1. Record Nr. UNINA9910677724803321 Autore De Forest Peter R. Titolo Blood traces: interpretation of deposition and distribution / / Peter R. De Forest, Peter A. Pizzola, Brooke W. Kammrath Hoboken, New Jersey; ; West, Sussex, England:,: Wiley,, [2021] Pubbl/distr/stampa ©2021 **ISBN** 1-119-76471-8 1-119-76472-6 1-119-76470-X Descrizione fisica 1 online resource (381 pages) Disciplina 363.2562 Soggetti Bloodstain pattern analysis Lingua di pubblicazione Inglese **Formato** Materiale a stampa Monografia Livello bibliografico Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Cover -- Title Page -- Copyright Page -- Contents -- Dedication --Epigraph -- Contents -- Foreword -- Acknowledgements -- Preface to Blood Traces: Interpretation of Deposition and Distribution -- CHAPTER 1 Physical Evidence Record -- 1.1 Generation of Physical Evidence Record -- 1.1.1 Scene as a Recording Medium -- 1.1.2 Creation of Blood Traces -- 1.2 Capturing the Physical Evidence Record: Crime Scene Analysis -- 1.2.1 The Stages of Crime Scene Investigation --1.2.1.1 Scene Protection and Security -- 1.2.1.2 Evidence Recognition -- 1.2.1.3 Evidence Documentation -- 1.2.1.4 Evidence Recovery, Packaging, and Transportation -- 1.3 Reconstruction of Past Incidents from the Physical Evidence Record -- 1.3.1 Definition -- 1.3.2 Art or Science, or Both? -- 1.3.3 Importance of the Scientific Method -- 1.3.4 Reconstruction vs. Reenactment -- 1.3.5 Holistic Philosophy: Blood Trace Configuration Interpretation Is Only One Aspect of Reconstruction -- References -- CHAPTER 2 Historical Perspective --2.1 Edgar Allen Poe and Sir Arthur Conan Doyle: History in Fiction --2.2 Hans Gross -- 2.3 History of Research in Blood Traces -- 2.4 Detective Charlie Chan: History in Film -- 2.5 Paul Kirk -- 2.6 Herbert

MacDonell -- 2.7 Bloodstain Pattern Analysis Committees

and Organizations -- References -- CHAPTER 3 Characteristics of Liquids Including Blood -- 3.1 Physical Properties and Fluid Mechanics

of Liquids -- 3.1.1 Surface Tension and Weber Number -- 3.1.2 Density -- 3.1.3 Newtonian and Non-Newtonian Fluids -- 3.1.4 Viscosity and Poiseuille's Equation -- 3.1.5 Flow Stability, Reynolds Number, and Rayleigh Number -- 3.1.6 Viscoelasticity -- 3.1.7 Caveats -- 3.2 Physical Characteristics of Blood -- 3.2.1 Definition and Description of Blood -- 3.2.2 Factors that Influence Droplet Deposit Periphery -- 3.2.3 Factors that Influence Droplet and Deposit Size. 3.2.4 Sedimentation and Hematocrit -- 3.3 Optical Properties of Blood Deposits -- 3.4 Physiological Characteristics of Blood -- 3.4.1 Hemostasis and Clotting -- 3.4.1.1 Postmortem Clotting -- 3.4.1.2 Lack of Clotting -- 3.5 Use of Blood Substitutes in Training and Simulations -- References -- CHAPTER 4 Detection, Visual Enhancement, Identification, and Source Attribution of Blood Deposits and Configurations -- 4.1 Optical Visualization of Blood Trace Deposits -- 4.2 Catalytic Tests -- 4.3 Protein Stains -- 4.4 Blood Typing and DNA Technology -- 4.5 A Limitation of Laboratory SOPs -- 4.6 Ongoing and Future Research -- 4.7 Conclusion -- References -- 5 Terminology, Typology, and Taxonomy -- 5.1 History of Terminologies Applied to Blood Trace Configurations -- 5.2 A Typology for Blood Trace Deposits -- 5.2.1 Contact Transfers -- 5.2.1.1 Figure(s): Static Contact Transfers -- 5.2.2 Noncontact Deposit Configurations -- 5.2.3 Arc ("Cast-off") Deposit Configurations -- 5.2.4 Arterial Deposit Configurations -- 5.2.5 Droplet Trail Deposit Configurations -- 5.2.6 Airborne Droplets in Respiratory Airstreams -- 5.2.7 Radial ("Impact") Spatter (Include Close-Up) -- 5.2.8 Secondary Spatter -- 5.2.8.1 Dropping Height Experiments -- 5.2.8.2 Dropping Volume Experiments -- 5.2.8.3 Various Substrates -- 5.2.8.4 Secondary Spatter Discussion -- 5.2.9 Spatter Associated with Gunshot Wounds -- 5.2.9.1 Patterns from Perforating (Through-and-through) Wounds -- 5.2.9.2 Backspatter from Entrance Wounds with No Exit (Penetrating Wounds) -- 5.2.9.3 Blood Traces from Blowback -- 5.2.10 Other Configurations -- 5.2.10.1 Flow Configurations -- 5.2.10.2 Pooling Configurations --5.2.10.2.1 Clotting, Serum Separation and its Significance -- 5.2.10.3 Diluted Blood Deposits -- 5.2.10.4 Significance of Voids -- 5.2.11 Post-Incident Events ("Artifacts"). 5.2.11.1 Human Attempts at Clean-Up -- 5.2.11.1.1 Inhibiting and Obscuring Cleaning Agents -- 5.2.11.1.2 Luminol and Investigative Leads -- 5.2.11.2 Animals and Insects -- 5.2.11.3 Unavoidable Environmental Events (i.e., Rain, Wind...) -- 5.2.11.2 Animals and Insects -- References -- Chapter 6 Blood Droplet Dynamics and Deposit Formation -- 6.1 Blood Droplet Motion and Velocity Vectors --6.2 Angle of Impact -- 6.3 Blood Droplet Trajectory and Resulting Impact Geometry -- 6.4 Region of Convergence and Region of Origin -- 6.5 Equivalence of Relativistic Motion -- 6.6 Impact Mechanism and Blood Trace Deposit Formation -- 6.6.1 Impacts of Falling Droplets with Sessile Blood -- 6.7 Conclusion -- References -- CHAPTER 7 Blood Trace Interpretation and Crime Scene/Incident Reconstruction --7.1 Principles of Blood Trace Reconstruction -- 7.2 Utility -- 7.2.1 Associative -- 7.2.2 Action -- 7.2.3 Positional -- 7.2.4 Directional --7.2.5 Temporal -- 7.2.6 Pattern Directed Sampling -- 7.3 Limitations, Problems, and Common Acceptance of the Status Quo -- 7.3.1 Lack of Teamwork and Potential Synergism Between Criminal and Scientist Investigator -- 7.3.1.1 Lack of Appreciation for the Contributions of the Scientist (or Undervaluing of the Scientist) -- 7.3.2 Potential Failures of the Scientist Investigator -- 7.3.2.1 Investigator Inexperience --7.3.2.2 Neglect of Scientific Principles -- 7.3.2.2.1 Misunderstanding and/or Misuse of the Scientific Method -- 7.3.2.2.2 Over-Interpretation

-- 7.3.2.2.3 Opinion of a Scientist vs. Scientific Opinion -- 7.3.2.3 Deficiency in Scientific Integrity -- 7.3.2.4 Cognitive Biases -- 7.3.3 Pre- and Post-Event Artifacts -- 7.3.4 Risks Engendered by Limited or Erroneous Information -- 7.3.5 Problems with "Patterns" -- 7.3.5.1 General Problems -- 7.3.5.2 Patterns Involving a Limited Number or Detail of Traces.

7.3.5.3 Chronological Sequencing -- 7.3.5.4 Effects Caused by Interaction of Blood and Target Surface -- 7.3.5.5 Configurations Observed after Application of Blood Presumptive and Enhancement Reagents -- 7.3.6 Problems with the Interpretation of Specific Blood Trace Configurations -- 7.3.6.1 False Expectation of Airborne Blood Droplets from the First Wounding -- 7.3.6.2 Limitations in Determining the Origin with the Radial Spatter Configurations -- 7.3.6.3 Measurement Uncertainty and Significant Figures -- 7.3.6.4 "Height of Fall" Estimations -- 7.3.6.5 Crude Age Estimations of Dried Blood Traces Based on Appearance -- 7.3.7 Experimental Design -- 7.4 Blood Trace Configuration Analysis as Part of a Holistic Approach to Reconstruction -- References -- CHAPTER 8 Science and Pseudoscience -- 8.1 Science -- 8.1.1 The Need for a Generalist-Scientist in Crime Scene Investigation -- 8.2 Pseudoscience -- 8.2.1 The Pernicious Consequences with Respect to Reconstructions -- 8.2.2 Pseudoscience Characteristics -- 8.2.2.1 Isolation -- 8.2.2.2 Nonfalsifiability --8.2.2.3 Misuse of Data -- 8.2.2.4 Lack of Replicability -- 8.2.2.5 Claims of Unusually High Precision, Sensitivity of Detection, or Accuracy of Measurement -- 8.2.3 Hallmarks of a Pseudoscientist -- 8.2.3.1 Impenetrability -- 8.2.3.2 Ulterior Motives (Financial Gain/Recognition) -- 8.2.3.3 Lack of Formal Science Education -- 8.2.3.4 Unwillingness to Self-Correct -- 8.3 Bad Science -- 8.4 Conclusions -- References --CHAPTER 9 Modes of Practice and Practitioner Preparation and Qualification -- 9.1 Existing Modes of Crime Scene Investigation Practice -- 9.1.1 The Folly of Casting Technicians into the Roles of Scientists -- 9.2 Preparations and Qualifications of Practitioners --9.2.1 Education and Training -- 9.2.2 Experience -- 9.2.3 Mentoring -- 9.2.4 Professional Development. 9.2.5 Peer or Technical Review -- 9.2.6 Certification & amp --

Qualification Standards -- References -- CHAPTER 10 Interesting and Illustrative Cases -- 10.1 The Sam Sheppard Case -- 10.1.1 Case Scenario/Background Information -- 10.1.2 The Physical Evidence and Its Interpretation -- 10.1.3 Conclusions -- 10.1.4 Lessons -- 10.2 Knife in the Gift Bag -- 10.2.1 Case Scenario/Background Information -- 10.2.2 The Physical Evidence and Its Interpretation -- 10.2.3 Conclusions -- 10.2.4 Lessons -- 10.3 The Farhan Nassar Case --10.3.1 Case Scenario/Background Information -- 10.3.2 The Physical Evidence and Its Interpretation -- 10.3.3 Conclusions -- 10.3.4 Lessons -- 10.4 Passive Documentation -- 10.4.1 Case Scenario/Background Information -- 10.4.2 The Physical Evidence and Its Interpretation -- 10.4.3 Conclusions -- 10.4.4 Lessons -- 10.5 The British Island Holiday Case -- 10.5.1 Case Scenario/Background Information -- 10.5.2 The Physical Evidence and Its Interpretation --10.5.3 Conclusions -- 10.5.4 Lessons -- 10.6 Absence of Evidence is Not Evidence of Absence -- 10.6.1 Case Scenario/Background Information -- 10.6.2 The Physical Evidence and Its Interpretation --10.6.3 Conclusions -- 10.6.4 Lessons -- 10.7 Triple Homicide --10.7.1 Case Scenario/Background Information -- 10.7.2 The Physical Evidence and Its Interpretation -- 10.7.3 Conclusions -- 10.7.4 Lessons -- 10.8 The O.J. Simpson Case -- 10.8.1 Case Scenario/Background Information -- 10.8.2 The Physical Evidence and Its Interpretation -- 10.8.2.1 Trails of Blood Droplets and Footwear -- 10.8.2.2 The Blood on and in the Bronco -- 10.8.2.3 The Socks and EDTA Testing -- 10.8.2.4 The Envelope -- 10.8.2.5 The Hat and Gloves -- 10.8.3 Conclusions -- 10.8.4 Lessons -- 10.9 A Vertical Crime Scene -- 10.9.1 Case Scenario/Background Information -- 10.9.2 The Physical Evidence and Its Interpretation. 10.9.3 Conclusions.

## Sommario/riassunto

"The authors of this practical book are of the opinion that there are many aspects of the interpretation of blood traces that are of concern and have not been treated with the thought or caution that should be afforded them and that existing texts do not sufficiently emphasize the need for interpretations to be made by experienced scientists with strict adherence to the scientific method. At present there are no science-based higher education requirements for bloodstain pattern analysts, although efforts are underway in the Organization of Scientific Area Committees (OSACs) and the American Standards Board (ASB) of the American Academy of Forensic Sciences (AAFS). Thus, this text addresses that situations involving the interpretation of blood trace configurations are often very complex and the difficulties faced in rendering conclusions in this area are among the most scientifically challenging of those in any area of forensic science. It aims to provide an understanding of the scientific basis for the use of blood trace deposits (e.g. bloodstain patterns) at crime scenes to better interpret a criminal event. Three key features that will be valuable to the reader are: To provide fundamental principles for the scientific examination and understanding of blood trace deposits and configurations, within the framework of a holistic crime scene investigation. To dispel commonly accepted misinformation about blood traces. To provide valuable illustrative case examples which will aid in demonstrating concepts discussed throughout the book"--