KRS 3D Imaging Project

Lead Investigators

Professor Paul Weiblen
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Why 3D Imaging?

An opportunity to demonstrate a clear Medieval origin of the Kensington Rune Stone (KRS)
The KRS Park in Douglas County, Minnesota
The Ohman Family, circa 1893
The KRS Face Inscription

8 Goths and 22 Norwegians upon this acquisition trip from Vinland far to the west. We had camp by two shelters one day’s travel from this stone. We were fishing one day. After
we came home, found 10 men red from blood and death. Ave Maria.

Save from evil.

The KRS Side Inscription

(There) are 10 men by the inland sea to look after our ships 14 days travel from this island. Year 1362.
State of the KRS

The KRS was badly stained by silicon rubber molding process in the Spring of 2003 while in the custody of a third party, thereby making photo interpretation next to impossible. This black staining was first noted by Patton and Nielsen in Stockholm in October 2003.
The Black Death of the Face
The Past Runes
Figure #23: The dark gray areas adjacent to the white retooling were produced by pieces of rock that flaked off when the original inscription was carved. These flaked surfaces have the same properties as the entire split side, which indicates that they were created at the same time (line 3, character #51).
The Solution
A 3D Imaging Process to Capture the Contours of the KRS

PJAGLSEFARJ: FRO:
GEÑ : WEJ : 2 : SKlAR : EN:
The Side Inscription

Figure #20: The split side of the stone that contains the last three lines of the inscription and the Holand “H”, which was carved by Hjalmar Holand in 1907. The dark gray color and rougher texture of this surface is different from all the other glacial-aged weathered surfaces.
Beecher Side Cast From the 1930s
Stain Removal Project

Lead Investigator Professor Paul Weiblen w/ assistance of Darwin Ohman and Richard Nielsen w/ assistance of The Metropolitan Museum of Art, New York

Professor Weiblen’s comments will follow this presentation.
Solution by 3D Imaging
Features

Remotely Accessible Data Base
With Azimuth and Elevation
Lighting Adjustment for
Surface Indentation Detection
Samples of a Carved Greek Statue Head

Variable light
Current Triangles: 3,971,898
Selected Triangles: 0
X: 135.024 mm
Y: 170.169 mm
Z: 101.700 mm
Bogus Dot in the Foot of R (ﾙ)
The Bogus Dot Was a Pattern Mark
Prof. Henrik Williams

• Holds Chair of Runology and Linguistics at Uppsala University, Sweden.
Hemse G 57
Punched Runic Pattern
What We Might Find

• Indentification of dots and marks hidden by mud, gypsum, and silicon rubber staining. Rejection of spalls, nicks and similar flaws as intended runic markings is also a major benefit.
Incorrect Runic Interpretations

The top Swedish runologist and linguist, Prof. Henrik Williams of Uppsala University, and I agreed in May 2008 that the special dots on the KRS runes ᚩᛉᚫᚴᚼᚩᚽᚽ are remnants left over from the initial punch pattern for these runes.

Hence the assumed dotted runic code GRAL does not exist with the absence of two ᚩ ᚩ dotted runes for GR in GRAL.
The v-rune (ᚩ) is not found in books in Minnesota until after 1900. It was not used in inscriptions after 1500. This would mean of west becomes ov vest (far to the west) with unvoiced f assimilating into the voiced v in vest (west).
Six Candidate Medieval Dotted Rs

The first, Ṝɝ (north), was identified by Nielsen in 2000.

Falke (Götel = Götaland),
Falke (Noramen = northmen),
Va (va = were),
äpt (äpti = after),
*här (här = is),
ah (ah = ar härrä = Year of the Lord = anno domini).
A Palatal R in WaR (were) Identified by Nielsen (2004), But Punch Mark Is Unsure.
Cast Impression of the Silicon Rubber Mold for the Palatal Word “Were” ὩXHR

The dot in Ὡ?

Wahlgren 1958
Using Eth (Þ identified as þ)

• If the following words have dots or stokes in the runic þ for Þ that would lead, if clearly present, to medieval rune forms with eth (dh). These forms were not seen in books on runes in the 19th century. One example is the Rosander book of 1882 owned by Olaf Ohman.

• Fardh (journey), Vinlandh, hadhe (had), wedh (by), dhags (days), dhagh (day), blodh (blood), dhedh (death).
Edh (with a stoke in ⱨ =₽ for ⱨ)

* торрент = hadhe (had)
Ambiguous Results Using $b = d$

With a initial, medial or final $d$:

- $far_b = fard = färd$ (journey),
- $winlan_b = Vinland$ (Vinland),
- $ha_b = hade$ (had),
- $we_b = wed = vid$ (by),
- $bags = dags$ (day’s),
- $bagh = dagh = dag$ (day),
- $blo_b = blod$ (blood),
- $be_b = ded = död$ (death)

could be either medieval or modern forms, hence ambiguous for determining age of the KRS.
The KRS p-Rune (Ƿ)

The KRS p-Rune (Ƿ) is medieval and not known in books in Minnesota by 1900. Its variations (Ƿ Ƿ Ƿ Ƿ) may also be found on the KRS in the 3-D imaging study.
Candidate Dotted p-Runes ᚦᚦᚦعكس؟
Old Swedish Language and Scandinavian Runic Collaborators

Prof. Henrik Williams
Prof. Michael Barnes
Atlantic Connection

Runic Studies Across the Atlantic with Uppsala University and University College London

![Map showing the connection between Atlantic regions with runestones highlighted.](image-url)
Henrik Williams at the Mora Stone near Uppsala
Runologist Prof. Michael Barnes,
University College, London
KRS Language Confirmations

Spelling Related:
1250  **norþrby > norrby** with “rr”.
1324  **og** (and).
1326  **norþrgarþum > norrgardhe**
1344  **fraa** (from) with long a.
1353  **dhag** (day) with eth (dh).
1357  Initial h-insert in **heuru** (are).
1359  **oprise** (uprising) with an “i” as **rise**
1363  **weder** (by) with an “e”.
1364  **haddhæ** (had) with dropped “f.”
1364  **ogh** (and), as **og**.
1372  **ffræælsth** as in **fræelsæ** (save).
1388  **pa** (on). **Paa** used by 1349 (in Scandia, then part of Sweden).
1380  post vocalic “h” insert: as **øh** (island) and **ahr** (year).
1390  **ded** (death) with a root vowel “e”.
1407  **dhødhæ** (died) with eth (dh).
1520  **risor** (times) with an “i”.

Grammar Related
1358  Five singular verbs in plural function.
1362  **winland**, **sten** (stone), **blodh** (blood), and **ded** (death) can be endingless.
1362  **wi** (we) directly before the verb
1364  **mæns** (men’s); as **mans**.
1364  Two singular verbs in plural function.
1369  **waar[r]a** (our) in neuter accusative plural. **wore** Denmark (1371), Dalsland (1388).
1369  **widh landit** (by the land), accusative as **we havet** (by the inland sea).
1388  **wi haftæ** (we had).
1372  Diploma in style of the KRS.

Vocabulary Related
1363  **reso** in usual meaning of **færd** (journey).

[Type a quote from the document or the summary of an interesting point. You can position the text box anywhere in the document. Use the Text Box Tools tab to change the formatting of the pull quote text box.]
Language Confirmations

• 1358 Five verbs in plural function
• 1362 *we* directly before the verb
• 1362 Endingless dative.
• 1364 Two singular verbs in plural function
KRS words seemingly not found in 19th Century Swedish dialects.

ahr (year) with h-insert.
dagh (day) with h-ending.
deno (this) with o-ending.
ded (death) with e-root vowel.
fard (journey) with a-root vowel.
fräelse (save); double vowels.
hör (is) with aspirated initial “h”.
mans (of men) with a-root vowel.
rise (journey) with i-root vowel.
vest (west) with e-root vowel.
äptir (after) with “p”.
øh (island) with post h-insert.
KRS Vocabulary Not Yet Found in 19th Century Swedish Dialects

from (from)
of (extremely)
ok fiske (fishing) with “ok”.
optagelse (acquisition)
skelar (??)
Imaging Study Status

RSM Board Approval Obtained in July 08
Cost Identified
Imaging to be one day in the week of 13 October 08
Contract and fundraising pending
The past and present n-rune (†). Both photos are found in the Geological Report submitted for review in Sweden in October 2003, but neglected is a mention of any such staining in the report.

Runo Löfvendahl (2004) reported that he was told that the RSM was responsible for the staining.
The Silicon Rubber Mold Stained r-Rune
The First Six Lines of the Darkened, Spotted Runes

[Image of a stone slab with runes]