

Corroded Firearms: The Non-Destructive Approach

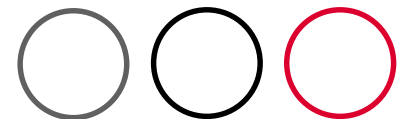
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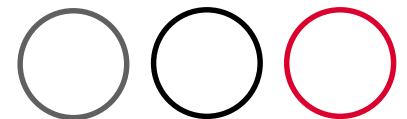
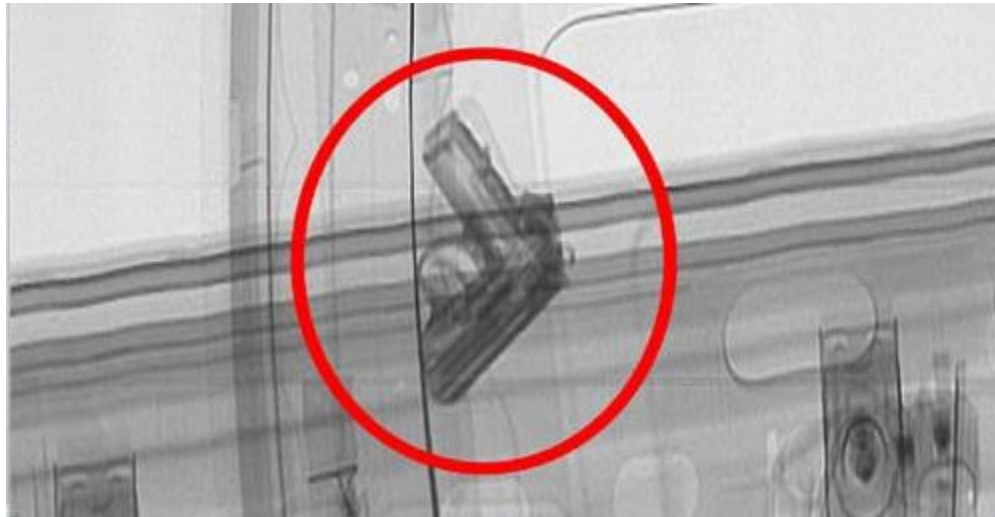
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The problem

- Nottinghamshire Police (March 2011)
- Battlefield weapons (May 2014)
- Highly corroded firearms recovered
- Completely seized
- **Are they safe? Any evidentiary value?**



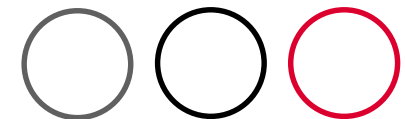
X-ray analysis: A potential solution?



X-ray analysis: A potential solution?

- Non-destructive
- Good imaging resolution (<1 mm)
- Rapid (<2 min)
- In-situ threat detection

- Examination of suspect objects
 - concealed weapons
 - homemade weapons
 - corroded weapons

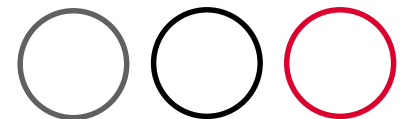
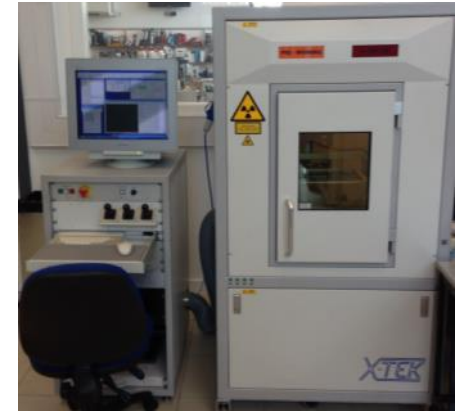




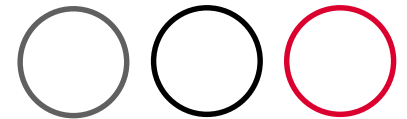
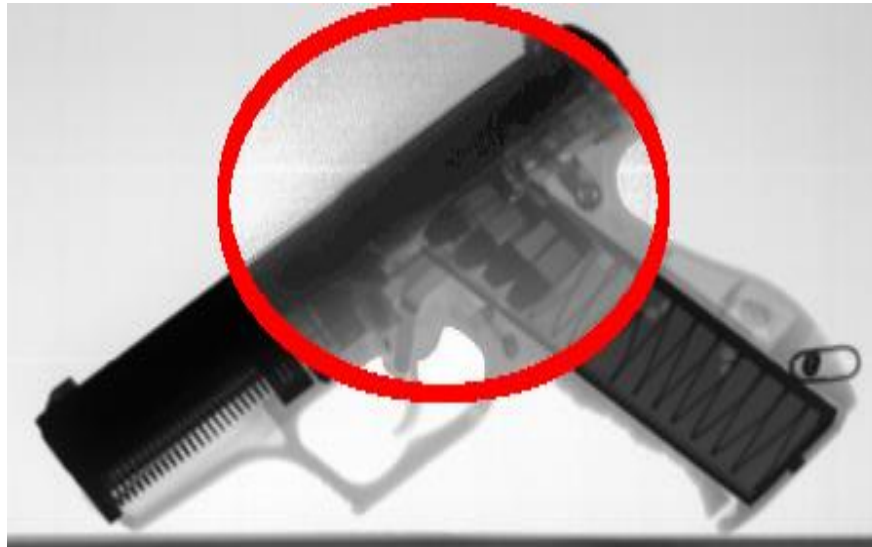
Equipment

- Static x-ray scanners
 - X-Tek VTX (160 kV)
 - 3DX-Ray SRI 250 (250 kV)

- Portable x-ray scanner
 - 3DX-Ray FlatScan-TPXi (120 kV)
 - 3DX-Ray FlatScan-TPXi (160 kV)

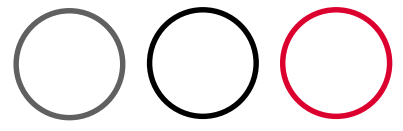
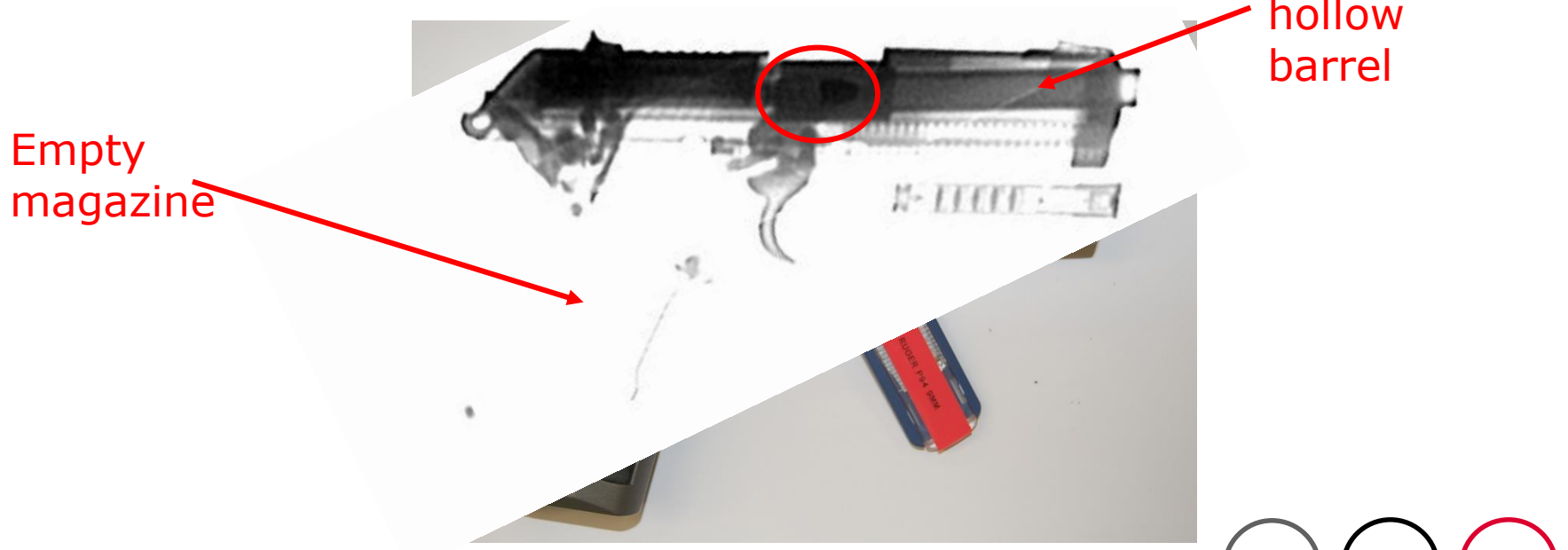


What can x-ray reveal?: Is it 'safe'?

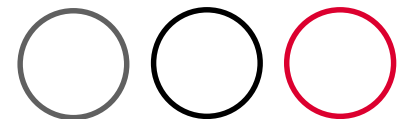
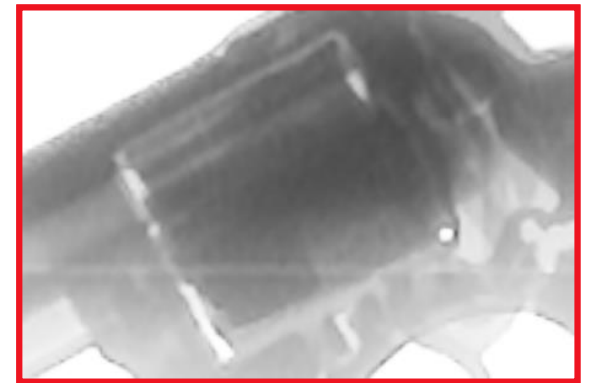
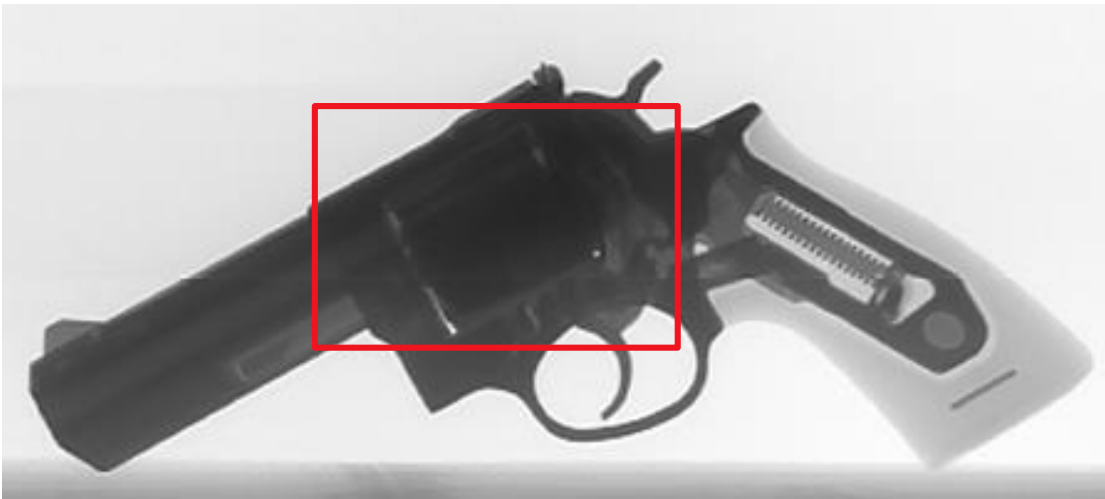




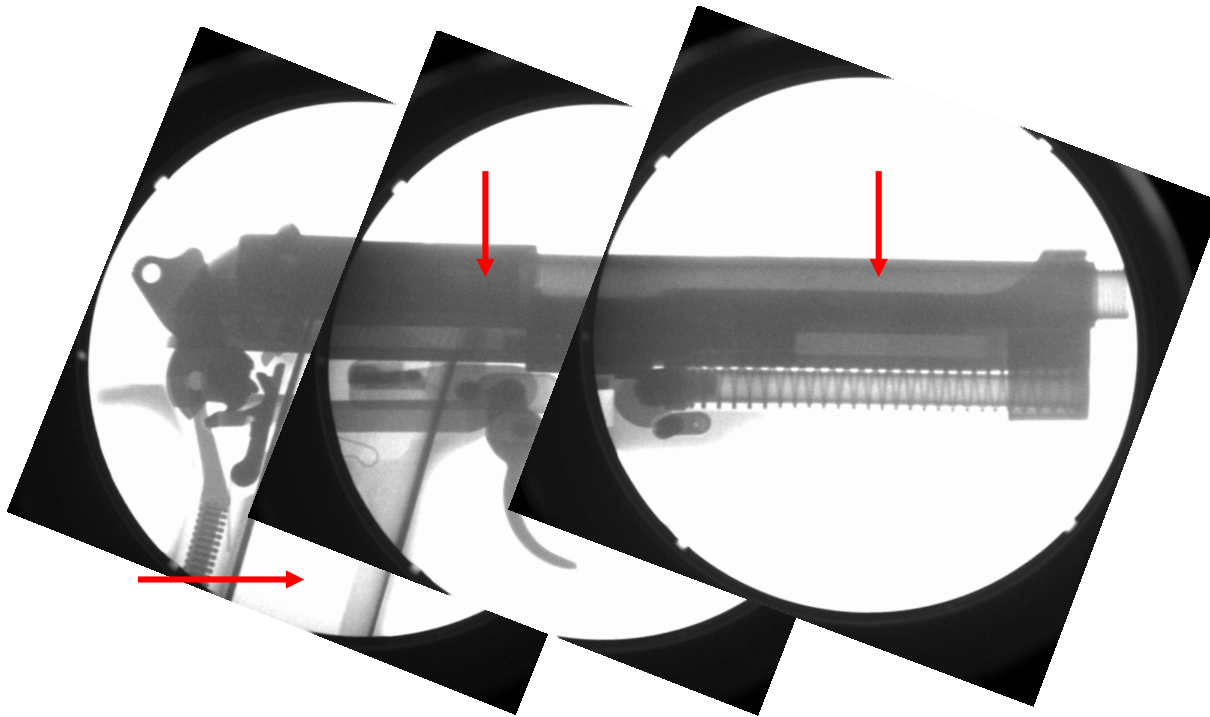
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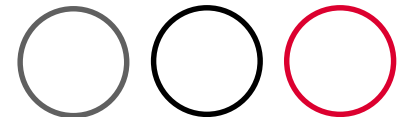
What can x-ray reveal?: Fired or unfired ammunition?



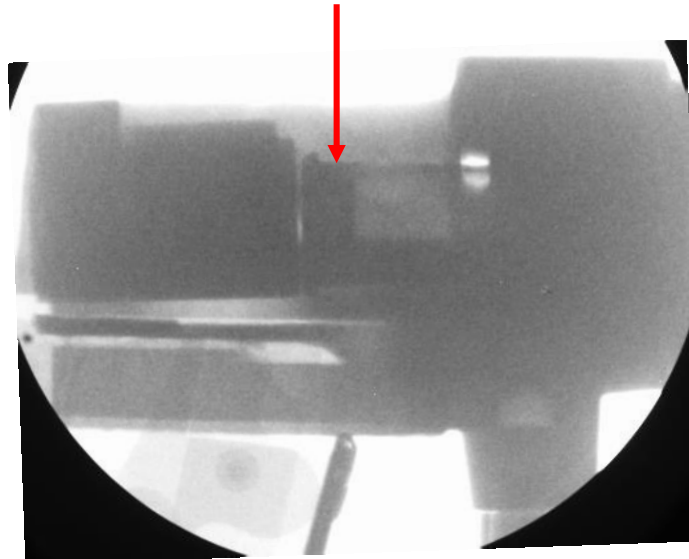
Corroded firearms: Exhibit 1



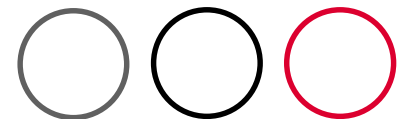
- Complex firing
- Dense material
- Empty magazine
- Empty chamber
- Empty barrel
- Safe S5 firearm



Corroded firearms: Exhibit 2

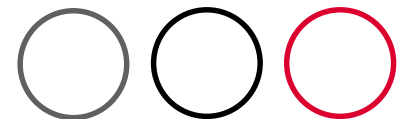


- Case in chamber
- Safe or unsafe?
- Projectile?



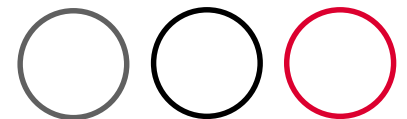
Conclusions

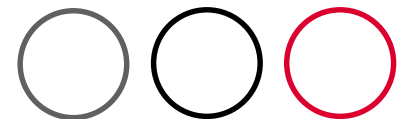
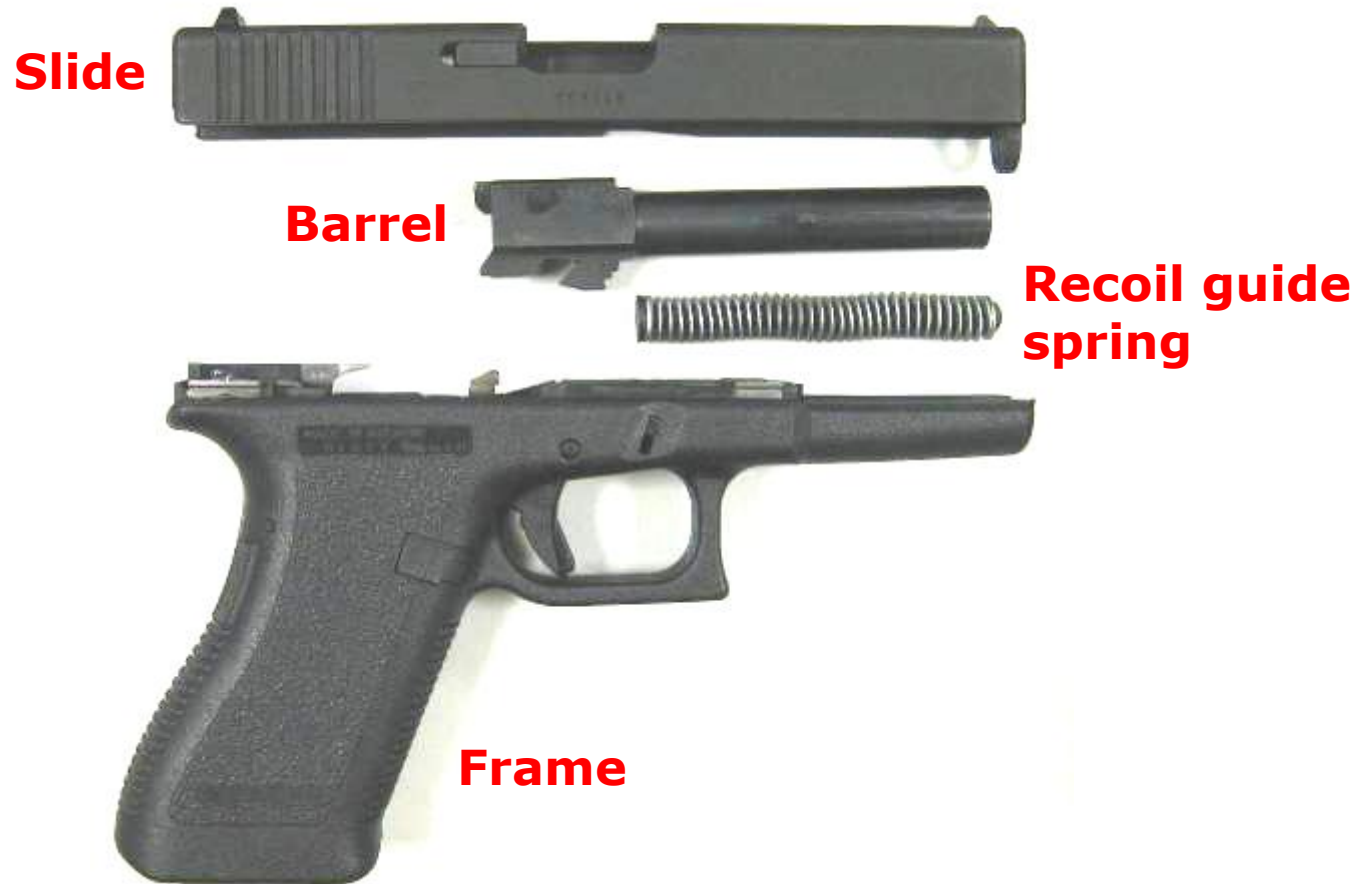
- Examinations:
 - Live or deactivated
 - Loaded or unloaded
 - Evidentiary value
 - Historic preservation
- In-situ (if required)
- Higher energy sources may be required

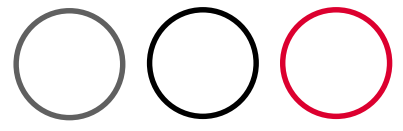
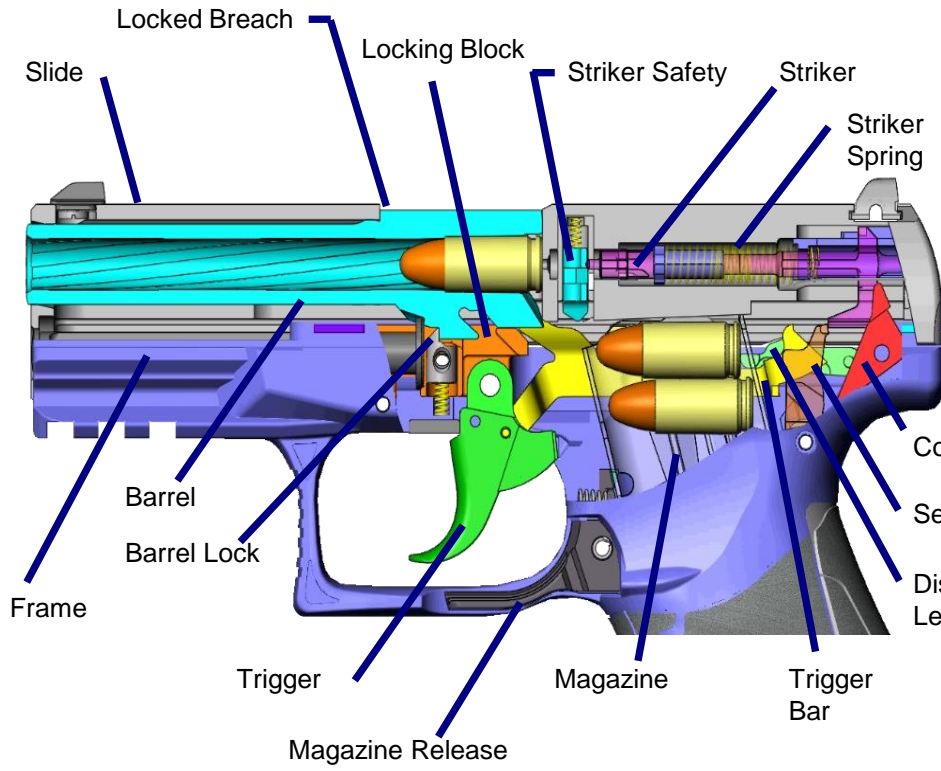


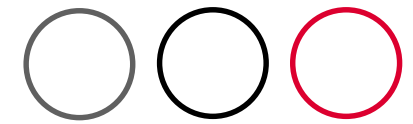
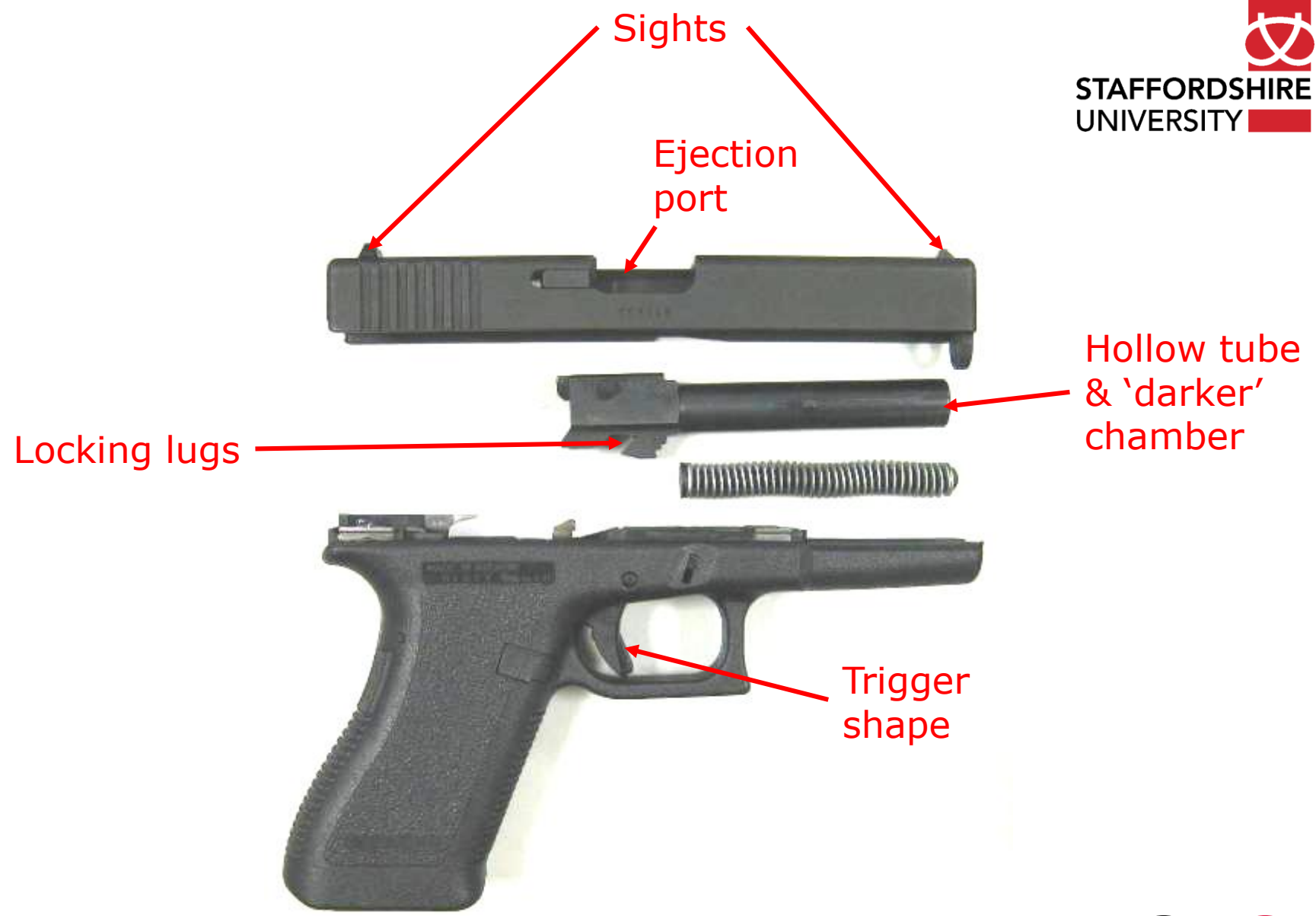
Future for x-ray analysis ...

Firearm components?









Acknowledgements

- James Young & Nick Fox



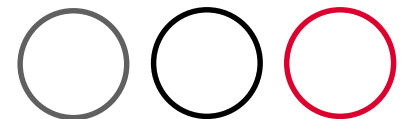
- Paul Hodkin & Alan Rawsthorne



- James Chan, Prof. Paul Evans & Simon Godber



- Lee Trueman (Apex Firearms)



Thank you



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