Chapter 1.4: Dynamic Duo of Principles

Two basic principles have come to underlie much of forensic science: Locard’s Exchange Principle and The Principle of Individuality. While often taken for granted, reliance upon these basic concepts allows us to fundamentally apply scientific methods for criminal detection.

Locard’s Principle

In section 1.2, the concept of Locard’s Exchange Principle was first introduced. This principle is central to all of forensic evidence and briefly states that when two objects come into contact, some materials or information is transferred between the two. If this transferred evidence can be found, then the connection between the two can be established. For example, glass shards, pollen, or DNA found on a suspect’s clothing can link them directly to a victim or crime scene. Alternatively, body fluid, hairs, or fingerprints from a suspect found at the crime scene can likewise link the two.

The common thread which links together items of evidence often can be the definitive clue needed in a case. Locard’s principle also goes, however, beyond criminal cases to include application in civil trials, identification of remains (even if the identification is primarily for recovery such as human remains from combat zones), authentication of important documents, and other cases. Finding an artist’s inadvertent fingerprint (something that they “left behind”) on a canvas can verify a painting’s authenticity or connecting a parent to their offspring via DNA data are all simple extensions of Locard’s Principle.

Principle of Individuality

This idea was first borrowed from philosophy which states that each person is separate and different from all other people, no matter how similar they may otherwise appear. In forensic science, however, the principle of individuality (or principle of uniqueness) states that even though two objects may be indistinguishable, they can never be exactly identical. This means that, while we might not be able to tell the difference between two

Figure 1.4. Locard’s Principle says that whenever two objects touch, something is transferred. This picture shows a microscopic crystal of cocaine that was transferred to a dollar bill and trapped in the fibers making up the bill when the two can into contact (www.businesspundit.com/up-to-90-of-us-bills-contain-traces-of-cocaine/).

Figure 1.4.1. All things, even though they may be indistinguishable, are not identical (www.theplanetfunniestanimals.com/2010/08/identical-twins/).
objects, at some level – maybe even only at the atomic or molecular level – they must be different. This idea says that we should be able to determine whether two samples came from one original source or from two completely separate sources. Once again, this idea is useful in tying together two pieces of evidence when they come from a single, unique source. The main question, of course, is do we have the ability to be able to distinguish between two objects given the experimental techniques available to us. For example, even identical twins are not exactly identical – one may have a scar or a different fingerprint that serves to distinguish one from the other. In this instance, the method for distinguishing between the two is fairly easy – look for scars and other small physical differences. In forensics, for example, two bullets may be made successively by the same manufacturer at the same time and packaged together but when fired from a gun, differences can be found to distinguish between the two. The application of the principle, in this case, is limited by our ability to find uniquely distinguishing features separating the two bullets. This principle, in theory, allows us to look for similarities and differences to support or refute connections between two pieces of evidence, presuming we can find these differences.

Sometimes, a third principle, called the principle of comparison, is used to measure the similarities and differences between people or evidence.

In the following chapter, we will examine the characteristics of evidence that can allow us to build upon the principle of individuality in forensic cases by distinguishing evidence by it class or individual characteristics.