

BOOK REVIEW

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A Review of Trace Elements in Human Hair

REFERENCE: Valković, Vlado, *Trace Elements in Human Hair*, Garland STPM Press, New York, 1977, 194 pages, no price listed.

It is very apparent the author spent considerable time researching prior to writing the book; however, I found very little work that he had apparently done himself. He relates what other scientists have done in the various fields and offers an opinion as to their results. I think the book may have some application to the medical or environmental field, but I do not believe it to be of value in crime investigations.

The various methods described by the author in determining the trace elements in the hair necessarily destroy or alter the hair shaft. This destroys what may be a valuable item of physical evidence and prevents a subsequent examination by another expert. Further, the presence or absence of certain trace elements does not associate a particular hair with a particular person inasmuch as groups of people living together in the same environment and eating similar diets would probably have similar trace elements present in their hair.

At the present time, the most accepted method of hair comparisons is through the use of compound comparison microscopes. A properly trained and experienced hair examiner can rapidly determine the race and body area a particular hair originated from. A direct comparison of the various microscopic characteristics present in hairs can associate or positively eliminate a particular individual as the source of a suspect hair. This is supported by experiments conducted by B. D. Gaudette of the Royal Canadian Mounted Police Crime Detection Laboratory, Edmonton, Alberta, Canada, who has had three papers published in recent issues of the *Journal of Forensic Sciences* on the subject of human hair comparisons including probabilities.

A study was made in the F.B.I. Laboratory in the mid-1960s of the possibility of identifying individuals through analysis by neutron activation of trace elements in hair. Samples of head hairs were taken from about a dozen different individuals and each sample was divided equally, with single hairs removed from each sample given designated numbers and set aside to serve as questioned hairs. One set of samples was subjected to neutron activation and the other set was compared microscopically. The matching of the questioned hairs with the known samples when compared microscopically was 100% correct and required only a matter of hours to accomplish whereas no match was made through neutron activation, which required several days and also destroyed the samples. Unfortunately, a paper was not published regarding these findings.

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The author mentions that a high concentration of arsenic discovered in a sample of hair taken from Napoleon shortly after his death suggests he may have been poisoned, according to Smith in 1962. It was pointed out that other researchers disagree with this theory. I would very much doubt a pathologist would attribute the cause of a death as poisoning based on a heavy concentration of poison in the hair when other body organs could be evaluated and studied more rapidly and efficiently.

The first three chapters present an excellent overall description of hair including growth, structure, and composition and would be of value to a student beginning his study in hair comparisons in a forensic science laboratory. However, I repeat that the remainder of the book would be more applicable to environmentalists.