Proactive Forensic Science and its Impact on Combating Terrorism: Israeli experience

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FORENSIC SCIENCE:
The use of scientific methods for resolving crimes
The assassination of the Minister of Tourism
October 17, 2001
The Murder Scene
Hyatt Hotel, Jerusalem
Burning cigarette butt

Found on the stairway presumably at the position from which the shots were fired.
## DNA profiles

<table>
<thead>
<tr>
<th></th>
<th>D16S539</th>
<th>D7S820</th>
<th>D13S317</th>
<th>F13A</th>
<th>FESFPS</th>
<th>vWA</th>
<th>CSF1PO</th>
<th>TPOX</th>
<th>THO1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hot Cigarette</strong></td>
<td>11,11</td>
<td>9,12</td>
<td>8,11</td>
<td>7,7</td>
<td>10,12</td>
<td>14,15</td>
<td>11,12</td>
<td>8,8</td>
<td>8,9.3</td>
</tr>
<tr>
<td><strong>Cigarette A - Room 548</strong></td>
<td>11,11 A</td>
<td>9,12</td>
<td>8,11</td>
<td>7,7</td>
<td>10,12</td>
<td>14,15</td>
<td>11,12</td>
<td>8,8</td>
<td>8,9.3</td>
</tr>
<tr>
<td><strong>CigaretteB - Room 548</strong></td>
<td>9,11 B</td>
<td>11,13</td>
<td>12,13</td>
<td>6,6</td>
<td>11,12</td>
<td>16,16</td>
<td>12,12</td>
<td>8,11</td>
<td>6,7</td>
</tr>
</tbody>
</table>

**Mismatch probability not higher than**

1/3,500,000,000
The burnt cigarette butt is the only physical evidence connecting the assassination scene to the people from room 548.
Newspaper found in room 548
Hauze, Petrovskaia, Taylor, Joullie, Ramotowski, and Cantu, J. Forensic Sciences, 1998
Latent fingerprints developed by indanedione
The Assassin
Car-bomb near Tel Aviv
Zündfolge 1-4-3-2
06911107
The murder of Tal Reichman
The Back-spatter Effect

The presence of atomized forward or back spatter on any object is dependent upon the proximity of the object to the blood source. Due to its small size this spatter usually travels only 4-5 feet.
D.N.A. Sampling from inside the barrel
It is harder to fight terrorism today than ever before

a. Criminal States: 6 or 7 out of 190 countries support terrorism
b. Free movement between countries
c. Suicidal terrorism
d. Access to mass-destruction weapons
e. The Internet---easy access to “hard” information
Proactive forensic science
Forensic science for the most part is reactive and responsive to crimes which have already been committed.

Thinking out of the box

Proactive forensic science
Thinking out of the box

Proactive forensic science

Forensic science for the most part is **reactive and responsive** to crimes which have already been committed.

**PROACTIVE FORENSIC SCIENCE DOES NOT WAIT FOR A CRIME TO BE COMMITTED FOR IT TO BE CALLED INTO ACTION**
STRATEGIC:

ESSENTIAL TO THE EFFECTIVE CONDUCT OF WAR

The American Heritage Dictionary of the English Language
Resolving shooting incidents

Collecting ballistic signatures
Signing the “Oslo Accords”, Sept. 13 1993
Predicting new trends
1. The use of improvised explosives
Hexamethylene triperoxide diamine (HMTD)
Triacetone triperoxide

TATP
TATP "laboratory" in Jenin
Clandestine laboratory for the production of TATP, 1998 (700 Kg, perhaps the largest amount in history)
Keinan’s smart PET (Peroxide Explosives Tester)
Urea nitrate structure
At 12:17 pm on February 26, 1993, an explosion ripped through multiple levels of the World Trade Center parking garage, killing six people and injuring over one thousand more.

...The main explosive component of the bomb was 1,200 pounds of urea nitrate fertilizer.
Why Urea nitrate?

1. Easy to make
2. Readily accessible starting materials
3. Inexpensive
4. Very stable (much safer than TATP)
5. Bonus: Hard to distinguish from innocent materials and hard to identify in post-explosion debris
Starting materials for urea nitrate

Courtesy Dr. A. Bornstein
“Kitchen production" of urea nitrate

Courtesy Dr. A. Bornstein
Merkava tank destroyed by a large improvised mine of urea nitrate

(Notice the size of the crater)
Analysed post – blast cases 2004-2006**

Red: improvised
Blue: standard (military)
Yellow: mixed

** Courtesy DIFS, Israel Police
Improvised explosives
TATP and (urea+nitrate) 2002-2006**
Reconstructed improvised explosive devices (IED’s)*

*Courtesy EOD lab, Israel Police
Urea nitrate is a loose compound of urea, the diamide of carbonic acid, ... Explanation: Urea nitrate is a plastic explosive used for the charge on a ... www.reciprocalnet.org/recipnet/showsample.jsp?sampleId=27343952 - 8k - Cached - Similar pages

UREA NITRATE EXPLOSIVE ...

... Urea nitrate crystals will collect on the paper. [5] Wash the Urea nitrate by pouring water over it. [6] Remove urea nitrate crystals from the filtering ... www.textfiles.com/groups/OMNIPOTENT/ureanitr.omn - 4k - Cached - Similar pages

Homemade Explosives

... Finally Urea Nitrate which appears to be very popular with terrorists. ... the solid left on the cloth is Urea Nitrate which should be cleaned with ... www.linkbase.org/articles/Homemade-Explosives.htm - 28k - Cached - Similar pages

Urea, Nitrate & Nitrite poisoning in cattle & sheep: Sources ...

Urea, Nitrate & Nitrite Poisoning in Cattle & Sheep: Toxic Doses, Treatment & Prevention. tnet.teagasc.ie/Grange%20Pages/dat/ureanitr.htm - 47k - Cached - Similar pages
=ENhanced Detectability of Urea Nitrate
Detecting recent contact with firearms

The Ferroprint
A match between Ferrotrace mark and pistol found in suspect’s car
Thank you
INTELLIGENCE IS THE MOST IMPORTANT MEANS TO THWART TERRORIST ACTS

Forensic science can play a key role in intelligence collection
Some intelligence information can be **collected**
only by forensic science methods

Some intelligence information can be **evaluated**
only by forensic science methods
INTELLIGENCE COLLECTION and EVALUATION by FORENSIC MEANS

1. Identification of terrorist organizations
2. Association between terror incidents
3. Identification of new trends