

BOOK REVIEW

The Petrographic Microscope. Daniel E. Kile (2003) Supplement to the Mineralogical Record, Publication Number One. 96 pp. The Mineralogical Record, Tucson, AZ. \$20.

It's a rare student who is not captivated by the first sight of a thin section under crossed polarizers with a petrographic microscope. Many students who are ultimately captured by petrography develop a relationship with microscopy that is one of continuous fascination. More modern analytical instrumentation has revolutionized petrology, but the enduring role of optical petrography calls directly to one of our most powerful senses, with a direct feed to the analytical brain in ways that remote inspection of samples crushed, vaporized, or loaded in vacuum chambers cannot claim. Optical petrography is old but it retains a unique and fundamental role in mineralogy and petrology.

Daniel Kile's monograph on *The Petrographic Microscope* is at first glance a piece devoted to beautiful old brass instruments. This impression is excusable because of the 93 color photographs that he has compiled, many of which illustrate superbly built microscopes and associated attachments of an earlier era. However, Kile is clearly one of those students captured to the fascination of petrography and he devotes most of his monograph to the story of how optical petrography evolved over time. The monograph begins with six pages of introduction and description that explain the characteristics of a petrographic microscope in detail sufficient for a reader not familiar with optical petrography. The next six pages similarly explain the basic properties observable with a petrographic microscope, including clear descriptions of the indicatrix and the effects of plane and crossed polarization with parallel and conoscopic light. Kile includes pictures of some things I had not seen, such as hollow glass teaching models of indicatrices, the positive ones half-filled with red liquid and the negative ones with blue liquid, that allow the student to rotate the model and see the dimensions and orientations of infinite optic sections. The indicatrix models I knew were still fun to play with but were made of plaster. Following this preliminary material are 26 pages devoted to the history of the petrographic microscope, illustrated with many color photographs of instruments dating from 1880 through the 1970s. The history, however, ranges from

the definition of Snell's law in 1621 through a description of the Bloss and Light detent spindle stage of 1973. A three-page table at the end of the section nicely summarizes over 100 milestones in the development of the petrographic microscope.

The remaining sections of the monograph are devoted to a history of the manufacturers of petrographic microscopes (5 pages), a detailed section on the many accessories (some long abandoned) that have been developed for the petrographic microscope (31 pages), a section on evaluation and restoration of petrographic microscopes (3 pages), and conclusions, acknowledgements, and references (11 pages). There is no index, but in a monograph of less than 100 pages this is not a serious shortcoming. The text is well written and generally free of errors (I only noticed two minor things that an editor should have caught).

I read through this monograph, cover to cover, because I found so much in it that I had not been aware of. My exposure to optical petrography was through teachers with a gift for history as well as a passion for petrography, so I knew some historical details such as the stories of Henry Clifton Sorby making admirable Victorian use of his time by grinding thin sections in his lap as he rode trains across England in the mid-19th century. I did not know that Sorby delved into microscopy for the measurement of hemoglobin in blood. I had never seen an elliptical analyzer or a Quirke hemisphere (what a neat teaching tool!) I now know what integrating stages look like and am grateful that I never had to use one. There's an abundance of detail in these 96 pages.

There are a few things that could have used more attention. Those who have spent long hours point counting might be interested in more coverage of manual and automated stages for this purpose. Developments in light sources and photomicrography could have been described. Nevertheless, Kile has chosen material of broad interest and compiled it into a very readable and visually pleasing product. This monograph is a great value for mineralogy teachers and students, and especially for people that admire or collect historic scientific instruments.

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