The Forensic Laboratory

Forensic Science

Introduction

- The forensic laboratory is where the essence of forensic science takes place, with one objective - to deduce all of what is possible from evidence. Thus, there is the need for multiple departments, personnel and methods of analysis.

General Locations

- Forensic laboratories contain almost all aspects of forensic science in one place, where skilled scientists and specialists who focus on specific areas of forensic science work together to unravel and solve even the most intricate of crimes. Forensic laboratories are commonly attached to universities so the scientists who work there can give students studying forensics a first hand experience. Large police departments may have their own forensic laboratory but otherwise, forensic laboratories are independently run.

The Principles

- Forensic laboratories all run following the same basic rules and regulations. Any item of evidence that enters the lab must never come into contact with anything that could contaminate it. Its progression through each of the lab's departments must therefore be fully recorded so that it can be perused at any time. Once the sample is in the lab, the most straightforward diagnosis is always carried out first i.e to verify that the item is really what it is, before moving onto more expensive, but precise procedures to discover the evidence the item might hold. Any tests that may destroy the piece of evidence are carried out last, after all the other tests have been completed.

The Departments

- Forensic laboratories contain the most up-to-date technology and techniques for enhancing and analysing fingerprints, shoeprints and tyre marks. As specific methods of analysing evidence at a crime scene are not practical, the objects are recovered and brought into the lab. Below are some common units found in many major labs.

Trace Evidence

- In most labs, a unit commonly known as a 'trace evidence unit' forms an area where scientists look for clues in evidence such as hair, fabric, dust, fibre and skeletal remains. Refer to the 'Every Criminal Leaves A Trace' section.

Chemistry

- A chemistry unit is present in any laboratory and is used to test samples of blood and urine for alcohol, drugs and poisoning. Chemistry sets are also used in the analysis of synthetic materials such medicines, dyes and stains. Specialists in the area of chemistry also rely on gas chromatographs, mass spectrometers and microscopes to identify chemicals.

Serology

- The serology unit specializes in the identification and analysis of bloodstains and other bodily fluids, as well as DNA sequencing. The most common of the DNA tests, the polymerse chain reaction, is now able to be performed in small laboratories, thanks to advancements in this area, however, the analysis of mitochondrial DNA is still only performed in large forensic laboratories.

Materials

- Material units are used to identify and analyse metals, paints, ceramics, soil and wood in an attempt to trace a crime back to a possible suspect. The biology unit is in charge of analysing all biological evidence such a seeds and plants.

Firearms

- Firearms units test weapons to see which weapon made the mark on an object or wounded or killed a person. To be able to carry out these tests, firearms specialists study the used bullet cartridges and use shooting baths to fire weapons, identify the bullet marks and establish the firing distance.

Photography

- Photography plays a vital role in the forensic laboratory, as photography is used to document crime scene evidence. Processing resources and dark room services allow specialists in the area of photography to analyse photographs and bring the evidence to light.

Others

- Large labs also have arson and explosives experts as well as specialists in software, computer data, files, documents, audios and video recordings. The units available in different labs will vary from one to the other, however, the need for certain analyses and the budget of each lab determines the availability of the departments.

Efficiency And Staff

- Forensics laboratories are extremely complex and involve up to hundreds of people to ensure everything runs quickly and efficiently. Staff ensures that evidence is correctly booked in, prepared and stored, cleans and maintains the lab, as well as servicing the various technical equipment and keeping it looked after. Testing results from the evidence is useful in solving one crime, but when added to a worldwide database, the evidence can be linked to other crimes that the suspect may have committed.