G45 Perspectives on the Variety of Mass Identification Projects

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The goal of this presentation is to relate considerations and strategies for identifying a large collection of corpses.

The incidence of mass identification efforts looks to increase in the future as it has in the past. The aim of this presentation is to encourage the use of experience from past identification efforts in solving new ones.

Experience with previous mass identification projects establishes a general framework to apply to such problems, but also teaches the lesson to expect novel challenges each time.

Airplane crashes (SwissAir 111 near Halifax in 1997, American 587 in Queens shortly after 9/11/2001), wars (Bosnian mass graves, Kuwaiti POWs), and the destruction of the World Trade Towers have in common a large number of deaths with most of the corpses damaged beyond recognition. Given the condition of the bodies, DNA is the most reliable modality for identification. Given the large numbers, sorting out the identities requires efficient and carefully-designed routines. A few general ideas seem to be always applicable; other kinds of ideas, the list of which grows with each new experience, are important for one disaster or another.

The first category, the generalities, includes: DNA profiles are obtained from the victims, and from references – family members and/or personal effects. Tentative or candidate identities are determined by a *screening* step in which every victim is rapidly compared with every reference sample, highlighting related-seeming pairs. The screening list should be prioritized by degree of similarity. Each candidate identity is then *tested* beginning with the easiest. The DNA part of the test consists in making appropriate kinship and/or DNA matching calculations taking into account all typing information. The result of the calculation is a number, a likelihood ratio that is usually either very large or very small – virtually ensuring or else contradicting the tentative match – but sometimes inconclusive. Common sense dictates that even when the likelihood ratio is very large, all available information must be carefully checked for any inconsistencies that might suggest a human error occurred. If all is well, the identity will be assumed.

Other ideas are sometimes critical but not universal. The DNA of victims from old graves or the smoldering ruins of the WTC (unlike that from plane crashes) is often of poor quality; analysis must cater to allelic dropout. Related victims are a salient feature of some tragedies, which needs to be appreciated lest a war victim be mistaken for his son or his brother. Moreover, in the airplane crashes, the relationships among victims were even an essential component of some of the identifications. For the WTC alone bodies are generally so fragmented that association of victim parts is an important preliminary to screening. One site or several? Where the victims are distributed among multiple graves, as in Bosnia and Kuwait, the criterion for a "very large" likelihood ratio varies with site and circumstances. One grave found in Iraq had about 150 bodies and there was a list, of unknown reliability, of mostly Kuwaitis claimed to be there. It turns out that tentative identifications reinforce each other as the pattern emerges that the list is largely accurate though it has some omissions. Large disasters of course magnify difficulties, but also create a new problem in kind: For a plane crash a seeming parent-child or even sibling-sibling relationship between a victim and a reference person usually proves to be a correct relationship, but in the case of WTC or Bosnia it usually does not. When the number of victims is very large, the screening process needs to emphasize combinations of at least two family members both of whom match the same victim. Otherwise false leads in the candidate list swamp the good ones. If a project is ever mounted to identify a hundred thousand or more dead, such as the Kurds or Shiites killed in Iraq, it is a safe bet that previously unnoticed difficulties will come to light requiring some new ideas to solve.

The process of identifying a large number of victims using DNA is rapidly gaining maturity. Many mass identification projects have been attacked in isolation, as if each were a new problem. But now there is a sizeable body of experience. The ideas from past work provide useful lessons and tools for approaching new identification projects. One of these lessons is to keep an open mind. There is always something new.

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