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Q8(a)

Forensic Science can help in criminal investigations. Discuss

UPSC Civil Services Mains 2015 · Anthropology GS 1 · 20 marks · Applications of Anthropology

12. Applications of Anthropology: Anthropology of sports, Nutritional anthropology, Anthropology in designing of defence and other equipments, Forensic Anthropology, Methods and principles of personal identification and reconstruction, Applied human genetics-Paternity diagnosis, genetic counselling and eugenics, DNA technology in diseases and medicine, serogenetics and cytogenetics in reproductive biology.

Core demand of the question

- Forensic Science can help in criminal investigations. Discuss
- Write about 250 words for 20 marks

Revision summary

Forensic science links person, object, and scene for the court.

Fingerprints and **STR DNA** are leading identifiers.

Skeletal anthropology estimates the biological profile and trauma.

Locard's exchange guides trace evidence.

Error comes from contamination and overclaim; procedure matters.

Introduction

Forensic science applies laboratory and field methods to legal questions. In crime work it links person, object, and scene with a chain of custody.

Body**Identity of persons**

- **Fingerprints** after **Galton** and Indian police practice remain a first-line individualiser.
- **DNA STR** profiles, as in the UK **FSS** model and Indian **CDFDs**, can include or exclude with high power if samples are clean.
- **Forensic anthropology** estimates age, sex, stature, and ancestry from bone, and trauma from cut marks, as in mass-disaster **DVI**.

Scene and object

- **Ballistics, fibres, glass, and paint** use **Locard's exchange**: contact leaves a trace.
- Toxicology names poisons. Questioned documents and digital logs widen the file.
- Odontology and bite marks are used with more caution after wrongful-conviction reviews.

Anthropology's slice

- **T. Dale Stewart** and later **Clyde Snow** showed skeletal ID in war-crime and disaster settings.
- Indian cases use **forensic medicine** departments plus anthropology for unknown remains.

Limits

- Contamination, planted evidence, and oversold 'unique' marks have caused error.
- Science helps investigation. Courts still need corroboration and lawful procedure.

Flow diagram

Forensic science -> Prints DNA bone

Forensic science -> Trace Locard

Forensic science -> Chain of custody error

Conclusion

Forensic science helps by identifying people and tracing contact at the scene. DNA, prints, and bones are strong when chain of custody holds; they are not a substitute for the whole case.

Facts & figures

Locard

Every contact leaves a trace; the founding slogan of scene work.

STR DNA

Short tandem repeat panels used in national forensic databases.

Clyde Snow

Applied forensic anthropology to political killings and disasters.

DVI

Disaster victim identification: a planned mix of DNA, dental, and anthropology.