The Petrographic Microscope. Daniel E. Kile (2003) Supple-
ment to the Mineralogical Record, Publication Number One.

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 pe-
trography develop a relationship with microscopy that is one of
continuous fascination. More modern analytical instrumentation
has revolutionized petrology, but the enduring role of optical pe-
trography 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 mi-
crosopes 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 ex-
plain 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 his-
tory 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 admi-
irable 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 inter-
ested 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 mate-
rial 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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