The pagan Great Midwinter Sacrifice and the 'royal' mounds at Old Uppsala

Göran Henriksson*

Abstract
According to the established interpretation, the pagan Great Midwinter Sacrifice at Old Uppsala, in Uppland province, took place every ninth year. In our modern way of counting, this means every eighth year. The starting date was determined by the full moon that occurred between 21 January and 19 February in the Julian calendar. After the introduction of Christianity, the tradition with a great assembly at Old Uppsala at midwinter was continued by the *Disting*, which consisted of an assembly and a market. By combining historical data and calculations of the dates of the full moons within the Disting period, it has been possible to establish the exact years of the eight-year cycle. One such year was AD 852 the same year as St Ansgar's second missionary journey to Birka, the oldest Swedish town.

At the end of the 17th century, the farmers of Uppland were still using the so-called rule of King Aun, according to which the phases of the moon in the Julian calendar fell one day earlier after 304 years. Such displacements in the eight-year cycle took place in 1692, 1388, 1084, 780, and 476. The semi-legendary king Aun is considered to have reigned about AD 450-500 and to have been buried at Old Uppsala. The three 'royal' burial mounds there have been dated to AD 450-550. These mounds are oriented in such a way that they could have been used to regulate the sacrificial calendar.

Historical sources for our knowledge of the Great Midwinter Sacrifice at Old Uppsala

Vita Ansgarii, written before 876 by Rimbert (Rieper 1995), the successor of Ansgar as archbishop in Hamburg-Bremen, tells about the earliest known Christian Missions to Sweden, the two visits by Ansgar and some other priests to Birka in Lake Mälar 829-830 and 852. The ruler during the first visit (Rieper 1995: 37-40), King Björn, invited them because he wanted better relations with the Christian countries in northern Europe. One big problem in these relations was the Great Midwinter Sacrifice, including human sacrifice, which was celebrated regularly and was lead by the king. During Ansgar's second visit to Birka in 852 (Rieper 1995:66-76), he learned that there recently had been such a Great Sacrifice and that the Christian priests were no longer popular. The situation was similar in Denmark and Norway, but the Christian influence in Denmark was greater than in Sweden. *Chronicon,* written by Thietmar from Merseburg about 1000 (Trillmich 1957, chapter I:17), tells about the last Great Sacrifice at the ancient Danish heathen centre at Lejre.

Gesta Hammaburgensis Ecclesiae pontificium, by the German missionary Adam from Bremen, written about 1075, gives details about the Great Midwinter Sacrifice at Old Uppsala, the ancient main heathen cult centre in Sweden (Tschan 1959: 207-208 [Adam 4.26-27]). In the original text, Adam wrote "*Solet quoque post novem annos communis omnium Sueoniae provintiarum sollempnitas in Ubsola celebrari*". This means that every ninth year all the Swedish provinces had to send representatives to Old Uppsala for a common celebration. We must note, however, that when the early Swedes said *every ninth year* this corresponds to *every eighth year*, as they had no zero and counted the beginning of the first year as year one and reached year nine when only eight years had elapsed. It was the German Historian of Astronomy Otto Sigfried Reuter who first realized that *post novem annos* corresponds to *every eighth year* in the our way of counting (Reuter 1934: 483-484). Most Swedish scholars, however, continue to believe that it was a true nine-year cycle. In fact, this celebration took place every eighth year according to an eight-year cycle determined by the phases of the moon. The eight-year cycle is the shortest period after which the same lunar phase is repeated approximately on the same date, as eight tropical years = 2921.934 days and 99 synodic months = 2923.528 days. This means that the same phase of the moon will appear delayed by one and a half days after eight years. After 19 eight-year cycles (= 152 years), the cycle is shifted by a whole month, which was already mentioned by the Greek astronomer Geminos ca 70 BC (Aujac 1975: 47-58). He also explained why this cycle was called both the nine-year and the eight-year cycle in antiquity.

Aside from the above works, the earliest available written sources for early Swedish history are the old Nordic sagas and chronicles preserved on Iceland, written by Christian scholars such as Snorre Sturlason, who wrote a history of the kings of Norway ca 1230 (Monsen 1932). The first

chapter gives the history of the earliest kings in Old Uppsala, from ca AD 150-200, as they were also the ancestors of the Norwegian kings. They were reckoned as offspring of the fertility god Freyr, who is said to be buried in Old Uppsala. An extensive collection of sources concerning early Scandinavian literature can be found in Sundqvist (2002: 39-62).

The Great Midwinter Sacrifice in Old Uppsala as described by Adam from Bremen

The place called Uppsala in the ancient texts is nowadays Old Uppsala (Gamla Uppsala), located a few kilometres north of the modern city of Uppsala. It was the main heathen cult centre in ancient Sweden, famous for its three large burial mounds (Fig. 1).

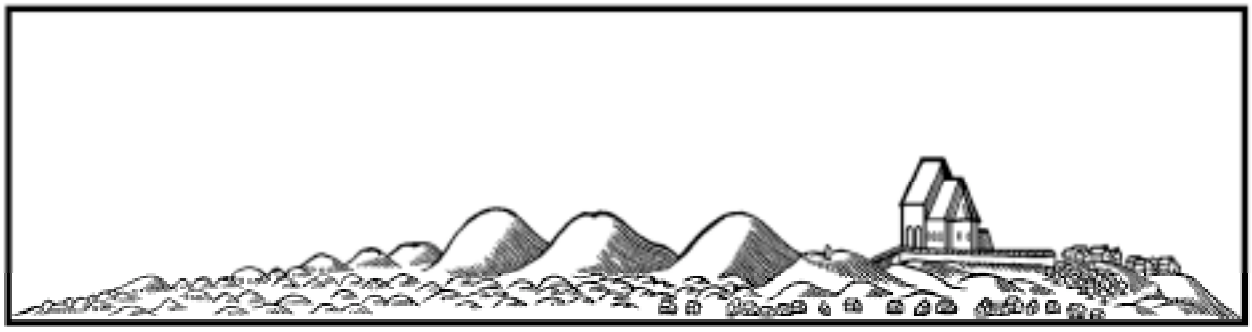

Fig.1 The royal burial mounds at Old Uppsala from the south. Note the menhir on the flat 'Tingshög' (thing mound or thingstead). From Rudbeck 1679b: plate 16, fig. 77.

It was a great triumph for the Christian Church that this terrible pagan place could be transferred to the Swedish archbishopric in 1164.

Some Christians had visited Uppsala and told Adam about the horrible Great Sacrifice, and he wrote that from every living creature, nine male individuals were sacrificed to conciliate the gods. The bodies were hanged up in a sacred grove close to the temple. This grove was considered to be so sacred by the heathens that every tree was believed to have a divine force derived from the death and decay of the victims. For a period of nine days, one man and seven male domestic animals were sacrificed. When the sacrifice was completed, one could see altogether 72 bodies hanging in the holy tree. Birds and rats ate the bodies when they disintegrated (Tschan 1959: 208 [Adam 4.27]). The excavator Bror Emil Hildebrand found some non-cremated human bones and bones from seven different domestic animals: horses, oxen or cows, pigs, rams, dogs, cats, and cocks in the filling material of the eastern mound. This may indicate that the holy tree was situated in the vicinity of the eastern mound (Lindqvist 1936: 206).

The importance of the Disting and the precise definitions as to when it should take place

The original meaning of the Disting was threefold; there should be: a great sacrifice for peace and victory for the king, a general meeting with representatives from all the Swedish provinces, and a major market (Granlund 1958: cols 112-115). At the general meeting, important common political decisions were taken, such as election of a new king or solution of judicial questions that not could be solved at local courts. The participation of the representatives was compulsory, and Christian representatives who refused to come because of the human sacrifice had to pay a great fine.

The dates for the Disting were linked to the phases of the moon according to an ancient rule preserved in medieval texts. Already Tacitus had pointed out that important meetings among the Germanic peoples must take place at the new or full moon (Hutton 1970: 149 [*Germania* 11]). In his *Historia de gentibus septentrionalibus*, written in 1555 during his exile in Rome, Olaus Magnus, the last Roman Catholic archbishop in Sweden, explained that the Disting was started at the full moon because the light from the moon facilitated travel to Uppsala during the short days at midwinter (Foote 1996: 203 [Magnus 4.6]).

The exact rule for determining the starting date of the Disting was given by Olof Rudbeck (1679: 68), professor in medicine at the university of Uppsala and a scholar with broad scientific interest: The moon that shines in the sky on Twelfth Day (6/1) is the Christmas moon and after this follows the Disting's moon. This means that the earliest date for the beginning of the Disting

was 21 January (7/1+14 days) and the latest date was 19 February (7/1+29 days). The Disting started on the day of the full moon between 21/1 and 19/2, according to the Julian calendar. The corresponding interval for the beginning of the Disting in our modern calendar is 28 January-26 February. It may seem strange that this originally heathen rule was related to Twelfth Day, or the Epiphany, as in the rule for the start of the Disting in Magnus (Foote 1996: 203 [Magnus 4.6]). The explanation is that the rule for the dates of the Disting was related to the Christian calendar in the 12th century. At that time, there was a shift by seven days between the Julian calendar and our Gregorian calendar that is closely related to the solstices and equinoxes. This fact also explains why the Swedish tradition says that the night of St. Lucia, 13 December, is the longest and darkest night of the year. If seven days are added to this date, we get the date of the winter solstice at that time. This fact indicates that the pre-historic Swedish calendar was closely related to the solstices and equinoxes and supports the results found in my earlier archaeoastronomical investigations of ancient monuments in Sweden (Henriksson 1983, 1989a and b, 1992, 1994, 1995, 1999 and 2002).

People of today may find it difficult to understand why such an exact rule was needed to determine the day for the sacrifice to the gods, but there seems to have been a long tradition in Europe that the gods must be worshipped on specific days. Geminos wrote that when the years are reckoned exactly according to the sun, and the months and the days according to the moon, then the Greeks think that they sacrifice according to the costume of their fathers; that is, the same sacrifices to the gods are made at the same time of the year (Aujac 1975: 50 [Geminos 8.15]).

An extensive discussion about the introduction of the eight-year cycle in Greece can be found in Ginzel (1911: 365-385).

The exact years in the eight-year cycle for the Great Midwinter Sacrifice

The oldest historical records give three conditions for identifying correctly the sacrificial years of the eight-year cycle:

1) There was a Great Sacrifice 851-853, just before the second visit of Ansgar at Birka, according to the Chronicle by Rimbert, written before 876 (Rieper 1995: 66-76).
2) The Great Sacrifices took place about the time of the vernal equinox before 1075, when Adam wrote in his Chronicle: "*Hoc sacrificium fit circa aequinoctium vernale*", which means this sacrifice took place about the time of the vernal equinox, i.e., at the end of February and beginning of March (Tschan 1959: 208 note b).
3) The Great Sacrifices at Lejre, the Danish counterpart to Uppsala, took place in January before 934, when they were forbidden, according to Thietmar of Merseburg, writing about 1000.

To solve this problem I computed all full moons between 28 January and 26 February in the Gregorian calendar for the period AD 200-1200. The only possible solution is an eight-year cycle including the year AD 852 as the year for the second visit of Ansgar in Birka. This means that the exact year for all the Great Midwinter Sacrifices can be computed as multiples of eight years counted from year 852 (Henriksson 1992, 1995).

Early Swedish history and the eight-year cycle

Not many exact years are known in early Swedish history, but those that we have correlate very well with the eight-year cycle (Table 1). This is easy to understand as all the important decisions were taken at the general assembly that took place every eighth year. It is also interesting to note that the tradition of having general meetings every eighth year continued after the last official Great Midwinter Sacrifice in 1084.

The historian Tore Nyberg (2000: 120-137), at the University of Odense in Denmark, has used this eight-year cycle to establish a chronology for early medieval Scandinavian history. He notes that the relations between the church and the people in Denmark and Sweden deteriorated close to the years in the eight-year cycle in which there was a Great Sacrifice and that all the important clerical meetings took place in middle of the interval between such years. He believes that there was a heathen political party that tried to continue the series of sacrifices as late as the middle of the 12th century. He also suggests that the murder of king Sverker the older, in 1156, was performed by members of this heathen party because Sverker may have tried to stop the sacrifice that year.

Year	Event
852	Second visit of St. Ansgar at Birka
980	Foundation of Sigtuna, the royal city succeeding Birka, according to dendrochronological dating
1060	The first bishop in Lund, Scania
1076	King Anund had to abdicate because he refused to lead the Great Sacrifice at Old Uppsala
1084	The last Great Midwinter Sacrifice in Uppsala. The heathen temple was burnt down
1124	The bishop at Old Uppsala had to leave the country after a few months
1156	King Sverker was murdered. According Nyberg (2000: 136-137), this may have been an act of revenge from the last heathens in Sweden
1164	The first archbishop at Old Uppsala
1188	The minting of coins starts again in Sweden
1204	At a general meeting in Söderköping it was decided that new towns should be built in Sweden

Table 1. Important events in early Swedish History

Determination of the phases of the moon one year in advance according to the farmers' rule

During the Disting market in 1689, Rudbeck talked to a 90-year-old farmer from Uppland who demonstrated his old runic calendar staff (*runstav*). The farmer taught him the following rule for the shifts of the phases of the moon in the same month of the next year: *The phases of the moon will be shifted either 12 days backwards or 20 days forwards in the same month with 30 days the next year* (Rudbeck 1689: 652). Rudbeck demonstrated that this rule worked perfectly. For a modern reader, it is also clear that he made the computations without zero. According to modern arithmetic, we subtract 11 or add 19 days to the actual date instead of 12 and 20, as in the old rule. This rule could have been especially useful in the determination of the day of the Great Sacrifice one year in advance. For instance, if it were full moon on 8 February, the year before the Great Sacrifice, the next Great Sacrifice should be shifted from the latest date, 26 February, to the earliest date, 28 January. This could be directly observed in Uppsala as the sun sets along the three burial mounds on 8 February. Rudbeck also learned how the farmers determined the dates of the full moon as shown in Fig. 2.

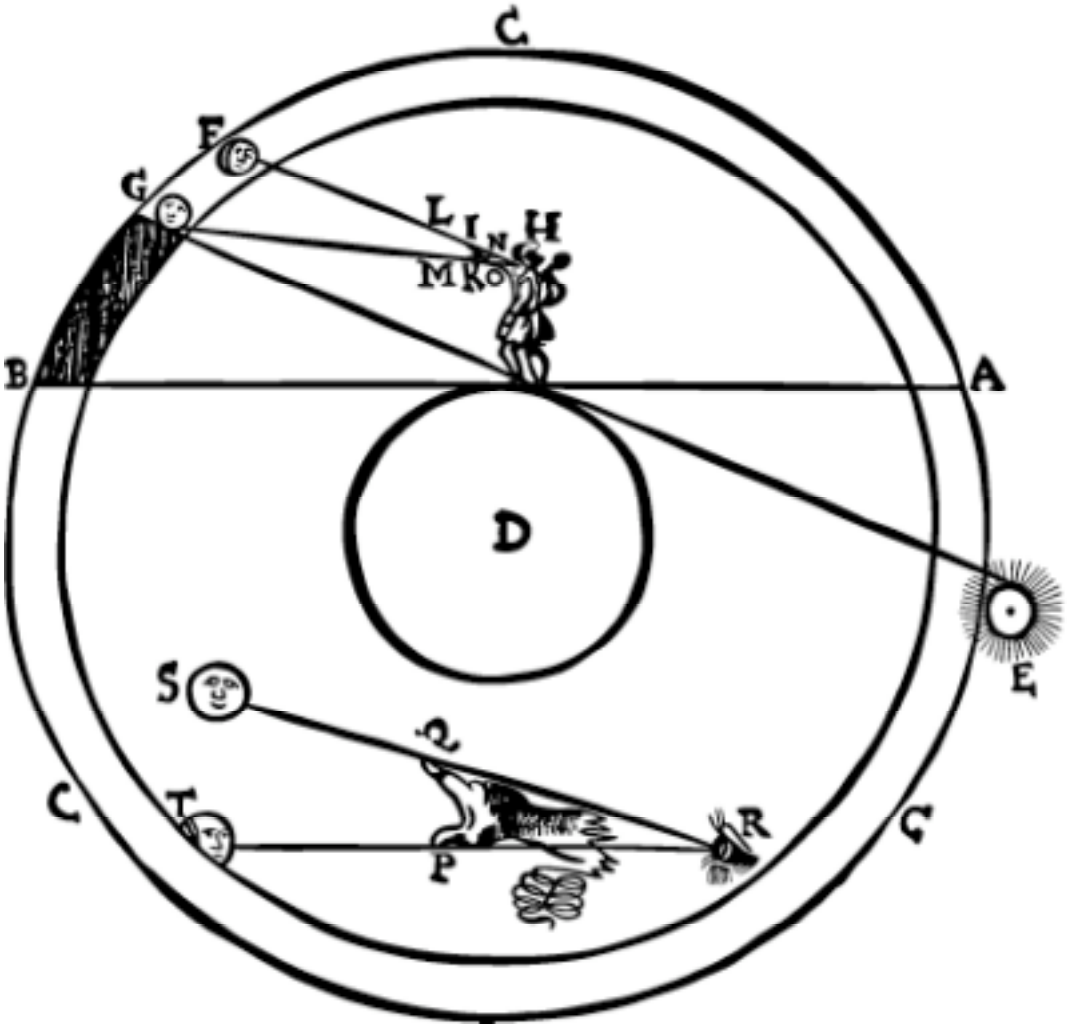

Fig. 2. Uppland farmers determined the dates of the next full moon by measuring the moon's distance at sunset from the 'pale yellowish-red' night-ring. The distance between the thumb and the forefinger was called a 'span' and corresponded to the moon's movement during a 24-hour period (cf. Fig. 3). E = the sun, D = the globe, the line A-B = the horizon, the arc BG = the earth's shadow, G = the night-ring at full moon, and F = the moon's position before full moon. From Rudbeck 1689: 554.

When Snorre Sturlason visited the province of Västergötland during the spring of 1219, he was told that the Disting had earlier taken place in the month called Göje, corresponding to February, but after Christianisation, it was moved to Candlemas, 2 February (Monsen 1932: 280-281). This is probably a misunderstanding because it happened to be full moon on the evening of 1 February 1219, which means that the Disting market should have started on Candlemas that year. The fact that it was full moon on 1 February in 1219, which corresponds to 8 February in our calendar, and that the next year, 1220, was one of the years in the ancient eight-year cycle, means that in 1220 the eight-year cycle was shifted from the end of February to its earliest date, 28 January.

The phases of the moon fall one day earlier after 304 years in the Julian calendar

According to Magnus (Foote 1996: 73-74 [Magnus 1.34]), the farmers of Uppland knew about the shifts between the true phases of the moon and the predictions in the Julian calendar during periods of 10 and even 600 or 1000 years. This knowledge must have been based on observations that covered at least one millennium before 1555, when his book was written. He described the runic calendar staffs, which had enabled the farmers from very early times to keep track of the calendar. There is a woodcut in his book (frontispiece in this volume) showing a mother

instructing her daughter and a father his son in the art of using the calendar staff (see also Hallonquist in this volume).

The older people of Uppsala knew that in 1689 the Disting would fall for the first time one day earlier than it had during the last 300 years. When Rudbeck (1689: 652-653) asked the 90-year-old farmer why, he answered that there exists an old rule according to which the Disting's full moon had now completed the cycle of Aun and that it should be shifted by one day every 19th year during 300 and some years. He explained that the rule was called after the ancient King Aun and that 1689 was the correct year to adjust the date of the Disting, as one of his forefathers had engraved a half moon on his rune staff on the day of the Disting, the year, and the golden number of that year, and now 300 and some years had elapsed (Rudbeck 1689: 652). The statement of the old farmer as to the reason for the shift by one day in 1689 can be checked. I realized that the marking of the Disting full moon as a half moon in 1385 (1689-304 years) could be interpreted as the result of a lunar eclipse. This hypothesis could easily be verified because in 1385 the Disting's full moon was totally eclipsed after midnight and could be the seen as a half moon about 7 o'clock in the morning.

Shifts in the date for the Great Midwinter Sacrifice every eighth year according to the 304-year rule

During the 19-year cycle that began in 1689, the dates of the Disting full moon were shifted one day earlier. The first year to be shifted in the old eight-year cycle for the heathen Great Midwinter Sacrifice was 1692. This means that the earlier shifts had taken place in 1388, with no sacrifice, in 1084 with the last sacrifice, and in 780 and 476 with sacrifices. The year 476 falls within the estimated time of rule for the semi-legendary King Aun, 450–500. This is very interesting as King Aun, according to the tradition preserved by the old farmer mentioned above, established this 304-year rule. This implies that the Julian calendar was introduced in Uppsala by at least 476 or that the ancient Swedes had independently invented a calendar with intercalation of one day every fourth year.

According to Lindqvist (1955: 79), the excavator of Old Uppsala, King Aun may be buried in the middle, and oldest, of the three burial mounds. In 476, it was full moon on the last day of the Disting period, when the sun was setting on the top of the middle mound. The excavations of these mounds showed that the burial ceremonies had great similarities with the cremation of Roman emperors, and Roman grave goods were found.

The Historian of Religion Ingemar Nordgren (2000: 1-2, 103-141) has used the eight-year cycle to reconstruct the cult of *Freyr* and the 304-year cycle of Aun to date the arrival of the cult connected with *Odin* in the Mälar valley region.

The latest shift in the 304-year cycle occurred in 1996 (1692+304 years), on 3 February, which corresponds to 21 January in the Julian calendar (Fig. 3).

Fig. 3. The rising full moon from the Tingshög (Thing mound) on 3 February 1996 at 16:13 Swedish Standard Time. The upper edge of the sun had disappeared below the horizon five minutes earlier, and the dark shadow of the earth's surface is clearly visible on a colour photo at half the altitude of the moon. The brighter part of the sky in this greyscale picture is blue. The moon is visible in the 'pale yellowish red' night-ring, between the blue sky and the shadow of the earth, which means that it was full moon in accordance with the rule used by the Uppland farmers in the 17th century (Rudbeck 1689: 649-661). Cf. Fig. 2.

This method is much more exact for determining the phases of the moon than the observations of the new moon's crescent used by the ancient civilisations of the Mediterranean region and the Middle East. It was possible to determine without difficulty the date of a full moon and to mark the 19 different moon series on the calendar staffs. By comparing the markings on the staff with the observed dates of full moons, it should have been possible, without encountering any great problem, to discover the moon's displacements by one and a half days during the eight-year cycle and by one day after 304 years.

The full moon on this photo is the latest in the series of 304-year cycles that include 1692, 1388, 1084, 780, 476, 172, and 133 BC and 437 BC.

Early Contacts between Sweden and the Greek and Roman world

In 476, the Western Roman Empire fell. A worn Roman coin from that year was found in the so called Ottar's mound in Vendel, ca 30 km north of Uppsala. The size of that mound is comparable to the mounds in Uppsala.

In 471, Theodrik the Great became king of the eastern Goths and resided at Ravenna. His name is mentioned on several Swedish runic stones and, on the most famous one, *Rökstenen,* in the province of Östergötland, the text tells us proudly that one of the ancestors had fought with Theodrik the Great.

If we continue some 304-year cycles before 476, we get AD 172, 133 BC, and 437 BC. If the ancient king Aun based his 304-year rule on Swedish observations, they must have started at least in AD 172. At that time the Gothic people living at the fall of the river Vistula into the Baltic immigrated to the Black Sea where there were old Greek colonies.

According to Ginzel (1911: 390), Hipparchos (d. 126 BC) introduced a 304-year period consisting of four 76 year cycles (by Kallippos), or sixteen 19 year cycles (by Meton), after

which the phases of the moon will fall one day earlier. His reference for this in Ptolemy, however, is incorrect, and there is no other reference of this kind in the *Almagest*; nor do we know elsewhere of the use of such a period connected with Hipparchos. It is not mentioned by Geminos who lived 100 years after Hipparchos.

According to Diodorus (Oldfather 1961: 447-449 [Diodoros 12.2-3]), Meton is said to have introduced the 19-year cycle in Athens at the summer solstice in 432 BC. Hipparchos, who observed the solstices and equinoxes 146-126 BC, could in principle have observed and discovered this 304-year cycle in 133 BC, based on observations by Meton in 437 BC.

In any case, it seems very unlikely that the early Swedes got the 304-year cycle from Hipparchos, not only because we know of no scholar in the Classical period who had any knowledge of this cycle, but mainly because the epoch for such cycles at that time was related to the equinoxes and solstices, whereas the epoch for the early Swedish 304-year cycle was the Disting period, determined by the second full moon after the winter solstice.

The heathen cult centre at Old Uppsala

In 1986, I noticed that the three royal burial mounds had been carefully aligned. The orientation corresponded to sunset on the date, 8 February, which regulated the restart of the eight-year cycle for the above-mentioned periodic sacrifice of humans and domestic animals at the Midwinter, or the Disting's, full moon, according to the lunar eight-year cycle. Midwinter month is the second month after the winter solstice and Midwinter Day is the day exactly between the winter solstice and the vernal equinox, according to Rudbeck (1679: 70-71), which means 2-3 February in prehistoric times.

The three mounds are also oriented in the direction of sunset on 3 November. In ancient Sweden, the year started at the first new moon after the 14 October, the first winter day on the runic calendar staff, or 21 October according to the modern calendar. This means that the first full moon of the year could earliest appear on 4 November in the modern calendar, only one day after sunset in the direction in which the northern sides of the three mounds were oriented. This difference of one day is insignificant, because the dates of the full moons were computed according to rules preserved on the calendar staffs, with the full moon marked only at 19 fixed dates within each month.

Three lunar months later, on 8 February, the sun sets again in the same direction. Another three lunar months later, on 29 April, the sun rises in the opposite direction. Every 19th year, the moon will be full on all three of these days. The first day of the Disting period, 28 January, may have been defined by sunset at the top of *Tunåsen* (Tuna Ridge), the highest natural hill in the otherwise flat landscape, observed from an upright stone (menhir) on the Tingshög, the fourth large, but flat, mound. On the last day of the Disting period, 26 February, the sun sets on top of the originally smaller, middle mound, the oldest of the three royal mounds. This mound has been dated by Lindqvist (1955: 79) to AD 450-500 and may be the tomb of the semi-legendary king Aun, who is believed to have reigned sometime during this period (Figs. 4-7).

The same dates were already important in the Neolithic calendar that was marked by grooves in the bedrock on the island of Gotland in the Baltic, by the orientation of the passage graves in Västergötland, and the interpretation of the calendar ships on the Swedish rock carvings (Henriksson 1983, 1989ab, 1992, 1994, 1995, 1999 and 2002). According to my interpretation, the oldest grooves on Gotland were made on 27 January 3294 BC. The passage graves in Västergötland can be dated to ca 3300 BC, according to the archaeologist Lars Bägerfeldt (1989).

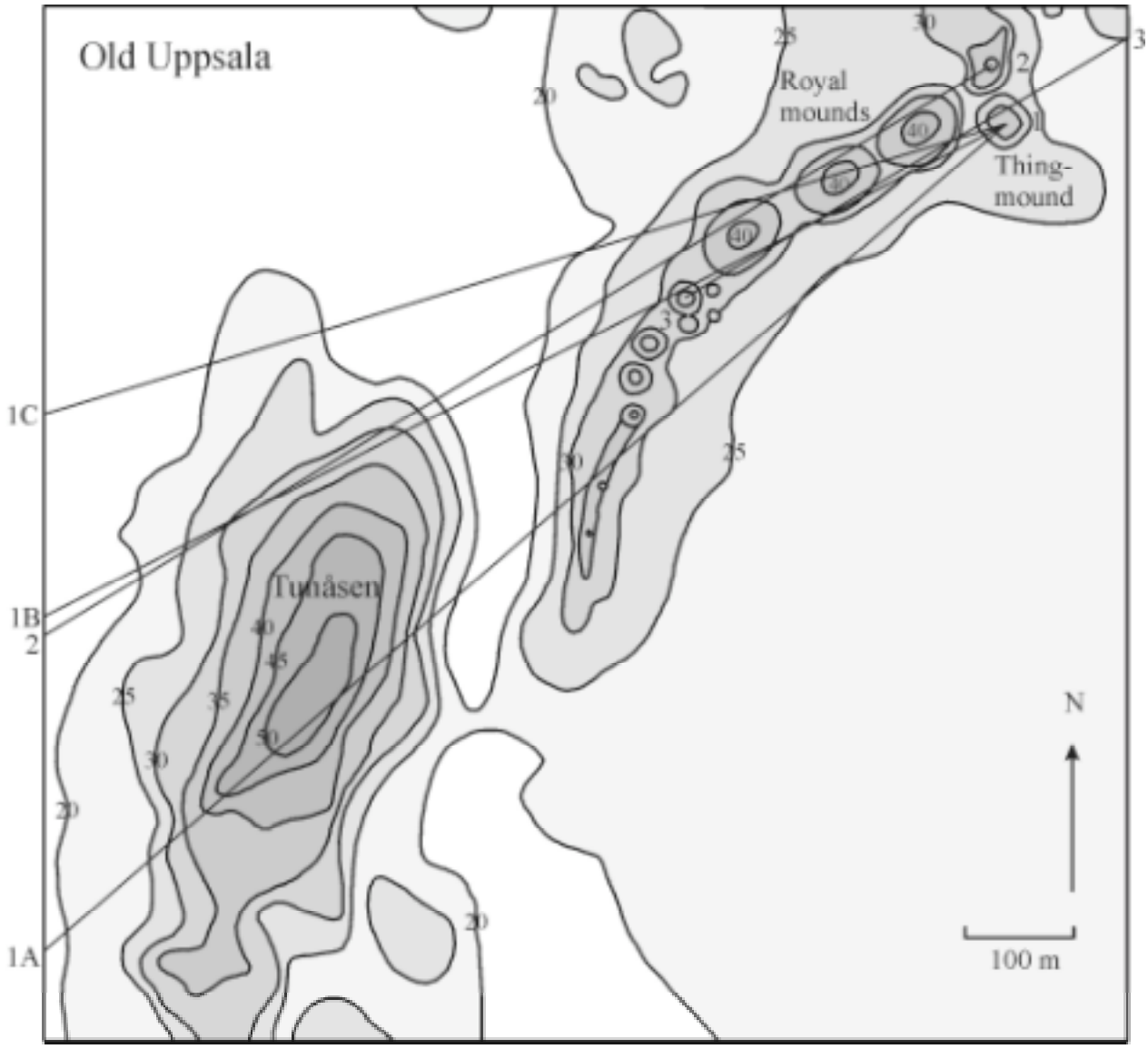

Fig. 4. Plan of the area occupied by the ancient monuments at Old Uppsala, with Tunåsen (Tuna Ridge) on the left. The three large mounds are situated largely on the line of the natural ridge, but their exact location, orientation, and design were determined according to a definite plan. From the menhir on the Tingshög, (point 1, top right) one can see the sun set at the highest point of Tunåsen on 28 January, in a V-shaped depression between the northern slope of Tunåsen and the southern slope of the west mound on 12 February and between the crests of the west mound and the middle mound on 26 February (see Figs. 1-3). On the left-hand edge, the corresponding lines of sight are marked by 1A, 1B, and 1C.

From the smaller observation mound (point 2, top right), one can see the sun set in line with the northern sides of the east and west mounds on 3 November and 8 February, but the view is today partly blocked by trees (see Fig. 5). The line of sight has been marked with the number 2 on the left-hand edge.

The rising of the sun in the opposite direction on 29 April and 13 August can, however, be observed without hindrance from the mound at point 3, to the left of the west mound (see Fig. 6). This line of sight has been marked with the number 3 on the right hand edge.

By observing the rising and setting of the sun along the sides of the mounds, a perfect control was established over the course of solar year and it was possible to determine the dates of the three important sacrifices at the beginning of the winter, the middle of the winter (midwinter) and the beginning of the summer.

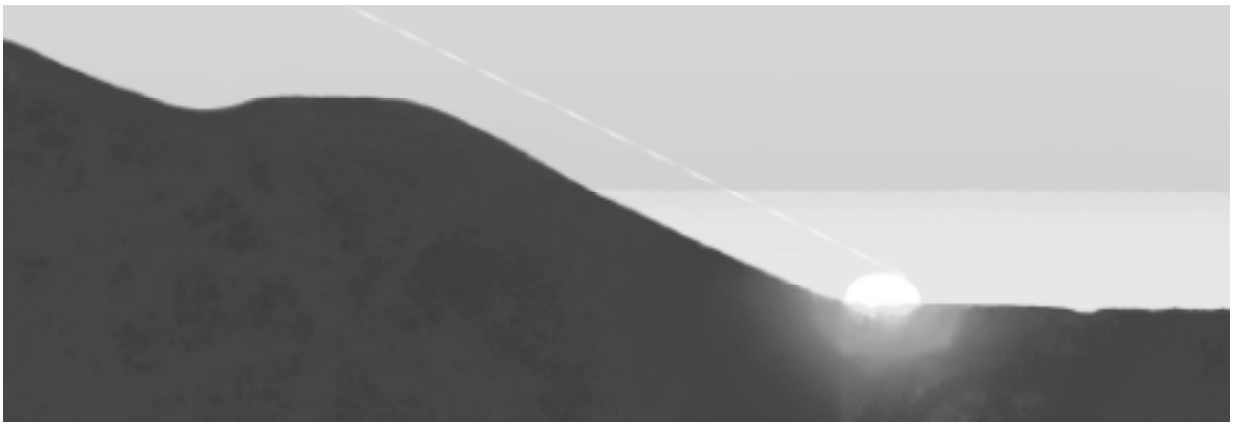

Fig. 5. The sun set along the mounds on 3 November and 8 February. If there were a full moon 8 February, the annual midwinter sacrifice should be begun, but it was even more important to know that, if the great eight-year sacrifice was to be held the following year, this should be begun as early as 28 January. This photograph was taken on 8 February 1993 at 16:17 from the observation mound at the southeastern corner of the churchyard wall. The trees have been removed by the computer.

Fig. 6. If there were a full moon at sunset along the mounds at the beginning of the winter on 3 or 4 November, there would also be a full moon six lunar months later on 29 or 30 April, when the sun rose along the mounds, and then the sacrifice for the summer's battles was held. The photograph was taken on 29 April 1988 at 03:56 Swedish Standard time. By observing the sunrise and sunset along the mounds, it was possible to maintain a correct calendar.

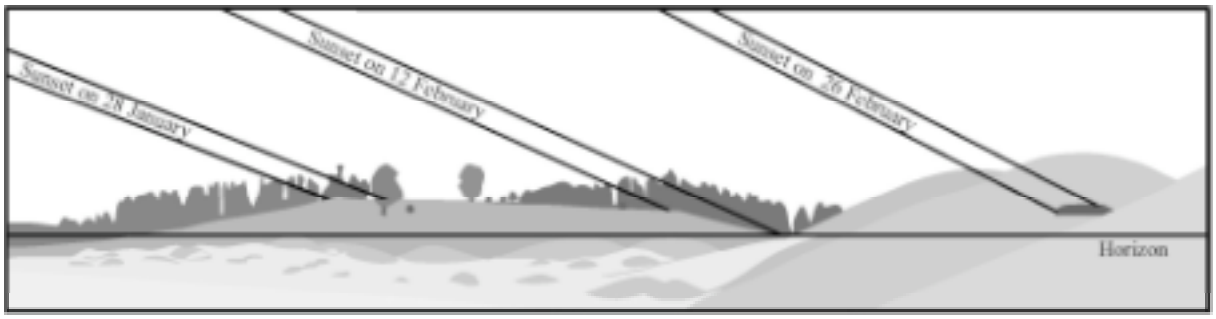

Fig. 7. The dating limits for the beginning of the midwinter sacrifice (later the Disting) could be established by observing sunset from the menhir on the Tingshög. On the first date (28 January), the sun set straight over the highest point on Tunåsen and, on the last date (26 February), at the position of the burial cairn in the middle mound (Aun's mound?). These dates are given in our calendar. Every eighth year, a Great Midwinter Sacrifice was made at the full moon, which fell between these dates. For each such major midwinter sacrifice, the date of the full moon was moved forward by, on the average, one and a half days and, after 144 or 152 years, the displacement amounted to a whole lunar month, at which time counting began again from 28 January. In AD 468, there was a full moon on 26 February, when the sun went down where the burial cairn in the middle mound now stands, and in AD 476, it was time to re-start the cycle of sacrifices on 28 January, at sunset over the highest point of Tunåsen. Even as late as the 17th century, the ancient King Aun was regarded as the inventor of the rule that predicted the displacement of the moon's phases by one day after 304 years. According to the interpretation of *Heimskringla. History of the Kings of Norway*, by Snorre Sturlason, Aun may have reigned in Uppsala about AD 450-500 and been buried there (Monsen 1932: 16-18, 22 note 5).

*Department of Astronomy and Space Physics, Uppsala University, Box 515, SE-751 20 Uppsala, Sweden, goran.henriksson@astro.uu.se.

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