A 'Bloody' Mess: The Use of Blood Evidence In Criminal Cases

Blood is one of the most obvious and common types of evidence left behind at a violent crime scene by the perpetrator and/or the victim. An average human adult has about 5 litres of blood pumping through out his/her circulatory system. Blood is not a simple fluid containing one type of substance - rather it has 4 major components:

1. PLASMA: fluid comprised mainly of water, dissolved nutrients, minerals & gases.

2. RED BLOOD CELLS: specialized cells designed to attach to O2 and CO2.

3. WHITE BLOOD CELLS: specialized cells that focus upon the destruction of foreign antigens; other significance = these are the cells obtain for DNA analysis.

4. THROMBOCYTES: specialized cells involved in clotting to prevent excessive bleeding.

Blood Flow During Stress: Fill in the blanks with the appropriate term...

- clean - heart rate - stress - blood

During a violent crime the human body will be in a state of _________________. It will respond by causing an increase in the _________________ and an increase in blood pressure. Thus, if a blood vessel is damaged/cut when a human is under stress there usually is an abundance of _________________ loss. Therefore, at a crime scene where violence is suspected to have occurred forensic investigators check for blood as well as materials that may have been used by a suspect to _________________ up bloodstains.

Looking at Red Blood Cells Under the Microscope:

A healthy male has about 5.4 million red blood cells per cubic millimeter of blood, while a female has 4.8 million. Therefore, it is estimated that an average adult has an average of 25 trillion red blood cells within her/his body! After about 120 days the red blood cell becomes weak and nonfunctional. Old erythrocytes are broken down by the spleen, liver and bone marrow.

Under low oxygen conditions at high elevations the human body will produce a greater number of red blood cells. Therefore, it is possible to estimate the elevation of where an individual has been by looking at his/her red blood cell count. Thus, a forensic scientist who only has a microscope at his/her disposal may use this to discern an approximate geographic location for an individual.

**Canadian example** = Calgary is at a higher elevation (1033m above sea level) than Edmonton (689m above sea level). As a result, someone who has been in Calgary longer than 5 days will have a higher red blood cell count than someone from Edmonton.

**US example** = Denver, Colorado is at a higher elevation (1609m above sea level) than Minneapolis, Minnesota (689m above sea level). As a result, someone who has been in Denver longer than 5 days will have a higher red blood cell count than someone from Minneapolis.