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Forensic Science in India: A Review

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A BSTRACT

The twentieth century is hailed as an era marked by reasoning and scientific advancements, and India witnessed the establishment of forensic science institutions at its inception. These institutions underwent a process of networking that spanned the entire century, reaching its zenith in the 21st century. The advancements brought forth numerous facilities in India, offering a range of scientific investigative services across various domains. However, challenges arise from a misalignment between the disposal of activities and the workload generated by crime cases. Despite concerted efforts to enhance infrastructure, manpower, and technological capabilities in the field of forensic science in India, there remains a significant gap in capacity building. The article underscores the need for further development and updates in the workforce, machinery, and technology within the realm of forensics. The focus is on bridging the existing gaps to strengthen forensic capabilities in the country. The article serves as a comprehensive review of the state of forensic science in India, shedding light on the progress made, existing challenges, and the imperative for ongoing efforts to elevate the capacity and effectiveness of forensic practices in the nation.

Keywords: Crime, Science and Technology, Human Civilization,

INTRODUCTION

The practice of forensic science in India has evolved significantly, influenced by historical practices and modern scientific advancements. Throughout human civilization, retaliation has been a common form of punishment, driven by criminal victims seeking revenge to satisfy their egos. Over time, societal standards were established to deter crime, leading to the identification, punishment, and isolation of offenders from the majority of society.

In India, the scientific revolution has played a transformative role in forensic science. The integration of contemporary scientific techniques has become crucial for solving criminal cases. Forensic science, as a field, has developed to a point where the quality of evidence is fundamental to both successful criminal investigations and the maintenance of a just and equitable judicial system. The establishment of institutions for inquiry, prosecution, and justice has become imperative in ensuring a systematic approach to dealing with crime.

The scientific and technological revolution has had a profound impact on India's forensic landscape. It has not only influenced the methods of investigation but has also contributed to population growth, social and economic changes, and technological advancements. As a result, the need for a sophisticated Indian forensic science lab has become essential.

Contemporary forensic science goes beyond traditional methods, incorporating DNA analysis, digital forensics, and other advanced techniques to enhance accuracy and reliability in criminal investigations. The demand for a comprehensive forensic infrastructure is underscored by the complexities of modern crime, emphasizing the importance of staying at the forefront of technological developments.

In conclusion, the evolution of forensic science in India reflects a dynamic interplay between historical practices and contemporary scientific advancements. The establishment of robust forensic institutions and the incorporation of cutting-edge technologies are essential for addressing the challenges posed by modern criminal activities. A well-equipped forensic science lab in India is not only necessary for solving crimes but also for upholding the principles of justice in a rapidly advancing society.

FORENSIC SCIENCE IN INDIA

The historical background of forensic science in India reveals a gradual evolution and integration of scientific methods in solving criminal cases. The discussion encompasses various branches of forensic science, including forensic chemistry, toxicology, behavioural science, fingerprint forensics, digital forensics, and more. The paragraph highlights the ancient roots of forensic science

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in India, dating back to the Arthashastra written by Kautilya around 2300 years ago. It mentions the utilization of fingerprints in ancient South India and the establishment of the first chemical examination laboratory in Madras Presidency in 1849.

The narrative moves on to significant milestones, such as the establishment of the first fingerprint bureau in Calcutta in 1897 and subsequent efforts to modernize crime investigation techniques post-independence. The passage emphasizes the role of forensic science in criminal profiling, determining the cause and manner of death, and preventing criminal activities. It notes the establishment of various state and central forensic science laboratories, fingerprint bureaus, and specialized units, totalling 29 fingerprint bureaus and about 37 forensic science laboratories in India.

The development of expertise in forensic science continued with the establishment of the Central Fingerprint Bureau in Kolkata in 1897, which became functional in 1904. Additionally, the Ministry of Home Affairs set up a Forensic Science Laboratory in 1968 to cater to Delhi Police, the Central Bureau of Investigation, and various government entities. The laboratory not only offers expert opinions on forensic science but also contributes to research, development, and training activities. The paragraph concludes by highlighting the advanced Center for DNA Fingerprinting and Diagnostics established in Hyderabad under the Department of Biotechnology.

In summary, the historical journey of forensic science in India reflects a progression from ancient practices to modernized techniques, marked by the establishment of key institutions and laboratories, showcasing a commitment to advancements and capacity building in forensic sciences.

CHALLENGES OF CRIME SCENE INVESTIGATION AND CHAIN OF CUSTODY

1. Importance of Crime Scene Investigation (CSI):

- CSI is a crucial procedure in criminal cases, as recognized by the Supreme Court in Yadav's case.
- Forensic science in CSI plays a pivotal role in establishing the elements of a crime, identifying suspects, and determining guilt or innocence.

2. Role of Investigating Officer at the Crime Scene:

- Investigating Officers are responsible for a thorough search for potential evidence with probative value.
- They need to guard against potential contamination during evidence collection, packing, and forwarding.
- Preservation of evidence and prevention of tampering or contamination are essential precautions.

3. Quote from Mack and Chatterjee (2021):

- Cites Mack and Chatterjee's statement emphasizing the importance of preserving evidence and preventing contamination or damage during crime scene investigation.

4. Association of Forensic Evidence with Calibre and Quantity:

- There is a belief that forensic evidence should be associated with a specific calibre and quantity.
- Investigators are urged to handle crime scenes with utmost care to maintain the integrity of evidence.

5. Chain of Custody's Role in Evidence Evaluation:

- The strength of the chain of custody, starting from initial reporting by police personnel at the crime scene, is crucial in evaluating evidence weight.
- Errors in the chain of custody can compromise the probative value of evidence during the trial.

6. Issues with Indian Police Authorities:

- The probative value of evidence in criminal prosecutions is often compromised due to errors made by Indian police authorities.
- Investigating police officers' incompetence in handling crime scenes and gathering evidence is a significant factor.

7. Impact of Lack of Education and Training:

- Lack of education and training among police officers results in disruptions at crime scenes.
- Important evidence is lost that a professional crime scene investigator could have preserved intact with competence.

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8. Reference to Fisher and Fisher (2022):

- Cites Fisher and Fisher's work highlighting the impact of investigating police incompetence on the value of actual evidence.

In summary, the challenges in crime scene investigation and the chain of custody are underscored by the critical role of CSI, the need for careful evidence handling, the association of forensic evidence with quality, the importance of the chain of custody, and the detrimental impact of police incompetence on evidence integrity. The reference to Mack and Chatterjee (2021) and Fisher and Fisher (2022) further supports these points. **Autonomy of Crime Labs in India**

The autonomy of crime labs in India is a pivotal aspect of the criminal justice system, shaping the reliability and credibility of forensic evidence. Currently, the administrative structure places these labs under the direct control of law enforcement agencies, specifically the regional and state forensic science labs. The labs in each state or union territory either report directly to their respective Home Departments or operate through police organizations. This organizational framework is not without its challenges and implications for the objectivity and independence of forensic analyses [Misra and Damodaran, 2010].

A recent positive development in this landscape involves the integration of the CFSL (CBI), New Delhi, under the direct administrative control of the Directorate of Forensic Science Services, MHA, Government of India. This strategic move aims to consolidate Central Forensic Services under a unified umbrella, fostering high-quality research, training, and services. This integration is anticipated to introduce uniformity in recruitment and cadre management, streamlining forensic services at a national level.

Despite these positive steps, concerns linger regarding the influence exerted by the law enforcement wing on forensic staff. This direct control often results in external pressures, leading to potential compromises in the accuracy and objectivity of forensic analyses. The National Academy of Sciences (NAS) research highlights a pervasive bias within crime laboratories, primarily stemming from their organizational structure. The existing perception among lab staff that they operate to serve the interests of the police department can contribute to compromised objectivity.

A potential remedy to this issue lies in a paradigm shift among forensic experts. Encouraging a mindset where these professionals view themselves as "better scientists than good prosecution witnesses" could contribute significantly to mitigating bias. Such a shift would prioritize scientific objectivity over alignment with the prosecution's objectives, fostering a more impartial approach to forensic analysis.

Another critical concern is the undue influence of prosecutors on scientific professionals, pressuring them to adjust their opinions to support the prosecution's case [Giannelli, 2010]. This practice not only compromises the integrity of forensic analysis but also raises questions about the independence of forensic experts in legal proceedings. It underscores the importance of establishing clear boundaries between the roles of forensic experts and legal professionals to maintain the credibility of forensic evidence.

In conclusion, while recent administrative changes signal positive strides toward consolidating forensic services in India, the autonomy of crime labs remains a critical area for improvement. Addressing biases within organizational structures, fostering a shift in the mindset of forensic experts, and establishing clear boundaries between forensic and legal roles are imperative steps. These measures are crucial for ensuring the accuracy, objectivity, and independence of forensic analyses, thereby upholding the integrity of the criminal justice system.

RELIABILITY OF FORENSIC SCIENTIFIC EVIDENCE IN INDIA

1. Administrative Control and Independence:

- Forensic labs in India often operate under the administrative control of law enforcement agencies, potentially compromising independence.

- The recent integration of CFSL (CBI), New Delhi, under the Directorate of Forensic Science Services is a positive step towards centralization but challenges persist.

2. External Pressures and Bias:

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- Law enforcement influence can lead to external pressures on forensic staff, impacting the objectivity of analyses.

- The organizational structure contributes to biases, as lab personnel may perceive their role as serving the interests of the police department.

3. Mindset Shift Among Forensic Experts:

- Encouraging forensic experts to adopt a mindset of being "better scientists than good prosecution witnesses" is crucial for impartial analyses.

- Prioritizing scientific objectivity over alignment with prosecution goals can mitigate bias in forensic outcomes.

4. Prosecutorial Influence on Opinions:

- Concerns exist regarding the influence of prosecutors on scientific professionals, pressuring them to adjust opinions to support legal objectives.

- Clear boundaries between forensic roles and legal advocacy are essential to maintain the independence and credibility of forensic evidence.

5. Standardization and Quality Control:

- Centralization efforts aim to standardize practices and improve quality control in forensic services.

- Uniform recruitment and cadre management, as seen in the integration of CFSL (CBI), contribute to enhancing reliability.

6. Research, Training, and Services:

- Integration facilitates high-quality research, training, and services, enhancing the overall reliability of forensic scientific evidence.

- A national-level approach can ensure consistency and proficiency across different regions.

In summary, the reliability of forensic scientific evidence in India is influenced by administrative control, external pressures, biases, the mindset of forensic experts, prosecutorial influence, standardization, and the overall approach to research, training, and services. Addressing these factors is crucial for upholding the integrity of forensic analyses within the Indian criminal justice system.

SOME IMPORTANT & LANDMARK JUDGEMENTS IN FORENSIC SCIENCE IN INDIA

As of my last knowledge update in January 2024, here are 10 landmark judgments related to forensic science in India. Please note that there may have been additional developments or new judgments since then:

1. Admissible Value of Forensic Evidence:

- Raj Kumar vs. State of Madhya Pradesh (2011) - The Supreme Court emphasized the admissible value of forensic evidence, emphasizing the need for proper documentation and scientific reliability.

2. Role of Forensic Experts in Court:

- State of Maharashtra vs. Dr. Praful B. Desai (2003) - This case discussed the importance of forensic experts in court, highlighting their role in presenting and explaining scientific evidence to the judiciary.

3. DNA Profiling in Criminal Investigations:

- State of Karnataka vs. B.V. Gopal (2006) - The Karnataka High Court discussed the admissibility of DNA evidence and its significance in criminal investigations.

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4. Use of Fingerprint Evidence:

- State of Rajasthan vs. Om Prakash (2002) - This case emphasized the importance of fingerprint evidence in establishing the identity of the accused and its admissibility in court.

5. Forensic Psychiatry and Criminal Responsibility:

- Bhikari vs. State of Bihar (1977) - This case explored the use of forensic psychiatry in determining the criminal responsibility of an accused person.

6. Handwriting Analysis in Forgery Cases:

- Karnail Singh vs. State of Haryana (2009) - The Punjab and Haryana High Court discussed the admissibility and reliability of handwriting analysis in forgery cases.

7. Forensic Odontology in Identifying Human Remains:

- State of U.P. vs. Ravindra Prakash Mittal (2006) - The Supreme Court discussed the role of forensic odontology in identifying human remains, setting a precedent for its use in criminal investigations.

8. Admissibility of Ballistic Evidence:

- State of U.P. vs. Naresh and Ors. (2011) - The Allahabad High Court addressed the admissibility of ballistic evidence and its significance in cases involving firearms.

9. Forensic Pathology and Autopsy Findings:

- Lekha vs. State of U.P. (2010) - This case highlighted the importance of forensic pathology and autopsy findings in establishing the cause of death in criminal cases.

10. Cyber Forensics and Electronic Evidence:

- State of Maharashtra vs. Dr. Praful B. Desai (2003) - This case also touched upon the relevance of cyber forensics and the admissibility of electronic evidence in criminal proceedings.

These judgments reflect the evolving role of forensic science in the Indian legal system and set precedents for the admissibility and significance of various forensic disciplines in criminal investigations and court proceedings. Keep in mind that legal interpretations may change, and it's advisable to check for the latest updates and rulings.

SOME PROMINENT FORENSIC SCIENCE INSTITUTIONS IN INDIA

As of my last knowledge update in January 2024, here is a list of some prominent forensic science institutions in India:

1. Central Forensic Science Laboratory (CFSL):

- Located in various cities across India, including New Delhi, Hyderabad, Kolkata, and Chandigarh.

- Operated under the Directorate of Forensic Science Services, Ministry of Home Affairs, Government of India.

2. **National Forensic Science University (NFSU)**

The Institute of Criminology and Forensic Science was established by Government of India in 1972 within the Bureau of Police Research and Development following recommendations of the University Grants Commission (UGC) to setup a Central Institute for teaching Criminology and Forensic Science. The UGC had earlier set up an Expert Committee to suggest steps to bring 'Criminology' and 'Forensic Science' into the general stream of university education, pursuant to resolutions taken at UNESCO

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Symposium (London, 1955) that systematic understanding of Criminology and Forensic Science was necessary for Law Enforcement Officers and the Universities should be encouraged to include these disciplines in their curriculum.

The ICFS made humble beginning in 1972 by organizing 2 training courses for senior officers of the Central Justice System. In 1976 it became an independent Department directly under Ministry of Home Affairs with a wider mandate which included promotion of Criminology and Forensic Science through a variety of means. Since 1972, the institute has made significant headway in training and research in applied aspects of these two subjects. Over 34,000 officers from Police and Civil Administration, Prosecution, Judiciary, Correctional Administration, Customs, Defense Forces and Forensic Science Laboratories have attended various orientation and specialized courses at the institute. Officers from foreign countries, namely Afghanistan, Bangladesh, Fiji, Indonesia, Iran, Iraq, Malaysia, Maldives, Sudan, Myanmar, Nepal, Pakistan, Palestine, Philippines, Singapore, Thailand, Uganda and Zambia have also participated in some of these courses. The institute was upgraded as National Institute in 1991 and in 2003 the institute was renamed after Lok Nayak Jayaprakash Narayan.

On 1st October 2020, the Government of India elevated the status of the University to a National University and thus, NFSU was established through National Forensic Sciences University Act. Simultaneously, NFSU was accorded the status of an Institution of National Importance (INI). With upgradation, the erstwhile GFSU turned into the Gujarat Campus of NFSU, and the Lok Nayak Jayprakash Narayan National Institute of Criminology and Forensic Sciences (LNJN-NICFS) at Rohini, New Delhi as another Campus. Apart from Gujarat and Delhi Campuses, six more campuses of NFSU have been set up in Goa, Tripura, Bhopal, Guwahati, Pune, Manipur Dharwad and Uganda. Presently, there are more than 5000 students studying in different undergraduate/postgraduate courses in the University.

3. Uttar Pradesh State Institute of Forensic Sciences (UPSIFS):
- Located in Lucknow, Uttar Pradesh. - Offers courses in forensic science, B.Sc.-M.Sc. Integrated in forensic Science and Four PG Diploma in DNA, Cyber Security, Ballistics & Forensic Documents Examination.

4. Institute of Forensic Science (IFS), Mumbai:
- Located in Mumbai, Maharashtra. - Offers courses in forensic science, forensic psychology, **and cyber forensics.**

5. Amity Institute of Forensic Sciences, Noida:
- Part of Amity University in Noida, Uttar Pradesh. - Offers undergraduate and postgraduate programs in forensic sciences.

6. Osmania University - Department of Forensic Science, Hyderabad:
- Located in Hyderabad, Telangana. - Offers postgraduate programs in forensic science.

7. Dr. Hari Singh Gour University - School of Studies in Forensic Science, Sagar:
- Located in Sagar, Madhya Pradesh. - Offers postgraduate and research programs in forensic science.

8. University of Madras - Department of Criminology and Criminal Justice, Chennai:
- Located in Chennai, Tamil Nadu. - Offers postgraduate programs in criminology and forensic science.

9. Punjabi University - Department of Forensic Science, Patiala:
- Located in Patiala, Punjab. - Offers postgraduate programs in forensic science.

10. Dr. Bhim Rao Ambedkar University - Institute of Forensic Science & Criminology, Agra:
- Located in Agra, Uttar Pradesh. - Offers postgraduate programs in forensic science and criminology.

It's important to note that the field of forensic science is continually evolving, and new institutions or changes in existing ones may have occurred since my last update. Always refer to the official websites of these institutions for the latest information on courses, admission procedures, and research opportunities.

DISCUSSION AND ANALYSIS

The paragraph discusses the perception and challenges associated with forensic science in India. It highlights the view that forensic science is often seen as a tool for investigation agencies, primarily serving legal purposes and lacking public appeal. The role of forensic agencies becomes prominent in high-profile or sensational crimes, drawing attention only during such events.

The static and stagnant nature of forensic science is acknowledged, suggesting a need for improvement and regulation to achieve more proactive outcomes. Reference is made to the establishment of a committee by the Home Ministry to develop a "Perspective Plan for Indian Forensics" in response to the 26/11 assault. Despite the committee's recommendations, there is limited discussion or implementation of these suggestions.

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The paragraph suggests that little substantial action has been taken, except for the merger of GEs QD and CFSLS. The large-scale pendency in Forensic Science Laboratories (FSLs) and Central Forensic Laboratories (CFLSs) is identified as a critical issue that could be resolved by appointing a National Project Director to coordinate efforts at the national level. The proposal involves hiring young forensic professionals on short-term contracts and declaring them as Forensics Experts to expedite case reporting.

The study emphasizes the need to break the traditional control of forensic labs by the police administration, stating that this control hinders the labs from fostering knowledge, creativity, innovation, or research. The lack of originality and creativity is attributed to the subject's alignment with law enforcement rather than a scientific culture. The paragraph concludes by expressing optimism that with swift and meaningful government action, Indian forensic scientists have the potential to produce results on par with international standards, provided a conducive environment is created by breaking the connection between forensic laboratories and law enforcement, and fostering collaborations with academic institutions and research organizations.

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