

INTRODUCTION:

Himachal Pradesh got full statehood on 25th January 1971 and since then the State has progressed by leaps and bounds. Efforts were on to have its own State Forensic Science Laboratory which came to fruition in 1988 so as to become self reliant in the application of science in the investigation of crime and the administration of justice besides keeping pace with the modernized criminals and to meet their challenges in the times ahead. Thus, State Forensic Science Laboratory, Himachal Pradesh was established in 1988 at Shimla with basic infrastructure of Biology, Serology, Chemistry and Toxicology Divisions. With the increasing requirement of investigation agencies, two more Divisions comprising four specialties viz. Documents, Photography, Physics and Ballistics were added by the State Govt. in 1997, which became functional in the subsequent years. The State FSL was shifted in December 2004 and at present functioning from Junga. In 2006, the HP Govt created two more specialties in the State FSL viz. DNA Profiling Division and NDPS Division.

LOCATION:

Junga is situated at a distance of 26 KM from Shimla, 22 KM from Kandaghat and 18 KM from Chail. It is a hilly place having a forest cover of Kail, Deodar, Cheel, Oak and other trees. Temperature ranges between 4^o C in winter to 35^o C in summer months at Junga.

INFRASTRUCTURE:

The buildings of State Forensic Science Laboratory, Himachal Pradesh, and Junga have covered area of about 28000 square feet. The work is in progress for planned expansion of additional divisions /specialities in the State FSL.

There are six scientific Divisions:

- i.) Biology & Serology Division.
- ii.) Chemistry & Toxicology Division.
- iii.) Physics & Ballistics Division.
- iv.) Documents and Photography Division.
- v.) Narcotics & Drugs Psychotropic Substances Division
- vi.) DNA Profiling Division

Biology & Serology; Chemistry & Toxicology Divisions are fully functional since 1990. In Physics and Ballistics Division, examination of some physics cases has started in 1999, however, for Ballistics work examination of cases started during the year-2002 and the division is fully functional. As regards Documents and Photography Division, the division is fully functional since October 2000. The analysis of narcotics drugs and psychotropic substances started in November 2006. Also in changing crime scenario measures are being taken to address new challenges of modernized crimes timely and objectively by adopting innovations of science and technology in the Forensic Sciences. The State FSL has seventy four sanctioned posts of scientific and supporting staff.

Filling up of vacant staff positions is actively under process and the vacant positions are required to be filled up immediately so as to keep pace with the ever-increasing workload.

The police staff is temporarily doing the reception and administrative work regarding crime cases in the SFSL at present.

The state Government also created two Regional Forensic Science Laboratories on each at Mandi and Dharmshala in the year 2006, which have been setup in rented buildings at both the places during the financial year 2008-09. The laboratories have become partially functional during the year and shall become fully functional during the next financial year after the recruitment of staff which is under active progress.

FORENSIC SCIENCE:

With the origin of man on the earth crime came into being and was committed by the members of the society since the formation of primary social groups. Simultaneously, the methods of prevention and control of crime persisted in the society in one form or the other. Before the enactment of laws and origin of law enforcement agencies in the world social order was maintained in the primitive societies by way of social sanctions, taboos or in other words do's and don'ts as framed by man in the society at that time. The physical force generated the ides of "Might is Right". The physical necessities of life for their attainment generated quarrels and feuds among different human groups living in a specific geographical territory. For hunting and gathering of food, weapons were devised with the help of stones, bones and wood materials and ultimately in the metal age the spears, harpoons, swords and the weapons of other types were manufactured for personal safety and prevention of crime. This was in fact the use of preliminary technical developments in the primitive society in the absence of police or law enforcement agencies whose work was taken up by the members of the society or the heads of various social groups in the society.

FORENSIC SCIENCE IN THE PAST:

If we pinpoint the use of science and technology for the authenticity of one's articles of use, the presence of thumb, hand, foot and palm impressions on the pot—sherds recovered from the Indus valley civilization, Mesopotamian civilization and in the excavations in Rome and Greek it is indicative of the fact that people in those times even affixed their hand, foot, palm, sole, thumb and finger impressions on different articles for keeping them separate or to save them from intermixing with the articles of other persons. Similarly, the cave paintings in different regions in the world and of the pre—historic times show the impressions of hand, palm and fingers indicating again about the authorship of the persons -Who made them. The use of thumb impressions for authenticity in China goes back to 3rd century B.C. and in Asyria 7 century B.C. Taking of foot and hand impressions of the new born babies in the 15 and 17 century A.D. was in fact the real scientific use of finger, footprint technology for prevention of intermixing of new born babies in British and American hospitals. It was also used for avoiding deliberate or accidental transfer of children from one mother to another.

In 1788, J.C.A. Mayer in Germany confirmed that ridges of fingerprints of no two individuals are duplicated. In 1823, Prof. J. E. Perkinge classified fingerprint patterns into nine types. Subsequently, the works of Sir William Hershel in 1858 and Dr. Henry Faulds in Japan and Sir Francise Galton in 1892 continued on the classification and identification of fingerprints; till such time in 1897 Sir Edward Henry, Inspr. General- of Police, Bengal developed a

system of classification of fingerprints. This was used in India and was started simultaneously in Scotland Yard (London) in 1901.

The discovery of A, B, O blood groups in 1900 and 1901 by Karl Land Steiner and the use of Forensic Anthropology for identification of person in Ruxton murder case in the year 1935 in England opened the eyes of the whole world law enforcement agencies that science can be used for the investigation of crime and in the administration of justice.

Not only this, in different parts of the world in different regimes of Kings and Queens' services of "Rajvaidyas" were taken for medico—legal opinions for knowing the cause of death or for reaching at the truth in different disputed cases of crime. The famous case of Emperor Solomon deciding a maternity dispute by the use of forensic psychology is fairly old. Two women came to the King Solomon claiming the maternity of a child.

The king ordered his men to cut the child into two pieces and to give the either part to each woman. One of the woman cried and said that the child be handed over to the other woman but should not be cut into two pieces. This indicated the real maternal affection and the child was handed over to the real mother who had requested not to get the child cut into two pieces. Hence, the wisdom of King Solomon for the application of forensic psychology in this case helped him to decide the matter.

FORENSIC SCIENCES PRESENT SCENARIO:

Today, we have more than 160 cellular antigens, 150 serum proteins and 250 cellular enzymes are known to occur in human blood for matching or differentiating the body fluids.

Human Leucocyte Antigen typing system in the eighties had been of immense help for the individualization of the body fluids and their stains in paternity disputes, gang rapes and other cases for establishing human identity. The discovery of DNA profiling by Prof. Alec Jeffery in the Lister Institute of England in 1984 gave most valuable and authentic technology for identifying the criminal and for establishing human identity on the basis of genetic material, i.e. D.N.A. The technology was further developed to enhance the number of bands as per the use of multilocus probes. Moreover, the technology permitted amplification of D.N.A. of the type which is recovered in minutest quantities in crime cases. The S.T.R. technology is another recent boon discovered in the past a few years.

What happened in between the developments of fingerprints and DNA profiling is apparent from the definition of Forensic Sciences itself, i.e. Any branch of science which is helpful in the investigation of crime and the administration of justice is Forensic Sciences. Hence, several other branches of forensic sciences came into being from physical, chemical, biological and applied sciences. Some of the examples are highlighted here:

1. Forensic Anthropology: It deals with the identification of human body remains on the basis of osteology, osteometry and superimposition techniques. It also involves blood grouping, red cell enzyme and serum protein typing from blood and other body fluids which is called specifically as Forensic Serology.

2. Forensic Biology: It deals with the identification of biological evidences whether plant or animal in origin, through mutual comparison and identification.

3. Ballistics: It deals with the study of projectiles, firearms, their ammunition for detecting range of fire, angle of fire and trajectory of projectiles etc. etc.

4. Explosives: It deals with the identification of explosives and their remnants from the site of explosion or confiscated suspected material. Nowadays, explosive detectors and sniffer dogs are pressed into service for locating the explosives. The Mine detectors metal detectors also detect the networking of explosives.

5. Physics: It identifies metal, precious metals from their physical properties and also examines building materials, toolmarks, glass and paints, etc. for quality in different crime cases and for identification of the source.

6. Chemistry: It deals with the identification of substances of all types by chemical tests for their constitution and chemical properties. Mutual chemical comparison of the substances permits opinions whether they are from the same source or otherwise.

7. Toxicology: It is the study of poisons under which forensic science indicates symptomatically as well as on the basis of chemical and instrumental analysis for the identification of poisons, narcotics, drugs and other psychotropic substances.

8. Documents: Authorship of manuscripts, typed materials, printed materials and signatures, etc. are examined and source/authorship is established by forensic documents examiners. They are also engaged in so many other problems concerning white-collar crimes like fake currency notes, fake lottery tickets, credit cards, passports, forgery and frauds in the banks and other Govt. departments.

9. Lie Detector: Polygraph is an instrument with the help of which peaks/ graphs concerning blood pressure, palpitation rate, perspiration rate and skin twitching etc. are recorded and a person can be interrogated scientifically as to whether he is speaking the truth or telling a lie.

10. Photography: Macrophotography at the scene of crime, whether is still photography or video-photography is of utmost help in recording the evidence. Likewise, photomicrography and micro-photography in the laboratory permits recording of minute physical clues from the crime case exhibits.

11. Footprints and tyre marks: It was treated to be rudimentary science in 60's, has developed as a scientific study and is treated to be an authentic evidence for the identification of persons from their foot/footwear's and vehicles from their tyre marks.' It is a reliable corroborative evidence at present.

12. Odontology: It is the study of the teeth, the alignment of teeth, their eruption, falling, malformations, wear and tear and other surgical artifacts used for the restoration of the teeth, which permit identification of a person. Moreover, teeth also permit estimation of age.

13. Medical jurisprudence: At the time of autopsy of a deadbody and medico-legal examinations of the persons the reports are prepared by the medical experts which are of utmost help in finding out the cause of death and also help in ascertaining the extent of injury to the person. It involves internal examination of organs, injuries and symptoms.

14. Instrumentation: It is emerging branch of forensic sciences under which duplicacy of different equipments which may be mechanical, electrical, electronic are examined and identified.

15. Engineering: Forensic engineering deals with the cases of development of cracks in buildings, dams and other structures before the specified time or before their fixed up age. They also deal with whether the material used has been as per specification or otherwise. The engineering defects are also studied in the process.

16. Geology: It deals with the analysis Of oars, gems, and other precious stones recovered from the earth crust. Geologists also identify such materials in co—relation to a particular sitè/ area. The precious fossil forms are also identified and co—related to the important sites.

17. Archaeology: The articles of antiquity recovered in excavation and precious idols when stolen have to be identified by Forensic Archaeologists with respect to their Originality and age by dating methods.

18. Computer: We are passing through the age of computers today We are using computer for data storage, data processing for speedy transmission of data. However, more networking of computer upto Police stations and Police post level is still needed. Computers can be used for portrait building of suspects and criminals on the basis of the descriptions given by the victims of crime. Computer graphics are of utmost help in this process. With all these important branches of forensic science in service today still it is hot mandatory for the police to keep forensic reports on the file which is a must if we really have to take help from science in the investigation of crime and for giving justice to a common man.

Today, we have more then 3000 forensic science laboratories in. the world and about 30 FSLs excluding Chemical Examiners laboratories, Fingerprint Bureaus, GEQDs are functioning in India . Not only this, a lot of private organizations and private experts are taking up scientific detection and forensic work for analysis and help. Though the origin of forensic science in India in the form of laboratories started in the decade of 50's but there has been appreciable expansion. However, the facilities are not still ample upto the grass root level and are required to be updated in view of the forthcoming problems in the 20th century.

FORENSIC SCIENCE IN FUTURE:

The crime scenario in this last phase of 20th century has become very complex. It is further expected to be more complex in the 21st century. The modus operandis of crime has become scientific as the criminals are using scientific methods in the commission of crime. As there is a famous phrase "Diamond cuts Diamond", hence it is essential to use science and technology in apprehending the criminals with the tools of science. For this purpose on one hand introduction of scientific methods in the investigation of crime and on the other hand to give extensive training in the use of science and technology in police work in the 21st century is highly essential. The extension of forensic science facilities upto the police station level will be required for the crime to be investigated effectively and scientifically. The burning problems in the 21st century for the police investigator and criminal justice system would be white—collar crime including bank scams and scandals, forgeries and frauds in other financial institutions, terrorism and explosives, drug menace, computer

crime, juvenile crime pertaining to persons and identification of person, firearms and materials.

Specific investigation kits would be required for the purpose of investigation by all police I.O's in different parts of the county. The means of communication and transport have become so fast that the criminal will be leaving the areas of occurrence of crimes without any lapse of time, hence, police machinery, transport and communication will also be required to be updated. The wireless and computer networking will have to be in use for timely information and exchange of data concerning crime and criminals. There will be specific situations, when police will always require the help of science and technology through scientific experts in crime cases.