



Sections of Sea Urchin Spines

Lewis Woolnough

After a thoroughly interesting and enjoyable day at the RMS. “Geo-Materials Sample Preparation for Microscopy Workshop” in September. I spent some time examining thin sections of Sea Urchin spines, this led to the production of the photomicrographs and observations that are the subject of this article.

The original spines used were approximately 10mm long and 1mm in diameter and came from English Sea Urchins. Some were white, some yellow and others purple; they are built of calcite, CaCO_3 (MacKenzie and Adams (2003)). A standard procedure for the creation of thin sections was adopted; this involved the use of a diamond saw and thickness reduction by hand, using a sequence of abrasives and was based on a procedure described by the late Ernie Ives (2009). The mountant used is “Practamount”. The sections in this group vary in thickness within

the $25\mu\text{m}$ - $50\mu\text{m}$ range, as measured using a scale engraved on the fine focus adjustment knob of a microscope.

Specimens were examined with a Wild M11 compound microscope, using a 10X (N.A. 0.25) achromatic objective and a Kyowa WFX10 eyepiece. Photomicrographs were taken with a Panasonic DMZ18 compact camera and cropped using



Figure 1: Plain transmitted light, thin section

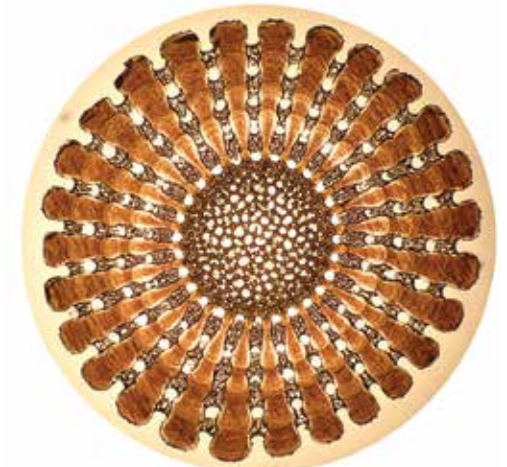


Figure 2: Plain transmitted light, medium section

Photoshop. A note about illumination arrangements accompanies each image.

Numerous approaches to the illumination of specimens are available and it is not difficult to create interesting and pleasing images using quite simple and inexpensive equipment. For those wishing to experiment with the techniques used by the author, two books that give clear introductions to them are listed below. (Bradbury and Evennett (1996) and Oldfield (1994)). An exploration of these techniques can also lead one to a deeper understanding of image formation by microscopes and the requirements for successful photomicrography.

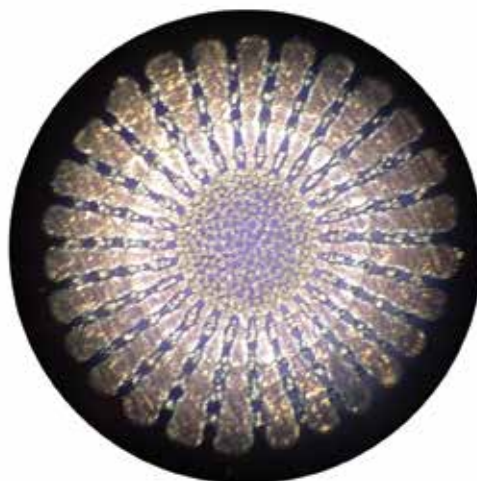


Figure 5: Illumination with crossed polars

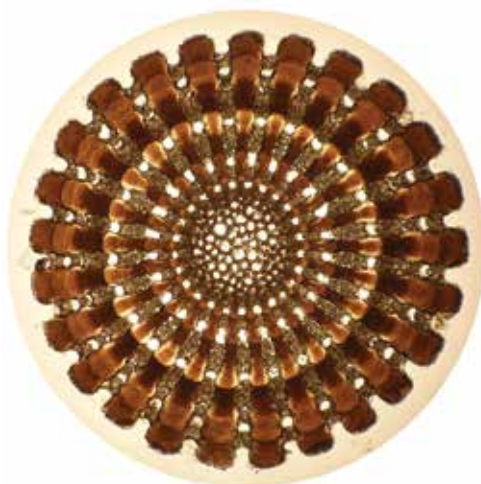


Figure 3: Plain transmitted light, thick section

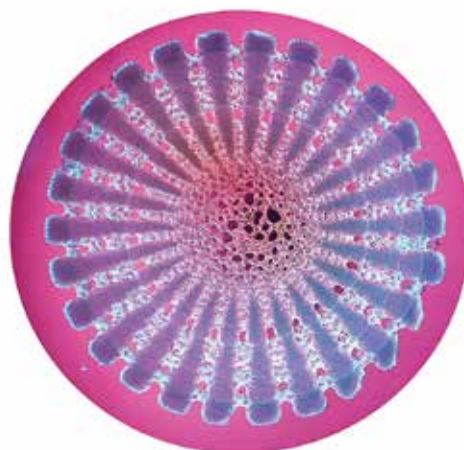


Figure 6: Rheinberg illumination, blue-red

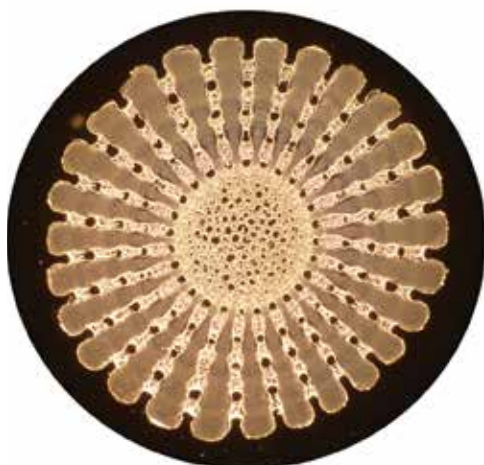


Figure 4: Dark ground illumination



Figure 7: Rheinberg illumination, blue-yellow

References

- Bradbury, S and Evennett, P.J. 1996. *Contrast Techniques in Light Microscopy*. Bios. (RMS Handbook 34)
- Ives, E. 2009. "Mounting", *Balsam Post*, Issue No. 83, 5 - 12. PMS
- Mackenzie, W.S. and Adams, A.E. 2003. *A Colour Atlas of Rocks and Minerals in Thin Section*. 62 - 63 & 110 - 113. Manson
- Oldfield, R. 1994. *Light Microscopy, An Illustrated Guide*. Wolfe



Lewis Woolnough

is a retired headteacher with a long-standing enthusiasm for Microscopy. He has written research papers and numerous articles

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Raymond Coleman, author of *Virtual Microscopy* (December 2012 issue)

