

2012

PITTCON

March 11–15, 2012
Orlando, FL
www.pittcon.org

Histochemistry 2012

March 21–23, 2012
Woods Hole, MA
www.histochemistry2012.org

MRS Spring Meeting

April 1–4, 2012
San Francisco, CA
www.mrs.org/spring2012

Microanalytical Reference Materials

May 15–17, 2012
Golden, CO
www.microbeamanalysis.org

MSC/SMC Annual Meeting

June 5–8, 2012
Halifax, Nova Scotia, Canada
<http://conference2012.msc-smc.org>

Electron Backscatter Diffraction

June 19–21, 2012
Pittsburgh, PA
www.microbeamanalysis.org

Microscopy & Microanalysis 2012

July 29–August 2, 2012
Phoenix, AZ
www.microscopy.org

European Microscopy Congress

September 16–21, 2012
Manchester, UK
www.emc2012.org.uk
Abstract deadline: March 16, 2012

2013

Microscopy & Microanalysis 2013

August 4–8, 2013
Indianapolis, IN
www.microscopy.org

2014

Microscopy & Microanalysis 2014

August 3–7, 2014
Hartford, CT
www.microscopy.org

2015

Microscopy & Microanalysis 2015

August 2–6, 2015
Portland, OR
www.microscopy.org

2016

Microscopy & Microanalysis 2016

July 24–28, 2016
Columbus, OH
www.microscopy.org

More Meetings and Courses

Check the complete calendar near the back of this magazine and in the MSA journal *Microscopy and Microanalysis*.

Microscopy Shows Neanderthals Ate Well

Stephen W. Carmichael

Mayo Clinic, Rochester, MN 55905

carmichael.stephen@mayo.edu

About 40,000 to 30,000 years ago, modern humans out-competed Neanderthals, and the Neanderthals became extinct. Some recent theories have speculated that Neanderthals had an inferior diet (predominately meat) that put them at a disadvantage. Evidence for plant foods is rare at sites occupied by Neanderthals, but this could be due to vagaries of preservation and insufficient attention to plant remains. In an ingenious study, Amanda Henry, Alison Brooks, and Dolores Piperno used microscopy to demonstrate that plants and cooked foods are present in dental calculus (the stuff the dental hygienist scrapes off your teeth) on the teeth of Neanderthals [1].

Henry et al. used brightfield and cross-polarized light microscopy to examine plant microfossils (starch grains and minute mineralized particles formed inside plants called phytoliths) trapped in dental calculus of Neanderthal individuals. The specimens were from known Neanderthal archeological sites in modern-day Iraq and Belgium—north-south extremes of the range of these people. The southern site was inland and mountainous, whereas the northern site was oceanic.

The evidence showed that Neanderthals in both environments included a spectrum of plant foods in their diets, including grass seeds, dates, legumes, plant underground storage organs (such as tubers), and other yet-unidentified plants. Importantly, several of the consumed plants had been cooked (see Figure 1). For example, the overall pattern of damage to the starch grains matches most closely with that caused by heating in the presence of water,

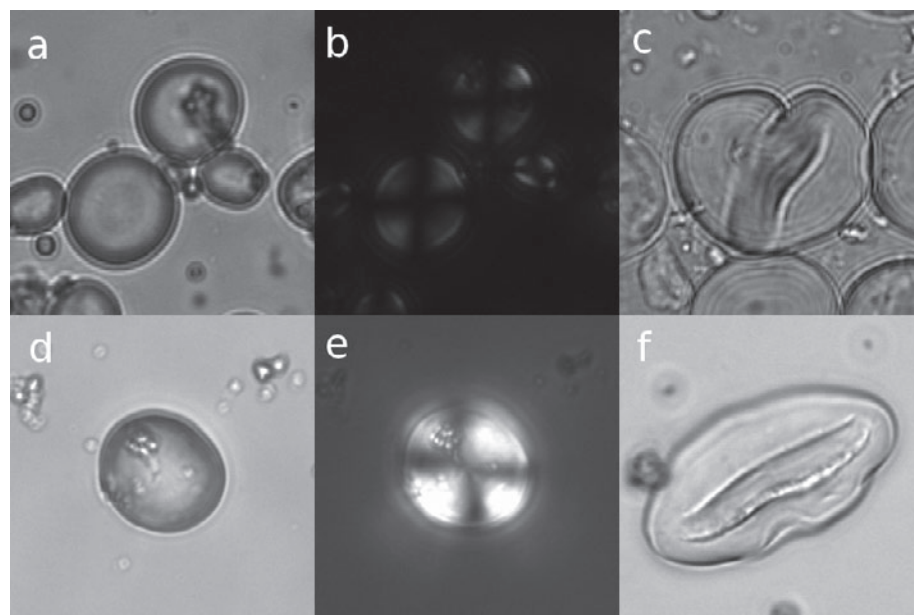
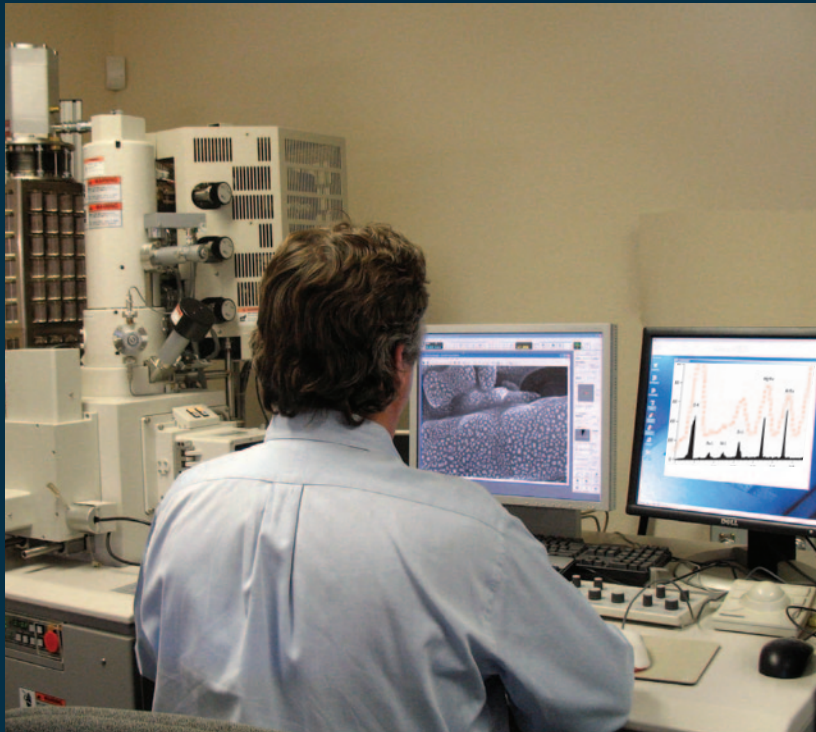


Figure 1: Ancient starches from the teeth of Shanidar III (bottom row) closely match those from *Hordeum bulbosum*, a wild relative of barley (top row). Figures b and e show the extinction cross, a distinctive feature of starch grains under cross-polarized light. The starches in c and f are partially gelatinized from cooking, indicating that Neanderthals cooked their food.

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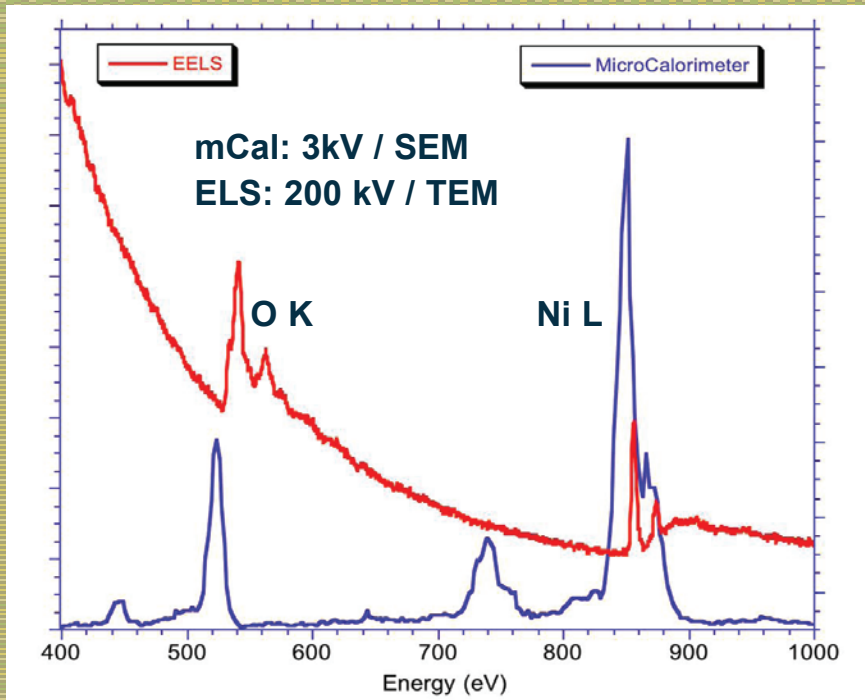
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Spectra Courtesy of Dr. N.J. Zaluzec / ANL EM Center.

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such as during baking or boiling. Also, several of the identified plant foods would have required moderate to high levels of preparation. These lines of evidence indicate that Neanderthals were investing their time and labor in preparing plant foods in ways that increased their edibility and nutritional quality. Overall, the data suggest that Neanderthals were capable of complex food-gathering behaviors that included both hunting of large game animals (established in earlier studies) and the harvesting and processing of plant foods.

The studies of Henry et al. extend the known record of starch consumption into the Middle Paleolithic Age and indicate that starch grain analysis in dental calculus specimens will enable reconstructions of diet in a range of fossil specimens. So do we know how modern humans displaced the Neanderthals? No, but it was not because they didn't have a well-balanced diet.

References

- [1] AG Henry, AS Brooks, and DR Piperno, *Proc Nat Acad Sci* 108 (2011) 486–91.
- [2] The author gratefully acknowledges Drs. Amanda Henry and Dolores Piperno for reviewing this article.

MT




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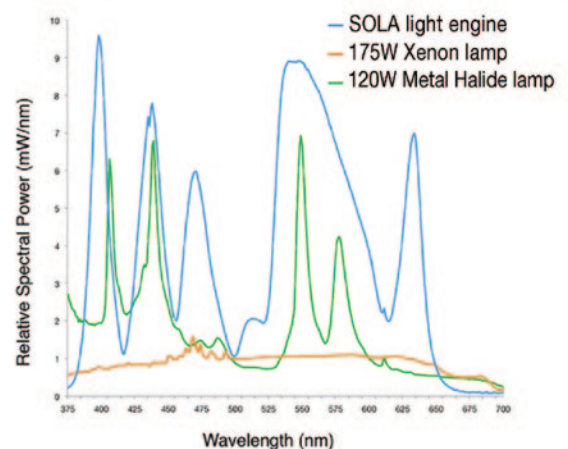
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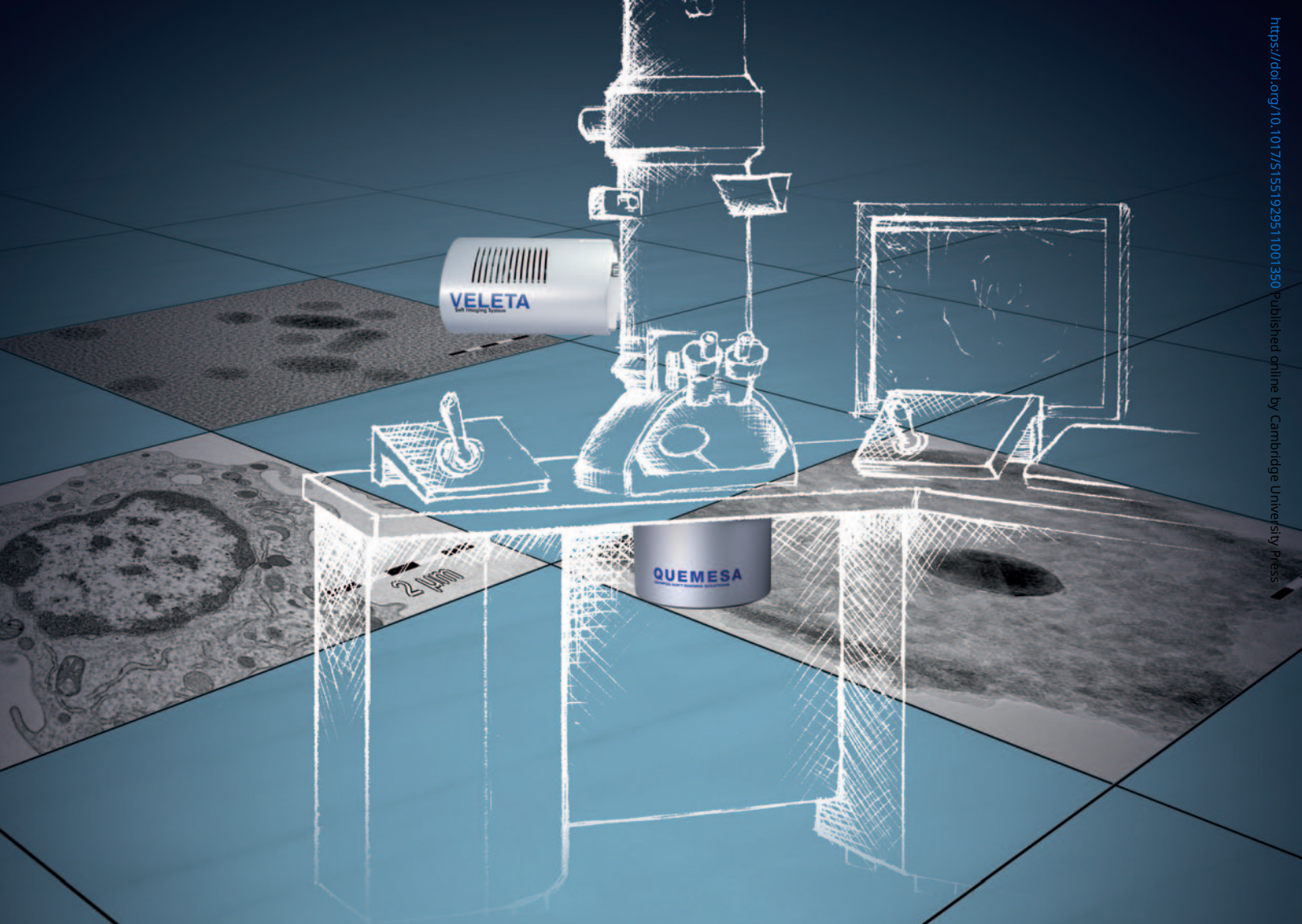
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