1.8 Evidence Types: glass, paint, soil and gunshot residue

Hello. This is John again, and in this podcast, we’re going to have a look at evidence types that are generally known as particulates, because they exist as small particles that you might find either at the crime scene, or on a suspect. And these particular evidence types include, glass, paint, soil, and gunshot residue, and we’ll start with glass that we’ve seen previously. It can be found at the crime scene when the pane of glass is broken to gain access to burgled premises. And some of that can be found on, for example, the woolly jumper worn by the suspect. You might also find glass fragments in the head hair of the suspect. And that would be recovered by the police, by standing the suspect over sheet of sterile paper, then combing the hair downwards towards the sheet, a comb that has cotton wool in it to tease out and retain the glass fragments.

Finding glass on the upper clothing and the head hair has much better evidential value than finding glass, say, in the sole of the shoe. To find glass fragments in the head hair, upper clothing, puts you in the vicinity, as we’ve seen previously, of glass that is being broken. Finding it on the sole of the shoe puts you in the vicinity of glass that was broken when you trod in it. So glass on the upper clothing or in the head hair puts you in the vicinity of glass at the material time when its broken, because breaking that window was required to gain access to the premises. So we saw previously how the type of glass can affect its evidential value, so can its location on the body.

Paint is a bit like glass in that, well, paint is paint, and it’s not particularly unique. You get many, many cans of paint of the same colour and the same composition. Let’s say, for example, we have two vehicles that collide, and one vehicle doesn’t stop. Some fragments of paint from the vehicle that doesn’t stop will scrape off it and attach to the other vehicle. They can be recovered by the crime scene investigator, the CS I. And without having the suspect vehicle, the forensic scientist can analyse the paint and will be able to say what’s in it, the colour, obviously, and then maybe give the police an indication of the make, model, year of manufacture of the vehicle that didn’t stop so that it will help them with this intelligence to try and find that vehicle.

When the vehicle is located, obviously, then a comparison can be done between the paint recovered at the crime scene and the paint on the suspect vehicle and it can be a match, as we saw with glass, that might not necessarily be a unique association. It’s good supporting evidence, but it’s not necessarily conclusive.

Sometimes paint can be better than that, though. If you have an item that over the years has been painted many, many times, many, many different colours, different thicknesses of paint, then a section through that would reveal quite a unique profile of that paint history. So if we had a fragment of paint recovered from the bicycle at the side of the road that a vehicle had struck and not stopped, that profile of paint layers might match the suspect vehicle. If we can get hold of the vehicle and we can see, perhaps, on an alloy that’s been painted many, many times, a section through its paint to see whether it is consistent with and the same as those paint layers recovered at the scene from the bicycle.
And that provides better evidence. More difficult to see how another vehicle would have exactly the same profile of paints as this particular lorry has. So the evidential value increases that that has to be the lorry that struck the cycle.

If we look at soil now, you might pick up soil on the sole of your shoe. You might pick up soil on the tyre of a vehicle, and it finishes up in the wheel arch. A bit like paint and glass, soil isn’t particularly unique. You need something in the soil, really, that is unusual, a particular mineral, for example, that puts that particular soil in one location that happens to be the crime scene. So then finding that soil on the underside of the shoe or the tyre of the vehicle is better evidence that that vehicle, that shoe, has actually been at that location of the crime scene.

And the final evidence type we look at here, gunshot residue. When you fire a gun, you get a cloud of particles of mainly primer residue, the primer being used to detonate the main charge that pushes the bullet out the end of the gun. And that primer consists of elements like antimony, barium, lead, and you’re looking for individual particles or conglomerates of the different elements fused together.

So evidence of finding these particles is evidence that the person who you're examining, either their hands, their arm, the sleeve of their jacket, their face, has recently been in contact or close proximity to a firearm that was being discharged. Finding gunshot residue, for example, in the coat pocket might mean that a gun has been placed in the pocket to leave the residue behind. It doesn’t mean you’ve recently fired a weapon.

How much gunshot residue you find is also affecting its evidential value. If you find a small amount of gunshot residue, it is possible that that has been picked up accidentally by innocent contamination, more of a problem in countries where guns are more common. And the issue of innocent contamination is a perennial problem for the forensic scientist.

In trying to see whether the evidence supports the prosecution hypothesis that the suspect committed the offence, the forensic scientist will need to consider how likely is it that the evidence they found could have been picked up by the suspect by innocent contamination. If they weren’t the person that fired the gun, but simply had been in contact with, close to, brushed up against somebody had recently fired a gun, could that explain how the gunshot residue got on their clothing or on their arm? So a bit like with the other particulate types where you find it on the suspect and how much of it there is and how unusual it is all affect the evidential value and the value of that particular evidence type in helping to solve and detect the crime for the police.