of Chief Police Officers (2000) *Murder Investigation Manual*.

Association of Chief Police Officers (2000) *The Manual of Standard Operating Procedures for Scientific Support Personnel at Major Incident Scenes*.