Comment on „Individual human scent as a forensic identifier using mantrailing"

Woidtke et al. [1] provide a report on systematic experiments with mantrailing dogs. It appears to me that the reported results are questionable in various instances. This is a sensible issue because the results of the use of mantrailers may be admitted as evidence in court in various countries. Hence, I want to comment on this publication as follows:

1) The authors state that their experimental conditions resembled "real police operating conditions". However, in the reported experiments the dogs started only 5 minutes after the trail was laid while in reality it will typically take hours (at least for the Saxonian police) until a mantrailing team is on site.

2) The whole study does not allow any conclusions on the dog´s ability to work on a ground trail. The target persons were waiting at the end of the trail (though hidden) at only 100 m distance to the starting point (and 50 m from the point where the dog eventually had to decide). It is a commonly held believe that dogs can find a target person via air scenting under these conditions. The latter is further supported by the fact that the dogs went into the wrong direction in 20-30% of all cases, although they were performing almost perfect in scent matching. If the dogs were almost always correct in matching the scent from a scent item to the odor that they detected on site then this error rate only makes sense in case of air scenting because turbulences in the air can easily lead into a wrong direction while the trail on the surface – once identified- should unambiguously point to the correct direction.

3) The statistics and the text itself indicate that the dogs were influenced by their handlers. Principally, the dogs placed at the center of a T- junction had three directions in which they could move: to the left, to the right and backwards into the direction from where the teams arrived (Fig. 1). The dog handlers knew that the target persons never went backwards. However, the dogs that all had been certified for operational use and that were not specifically trained for these experiments on a T-junction obviously had to decide between three possible directions. Hence, whenever a dog went wrong there should have been an even chance for the two possible (from the perspective of the dog) wrong directions. This, however, did not happen. In over 600 experiments the dogs never investigated the backwards direction from where they had arrived. In fact, the authors themselves do not seem to acknowledge that three possibilities existed for the dog when they state in section 2.4 Experimental Design: *"The decision-making area extended from the T-junction **50 m to the left and 50 m to the right**".*

4) The statement that DNA samples provide sufficient cues for the dog to trail an individual appears quite misleading to me. From a biological perspective it is not conceivable that a dog´s nose could do something like a DNA sequencing. Furthermore, DNA pieces large enough for individual identification are too large to be sufficiently volatile to find their way into the nose of a sniffing dog. Hence, the conclusion that DNA extracts can serve as an individual odor source for mantrailing dogs should be deleted or at least replaced by the conclusion that the used DNA extraction method apparently produced some cues of unresolved nature that allowed the dog to identify individuals.

1.   Woidtke, L., J. Dressler, and C. Babian, *Individual human scent as a forensic identifier using mantrailing.* Forensic Science International, 2018. **282**: p. 111-121.