Chapter

1

Introduction

Awareness about forensic aspects of investigation is gradually changing the scenario of crime spot findings in terms of evidence availability. Attempts of wiping staining weapon with blood to create fake evidence, use of chemicals to destroy DNA and washing events for the purpose of hiding the actual crime incidences and an attempt to change the crime spot, i.e. staging activities by assailant, are affecting the outcomes of investigation process. Information availability depends on the evidence material availability and data collection capability related to the crime events. Hence alteration or deformation of such pieces of evidence articles may further complicate the investigation process. To combat such changing crime scenario, it is worthwhile to accelerate the upgradation process in terms of promoting research and proper quality control management system development to boost up professionalism in investigation. This book offers a pictorial presentation of evidence articles received in forensic laboratory. Same type of crime events grouped together to demonstrate bloodstain pattern peculiarity among them. Readers will be able to differentiate and ascertain the particular type of crime event among diverse types of crime incidences based on bloodstain deposition pattern.

This book is a compilation of representative set of data based on real case incidence evidence articles received from police investigating officers in the forensic laboratory as well as crime scene visits done by author. Introduction section gives brief description about bloodstain pattern analysis to readers, subsequent chapter deals with classification system developed by author during this study. Proposed classification system is utilized in subsequent sections dealt with varieties of crime incident related evidence articles and their resultant deposited bloodstains to familiarize reader about the probable type of weapon used or type of assault occurred at the crime spot. Photographs of recovered weapons and garments are presented along with a few illustrations related to crime spot visit findings by author. Deteriorated stains during packing and transportation are also taken in account. Except last three chapters deal with crime scene management, author limited the scope of this book up to bloodstain pattern and corresponding wear and tears. Last three chapters summarize the interpretation of findings and crime scene management, related to different types of crime spot.

> "A forensic scientist may have to come to a dicision based on, in some cases, single non-repeatable items of evidence (information)", whereas scientists in other disciplines base their predictions on the results of replicable experiments.
>
> **–Robortson and Vignaux**
>
> (Bernard Roertson and AG Vignaux, Interpreting Evidence, Wiley, Chichester, UK, 1995)

During examination processes in the forensic laboratory, rather than going beyond preset boundaries and to look for some extra exhibit material helpful for the judiciary, tendency of sticking on, what asked for and what is routinely examined is also an impediment. Instead of mere routine type case examination, a progressive approach toward gradual uplifting in terms of investigation methodology is very important. This is the fact that police investigators do not have enough time to fully concentrate on particular crime spot due to increasing crime rate and multidimensional nature of 'policing'. What they have gained by observing things at crime scenes is experience. Policing is very important due to the fact that all crime spot-related work and file preparation is done by police.

Investigating officer gradually train their mind by repetitive observations at crime scenes, to be ready for further skilled observations in similar incident types. They are first responder and need proper training hence this book is equally important for them along with honorable judiciary.

Information source reliability weigh more on available pieces of remained physical evidences, hence this book is information source (reference book) for honorable judiciary also.

This book is an initiative toward centralized management cell establishment or system for data collection for the purpose of preservation and maintenance of these valuable pieces of information. Bloodstain deposition pattern related data on articles received at white walled laboratories is preserved in the form of pictorial data for the purpose of further reference in individual crime types. This book is an initiative to compile the data related to bloodstained weapon and their associated garments worn during crime incidence based on weapon (blunt/sharp) and incident type. Developing a deductive approach, in bloodstain deposition pattern analysis to help police, judiciary and public prosecutors as well as to ascertaining the distinction between staged and real crime incidences based on differentiation between created or real evidence article, reconstruction and collection of physical evidences, likely number of assailant/s involved, number of blows on victim, type of weapon used in the incidence, etc. can be deduced by bloodstain pattern analysis discussed in this book.

Physical evidence: Entering in any place and/or contacting any person, results in mutual exchange of material between them which alters both in some manner depending upon the nature of objects, type of contact, time and vicinity factors. Ranging from hardly detectable evidence by the naked eyes, i.e. *trace evidence*, to clearly visible physical evidences. Any remarkable change after the crime incident, from what was in the beginning of the incident may be termed ***'a piece of evidence'*** for that particular crime incident (Fig. 1.1A and B).

Any change from what was in the beginning, i.e. prior to the incident, **in *the crime trio*, i.e. the garments and body of assailant/s, the garments and body of victim/deceased and the crime scene (crime spot and surroundings)**, ranging from living to non-living and large to micro, during as well as after the crime events may be used or taken as an evidence for that particular crime assault, to establish the fact/s. In addition to physical material or impression, the specific odors and things felt by sense organs like smell and touch may also considered as an evidence. Physical evidence may be unrelated to the main act of crime incident, i.e. homicide, but then also it may correlate the events and establishes the fact of occurrence of crime related event or malafide intention. In a case related to homicidal poisoning, author received a needle and a used soap bar for blood detection and grouping. As per the investigating officer, after poisoning the wife of the deceased pricked him with needle repeatedly on genital parts to ascertain whether he died or not in an attempt of poisoning. Hence, in this case, needle is not a weapon, nor used in actual crime incident, i.e. poisoning but still an item of evidence to establish the fact of intention/motive. Consideration and weightage to any physical object as a piece of evidence depends on the type of incident (Figs 1.1 to 1.10).

Trace evidence (Figs 1.2C, 1.5 to 1.7): Trace evidences are either very few in quantity, very minute in size, or both, even microscopic in size ranging from single

Fig. 1.1A and B: (A) Rusted metallic particles, recovered from crime scene, were further correlated with the recovered rusted rod in a robbery and homicide incident; (B) Metallic rod and rusted iron pieces.

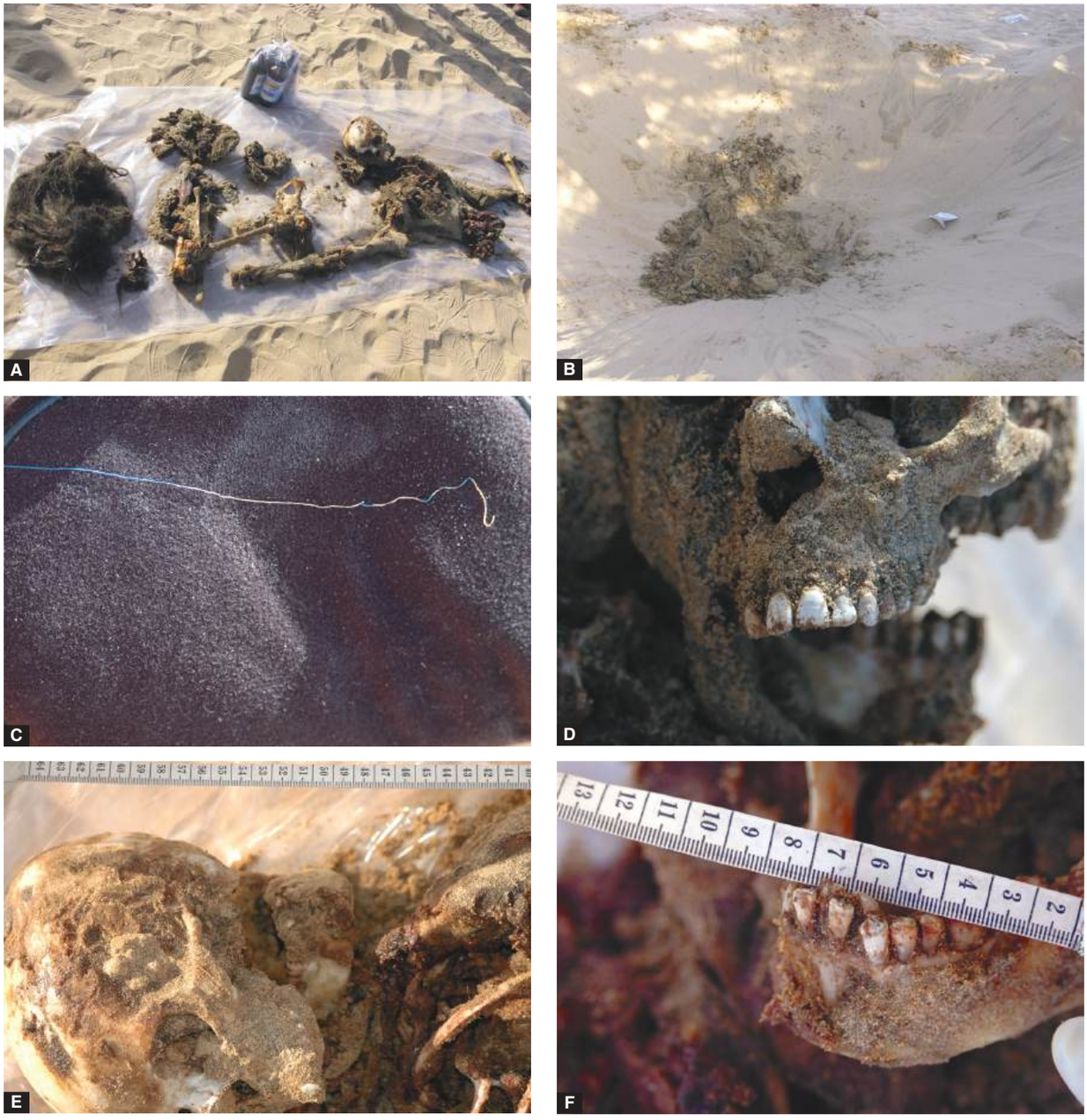

Fig. 1.2A to F: (A) Dug-up body found without her clothes. It was summer time and Incident was approximately one month old. Body was dug up from an open field outside a village; (B) Place where deceased lady found buried; showing the pit after dug-up. Note the wet moist soil resulted from decomposition process; (C) A single multi-colored cotton thread was recovered from the bunch of head hairs from the exhumed body without her clothing. This type of evidence is often helpful in identifying the type of garment worn during the incident; (D) Dentition of the unknown body photographed for further identification purposes; (E) Skull of exhumed decomposed body of the deceased lady, note the lower and upper jaw teeth hidden by sand particles and biological decomposed material adhered on them; (F) Removal of adhered soil from teeth, revealed typical dentition over lower mandible, characteristic feature, used in identification of the deceased missing.

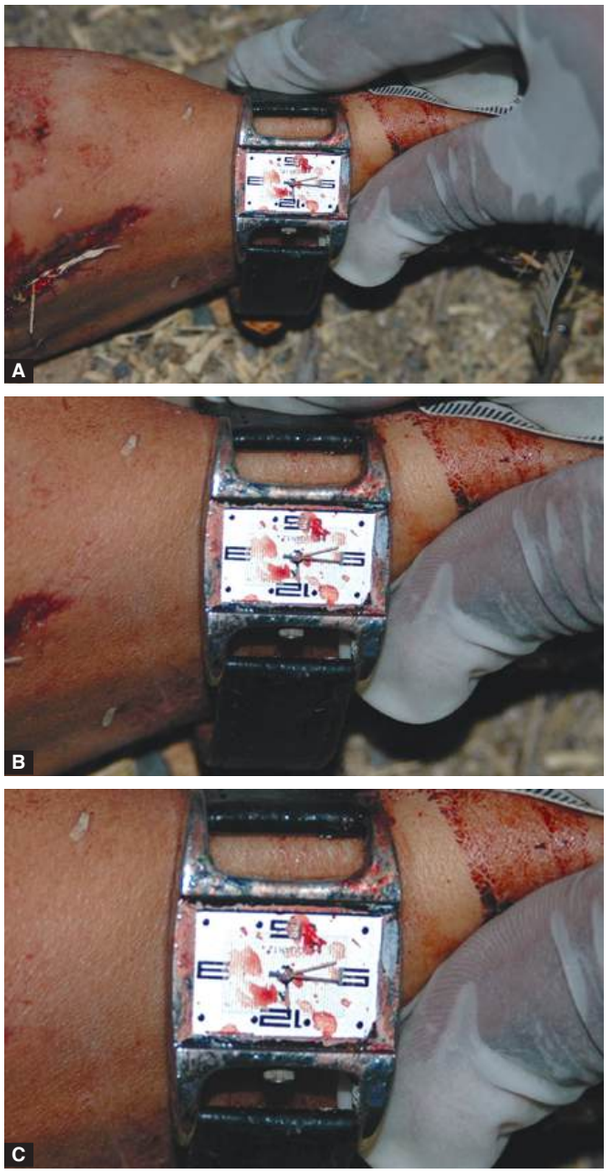

Fig. 1.3A to C: (A) Photograph showing wrist watch worn by deceased, in a homicide case by knife attack; (B) These two consecutive photographs showing stopped wrist watch during struggle, indicative of time of incidence; (C) Edited close-up of B showing time of incident.

thread, hair strand, blood remnants on washed garments, tiny fibers of cloths, tissue adhered on weapon, bloodstains, scrapings of fingernail, including epithelial cells, blood in traces remained in ridges between the washed floor tiles or washed weapon, often served as corroborative evidence, if

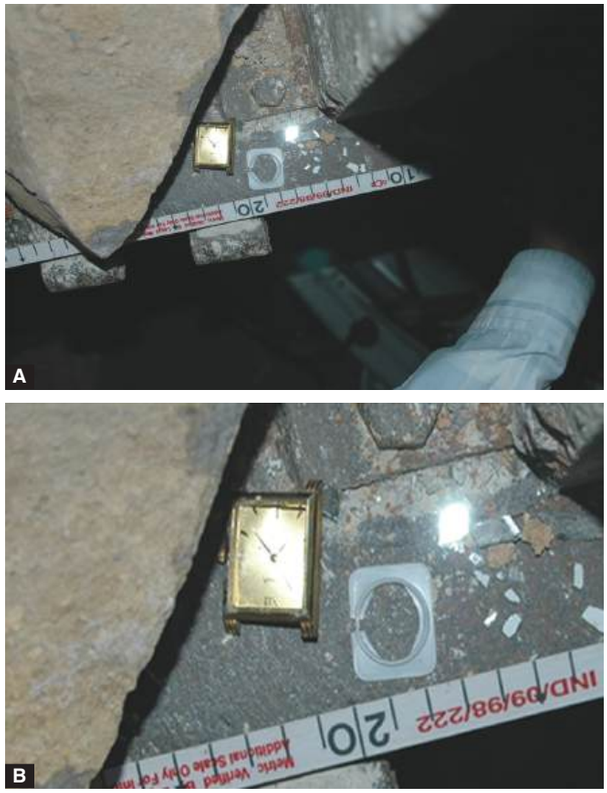

Fig. 1.4A and B: Another photograph of broken and stopped wrist watch indicating time of accident, in a tractor and bike accident case.

taken into consideration by the investigating officer. Limitation in terms of sense organs perception and instrumental limitation, the finding of trace evidence requires dedicated searching efforts. Trace evidences are time factor dependent thus are very prone to get lost at outdoor as well as indoor crime scene with contamination due to onlookers as well as environmental factors (Figs 1.5 to 1.7).

Wiped or washed bloodstained weapon or the dark peripheral stain remained after wiping/washing attempt (skeletonized bloodstains), hardly detectable by bare eyes, are few trace evidences investigators should be vigilant about during spot visit. Such trace evidence identification needs special attention as well as skill, in lifting, and preservation from the crime spot (Figs 1.8 to 1.10). In an incident of dug-up of a decomposed body of a lady recovered without clothes, a multicolored cloth fiber was noticed entangled in hairs (Fig. 1.2C).

Such types of trace evidences are very crucial to identify and recover the clothing worn at the time of

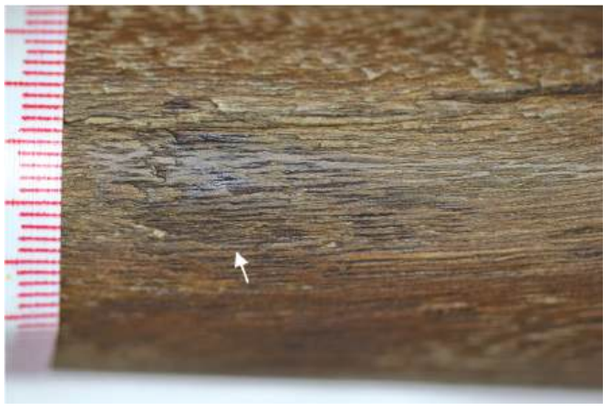

Fig. 1.5: Wiped bloodstain remnant on the wooden stick in traces. Such stains are vulnerable to be overlooked by mere visual inspection on camouflaged surface.

Fig. 1.6A and B: (A) Grey and black hair strand adhered on impacted blood smeared surface; (B) Note the textile fiber (trace evidence) on the wooden stick, similar to the garments worn by the deceased lady (*see* Fig. 3.8J).

Fig. 1.7A and B: (A) Blood in traces detected on the cuff buttons of washed shirt; (B) Note the red brown bloodstained threads in the button due to blood retained in traces, even after washing efforts done by assailant.

incident. Sample collection for DNA analysis is very critical in this context since DNA transfer just need mere touching the evidence article, although mere touching have very few DNA (touch DNA), to transfer but it may further complicate the investigation. Adherence with lab manual is very important begining from crime spot collection to laboratory examination, from sample picking to sample packing to sample handling, during examination in laboratory. Crime scene investigation team's role is very important in terms of avoiding the secondary contamination of evidence articles since contaminated evidence article and their inaccurate interpretation, affect further conclusion and cause trouble to innocent which is as serious as acquittal of the culprit.

Don't be afraid of criticism
It's capable of injury
But it is not capable of killing.

—The Art and fear (*by* David bail)

Fig. 1.8A to C: (A) Bloodstains labeled as '1' is a single drop of blood and a bloodstained partial palm print (transfer stain) is labeled as '2' in this photograph. These stains remained unnoticed and escaped washing attempt, after the incident by the assailants. On rest of the floor, vegetable soup was spilled and further washed to hide bloodstains; (B) Close-up view of blood drop on top of the tile skirting (border laid as a verticle peripheri outline of the floor); (C) Partial palm print 'imprint bloodstain; a sub-type of transfer bloodstain pattern' on the camouflaged surface of the wall shelf tile.

Fig. 1.9A and B: (A) Primary crime spot, a room where a handicap person was decapitated to hide identity and thrown elsewhere. Floor appeared washed. Body was found on an open field near road with missing right hand and head; (B) Blood was detected upon chemical test, inside the ridges of the washed floor.

Fig. 1.10A: Broom used to wash the blood on cemented floor.

Fig. 1.10B: Outline perimeter or boundary created by blood flow remained even after washing attempt on cemented floor.

In both plants and animals, vascular network of *transportation tubes* of various diameters, is so densely packed that it barely escapes tiniest area of the body. When we talk about vascular network connectivity, for the purpose to demonstrating the dense packing and supply of transporting vascular system, author included a close-up photo of a partially decomposed dried plant leaf as rhetorical representation of dense package of vascular connectivity in human beings (Fig. 1.11A and B).

Our body is densely packed with circulatory network of vascular system. Blood circulates in tubular tiny to large vessels of our body. So densely packed that even a needle pierce will result in oozing of blood, hence crime involved with wound inflictions, definitely results in bloodshed from breeched (crushed or severed) blood vessels from this dense vascular network. Physical injuries, resulting in internal and external hemorrhage documented as an evidence in an injury/postmortem report given by medical officer. Blood flows or spurt out from such breeched injured region hence bloodstain deposition on clothing worn by assailant and victim is correlated with the postmortem findings. Shaded blood's deposition and distribution pattern is the core of this study (Fig. 1.12A and B). Blood is a complex fluid of various cellular and other components in liquid plasma. When we separate the cellular components and proteins from blood by gravitational settling, this plasma is now termed serum but when serum is mixed with cellular components of blood termed plasma.

Throughout this book, the term ***incident*** is used for the incidence of occurrence of crime event. Blood is very crucial evidence link between ***the crime-trio***, i.e. the crime scene, the body and garments of the victim/

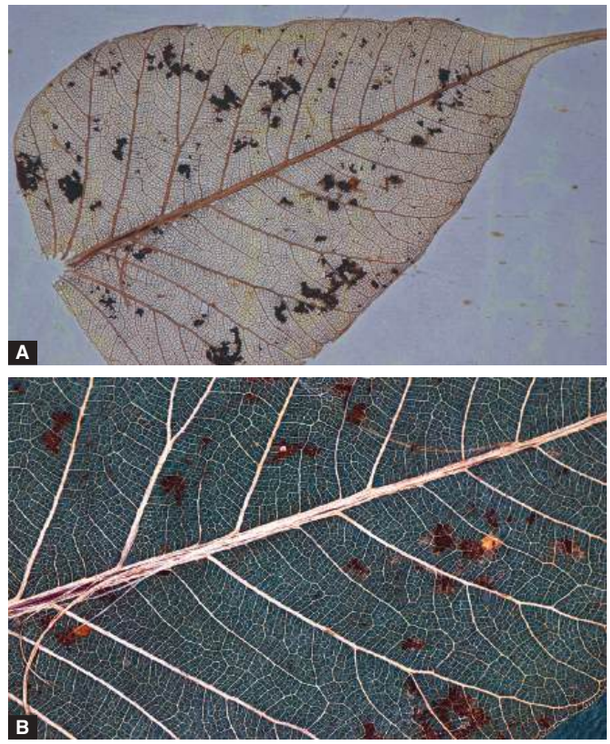

Fig. 1.11A and B: (A) Vascular system in dried and partially decomposed leaf; (B) Close-up view of leaf vascular system. Note the dense vascular system and mid-rib a rhetoric presentation of dense blood vascular system in animals and their further branching in smaller vessels.

deceased along with the body and garments of the assailant/s. Appearance, and context-wise, blood is distinctive in terms of color, hue, shine, sheen and reflectivity and odor, fresh blood has a very distinct odor. Behavior-wise blood is unique and distinct from other fluids due to its complex fluid nature. It can clot, separate into its: (1) Cellular and proteinaceous components, and (2) clear liquid serum component. Blood consists of immunological cells and clotting supportive platelet cells floating in liquid plasma, it has solid, elastic and bouncing discoidal single layered cells known as red blood cells (RBCs), with oxygen and other gaseous transportation capacity. Blood, is very specialized supplier medium among animals, due to its continuous flow in vascular system. Blood's flow fulfils various physiological, functional needs of survival, i.e. immunity, nutrition, gas exchange and behavioral pattern by hormonal transportation hence flow of blood inside body means flow of life and its cessation means cessation of life (Fig. 7.20). When it

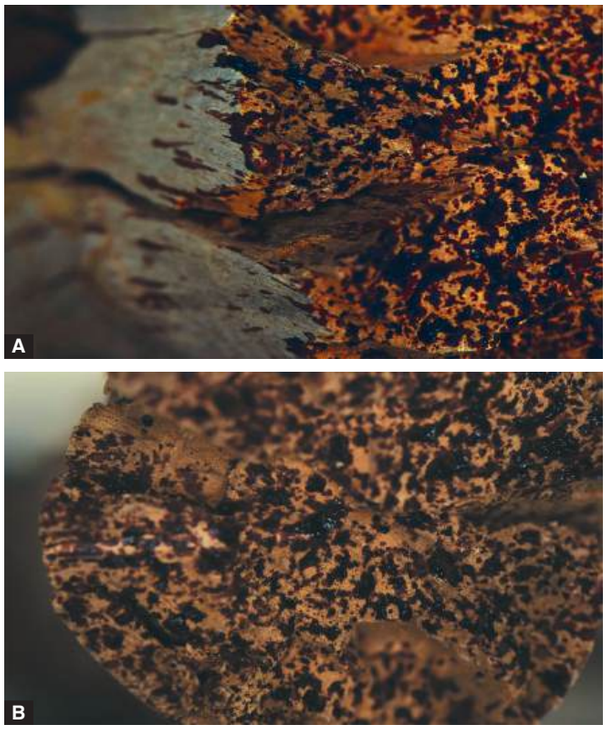

Fig. 1.12A and B: (A) Impact spatters on freshly broken transverse surface of nearby placed detached piece of wooden stick (weapon used in assault), on ground near the deceased, broken due the infliction of impacts during beating assault from the parent stick (weapon). Note the blood impact spatter pattern indicative of multiplicity of blows; (B) Another close-up showing transverse surface of broken end of wooden stick note the dense impact spatter pattern, blood spatters deposited roughly perpendicular, indicative of multiple impacts. Resulted in tiny impact spatters deposition on spiny and rough surface of broken end.

is very difficult to differentiate between antemortem, perimortem and postmortem wound, often bloodstain pattern deposited on the garments worn by deceased, become important. In an incident of neck incision by sharp weapon, after strangulation, due to cessation of blood pumping by heart, postmortem as well as perimortem injuries were opined by author due to associated passive blood flow, correlated with lying position during blood flow and absence of arterial spurts from incised neck vessels, along with pale sharp superficial wounds without any blood flow in limbs. Red blood cell's life is about 120 days, which should be kept in mind during its preservation in blood banks. Any bloodshed event during crime incident results in bloodstaining of nearby placed articles and persons in vicinity. Quantity of shaded blood depends on the part of the body wounded and the type of wound/s which further depends on the type of weapon (Fig. 1.12A and B).

Why this book: By preservation of the past similar crime incidence data, future research in crime investigation gradually pick-up pace and will fill-up the lacuna in terms of promoting research in this area. The uniqueness of bloodstain's spatial distribution pattern lies in specific spatial arrangement of deposited bloodstain pattern as well as their size and shape variations depending on the type of crime incident and the type/peculiarity of weapon used. Author documented, analyzed and presented those bloodstain distribution patterns on the crime assault related articles. This book is a source book of bloodstain deposition pattern types based on weapon type used, in particular weapon and/or crime incidence category. Illustrative photographs taken by author along with prerequisite case detail are classified and presented in this book. Crime scene visits during author's forensic career and their analysis is included in crime scene management section. This book may be used as a reference book for further analytical studies by scholars and scientists. The most common items illustrated in this book are garments and their related injury causing weapons based on the type of crime incidence. Book will be useful for naïve as well as experienced investigators to polish their skills *to differentiate* between same *looking bloodstain patterns created by different weapons* during the crime incidence and also helpful in finding anomalies (in staged crime) with the appearance of evidence or inconsistencies compared with the incident type. This book will help the reader to distinct between false reason told by accused for his/her bloodstained clothing and helps in recreation of the scene of crime incident. The size, shape, distribution pattern, discrete spatial arrangement of deposited bloodstains, their location based on injury types as per postmortem report and overall appearance on garments and related injury causing weapons are studied using method of visual examination and its precise photography. Items examined, fall into following categories: (1) Miscellaneous item recovered from crime scene, i.e. evidence articles placed nearby and vehicle in case of vehicular hit and run over cases and the weapon used in assault, (2) clothing worn by victim, (3) clothing worn by accused, (4) crime scene photographs taken during crime spot visit (by author). Although stain patterns on recovered

items were complex and obscured in majority of cases due to activities during struggle as well as soaking and diffusion of wet bloodstain during packing in wet condition from crime spot. In this book, following chapters are included as per broad weapon class types as blunt, sharp, vehicle hit/run over and firearm. Clothing and weapon are adequately described in terms of deposited bloodstain pattern, in conjunction with the injuries described in postmortem reports by medical officers. Overall and close-up photographs were taken without and with measuring devise in place. So, let's start this journey.

The bloodstain deposition pattern evaluation at the spot of crime based on the dynamics of bloodstains deposited on target surface is very crucial in reconstructing the events of crime incident. Bloodstain distribution and deposition pattern on garments and weapon at scene of crime tells about the events happened in a precise script, known as **bloodstain pattern analysis**. Deposited stain's analysis is fundamentally based on the examination of eccentricity (ratio of length by width), i.e. shape and size, spatial distribution, appearance, orientations of the bloodstains and their location on the target surface and the study of such patterned deposition is **bloodstain pattern analysis** for objectively reconstruct the events related to the crime incident, by finding out the circumstances of blood deposition on target surface. Major utilities of the bloodstain pattern study are in confirmation or refusal of the testimonial evidence, in identifying fake or real crime incident and in ascertaining reconstruction events by resulting bloodstain pattern created. The study of bloodstain pattern analysis on the crime related weapon and bloodstained garments have immense scope in the field of forensic science. Knowing the fact that bloodstain pattren analysis is a very complex and expanding area due to circumstantial condition variations, variations in exact force applied through the weapon on victim, probability of varieties of struggle movements between the assailant and victim during the occurrence of the crime incident as well, and varieties of crime assaults. During routine case examination work in serology division and crime spot visits as well, author noticed the pattern specificity of the bloodstains on the weapon and garments worn by deceased/victim and assailant's garments. This book provides the reader an organized data of bloodstains on the clothing, weapon used, and the other articles related, depending upon the type of crime incident, to find out peculiarities in deposited bloodstains. Wear and tear marks on clothing of victim caused by the weapon is also taken into account to corelate things holistically and to ascertain the type of weapon used if not known. The circumstantial condition during the incident, i.e. position of the body and body part/s being hit/inflicted upon, resulting injury types and number of blows by the weapon are correlated with the postmortem findings and first information report submitted by investigating officer. Wound types depend on the type of weapon used. Hence to analyze these patterns and to set up a comparative scale, data regarding bloodstain pattern on clothes are based on the weapon type. Analysis is based on the type of crime/accident/incident to study the resultant bloodstain pattern on, the weapon, articles in vicinity of the incidental place and the garments worn. This case study is also concerned about the genuineness of the bloodstains on the garments and weapon, i.e. whether the bloodstains on exhibits are a direct result of incident or just an act of staging (artificially created) hence this book will be very helpful for lawyers and judges. Variables in this case study were **extent of bleeding** (few/single bloodstain, moderate, numerous, extensive blood on the article), **type of clothing** (synthetic, woolen, cotton), **the type of weapon**, used during incident (blunt/sharp/ballistic related) and **number of blows** (single/multiple), part of the body involved (*impacted upon*) and the body part injured.

Weapon types and corresponding wound types—An overview: A weapon is peculiar in its inflicted injury type, depending on its shape, size and edge characteristics. To the forensic point of view, the term injury in this book is limited to physical injury, i.e. wound, both internally as well as externally. The weapon or object responsible for causing body injury can be of various types such as sharp or blunt object in their edge characteristic. The infliction of mechanical force or impact either by fall from height or by the impact of the weapon, everything in the physical dimensions are relative, likewise the terms bluntness and sharpness of the weapon edge characteristic as well. As we observe microscopically the razor-sharp edge appears like blunt one. The term *sharp* weapon is used for the object which is used to transfer the kinetic energy generated by force application in a very concentrated (minimum contact surface) space upon victim's body resulting in clean edged disengagement of the contacting surface and its underlined tissues one after another beneath, due to its wedge shape. Deep penetration of long pointed weapon results in **a**

stab wound (*see* Fig. 4.2). Shallow wounds on the other hand, in terms of less depth compared to outer breeched surface area caused by wedge shaped weapon or object results in sharp edge characteristics of wound, such a wound is termed an ***incised wound***. The term ***blunt weapon*** is used when there is relatively larger contact surface area during impact infliction. Energy dispersal of force applied by weapon, cause crushing or tearing instead of clear margin cut. Massive force application by assailant cause tearing of the skin and underlined muscle tissues known as a ***lacerated wound*** (by both smooth and rough surfaces blunt weapon) (Fig 1.14F). Scratching of superficial skin layer in known as an ***abrasion*** (Fig 1.13A and B). The force applied may cause internal hemorrhage without skin tearing due to the rupture the internal blood vessels, such wounds are termed ***contusion/bruise***.

In this case, Fig. 1.14A to G showing dead body found into the well—situated just outside her in-laws house. The patterned pressure abrasion was correlated with the bolt periphery and this information was used to find out possible direction from where the deceased fell. This information is used in finding any obstacle into the well toward that side to correlate with the injuries found on the body of the deceased (Fig. 1.15).

Fig. 1.13A and B: (A) Abraded tear mark on the T-shirt of the victim in an accident case; (B) Abrasion, just beneath the T-shirt, approximately 12 hours old, caused by tangential sheer force of impacting surface.

Investigator should try to reach at place of crucial value for evidentiary material, even inside the well as in this case but ensure his/her own safety first.

The resultant wound caused by the sharp weapon will be one of the three types: (1) ***Stab wound***, (2) ***Incision wound***, (3) ***Chop wound***. On the other hand, blunt weapon causes: (1) ***Laceration***, (2) ***Contusion*** and (3) ***Abrasion***. The type of wound is specific to type of weapon and the applied force. *Blunt weapon* is capable of causing **fracture**, *contusion*, *abrasion* and *laceration*. The types of injuries caused by the *sharp weapon* are: (1) *Chop-wound*, (2) *Stab-wound*, (3) *Incised-wound*. The type of bloodstains created due to infliction of these injuries are also different due to nature of weapon (blunt/sharp) and the variation in kinetic energy transfer to the body surface area upon contact during hitting. Impact of the weapon results in varying degree of destruction depending upon the body part affected and the type of weapon used.

Collection of evidence articles and their chain of custody: Bloodstained clothes and other bloodstained articles, lifted and packed at scene of crime in presence of two eyewitnesses by the police. These articles are and then forwarded to forensic science laboratory by police for further examination through district head officer. Upon receiving in the laboratory, recovered articles were stored in an exhibit room, before examination. These garments and weapon were analyzed during this case study. Limitations in this case study is that crime event once happened is a no repeatable event. The data collected by photography, is corroborated with medical reports, first information report and field notes by investigating officer of the cases.

Chapterwise presentation of data in five major categories, based on type of the weapon, used to inflict injuries, i.e. (1) Sharp weapons, (2) Blunt weapons, (3) Firearm assault related bloodstains, (4) Multiple weapons, (5) Vehicle impact. SWGSTAIN® terminology is being used in this book to distinguish between bloodstain types. A representative set of different bloodstained garments and their respective type of weapon were chosen. Each weapon related group is being further divided into (1) Case study with brief case history with all related photographs, (2) Selective photographs with peculiar findings. Focus was on *total drop concentration*, *drop orientation*, *average size* and *shape* as well as *gradual distribution pattern* of spatter and blood drops within the whole specific pattern. Type of crime incident and the resultant bloodstain pattern was the central core of this study. Different

Fig. 1.14A to G: (A) Patterned pressure abrasion on the posterior left side, created due to impact with the bolt tightened in a wooden slab inside the well. Deceased's body was recovered from inside the well. Note the other abrasion marks on the back; (B) Note the edge characteristics of the bolt inside the well. Comparing its edge characteristic with the patterned abrasion mentioned in Fig. A, helped to determine body orientation at the time of impact with this bolt. (C) Note the blood smear on the left and drip pattern on the right side of the wooden slab just beneath the bolt fixed wooden slab, indicating suspension of body of the deceased on the upper slab and further sliding down making smear of blood due to prior injured head contact while sliding down from the upper slab; (D) View inside the above-mentioned crime spot the well; (E)Note the graze abrassions on the face; (F and G) Lacerated wound on head region and two separate head injuries on temporoparietal and parietal regions, respectively.

Fig. 1.15A and B: (A) Patterned contusion on the inferior right back side of the deceased caused by blunt weapon like wooden stick; (B) Close-up view of the contusion caused by the blunt weapon (stick) helps in estimating approximation of width of the weapon.

types of weapon and their respective bloodstained garments of accused as well as deceased/victim were grouped based on similarities and studied to detect consistency and variability in their respective bloodstain pattern analysis (BPA). Information regarding body positions and circumstantial conditions of 'crime trio', i.e. victim, assailant and crime spot, and background information about the incidents have been collected by *first information report* (*FIR*) provided by the investigating officer while submitting case to forensic laboratory. Information regarding location, type of wound and source of bleeding were gathered from *postmortem/injury* reports received through investigating officer. Three types of documents, used in this case study, are case forwarding letter by district head police officer, first information report by the investigating officer and postmortem/injury report by the medical officer.

At forensic science laboratory, the physical evidence examination section uses procedure that are well established and generally accepted in the field. Chemical analysis like benzidine test, human origin test, establishes or refute the presence and origin of blood on the received questioned articles (garments and weapon received in laboratory). During this case study size, concentration, shape, whole spatial distribution pattern and location were analyzed in relation to deceased's body-part impacted. In addition to individual drop's shape and size, a whole spatial pattern of the blood drop's distribution and their size variations, holistically can determine the nature of crime scene, i.e. nature of assault, timing, type of weapon (sharp/blunt/ballistic or the use of multiple weapons), number of impacts/blows/fires, position of victim as well as assailant, movements of victim and assailant during and after the incident. Analysis of whole bloodstain distribution pattern along with shape and size range of deposition on the crime spot, garments of victim, assailant, bystander and on the weapon itself is known as *bloodstain pattern analysis*. Postmortem report by medical officer were used to correlate the bloodstain pattern with the part of body injured, extent and the type of injury as well as wears and tears on the garments. First information report by police gave insight into nature of crime and to get some glimpse of circumstantial situations about the incidence.

Findings and descriptive results of the analysis were documented and recorded by digital camera. In this process, care is taken into consideration regarding screening out the mirror images (transfer stain pattern) of the bloodstains created during transportation of the body by the investigating officer/medical practitioner for submission to the laboratory as well as by folding of wet clothes during packing hence most of the garments examined were in crumpled condition. While during data collection, inside-out images of the clothing also taken into consideration. Aim during this book preparation was to collect varieties of bloodstain pattern on the same class of weapon depending upon the body position during impact due movements during struggle as well as part/s of the body injured. This case study is classified based on type of weapon used in violent crimes and resulting bloodstain pattern on weapon itself as well as on the garments worn by victim and assailant during the incident in relation to the associated damage, i.e. tear/cut marks on the victim's clothing and physical objects in possession of the victim, corresponding with the injuries sustained by him/her. Next chapter deals with the classification system developed by author, using SWGSTAIN® terminologies as well as self-developed terms.