AN INTRODUCTION TO THE SAPS FORENSICS LABORATORY

PRESENTED BY: LT.COL. J. KOCK
STRUCTURE OF THE DIVISION FORENSIC SERVICES
SOUTH AFRICAN POLICE SERVICE

Divisional Commissioner
Criminal Record and Forensic Science Services

Lt. General JK Phahlane

Head
Criminal Record and Crime Scene Management (CR & CSM)

Head
Forensic Science Laboratory (FSL)

Head
Quality Management (QM)

CR
LCRC
CSM
EXPLOSIVES
IPU

Biology
Chemistry
Scientific Analyses
Ballistics
Questioned Docs
VIC
FSL W-Cape
FSL E-Cape
FSL – KZ-Natal

Technology Man Support
Development Facilitation
Database Man
Quality Man CR & CSM
Quality Man. FSL
WHAT IS “FORENSICS”?

The term “Forensic” is derived from the Latin word *forum* which indicates: “submission of evidence before a court of law”

*Forensic science* is the application of natural sciences to matters of the law. Forensic science is concerned with the recognition, identification, individualization, and evaluation of physical evidence. Forensic scientists present their findings as expert witnesses in the court of law.
LOCARD PRINCIPLE:

Dr Edmond Locard (1877-1966) was a French criminalist renowned for being a pioneer in forensic science. He formulated the **Locard's Exchange Principle**.

“Any action of an individual, and obviously, the violent actions constituting a crime, cannot occur without leaving a trace.”

or

“**Every contact leave a trace**”
LOCARD PRINCIPLE ILLUSTRATED:

“EVERY CONTACT LEAVES A TRACE”

WHEN TWO BODIES COME IN CONTACT WITH EACH OTHER A RECIPROCAL TRANSFER OF EVIDENCE OCCURS.

→ CREATION OF PHYSICAL EVIDENCE
UNKNOWN OR CRIME SAMPLES:

The unknown (crime) sample is material found at a scene but where its source (origin) is unknown.

Examples of crime samples are:
- Cigarette filter found on the crime scene.
- Abandoned clothing found on the crime scene.
- Spent cartridge case found on the crime scene.
- Chemical substance of unknown origin.
- Document with handwriting of unknown author.
- Fibres of unknown origin.
KNOWN OR CONTROL SAMPLES:

The known (control) sample is material collected from a known source. Examples of control samples are:

- Blood collected by pathologist from the deceased body.
- Buccal epithelial cells collected by authorized person from suspect or victim.
- Test cartridge and projectile fired from firearm during examination.
- Chemical component library samples.
- Specimen handwriting samples for suspected author.
- Fibres removed from garment during analysis.
KNOWN VS UNKNOWN SAMPLES:

Forensic analysis is based on the comparison of the unknown with the known.

The aim of forensic analysis is to identify the unknown sample in order to link it to its origin.
BIOLOGY SECTION

Function:
To examine biological material in order to identify ownership through DNA analysis.
To create **linkage** between an individual and exhibit.
EQUIPMENT USED

ROBOTIC LIQUID HANDLER

DNA CYCLER

GENETIC SEQUENCER
NFDD: NATIONAL FORENSIC DNA DATABASE OF SOUTH AFRICA

Act No. 37 of 2013: Criminal Law (Forensic Procedures) Amendment Act, 2013
As published in Government Gazette No. 37268 of 27 January 2014

Section 36D: an **authorised person** must take a **buccal sample** of any person arrested for any offence referred to in Schedule 8.
CHEMISTRY SECTION

Function:
To analyse possible drugs for the presence of illegal components.
Fire investigation of scenes and analysis of fire related exhibits to detect the presence of accelerants.
Toxicology
Alcohol analysis
Mass Spectrometer containing the ion source, mass analyser and mass selective detector

Gas chromatograph containing the column inside the oven
SCIENTIFIC ANALYSIS SECTION

Function:
Primer residue testing.
Precious metal testing.
Image analysis
Polygraphy
Trace analysis: paint, glass, fibres
Material analysis: soil, gemmology
EQUIPMENT USED

POLYGRAPH EQUIPMENT

SEM ELECTRON MICROSCOPE
BALLISTICS SECTION

Function:
To examine firearms and firearm related evidence.
To examine tool marks and to link it through physical matching to the tool which created it.
EQUIPMENT USED

SHOOTING TANK

WATER TANK USED FOR THE SHOOTING AND RECOVERY OF TEST BULLETS AND CARTRIDGE CASES FOR COMPARISON PURPOSES.

COMPARISON MICROSCOPE

ALLOWS FOR THE MICROSCOPIC COMPARISON AND ANALYSIS OF BALLISTIC EXHIBITS.
IBIS: INTEGRATED BALLISTICS IDENTIFICATION SYSTEM

Database application.
A computer data storage facility which stores and continuously correlates microscopic markings on fired cartridge cases and bullets.
Creates “HITS” on exhibits linked to different crime scenes.
QUESTIONED DOCUMENT SECTION

Function:
To examine any signature, handwriting, typewriting, printing or other marks whose source or authenticity is in dispute or is doubtful.
EQUIPMENT USED

Electrostatic Detection Apparatus

Video Spectral Comparator
VICTIM IDENTIFICATION SECTION

Function:
Disaster victim identification
Ante mortem - missing persons
Post mortem - unidentified bodies
Forensic entomology
Forensic anthropology
Facial reconstruction
Crime scene reconstruction based on bloodstain pattern analysis
EQUIPMENT USED

M-VAC DNA COLLECTOR

PL500 ALTERNATIVE LIGHTSOURCE

GPR EQUIPMENT

DENTAL X-RAY

PARA DNA ANALYSER

EQUIPMENT USED
THANK YOU