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Q6(b)

Discuss the applications of forensic anthropology with suitable examples.

UPSC Civil Services Mains 2024 · Anthropology GS 1 · 15 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

- Define forensic anthropology and organise its major applications
- Cover recovery, identification, trauma, **taphonomy** and humanitarian work
- Give suitable named and Indian examples
- State probabilistic and ethical limitations

Revision summary

Forensic anthropology applies skeletal biology and archaeological recovery to medico-legal problems.

Sex, age, stature and population affinity form a probabilistic **biological profile**.

Trauma must be separated from taphonomic damage.

Dental records, implants and STR DNA can confirm identity.

Clyde Snow and the Argentine team show its human-rights role.

Indian cases require local standards, chain of custody, dignity and explicit error ranges.

Introduction

Forensic anthropology applies biological anthropology and archaeology to human remains in legal and humanitarian contexts. It does not merely 'identify a skeleton': it recovers context, builds a **biological profile**, interprets post-mortem history and assists identification.

Body

Applications

Scene recovery: Archaeological mapping, controlled excavation and chain of custody establish whether remains are human, their minimum number, position and association.

William Bass's Anthropology Research Facility helped make decomposition and **taphonomy** experimentally testable.

Biological profile: Pelvic and cranial traits estimate sex; pubic symphysis, auricular surface, epiphyseal union and teeth estimate age; long-bone equations estimate stature. Metric and morphoscopic ancestry estimates are probabilistic reference-sample affinities, not biological race labels. **T. Dale Stewart** and **Wilton Krogman** systematised much of this osteology.

Individualisation: Dental records, healed fractures, implants and radiographs can identify. Autosomal STRs provide stronger confirmation; mtDNA assists with hair shafts or degraded bone. **Alec Jeffreys's** DNA profiling transformed personal identification. Facial approximation may generate leads but is not positive identification.

Trauma and cause-related evidence: Perimortem blunt, sharp and firearm trauma may be distinguished from post-mortem breakage. **Taphonomy** analyses burning, weathering, carnivore damage, burial and post-mortem interval. Cause and manner of death remain the medical examiner's legal conclusions.

Mass disaster and human rights: Disaster Victim Identification combines anthropology, odontology, fingerprints and DNA after crashes, floods or tsunamis. **Clyde Snow** and the Argentine Forensic Anthropology Team documented the disappeared, showing how skeletons can test state narratives. In India, unidentified railway deaths, disaster recovery and commingled remains are practical fields; local reference data are needed because imported equations may misclassify Indian populations.

Error ranges, observer variation, consent, family dignity, repatriation and secure genetic data are method, not afterthought.

Flow diagram

Recovery and context -> Biological profile

Biological profile -> Possible identity

Recovery and context -> Trauma and taphonomy

Possible identity -> DNA dental or medical confirmation

Trauma and taphonomy -> Legal and humanitarian interpretation

DNA dental or medical confirmation -> Legal and humanitarian interpretation

Conclusion

- **Forensic anthropology is strongest as a team science:** archaeology preserves context, osteology narrows identity, trauma and **taphonomy** reconstruct events, and DNA or dental records may confirm a name. Its conclusions should be transparent probabilities, not racial certainty.

Facts & figures

Clyde Snow

Helped establish the Argentine Forensic Anthropology Team and used remains to document enforced disappearances.

Krogman and Stewart

Major figures in systematising forensic skeletal identification and communicating its evidentiary limits.

Biological profile

An estimate of sex, age, stature and population affinity used to narrow a missing-person search, not by itself a name.

Taphonomy

Study of processes affecting remains from death to recovery, including decomposition, weathering, burial, animals and burning.

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