

## PLM and Dispersion Staining Through the Years

Because *The Microscope* has published so many papers on the topic of dispersion staining, and the McCrone Research Institute in Chicago teaches the subject in nearly all of its PLM courses, I am often asked if Dr. McCrone invented the technique. Of course he didn't, but he did help coin the term and discover the most practical analytical use for it. And through McRI he trained the greatest number of practitioners of PLM and DS for the purpose of identifying asbestos.

Known by other names, it has also been called focal "screening" or focal "masking" with the colors it produces being known to relate to the dispersion of refractive index during the immersion of one substance in another. It extends back, at least, to Brewster who noted colors in his 1819 paper "On the Action of Crystallized Surfaces on Light." Christiansen also observed DS colors and explained their origin in his paper "Experiments Upon Determination of the Refractive Index of White Powders by the Liquid Immersion Method" in 1884.

Crossman gets credit for perhaps the first analytical use of the phenomenon and suggested its use for the study of tissue in 1948. Of course, Dodge was using an alternate method in that same year and described "The Darkfield Color Immersion Method" in 1948. Papers by Ted Clarke and Tony Havics in this issue of *The Microscope* (see pages 147 and 155, respectively), revisit Dodge's high-resolution dispersion staining method. Crossman followed up with several papers of his own up until the late 1960s, and applied DS to corundum, textile fibers, quartz and asbestos.

At Inter/Micro 1960, Ray Wilcox revisits Cherkasov's 1960 "Russian" method of dispersion stain-

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*The PLM and dispersion staining method is employed worldwide in the analysis of asbestos products.*

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ing referred to as focal screening. This setup can still be found today on some Russian-made polarized light microscopes wherein the "screens" are located in the sub-stage condenser and an adjustable iris is located in the objective's back focal plane. Don Grabar of McRI

published a paper applying DS to settled dust in 1962.

England was way ahead of the rest of the world in recognizing asbestos as a health hazard. McCrone Research Associates, LTD in London was already using PLM and DS to identify asbestos, as early as 1965. In 1972, a paper by Julian and McCrone appeared in *The Microscope* and described the PLM and DS method essentially as it is now used throughout the world for the analysis of asbestos products. And in 1975, McRI in Chicago taught its first asbestos course for 18 students. By 2010, it will have had more than 425 additional courses and 6,250 additional students in its Asbestos Identification by PLM courses and over 9,000 microscopists trained in its environmental courses, overall.

Through McRI, Dr. McCrone is said to be responsible for the training of the vast majority of analysts who analyzed tens of millions of samples and for the publication of the large majority of papers on the subject in this and other journals. It is no wonder so many believe that he invented dispersion staining.



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