PART III

*

MATERIAL GROWTH

(to c. 1350)

9

Demographic conditions

OLE JØRGEN BENEDICTOW

In the Viking Age and the Middle Ages the vast majority of people in the Nordic countries were peasants or people who worked within the framework of the peasant economy.[1] The first clear tendencies towards urbanisation are discernible from the late eighth century. In the ninth century Ribe, Hedeby, Birka and Skiringssal/Kaupang may have had a total of 3,000–5,000 inhabitants.[2] At the end of the tenth century urban development entered a new and vigorous phase (see Chapter 11). The number of towns grew rapidly, especially in Denmark, but with a few exceptions they remained quite small, counting their permanent inhabitants in hundreds or low thousands. Probably only a handful of Scandinavian towns had more than 5,000 inhabitants during the Middle Ages.[3] No towns developed in Iceland or Føroyar. Roughly estimated, Viking Age urban populations barely exceeded 0.5 per cent of the total population in any Nordic country. At the end of the high Middle Ages this proportion may have increased to about 3 per cent in Sweden and Norway; only in Denmark may it have exceeded 5 per cent.

1 This short outline of Nordic demography in the Viking Age and the high Middle Ages is a much abbreviated version of my paper 'The demography of the Viking Age and the High Middle Ages in the Nordic countries', *Scandinavian Journal of History*, 21:3 (1996), pp. 151–82. Apart from this paper the only modern comprehensive introduction to medieval Scandinavian demography is O. J. Benedictow, *The Medieval Demographic System of the Nordic Countries*, 2nd edn (Oslo, 1996).

2 I. Skovgaard-Petersen, 'Oldtid og Vikingetid', in A. E. Christensen et al., *Danmarks historie*, 1 (København, 1977), pp. 114–17; A. E. Christensen, 'Tiden 1042–1241', ibid., pp. 318–20; P. Sveaas Andersen, *Samlingen av Norge og kristningen av landet 800–1130* (*Handbok i Norges historie*, 2, Bergen, 1977), pp. 222–9; B. Almgren, 'Städer och handelsplatser', in *Den svenska historien*, 1 (Stockholm, 1966), p. 164; G. A. Blom (ed.), *Urbaniseringsprosessen i Norden*, 1 (Oslo, 1977).

3 Skovgaard-Petersen, 'Oldtid og Vikingetid', pp. 142–5; A. E. Christensen, 'Über die Entwicklung der dänischen Städte von der Wikingerzeit bis zum 13. Jahrhundert', in M. Stenberger (ed.), *Die Zeit der Stadtgründung im Osteseeraum* (Uppsala, 1965), pp. 166–72; Christensen, 'Tiden 1042–1241', pp. 318–20; Blom (ed.), *Urbaniseringsprosessen i Norden*, 1; L. Törnblom, 'Medeltiden', in *Finlands historia*, pp. 376–9; Sveaas Andersen, *Samlingen av Norge*, pp. 227–30; K. Helle, *Under kirke og kongemakt* (Helle (ed.), *Aschehougs Norges historie*, 3, Oslo, 1995), pp. 86–8.

After the establishment of Christian church organisations the clergy came to constitute a social class of its own, and in the course of the high Middle Ages the secular aristocracy of the three Scandinavian kingdoms developed into a privileged nobility in the service of the Crown. These two social élites reached their highest numbers at the end of the high Middle Ages when they may have constituted roughly 2–3 per cent of the population: 1–2 per cent for the nobility and 0.75–1 per cent for the clergy. It should, however, be stressed that these figures are only tentative.

What is beyond doubt is the fact that the rural classes constituted the overwhelming majority of all the Scandinavian populations in the Viking Age. In about 1300 they probably still comprised about 95 per cent of the total population.

Life expectancy and mortality

Osteologists and osteo-archaeologists have provided new and invaluable data which can be used by historical demographers to provide information on life expectancy and mortality. In most cases, the main problem is a significant, even gross, deficit of children.[4]

Danish and Norwegian osteological studies on sizable Iron Age skeletal materials consistently show mean life expectancy at age twenty of only 15–18 years.[5] Today, in the Nordic countries, life expectancy at age twenty is about 55 years, at age sixty about 18 years. The vital data on Iron Age populations also indicate that long-run life-expectancy rates and mortality may not have changed significantly between the early Iron Age and the Viking Age.

Life expectancy at birth must have been much lower. One should note that even in the seventeenth and first half of the eighteenth centuries infant mortality was around 250 per thousand, and that about a quarter of surviving infants died before reaching the age of fifteen.[6] If infant and child mortality

4 These data involve a number of methodological problems which, for reasons of space, cannot be discussed here. They are presented and discussed in Benedictow, *The Medieval Demographic System*.

5 B. J. Sellevold et. al., *Iron Age Man in Denmark* (*Nordiske Fortidsminder*, Ser. B, 8, København, 1984), pp. 207–8, 214; P. Holck, *Cremated Bones: A Medical-Anthropological Study of an Archaeological Material on Cremation Burials* (*Antropologiske skrifter*, 1, Oslo, 1986), pp. 56, 102–11; personal communication from Holck relating to a forthcoming paper on his study of the large skeletal material excavated in the Iron Age burial ground at Møllegård in Fyn (Denmark).

6 K. Mykland, *Gjennom nødsår og krig 1648–1720*, in K. Mykland (ed.), *Norges historie*, 7, (Oslo, 2nd edn 1988), p. 154; S. Dyrvik, *Den lange fredstiden 1720–1784*, in Mykland (ed.),

Table 9.1 *Mean age at death for adults (age 20+) in Denmark in the Iron Age. Life expectancy at age 20 = e_{20} minus 20 years.*

	All adults		Men		Women	
Period	n	e_{20}	n	e_{20}	n	e_{20}
Early Roman	262	37.8	120	39.2	62	37.5
Late Roman	139	37.6	60	39.4	44	36.1
Viking Age	**242**	**38.0**	**70**	**39.2**	**68**	**41.3**
Iron Age	643	37.8	250	39.2	174	38.6

Source: Based on B. J. Sellevold et al. *Iron Age Man in Denmark (Nordiske Fortidsminder*, Ser. B., 8, København, 1984), pp. 207, 209.

rates in the Iron Age were the same, a normal level of life expectancy at birth of around twenty years is indicated. The complete or representative medieval cemetery populations discussed below suggest even higher rates of infant and child mortality.

According to the study of Danish non-cremated skeletal remains, Viking Age adult females had somewhat higher life expectancy at age twenty than adult males, 41.3 and 39.2 years respectively (see Table 9.1).[7] However, in the Iron Age as a whole (including the Viking Age) men had higher mean life expectancy than women, 39.2 and 38.6 years respectively. In two studies of cremated bones, life expectancy for males and females at age twenty was 38 years and 35 years in the first case, 37 years and 34 years in the second case.[8] In the light of this evidence, the deviant result, higher life expectancy for women than for men in the Viking Age, may have been caused by a particularly high level of warlike activity in this period. Lower life expectancy for women than for men can be explained by mortality caused by frequent pregnancies, childbirths and their after-effects in societies which practise universal and early marriage of women.[9] This is a characteristic feature of societies with very high

Norges historie, 8, (Oslo, 2nd edn 1988), p. 78; S. Dyrvik, 'Befolkningsutviklinga 1700–1850', in S. Dyrvik et al., *Norsk økonomisk historie 1500–1850* (Bergen, 1979), p. 127; S. Dyrvik, '1536–1814', in R. Danielsen et al., *Grunntrekk i norsk historie fra vikingtid til våre dager* (Oslo, 1991), p. 115; E. Ladewig Petersen, *Fra standssamfund til rangsamfund 1500–1700* (*Dansk socialhistorie*, 3, København, 1981), pp. 94–6.

7 That both figures are higher than the mean of the whole material reflects the fact that the age-determined but not sexable individuals had lower life expectancy.

8 Holck, *Cremated Bones*; personal communication from Holck on the material from Møllegård, Fyn (cf. n. 5).

9 Benedictow, *The Medieval Demographic System*, pp. 56–75; U. Högberg et. al., 'Maternal deaths in medieval Sweden: an osteological and life table analysis', *Journal of Biosocial Science*, 19 (1987), pp. 495–503.

Table 9.2 *Age-distribution at death, Frösön, 1035–1350, unrevised cemetery data*

Locality →		Frösön	
Cohort ↓	Age	No.	per cent
Infans	0–1	113	31.0
Infans I	1–6	70	19.3
Infans II	7–13	27	7.4
Juvenilis	14–19	15	4.1
Adultus	20–39	69	18.9
Maturus	40–59	65	17.9
Senilis	60+	5	1.4

Source: N.-G. Gejvall, *Westerhus: Medieval Population and Church in the Light of Skeletal Remains* (Lund, 1960).

mortality which must be compensated by very high fertility in order to ensure the survival of (local) society.

Information on the vital structures in the early and high Middle Ages is furnished mainly by two osteo-archaeological studies of rural skeletal populations excavated in cemeteries which were used from the eleventh century.

N.-G. Gejvall's study of the cemetery at Västerhus on Frösön, an island in Lake Storsjön in the province of Jämtland is considered particularly important (see Table 9.2).[10] Jämtland is a vast area, comprising 37,500 sq. km, the size of modern Denmark. It was extremely thinly populated in the Middle Ages; at the time of the medieval population maximum, around 1300, it contained about 1,130 peasant holdings[11] with, probably, about 5,600 persons in all. Thus, population density was roughly 0.15 person per square kilometre. Settlement consisted of small and widely dispersed peasant communities which were little affected by migration.[12] On the basis of anatomical–genetical observations Gejvall concluded that the cemetery population of Västerhus was homogenous and consisted of successive generations of a small number of biologically related families.

In the Viking Age and the high Middle Ages three or four named farms were cleared on Frösön; some of them were divided so that probably five or

10 N.-G. Gejvall, *Westerhus: Medieval Population and Church in the Light of Skeletal Remains* (Lund, 1960).

11 H. Salvesen, 'Jord i Jemtland: Bosetningshistoriske og økonomiske studier i grenseland ca. 1200–1650' (doctoral thesis, University of Trondheim, Östersund, 1979), p. 158.

12 C. H. Siven, 'On reconstructing the (once) living population from osteological age data', *International Journal of Anthropology*, 6 (1991), pp. 111–18.

six holdings were in operation at the time of maximum settlement.[13] This implies that the community's population increased from about 15–20 persons to 25–30 persons. The cemetery appears to have been established as early as 1035–40,[14] and was in continuous use until the settlement was abandoned shortly after the Black Death. The cemetery appears to be quite complete (also with respect to infants and young children). However, it contains a few more adult women than men. Hunting played an important role in the inhabitants' economic life, and the deficit of adult men may reflect the fact that some of them perished away from home.

This, then, is a cemetery that presumably reflects quite accurately the process of living and dying in this small peasant community. Gejvall estimated the mean life expectancy at birth for the whole population to be 17.7 years, and certainly not more than twenty years. The overriding cause for this very low mean life expectancy was very high infant and child mortality; half of all the children were dead before the age of seven.

Elderly people over the age of sixty constitute only 1.4 per cent of the skeletal population. This appears to be a regular feature: in two urban studies of skeletal populations excavated in Tønsberg and Trondheim (Nidaros) the proportions of dead aged over sixty are 2.1 per cent and 1.7 per cent respectively. Substantial under-representation of infants and young children[15] implies that the proportions of elderly people really were even lower, much on a par with the evidence from Frösön. Mortality took a heavy toll also of the adult population: altogether, persons who reached the age of twenty could, on an average, expect to live only another 15–18 years, much as in the Iron Age.

This means that marriages were often broken early by the death of one spouse, and that widows and widowers often remarried rapidly to reconstitute a functioning socio-economic unit. Families would therefore typically contain children of diverse backgrounds, and the number of children would represent far more marriages than those actually in operation at any one time. Thus, while families would rarely contain a grandparent, family size would be significantly enlarged by the presence of children who were the fruit of marriages broken by death and redistributed in new conjugal alliances.

13 Salvesen, 'Jord i Jemtland', p. 144.

14 N.-G. Gejvall, 'Early medieval church at Westerhus in the light of C^{14} collagen datings', in A. W. Mårtensson (ed.), *Res Mediaevalis Archaeologica Lundensia*, 3 (Lund, 1968), pp. 136–40.

15 P. Holck, *Skjelettmaterialet fra Peterskirken, Tønsberg: En antropologisk rapport* (Oslo, 1987); T. Anderson, 'The churchyard in the Folkebibliotekstomt (Library Site), Trondheim: An interim osteological report', in *Fortiden i Trondheim bygrunn: Folkebibliotekstomten, Meddelelser*, 2 (Trondheim, 1986); Benedictow, *The Medieval Demographic System*, pp. 29–36.

The other churchyard that has yielded evidence of demographic conditions in the early and high Middle Ages is the one at Löddeköpinge in Skåne; it was used from some time in the first half of the eleventh century until about 1150, and excavations have so far yielded 1,412 individual skeletal remains.[16] The osteo-archaeologist Jesper Boldsen emphasises that the skeletal population found here exhibits the characteristic features of the process of mortality in a stable agrarian community: 'The distribution of age at death at Löddeköpinge is incompatible with the cemetery being primarily the burial ground of a marketplace. Furthermore, the morphological variation in the Löddeköpinge population indicates a stable and homogeneous community.'

Mean life expectancy at age ten in the Löddeköpinge material is 28 years. Boldsen points out that probably only 50 per cent of all children born would reach the age of ten. More than half of these deaths would occur among infants (age 0–1) and as many as 40 per cent of the infants would die within the first month after their birth.[17] This indicates that mean life expectancy at birth in Löddeköpinge was around twenty years in the period c. 1025–1150. If we interpolate the mortality rates of infants and children in the Nordic countries in the early Modern Period (see above) average life expectancy would still only be 20–25 years and quite probably in the lower reaches of that range. Average annual mortality rate for the population in Löddeköpinge above age ten was 3.6 per cent, and for the whole population probably 4.5–5 per cent.

Sex was determined for all individuals older than nineteen, the age when this can be done with high accuracy. Mortality rates were markedly higher for women than for men in the cohorts of ages 20–40; with older people this difference disappeared. This is a normal pattern which clearly indicates that the high death rate among women was caused by a high rate of pregnancies and childbirths.[18]

Because of small numbers or short time-spans, only three other skeletal studies can be considered to be significant in the perspective provided by the studies of Västerhus and Löddeköpinge. About 40 miles south-east of Löddeköpinge the town of Lund emerged in the eleventh century. Two cemeteries established during the early phase of urbanisation have been excavated, one in the site of the PKbank and used between 1050 and 1100, another in the old part

16 H. Cinthio and J. Boldsen, 'Patterns of distribution in the early medieval cemetery at Löddeköpinge', *Meddelanden från Lunds universitets historiska museum*, new series, 5 (1983–84), pp. 115–27; J. Boldsen, 'Palaeodemography of two southern Scandinavian medieval communities', ibid., p. 111.

17 E. A. Wrigley, 'Mortality in pre-industrial England: the example of Colyton, Devon, over three centuries', *Dædalus*, 97 (1968), pp. 564–70.

18 Boldsen, 'Palaeodemography', pp. 105–15.

of the cemetery of St Stefan's used between 1050 and 1110.[19] The combined skeletal population consists of some 260–300 individuals which could be age-determined; in addition, about 180 individuals above the age of fourteen or fifteen could also be sexed. Mean life expectancy at age twenty was 15 (St Stefan's) and 14 years (PKbank). If we interpolate a mortality regime in which 50 per cent of all children died before the age of ten to fifteen years, and correct for a substantial immigration of adolescents and adults, we can again discern a society where mean life expectancy at birth was around twenty years.

According to the PKbank material, men lived significantly longer than women, 31.3 and 28.8 years respectively; according to the St Stefan's material, women lived slightly longer than men, 26.8 years and 26.2 years respectively. This difference is caused by the fact that the PKbank material contained far more female than male adolescents, although there was a considerable excess of men in all adult cohorts. Early marriage among young adolescent girls, who often would not be physiologically and anatomically ready for childbearing, resulted in significant early maternal reproduction-related supermortality in these cohorts. This again constitutes the main explanation for the shorter life expectancy of women. Characteristically, particularly high female mortality disappears after the age of forty, when women's reproductive role ceased.[20]

There is literary evidence for universal and early marriage of women; the Icelandic family sagas do 'not mention a single old maid'.[21] In addition, the usual age at marriage for females was 14–16 years, and they were normally married before the age of 19;[22] however, marriage also occurred at the age of twelve, without any indication that this was considered exceptional or improper. Early age at marriage for females is also indicated by passages in the succession laws of high medieval codes of law.[23]

Overall, it appears, on the basis of the osteo-archaeological studies of cemeteries, that life expectancy at the age of twenty in the early and high Middle

19 E. Persson and O. Persson, 'Medeltidsfolket från kvarteret Repslagaren', in A. W. Mårtensson (ed.), *St Stefan i Lund: Ett monument ur tiden* (Lund, 1981), pp. 151–70; O. Persson, 'Undersökning av människoskelett', in A. W. Mårtensson (ed.), *Uppgrävt förflutet för PKbanken i Lund: En investering i arkeologi* (Lund, 1976), pp. 171–4.

20 Benedictow, *The Medieval Demographic System*, pp. 56–75. A third much smaller skeletal population, but exhibiting the same main characteristics, is presented by K. Bröste in 'Skeletfundene fra den middelalderlige Rundbygning i Malling', *Aarbøger for nordisk oldkyndighed og historie* (1945), pp. 156–66.

21 R. Frank, 'Marriage in twelfth- and thirteenth-century Iceland', *Viator*, 4 (1973), p. 475.

22 J. V. Sigurðsson, 'Forholdet mellom frender, hushold og venner på Island i fristatstiden', *Historisk Tidsskrift* (Oslo, 1995), p. 321; G. Jacobsen, 'Sexual irregularities in medieval Scandinavia', in V. L. Bullough and J. Brundage (eds.), *Sexual Practices & the Medieval Church* (Buffalo, N.Y., 1982), p. 80; R. Keyser and P. A. Munch (eds.), *Norges Gamle Love indtil 1387*, 1 (Christiania, 1846), p. 231.

23 S. Lindal, 'Ægteskab', *KLMN*, 20 (Oslo, 1976), col. 495.

Ages was normally about 15–18 years, and that life expectancy at birth was about 18–23 years. Life expectancy of females appears to have been significantly lower than for males in all cohorts in which the health of women is affected by pregnancies and childbirth. Early age at marriage for females is indicated by extra high mortality of adolescent females, by written sources, and by the very high level of mortality among infants and young children which reflects a correspondingly high fertility.

It is almost impossible to discern any difference between survival rates and mortality rates for various age groups levels in Iron Age and early and high medieval populations. One might have expected that increasing population density, international communication by sea, and inland movement of goods and tradesmen – by peasants on their way to markets, by pilgrims and others – would have increased the spread of epidemic diseases and raised mortality. On the other hand, the reduction and eventual disappearance of slavery probably improved the lot of the lowest stratum of society.

Mean life expectancy at birth appears to have been 10–15 years shorter in the Viking Age and the Middle Ages than in 1750 when it was probably about 35 years. This implies that the transition from medieval to early modern society involved substantial and qualitative changes of demographic structures. In recent years environmental archaeologists have provided new and rather disconcerting glimpses of everyday Viking Age and medieval life in Norway and the Norse communities of the Atlantic. The quality of housing was very poor, and so was hygiene; people obviously lived in grossly insanitary conditions. Consequently, infection rates were high, especially among children, which in turn affected morbidity and mortality rates. Many of these conditions improved in the early Modern Period, resulting in a marked increase in life expectancy.[24]

The Reformation in the Nordic countries also led to the abolition of fasting, which was practised far more comprehensively and rigorously in the Middle Ages than by the Catholic Church today; fasting days and periods constituted between one-third and one-half of the year. Severe fasting on this scale in a very poor population must have undermined the health of many people, especially pregnant and nursing women, nurslings, adolescents and elderly people.[25]

24 This subject is discussed quite extensively by Benedictow, *The Medieval Demographic System*, pp. 77–88, 90–1, 233–6; Benedictow, 'The demography', pp. 165–70; O. J. Benedictow, 'Den epidemiologiske transisjonen og bekjempelsen av pesten', *Journal of the Norwegian Medical Association*, 114 (30/1994), pp. 3587–93.

25 O. J. Benedictow, 'The Milky Way in history: breast feeding, antagonism between the sexes and infant mortality in medieval Norway', *Scandinavian Journal of History*, 10 (1985), pp. 43–9.

Table 9.3 *Composition and size of the simple family household around 1300*

Household composition	Mean number	Per cent
Male (step)parent	0.93	42.5
Female (step)parent	0.87	
Children below age 15	1.91	45.0
Unmarried youth	0.32	7.5
Grand parents	0.21	5.0
Total	4.24	100.0

Source: O. J. Benedictow, *The Medieval Demographic System of the Nordic Countries*, 2nd edn (Oslo, 1996), pp. 161–72.

Co-residential types: family and household

The type and size of co-residential units are fundamentally important demographic structures. In a stationary population, all families, whatever their fate, will on average raise 2.1 children who reach adult age. Generally, at any one time, all spouses in a normal population will only have completed an average of two-thirds of their child-rearing efforts, and will thus have an average of 1.4 children. In societies shaped by the high mortality revealed by Nordic osteologists and osteo-archaeologists in Iron Age and early/high medieval Scandinavia, families would on average also take care of roughly 0.75 offspring from previous marriages by one or both of the spouses, a small but significant fraction of whom would be redistributed orphans. In other words, almost one-third of all offspring would have one step-parent, and some would be orphaned and taken care of by non-parental (but often biologically related) families.

These averages conceal the fact that many spouses died before their own reproduction had been secured; on the other hand, spouses who survived their fertile period would often enjoy considerable reproductive success. If we assume some population growth – for example an average of 1.5 children per marriage at any one time and 2.25 surviving children per family – the basic family unit (the conjugal/nuclear family) would be composed much as in Table 9.3.[26] According to this composite estimate, the mean size of a simple family household occupying a usual Scandinavian holding around 1300 would be c. 4.25 persons. This average would be slightly increased, to about 4.5 persons, by a modest element of living-in servants and lodgers and by the infrequent occurrence of joint (biologically related) or multiple (unrelated)

26 Benedictow, *The Medieval Demographic System*, pp. 161–72.

families. This corresponds well with what we know about the size of households in other European countries.

It is generally assumed that sub-tenancies ('undersettles') were rare in medieval Scandinavia. Icelandic sources suggest a significant but relatively small incidence of joint and multiple families.[27] In Finland, joint and multiple families were quite frequent in some districts in the early Modern Period, but there is no significant evidence for them in the Middle Ages, although it is likely that there were quite a few such families towards the end of that period.[28]

One important demographic aspect of slavery is that it enlarges the mean household size, which may therefore have been quite large in the Viking Age when quite high proportions of the Nordic population may have been slaves – in Norway possibly between one-fifth and one-quarter around 1030.[29] Given the latter estimate, an average household size of 5.5–6 persons seems reasonable in Norway at that time. The gradual disappearance of slaves from the peasant households in the following period was not balanced by a corresponding increase in the number of living-in servants (with families). Instead, the simple family household consisting of spouses and children (the conjugal family) became the prevailing household type for the rest of the Middle Ages.

Continuous population growth in the early and high Middle Ages caused the rise of a large proletarian class of smallholders and cottagers who were dependent for their livelihood on wage-labour. They settled on the outskirts of the old peasant communities.

27 W. I. Miller, 'Some aspects of householding in the Medieval Icelandic commonwealth', *Continuity and Change*, 3 (1988), pp. 325, 333 and passim; Sigurðsson, 'Forholdet mellom frender', pp. 322–3. The joint family's structural socio-economic connections with well-to-do peasants and animal husbandry is discussed by M. Tornberg, 'Storfamiljinstitutionen i Finland', *Nord-Nytt* (1972), pp. 4–17, and O. Löfgren, 'Family and household among Scandinavian peasants', *Ethnologia Scandinavica* (1974), pp. 17–52. See also Benedictow, *The Medieval Demographic System*, pp. 99–106.

28 Benedictow, *The Medieval Demographic System*, pp. 87–94; Tornberg, 'Storfamiljinstitutionen', pp. 4–17; Löfgren, 'Family and household', pp. 17–52; K. Jern, 'Förvaltning, beskatning och befolkningsutveckling i svenska Österbotten före 1809', in *Svenska Österbottens historia*, 1 (Vasa, 1977), pp. 186, 189–92; E. Orrman, 'Ett samhälle av bönder och syndersfolk', in *Emsalöboken*, 1 (Borgå, 1992), pp. 37–9; B. Moring, *Skärgårdsbor: Hushåll, familj och demografi i en finländsk kustbygd på 1600-, 1700- och 1800-talen* (Helsinki, 1994), pp. 50–5. I am indebted to Professor E. Orrman for some of the references.

29 J. Sandnes, 'Bondesamfunnet', in I. Semmingsen et al. (eds.), *Norges kulturhistorie*, 1 (Oslo, 1979), pp. 49–50; Sandnes, 'Tolv kyr, to hester og tre træler: Litt om omfanget av træleholdet i Norge i vikingtid og tidlig kristen tid', *Historisk Tidsskrift*, 62 (Oslo, 1983), pp. 79–82; T. Iversen, *Trelldommen. Norsk slaveri in middelalderen* (Bergen, 1997); Benedictow, 'The demography', p. 154; Benedictow, Review of T. Iversen's monograph in *Historisk Tidsskrift*; Benedictow, *The Medieval Demographic System*, pp. 125–6.

Population size

In 1938 Professor A. E. Christensen used the *Halland Register* in the so-called *King Valdemar's Land Register* (*Kong Valdemars Jordebog*) as the basis for an estimate of Denmark's thirteenth-century population that was accepted by many historians.[30] However, in 1977 Christensen himself denied the value of the estimate and the usefulness of the *Halland Register* for the purpose of estimating the Danish population.[31] Nevertheless, in the second half of the thirteenth century Denmark's population was clearly much larger than that of any other Nordic country.

Only Icelandic historians have at their disposal literary evidence which may possibly be used to produce valid estimates of Iceland's medieval population. However, the sources are difficult to interpret and so far estimates vary greatly. It now seems to be more generally acknowledged that Iceland's population can hardly have been larger at the time of its medieval maximum than in 1703, when the first modern census registered 50,358 inhabitants distributed among 5,915 peasant holdings and 1,181 sub-tenancies.[32] In the most recent Icelandic study Jón Viðar Sigurðsson concludes that in the thirteenth century there were 5,000–6,000 peasant holdings and no sub-tenancies in Iceland.

As there are no medieval sources containing statistically useful information on the size of medieval Icelandic households, Sigurðsson turns to the census of 1703. By studying a sample of eight local communities (*hreppar*)[33] in three different administrative districts (*sýslur*) he finds that the average number of persons living on each of the 366 peasant holdings of these *hreppar* was 6.5 persons. It is, however, uncertain whether this figure can be taken as representative of the medieval Icelandic household. If that were the case, Iceland may have had 32,500–39,000 inhabitants in the thirteenth century.[34]

30 A. E. Christensen, 'Danmarks befolkning og bebyggelse i middelalderen', in A. Schück (ed.), *Befolkning under medeltiden* (*Nordisk Kultur*, 2, Stockholm, Oslo og København, 1938), pp. 32–48.

31 Christensen, 'Tiden 1042–1241', p. 299; cf. E. Porsmose, 'Middelalder 0. 1000–1536', in *Det danske landbrugs historie*, 1 (Odense, 1988), pp. 234–7; Benedictow, *The Medieval Demographic System*, pp. 181–2.

32 B. Teitsson and M. Stefánsson, 'Um rannsóknir á íslenzkri byggðarsögu tímabilsins fyrir 1700', *Saga*, 10 (1972), pp. 134–78; cf. Benedictow, *The Medieval Demographic System*, pp. 183–4.

33 A *hreppr* was a local administrative unit which provided social assistance to poor and disabled persons.

34 J. V. Sigurðsson, 'Fra godord til riker: Gode- og godordsinstitusjonenes utvikling på Island på 1100- og 1200-tallet' (Graduate thesis, University of Bergen, 1987), pp. 170–5; cf. J. V. Sigurðsson, *Frá goðorðum til ríkja: Þróun goðavalds á 12. og 13. öld* (Reykjavík, 1989), pp. 126–9.

The Nordic population which can best be estimated is that of Norway thanks to an agrarian settlement pattern of separate farms whose names have largely been preserved. At the end of the Viking Age there may have been 27,500 peasant holdings ±10 per cent (25,000–30,000) within the present-day borders,[35] and probably a further 3,900 (3,500–4,300) within the medieval borders (comprising the later Swedish provinces of Jämtland, Härjedalen and Bohuslän). Mean household size including slaves has already been roughly estimated at 5.5–6 persons. The addition for persons living outside the farming economy at this stage of social development is minimal, probably not more than 1–1.5 per cent. Thus, the population of medieval Norway at the end of the Viking Age can be estimated at around 185,000 persons. The margins of uncertainty are wide, 160,000 and 210,000 respectively, but one should keep in mind that they represent the multiplicative effects of extreme assumptions.

Around 1330 the number of peasant holdings in Norway can be more safely estimated than at the end of the Viking age, at 64,000 ±10 per cent within the present borders, and at 73,000 ±10 per cent within the medieval borders of mainland Norway. At this time population growth had probably almost stopped, which suggests a mean household size of 4.5 persons, as mentioned above. Most of the uncertainty regarding the frequency of joint and multiple families, lodgers and living-in servants is probably taken into account if the estimate is widened to 4.25–4.75 persons.[36] Thus, the central estimate of the farming population within the medieval borders of mainland Norway is 328,500 persons (279,000–381,000). If 5 per cent is added for the non-farming population, the central estimate increases to 345,000, with margins of uncertainty from 293,000 to 400,000 persons. In reality, these margins are not exhaustive, but their extension requires quite extreme assumptions. Thus, the population estimate can be reasonably expressed as 345,000 ±15 per cent.

Other historians have argued for higher numbers of inhabitants within the present-day Norwegian borders towards the end of the high Middle Ages: about 400,000 and even more.[37] However, these estimates are based on a household multiplier, or rather on an average number of inhabitants per holding,

35 J. Sandnes, 'Gårds- og andre bustadnavn', in Sandnes and O. Stemshaug (eds.), *Norsk Stadnamnleksikon* (Oslo, 1976), p. 31.

36 The lower figure implies that there were almost no such persons at all (which is an extreme and even incredible assumption), the higher figure that there were, on average, 0.5 additional persons of these social categories per household, which must be considered quite a high estimate under the social circumstances outlined above.

37 See particularly J. Sandnes and H. Salvesen, *Ødegårdstid i Norge: Det nordiske ødegårdsprosjekts norske undersøkelser* (*Det nordiske ødegårdsprosjekt: Publikasjoner*, 4, Oslo, 1978), p. 61; K. Lunden, 'Gardar, bruk og menneske i høgmellomalderen', *Historisk Tidsskrift* (Oslo, 1979), pp. 137–8.

calculated on the basis of censuses of males produced in the 1660s. At that time society had changed comprehensively and profoundly from what it was in the Middle Ages, not least by the emergence of a new social class of cottagers (Norw. *husmenn*, sing. *husmann*) living on sub-tenancies within the territories of established farmsteads. This was a development which increased the average number of inhabitants per farmstead substantially, to 6 persons, a number for which there is no medieval evidence, whereas the multiplier of 4.5 persons established above is based on medieval demographic data.

Compared to the central estimate of the population at the end of the Viking Age, our evaluation of the medieval population maximum in about 1330 implies a growth of 75 per cent, and a mean annual growth rate through the period of about 0.2 per cent (i.e. a doubling of the population in 350 years). This is significantly less than the increase in the number of holdings because the end of slavery meant that unfree families and servants moved out and entered the social categories of small tenants, cottagers and day labourers. The incidence of multiple families would thus have been sharply reduced and the mean household size would have decreased correspondingly.

Toponymic and archaeological studies show that the populations of the Nordic countries must have grown quite rapidly in the Viking Age, and that growth continued until the last decades of the thirteenth century when it probably ended in most regions. Little more can be said with confidence about Denmark and Sweden.[38] However, it seems reasonable to suggest that the populations of Denmark and Sweden, like that of Norway, increased by roughly 75 per cent in each of these two periods, and that they were about three times larger in 1300 than in 750. This increase corresponds to a mean annual growth rate of around 0.2 per cent. Because of the exponential nature of the estimate, this means of course that growth, measured in absolute numbers of holdings or persons, was much faster in the Middle Ages than in the Viking Age.

In order to put these estimates in perspective one should note that, while in the 550 years between 750 and 1300 the Nordic populations may have trebled, the world population only doubled between AD 1 and 1550 (from about 250 millions to about 500 millions), which corresponds to an annual growth rate of c. 0.06 per cent.[39]

38 Skovgaard-Petersen, 'Oldtid og vikingetid', pp. 78–87; Christensen, 'Tiden 1042–1241', pp. 318–20; Porsmose, 'Middelalder', pp. 234–7; A. Schück, 'Ur Sveriges medeltida befolkningshistoria', in Schück (ed.) *Befolkning under medeltiden*, pp. 160–4.

39 M. Livi-Bacci, *A Concise History of World Population* (Cambridge, Mass., 1989), p. 31.