

Anthropologist in the Attic

Notes by a socio-cultural anthropologist in areas and topics that appeal to her.

Wednesday, February 2, 2011

Did Vikings navigate by polarized light?

Sunstone' crystals may have helped seafarers to find the Sun on cloudy days.

A Viking legend tells of a glowing 'sunstone' that, when held up to the sky, revealed the position of the Sun even on a cloudy day. It sounds like magic, but scientists measuring the properties of light in the sky say that polarizing crystals – which function in the same way as the mythical sunstone – could have helped ancient sailors to cross the northern Atlantic. A review of their evidence is published today in *Philosophical Transactions of the Royal Society B*¹.

The Vikings, seafarers from Scandinavia who travelled widely and settled in swathes of Northern Europe, the British Isles and the northern Atlantic from around 750 to 1050 AD, were skilled navigators, able to cross thousands of kilometres of open sea between Norway, Iceland and Greenland. Perpetual daylight during the summer sailing season in the far north would have prevented them from using the stars as a guide to their positions, and the magnetic compass had yet to be introduced in Europe – in any case, it would have been of limited use so close to the North Pole.

But Viking legends, including an Icelandic saga centring on the hero Sigurd, hint that these sailors had another navigational aid at their disposal: a sólarsteinn, or sunstone.

The saga describes how, during cloudy, snowy weather, King Olaf consulted Sigurd on the location of the Sun. To check Sigurd's answer, Olaf "grabbed a sunstone, looked at the sky and saw from where the light came, from which he guessed the position of the invisible Sun"². In 1967, Thorkild Ramskou, a Danish archaeologist, suggested that this stone could have been a polarizing crystal such as Icelandic spar, a transparent form of calcite, which is common in Scandinavia².

Light consists of electromagnetic waves that oscillate perpendicular to the direction of the light's travel. When the oscillations all point in the same direction, the light is polarized. A polarizing crystal

Blog Archive

▼ 2011 (36)

▼ February (5)

[The Great Chinese Mariner
Zheng He \[Cheng Ho\]](#)

[Stratford-upon-Avon African
skeleton was Roman sol...](#)

[Stereotyping Beyond the
Grave?](#)

[Did Vikings navigate by
polarized light?](#)

[Stone tools discovered in
Arabia force archaeologi...](#)

► January (31)

► 2010 (351)

► 2009 (145)

► 2008 (5)

Search This Blog

powered by 

Followers

such as calcite allows only light polarized in certain directions to pass through it, and can appear bright or dark depending on how it is oriented with respect to the light.

Centred on the light

Scattering by air molecules in the atmosphere causes sunlight to become polarized, with the line of polarization tangential to circles centred on the Sun. So Ramskou argued that by holding a crystal such as calcite up to the sky and rotating it to check the direction of polarization of the light passing through it, the Vikings could have deduced the position of the Sun, even when it was hidden behind clouds or fog, or was just beneath the horizon.

Historians have debated the possibility ever since, with some arguing that the technique would have been pointless, because it would only work if the crystal was pointed at patches of clear sky, and in such conditions it would be possible to estimate the position of the Sun with the naked eye, for example from the bright lining of cloud tops³.

Gábor Horváth, an optics researcher at Eötvös University in Budapest, and Susanne Åkesson, a migration ecologist from Lund University, Sweden, have been testing these assumptions since 2005. The special issue of Philosophical Transactions of the Royal Society B in which their review appears is dedicated to biological research on polarized light¹.

In one study, the researchers took photographs of partly cloudy or twilight skies in northern Finland through a 180° fisheye lens, and asked test subjects to estimate the position of the Sun⁴. Errors of up to 99° led the researchers to conclude that the Vikings could not have relied on naked-eye guesses of the Sun's position.

To check whether sunstones would work better, in 2005 they measured the polarization pattern of the entire sky under a range of weather conditions during a crossing of the Arctic Ocean on the Swedish icebreaker *Oden*^{5,6}.

Through the clouds

The researchers were surprised to find that in foggy or totally overcast conditions the pattern of light polarization was similar to that of clear skies. The polarization was not as strong, but Åkesson believes that it could still have provided Viking navigators with useful information.

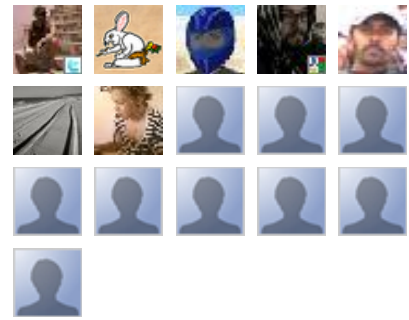
"I tried such a crystal on a rainy overcast day in Sweden," she says.

Follow

with Google Friend Connect



Followers (16)



Already a member? [Sign in](#)

About Me



C'est Moi - Selina

I'm a socio-cultural anthropologist. It's always "on" and there's nothing I can do about it. But thanks to all

those who unwittingly contribute to my on-going research. Without you, I'd be bored.

[View my complete profile](#)

My Blog List



Language Log

[Urination is inhuman](#) - David Moser has sent in another

example for what he calls our

xiaobian 小便 ("lesser

convenience") collection: The

sign says: Xiǎobiàn bùshì rén 小便不是人. A lit...

1 hour ago



Dienekes' Anthropology Blog

[Harappa Ancestry Project](#) - Zack

Ajmal has been doing some great

work on the Harappa Ancestry

Project, including posting some

code and detailed instructions on

how to process various ...

9 hours ago



OPEN ANTHROPOLOGY

[The American Anthropological](#)

[Association and Egypt: It's](#)

[Mostly About the Artifacts?](#) - I

was getting really upset that

"The light pattern varied depending on the orientation of the stone."

She and Horváth are now planning further experiments to determine whether volunteers can accurately work out the Sun's position using crystals in various weather conditions.

Sean McGrail, who studied ancient seafaring at the University of Oxford, UK, before retiring, says that the studies are interesting but there is no real evidence to indicate that the Vikings actually used such crystals. "You can show how they could be used, but that isn't proof," he says. "People were navigating long before this without any instruments."

Surviving written records indicate that Viking and early medieval sailors crossed the north Atlantic using the Sun's position on clear days as a guide, in combination with the positions of coastlines, flight patterns of birds, migration paths of whales and distant clouds over islands, says Christian Keller, a specialist in North Atlantic archaeology at the University of Oslo. "You don't need to be a wizard," he says. "But you do need to combine a lot of different sorts of observations."

Keller says he is "totally open" to the idea that the Vikings also used sunstones, but is waiting for archaeological evidence. "If we find a shipwreck with a crystal on board, then I would be happy," he says.

References:

Marchant, Jo. 2011. "Did Vikings navigate by polarized light?". *Nature*. Posted: January 31, 2011. Available online: <http://www.nature.com/news/2011/110131/full/news.2011.58.html>

Article References

1. Horváth, G. et al. *Phil. Trans. R. Soc. B* 366, 772-782 (2011).
2. Ramskou, T. *Skalk* 2, 16-17 (1967).
3. Roslund, C. & Beckman, C. *Appl. Opt.* 33, 4754-4755 (1994).
4. Barta, A. , Horváth, G. & Meyer-Rochow, V. B. *J. Opt. Soc. Am. A* 22, 1023-1034 (2005).
5. Hegedüs, R. , Åkesson, S. , Wehner, R. & Horváth, G. *Proc. R. Soc. A* 463, 1081-1095 (2007).
6. Hegedüs, R. , Åkesson, S. & Horváth, G. *J. Opt. Soc. Am. A* 24, 2347-2356 (2007).


Posted by C'est Moi - Selina at **8:15 AM**





Labels: [crystals](#), [navigation](#), [polarizing crystals](#), [sunstone](#),


every time I went on a show, all you would see is "Crisis in Cairo," "Unrest in Egypt." And they were totally missing the h...
10 hours ago

Language Hat
DAVID GORDON, POET. - There are a lot of David Gordons out there, and a lot of them have written books; in trying to disentangle the LibraryThing author page I managed to sepa...
13 hours ago

 **Anthropology.net**
Survival International & Uncontacted Amazonian Tribes - Anyone remember 2 years ago, when Survival International released some photos of an uncontacted tribe at the border of Brazil and Peru? Well an update came...
1 day ago

 **the world in words**
At the BBC, fewer languages and less influence - Like millions of others, I grew up with the BBC. Today I work for a BBC co-production. I'm not a BBC employee, but I'm close to this story. And, um, that's...
3 days ago

 **Jabal al-Lughat**
Language use in Tunisian politics - Unless you've been stuck on an iceberg in the Antarctic, you probably know that the Tunisian people have earned themselves imperishable honour, no matter w...
2 weeks ago

 **Glossographia**
Retractions in anthropology - An editorial in the British Medical Journal earlier this week described Andrew Wakefield's controversial 1998 Lancet article linking the MMR vaccine with a...
4 weeks ago

Ethnography.com
Book Review! Rejecting Refugees: Political Asylum in

Viking history, Vikings

0 COMMENTS:

[Post a Comment](#)

LINKS TO THIS POST

[Create a Link](#)

[Newer Post](#)

[Home](#)

[Older Post](#)

Subscribe to: [Post Comments \(Atom\)](#)

the 21st Century - Carol Bohmer and Amy Shuman. *Rejecting Refugees: Political Asylum in the 21st Century*. London: Routledge, 2007. 304pp. \$39.95 (paper), ISBN: 0415773768...
4 weeks ago



Culture Matters

The Nobel Committee and

Chinese values - According to the BBC, the Nobel Peace Prize Committee insisted yesterday – on the eve of Chinese dissident Liu Xiaobo’s award ceremony – that its decision ...

1 month ago



podictionary - for word lovers - dictionary etymology, trivia & history

Away for a While - Sorry Podictionary listeners and readers. I have stepped away from the microphone (and keyboard) for a while. I’ll update the podcast and blog when I have ...

...

4 months ago



Flynn's Inn

Charles Darwin's ecological experiment on Ascension isle -

By Howard Falcon-Lang A lonely island in the middle of the South Atlantic conceals Charles Darwin's best-kept secret. Two hundred years ago, Ascension Island w...

5 months ago



The Botanist Next Door

Ann Coulter in Alberta -

1 year ago



Linguistic Anthropology

SLA Blog - New blog posts relating to linguistic anthropology are available at SLA Blog, the official blog of the Society for Linguistic Anthropology. Also check out the...

1 year ago



In Focus: Reflections on Anthropology News

AAA Debuts New Blog Design - AAA is pleased to announce the

debut of our new, unified association blog, available at <http://blog.aaanet.org>. We have created this blog as a service to
0...
1 year ago

Your Anthropology Library

- Anthropological Linguistics: An Introduction
- Anthropology and Modern Life
- Archaeological Approaches to Cultural Identity
- Before Columbus: Exploration & Colonization from the Mediterranean to the Atlantic, 1229-1492
- Before European Hegemony
- Colonialism and Neocolonialism
- Coming of Age in Samoa
- Corpus of Early Arabic Sources for West African History
- Debating Cultural Hybridity: Multicultural Identities And the Politics of Anti-racism
- Decolonization and the Decolonized
- Doing Fieldwork
- Encyclopedia of Social And Cultural Anthropology
- English and Ethnicity
- Ethnography of Communication: An Introduction
- Ethnography Through Thick and Thin
- Interpretation of Culture
- Maps of the Ancient Sea Kings
- Marxism and the Interpretation of Culture
- Migrations and Cultures: A World View
- Misreading the African Landscape
- No Bone Unturned
- One River
- Pedagogy of the Oppressed
- Popol Vuh
- Prison Notebooks: Selections
- Sociolinguistics: The Essential Readings
- Tape Recorded Interview 2nd Ed.: Manual Field Workers Folklore Oral History
- The Archaeology of Islam in Sub-Saharan Africa
- The Bone Woman
- The Essentials of Anthropology
- The Lost Cities of Africa
- The Serpent and the Rainbow
- Understanding Religious Conversion
- Writing for Academic Journals

