CHAPTER 5

SETTLEMENT AND CHRONOLOGY

5.1 THE PROBLEM

Hitherto, the ruin-group material has been treated as one chronological unit. This can be justified for the types of analyses made so far, but it is hardly satisfactory for a deeper understanding of the history of the settlement.

This is especially relevant, since a key factor in the discussion of Norse Greenland is **change**. Central questions in this debate are connected to climatic change, ecological change, economic change, and political change. The aspect of time is, in other words, crucial.

Unfortunately, a reliable ruin-group chronology is not yet established. Previously accepted systems of evolutionary typology have lately lost much of their credibility. Thus it is difficult to suggest the dating of a ruin-group from the surface appearance of the ruins. Only a fraction of the ruin-groups have been subject to archaeological excavation, and very little of the excavated material has been dated. Our knowledge about the settlement development and chronology is therefore scanty indeed. Still, an attempt to give an outline of the chronological development must be made.

To do this, I will first discuss some aspects tied to the question of demographic development. Also, some lines of thought connected to settlement expansion will be presented.

Then I will discuss the archaeological dating of finds and ruin-groups.

Eventually, this will lead us to the one group of archaeological material which at present offers the best possibilities for dating, the churches. Hence, a closer discussion of the church buildings, and the church history of Greenland will appear in the next chapter.

The present chapter is centered around two questions:

1. Where did the settlement begin ?

2. How did the settlement expand ?

Unfortunately there are few datable finds to help us answer these questions. Until such material is available, we will have to make do with an indirect approach, which is what is attempted below.

5.2 DEMOGRAPHY

5.2.1 The landnám population size:

The population of Norse Greenland has obviously been subject to demographic development and fluctuations, just as other biological populations. It is therefore important to construct some theoretical models for demographic development to serve as a basis for further discussion.

The subject has previously been dealt with by this author in a paper from 1986, although I have been forced to change my opinions on certain topics discussed there. Thus some of the discussion below will be a summary of viewpoints from this paper, but with some alterations.

The reason for discussing demography is, however, not primarily because a population estimate is required. More important, it gives us an angle from which to approach the archaeological material. We would, for example, expect that a linear increase in population would result in a linear increase in the number of settlements or farms. Whereas fluctuations in the population would be expected to cause similar fluctuations in the number of farms.

The relationship between population size and the number of farms is obvious, but also complex. A discussion of the demography of the Eastern Settlement will therefore give us an opportunity to examine this relationship more closely.

The possibilities for constructing a theoretical model for demographic development in Norse Greenland are in some respects better than for most prehistoric and early historic populations.

The reasons are first of all the relatively limited span of time we are dealing with, and second, the two demographic "fix-points": The **landnám** and the **population maximum**. The possibility for testing such a model is, however, considerably more delusive.

Our knowledge about the **landnám** population is of course limited. What we do know with some certainty, is that Greenland was settled by people of Norse origin some time around the year 1000. The written sources Islendíngabók (by Ari Fróda), Eiriks Saga Rauda (The Story of Eric the Red) and Landnámabók say that Greenland was settled from Iceland 15 (18) years before Iceland was officially Christianized (A.D. 999/1000). The two latter sources state that Eric left Iceland with 35 (25) ships, 14 of which arrived in Greenland (GHM I:169, 179 & 207).

The figures regarding the dating and the number of ships diverge in the different versions of the texts, and there is no reason to believe that these sources, written down roughly 200 years after the events they describe, are accurate in every detail. (See Jansen 72 and Halldórsson 78 & 81 for a general comment on the sources.) So far, no archaeological evidence has been uncovered to challenge the dating.

The number of people on board the landnám ships has also been discussed. A figure of 35 men in a single ship is mentioned in Eiriks Saga Rauda (GHM I:215 & 216). This entry, however, concerns Leif's voyage of discovery to Vinland, where a military force may have been needed, and not a colonization party loaded with children, animals, provisions and equipment. Moreover, the figure seems to better agree with ship types of the 13th century, when the stories were recorded, than with colonization period ships

(Crumlin-Pedersen, pers. comm.).

Disregarding such reservations, Nørlund evidently used the figures from these sagas uncritically when he postulated that the party that left Iceland consisted of 500 - 700 people (Nørlund 67:18). If we are to take the saga texts as literal as Nørlund did, the colonization was a grand scale operation, led by a single man, Eric the Red.

In my opinion, it is just as likely that there was a steady drifting of people from Iceland, and probably also Norway, during the first part of the settlement period.

A careful estimate of the total Norse population in Greenland around the year 1000 could, perhaps, be suggested to something between 300 and 800 people, or some 200 to 600 in the Eastern Settlement alone.

5.2.2 The maximum population:

As previously discussed, the number of recorded ruin-groups in the Eastern Settlement at present amounts to 444, of which 43 have been suggested as 'saeters'. This brings the maximum number of 'farms' down to 401. (My paper from 1986 was based on a lower figure).

We have no specific knowledge about the last 100 ruin-groups recorded on Krogh's map, but we may assume that there are a fair number of 'saeters' and single ruins among them (see Section 4.3.5 above). Anyway, it is likely that 400 farms in the Eastern Settlement is too optimistic an estimation.

Let us therefore cautiously assess the maximum number of 'farms' to 350. There is, however, no saying that all of these were inhabited at the same time, so it must be considered as a rough maximum figure.

There may, however, have been farms with several holdings. I have therefore estimated the number of holdings in the Eastern Settlement to 400, well aware that this may be somewhat on the high side.

Nørlund suggested that the larger farms had a population of 20-30 people, while the smaller farms, 5-10. This was the basis for his suggestion that the maximum population in Norse Greenland amounted to about 3000, 2/3rds of which inhabited the Eastern Settlement (Nørlund 67:22). The recorded number of ruin-groups at his time of writing was about half the number known today.

Krogh has had access to later survey reports, and suggests that the population of both settlements amounted to a total of 4000-6000 people. This was based on a figure of 250 farms in the Eastern Settlement, and 80 in the Western (Krogh 82a:65). This gives a total of 330 farms, with an average of 12 - 18 persons per farm.

Joel Berglund gives a similar estimate, evidently based on Krogh's figures (Berglund 86:113).

One way to estimate the population of a settlement site is to calculate the floor area. This has been done on several locations around the world, on archaeological and ethnographical material alike (see Narroll 62, Casselberry 74 & 75, Myhre 83). Bjørn Myhre is critical of the formulas employed by Narroll and Casselberry. He has studied Late Roman and Early Migration Period farms in Jæren in south-west Norway, and concludes that the average population of these farms were 10 - 13 persons (Myhre op. cit.:156).

Olav Sverre Johansen has made estimates of the population of named-farms in Vestvågøy in Northern Norway from the Viking Period and High Middle Ages (Johansen 82:63). He arrives at an average of 15,3 persons per named-farm (the term named-farm is defined in Section 3.4.2 above). This may seem odd, as it was previously believed that Early Iron Age farms supported extended families, while Viking Period farms were single-family units. Although this concept has been challenged during the later years, Johansen's figures still seem a little on the high side.

If we use Myhre's minimum of 10 persons per farm, and multiply it by 350, we get a population of 3.500 in the Eastern Settlement, while if we use Johansen's figure of 15 persons and multiply by 350, we get a population of 5.250.

If we divide these figures by the estimated 400 holdings, we get respectively 8,15 and 13,125 persons per holding. I find the latter figure somewhat high.

As a conclusion, the maximum possible population of the Eastern Settlement can tentatively be set between 3.500 and 5.000, based on traditional methods and disregarding chronology.

Another way of calculating medieval population size, used by historians, is based on the payments of the Peter's Pence. One such payment from Greenland was recorded in 1327. This will be discussed later (Section 8.3.9), but my conclusion is that the source is too inaccurate for our purposes. Thus Luka Jelic's fantastic estimate from 1891 of 10.000 people must be rejected (Jelic 91, from Rey 76:138. Incidentally, Jelic was the man suspected of having faked the so-called Vinland Map, see Wahlgren 86:112).

The same reservation applies to the 190 (or 210 ?) farms given in "Grænlands annál" (above, Section 3.2.2). The source is, however, still of some interest, and will be discussed in Section 9.4.3.

5.2.3 Chronological framework:

Even if Greenland was geographically isolated, there must have been a certain exchange of population with Iceland and Norway, at least during the first 2-300 years.

Immigrants arriving during the early phases of settlement would, of course, have contributed to the demographic increase through their offspring. And contrarily, immigrants coming late would have had fewer generations of descendants, and less effect on the maximum population size. Thus the immigrants during the first century of settlement formed the demographic basis from which the population would grow and ultimately reach its maximum.

The problem is, however, that we do not know exactly when this population maximum was reached. This is an important question, as the dating of the population maximum also would mark the beginning of the decline. This again involves the questions of what caused the desertion. There is, in other words, a danger of running in circles here.

If we turn to Ivar Baardson's "Description of Greenland", the Western Settlement is reported as being deserted by around 1350.

Lately, his statement has been challenged through the results of the excavations of two ruin-groups in the Western Settlement; V-48 Niaquusat, and V-54 Nipaatsoq. Radiocarbon datings from the sites have been claimed to contradict Baardson (McGovern et al 83:109, Andrassen 82:187. See also Berglund 86:117-118).

SAMPLE NO.	MATERIAL	RADIOCARBON YARS	STUIVER & PEARSON 1986 CALIBRATION
Nipaatsoq:			
K-3058	charcoal	950 B.P.	1010 - 1165 A.D.
K-3059	caprine faeces	940 B.P.	1015 - 1170 A.D.
K-3060	charcoal	750 B.P.	1255 A.D. (Clark 75)
K-4742	reindeer bones	680 B.P.	1270 - 1375 A.D.
K-4741	seal bones	670 B.P.	1275 - 1380 A.D.
K-4762	charcoal	670 B.P.	1270 - 1380 A.D.
K-4763	charcoal	650 B.P.	1280 - 1390 A.D.
K-3061	bog peat near farm	540 B.P.	1405 A.D. (Clark 75)
K-3062	bog peat near farm	450 B.P.	1440 A.D. (Clark 75)
Niaquusat:			
K-3199	bones, mixed spec.	990 B.P.	1010 - 1035 A.D.
K-3200	seal bones	980 B.P.	1010 - 1040 A.D.
K-3063	Salix twigs	960 B.P.	1005 - 1165 A.D.
K-3197	cattle bones	960 B.P.	1015 - 1155 A.D.
K-3198	seal bones	920 B.P.	1025 - 1170 A.D.
K-3202	seal bones	870 B.P.	1055 - 1220 A.D.
K-4740	cattle/reind. bones	830 B.P.	1165 - 1260 A.D.
K-4739	seal bone	820 B.P.	1165 - 1265 A.D.
K-4737	seal bone	800 B.P.	1170 - 1270 A.D.
K-4732	seal bones	790 B.P.	1190 - 1270 A.D.
K-4730	seal bones	780 B.P.	1215 - 1275 A.D.
K-4736	seal bones	780 B.P.	1215 - 1275 A.D.
K-4733	reindeer bones	720 B.P.	1260 - 1285 A.D.
K-4734	seal bones	660 B.P.	1270 - 1390 A.D.
K-3201	bones, mixed spec.	640 B.P.	1280 - 1390 A.D.
K-4731	bones, mixed spec.	620 B.P.	1285 - 1400 A.D.
K-3203	bones, mixed spec.	610 B.P.	1285 - 1400 A.D.
K-4735	reindeer/seal bones	600 B.P.	1290 - 1405 A.D.
K-3204	seal bones	560 B.P.	1310 - 1420 A.D.
Thule culture reindeer camps:			
K-4040	reindeer bones	270 B.P.	1635 A.D.(Stuiver 82)
K-4041	reindeer bones	260 B.P.	1640 A.D.(Stuiver 82)

The samples used to contradict Baardson are K-3061 and K-3062 (above), which have given the dates 1405 and 1440 A.D. with calibration Clark 75. These were taken from peat 25 m from the site, from a layer on which the last inhabitants walked. I understand the disagreement concerns to what extent part of the layer was formed after the inhabitants had left (Arneborg & McGovern, pers. comm.s).

Jette Arneborg has recently received a new series of datings from the same sites, which she has given me the kind permission to publish (above). As far as I can see, the datings seem to fall in line with the statement of Ivar Baardson.

It is, however, dangerous to assume a priori that the desertion of the Western Settlement coincided with a decline in the Eastern Settlement; especially if the causes for desertion of the two settlements were different.

Another question is what happened to the people of the Western Settlement. The only point of interest to our present subject is the possibility that they moved to the Eastern Settlement, as Berglund has proposed (86:117-118). This would have caused disturbances in the demographic situation there.

A large scale movement could, theoretically, have lead to a sharp increase in the population of the Eastern Settlement, thus resulting in a population maximum after the Western Settlement had been abandoned. However, for the time being we have no archaeological or historic evidence to support this theory.

So, until we have a substantial number of radiocarbon datings from the Eastern Settlement, our best guess for a population maximum for all Norse Greenland is still 1350, give and take some 25 years.

5.2.4 Models for demographic development:

Considering the discussion above, we may ask whether it is possible to make sound estimates of the demographic development in the Eastern Settlement? The sources available are dubious, to say the least, and would hardly survive closer inspection.

Many good studies have been made on European medieval populations, and these may be used as models for Norse Greenland as well. I hesitate to take this approach, however, basically because this means a transference of demographic mechanisms from established societies with a developed medieval economy, which includes towns, to a pioneer society of quite a different standing.

We must therefore conclude that we have few possibilities to make sound estimates of the population size in Norse Greenland on the basis of our present knowledge.

Still, there are good reasons to try to construct some demographic models, even though the chances of them being accurate are rather remote. There are, however, possibilities to test such models through archaeological investigations.

First of all, it is interesting to see if it is biologically possible to produce a population as large as suggested by some authors, within the time span available. This was the prime purpose of my paper from 1986.

Second, the discussion of a demographic model has implications for our approach to the archaeological material. Thus it will appear that the development from the landnám-farms to second-, third- and fourth-generation farms hardly is a linear development.

Still, the increase in the number of farms must, in some way, be connected to the increase in population.

Therefore, I maintain that an archaeological material as extensive as that of the Eastern Settlement should be approached from a demographic angle. Further testing and correction of the model can be done in the future by dating a limited number of farms.

Third, the discussion of a demographic model offers a good opportunity for considering some developmental issues, such as the partition of farms, tax principles and tenantry.

On this basis, I have decided to present some demographic models. They are based on the estimates presented above and must, as most models, be considered as speculative. Still, they may be of some value for the later discussion.

The suggested figures for the population of the Eastern Settlement are as follows:

Landnám	A.D. 1000 - 1100	Population 225 - 600
Pop. maximum	A.D 1325 - 1375	Population 3500 - 5250

The unknown, and critical, variable is the speed of reproduction among the settlers. In PLATE 20 (below), a model with two alternative curves for population growth are presented, based on reproduction rates of 0,7 and 1 % per year.

As we see, both curves will give a population size within the values chosen above.

The reproduction rate of 0,7 % matches the reproduction rate in rural Norway during the 18th century (Søgner, in: Sødahl & Walløe 82:38). This is also considered the maximum reproduction rate of the Upper Paleolithic (Welinder 79:46).

The reproduction rate of 1 % equals that of non-industrialized countries before 1930 (Ohlin 67:12).

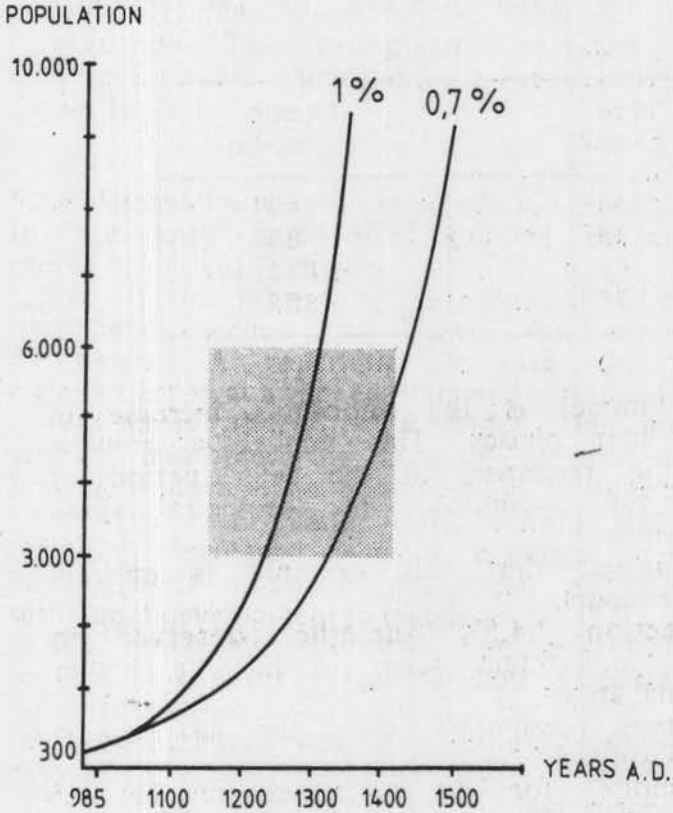

PLATE 20

Demographic models showing a theoretical population growth based on reproduction rates of 0,7 and 1 %. The shaded area gives a very rough indication of the expected time and size of the maximum population.

The total population in Europe between A.D. 1000 and 1300 seems to have reproduced at the very modest rate of 0,2 - 0,3 % per year (calculation based on figures in Gimpel 78:65). But locally, populations could increase with 0,85 % per year, such as the population of Taunton in Somerset in south west England in the

14th century (calculations made on the basis of the payments of the "hundredpenny" between 1209 and 1311 (Titow 75:51-53)).

The maximum reproduction rate of modern man seems to be 3,4 % - a rate that was observed among Australian immigrants, and today in certain developing countries (Welinder 79:46).

In the model presented above, a careful estimate of 300 people as the starting population was used. Still, the curves rise easily to the estimated population maximum within 1350.

So far, we must conclude that even the boldest estimates of population size in the Eastern Settlement are by no means impossible - seen from a biological viewpoint alone.

Still, this is under the precondition that the possibilities for reproduction were higher in Norse Greenland than in medieval Europe.

5.2.5 A model for development of farms:

A reproduction of 0,7 % per year seems to be acceptable as a theoretical rate for the population of Norse Greenland. This equals a doubling rate of 100 years.

As a tentative model, we may assume that in a long-term perspective, the number of settled sites will reflect the population growth. If we regard this a mechanical relation, the following model for the number of farms from each century in the Eastern Settlement can be estimated.

Period	"New" farms	Farms in total
1000 - 1100	44	44
1100 - 1200	44	88
1200 - 1300	88	176
1300 - 1400	176	352

The interesting aspect of this model is the enormous increase in the number of farms in the later phases. This implies a growing increase in the demands on the resources in the later period of settlement. It also shows that the possibilities for ecological stress are greatest towards the end of the period.

However, it must be emphasized that this example is entirely mechanical, and based on a speculative model.

As previously mentioned (Section 3.4.5), Aarsether observed in Northern Norway that farms in good areas seem to have a higher partition quotient than farms in marginal areas.

As farms in the marginal areas presumably were the last to be established, this has chronological implications.

I will therefore create a model for the estimated number of holdings for each century.

If we assume that the best farms were inhabited first, and that they were divided at a relatively early stage, the model would look something like this:

Year	New holdings	Holdings in total	New farms	Farms in total
1000	0	0	0	0
1100	50	50	50	50
1200	50	100	25	75
1300	100	200	75	150
1400	200	400	200	350

In this model it is assumed that the number of farms increased more slowly than the number of holdings throughout the 12th and 13th centuries, but increased with the same speed during the last century.

The possibility for ecological stress in the marginal areas at a very late stage is again obvious.

It should be mentioned here that there is no saying that the farms counted above were free or independent. Actually, a later analysis will indicate that the number of "official" farm units may have been established during the first two centuries of settlement (Section 7.4).

Finally, it must be emphasized that the testing and correction of the demographic models can only be done by dating a number of ruin-groups. The ruin-groups selected for dating must be chosen with great care, preferably a cross-section of one or more parts of the settlement.

5.2.6 Alternative progress of population growth:

In the very mechanical models presented above, the reproduction rate of 0,7 % was employed.

But it is fully possible that the reproduction rate in the more "optimistic" period was higher, for instance with a doubling rate of 50 years. A reproduction rate this high would have lead to overpopulation at a very early stage if continued unchecked.

We must therefore consider the possibility that the population growth, and thus the clearing of new farms, was greater during the first two centuries than as indicated in the models above.

On the other hand, birth control (by the abandonment of newborn children), increased age of marriage, and increasing death rates may have caused a slower population growth than presented here, with a settlement development to match.

We must also consider the possibilities of unrecorded population movement between Iceland and Greenland. This may appear to be pure speculation, which it is, but there is no more reason to believe that immigration was a one-time-event, or a steady trickle, than to assume that it came in waves.

So it must at least be a legitimate question to ask what events could have triggered such population movements. We know, for instance, that famine is a common cause of migrations (in human and animal populations alike), such as the Irish migration to U.S.A. after 1847.

And the people of medieval Iceland were indeed subject to hardships.

The Icelandic annals tell of periods of cold climate and increased

drift-ice which caused famine. But we may also assume that such climatic changes affected Greenland in a similar way, thus giving little reason for the Icelanders to jump from the frying-pan into the fire, to use an ill-suited expression.

If we are to find reasons for migrations between Iceland and Greenland we must look for phenomena that were specific to Iceland.

Two such phenomena can immediately be singled out:

1. Volcanic activity, which periodically reduced the carrying capacity of the land.

2. Epidemics which reduced the population.

During the 14th and 15th centuries in particular, the population of Iceland suffered great fluctuations due to such disasters.

Migrations of large numbers of people were recorded in Iceland after 'plágan sidari' ("The Last Plague", which it was not) of 1495, and it is likely that earlier catastrophes released similar movements (KLNM II:373-374, Teitsson & Stefánsson 72:136).

Several demographic analyses of the medieval Icelandic population have been attempted, but they are hardly reliable (see Teitsson & Stefánsson 72:133-138 for a review).

By 1703 the Icelandic population was estimated at 50.000, which was probably less than it was 600 years earlier. Two years later, an epidemic of smallpox had reduced the population to 35.000. A famine followed in 1752-57, and finally earthquakes and volcanic eruptions in 1783-84 poisoned fishing grounds and pastures in eastern Iceland, releasing hunger marches towards the west coast (Henriksen 87:328).

The major volcanic eruptions in medieval Iceland were:

Year:	Description:
1000	Eruption at Katla in the far south of Iceland. Great masses of tephra carried to the NNW.
1104	Great eruption at Hekla in Southern Iceland. 1,5 cubic kilometers of tephra deposited on land, mainly due north of the volcano. Caused permanent desertion at Thjórsárdalur, and probably temporary desertion of other settlements. Followed by famine, mostly due to masses of drift-ice in the north.
1158 1206 1222	Smaller eruptions at Hekla, the first releasing a considerable amount of lava.
1300	Big eruption at Hekla, with destructive earthquakes. 0,5 cubic kilometers of tephra deposited due north of the volcano. Followed by famine and high mortality in Northern Iceland.

1341	Big eruption at Hekla. Even distribution of the tephra indicates a long lasting eruption. High concentrations of fluorine were probably the cause of the severe loss of livestock in the south of Iceland, and many people left their homes.
1362	Gigantic eruption at Öræfajökull. 2 cubic kilometers of tephra covered more than 1/3 of the country. At least 30 farms permanently deserted, and an unknown number temporarily abandoned.
1389	Eruption at Hekla. Little deposition of tephra, but the lava destroyed several farms.

(From Thórarinsson 67:21-57, and Teitsson & Stefánsson 72:128).

Thórarinsson has maintained that a 20 cm layer of tephra would cause permanent desertion of settlements in the highlands and the north of Iceland, where conditions were marginal.

In the lowlands of Southern Iceland, a similar deposit would only cause temporary desertion (Thórarinsson 67:37).

As erosion seems to have accelerated from the 12th to the 14th century (Teitsson & Stefánsson 72:127), the effects of the tephra falls may have been more damaging in the later periods.

If we are to assume that people moved from Iceland to Greenland due to volcanic activity, it should have released waves of migration around the year 1000, after 1104, and possibly around 1300, 1341 and 1362, even if the latter may have appeared as a choice between two evils, due to the increasing cold.

Recorded epidemics in Iceland were:

1240	Smallpox
1310	Smallpox
1347	Smallpox
ca. 1380	Smallpox
1402-04	'plágan mikla' "The Great Plague", estimated to have killed between 1/3 and 2/3rds of the population.
ca. 1431	Smallpox
1495	'plágan sidari' "The Last Plague", great loss of population.

(From Teitsson & Stefánsson 72:135-138.)

While temporary reduction of the carrying capacity in Iceland may have triggered migrations to Greenland, the reduction of the population in Iceland may have had the opposite effect.

The decimation of a better part of the Icelandic population after 1404 may have created a tempting situation for the Greenlanders who, for climatic reasons, already had their backs against the wall.

Certain records indicate a general shortage of labor in Iceland during the 15th century (Teitsson & Stefánsson 72:136). At this time, the Icelanders seem to have had ships of their own, which was not the case in the preceding centuries (but see Kristjánsson 65). It is therefore theoretically possible that Icelanders fetched labor from Greenland to cover the shortage.

It must be noted, however, that we have no records to support these suggestions, nor have we any ideas of what epidemics may have reached Greenland. Still, the line of thought is not unreasonable, and may illustrate the possibilities for demographic interaction between Iceland and Greenland.

5.3 STRATEGIES FOR EXPANSION

5.3.1 Social differentiation:

Even a quick tour of the Eastern Settlement will convince the visitor that social differences existed in the Norse medieval Greenland. The ruin-groups vary considerably in size and layout, as does the vegetational coverage around them.

Even if we know little about the number of people in each farm, the size of the ruin-groups should tell us something about the social hierarchy, at least from a materialistic viewpoint. It would, for instance, be interesting to know the number of rungs on the socio-economic ladder. Was this a society with a wide basis and a narrow top? Did it have an extensive "middle class"?

In his book "Farms and Churches...", Aage Roussell divided the ruin-groups into 6 classes according to size. Although Roussell was mostly interested in the chronological aspect (see Sections 2.6.6, 2.7.8, 2.7.9 and 5.4.4), the classes are clearly hierarchically arranged.

Roussell's classes are listed below, in their original wording. The number of ruin-groups in each class (status in 1941) are listed in columns to the right (from Roussell 41:289-325).

Ruin-group classes after Roussell	Eastern Settlement	Middle Settlement
1. Homestead with a church	11	-
2. Homestead	2	-
3. Farm	106	24
4. Dairy farm	4	-
5. Cot	25	4
6. Small site	28	7

Unfortunately, Roussell's terms are not sufficiently consistent to be used in a sociological analysis.

The churches, for instance, differ considerably in size, and probably also in social significance (see Chapters 6 and 7).

Roussell's "dairy farms" and "cots" may in many cases simply have been 'saeters' without permanent habitation (Section 4.2.1).

The "small sites" may be haymaking 'saeters', isolated barns, storage houses, or sheep sheds, and thus uninhabited.

Finally, Roussell's table covers only about 50 % of the ruin-groups known today, and his identifications have proved quite unreliable in other contexts (Section 6.5.4).

Still, Roussell's classification is an illustration of the diversity of the ruin-groups. Also, the small number of "homesteads" demonstrates that there was a social upper class with relatively few members. If we look at the Eastern and Middle Settlements, the "homesteads" and "homesteads with churches" make up only about 6 % of the total number of ruin-groups at the time.

Today, the total number of ruin-groups in the Eastern Settlement amounts to 444, the Middle Settlement included (Section 3.2.2). There are 17 ruin-groups with churches, or 3,8 % of the total (Section 6.1.2).

I have elsewhere hesitated to use Roussell's lists as evidence because of their inaccuracy (Section 6.5.4). The major farmsites have, however, been subject to extensive excavations in the thirties, and identifications of their different buildings are probably more reliable than for the smaller ruin-groups.

Roussell's tables may, in other words, be of some relevance as far as the larger ruin-groups are concerned. Still, several ruin-groups in the "homestead" class (but without a church) were recorded for the first time as late as the 1960ies (Bak 70c: the list before page 68).

It may therefore be argued that Roussell's tables indicate a social pyramid with a very narrow top, although the lower parts of the pyramid still lie much in the dark.

There are a few other analyses that may elucidate the problem, although the number of ruin-groups used in the analyses is rather limited.

Thomas McGovern has measured the floor area of storage structures of 17 ruin-groups in the Eastern and Western Settlements.

The bar-graph, PLATE 21 (left) clearly demonstrates the differences, not only within the Eastern Settlement, but also between the Eastern and Western Settlements (from McGovern 85a:310).

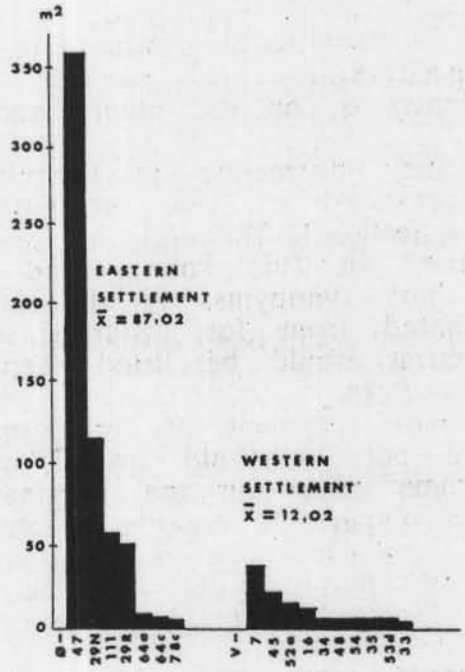

PLATE 21

Floor area of storage constructions in 17 ruin-groups of the Eastern and Western settlements. From McGovern 85a:310.

The dominance of ruin-group Ø-47 at Igaliku (the bishop's farm at Gardar) is obvious, and also the two ruin-groups Ø-29 N (The "North Farm") & Ø-29 R (The "River Farm") at Qassiarsuk (Brattahlid), and Ø-111 at Ikigaat (Herjolfsnes).

With the exception of Gardar, the vegetational resources around these farms are by no means exceptional, indicating that their storage area was intended for more produce than could be produced within the farm itself (see Section 4.3.4).

It is a fair assumption that this reflects differences related to taxation, land rent, and tenantry conditions (McGovern et. al. 85, and Section 9.4.3 below).

A similar, but less dramatic social differentiation is demonstrated in an analysis of the floor area of halls in McGovern's paper "Climate, correlation and causation" from 1987 (UNPUBLISHED).

Equally, Andreasen and Berglund have suggested a social differentiation of house-types (Andreasen 81, Berglund 82, discussed in Sections 2.7.9, 2.7.10 and 5.4.4).

This may lead to three simple assumptions:

1. That a number of the farmers were not independent.

2. That settlement expansion and clearing of new farms was not an entirely free choice, but depended on decisions of the land-owners.

3. That some of the ruin-groups represent independent farms, while others may represent tenant farms, crofts of farms otherwise dependent.

(The question of tenantry is further discussed in Sections 9.4.3).

It must be emphasized that it is difficult to find proof of such conditions, but for a rural medieval society such assumptions are hardly controversial. (See for instance Hastrup 85:118).

The extent of tax pressure and tenantry is, on the other hand, a considerably more complex question.

It is interesting, then, to regard the information in Grænlands annál that the Eastern settlement consisted of 190, alternatively 210, farms (GHM III:226-229. Discussed above, Section 3.2.2).

It is obvious that the term "farm" in this source and the archaeological term "ruin-group" are not synonyms. If the farms mentioned in Grænlands annál originated from for instance some kind of a tax list, only tax-paying farms would be listed. Tenants and crofters could be counted as part of the main farm.

This would, however, not apply to the payment of for instance the Peter's Pence, which was counted per household (see Chapter 8). Tax systems probably even had some effect on the termination of slavery in Iceland, but this is more obscure as regards Greenland (see Iversen 85:166-177).

Equally, if the list held some juridical purpose, like counting the number of representatives to the 'Ting' (Legal Council), only independent or "free" farms would be counted.

There is, in other words, no inherent contradiction between the number of farms in Grænlands annál and the number of ruin-groups in the archaeological material, except that the number of ruin-groups recorded in the Western Settlement is still on the low side.

The 90 farms mentioned for the Western Settlement may, although unproportionately large, indicate that tenantry was less common there than in the Eastern Settlement.

Unfortunately, this source is not only undated, but also unconfirmed by other sources. Any direct comparison between the number of farms in Grænlands annál and the number of ruin-groups will therefore be highly unreliable. At best, the source may indicate that roughly half of the ruin-groups in the Eastern Settlement, at some time or other, were occupied by peasants of some social status.

5.3.2 Strategies for expansion:

The previous discussions should make it clear that settlement expansion was a complex process, dependent on the distribution of resources as well as family bonds and social regulations.

These conditions must undoubtedly have created a diversity of local variations in the settlement pattern.

Nevertheless, a theoretical discussion of the different alternatives for handling population growth may be of interest:

1. Married children could chose to stay with one of their parent families, thus creating a grand-family.

2. Named-farms could be divided into separate, one-family holdings.

3. One child (traditionally the eldest son) could inherit his parents' farm. Other children would have to move out and clear new farms.

4. As point 3, but the younger children would have to establish themselves as tenants on larger farms.

5. Children unable to take over or clear a farm, or become tenants, could enter alternative occupations, such as trade, soldiering, commercial fishing, crafts or monastic life.

All these strategies seem to have been common in Norway at different times.

The alternatives 1 and 2 have the advantage that it is not necessary to clear a new farm from scratch, construct new buildings, erect fences, break the ground, etc. Thus the "initial investment" is low.

Accordingly, such strategies are useful to deal with quick fluctuations within a small population, caused by uneven age- and sex distribution. Such fluctuations seem to be among the most difficult variables to handle in peasant communities.

These alternatives require, however, that the farm possesses a production potential high enough for several families.

The alternatives 3 and 4 would be required in marginal areas, where the potential of the farm is insufficient for several families, and in areas where expansion is restricted by neighboring properties.

Alternative 3 will require a higher initial investment than the

other alternatives, and will also put a stress on the son inheriting the parent-farm. He would have to buy out his siblings, or rent their parts in his farm.

Such conditions would normally lead to unstable and fluctuating settlement in the outskirts, resulting in temporary desertion of the most marginal farms, like it is known in Norway from the 19th century.

Alternative 4 will often be the only alternative for children of little means, thus ensuring a supply of seasonal labor-force to the bigger farms.

Alternative 5 took off much of the abundant population in rural Europe, but the possibilities for alternative occupations must have been scarce in Greenland. Thus, the society had few buffers to absorb the effects of demographic fluctuation.

The conclusion from this discussion must be that the cost of settlement expansion in terms of invested labor increases considerably as the expansion approaches the more marginal areas.

These are mechanisms that forced many European peasants into tenantry, and they are likely to have taken place in Greenland as well.

5.4 DATING OF THE ARCHAEOLOGICAL MATERIAL

5.4.1 The problem:

If we are to study the evolution of the settlement pattern of Norse Greenland, it is important to be able to date the farms in the different areas.

This would reveal where the initial farms were located, to where the settlement expanded and when, and finally what areas were last inhabited before the termination.

This is the slow, but safe way towards an understanding of the Norse Greenland society.

It is therefore unfortunate that only a few ruin-groups have been dated so far (Berglund 86:113).

Most of the archaeological activity has been concentrated to the major farmsites, and the few excavations performed at the less spectacular sites have turned out little material useful for dating.

To a modern archaeologist, the total lack of radiocarbon datings from the Eastern Settlement is incomprehensible. And what is more, it makes the construction of a farmsite chronology rather troublesome.

Still, the question of chronology has been one of the major subjects within Greenland archaeology, and a short discussion of the topic is necessary.

The early (first century ?) finds are shown in the map PLATE 22, below.

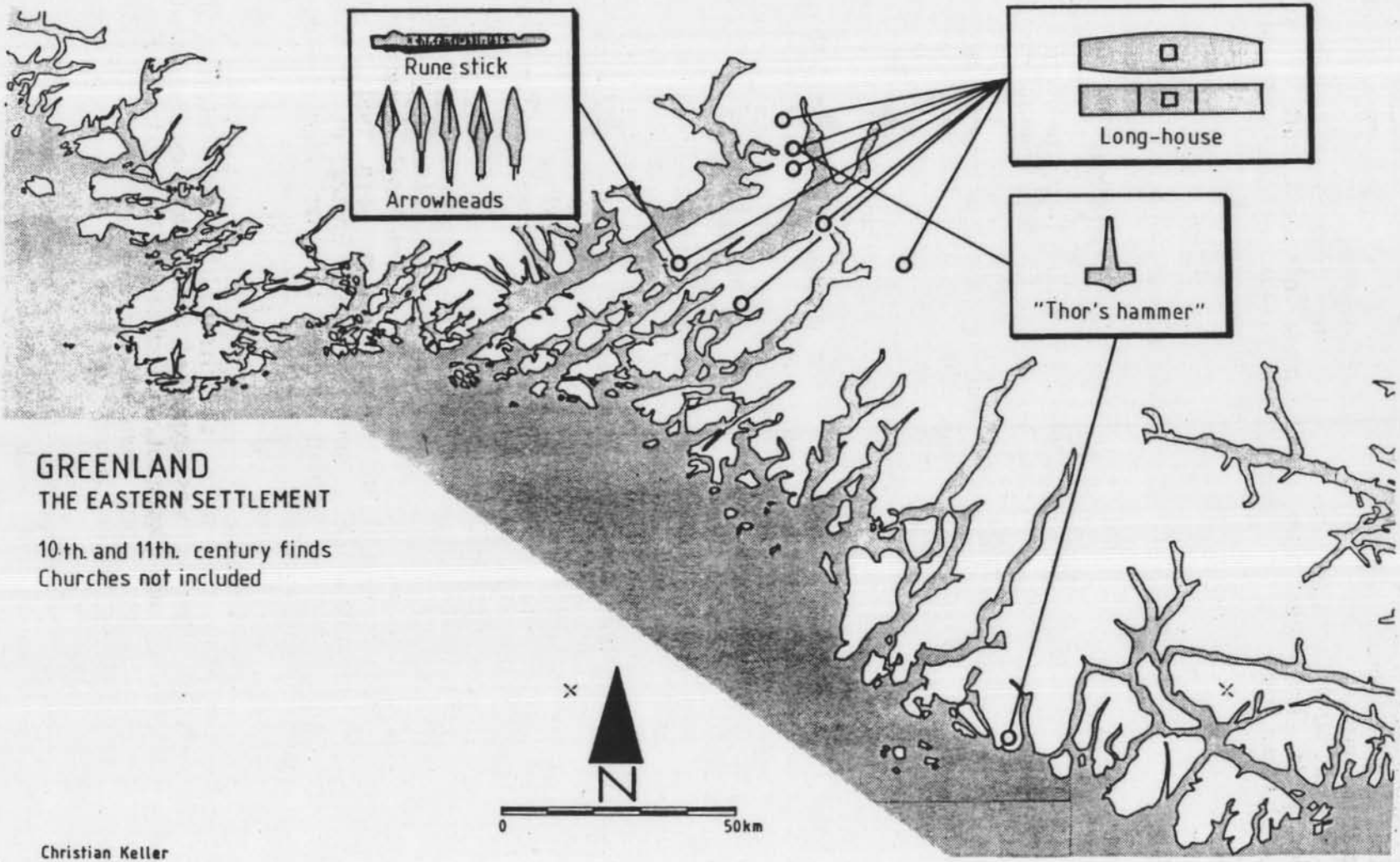

PLATE 22

5.4.2 The evolution of the dwelling:

In the Nordic countries, the early Iron Age dwelling was a long-house where animals inhabited one end, and humans the other.

It was a stave construction, in which the roof was supported by interior posts. The walls were usually made of wood, turf or wattle and daub. Its origin can be traced back to the Neolithic and Bronze Age (Norway: see Myhre 80 & 82, Reimers & Anker 81, Løken 85. Denmark: see Brøndsted 57,I:172, Hvass 82).

Some houses had an inner panel of wood, and an outer, protective wall of stone and/or turf. One or both of the gabled walls were made entirely of wood. This type of construction is present along the West Coast of Norway from the first to the eleventh century A.D., especially in the so-called "court-sites", 'ringformede tun' (Johansen & Søbstad 78). In Northern Norway it may be called the most common type of Iron Age building outside the Sami area. This particular building tradition had a number of features in common with the later building tradition in Iceland and Greenland. It is therefore surprising that, in the literature on the development of the dwelling in the West Atlantic, there is virtually no discussion of the Norwegian court sites, or the houses of Northern Norway at that. (See Sections 6.2.3 below for a closer discussion).

In the Late Roman Period, the long house of Western Norway seems to have developed to a wooden construction with a protective wall of stone and/or turf. This type seems to have become quite common by the Migration Period (Myhre 82:108, see Sections 6.2.3 below for a closer discussion).

Some people have argued for a connection between the Scandinavian long-house and houses in the Celtic area, for instance the so-called black-houses of the Hebrides (see Roussell 34 & 37, Stoklund 82), but the view has met severe challenges (Fenton 82, Small 82, Fenton and Pálsson 84).

In the Viking Period, the Nordic house had developed to a boat-shaped construction with curved long-walls. This type was the one brought to the islands of the North Atlantic by the early emigrants (Ágústsson 82, Albrethsen 82, Thorsteinsson 82).

In Norway, the long-house was gradually exchanged with smaller houses, some time in the Late Viking or Early Medieval Period, eventually creating a layout of 5 to 20 "special-purpose" houses in a farm. This development has by some authors been tied to the introduction of log-houses ("laftehus"), but the finding of a Viking Period farm with small, stave-built houses in Ytre Moa in Sogn contradicts this theory (Bakka 65:141).

In Iceland, the long-house developed gradually to a complex structure through a series of stages:

The long-house was simple at first, like in Isleifsstadir (Stenberger 43), but later it was expanded with added rooms in the back, like in Stöng and Skallakot (Steenberger 43) and Sámsstadir (Rafnsson 76). This evolution occurred before the Hekla eruption now assumed to have taken place in 1104 (Thórarinsson 67:50, Agústsson 82:258).

The next stage of development was the passage-house, where a central passage lead to the back of the house, and with doors opening to rooms on each side of the passage. An early example was excavated at Gröf, which was covered by a layer of pumice in 1362 (Ágústsson 82:258). A fully developed passage-house was

excavated at Forna-Lá at Snæfellsnes, and dated to 1450-1550 (ibid).

The type later developed to the elaborate constructions known from the 19th century.

This evolution of the buildings had, of course, consequences for the total lay-out of the farm. As more and more functions were incorporated in the main complex, the number of separate houses decreased.

This development was, in fact, a reversion of the development taking place in Norway, where the number of special-purpose houses increased during the same period.

5.4.3 Greenland dwelling-types:

The evolution of house-types in Greenland followed roughly the same pattern, but with an extra stage if compared to Iceland. (The Western Settlement is omitted in the lists below).

Stage 1a:

The long-house, with curved, and later straight walls are found at the early farmsteads, such as:

Ø-17a Narsaq (Vebæk 64)
Ø-20 Tunuarmiut (Bruun 1895:264)
Ø-29a Qassiarsuk (Brattahlid)(Krogh 76, & 82:34)
Ø-34 Qorlortup Itinnera, (unpublished records of the NAE 1976)
Ø-47 Igaliku (Gardar), which actually displays four steps of development (Nørlund 29a:80)
Ø-64a (Vebæk 43:18)
Ø-83 Qaqortukulook (Hvalsey) ruin no. 6
Ø-200 Ammassiviup (Unpublished expedition report, Albrethsen 70:43)

(See Albrethsen 82 for a review).

Stage 1b:

Ø-37 Qorlortup Itinnera. The dwelling has a layout much like that of Stöng (unpublished records of the NAE-76)

Stage 2:

The passage house, known in:

Ø-2 in Nordre Sermilik (in its most classical form, see Bruun 96:216, Roussell 41:152)
Ø-29a Qassiarsuk (Brattahlid) in the northern part of the complex
Ø-83 Qaqortukulook (Hvalsey)
Ø-47 Igaliku (Gardar) in part of the bishop's residence

(See Albrethsen op.cit. for review)

Stage 3:

The centralized house. This is in principle the same as stage 2, except that the rooms are not arranged around a passage, but joined together in a haphazard way. Most of the published examples are from the Western Settlement (Roussell 41:159-189, Andreasen 82, Buckland et. al. 83), but a typical example is found at Ø-64a (Vebæk

43:24), and most probably in Ø-34 Qorlortup Itinnera (unpublished records of the NAE 1976).

5.4.4 Explanatory theories:

Roussell was the first to establish the stages and to suggest them as chronologically significant (Roussell 41).

The chronology rests basically on an aesthetic principle, the evolutionary typology, and is hardly useful for practical dating. On the contrary, when checked against modern dating methods as done in the Western Settlement, it appears that the typology at best is an evolutionary principle (Andreasen 81, Albrethsen 82:270).

This is, in fact, not surprising if we look at the different ways in which the evolution of house-types have been explained.

The idea of evolution has already been presented in the stages above. This was, of course, the logical way to start a systematic classification of the material. But, as we shall see below, it created a number of questions: When did the changes take place, and why?

The theory of diffusion.

The idea of diffusion is near at hand, and a man like Roussell worked intensely to find traces of the Nordic building tradition in Northern Britain.

But, and it may be typical, the idea of diffusion has mainly been considered as going from the Norse to the Celts, and not vice versa (Roussell 34).

As for Greenland, attempts to compare the typological stages with those dated in Iceland have not proved very successful. This is partly because Greenland lacks the possibilities for tephra-chronology provided in Iceland (Thórarinsson 67). However, it may look as if the developmental stages occur somewhat earlier in Greenland than in Iceland (Albrethsen 82:270). If this is correct, it must be considered if Greenland was the innovation center for house-types, and that the ideas spread from there to Iceland. This would indeed be curious, and could support the theory of ecological adaptation referred below.

The ecological theory.

The ecological explanation was forwarded by Roussell. He based his suggestion of chronology on the assumption that the coastal areas of the Western Settlement were the first to be occupied. The inland areas were supposedly settled later, and, as the colder climate of the 1300s set in, inland farms were built as centralized houses, to keep a better fuel economy (From Andreasen 81:180). Recent radiocarbon datings from an inland farm in the Western Settlement, V- 54 Nipaatsoq (see Section 5.2.3 above), indicate that this farm was among the earliest settlements in the area (Andreasen 82:187). Roussell's concept has in other words met severe challenge.

The idea of a conjoined building complex as a response to climatic deterioration has lately been further developed for Iceland, where the different building stages have been plotted against a temperature curve (Agústsson 82:265).

The sociological theory.

The latest explanation is a sociological one. Berglund has pointed to the fact that extended long-houses with a big hall was typical for the farms with important churches: Herjolfsnes, Hvalsey, Gardar and Brattahlid (Berglund 82a).

Andreasen has argued that the long-house continued to be used by high-status people, although in a somewhat converted form, till late in the settlement period,r while the low-ranking farmers had less productive land, and thus concentrated their buildings in one complex.

The theories of explanation have, as we have seen, changed from an aesthetic concept of the evolution of types, to a more functionalistic view.

However, the different models do not necessarily exclude each other. They may in fact be different facets of the same reality.

But as regards the chronology, the picture is far more obscure. It obviously creates a problem if a particular type of building at one time is used as a dating element, and at another time as a social indicator because it has maintained archaic features.

This is in fact, the core of the problem: Any building is a product of tradition as well as of social status.

To make a conclusion, it is possible that the introduction of certain building features can be dated post quem. But archaic types may very well have been constructed and used at later stages.

5.4.5 The churches:

The church ruins have been subject to much interest from the archaeologists, and will be discussed in detail in Chapter 6.

Concerning the chronology it can briefly be stated that church building seems to follow the stylistic changes in Norway in an almost surprisingly well synchronized manner. From small churches in turf and wood, the style of the churches followed the development of Gothic and Romanesque stages until sometime around 1300.

The churches therefore offer the best possibilities for dating of none-scientific material in Greenland. So far, the unique position of this material has hardly been exploited for purposes other than that of architectural history.

The dating of the turf churches has, however, been controversial (see Sections 2.7.1 & 2.7.2). One reason for this is that comparative material in Scandinavia seems to have beeen lacking.

What is less known, is that Northern Norway features some 50 ruins of turf churches (Reidar Bertelsen pers. comm.).

This material has not been examined, but it seems to offer interesting parallels to the West Atlantic churches.

5.4.6 Other objects:

It has been argued that the isolation of Greenland from the Nordic countries may have led to a fixation of certain types and styles.

This fixation may well have been socially differentiated, in the way that church buildings and items of fashion followed whatever impulses arrived from Europe, while the more prosaic implements of everyday life stayed unchanged.

Although this is a mere assumption, it makes the use of archaeological objects for dating purposes rather awkward.

Logically, this argument has little value for the first centuries, when the contact across the Atlantic supposedly was frequent. But as the navigation decreased during the 14th century, a stylistic fixation, or even a local evolution of style is to be expected.

When Nørlund and Roussell made their extensive investigations in the twenties and thirties, comparative material available in the Nordic countries was, in all practical respects, limited to the Viking Period. Only during the last fifteen years have finds from the medieval towns yielded material useful for comparison and dating. So far, this valuable asset has not been exploited in Norse Greenland archaeology.

There is at present a considerable amount of finds in the Danish National Museum which has not been published. A full review of the archaeological finds is beyond the purpose of this book. Also, people at the National Museum are now working on parts of this material for publication. Still, a short discussion of the different groups of the published material may be useful (See the map in plate 22, section 5.4.1).

Pagan relics:

Of the objects found in the house-ruins and middens, the 11th century types are the easiest to date.

Pagan relics must, above all, be assumed to belong to the colonization period. Unfortunately, the finds are few, and they were all located to the "classical" sites.

At Ø-17a at Narsaq a staff with runic inscription is found to refer to the Asa-gods of Norse mythology. The A-side of the staff reads:

> "In the sea, sea, sea is the place where the asa-gods are on their watch, Bibrau, she is called, the virgin who is sitting in the blue sky (or: vault of heaven)". (Moltke 61:408, Stoklund 82:198, English version cited from Jansen 72:101).

The text is written in short-twig runes. From the design of the runic letter for "nasal a" it is dated to the period before 1020 (Stoklund loc. cit.).

At Ø-29a at Qassiarsuk (Brattahlid, the so-called "River Farm") a piece of a steatite loom weight with an incised Thor's hammer was found (Nørlund & Stenberger 34:91 & 131, Krogh 82a:51).

At Ø-111 Ikigaat (Herjolfsnes) a similar symbol was found on a steatite fragment (Nørlund 24:225).

Pagan graves:

At Ø-83, ruin 15 at Qaqortukulook (the "croft" at Hvalsey) Roussell believed to have found the grave of Torkell Farserk, mentioned in Landnámabók to be buried in a cairn, from which

he appeared to haunt the living. Roussell excavated it, but his identification of the mound as a grave is not more convincing than the ghost story itself (Roussell 41:95).

At Ø-29 Qassiarsuk (Brattahlid), an oval hollow denoted ruin 45, near the present shoreline, was excavated in 1932 by Nørlund and Stenberger. It was believed to be the remains of a Viking Period boat grave, but no finds were made to support this interpretation (Nørlund & Stenberger 34:116-117).

In 1962 ruin 29 was subject to a trial excavation. It was a construction containing charcoal, burned bones and fragments of steatite. The question has been raised whether this was a pagan Norse burial place (Jansen 72:100). Until further excavations are made, the question must remain unanswered.

In the Western Settlement, two mounds believed by Roussell to be grave mounds were excavated in the thirties (Roussell 41:96). The only indication of a Norse origin is the head of an iron nail, and some pieces of steatite. As we know nothing about their dating, the finds may just as well be later deposits made by the Inuit. Ingstad has pointed out that it would have been unlikely for the people at Sandnes to bury their dead half an hour's walk into the wilderness. He thinks the mounds looks like animal traps (Ingstad 59:447-448).

The apparent lack of pagan graves is in itself not an indication of a Christian population. Late Viking Period graves in Norway were evidently influenced by Christian burial customs. They are often inhumation graves without visible surface constructions. This is even the case in Iceland, where cremation burials are virtually unknown.

It is also possible that late pagan graves were opened, perhaps destroyed, and the corpses reburied in the churchyard (Gad 67:57). During the later years, indications have been found in Denmark that corpses were removed from their pagan graves to be buried at Christian burial sites at the time when Christian religion was introduced (Krogh's excavation in the church at Jelling).

The evidence of a pagan religion in Norse Greenland is, however, fragmentary. From the archaeological material alone it is difficult to verify, or falsify, the written sources in their general statement that the first settlers were heathens.

Other finds are:

Copies of iron implements:

Among the more picturesque items found in Greenland are bone- and antler-copies of iron implements, such as the well-known whalebone battle-axe (Roussell 36 fig. 74), and bone belt-buckles (Roussell 41 fig. 161 and fig. 164), all from the Western Settlement.

From the Eastern Settlement is known a padlock of bone from Ø-64c (Vebæk 43:87), and a number of 11th century type arrowheads of reindeer antler, from Ø-17a at Narsaq (Vebæk 64:215). Similar arrowheads are known from Northern Norway (Reidar Bertelsen, pers. comm.).

Steatite vessels:

When Nørlund described the fragments of steatite vessels found at Ø-111 Ikigaat (Herjolfsnes), he assumed that their shape and decoration was copied from European earthenware vessels (Nørlund 24:220).

This philosophy was a parallel to that of the Norwegian archaeologist Haakon Shetelig (to whom Nørlund did not refer), who had published a typological system for classification of Iron Age steatite vessels based on the same principle (Shetelig 12).

The first to offer a system of chronology for the medieval material was Siri Myrvold Lossius, with material from the Kaupang at Borgund, in Western Norway (Myrvold Lossius 77).

Her chronological table (op. cit.:52) should offer possibilities for comparison. A type of special interest is the four-sided vessels with a flat bottom, called type D, which seem to appear regularly from the beginning of the 16th century, although there are a couple of Viking Period exceptions (ibid.).

Four-sided vessels were found at ruin-groups Ø-64a and Ø-64c, supporting the late dating suggested for these sites (Vebæk 43:93 and 101), and may indicate a very late Scandinavian contact.

As a contrast, it is interesting to note that there is no indication of D-type vessels among the very fragmentary published material found at Ikigaat (Herjolfsnes) (Nørlund 24:221).

Four-sided vessels are known from Shetland (Heid Gjøstein Resi, pers. comm.).

Combs:

The combs found in Greenland belong to the one-sided Viking Period / Early Medieval type (Roussell 41:263, Vebæk 64:217), as well as the later two-sided type (Nørlund & Stenberger 34:134, Roussell loc.cit., Vebæk 43:103).

Being a toilet article, and thus closely connected to fashion, one would expect them to follow European styles whenever possible.

The excavations in the medieval towns are about to yield useful material for comparison and dating (see Blomqvist 43, Christophersen 80, Ambrosiani, K. 81, Christensen 86). Much material is still unpublished, but this situation will hopefully change in the near future. In Bergen Inger Kelmer is working on material from Bryggen. This will probably arrive in the Bryggen Papers.)

Clothing:

On the dating of dresses and clothing, see Sections 2.6.2 above.

5.4.7 Conclusions:

The demographic models, which for the time being must be considered speculative, indicate a possibility for increased stress on the resources from the 13th century.

It is also possible that the most marginal farms were cleared

during the 13th and 14th century, but so far there is no archaeological evidence to confirm this theory. The models for demographic development and settlement expansion strategies mark the 14th century as the most difficult period. However, the possibility for a certain demographic interaction with Iceland cannot be ruled out.

The numerical methods applied in this book require comparative data on a massive scale. With the exceptions of the churches and the few 11th century finds, relevant dating material is scarce.

The house-type chronology created by Roussell is hardly useful for archaeological dating purposes.

A modern review of the Norse Greenland finds should, undoubtedly, prove interesting, but would hardly give the massive dating of ruin-groups required for a holistic diachrone analysis.

In lack of such material, I have been compelled to make use of the ruin-groups as such, with little chronological differentiation. If a number of the ruin-groups can be dated in the future, we will have a chance to use these datings to correct the demographic models presented above.

In lack of such datings, I will try to create a chronological picture based on the churches, and on the few 11th century finds available.

This is, however, just making the best out of a difficult situation. The conclusion must inevitably be that the lack of a farmsite chronology and periodization of the profane material is by far the greatest obstacle in Norse Greenland archaeology at present.