The plague of Justinian and other scourges: an analysis of the anomalies in the development of the iron age population in Finland
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The Plague of Justinian and Other Scourges

An analysis of the Anomalies in the Development of the Iron Age population in Finland

By Tapio Seger


In this paper the corpus of excavated and dated Iron Age burial grounds in Finland is quantitatively analyzed with various statistical methods in order to isolate and define the anomalies of burial ground development which probably reflect actual disturbances in population growth. Various potential explanations thereof are discussed, and epidemics recorded in historical sources from other parts of Europe — especially the great pandemic of bubonic plague known from the reigns of Justinian I and his successors — suggested as probable causes of some of the anomalies.

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The present paper is partly based on an earlier study, where the corpus of excavated and dated Iron Age burial grounds in Finland was quantitatively analyzed (Seger 1982). Burial grounds were chosen as indicators of Iron Age population development, because only very few dwelling sites of the period are so far known in Finland (Meinanen 1980 pp. 7—8). The material, its limitations and results of the statistical calculations were presented in detail in the previous study. It suffices here to state that the numbers of burial grounds are not absolute, but are highly representative of the known total. The most severe limitation is the fact that the different burial grounds of various types and...
periods are not directly comparable quantitatively, and to create a system of weighting them is all but impossible due to the vague character of the cremation burial grounds, the restricted scope of most excavations and the consequent difficulties in establishing or even estimating the numbers of graves (cf. Meinander 1977 pp. 35—36). However, these limitations are taken into account in the discussion, and no attempt is made to estimate absolute population size. The main aim of the present paper is to locate the most obvious anomalies by period and province in the quantitative development of numbers of burial grounds, to make them comparable to some degree and to suggest probable explanations for them.

By and large the methods used here resemble those applied by Renfrew (1972, Chapter 14) to the Neolithic and Bronze Age dwelling sites in the Aegean in order to detect various patterns of population growth.

The conventional period division of the Iron Age in Finland is followed here for convenience (for discussion on various period transitions see Meinander 1969 p. 66; Sarvas 1972 pp. 49—53; Cleve 1978 pp. 194—195, 239; Seger 1979); the Pre-Roman Iron Age is omitted from the analysis because of the lack of burial grounds due to burial customs at that time (cf. Meinander 1969):

<table>
<thead>
<tr>
<th>Period</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Roman Iron Age</td>
<td>c. 500 B.C. — 0</td>
</tr>
<tr>
<td>Early Roman Period</td>
<td>0 — 200 A.D.</td>
</tr>
<tr>
<td>Late Roman Period</td>
<td>200 A.D. — 400 A.D.</td>
</tr>
<tr>
<td>Migration Period</td>
<td>400 A.D. — 550 A.D.</td>
</tr>
<tr>
<td>Merovingian Period</td>
<td>550 A.D. — 800 A.D.</td>
</tr>
<tr>
<td>Viking Period</td>
<td>800 A.D. — 1050 A.D.</td>
</tr>
<tr>
<td>Period of the Crusade</td>
<td>1050 A.D.—1150 A.D./1300 A.D. in eastern Finland.</td>
</tr>
</tbody>
</table>

The spatial division (Fig. 1) follows the old provincial (maakunta) division which seems to be somewhat better correlated with the Iron Age settlement pattern as reflected in burial grounds (cf. Kivikoski 1959) than the modern division into provinces (lääni). Åland is omitted here, as being best described as an extension of Central Sweden in the Iron Age (Meinander 1980 p. 7), as is eastern Finland, where burial grounds only began to emerge in the Viking Period.

**The Analysis**

First, the number of burial grounds by period in the whole country (excepting the omissions mentioned above), the percentages by period of the total number and the coefficients of growth between periods are presented in Table 1.

The number of burial grounds increases steeply during the earlier Iron Age. After the Merovingian Period growth is retarded, and there is a sharp decline from the Viking Age to the Period of the Crusades. The peak of growth consequently clearly falls in the Merovingian Period.

Second, the periodical distribution of the numbers of burial grounds by province (percentages according to period of the total
Table 1. Numbers of burial grounds in use by period; percentages of the total number according to period and coefficients of growth between periods in the whole country. — Antalet gravfält i användning per period, procentalen per period av det totala antalet och tillväxtkoefficienter mellan perioder i hela landet.

Total number of burial grounds = 323

<table>
<thead>
<tr>
<th>Period</th>
<th>Burial grounds in use</th>
<th>% of total</th>
<th>Coefficients of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Roman</td>
<td>26</td>
<td>8.0</td>
<td>2.1</td>
</tr>
<tr>
<td>Late Roman</td>
<td>55</td>
<td>17.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Migration</td>
<td>119</td>
<td>36.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Merovingian</td>
<td>151</td>
<td>46.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Viking</td>
<td>133</td>
<td>41.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Crusade</td>
<td>47</td>
<td>14.6</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Coefficients of growth in the numbers of burial grounds according to province from the Early Roman to the Merovingian Period and from the Merovingian to the Period of the Crusades. — Tillväxtkoefficienter av antalet gravfält per provins från den äldre romerska järnåldern till merovingertiden och från merovingertiden till korstågstiden.

<table>
<thead>
<tr>
<th>Province</th>
<th>Early Roman → Merovingian</th>
<th>Merovingian → Crusade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland Proper</td>
<td>3.5</td>
<td>0.4</td>
</tr>
<tr>
<td>Satakunta</td>
<td>13.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Tavastia</td>
<td>22.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Ostrobothnia</td>
<td>5.5</td>
<td>—</td>
</tr>
<tr>
<td>Nyland</td>
<td>2.3</td>
<td>—</td>
</tr>
</tbody>
</table>

Table 3. The provinces arranged in rang order by period according to density of burial grounds (burial grounds/1000 km², the numbers of burial grounds by period being compared to the total area of parishes with known Iron Age burial grounds in a province). — Provinserna arrangerade i rangordning per period enligt gravfälfstfrekvensen (antalet gravfält/1000 km², då antalet gravfält jämförs med den totala area- len av socknar med kända järnåldersgravfält i en provins).

<table>
<thead>
<tr>
<th>Period</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>Finland Proper</td>
<td>Nyland</td>
<td>Ostrobothnia</td>
<td>Satakunta</td>
<td>Tavastia</td>
</tr>
<tr>
<td>LR</td>
<td>Finland Proper</td>
<td>Nyland</td>
<td>Ostrobothnia</td>
<td>Satakunta</td>
<td>Tavastia</td>
</tr>
<tr>
<td>Mi</td>
<td>Finland Proper</td>
<td>Ostrobothnia</td>
<td>Satakunta</td>
<td>Nyland</td>
<td>Tavastia</td>
</tr>
<tr>
<td>Me</td>
<td>Finland Proper</td>
<td>Satakunta</td>
<td>Ostrobothnia</td>
<td>Nyland</td>
<td>Tavastia</td>
</tr>
<tr>
<td>V</td>
<td>Finland Proper</td>
<td>Satakunta</td>
<td>Tavastia</td>
<td>Nyland</td>
<td>Ostrobothnia</td>
</tr>
<tr>
<td>C</td>
<td>Finland Proper</td>
<td>Satakunta</td>
<td>Tavastia</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

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The periodical distribution of the burial grounds according to province (percentages by period of the total number in a province). ER = Early Roman Period, LR = Late Roman Period, Mi = Migration Period, Me = Merovingian Period, V = Viking Period, C = Crusade Period. The scale on the y axis is logarithmic.

The growth is steady but fairly slow in the province of Finland Proper (Egentliga Finland, Varsinais-Suomi), with a rather high percentage of burial grounds already in the Roman Iron Age and the culmination in the Viking Period. In the other provinces the growth is much stronger, starting with low percentages in the Early Roman Period and reaching its peak in the Migration Period in Ostrobothnia (Österbotten, Pohjanmaa), in the Merovingian Period in Satakunta and in the Viking Period in Tavastia (Tavastland, Häme). The development in Nyland (Uusimaa) is clearly anomalous with the peak already in the Late Roman Period, a sharp temporary decrease in the Migration Period and a further increase in Merovingian times. Judging by evidence from the burial grounds, settlement in Ostrobothnia and Nyland seems to have ceased in the course of the Viking Period.

Third, the development according to province from the Early Roman to the Merovingian Period on the one hand, and from the Merovingian to the Period of the Crusades on the other, is presented graphically in Fig. 3. The method is liable clearly to show both the long-term trends and the relative order of the provinces in the beginning, the middle and the end of the period under study. The corresponding coefficients of growth are collected in Table 2.

Furthermore these methods bring out the strong increase in the number of burial grounds in Tavastia and Satakunta during the earlier Iron Age, while in Finland Proper the growth is much slower. The absolute number of burial grounds in the Merovingian Period is highest in Satakunta, while Finland Proper comes a close second, the latter being the first in the beginning and at the end of the period under study. The development in Ostrobothnia and Nyland is retarded by the anomalous decrease from the Migration to the Merovingian Period, and the sharp temporary decline in the Migration Period, respectively. The growth is negative in all provinces between the Merovingian and the Period of the Crusades. The decrease is smallest in Tavastia, because of the stronger growth from the Merovingian to the Viking Period.

Fourth, the provinces are arranged in chronological order according to burial ground density in Table 3. This density here means the ratio burial grounds/1000 km², when the number of burial grounds by period is compared with the total area of the parishes in the province with known Iron Age burial grounds.

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Fig. 3. The development of the numbers of burial grounds according to province from the Early Roman to the Merovingian Period, and from the Merovingian to the Period of the Crusades. The scale on the y axis is logarithmic.

Fig. 4. Percentages of continuity of burial grounds between periods and percentages of new burial grounds by period, according to province, presented as histograms.

Finland Proper retains the leading position throughout the period in question. The province of Satakunta steadily ascends in the order of precedence in the course of time, and the descent of Ostrobothnia after the Migration Period is evident, but the development in the other provinces is not as clear in the light of this method.

Fifth, the principal figures of burial ground continuity (ratio of burial grounds in use in both of two succeeding periods to those in use in the former period) and the percentage of new burial grounds in the latter period, according to province, are presented as histograms in Fig. 4.

The most striking common feature of the histograms is the low continuity from the Viking to the Period of the Crusades. The burial ground continuity is exceptionally low also in Satakunta and Nyland from the Early to the Late Roman Period, in Nyland from the Late Roman to the Migration Period and in Ostrobothnia from the Merovingian to the Viking Period. The comparatively low continuity from the Migration to the Merovingian Period, perceptible above all in Finland Proper (a province of generally high continuity), in Satakunta and in Ostrobothnia is another prominent feature. The percentages of new burial grounds are higher than average in both Tavastia throughout the Iron Age and in Satakunta, Ostrobothnia and Nyland in the earlier Iron Age.

Sixth, the figures of burial ground conti-
Table 4. Ratios by province obtained by dividing the actual number of burial grounds in use in both of two succeeding periods by the figure of expected random continuity ($\bar{x} = 1.7$). — Relationstalen per provins erhålls genom division av det verkliga antalet gravfält i användning i båda av två successiva perider med väntad tillfällig kontinuitet ($\bar{x} = 1.7$).

<table>
<thead>
<tr>
<th>Province</th>
<th>ER $\rightarrow$ LR</th>
<th>LR $\rightarrow$ Mi</th>
<th>Mi $\rightarrow$ Me</th>
<th>Me $\rightarrow$ V</th>
<th>V $\rightarrow$ C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland Proper</td>
<td>2.1</td>
<td>2.0</td>
<td>1.7</td>
<td>2.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Satakunta</td>
<td>0.7</td>
<td>1.5</td>
<td>1.3</td>
<td>2.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Tavastia</td>
<td>2.5</td>
<td>2.0</td>
<td>1.7</td>
<td>1.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Ostrobothnia</td>
<td>2.0</td>
<td>1.6</td>
<td>2.4</td>
<td>2.1</td>
<td>—</td>
</tr>
<tr>
<td>Nyland</td>
<td>0.7</td>
<td>0.6</td>
<td>1.9</td>
<td>1.9</td>
<td>—</td>
</tr>
</tbody>
</table>

Ratios by province obtained by dividing the actual number of burial grounds in use in both of two succeeding periods by the figure of expected random continuity (the number of burial grounds to be expected to have been in use in both of two succeeding periods, when the continuity is assumed as random and all the burial grounds in use in either period are assumed to equally likely to have been in use in both the former and in the latter period). The figures of expected random continuity between periods are obtained from the following formula:

$$\frac{N_a \times N_b}{2(N_a + N_b)}$$

where $N_a$ = the number of burial grounds in use in the former, and $N_b$ = the number of burial grounds those in use in the latter period; the mathematical proof of the formula is presented by Renfrew (1972 pp. 247—248, footnote 1). Meaningful here are the ratios obtained by dividing the number of burial grounds actually in use in both of two succeeding periods by the figure of expected random continuity. If the ratio is 1.0, the actual continuity equals random continuity. If the ratio $> 1.0$, the actual continuity exceeds random continuity and vice versa. The between-periods ratios are collected in Table 4.

At least the ratios exceeding 2.0 can be regarded as indicators of a continuity decisively higher than the random. Ratios $< 1.0$ appear only in the continuity in Satakunta and Nyland from the Early to the Late Roman Period and in Nyland from the Late Roman to the Migration Period. Uncritical interpretation of the results of the test may, however, be easily misleading, cf. the continuity in Ostrobothnia from the Merovingian to the Viking Period (burial grounds 22 $\rightarrow$ 1). The test is dependent on the numbers of burial grounds in both periods, and since the only Viking burial ground shows continuity from the Merovingian Period, the ratio will be surprisingly and deceptively high.

**Discussion**

On the basis of the analysis, three main patterns of burial ground development can be distinguished:

A. Steady but slow growth with high absolute numbers of burial grounds, high burial ground density and continuity together with rather low percentages of new burial grounds throughout the period under study. This pattern is discernible in Finland Proper.

B. Pattern defined by strong and rapid growth, generally fairly low burial ground continuity (the high figures of continuity in Tavastia in the early Iron Age depend on the paucity of burial grounds, and cannot be considered significant) and high percentages of new burial grounds coupled with lower burial ground density than in Finland Proper. This pattern can be seen in the provinces of Tavastia and Satakunta.

C. Pattern of clearly anomalous development with sharp decreases in the number of burial grounds during periods of more or less continous growth in the other provinces. The development in Ostrobothnia and Nyland belongs to this category.

Strictly speaking, the general interpretation...
of the patterns lies outside the scope of the present paper, but the discernment and definition of the relevant anomalies, call for a short general discussion.

Burial ground development cannot be considered as directly describing population growth. However, in statistical terms it certainly reflects the main trends, and can serve as a basis for analysis of population development, particularly if some economic and social factors are taken into account.

In the area of pattern A, i.e. Finland Proper, the settlement was evidently the densest, comparatively stable and stationary throughout the Iron Age. The obvious advantages of the region were its suitability for agriculture, favourable climate and advantageous location in terms of maritime connections. On the other hand, it is comparatively small (the total area of the parishes with known Iron Age burial grounds is about 3500 km², when the corresponding figure in e.g. Tavastia approaches 10,700 km²). These factors apparently resulted in rather dense settlement with limited possibilities for expansion already at an early stage.

The settlement in the regions of pattern B, the provinces of Tavastia and Satakunta, seems to have been much more expansive, labile and mobile with virgin areas for slash-and-burn cultivation and for hunting and fishing available in abundance throughout the period under study. It has been questioned, whether the families practicing non-arable farming actually moved also the houses (and burial grounds) to new cultivation areas after an interval of perhaps a few decades, or whether only the sites of cultivation circulated, while the dwellings remained stationary (Meinander 1980 p. 12). However, periodical removal of at least many of the farms in the regions where this was possible seems to be the most plausible explanation of the fairly low figures for burial ground continuity and the corresponding high percentages of new burial grounds in the areas of pattern B. Social factors, e.g. a system of inheritance dictated by economic circumstances and therefore different from that prevalent in the region of pattern A, and the consequent differences in readiness to split up farms might also be worth consideration.

The retarded growth in the Viking Period together with the sharp decrease in the number of burial grounds connected with low burial ground continuity from the Viking to the Period of the Crusades probably do not indicate a corresponding stagnation of population growth. The former development can more naturally be seen as a result of the transition from single households practicing slash-and-burn farming to village settlements and field cultivation at least in SW. Finland, a process which evidently began in the 8th century and was completed in the course of the Viking Period (Meinander 1980 pp. 12—13). The latter development would seem to be due to the overall change in burial customs in the beginning of the Period of the Crusades; cremation burial grounds on level ground gave way to inhumation graves, which are more difficult to detect. The change in burial customs probably also caused burial grounds of the new type to be removed to new sites. Additional causes may be early local influence of Christianity (Huurre 1979 pp. 133, 161) together with the short duration of the period in western Finland.

The anomalies of burial ground development which presumably indicate actual anomalies in population growth can now be distinguished:

1) The abandonment of the Early Roman tarand type burial grounds in the provinces of Finland Proper, Satakunta and Nyland (e.g. Huurre 1979, map XIV) during the transition to the Late Roman Period (Salo 1968 pp. 201—203; 1970 pp. 160, 192; cf. Hirviluoto 1968 p. 32), detectable in the low burial ground continuities between the periods in question (there is, however, some doubt whether this occurrence really is relevant in the present context; it may simply be a question of a change in burial customs: see below).  
2) The temporary decrease of burial grounds in the Migration Period in the province of Nyland.  
3) The decline of the number of burial grounds in the Merovingian Period in Ostro-
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4) The evident stagnation of settlement in the province of Nyland during the Viking Period.

The problem most discussed hitherto is undoubtedly the retardation and disappearance of the settlement in Ostrobothnia (e.g. Meinander 1950; 1952; 1977; Virrankoski 1978; Ahtela 1981). Meinander (1977 p. 43) regards the development as a long process caused by the combined effect of unidentified economic and social factors, leading to the inability of the weakened community to take the decisive step towards village settlements and economy at a time when it apparently proved necessary elsewhere. Virrankoski (1978; cf. Meinander 1950 pp. 147, 158; 1977 p. 43) suggests that the inhabitants of Tavastia or Upper Satakunta destroyed the Ostrobothnian settlement and population as a hindrance to their emergent tax expeditions to the north. Ahtela (1981) mainly reviews the earlier theories.

The theory proposed by Meinander is reasonable and most probably valid, but does not, after all, explain very much. The suggestion by Virrankoski is dramatic enough but lacks concrete proof. Furthermore, it does not explain, or take into account the decrease of population before the beginning of the Viking Period. In any case, the disappearance of the Ostrobothnian settlement is a fact, the archeological argument being supported by palynological data from the area (Tolonen et al. 1979).

The explanation which will be suggested in the present context owes its origin to the inspiring paper by Bo Gräslund (1973), where the bubonic plague, documented in the reigns of Justinian I and his successors, is proposed as the cause of the stagnation of the kämpagrav settlement on Gotland at the end of the Migration Period and in the transition to the Vendel (Merovingian) Period (Stenberger 1955 pp. 1144—1154, 1161—1183; Björnstad 1955 pp. 924-951, 963—964; Gräslund 1973 p. 281). The theory is accepted and applied to the approximately concomittaneous cessation of settlement in various parts of Holland and Germany (van Es 1968 pp. 559—566; Jankuhn 1969 p. 159; Schmid et al. 1973 pp. 97—105, 108) as well as in SW Norway (Myhre 1974; 1977) by Bjørn Myhre (1978 pp. 233—234, 239).

The epidemic known as the plague of Justinian (e.g. Seibel 1857; Zinsser 1947; Hirst 1953; Shrewsbury 1964; 1970; Wells 1964; Rackham 1979) is in every respect comparable to the Black Death, the great plague of the 14th century. The pandemic, well known from historical sources (Agathius, Bede, Evagrius, Gregory of Tours, Procopius of Caesarea etc.; see Seibel 1857; Rackham 1979) from just after 540 to c. 590, swept the whole of the then known world from Far East to the British Isles (Gräslund 1973 p. 280; Rackham 1979 p. 116), with severe demographic, economic and cultural consequences (Hirst 1953 p. 11; Rackham 1979 p. 118). The ravaging epidemic recorded in the Irish Annals from the 660's has been interpreted as a secondary outbreak of the great pandemic (MacArthur 1949).

The plague in its pandemic form is traditionally considered (e.g. Hirst 1953; Shrewsbury 1970; Gräslund 1973; Rackham 1979) attributed to the black rat, Rattus rattus (Linnaeus), the principal carrier and transmitter of the primary vector of the disease, the flea Xenopsylla cheopis, host of the bacterium Yersinia pestis (or Pasteurella pestis; cf. Hirst 1955 pp. 106—111), although other rodents and fleas may act as carriers and give rise to isolated occurrences of the disease.

The main problem for Gräslund in 1973 was that the earliest proof known to him of the black rat in Europe derived from the late Viking Period or early Medieval times (Gräslund 1973 pp. 278—279 with references), although he argues convincingly that the rapid spread over Europe of the domestic cat approximately at the time of the plague (Stenberger 1933 pp. 136, 139, 144; Geijvall 1955 pp. 789—790; Boessneck et al. 1968 pp.)
85—86) must be seen as indicating the presence of the black rat. However, *R. rattus* has lately been shown to have been present in Central Europe (Luttschwager 1968) as well as on the British Isles (Rackham 1979) at least from the Roman Period, a fact which lends further support to the theory. It is highly unlikely that Scandinavia and Finland would have escaped invasion by the species, a typical ship rat easily spread by the lively maritime connections of the period (cf. Gräslund 1973 pp. 280—281). In addition, as Gräslund (1973 pp. 279—280) remarks, the flea *X. cheopis* is able to spread the plague bacillus over long distances even without the agency of *R. rattus* e.g. in cloth, grain and hay, the most advantageous temperature being about 10—15 °C, i.e. conditions prevalent for most of the sailing season in the Baltic. Import of cloth and even grain to Finland in the Iron Age is probable, and hay or straw may have been used as packing material for various commodities. Gräslund (1973 p. 281) maintains that the disease is as contagious to cattle as to people. However, this is not exactly true. Experiments carried out during modern plague epidemics have given contradictory results (Hirst 1953 pp. 150—151). Nevertheless, it seems that the various farmyard animals sometimes can be susceptible to plague, and this would naturally aggravate the economic consequences of the potential epidemic. A possibility of cattle disease at the time on Gotland was suggested by Stenberger (1955 pp. 1177—1178).

The potential pandemic could be expected to appear in the burial material as a decrease in the number of graves from the latter half of the 7th century, and probably the 8th as well; in the relevant Finnish archaeological literature the expression "dating to the 7th century" generally means the early phase of the Merovingian Period, e. 550(575)—650(675) (cf. Cleve 1943 p. 172; Meinander 1977 p. 27). This is exactly the situation discernible in the Ostrobothnian burial grounds (cf. Meinander 1977 pp. 28, 29, 30). Another eventual consequence would be the incidence of mass graves in the early Merovingian Period. The two remarkable Ostrobothnian water deposits of human bones from at least 60 individuals at Käldamäki in Vörä (Vöyri) and Leväluhta in Storkyro (Isokyrö), dated to the early Merovingian Period (Hackman 1913; Meinander 1950 pp. 136—145; 1977 pp. 37—38; the Leväluhta find also contains a few artefacts from the middle phase of the period) are certainly worth consideration in this context. They have been interpreted as sacrificial sites (Hackman 1913; Meinander 1977 p. 38) or burial grounds for slaves (Meinander 1950 pp. 145, 146), but they can with justification be regarded as sites, where victims of the highly infectious plague were hastily interred.

Another possibly relevant feature is the emergence of double graves in the early Merovingian Period, four of which are known from Ostrobothnia and a few from southern Finland (Meinander 1977 pp. 36—37, cf. pp. 28, 29; 1950 p. 206, find no. 183; Salmo 1938; find no. 29; Meinander 1950 p. 178, find no. 2, p. 204, finds nos. 171, 172; Salmo 1938 pp. 51—52; the latter grave is somewhat younger than the rest). All are warrior graves, where two males in full armour are buried together. They may represent graves of a chieftain and a slave sent to protect him in the afterlife, but this is contradicted by the fact that the outfits of both bodies are approximately as "rich". It is likely that they are graves of a father and a son, two brothers, or close friends who died at the same time, very possibly as victims of the plague.

The above, together with the comparatively low burial ground continuity from the Migration to the Merovingian Period in other provinces too, lends strong support to the possibility of the plague of Justinian having spread even to Finland. Moreover the evident local cessation of settlement in the early Merovingian Period in SE Finland Proper, e.g. the Salo region (Seger 1981), should probably be seen in this light. However, Ostrobothnia seems to have been most severely afflicted, for reasons best understood by epidemiologists. Nevertheless, the Migration Period settlement in the province was fairly dense and concentrated in a comparatively restricted area, and connections between the
province and foreign regions were lively at the time; some kind of loose political liaison between Ostrobothnia and parts of Sweden has even been suggested (Meinander 1977 p. 34). Notwithstanding, the graves in the province from the middle phase of the Merovingian Period are comparatively few and poor, and many parishes had become totally devoid of inhabitants (Meinander 1977 pp. 28, 34). The process of the weakening of the Ostrobothnian settlement outlined by Meinander (1977 p. 43; see above) can best be understood as a result of the great plague with its economic consequences. The initial shrinking of the settled area in Ostrobothnia from c. 400 (Meinander 1977 p. 42) should rather be interpreted as an increased cohesion of the settlement pattern for economic, social and eventually political reasons on the threshold of economic boom in the province in the Migration Period; it should be remembered that the Ostrobothnian settlement in the Late Roman Period, although distributed over a fairly wide area, was very thin, the figures of burial ground density being 2.7/1000 km² in the Late Roman and 9.8/1000 km² in the Migration Period (Seger 1982, Appendix IV).

Another problem is the disappearance of the tarand burial grounds in southern and south-western coastal Finland during the transition from the Early to the Late Roman Period, apparent in the low percentages of burial ground continuity in Satakunta and Nyland. This has been attributed to stagnation of the fur trade in the latter half of the 2nd century, resulting from the dissolution of the Pax Romana (Salo 1968 pp. 201—203; 1970 pp. 160—161, 192—193). This event may well have affected the whole of Europe, but it is difficult to believe that it could have been this drastic as far north as Finland. The traditional study of the Iron Age in Finland seems to have had an exaggerated and somehow very modern conception of prehistoric exchange with supposed groups of professional merchants, networks of regular trade routes over Europe, commercial colonies etc. A reasoned criticism of this view was recently presented by Meinander (1977 pp. 33 f).

The evident import commodities in the preserved Finnish archaeological record are mainly luxuries: status weapons, foreign finery etc. While these certainly were of social significance, the introduction of iron working had made possible the local manufacture of tools and basic weapons (e.g. Nylén 1974), and it is difficult to imagine an import commodity in the Iron Age meaning life or death to the people. Salt was evidently imported, but one does not die for the lack of it. The desertion of the tarand burial grounds and the corresponding settlements for commercial reasons would only be understandable, if the people buried in them were indeed traders of foreign origin.

If the process really reflects an actual disturbance of population development (an assumption subject to challenge, as other types of burial ground seem to show continuity) and not simply a change in burial customs, a more plausible explanation would be another epidemic, afflicting most severely the coastal regions in closest communication with outside areas. A well-documented pestilence called the plague of Antoninus (or of Galen), with a high mortality rate swept the entire Roman Empire; it has been identified as typhus (Castiglioni 1947), a form of smallpox (Zinsser 1947) or true plague (Patrick 1967), and dated to the end of the 2nd century, the exact time of the cessation of the tarand burial grounds in Finland. The Marcomannian Wars (166—180) carried the epidemic into Free Germany, and there to the very areas bordering northern Europe (Gräslund 1973 pp. 281—282).

The only point to be made at present with any certainty concerning the steep decline in the number of burial grounds in the province of Nyland during the Migration Period is, that the development was not caused by the plague of Justinian. The decrease is clearly due to the very low burial ground continuity from the Late Roman Period, which means that the cause must coincide with the end of the Roman Iron Age, but for the time being cannot be identified.

The last of the defined anomalies is the end of the settlement in westernmost Nyland in
the course of the Viking Period. There is some doubt whether the disappearance was factual, as pollen analytical data from the area demonstrates continuous agricultural activity from the late Iron Age to Medieval times (Tolonen et al. 1979 pp. 16, 22, 58—59). This is usually interpreted as indicating long-distance slash-and-burn cultivation practiced by the Tavastians or the Estonians (Tolonen et al. 1979 pp. 58—59; Meinander 1980 p. 12), but there remains the possibility of continuous local habitation, for one reason or another out of the reach of archaeological observation (Kerkkönen 1945, 152; Honkanen 1981; cf. Gardberg 1970 pp. 28—29).

On the other hand, the cessation has generally been considered real, and potential explanations ought to be discussed. One of the routes of east-bound Vikings evidently followed the coast of Nyland, and attacks by them have been suggested as the reason (af Hällström 1948 pp. 87—88). However, it is difficult to understand what would have been the gain for Vikings on their way to rich Miklagaard in destroying a rather poor settlement of small farmers so close to their point of departure, somewhat hazardous but hardly profitable enterprise. A possibility could be raids by groups of Vikings returning empty-handed from the east, to capture slaves in order to have something to bring home. It is equally plausible, however, that the cause was another epidemic, one of the many reportedly (Birkeland 1954; Skyum-Nielsen 1967 pp. 34—41; Gräslund 1973 pp. 282—284) brought back by the Vikings from their travels.

Concluding Remarks

The evident anomalies of Iron Age population development in Finland as reflected in the burial grounds have been discussed, and epidemics known from historical sources are suggested as explanation for many of them. The aim is not to maintain that disease was the sole or even the main reason for every disturbance of population growth, but it represents a very important potential factor capable of wide devastation, and hitherto totally neglected in the study of the Iron Age in Finland. Very few of the diseases caused by bacteria or viruses leave any trace on human skeletons (Hare 1967 p. 115), and consequently cannot be detected directly in the osteological material, but, in any case, the explanatory potential of historically firmly documented and dated epidemics must be considered far greater than that of purely hypothetical wars or economic catastrophes. As Gräslund (1973 p. 280) says: ""Rattus rattus och Xenopsylla cheopis kan knappast tillfånga att ha förlagt sin verksamhet enbart till länder där skrivkunnigt folk var tillställdes"" ("It is hard to believe that Rattus rattus and Xenopsylla cheopis were vain enough to restrict their activity only to countries where people capable of writing were at hand"), and the same naturally holds good of any other transmitter of the various pestilences, particularly in the light of the fact that ... "an infectious disease such as influenza can break out in pandemic proportions in the present century, circle the world and be reputed to have killed as many as one hundred million human beings, reaching into such isolated populations as the Eskimos of Greenland and Labrador" (Rackham 1979 pp. 118—119; cf. Elton 1958).

References


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Gräslund, B. 1973. Aiing, näring, pest och salt. (Summary: Farming, nutrition and disease. On some negative effects of the introduction of farming). Tor XV.


Luttschwager, J. 1968. Hamster- und Hausratten-
Den justinianska pesten och andra hemsökelser. En analys av anomalierna i befolkningstillväxt under järnåldern i Finland

I denna artikel analyseras de utgrävda och daterade järnåldersgravfält i Finland kvantitativt med olika statistiska metoder för att få fram och definiera de anomalierna i den kvantitativa tillväxten av antalet gravfält per period och provins, som sannolikt återspeglar verkliga rubbningar i befolkningsstillväxten.

Tre tydliga mönster av tillväxt blottas genom analysen:

A. Ett mönster med jämn men långsam tillväxt med komparativt höga antal absoluta gravfältsmängder, hög gravfältsfrekvens och -kontinuitet samt ganska låga procenttal av nya gravfält under hela den granskade perioden. Detta mönster kan iakttagas i Egentliga Finland.

B. Ett mönster präglat av stark och snabb tillväxt, i regel ganska låg gravfältskontinuitet och höga procenttal av nya gravfält samt lägre gravfältsfrekvenser än i Egentliga Finland. Detta mönster upptäcks i Tavastland och Satakunta.

C. Ett mönster med klart anomalisk tillväxt med tydliga sänkningar i antalet gravfältsmängder, hög gravfältsfrekvens och -kontinuitet samt ganska låga procenttal av nya gravfält under hela den granskade perioden. Detta mönster kan iakttagas i Egentliga Finland.
fält under perioder av mer eller mindre kon­
tinuerlig tillväxt i andra provinser. Tillväxt-
mönsten i Österbotten och Nyland hör till
denna kategori.

Skillnaden mellan mönsten A och B för­
klaras här med olikaartade ekonomiska förut­
sättningar dikterade av territoriella förhåll­
landen. Varken vikingatidens fördröjda till­
växt eller den skarpa sänkningen av antalet
gravfält under övergången från vikinga- till
korstågstiden återspeglar någon verklig tillbakagång av befolkningstillväxt, utan snarare förorsakas de av övergången från svedjebruk och enstaka hemman till
bybebyggelse och åkerbruk återspeglar någon verkligen anomali, som troligtvis reflekterar
verkliga rubbningar i befolkningstillväxten,
är följande:

1. Upphörandet av "tarand" gravfälten i
S och SW Finland under övergången i det
åldre och yngre romerska järnåldern.

2. Den tillfälliga sänkningen i gravfälts-
antalet i Nyland under folkvandringstiden.

3. Sänkningen i antalet gravfält under
merovingertiden i Österbotten, en utveckling
som troligen kan beskrivas av en låg gravfälts-
kontinuitet. Det är dock möjligt, att fenomenet helt enkelt harrör av en förändring i begravningsbruket, då grav-
fält av andra typer tycks visa kontinuitet.

4. Det (sannolika) upphörandet av bebyg­
gelsen i W Nyland under vikingatiden.

Det hittills mest omdiskuterade problemet
är att de olika tillbakagången och upphöran­
det av den österbottniska bebyggelsen. Ut­
vecklingen förklaras här som en följd av den
justiniantska böldpåse, en av de övriga Europa-
väldokumenterade epidemiom som härjade ca
540—590. Det starkt minskade antalet gra­
vor i Österbotten daterbara till merovingertiden, en följd av att de flera svåra och vidspridda epidemier kända
från det 1:a årtusendet e. Kr. skulle ha härjat
endast i de områden varifrån det finns skrift­
liga källor.