Could the KRS Rune-Row Be Older Than the Larsson Rune-Row Documents in Light of Recent 3D-Imaging Results?
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By Dr. Richard Nielsen
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Contents
1. Introduction
2. The Larsson Rune Rows with Their Pentadic Numbers and Kensington Rune Stone Deviations of Note.
3. Applicable 3D Imaging Results for Single Dotted ã-Runes (X) and the ð-Rune (Ø) with Macron.
4. The Present Purported Dotted Runes on the KRS: the Í-Rune (Í) and Ñ-Rune (Ñ).
5. Summary and Recommendations.
6. References.
A. Post Script One on the Dotted þ-Rune (Ƿ) in Scandinavia and KRS Dotted r-Rune (R) in norr (north).
B. Post Script Two on the “Proposal for a Laser (White Light) Imaging Study of the KRS.”

Tables
Table 1a. Table 1a. Identification of open runic investigations.
Table 1b. The Translation of the KRS with New Linguistic Discoveries Since 2003.
Table 2. The Three Emil Larsson Rune-Rows and Their Pentadic Number Sequence.
Table 3. A Comparison of the Täby Church Inscription in Painted Runes from 1758, the Larsson Document from 1883 and the KRS Rune-Row.
Table 4. Questions on the Origin of Runes on the KRS that Are Not Found in the Emil Larsson Rune-Row of 1883.
Table 5. A Swedish Grave Slab from 1335 Carved with a Latin A with a Hook for Old Swedish Å (ä).
Table 6. An Arabic date of 1414 on a Grave Slab Carved in Latin for a German Knight Buried in the Cistercian Cloister at Alvastra.
Table 7. The Pentadic Forms on the KRS, the Emil Larsson Document of 1883, and Elsewhere.

Figures
Figure 00. The Emil Larsson Rune-Row Manuscript from 1883.
Figures 1. The KRS äptir (after) on the 11th Line Apparently Has a Single Dotted X-Rune (X) for the ã-Rune.
Figures 2. The KRS här (are) on the 10th Line Apparently Has a Single Dotted X-Rune (X) for the ã-Rune.
Figures 3. The KRS äptir (after) on the 6th Line of the KRS Apparently Has a Single Dotted X-Rune (X) for the ã-Rune.
Figures 4. The Purported Debris Filled Hook in äptir (after) on the 6th Line of the KRS.
Figures 5. Does the KRS läger (camp) on the 4th Line of the KRS Have a Single Dotted X-Rune (X) for the ã-Rune?
Figures 6. Does the KRS fræelse (save) on the 9th Line of the KRS Have a Single Dotted X-Rune (X) for the ã-Rune?
Figures 7. The KRS ð (peninsula, island) on the 12th Line Apparently Contains a Macron.
Figures 8a. A Suggested Punch in the KRS el-Bind-Rune (Ƿ, Ð) on the 3rd Line of the KRS for Vineland (land of vines).
Figure 8b. An Alternate Possibility for the Suggested I-Rune (either Ð for Ð) on the 3rd Line of the KRS.
Figure 8c. The Åkerby Font in Bornholm, Denmark with a Dotted I-rune (Ƿ).
Figures 10. The Suggested Dotted f-Rune (Ƿ) on the 3rd Line of the KRS in of (far, extreme).

Post Script One
Figure 11. The Norwegian Skjeberg Church I and II Inscriptions with the Rare Single Dotted þ-Rune (Ƿ).
Figure 12. Rejection of the Purported Dotted r-rune (R) in norr (north) on the 5th Line.

Post Script Two
The 2008 Proposal for 3D Imaging of the Kensington Rune Stone.

Note: This article will be used as part of a comprehensive presentation planned for an academically accredited journal and may be subject to future revision. Because of the current high interest in 3D imaging it is appropriate that these technical results are published and posted at this time. Abbreviations used are (RSM) Runestone Museum, (RN) Dr. Richard Nielsen, (MHS) Minnesota Historical Society, (KRS) Kensington Rune Stone, (DJ) David Johnson, (HW) Prof. Henrik Williams, (ESOP) Epigraphic Society Occasional Papers, DS (Diploma Swedish = Old Swedish letters) and AARS (American Association of Runic Studies).
Acknowledgement: David O. N. Johnson (DJ), who recently became a Board member of American Association of Runic Studies (AARS) has given me some pointers on how best to present some of the history concerning the issues surround the use of 3D imaging discussed in the introduction. DJ is a well known Lawyer in Minnesota and a graduate of Hamline University School of Law following his Master of Arts in Biology and Geology from Bimidji State in Minnesota. We are also both the U of M with David at Minnesota (Morris) and I at Michigan (Ann Arbor).

As myself he is a grandson of Scandinavian immigrants, his from Norway and mine from Denmark. He studied law one summer in Norway and I studied advanced engineering in Denmark. We both learned the native tongues of our grandparents and that these language skills are an absolute requirement for any serious investigator undertaking to understand matters concerning the KRS. We both agree with Prof. Paul Weiblen (2008) and Dr. Lövendahl (2004 and 2005) that the measurement instruments used in modern geology are not keen enough to determine the age of weathering on the KRS.

1. Introduction
Discovery of the two Larsson Rune Row documents compiled by the Larsson brothers has raised questions that are addressed by this article. The first document, prepared by Emil Larsson in 1883 and featured in Table 00, was subsequently followed by the second document, compiled by his younger brother Edmund Larsson and is dated 1885. Both of these documents first surfaced in Sweden in the year 2004, ironically, the same year the KRS was being shown in Sweden. The Larsson documents have piqued the interest of researchers and were recently re-examined and reported by Williams (2011b).

The stark specter of the Larsson Rune Rows has led many to believe that their discovery represented the death knell of the Kensington Runestone (KRS) as a medieval artifact. However, the inscription on KRS depicts runes and practices that are viable candidates for ascription to medieval times if knowledge of these was not readily present in Minnesota in 1898. If these runes and practices are not found in any books or literature present in Minnesota prior to 1898 they could be used to establish the provenance of the KRS in one manner or another, regardless of what century it was carved.

Prof. Henrik Williams and RN have collaborated on the multifaceted questions raised by the Larsson Rune Rows especially concerning the KRS, since the papers first surfaced in 2004. Much of the information, data and facts related in this article have been subject to discussion between Prof. Williams and RN. On September 30, 2011, Prof. Williams and RN had planned to inspect the KRS with emphasis on the candidate dotted runes. Prof. Williams had to proceed without the help of RN due to a change by the RSM in the previously agreed procedure with Prof. Williams. The inspection was to include the f-runes, l-runes, r-runes, þ-runes, p-runes, ô-runes, and ä-runes for presence of dots or punches. All of the r-runes and þ-runes have now been eliminated from further consideration by direct inspection and examination, including re-evaluation of 3-D imaging results. The data and results for the 3-D imaging study concerning the ô-runes, and ä-runes has been reported by Frankki (2009: 87-88) and Nielsen (2009b:128-134 and as revised in 2010c).

Only two runes, the f-rune (₽) in of (far) and the purported l-runes (₽, F) in Vineland (Vinland) remain in my view as viable candidates for an unambiguous attribution of medieval provenance regarding the KRS. Proof of this validity requires further historical investigation as to what materials and information was known in Minnesota prior to 1898, the year of the KRS discovery. A prime example is the Danish Pavilion at the Chicago World’s Fair in 1893, at which time there was most likely distributed a book on runes authored by Danish Professor Ludvig Wimmer (1874), where both the dotted f-rune (₽) for “w” and the
dotted þ-rune (Þ) for “ð” are noted on page 210. The question is then whether the Swedish and Norwegian Pavilions also distributed and/or sold books or other documents on runic inscriptions at the Chicago World Fair of 1893.

Based on our current level of knowledge, the University of Uppsala can best provide information on what was known in the books and other literature concerning Scandinavian runes, but good runic records are also found in Norway and Denmark, and some American Universities concerning Swedish medieval runes. In this respect, I am very fortunate to have worked with Prof. Henrik Williams of Uppsala University over the past nine years concerning North American runiforms, such as the Spirit Pond Runestones of Maine described in Nielsen (2009c), the Heavener Runestone of Oklahoma and the Kensington Rune Stone of Minnesota. A link to Prof. Williams’ Uppsala website is given in the reference section. It is my hope that we could help to unlock some of the mystery of the KRS enigma in advance of our September 2012 lecture tour in Minnesota. However, a final solution will require a re-inspection of the KRS by Prof. Henrik Williams together with both Dr. Helmer Gustavson and RN, in a neutral facility. Gustavson (1985) has identified most of the myriad of post-Reformational runes found after 1500 in Sweden and his work is quite pertinent to the discussion of Larsson Rune-Rows in relation to the KRS runes. RN’s work on 3D imaging complements their runological expertise. This week-long tour will be devoted to a series of lectures that detail any new finds that recent research has uncovered.

In July 2008, RN made a presentation at the Minnesota Geological Survey in St. Paul, Minnesota to a group of interested parties including Jim Adam, RSM Board member, Darwin Ohman, Prof. Paul Weiblen, Mark Kinders, and Loraine Jensen. The latter three and RN were at this time, recognized consultants concerning the Kensington Rune Stone by the Runestone Museum. The presentation was designed with the purpose of providing valuable insight into the promising new technology of 3-D imaging. The primary objective was to establish the exact rune forms contained on the KRS. Specifically, a particular goal was to analyze and determine if the Grail Code theory (GRAL) and the purported dotted r-rune located on line six (6) of the KRS, would survive scrutiny under the 3-D imaging examination. In addition, another goal was to examine and check all potential dotted runes that indicated medieval origin of the KRS. All the þ-runes (Þ), f-runes (Þ), l-runes (Þ), p-runes (Þ), and r-runes (R) were examined by 3-D imaging. The data and examination evidence were then to be analyzed to determine their viability as medieval indicators. See Nielsen (2008) for details on these objects of examination. As it has finally turned out, the only runes with a viable medieval connection, insofar as could be ascertained with having intended punches using 3-D Imaging were the five double dotted runes for rendering of ã (Â) seen in (Frankki 2009: 87-88), plus the three ò-runes (Ô, Î), the dotted l-rune (Þ, Þ); and a dotted f-rune (Þ). These 10 runes still remain objects of further investigation for determining their provenance.

The Grail Code (GRAL) was disqualified on the KRS because the code sequence detected by 3-D imaging was GTER – rather than GL. The so-called dotted r-rune was disqualified in light of the depression being too shallow (circa 0.25 mm in depth). In addition, adjacent pock marks in excess of 0.35 mm lent further credence to disqualification. Based on the imaging data, both the Grail Code and the dotted r-runes were disqualified as viable proof of a medieval origin for the KRS by Nielsen (2009b:128-133 & its revision in 2010c). This evidence, although based on sound scientific principle, was not met with total acceptance by everyone interested in the KRS. In some circles, the results of the 3-D Imaging led to efforts by others to
decide what alternative research they wished to proffer as “proper” evidence. In an effort to allay any concerns of the interested parties, a document referred to as my “Answers to the RSM Information Committee” was provided (Nielsen 2010d). Despite my role of being recognized as the Chief Scientific Consultant to the RSM in the period from February 2008 to April 2011, it became readily apparent that other interested parties were unwilling to accept the hard data and evidence ascertained during the 3-D imaging project. RN’s disqualification of both the dotted r-rune and the Grail Code, through uncontroverted evidence, led to a number of consequences including the removal of RN’s ESOP papers, Nielsen (2009a, 2009b, 2009c & 2009d), from consideration by the RSM Information Committee. This was done in spite of the fact that these papers had been accomplished in collaboration with Prof. Henrik Williams of Uppsala University with the prior knowledge and encouragement of the RSM. The hard evidence is what it purports to be, the decision of the other parties to proceed without having competent knowledgeable advisors with solid evidence is contra-indicated by those striving for proper academic endorsement of a provenance for the KRS no matter what century it was carved.

Unwilling to accept evidence proffered by Nielsen (2009b & 2010), which indicates that the dotted r-rune (R) located on Line 6 of the KRS is not man-made (too shallow, being less than 300 microns) and is therefore not a viable indication of medieval origin, an alternative method was authorized by the RSM utilizing a microscopic examination. This method was claimed to be the most accurate indicator for measurement of depth, but in fact it is not more accurate than 3D imaging as demonstrated in Nielsen (2011). Wolter (2011) who conducted the examination offered an opinion that the evidence generated by his testing indicated that the punch was man-made. The claim is apparently based on an unidentified, undated photograph of unknown provenance, but seemingly taken before the KRS was stained in the spring of 2003 described in Nielsen 2010a. The proffered photo only depicted an elliptical small hole (less than a half a mm) and without the detail for this mark clearly presented as in Nielsen (2010c, 2010d & 2010e). The hole could result from either the extraction of a rock fragment or quartz mineral remnant—their sizes range from 0.5 to 1.0 mm (Weiblen 2001: Figure 5). There is a dearth of proof that this pictured hole emanates from a punch or that the photographic illustration of a hole has not been altered in some respect. Wolter did not discuss the contrary results as would be expected in a proper scientific inquiry concerning the dotted r-rune evidence that was presented to the RSM Information Committee by Nielsen (2010c) in September 2010. Wolter was present when RN reported these results at the technical lecture at Alexandria Technical College on September 30, 2010, documented in the power-point presented in Nielsen (2010e). Omissions of this magnitude, are in serious conflict with the Scientific Method. The omissions make this proffered microscopic evidence for a medieval attribution for the dotted r-rune fatally ambiguous. As a consequence, the microscopic study by Wolter has no support for a claim that this purported r-rune (R) on line 6 of the KRS is man-made during medieval times. Subsequently, both Williams (2011a & 2011c) and Nielsen (2011) have discussed the disqualification of the three purported dotted r-runes, the r-rune (R) in var (were) on the 6th lines, the r-rune (R) in norr (north) on the 5th line and the assumed lost r-rune (R) in normen (Northmen) on the first line. The same disqualification applies to the purported dotted þ-rune (Þ) in þep (death) on the 8th line. The r-rune in var (were) and the þ-rune in þep (death) have marks that are simply too shallow to indicate an intentional punch and in fact are less deep than the myriad of damage marks on the KRS near this very rune.
Table 1a. Identification of open runic investigations. New dotted runes in need of runological inspection. Figs. 8-10. Eight double dotted runes needing runological viewing. Lines 1, 4, 6, 7, 9, 10-12; Figures 1-7. Four possible abbreviations of final runes on lines 6, 7 & 10.

1. 8 Göter ok 22 norrmen paa
2. (ten)o optagelsefard fraa
3. vingeland ov vest, vi
4. hade läger ved 2 skelar en
5. dags rise norr fraa theno sten.
6. Vi waro o fiske en dagh. Äptir
7. vi komo hem fano 10 man röde
8. af blod og þeþ. AVM
9. fraelse af illu.
10. Här 10 mans ve havet at se
11. äptir vaare skip 14 dagh rise
12. fraam theno öh. Ahr 1362.

1. 8 Götalanders and 22 Northmen upon
2. (this) acquisition journey from
3. **Vinland** far to the west, we
4. **had** camp by two shelters (?) one
5. day’s journey north from **this stone**
6. We were **fishing** one day. After
7. we came home [found 10 man red from **blood and death** Ave Maria;]
8. **Save from evil.**
9. [There] are---10 men by the inland sea to look
10. after our ships --- a 14 days journey.
11. **Note: From** (from) presently under runological and linguistical study by Prof. Henrik Williams.

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<th>No</th>
<th>Note</th>
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<tr>
<td>1.</td>
<td><em>Norbrmen</em> &gt; <strong>norrmen</strong> (Northmen). <em>Paa</em> (upon) is found by the 1349 in Skåne.</td>
</tr>
<tr>
<td>2.</td>
<td><em>Optagelse</em> (acquisition) in lieu of <strong>opdagelse</strong> (discovery). <em>Fraa</em> (from) is found in Old Swedish diplomas as early as the 1350s.</td>
</tr>
<tr>
<td>3.</td>
<td>No dative i-ending in <strong>Vinlandi</strong> (Vinland) is ok for 1362. The dotted I-rune (𝗏, 🇨) for el or ll? <em>Ov</em> (far) with dotted f (𝗋) for “v”, of (far).</td>
</tr>
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<td>4.</td>
<td><strong>Hade</strong> (had) may be a unit singular. <em>Hafde &gt; haddhæ</em> in 1363 diploma.</td>
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<td>5.</td>
<td><strong>Rise</strong> (Journey). No i-ending in <strong>peno steni</strong> (this stone) is acceptable for 1362.</td>
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<td>6.</td>
<td>Plural <strong>varo</strong> (were) might be abbreviated to singular var.</td>
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<tr>
<td>7.</td>
<td><strong>komo</strong> (were) may be abbreviated to sing. <em>kom</em> as also <em>fanno</em> (found) &gt; <em>fan</em>.</td>
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<tr>
<td>8.</td>
<td><strong>Ded</strong> (death) for former “dead.” No dative i-ending in <strong>blodi</strong> (blood) and <strong>dedi</strong> (death) is acceptable in 1362. The <em>og</em> for <strong>ok</strong> (and) is found in a 1363 diploma.</td>
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<td>9.</td>
<td><strong>Här</strong> (are) for <strong>har</strong> (have). <strong>Havet</strong> (sea) is an “inland sea 10 Mans (10 men) is ok.</td>
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<td>10.</td>
<td><strong>Vore</strong> (our) has the new e-ending and <strong>skip</strong> (ships) is accusative neuter plural and both are acceptable for 1362. <strong>Rise</strong> (journey).</td>
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<td>11.</td>
<td><strong>Theno öh</strong> (this peninsula/island) is ok for 1362. <strong>Year.</strong></td>
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**Table 1b. The Translation of the KRS with New Linguistic Discoveries Since 2003.** Since 2002 HW and RN have continued to revise the translation of the KRS with the some 20 forms highlighted in **Yellow** for vocabulary and **Purple** for grammar. See Williams and Nielsen (2003) for an earlier report regarding **optagelse** (acquisition), **här** (are), **öh** (peninsula) and **ahr** (year). **Pink** denotes a runological investigation is required.
Candidate Medieval Runes found by 3-D imaging since 2008

- A possible dotted l-rune (ᚠ, ᚠ) for either speech (long l =ll) or the bind-rune “el” in either Vinland (Vinland) or Vineland (Land of vines).

- A possible dotted f-rune (ᚠr) for “v” used in late medieval times in ov (far, extreme). This remains a Norwegian word for “extraordinary,” such as ovdyr (very expensive) but it did not make it to Swedish, except perhaps in oväder (storm = ov väder > oväder (extreme weather, extreme wind).

- Use of a purported single dotted æ-rune (ᚠ) for the Larsson Æ–rune (ᚠ) in lâger (camp), äptir (after) twice, fræelse (save) and hâr (are). These five runes and the purported dotted l-rune (ᚠ) in Vineland (land of vines) and dotted f-rune (ᚠr) in of > ov (far, extreme) in absolutely require another runological inspection by Prof. Henrik Williams to establish its provenance.

- Purported use of a macron (horizontal bar) for the umlaut indicator on the ö-rune (᛬) on the KRS side inscription in öh (peninsula, island). This would require a runological inspection by Prof. Henrik Williams to establish its provenance.

These candidate runes are now being examined against the runic records in Sweden by Prof. Henrik Williams and RN. If it turns out that some of these candidate runes had no printed record easily available in 1898 in Minnesota, a strong case for a medieval provenance for the KRS might be made. The bar must be set high for a proof of medieval provenance for the KRS. The evidence must be absolutely unambiguous and this may be quite difficult to achieve.

The o-rune (ᚠ) is used for both “o” and “aa” on the KRS: Words with expected “aa” are: paa (on), fraa (from) twice, and fraam (from). On the other hand in the 19th century in Sweden “o” was often used in the dialects for “å = aa”. Frå(å) (from) is found in Swedish Dictionaries as late as the 1880s.
The first rune-row is described as a complete alphabet with its origin by Odin, the Norse god. The second caption states that for some unknown reason the first alphabet was changed to a different appearance as seen in the middle rune-row. The caption to the third alphabet, the Box Code, states that these letters, the first in the World, were secret letters used to record the laws. The pentadic number series is referred to as “Old Ciphers”.

Figure 00. The Emil Larsson Rune-Row Manuscript from 1883. The gist of the writing is:
2. The Larsson Rune Rows and their Pentadic Numbers and Kensington Rune Stone Deviations of Note.

Table 2. The Three Emil Larsson Rune-Rows and the Their Pentadic Number Sequence. Row 1 is a rune-row applicable to circa 1500. Row 2 is a rune-row that contains special runes quite similar to the special runes on the KRS. Row 3 is a box rune-row used in Dalecarlia in Sweden in the latter quarter of the 19th century, but incorrectly identified as secret runes used to write the early laws. The box code was in common use on carts and store windows and had no correspondence to the Masonic codes that arose in the mid 1750s. The use of “w” from New Swedish rather than the “v” of Swedish might help in dating Larsson 3. King (2001: 349, Fig. E17) shows this box code from circa 1500 without the letters w, å, ä, and ö that have been added to the Larsson Box Code above.

Fig. E.17 Square alphabetical symbols in a 15th-century German manuscript. (From MS Munich BSB lat. (= Clm.) 16226, fol. 275r, courtesy of the Bayerische Staatsbibliothek.)
Table 3. A Comparison of the Täby Church Inscription in Painted Runes from 1758, the Larsson Document from 1883 and the KRS Rune-Row. The pending candidate dotted runes are two, \( \text{t} \) and either \( \text{f} \) or \( \text{f} \). The purported dotted r-rune in \text{war} (were) on the 6th line and dotted \( \text{þ} \)-rune (\( \text{þ} \)) in \text{þep} (death) on the 8th line claimed in Wolter (2011) are disqualified as intended punches since they are shallower than surrounding damage by impact to the surface of the KRS and no proof of a man-made punch was established. See also Williams (2011a, 2011c) for a discussion on the rejection of these dotted r-rune and \( \text{þ} \)-runes during his re-examination of the KRS on September 30, 2010. His earlier examination of the KRS was at the Swedish Historical Museum in Stockholm in late October 2003 accompanied by Prof. James Knirk from the University of Oslo, Dr. Helmer Gustavson from the Swedish Heritage Board and RN.

Inscription in Täby Church near Stockholm (seen by RN in October 2003). Yellow highlights are runes also used on the Larsson rune-row I alphabet. The letters for \( \text{c} \), \( \text{p} \), \( \text{g} \) and the date are rendered with Latin letters and are uncolored. Note the h-insert in \text{ãhr} (is), a New Swedish trait, and the un-dotted and double dotted x-rune for a (\( \text{X} \)) and \( \text{ā} \) (\( \text{X} \)). Note the KRS rendering of this word by \text{hãr} (is) on the 10th line of the KRS. \text{Hæru} (are) in plural is found in the Old Swedish diplomas three times: In DS 5792 (1357), DS 5881 (1358), and X136 (1372).

On the other hand this \( \text{Xþr} \) (is) painted on the Täby Church inscription is similar to \text{ahr} (year) on the KRS, since both have a parasitic h-insert. The rendering of \text{ahr} (year) is on also on the Spirit Pond inscription but it is believed to be copied from books on the KRS (Nielsen 2009c: Table 3).

This pulpit stand is painted in 1758 by Samuel Cronberg.

The Täby Church inscription was furnished to RN by courtesy of Dr. Runo Löfvendahl of the Swedish Heritage Society Board in January 2004.
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<td>t</td>
<td>x</td>
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<td>X</td>
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<td>f?, f? f</td>
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Possible available books that could be used for runes in Minnesota in 1898: Bureus (1611), Worm (1643), Liljegren (1832 and 1834), Stephens (1866-67) and Wimmer (1874), Thorsen (1877). Wimmer (1873) was most likely available for sale at the Chicago World Fair in 1893.

The crossed f is mistakenly used for the Golden Year-rune (f) in Larsson I. On the KRS is seems to have a dual role as an el-bind-rune in skelar (shelters?) and the Golden Year marker (f) for 1362.

Table 4. Questions on the Origin of Runes on the KRS that Are Not in the Emil Larsson Rune-Row of 1883. Did the possible models for these runes appear in books by 1898 is the question?
Table 5. A Swedish Grave Slab from 1335 Carved with a Latin A with a Hook for Old Swedish Ä. The Hooked a (ᴬ) in Latin orthography for the Old Swedish vowel “ä” that was not originally part of the Latin Alphabet (Gardell 1937: #175). This sign was induced into the Latin alphabet for Scandinavian usage by the Church as early as 1200 to cover this special vowel sound for ä to be used in place names and names.

Table 6. An Arabic date of 1414 on a Grave Slab Carved in Latin for a German Knight Buried in the Cistercian Cloister at Alvastra. Gardell 1937: #360, 357-8). This is the earliest extant Arabic date present in Sweden, the previous being from 1480 (Gardell 1937).
### Table 7. The Pentadic Forms on the KRS, the Emil Larsson Document of 1883, and Elsewhere.

The Larsson, the Danish Calendar of 1530, and the KRS have the horizontal bars in numbers 1-4 at the top of the staff (two blocked like a flag on a staff). All other extant pentadic numbers for 1-4 have the horizontal bars centered on the staff.

Quoting Williams and Nielsen (2003), “In the 1820s Nils Henrik Sjöborg published *Samlinger for Nordens fornälskare* [Collections for Scandinavian “Antiquarian Enthusiasts,”] which had a wide circulation. It includes a tabulation of runic numerals! It has been taken from a pocket calendar from 1601. Even people in the 1800s therefore could have been familiar with the pentadic system from this book, notwithstanding that the Kensington Stone 10 is not found with Sjöborg.”

“*Runstaven Linnés Hammarby*” by Barbro Håkursen (2004). This speaks of the runic staff from the 1790s found at Linné’s home at Hammarby near Uppsala. See Nielsen and Wolter (2006: 92).

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3. Applicable 3D Imaging Results for Single Dotted ä-Runes (X) and the ö-Rune (Ö) with Macron

The 3D imaging studies use the data base developed with Accurex in October 2008. The database is operated under two agreements between the RSM and RN arrived at in September 2008 and September 2009. RN’s sole obligation to the RSM is to furnish them the 3D images he chooses to publish. RN/RSM both enjoy joint copyright on these images. The RSM does not have any rights to the Accurex data base and RN has always been in full compliance with the mutual agreements regarding the images produced from the database.

Figures 1. The KRS äptir (after) on the 11th Line Apparently Has a Single Dotted X-Rune (X) for the ä-Rune. The hook groove is over 1.5 mm deep. Single and double dotted ä-runes (å, å, & ö) were used in the Swedish provenance of Dalecarlia in the 17th Century. A hooked ä-rune (寰) was used as well. This data would help to date the hooked a-rune (X) on the KRS. The Dalecarlian runes were first recorded in 1599 on wooden objects and perhaps their initial carvings took place centuries earlier. See Bureus (1611), Nielsen (2010b) and Gustavson (1985).
Figures 2. The KRS här (are) on the 10th Line Apparently Has a Single Dotted X-Rune (X) for the ä-Rune. The guide punches at the end of the hook are too shallow most likely due to hard spot, which also did not permit the hook to reach the guide punch, so this rune could be considered to be single dotted. From early days this rune was considered to be un-dotted yielding här (have), a modern Swedish word. Barry Hanson established the single dotting in 2001 and this led to the word här (is) in 2003 by Williams and Nielsen (2003). The plural verb, haoru (are) is found in DS 5792 (1357), DS 5881 (1359) and DS X136 (1372) with the initial h-insert. Unless this initial h-insert trait can be explained as known in Swedish speech in 1898, the form här (are) is a strong candidate for proof for a medieval provenance for the KRS.

Inserts in medial and final position, as in the KRS ahr (year) and ön (peninsula, island), came into New Swedish in the 16th century from the German practice of using “h” as a vowel lengthener. It is not used in Swedish today except in place and personal names.
Figures 3. The KRS äptir (after) on the 6th Line Apparently Has a Single Dotted X-rune (X) for ð-Rune.
The red arrows identify the hook groove apparently filled with debris and this observation needs examination by a curator. This feature needs careful inspection, as the possibility that dateable material is present in the groove should not be overlooked. The right punch apparently served as a template end point for the hook.
Fig. 4. The Purported Debris Filled Hook in āptir (after) on the 6th Line of the KRS. Note the possible debris filled hook path denoted by the red arrows. The right punch is clearly not centered in the rune. If filled with wet clay when discovered, the dry clay would reduce its volume when drying and perhaps cause the visible line along the hook path.
Figures 5. Does the KRS läger (camp) on the 4th Line Have a Single Dotted X-rune (X) for the ā-Rune?
The apparent hook is not in the correct place, which is much higher on the right arm. The right punch is not centered and is up to the right to serve as the hook’s end point.

Note the r-rune (R) on the end with an overstrike over of earlier incorrectly placed word dividers
Figures 6. Does KRS fräelse (save) on the 9th Line Have a Single Dotted X-Rune (X) for the ä-Rune? The red arrow points out the possible hook path never chiseled or filled with debris in the Steward photograph and 3D imaging. The spelling is reminiscent of linguistic breaking in frialsa (free) in Old Swedish DS 6097 (1359) and DS 5881 (1958) or possibly a double vowel for fräälse (save) as found in fräälsth in DS X124 (1372), since “ä” is a short “e.” The damage done to this word by frequent cleaning of the calcite is obvious in the 3D displayed from the back.
Figures 7. The KRS öh (peninsula, island) on the 12\textsuperscript{th} Line Apparently Contains a Macron. The macron groove chiseled over the two dots is circa 1000 microns deep and shapely cut. Perhaps the ö-runes on the face in göter (Götalanders) on the first line and röde (red). The need for unambiguous evidence cuts both way. No longer can the ö on the KRS be used as an unambiguous proof of a modern provenance.

The two double dotted runes (Ø) on the face inscription may have been intended to be joined for a macron. The intended macron on one Medieval Swedish Latin grave slab was carved as ö = ö to denote the abbreviation “or”. The carver had forgotten to join the dots for the abbreviation for “r”. The same error may have occurred on the KRS. See Gardell (1937 II).
4. The Present Purported Dotted Runes on the KRS: the l-Rune ( Penis) and f-Rune ( Penis).

Figure 8a. The Suggested Punch in the KRS el-Bind-Rune ( Penis) on the 3rd Line for Vineland (land of vines).
If an el-bindrune Vinland would become Vineland (land of vines) for the e-dialect of Old Swedish masculine processive plural, vina (of vines). It should be noted that the English for Vinland in 1898 was spelled Wineland.

Wimmer (1908) wrote extensively about the Åkirkeby font in Bornholm with its dotted l-rune ( Penis). In 1893 he sold his early rune-books at the Chicago World’s Fair. The history of the Danish Pavilion should be investigated for its presentation material. It is certainly likely this rune-form was presented in one of these books. This remains to be determined in the libraries of the mid-west and the records of the world fair.

The white arrow identifies the punch, perhaps filled with gypsom from the molding process of the 1930s. The punch is about 1000 microns (1 mm) deep.
Figure 8b. An Alternate Possibility for the Suggested I-Rune (either $\mathfrak{f}$ or $\mathfrak{f}$) on the 3rd Line of the KRS. Perhaps the rune stands for a long l denoting double ll. If so, Vínland (Vinland) would follow the model presented in Benson (1954: 14) in Ur Vidhem's anteckningar (From the notes of the Priest of Vidhem) circa 1325. The dative Wæstægøtlandi (West Gotland) and Østægøtlandi (East Gotland) both have double I-s. The dotted I-rune ($\checkmark$) for long i is seen in four inscriptions carved in Gotland. Whether any of this runic information was known in Minnesota in 1898 remains to be seen.

- Ḧ𐰃 skuldi skuldi (should). The DR 373 Akerby Font was exported to Bornholm from Gotland.
- Ḧ핧 kiallera kialleri (cellar), G 163 Mulde. Note open r-rune ($\checkmark$). See also Snædal (2002: 265 paragraph 4.2.7.3) and Jansson and Wessen (1978: 66-68).
- Ḧ峄 allir allir (all), G192 Vesterlands. There is no confirmed dotted palatal r-rune ($\checkmark$) in this inscription as reported in Nielsen and Wolter (2006: 57) and neither are the forms ($\checkmark$) confirmed academically elsewhere in Gotland. See Snædal (2002: 209-212) and Jansson and Wessen (1978: 137-141).
Figure 8c. The Åkerby Font in Bornholm, Denmark with a Dotted I-rune (ϝ). The red denotes the dotted I-rune (ϝ) in Ἰρό ΟὐΡίΣ ρωμής (should). Scene one: The Angel Gabriel’s announcement to Mary. Scene Two: Mary and Elizabeth. Scene Three: The manger with Mary, Joseph, and the Christ child. Eight panels follow in Wimmer (1908: between pages CLXVIII-IX).
Figure 9. The Suggested el-Bind-Rune (†) on the 4th Line of the KRS for Skelar (shelters?). The bind-rune is found in skelar (shelters) and the last three runes are shown above for sk†XR skelar (shelters). The light blue arrows show the clear chisel path on the el-bind rune in a gold presentation used to identify flat surfaces. The l-rune for 14 is the Golden Year Rune for 1362. The Sunday Rune (怩) for 2 is represented by the crossed u-rune (♀) on the KRS.

The rune-row sequence ⚠️ ₠ ₡ ₢ ₣ ₤ ₥ ₦ ₧ ₨ ₩ ₪ ₫ € ₭(naming 1362) gives the 19 year Golden Year Moon cycle and l is the 14th rune and runic u is the 2nd rune. In the 8th column the sequence is unique and 8 may have been supplied by the initial pentadic number 8; however there is no special code on the 8 to denote this and other non-unique dates could be found. See Nielsen (2011a).
Figure 10. The Suggested Dotted f-Rune (Ѱ) on the 3rd Line of the KRS in of (far, extreme). This would indicate the v-rune (Ѱ) is unvoiced in the following vest (west) and that a final f-rune had been voiced to “v” well before 1362. I will leave it to Prof. Henrik Williams to decide on this linguistic point. However, the dot at the top of the lower limb of the f-rune is in line with the word dividers and may be a pattern punch. On the other hand, dots at the end of laterals are found in Ukna Church Sm 145 in Småland for both the t-rune (Þ) and n-rune (ᛓ). Even Bureus (1611) reports a dotted f-rune (Ѱ) used for “v” in av (from). Thorsen (1877: 92) has Liljegren (1832: 32) and Wimmer (1873: 210) also show the dotted f-rune. Figure A4 in Postscript Two to follow shows a similar three punch arrangement for the g-rune in Göter (Götalanders), which was once assumed to be the opening letter in the Gral Code. See Nielsen (2010b).

Sjöborg (1822) reported the late medieval dotted f-rune (Ѱ) in Urguda (G-70) from 1514. However, Sjöborg’s (1822-24) book could have found its way to a Swedish immigrant home or to University libraries in Minnesota and the mid-west by 1898. The dotted f (Ѱ) = “v” is used in ventris (womb in Latin) in Ukna Sm 145 in Småland (Kinander (1935-61: 296-8). Olsen (1960: 156, note 1) reports the dotted f-rune appears one inscription in Norway (NR 549) and also in the the Codex Runicus (Thorsen (1877: 92) for ⚩IR (var). Olsen (1960: 156) states it appears once in Denmark in DR 74 Vejerlev, but this evidence was not obtained until after 1914. See also Jacobsen etal (1942: 953-4) regarding the Maria Klangen manuscript. The chance that this rune was known in Minnesota by 1898 seems quite slim.
5. Summary and Recommendations

It is obvious that there are some unanswered questions on the Larsson Rune-row. It is the exceptions on the KRS rune-row that open up so many possibilities for a medieval solution for the KRS. The following open candidates could help to prove a medieval provenance for the KRS if not found in common books by 1898 available in Minnesota.

- A dotted l-rune (either ꚇ or ꚇ) for either length (לל) or for the bind-rune “el”
- A dotted f-rune (Ҭ) for “v” used in late medieval times for denoting voiced ’f”. As an example the word “off” is unvoiced (vocal cords do not vibrate and air is pushed out pass the teeth) but the “f” in “of” is voiced (vocal cords vibrate and no air is pushed out pass the teeth) as “v” in English.
- Use of single and double dotted ä-runes (��, ಜ and ಞ) that were used in the Swedish province of Dalecarlia in the 17th Century. The Dalecarlian runes are believed to be first recorded in 1599 on wooden objects and perhaps their initial carvings took place centuries earlier. Use of a suggested single dotted ä-rune (𐌓) for the Larsson ä–rune (𐌓) as reported in Frankki 2009: 87-9) needs a detailed inspection by Prof. Henrik Williams before this is a viable candidate.

Practices That May Help to Establish the Provenance of the KRS in Whatever Century It Was Carved.

- Use of a macron for the umlaut indicator on the ö-rune (𐌄) on the KRS side inscription in ᵀ h (peninsula, island) may be medieval. The distinct bar of the macron is over 1 mm deep. The two double dotted runes (𐌄) on the face inscription may have been intended for a macron template. The carver may have neglected to join the dots to create the macron bar for the two ö-s on the KRS face. If so, the double dots would not be sure proof of a modern inscription; the evidence for this would not be unambiguous.

- A hooked ä-rune ( сохранив) in Dalecarlia. This rune may help to date the origin of the hooked a-rune (𐌓) on the KRS to earlier than 1600. This rune can be very telling if either recorded in printed books available in 1898 in Minnesota or found on inscriptions before 1500. Not much had been printed regarding Dalecarlian runes until the 20th century, as seen in Gustavson (1985). See also Nielsen (2009a), Frankki (2008) and Williams (2009) regarding the hooked a-rune.

- On the other hand there were certainly ample books in print before 1898 to have supplied the carver with the form of the little used dotted f-rune (פן), the dotted l-rune (ף or ꚇ), and the dotted þ-rune (Þ).
  - Bureus (1611), Liljegren (1832: 32), Wimmer (1874: 210-11) and Thorsen (1877: 92) all show the dotted runic f-rune (פן).
  - Wimmer (1908) shows the dotted l-rune (ף) in this book, but this form is in Wimmer (1887).
  - Bureus (1611), Worm (1643) and Wimmer (1874: 210-11) show the dotted þ-rune (Þ). In the case of the Worm (1643), see Lithberg (1939: 25).

The steps to take now are:
• Confirm that a purported runic feature was intended by a re-inspection of the KRS in 2012 (HW).
• Determine if the runic feature is linguistically sound in the context of the inscription (HW).
• Determine if the runic feature could have been known in 1898 in Minnesota (RN).
• Determine if the runic feature could have been known in 1898 Scandinavia (HW).
• Write a published peer reviewed report (RN and HW) by 2014.

6. References
Jacobsen, Lis and Erik Moltke (1942) Danmarks Runeindskrifter (Denmark’s Runic Inscriptions). Ejnar Munksgaards Forlag: København.


Sjöborg, Nils Henrik (1822-24) Samlinger for Nordens fornälskare (Collections for Scandinavian antiquarian enthusiasts) in two volumes. Stockholm


(1887) “Døbefonten i Åkirkeby kirke” (The Baptismal Font in Åkirkeby Church). CLXVI-CLXXVII.

Worm, Ole (1643) Fasti Danici. Copenhagen.

A. Post Script One on the Dotted þ-Rune (Þ) in Scandinavia and KRS Dotted r-Rune (R) in norr (north).

![Image of Skjeberg Church Inscription]

**Figure 11.** The Norwegian Skjeberg Church I and II with the Rare Single dotted þ-Rune (Þ). This rune is shown above on Skjeberg Church II at the red arrow. These runes are from 4 to 5 inches in height. These two inscriptions are the only ones that use Þ in Norwegian Inscriptions.

**In Sweden:**
Ukna Sm 145 in Småland and Väte G 178, Lye G 100 and Hellvi G 291 in Gotland each has a dotted þ-rune (Þ). See also Snædal (2002) for further information on Gotlandic runes. Lithberg (1939: 25) reported the Gotlandic Runic Calendar of 1328 with the dotted þ-rune (Þ) from Worm (1643).

**In Denmark:** Wimmer (1874: 210-11) reported both the dotted f-rune (Ƿ) and the dotted þ-rune (Þ). Bureus (1611), Worm (1643) as does Worm (1643) as reported in Lithberg (1939: 25).
The r-rune (℞) in the final r-rune in norr (north) on the left has a word divider the carver failed to overstrike effectively like the clean overstrike (gold arrows) of the r-rune (℞) in läger (camp) on the right. Thus neither rune is a dotted r-rune (Nielsen 2011: Fig. 17).

Figure 12. Rejection of the Purported Dotted r-rune (℞) in norr (north) on the 5th Line. The Final r-rune (℞) in norr (north) on the 5th line of the KRS has misplaced word dividers as does the final r-rune (℞) depicted in läger (camp) on the 4th line above. The red arrow indicates the punch that had been missed in norr. It was partially covered by debris from damage of some sort and it took many images to reveal what had obscured the identification. Note: Barry Hanson inspected this rune with a microscope in 2000, but concluded it was a natural defect. This then started a discussion with Barry Hanson and Prof. Henrik Williams and RN at the Scandinavian Heritage Conference at 1000 Oaks, California in February 2002. Prof. Williams stated that norr (north) would not have a palatal R-rune (℞). On Gotland the Gotlandic palatal R (℞) was used until the late 1300s, but then often incorrectly. There are no confirmed dotted r-runes (℞) for the palatal R on Gotland. Those suggested dotted R (℞℞) runes thought to be found in Gotland by Nielsen and Wolter (2006: 54-58) have proven to have ambiguous evidence against their acceptance. Rejections of some of these suggested dotted Rs in Gotland are discussed in Nielsen (2009b: 135).

Post Script Two on the “Proposal for 3D Imaging of The Kensington Rune Stone.”

By Richard Nielsen
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See Nielsen (2008a) in Reference Section.

Contents
Introduction
The So-Called Signs on the G and R rune in Gøter (Götalanders)
A Proposed Laser Study
Figures
Figure A1. The r-Rune with an Unconnected Punch below the Right Side Leg in Gøter (Götalanders) in the Purported Gral (Grail) Code Theorized by Nielsen and Wolter (2006: XV).
Figure A2. The r-rune in Gøter (Götalanders) in the purported Gral (Grail) Code.
Figure A3. The g-rune in Gøter (Götalanders) in the purported Gral (Grail) Code.
Introduction

On April 20, 2008 I commissioned Jeff Roste to photograph the runes of the KRS in order to record the damage caused by the deposit of mold material residue on the surface of the KRS at the time a mold was made of the KRS in early 2003. The first enlightening find was that the dot at the right foot of the r-rune in Göter (Götalanders) was detached. This had represented the R in the first four assumed special signs on the KRS that before would have spelled GRAL. Clearly the punch indicated that it was placed as a pattern marker and GRAL cannot now be suggested.

Figure A1. The r-Rune with an Unconnected Punch Below the Right Side Leg in Göter (Götalanders) in the Purported Gral (Grail) Code Theorized by Nielsen and Wolter (2006: XV).

Blue arrows denote apparent template punches in line with the lower word divider.
The So-Called Signs on the G and R rune in Göter
The R-Rune: A closer look at the KRS photo study below shows that the right foot punch was meant for a pattern mark. Many of the other pattern punch marks on the rune are also clearly visible.


Figure A2. The r-rune (℞) in Gøter (Götalanders) in the Purported Gral (Grail) Code. The staff leg also has a foot punch as noted by the red arrows. This separation of the punch from the lower right leg, as indicated by a gold arrow, was not noted in Nielsen and Wolter (2006: 52).
The same situation applies to the left upper arm of the G-rune in Göter (Götalanders). 

Figure A3. The r-rune in Göter (Götalanders) in the purported Gral (Grail) Code. The red arrow shows two additional purported punches in the g-rune. The Gral (grail) code was described as a theory in Nielsen and Wolter (2006: XV). Photos from Nielsen and Wolter (2006: 118). Note what appears to be three word dividers attached to the front of the g-rune.

G-rune in Göter
These two runes, G and R, represent the general situation with all the runes on the KRS. On May 9, 2008, RN went over the observations of these newly discovered dots and other observations on the KRS with Prof. Williams of Uppsala University and the intention to propose a laser imaging study to once and for all to identify the signs on the KRS.

Investigation of Hemse G 57 in Stockholm
On May 19, 2008, RN visited the Swedish National Museum storage facility located in Southwest Stockholm with Prof. Henrik Williams to the purpose of examining Hemse G 57 to determine if a reported spall mark could actually be meant for a dotted R. After determining there was no viable punch mark in
the R-rune, Prof. Williams immediately noted pattern punch marks for the runes on Hemse G 57 similar to those found on the KRS. Apparently this has been standard medieval practice, but it has not been reported before by anyone to the Professor’s knowledge. This feature speaks well for a medieval artifact rather than one carved in the 19th century, since this pattern requirement would not have been known in 1898 and would have to have been discovered independently.

Figure A4. Prof. Henrik Williams Notes on Hemse G 57 from Gotland.
Figure A5. Prof. Henrik Williams at the National Museum Storage Facility in Stockholm.

Figure A6. Hemse G 57. Runic Inscription from circa 1150 with punch marks as a pattern for the rune carver clearly visible. The carving yields the name Kairalf.
A Proposed Laser Study
Prof. Paul Weiblen and I visited the Metropolitan Museum of Arts on the last day of March and the first day of April, 2008 in New York City. Our efforts to learn if the KRS could be cleansed of the damage from the molding process are reported separately to the RSM by Prof. Weiblen. The major benefit of the visit was to learn that the MET routinely scans objects in great detail to create a 3-D file that can be accessed by computer with the added ability to inject shadow from a light at an arbitrary azimuth and elevation.

Once the data is collected, a 3-D carving of the KRS in any material and to any size is possible.

The advantages of this system are obvious. It is not costly. A full day is all that is required to capture the KRS in great detail with non-intrusive imaging equipment. The cost for this would be 3000 dollars plus travel and lodging and would be carried out by experts from the Met. The costs can be raised by outside subscription.

The imaging can then be accessed by a free download reader program and this would enable for example Prof. Williams and RN to collaborate on line and agree to what marks are actually on the KRS. The dots and marks on the KRS runes are each one important and at present photographs do not begin to cut the mustard.

Figure A8. Example of 3D Imaging (Permission of the Metropolitan Museum of Art, NY. NY.)