CASE REPORT

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Identification of a Rope by Means of a Physical Match Between the Cut Ends

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ABSTRACT: A case in which a rope found at the scene of a homicide is conclusively matched to its source is reported. It demonstrates that the preliminary stereomicroscopic examination of the cut edges of cords and ropes is important.

KEYWORDS: criminalistics, rope, microscopy, comparative analysis, physical match, rope comparisons

Forensic scientists are occasionally required to examine ropes encountered as evidence in criminal investigations. Usually, the forensic scientist is asked to state an opinion as to whether a particular rope could have originated from a particular source. Some of the characteristics examined include diameter; direction of twist; the number of twists per unit of length; the material used to construct the rope; and the number of strands, threads, and fibers [*1*]. Rarely can a forensic scientist state with certainty that a rope originated solely from one source to the exclusion of all others. The following case illustrates one such occurrence where a conclusive identification was made.

Case Report

In July 1982, a 22-year-old woman was found dead in her home. She had been strangled and sexually assaulted. Search of the crime scene revealed a 122-mm (48-in.) piece of rope in the victim's driveway (Fig. 1). This piece of rope was believed to have been used to strangle the victim as markings found on the victim's neck were consistent with being made by such a rope. A suspect was quickly found and a search of the suspect's residence revealed the presence of a large spool of rope seemingly consistent with the piece of rope found at the scene (Fig. 2). Law enforcement officials submitted the 122-mm (48-in.) piece of rope and the spool of rope and wished to know whether they matched.

Examination of both items revealed them to consist of several outer strands of white-colored bright nylon fibers. Within this outer wrapping of nylon was found white-colored cotton and polyester fibers. Finally, in the center of each rope, running longitudinally along the length,

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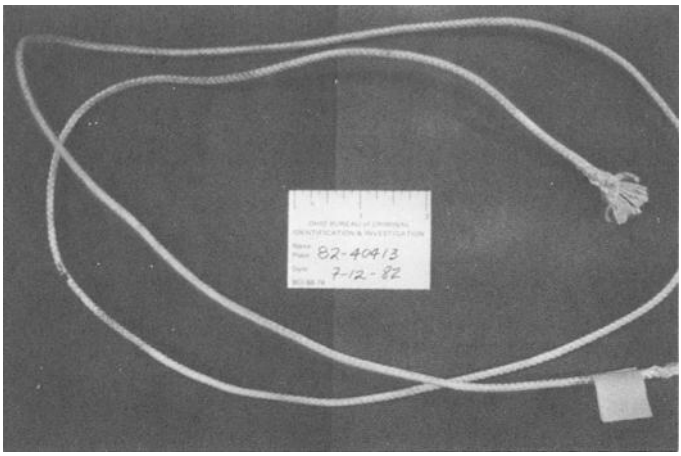

FIG. 1—*A piece of rope found in the victim's driveway which was believed to have been used to strangle the victim. The arrow on the rope indicates a suspected bloodstain.*

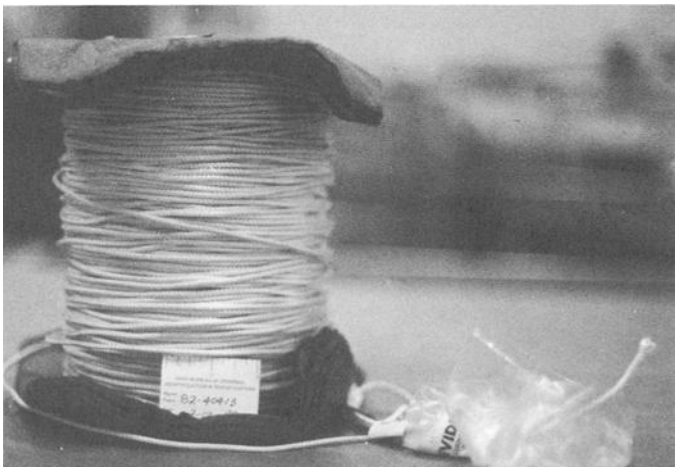

FIG. 2—*A large spool of rope that was found at the suspect's residence.*

were two stiff, coarse, bright-orange cords. These cords were approximately 0.5 mm thick and consisted of bundles of cylindrical glass fibers.

Discussion

Stereomicroscopic examination of the cut ends of the ropes revealed a physical match between the central cords of the rope found at the scene of the crime and the rope from the spool (Fig. 3).

One of the central cords from each of the ropes was cut leaving jagged ends (top cords in Fig. 3). The ends fit together like pieces of a puzzle. The stiff texture of the cords allowed for maintenance of the cut edge and subsequent comparison.

The other cord from each of the ropes was cut cleanly, leaving rather smooth ends (bottom

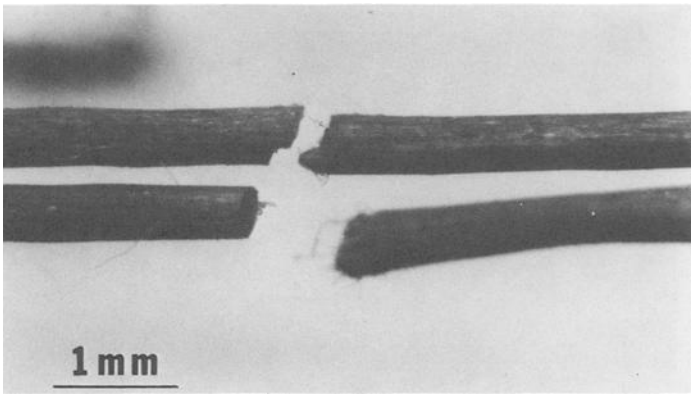

FIG. 3—*Photomicrograph of the central cords from the spool of rope* (left) *and the piece of rope from the crime scene* (right). *Magnification approximately* ×*20.*

cords in Fig. 3). If both cords had been cut as cleanly, it is doubtful whether such a definite conclusion of matching could have been reached.

Conclusion

In conclusion, comparison of ropes, cords, and the like, especially ones having stiff textures, should always begin with a stereomicroscopic examination of the cut edges. Such matches save work, time, and provide much greater evidentiary value than enumeration of common features which, at very best, allow only for the "could have originated" conclusions.

The suspect in this case was subsequently tried and found guilty of murder.

Reference

[1] Kirk, P., *Crime Investigation*, John Wiley, New York, 1974.

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