

CHAPTER 3

THE SETTLEMENT PATTERN

3.1 THE PROBLEM

3.1.1 A representative selection of sites:

The Eastern Settlement represents a unique archaeological potential, even if regarded in a world-wide perspective. There are several reasons for this:

1. The period of settlement was relatively short, i.e. something like five hundred years. Thus, contamination by constructions from before or after this period is a minor problem.
2. The settlement was abandoned nearly five hundred years ago, leaving the buildings to collapse virtually undisturbed.
3. The settlement was isolated in so far as it was surrounded by wilderness on all sides. There are, in other words, no neighboring settlements to create border problems.
4. The ruins have suffered surprisingly little damage: Some have been lost due to the eustatic rise of sea-level and the advancement of glacier lobes, while a few have been ruined by the construction of Eskimo dwellings, modern housing construction, sheep-farms and airstrips. Also, a number of the ruins show minor traces of disturbance, most probably from Thule / Inuit hunters searching for metal. But the number of destroyed ruins can hardly represent more than a small percentage of the total remains, making the material very near complete.
5. The area has been subject to a number of archaeological surveys, making a large amount of the material available for research.

Accordingly, the archaeological data is extremely representative of the medieval situation, compared with other regions.

Admittedly, there are also problems. Greenland is remote from most of the world, and communications within the country are undeveloped. Roads are practically non-existent, leaving most

travellers with few options (apart from their own feet) but boats and helicopters, with all this implies in Arctic regions. The area is thinly populated, and many of the ruin-groups lie in isolated areas.

To visit ruin-groups outside the immediate vicinity of modern population centers is therefore difficult, expensive and time-consuming. Hence, only a few archaeologists have had the opportunity to visit more than a handful of Norse ruin-groups. The rest of us have had to make do with shorter visits, and with basing our work on reports from archives and literature. The collecting of supplementary data is difficult.

There are also a number of archaeological problems to be faced, first of all concerning the chronology within the settlement period. The dating of a ruin-group is, in most cases, a tedious task, and requires extensive excavation. The overall lack of such excavations, and of radiocarbon datings, limits our knowledge of the inner chronology of the settlements, and reduces the validity of the material for numeric studies. This demands a critical scrutiny of the material at hand, and above all, a careful interpretation of the analyses' results.

3.1.2 Questions about the settlement pattern:

An important concept in this study is that the settlement pattern, as revealed by the archaeological material, conveys important information about the settlers' economy, organization and adaptation to the environment.

The task can therefore be specified as follows:

To uncover as much information as possible from the distributive pattern of the present ruins.

This can only be done with reference to our existing knowledge about the Norse Greenlanders, as derived from written sources and archaeological excavations. Hence the questions we ask are not created in a vacuum, but derive from the background of important issues in Norse Greenland research.

The distribution of ruin-group may, of course, give the picture of a static settlement, reflecting the population maximum. The fact that ruin-groups are found even in remote and barren areas has been used to support this view. Ove Bak, an amateur archaeologist who has surveyed a large part of the Eastern Settlement, writes:

"I have ...attempted to picture myself in the place of a Norse farmer... Where would you, as one of the landnáms-men, place your farm? Where would you place a second-generation farm? Where would you move, if you were the youngest son of a peasant on a second-generation farm? - Etc. - I soon realized that the country thus described had been fully settled." (Bak 70c:37, my translation).

It is equally possible that the ruin-groups hide traces of population movements.

Most theories concerning a supposed ecological crisis in Norse Greenland, whether supposed to be self-inflicted or not, seem to preclude a failure in the settlers' ability to adjust to the changing

environment.

Hence, we may assume that severe changes in the environment would normally have led to visible changes in the settlement pattern. And further, that it should be possible to register these changes, if indeed they took place. The lack of chronological evidence within the settlement period makes the task rather complicated.

I have listed four questions that I will attempt to answer:

1. Does the settlement pattern we observe concord with our present knowledge of the Norse economy, or does it reveal peculiar features in distribution and density?
2. Is it possible to identify the initial settlement areas, and to trace the further development of the settlement?
3. Are there signs indicating that centers of dense population shifted significantly, for instance from inland to coast?
4. Is it possible to distinguish administrative units, and to relate these to the total settlement pattern?

Obviously, these questions demand an evaluation of the settlement pattern at large. Before doing so, a more detailed presentation of the material is necessary.

3.2 THE MATERIAL

3.2.1 What is a "ruin-group"?

A ruin-group is exactly what the word implies, a site consisting of ruins, identified as Norse of origin.

Each group has been given an official letter prefix and a number; Ø referring to the Eastern Settlement (Østerbygden), M to the Middle Settlement (Mellebygden), and V to the Western (Vesterbygden). Thus the first ruin-group recorded by Daniel Bruun was given the number "Ø-1", the second "Ø-2", etc.

Surveyors seem to have tried to keep one "farm"-unit as the standard, while smaller groups close to a bigger unit often have been given a supplementary letter, for instance "Ø-2a".

Unfortunately, this practice has not been consistently followed, and the ruin-group numbers cannot be used directly for statistical analyses.

There is, in other words, no inherent connection between the terms "ruin-group" and "farm". A ruin-group may equally well represent a 'saeter' (shieling), an isolated barn, or a hunting station. Thus there are ruin-groups with as little as one ruin, and others with 30 - 40 ruins. This may appear alarming if the ruin-groups are to be used as statistical units (as they are in this book). These examples represent, however, the extremes. Thus it would be

unwise to ignore the fact that the great majority of the ruin-groups represent independent settlement units. Experience shows that in many cases where a single ruin has been discovered, more ruins will appear when the area is given a thorough search.

The statistical implications of the diversity of this material is discussed later.

In this book, the use of related designations like ruin-group, farm, "farm", and holding may appear confusing to the reader. I have, however, tried to maintain a strict adherence to the use of these terms:

Ruin-group - refers strictly to sites with a specific ruin-group number, as used in the Danish National Museum surveys. It must be considered a technical archaeological term.

Farm - is used when referring to such units in historic documents, or when discussing rural settlement on a general level.

"Farm" - does not refer to real farms, but signifies a reconstruction; for instance a number of ruin-groups from which identified 'saeters' are subtracted.

Holding - is a socio-economic unit which may be identical to a farm, although there were obviously Norse farms with several holdings.

The Kalaallit Nunaata Katersugaasivia (The Greenland Museum) has recently created a system of "preservation numbers" to substitute the old ruin-group numbers. A cross reference list has been published, for the Eastern Settlement limited to the ruin-group numbers Ø-1 - 383 (Berglund 86:129-134). The relevant part of this list is included in this book, Appendix II.

3.2.2 The number of ruin-groups:

In "Grænlands annál" (which was probably compiled by Jón Gudmundsson "the learned", and later somewhat changed by Björn Jónsson of Skardsá (1623) (Halldórsson 78:449)) there were said to be 190 farms in the Eastern Settlement, while the number in the Western Settlement is said to be 90 (GHM III:228).

(In the original text, the word "farm" is written "bygda", directly translated "settlement" or "settled". There is no reason to doubt that the author actually means farms in this case. Still, the exact interpretation of the words in these texts is not as straightforward as it may seem: A related expression "bij", pl. "bije", is used in the "Description of Greenland" by Ivar Baardson (Jónsson 30a:19 & 22) concerning Skagafiort and Vatnsdal. Knud J. Krogh uses the modern word "bygd", i.e. settlement, in his translation of Ivar Baardson, in line with previous interpretations (Krogh 82a:126).

In my opinion, it is unclear whether this word refers to a group of settlements or a single farm. In modern Scandinavian the meaning of these words have been

shifted. In Danish and Norwegian "bygd" means "settlement", i.e. "a group of farms", and "by" means "town" or "city". In Swedish, however, "by" means "a farm", usually one with several holdings, more or less a parallel to the term "named farm" as used elsewhere in this book.

In modern Icelandic, the word is "bær" (also Bæjar, bæir), which means "farm", sometimes "the farm houses", "settlement" in the meaning "a group of farms", and "town" or "city" (Blöndal 24:122). A related word "byr" is a poetic expression, and hence probably old. It has a similar meaning as "bær", but in addition it may denote "settlement" in a general sense, and even "inhabited area", in contrast to "óbygdir" - the uninhabited areas, i.e. the desert.

In the Norwegian Law of King Christian IV from 1604, the word "by", pl. "bye", is used as a synonym for the word "gaard", pl. "gaarde", meaning "farm" (for instance in Chapters 29 & 52, see the edition by Hallager & Brandt 55:131 & 149). However, other near-contemporary sources, such as the records of Bishop Jens Nilssøn from 1574 to 1597, and the Hamar Chronicle manuscripts (the oldest from before 1617) seem to use the word "gaard" (Nielsen 85, Pettersen 86). There is in other words a fair chance that Baardson's word "bij" actually means "farm", but a wider study of the use of this word is required to reach valid conclusions.)

It is written in the text that this section of Grænlands annál was taken from an older source

Original text: "Grønlandiæ vetus chorographia á afgömlu kveri", (from GHM III:226, Jónsson 98:319, see Jansen 72:69 note 82).

Nothing certain is known about the dating of this older source. There is a possibility that the original manuscript was in Latin (Jansen loc. cit.).

It has been suggested that the number of farms in the Eastern Settlement should be corrected to 210, as the 'hundred' could refer to the old designation 'storhundre' (great hundred); a unit of 120 (Krogh 82a:65).

In the text the number is given in Roman numerals: clxxx. The "great hundred" was often written "c", but the actual number the figure represents is often unclear (KLN VII:190). In the D version in GHM the figure 190 is given in Arabic figures. The question is therefore open indeed.

Attempts to correlate the number of ruin-groups in the two settlements with the number of farms in this text are, of course, tempting, but highly uncertain.

First of all, we do not know when the original text was written, and hence when the count was made.

Second, we do not know the intent behind the original text. It may, for instance, have originated as a tax-list, in which case the clerical men and the poorer families would have been omitted. (In Iceland, the number of tax-paying farmers appear to have decreased

from A.D. 1095 to 1311, possibly because of increasing tenantry (Hastrup 85:173).

Thus the text can at best supply us with the minimum figures of farms or house-holds (see Sections 5.3.1 & 9.5.3).

The number of ruin-groups in the Eastern Settlement has increased steadily through the results of archaeological surveys, carried out over a period of more than one hundred years. As a result, the registered ruin-groups have risen to a number far beyond the indicated 190 (or 210) farms.

In his book from 1982, Krogh estimated there were around 250 farms in the Eastern settlement (Krogh 82a:65). My demographic models from 1986 were based on this estimate (Keller 86:146).

A close inspection of Krogh's book, however, reveals that the number of ruin-groups marked on his maps far exceeds the number mentioned in his text. Evidently, the added number of ruin-groups provided by the surveys made in 1980-81, just before the book hit the press, were included in the maps. This added nearly 100 ruin-groups to the list, mainly in the Igalikup Kangerlua (Vatnahverfi) area.

There are (April 1989) no reports available from these latest surveys. Krogh has in a letter to the present author kindly informed that the additional surveys largely confirm the picture of the older surveys as regards the number of ruins in each ruin-group, i.e. with big and small groups among each other. Krogh states that some groups are so small that they hardly represent independent farms (letter of Feb. 20. 1989).

To establish a basis for the analyses presented in this book, I compared Krogh's map with the official maps from the Danish National Museum in Copenhagen, and with material collected by Albrethsen and myself (Albrethsen & Keller 86). These minor adjustments bring the present number of ruin-groups in the Eastern Settlement to 444. (The Middle Settlement is included under the Eastern Settlement).

In an official table of ruin-group numbers from 1986, 13 sites are listed as "not authenticated Norse sites" (Berglund 86:129-134, see Appendix II). They are omitted here.

3.2.3 The distribution of ruin-groups:

PLATE 5 shows the location of all registered ruin-groups in the Eastern Settlement (below).

It will appear that even with a small-scale map it is difficult to properly understand the distribution of the ruin-groups in the landscape.

To obtain a better basis for analyses, I transposed a grid-frame of 10 by 10 km squares on the map. The "grid-north" was placed parallel to the 45° W meridian. This made it possible to count the number of ruin-groups in each square, thus creating the basis for statistical studies.

When counting the number of ruin-groups within the grid, the 444 ruin-groups appeared to occupy 112 "inhabited" squares, giving a populated area of 11.200 square kilometers in total.

The size of each ruin-group was not taken into account in this analyses, mainly because of the varying nature of the information found in the survey records.

The lack of sufficient information in this regard will of course reduce the statistical significance of the analyses to come. The ruin-groups must, statistically speaking, be considered "dirty data", and should be treated with great caution.

This is a limitation of which I am well aware, and which can only be regretted. As a consequence, I have kept the statistical analyses on an extremely elementary level. This way, I hope that any uncertainties emerging from the "dirty data" will be easy to recognize, even to the statistically ignorant.

It would of course have been far better to use the number of buildings, or even better, the number of square meters of building area as the basis for the analyses. Such data are, however, only available for a few, limited areas.

If we are to get an overall picture of the situation in the Eastern Settlement today, we are, unfortunately, compelled to use the ruin-groups as our main counting unit.

This may not be fully representative for the number of settlements in the area, but it is at least representative for the number of ruin-groups!

Still, it should be possible to get a picture of the main features of the settlement based on the number of ruin-groups alone; a picture significant enough to be discussed. After all, any ruin is a reflection of medieval activity, and indicates a place of importance to the Norse settlers.

3.2.4 The ruin-group distribution map:

In PLATE 6 I have presented the ruin-group distribution of the Eastern Settlement, using four types of hatching, separated by iso-lines (below).

Each type of hatching contains 25 % of the ruin-groups. The highest density has the darkest signature.

To construct the iso-lines, I used a 20 x 20 km sliding square that was moved in steps of 10 km.s. This way, each ruin-group was counted four times, giving a total of 1.776 counting-points.

The picture that emerged was quite interesting:

As expected, the highest ruin-group density was found around the inner parts of the Tunulliarfik (Eiriksfjord), near Qassiarsuk (Brattahlid), and in the area south of Igalikup Kangerlua (Vatnahverfi).

These areas contain a number of ruin-groups situated in remote inland areas, several of which should probably be regarded as 'saeters', i.e. stations in a transhumance system, and not regular settlements (Albrethsen & Keller 86, see Section 4.2 below).

Further, there is a concentration around the Uunatoq fjord, and another around the outer part of the Tasermit fjord.

Most scholars have held the view, that the highest population density was at the inner parts of the fjords. Equally, it has been assumed that the settlement started there, later expanding towards the coast (Roussell 41:12, see Section 6.5.2 below).

PLATE 6

GREENLAND
THE EASTERN SETTLEMENT
DENSITY OF NORSE GROUPS OF RUINS
Each type of hatching covering
25 % of the population
Latest survey 1981



Christian Keller

On this background it is especially interesting to note that an apparent "ridge" with a relatively high ruin-group density can be observed, stretching from the area around Narsaq and south to the Uunatoq.

This indicates that the outer parts of the fjords were relatively important settlement areas. Whether this is a feature from the initial *landnám* phase, or a later development, will be discussed later (Section 6.4).

3.3 SETTLEMENT DENSITY

3.3.1 Function and chronology:

The question of settlement density is important from several reasons, some of which will be discussed below. But before embarking upon this discussion, there are a number of basic problems to be considered.

Obviously, settlement density cannot be directly derived from the ruin-group density.

First of all, the ruin-groups vary considerably in size.

Second, several of the ruin-groups may have been intended for seasonal occupation, in connection with transhumance, hunting, fishing, sheep-sharing, etc.

Third, we have the problem of chronology. It may of course be argued that the ruin-group pattern reflects the population maximum, but this can only remain an assumption.

There are indications that Norse Greenland farms may have been moved, thus leaving a "double imprint" of ruins. Such movement is known to have taken place in Iceland after the *landnám* (Jóhannesson 69:28).

Unfortunately, the few archaeological investigations carried out in the Eastern Settlement cannot provide us with any real help with these problems.

Instead, I have chosen to base my studies on an analysis of the ruin-groups as a whole, and then gradually approach the problems of function and chronology along the way. The different analyses will, I hope, shed some light on these issues.

3.3.2 Questions to the material:

Human ecology is basically a question of balance between demands and resources.

If the demands of the population exceed the carrying capacity of a given area, a shortage of resources will appear. In this respect it does not matter whether this shortage was the result of increasing demands due to population growth, excessive tax-pressure, a lowering of the carrying capacity because of climatic deterioration or overgrazing (as suggested by Nørlund 24:228-244, Roussell 41:9-10, Werenskiold 45, McGovern 80b & 81, McGovern et al. 85, Krogh 82a:183, Keller 86). In all these cases, the picture would be the same.

If we put aside, for the moment, the question of political and economic centers, we should expect to find that the settlement density reveals something about resource exploitation. Accordingly,

high settlement density would point to the most productive areas, while low settlement density would indicate less productive areas. Thus the settlement density can give us an idea of the degree of stress on these areas.

Equally, we would expect that a crisis in agricultural production or animal husbandry would force people towards areas rich in marine resources, such as fish and seals, thus releasing migrations towards the outer coast.

On the other hand, we might expect that fear of hostile foreigners, whether Eskimos or European pirates, would encourage settlements in the inner and least accessible areas (Bruun 18:134).

The now questioned house-type chronology of Roussell actually indicated a movement inland during the later stages of settlement, although he himself rejected the "hiding-theory" (Roussell 41:2-3, Vebæk 43:69).

If such massive strategies were followed by a large number of people, and over a certain span of time, it should be expected to leave marks on the settlement pattern, and hence in the archaeological material.

Finally, the apparent desertion of the Western Settlement around 1350, might have forced this population to move south to the Eastern Settlement (Berglund 86:117). Such a population impact should be expected to leave traces in the settlement pattern.

The distribution pattern of ruin-groups ought to reveal such settlement shifts, if indeed these imply the movements of a significant number of people, and not only a handful of families during the last stages of settlement.

The map in PLATE 6 (above) clearly indicates where the areas with high ruin-group density were located. How dense they actually were, is another matter. We may therefore raise the following questions.

1. Was the settlement pattern unusually dense compared to other rural medieval settlements in similar environments?
2. Was the settlement pattern dense in relation to the available resources in this part of Greenland?

In the following I will try to establish a basis for answering these questions.

3.3.3 Estimates of ruin-group density:

PLATE 7 (below) is a bar graph showing the number of 10 x 10 km squares with varying ruin-group density. It appears that 28 squares contain one ruin-group each, while only one square has the unique density of 28 ruin-groups. This square is situated in the Qassiarsuk (Brattahlid) area.

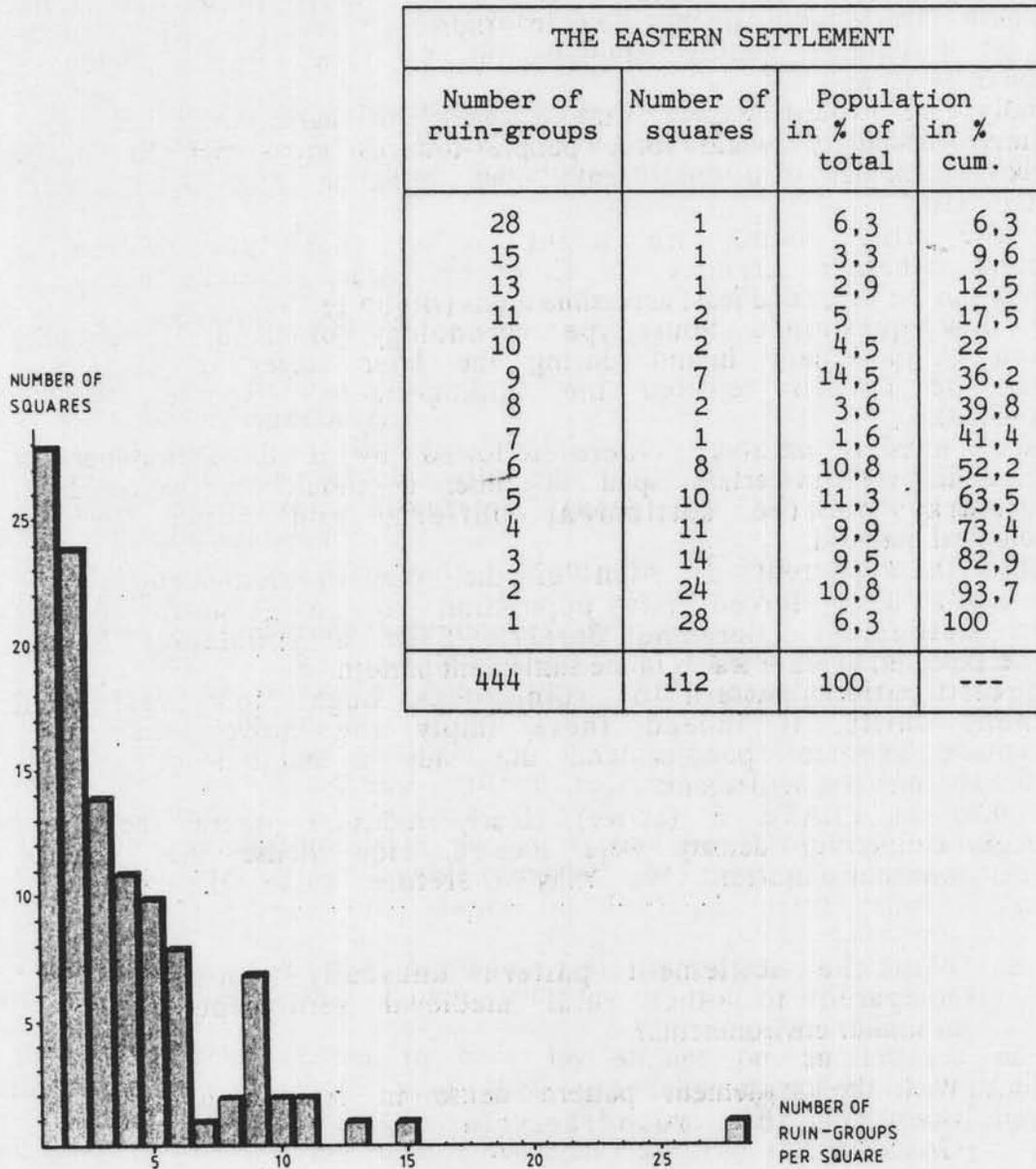


PLATE 7

Bar graph showing the number of squares with various numbers of ruin-groups.

PLATE 8 (below) is a bar-graph showing the distribution of the ruin-group population in percent to squares with varying population density.

It is apparent that a substantial number of the ruin-groups lie in areas with 1 - 6 groups per square, which means in thinly populated areas indeed.

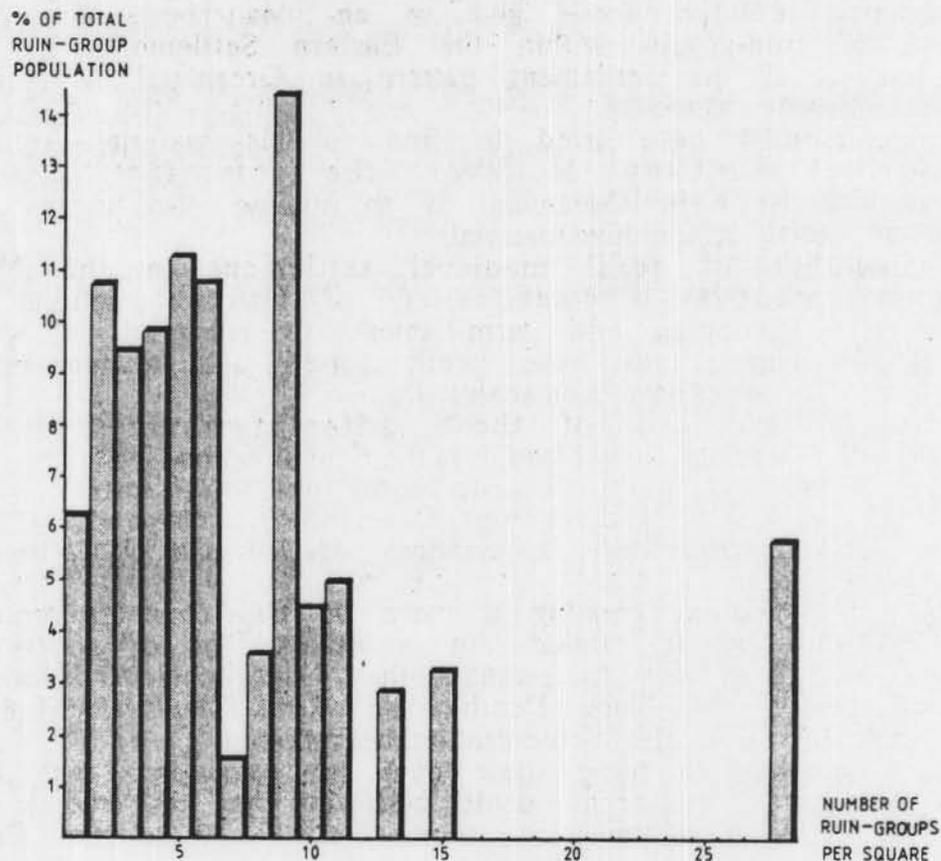


PLATE 8

Bar graph showing the percentage of ruin-groups as distributed in squares of varying population density. Based on the figures from the table in Plate 7.

(The reader may have noticed a slight tendency towards bimodal distribution: One type of settlement in areas with 1 - 6 ruin-groups per square, and another type in areas with 7 - 10 ruin-groups per square. I have tested the significance of this apparent tendency by moving the grid-frame 5 km, and by using squares of different sizes. The tests showed that the bimodal pattern is accidental, and the picture will change considerably by moving the grid.)

3.4 SETTLEMENT DENSITY COMPARED TO OTHER AREAS

3.4.1 Background:

The diagrams presented above give us an idea about the relative distribution of ruin-groups within the Eastern Settlement, but they do not tell us if the settlement pattern in Greenland is unusually dense for a medieval rural society.

For comparison I have tried to find suitable material from the other Nordic countries. However, the very fact that the archaeological material in Greenland is so unique also means it is difficult to find directly comparative material.

Our knowledge of rural medieval settlement in the Nordic countries is based on a great variety of historical sources. Tax lists, cadasters, diplomae and farm-names are recorded in writing. Archaeological investigations have been carried out in farm-mounds and ruins, and pollen series have been analyzed.

By using a synthesis of these different sources, indirect comparisons with Greenland should lead us in the right direction.

An obvious starting point was to look into the results of the "Scandinavian Research Project on Deserted Farms and Villages" (Nasjonale forskningsoversikter 72, Sandnes & Salvesen 78, Gissel et al. 81, Hansen (ed.) 81).

This project aimed at creating a more or less common procedure of investigation, and it carried out a number of local case-studies. Its main goal was to estimate the "High Medieval Maximum" (the period before the Black Death), the "Late Medieval Minimum" (after the Black Death), and the re-colonization that followed.

The main problem in using these data for comparison with Norse Greenland is that the areas dealt with in the case-studies were quite small. None of them were more than 10 % of the Eastern Settlement in size.

Another problem is that all investigated areas were located south of the "Cereal Border", i.e. the northern climatic limit for cereal production (see Kolsrud 61:89). This is of course unfavorable, as the Norse settlements in Greenland in most practical respects lay north of this border (Krogh 82:103-105).

Still, the comparison brought to light a number of interesting points.

3.4.2 Vestvågøy:

The island Vestvågøy is situated in the Lofoten archipelago in northern Norway, just above latitude 68 N.

The Viking Period settlement has been investigated by Olav Sverre Johansen (82:46), and the medieval settlement by Alf Ragnar Nielssen (81:335). Both periods have been discussed by Reidar Bertelsen (85).

The island has the most favorable conditions for cereal production in Lofoten, and the medieval economy was based on a combination of agriculture, animal husbandry and fishing, the latter for local consumption as well as for export.

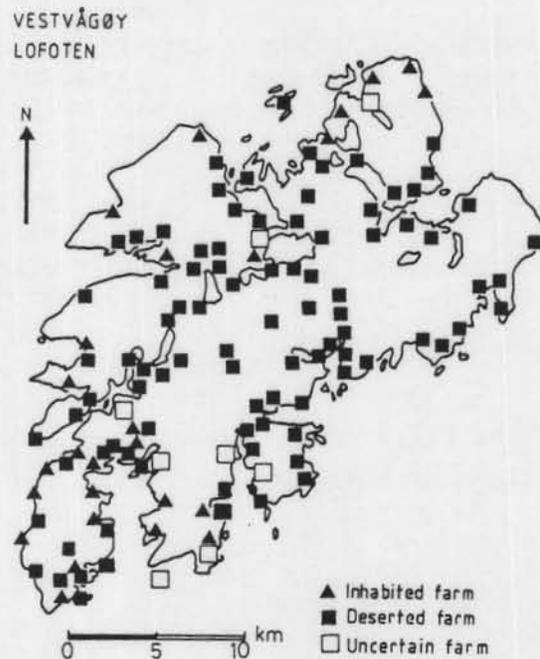
During the High Middle Ages the settlement maximum is estimated at 129 "named farms", 5 of which have not been positively located (Nielssen in: Hansen (ed.) 81:366).

The term "named-farm" is translated from the Norwegian term

'navnegård', meaning a farm with a separate name. Most such farms have later been divided into smaller units, usually one-family holdings, often bearing the same name (Sandnes in Gissel 81:90). Usually the divided farm was later given an additional identifier to its name, like "Northern", "Southern", "Upper", "Lower", "Big", "Small", etc.

Among Norwegian historians the named-farm is generally regarded as the most consistent counting unit.

The desertion frequency in Vestvågøy in the Late Middle Ages was between 74 and 80 %.



In order to compare the data with the Eastern Settlement in Greenland, I erected a grid with 10 x 10 kilometer squares on the map of Vestvågøy made by Nielssen (op. cit.:366) PLATE 9.

(The map in his paper is shown to the wrong scale, and is corrected by me).

This gave a total of 110 located medieval farmsites, distributed over 9 "populated" squares, giving an average of 12,22 farmsites per 100 square kilometers.

On average, the settlement density in the Eastern Settlement gave a relation of 1:3 compared to Vestvågøy.

PLATE 9

Inhabited and deserted farms in Vestvågøy, Northern Norway in the Late Middle Ages.
(Based on Nielssen 81:366).

The relative distribution of settlement density is given as a table and as cumulative curves in PLATE 11 (below).

3.4.3 Salten fjerding:

This area is situated south of Lofoten, just above latitude 67 N.

The medieval settlement in Salten was investigated by Ragnhild Aarsæther as part of the Scandinavian Research Project on Deserted Farms and Villages (Aarsæther in: Hansen (ed.) 81:394). The economy in the area has traditionally been based on cereal cultivation, animal husbandry and fishing. An important feature of the economy is that the male population of Salten regularly participated in commercial seasonal fishing in Lofoten, i.e. outside the investigation-area. As with Vestvågøy and the Eastern Settlement, I erected a grid of 10 x 10 kilometers squares on Aarsæther's map (op.cit.: 406-407), see PLATE 10 next page.

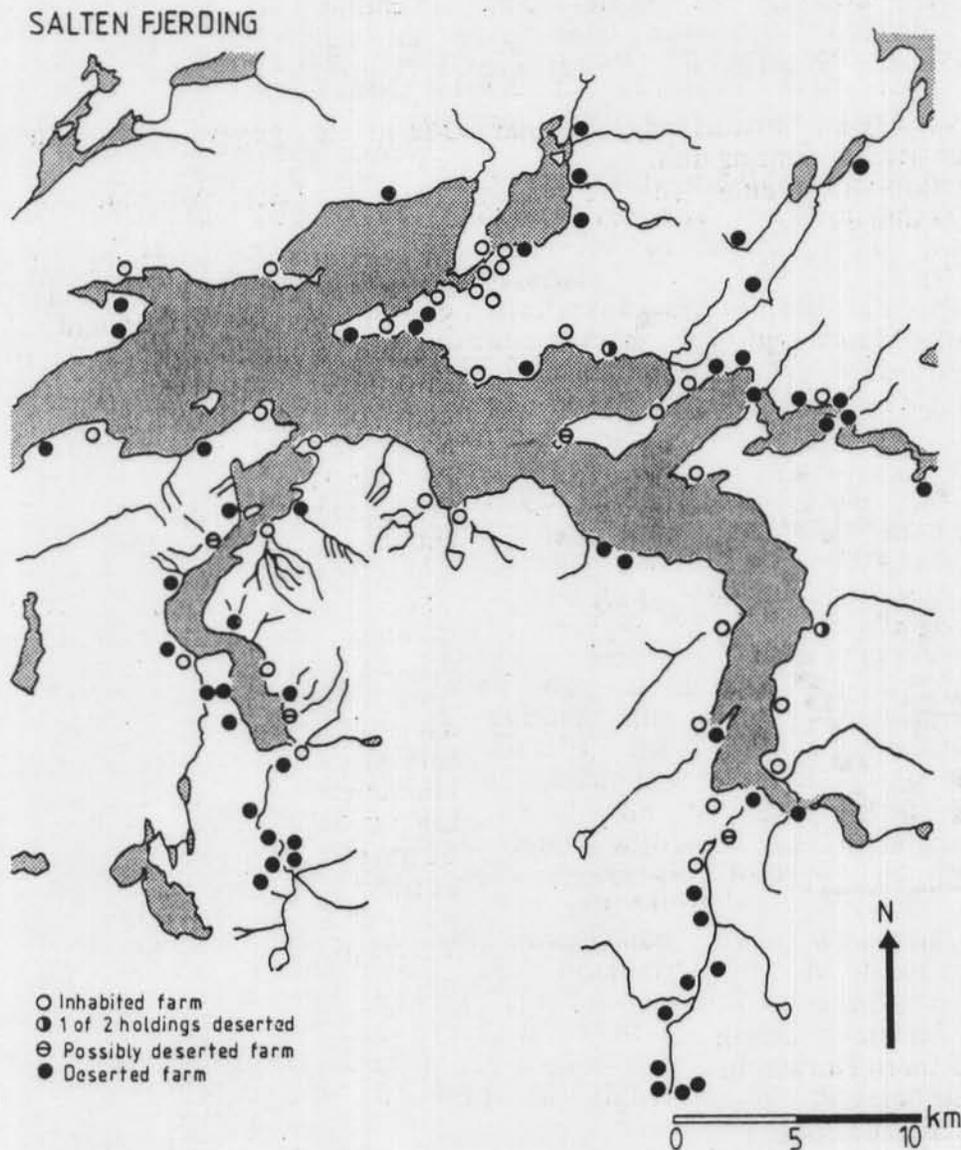


PLATE 10

Inhabited and deserted Late Medieval named farms in Salten fjording, Northern Norway. From Arsether 81:394.

This gave a total of 73 located named farms distributed over 10 "populated" squares, giving an average density of 7,3 farmsites per 100 square kilometers. The relationship between the average settlement density in the Eastern Settlement and Salten fjording thus was calculated to 1:1,8.

The relative distribution of settlement density is presented as cumulative curves in PLATE 11 (below).

3.4.4 The comparison of farms:

When comparing the two areas in Northern Norway with the Eastern Settlement in Greenland there are certain features that need to be considered.

First, the two Norwegian areas are small, and actually represent less than 10 % of the area making up the Eastern Settlement. Still, they were among the largest communities investigated by the Nordic Project on Desertion, and thus provide the best comparative material available for our purposes.

Second, contrary to Norse Greenland, the economy of the Norwegian areas also involved local cereal production.

Third, people in the two Norwegian areas were engaged in commercial fishing activity, which favored import of food from areas further south, and thus, contrary to Norse Greenland, cannot be regarded as closed economic systems.

These are important differences which must be kept in mind when comparing these areas with Greenland.

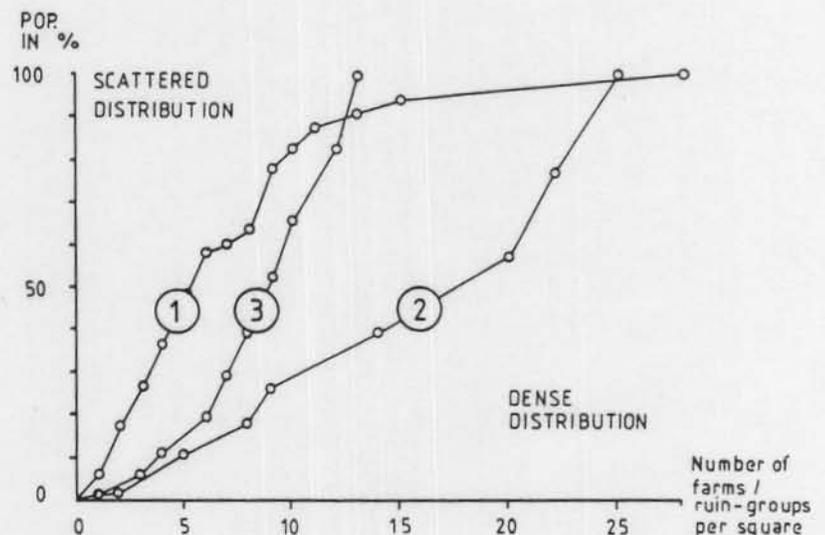


PLATE 11

Cumulative diagram showing:

1. Ruin-groups in the Eastern Settlement, Greenland
2. Medieval named farms in Vestvågøy, Northern Norway
3. Medieval named farms in Salten fjerding, Northern Norway

The population is given in percent on the vertical axis, and the squares are arranged according to the number of individuals per square on the horizontal axis. The squares are 10 x 10 kilometers for all areas. The diagram demonstrates that the Eastern settlement has the lowest settlement density for 90 % of its ruin-group population.

INDIVIDUALS PER SQUARE	NUMBER OF SQUARES	POPULATION IN %	POPULATION IN % CUMULATIVE
The Eastern Settlement, ruin-groups:			
1	28	6,3	6,3
2	14	10,8	17,1
3	14	9,5	26,6
4	11	9,9	36,5
5	10	11,3	47,8
6	8	10,8	58,6
7	1	1,6	60,2
8	2	3,6	63,8
9	7	14,2	78
10	2	4,5	82,5
11	2	5	87,5
13	1	2,9	90,4
15	1	3,3	93,7
28	1	6,3	100
444	112	100	-----
Vestvågøy, named farms:			
2	1	1,8	1,8
5	2	9,1	10,9
8	1	7,3	18,2
9	1	8,2	26,4
14	1	12,7	39,1
20	1	18,2	57,3
22	1	20	77,3
25	1	22,7	100
110	9	100	-----
Salten fjerding, named farms:			
1	1	1,4	1,4
3	1	4,1	5,1
4	1	5,5	11
6	1	8,2	19,2
7	1	9,6	28,8
8	1	11	39,8
9	1	12,3	52,1
10	1	13,7	65,8
12	1	16,4	82,2
13	1	17,8	100
73	10	100	-----

PLATE 11 is a cumulative diagram where the populations of ruin-groups and named-farms are presented in percent on the vertical axis, thus allowing comparison.

On the horizontal axis the population density, i.e. the number of units per square, is presented.

It appears that the Eastern Settlement (1) has the lowest density for 90 % of its population.

The area Salten fjerding (3) shows great similarities in distribution, but lacks the very low and very high densities of the Eastern Settlement.

Finally, Vestvågøy (2) generally has a more dense settlement pattern than the other two. For Vestvågøy, almost the whole population has a markedly higher settlement density than that of the Eastern Settlement.

For both areas the difference is at the greatest in the thinly populated areas, while the Eastern Settlement actually can "compete" concerning the highest concentration.

In spite of the differences in population size, type of economy etc., a clear tendency appears: The Eastern Settlement has obviously the most widespread settlement pattern, but the population also shows a tendency towards concentrations which equals or slightly exceeds that of the two Norwegian areas.

3.4.5 The comparison of holdings:

At this point we run into a problem. The comparison above is based on units that are not directly comparable.

As previously mentioned, the estimates of the Eastern Settlement are based on ruin-groups as the counting unit, a unit which may vary considerably in size, to say the least. (The details are discussed later on).

The populations of the two Norwegian areas are, on the other hand, based on named-farms. And even if these farms originated as separate economic units, most of them were split into two or more holdings by the time of the High Medieval Maximum.

The partition quotient, i.e. the average number of holdings per named-farm, can roughly be estimated to 2,7 in Salten fjerding (Aarsether 81:408).

No estimates of the partition quotient in Vestvågøy is given for the medieval period, but Johansen (82) has estimated a relatively large population in the Viking Period. Even if his estimate has been indirectly criticized for being too high (Bertelsen 85:119), it is likely that the partition quotient for the Middle Ages was considerable. If we estimate a partition quotient of 2 holdings per farm, we are probably safe, though this figure may be on the low side.

There are indications that partitioning was quite uneven, with several holdings per farm in the best agricultural areas, while the more marginal farms probably remained undivided (Aarsether loc.cit).

This is a most important observation, indicating that only the more productive areas could carry farms with more than one holding.

If we look at the Eastern Settlement, there are a few indications of farms being divided into several holdings.

The ruin-group Ø-34 in the Qorlortup Itinnera consists of two "sets" of buildings, each set making up pairs of similar constructions, such as two sheep sheds, two barns, two 'skemmas' (storage-houses), etc. (Archive material from the Nordic Archaeological Project 1976 & 77, my survey). See PLATE 12 below.

The ruin-group Ø-33 at Qorlortoq has a different lay-out, with two similar farms lying on each side of a little brook. (Archive material from the Nordic Archaeological Project 1976 & 77).

The farm site at Qassiarsuk (Brattahlid) appears to consist of

three different farms, each with a separate ruin group number, Ø-29, Ø-29a and Ø-29b.

This results in the somewhat confusing situation that while the ruin-groups Ø-33 and Ø-34 appear to have a partition quotient of 2, the Qassiarsuk farms seem undivided as far as ruin-group numbers are concerned. They may, however, have originated from the same farm, thus having a "real" partition quotient of 3.

Another problem in Greenland is the very large, complex ruin-groups. Like the farm mounds in northern Norway, they may have consisted of several holdings, but this cannot be proven without extensive archaeological excavations.

Among the 7 ruin-groups that were surveyed by the Nordic Archaeological Project in the Qorlortup Itinnera, only the two mentioned above were clearly divided.

As all these 7 ruin-groups were situated in the very best part of the Eastern Settlement, it should be fair to estimate that the partition quotient of the marginal areas were lower. Accordingly, we may assume that the average partition quotient of the Eastern Settlement was considerably lower than in the two comparative areas in Norway.

I mentioned previously, however, that not all ruin-groups were independent farms. Some of them were obviously 'saeters', especially a number of those lying far inland. Thus, two registered ruin-groups may actually make up one farm. Until further data is available, I find the only "safe" assumption is to say that the divided farms and the 'saeters' neutralize each other, and accordingly I have counted the 444 ruin-groups as 444 holdings.

My personal impression of the material is that this is probably too high an estimate, but for the time being I can see no way at arriving at safer figures.

From this basis I have made a tentative diagram showing the numbers of farms, the estimated numbers of holdings and the average density of holdings in the three areas:

	Ruin-groups named farms	Partition quotient	Number of holdings	Number of squares	Average density per 100 km ² sq.
Eastern S.	444	1 ?	444 ?	112	3,96 ?
Vestvågöy	110	2 ?	220 ?	9	24,44 ?
Salten fj.	73	2,7	197	10	19,70

The density of holdings in the Eastern Settlement, compared to those of the other two areas have on average a ratio of 1:5 and 1:6.

The relative density of ruin-groups and named-farms are 1:1,8 and 1:3.

Taken with all possible reservation, the figures indicate that the settlement density in the Eastern Settlement was low, compared to the other two areas.

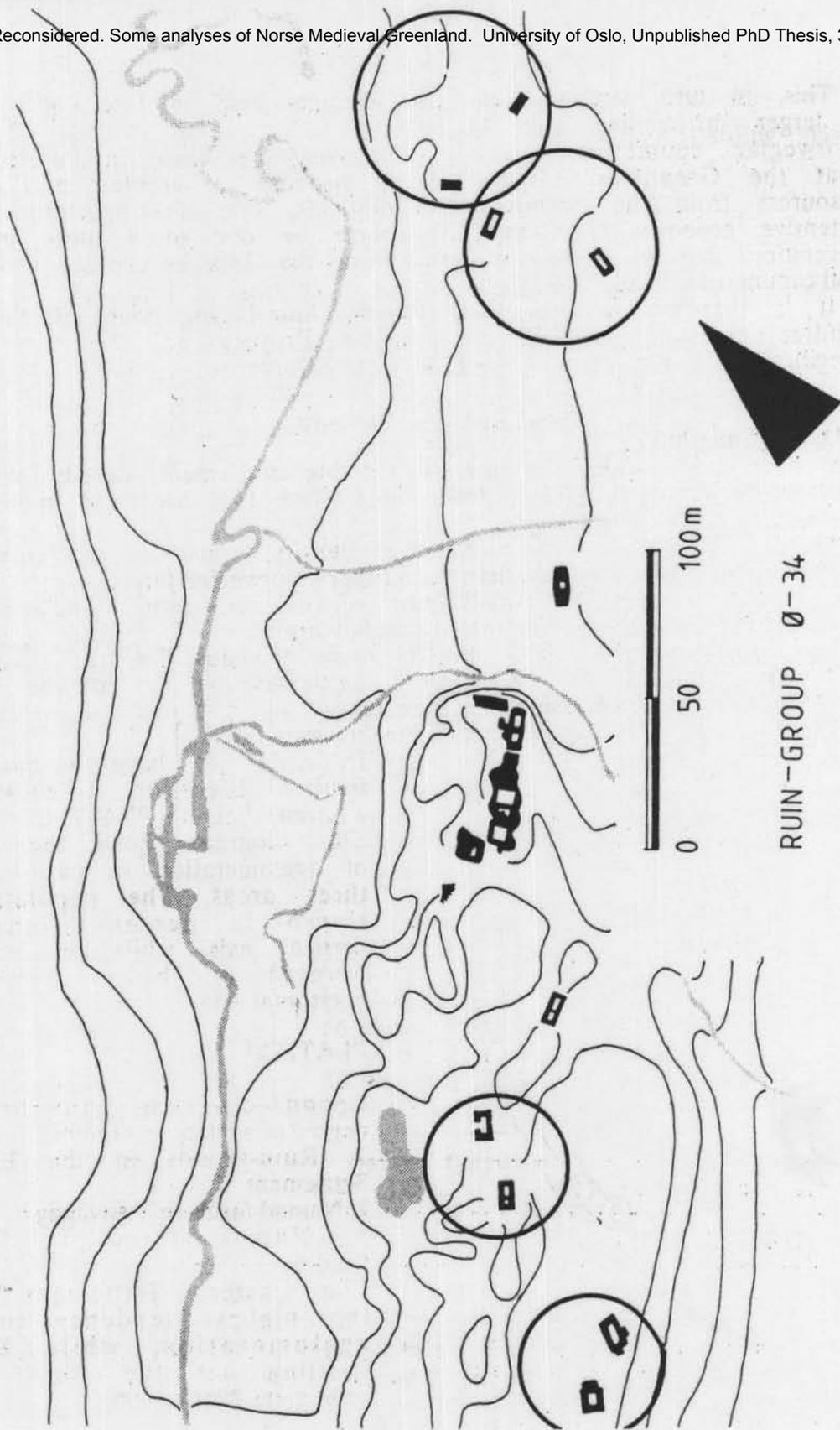


PLATE 12

Ruin-group Ø-34 in Qordlortup Itinnera, my survey (NAE 76). The site features 2 dry stone houses, 2 sheep sheds, ect. Ruins that appear in such "pairs" are encircled.

This, in turn, suggests that the average farm in Greenland needed a larger surrounding area to support its economy than its Northern Norwegian counterparts. The reason for this must undoubtedly be that the Greenland farm had to procure a greater part of its resources from the pastures and outfields, thus making for a more extensive economy. This may of course be due to a more marginal vegetation, but it may also stem from the lack of cereal production and commercial fishing.

It is therefore a pity that, to my knowledge, none of the case studies carried out by the Nordic Project on Desertion have specifically dealt with areas north of the "Cereal Border".

3.4.6 Agglomerations:

We have seen from the graphs showing settlement density that the Eastern Settlement differed from the other two areas in more than one respect.

Besides having a lower average density, most of its ruin-group population was more scattered than the northern Norwegian farms. On the other hand, a small part of its ruin-group population was more heavily concentrated than the Norwegian farms.

The great variation in density may perhaps be the result of differences in size. As the Eastern Settlement is by far the largest, the variations may be correspondingly greater.

This might not be the whole explanation, however.

In order to have a basis for further discussion, I constructed a Lorenz diagram, PLATE 13.

This diagram shows the degree of agglomeration in each of the three areas. The population is shown in percent along the vertical axis, while the area in percent is shown along the horizontal axis.

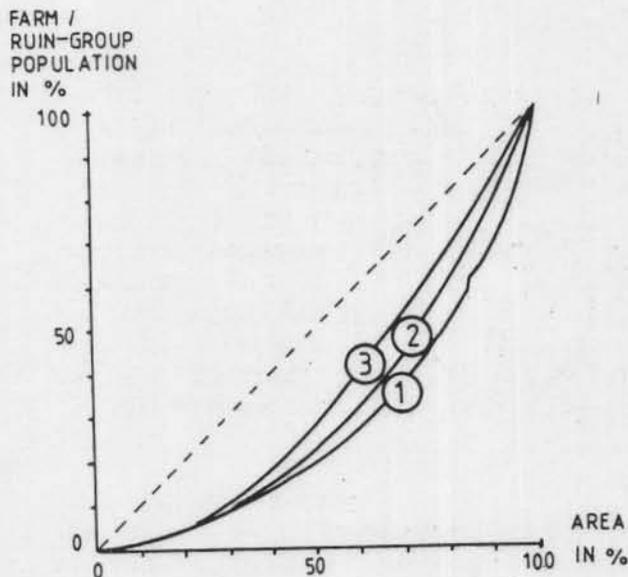


PLATE 13

Lorenz-diagram showing the degree of agglomeration for:

1. Ruin-groups in the Eastern Settlement
2. Named farms in Vestvågøy
3. Named farms in Salten fjerding

The Eastern Settlement shows the highest tendency towards agglomeration, while Salten fjerding has the most linear settlement distribution.

A linear distribution, with for instance 10 % of the population inhabiting 10 % of the area would create a straight regression line.

The more the curve bends towards the lower right hand corner, the greater the tendency towards concentrations.

The Eastern Settlement has the greatest tendency towards

agglomerations, with a quotient of 0,46.

Vestvågøy had a quotient of 0,38, while the Salten fjerding has the most linear distribution with 0,30.

Salten fjerding	Vestvågøy	The Eastern Settlement
8.7	8.0	

SQUARES		POPULATION	
number of	cumulative percent	per square	cumulative percent
The Eastern Settlement			
28	25	1	6,3
24	46,4	2	17,1
14	58,9	3	26,6
11	68,7	4	36,5
10	77,6	5	47,8
8	84,7	6	58,6
1	85,6	7	60,2
2	87,4	8	63,8
7	93,7	9	78
2	95,5	10	82,5
2	97,3	11	87,5
1	98,2	13	90,4
1	99,1	15	93,7
1	100	28	100
Vestvågøy			
1	11,1	2	1,8
2	33,3	5	10,9
1	44,4	8	18,2
1	55,6	9	26,4
1	66,7	14	39,1
1	77,8	20	57,3
1	88,9	22	77,3
1	100	25	100
Salten fjerding			
1	10	1	1,4
1	20	3	5,5
1	30	4	11
1	40	6	19,2
1	50	7	28,8
1	60	8	39,8
1	70	9	52,1
1	80	10	65,8
1	90	12	82,2
1	100	13	100

Continued overleaf...

The table below shows the average settlement density and the agglomeration quotient for all three areas.

	The Eastern Settlement	Vestvågöy	Salten fjerding
Total population	444	110	73
Area in 100 km ²	112	9	10
Average density	3,96	12,22	7,3
Aggl. quotient	0,46	0,38	0,3

3.4.7 The results of the comparison:

Much can be said against comparisons of this type, and their results must indeed be viewed with caution.

There are, of course, a number of spatial analytic methods which might have allowed a closer comparison than made here. The method of analysis employed above has, however, one distinct advantage in that no other variables but distribution are used.

There are for instance no built-in assumptions that the ruin-group distribution is linked to valleys, coastlines or vegetational resources. The analysis is in other words "objective" in a limited sense.

Later in this book, deeper analyses will be made, but for the present, the following conclusions can be made:

1. The ruin-group density of the Eastern Settlement seems much lower compared with than the farm density of the other areas.
2. An attempted estimate of the density of holdings increased the difference more than twofold, but this estimate is also far more unreliable than the one based on farms and ruin-groups.
3. The tendency towards agglomerations in the Eastern Settlement is somewhat surprising, and is worth regarding more closely.

Even if these results are of a very general nature, they seem to reveal some interesting characteristics of the Norse Greenland settlement pattern and distribution. The great variety in settlement density must eventually lead us to the question of whether this pattern reflected resource distribution alone, or whether it was also the result of political factors. These and related questions will be discussed later.