

# Catalogue of palaeomagnetic directions and poles from Fennoscandia: Archaean to Tertiary



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## ABSTRACT

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Palaeomagnetic data from Fennoscandia ranging from the Archaean to the Tertiary have been compiled into a catalogue. The data are presented in table format, listing Precambrian data according to tectonomagmatic blocks and Late Precambrian–Phanerozoic data according to geological periods. Each pole is graded with the modified Bremen–Duff classification scheme. The catalogue (complete to the end of 1988) contains 350 entries from 31 tectonomagmatic blocks and/or geological periods. Normal and reversed polarity data are listed separately to allow polarity asymmetries to be studied. Each entry also has an indexed abstract summarizing relevant information, such as the age of the rock, the age of the natural remanent magnetization and the basis for the assigned reliability grade. All the data are stored in the palaeomagnetic data bank, which will be updated annually with new data. The catalogue is the basic source of data for the microcomputer-based palaeomagnetic database for Fennoscandia now being compiled.

## Introduction

Palaeomagnetic data provide important tectonic information, and one of the most successful applications of palaeomagnetism has been the determination of the relative positions of continents during Mesozoic times (e.g., Smith et al., 1980). In the early 1980s, palaeomagnetic data were also used to calculate the movements of the Precambrian shields during Proterozoic times (e.g., Irving and McGlynn, 1981; Pesonen and Neuvonen, 1981). More recently much attention has been paid to the use of palaeomagnetic techniques to measure the past movements of the cratons

before they were amalgamated to form the present-day shields (e.g., Irving et al., 1984; Pesonen, 1987b). These studies have improved our understanding of the tectonic evolution of the orogenic belts between the joined cratons (e.g., Van der Voo and Channel, 1980).

The palaeomagnetic technique in these studies is based on a comparison of the apparent polar wander paths (APWPs) of source blocks (either microplates, nappes, cratonic blocks or entire continents) at successive time intervals: differences between APWPs indicate relative movements between blocks (see Irving and McGlynn, 1981 and Pesonen and Neuvonen, 1981). The basic requirement for these comparisons is consensus among palaeomagnetists in constructing the APWPs. A literature review, however, demonstrates that this is often not the case. For example, three different

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APWPs have been proposed for Fennoscandia during the Middle Proterozoic (Poorter, 1981; Pesonen and Neuvonen, 1981; Piper, 1982), resulting in contrasting tectonic and kinematic interpretations for the evolution of this shield during Proterozoic times. There are two reasons for these differences: (i) discrepancies exist in the palaeomagnetic data and literature sources used by the various authors, and (ii) the criteria used to select reliable data for building the APWPs vary.

The problems mentioned above can be resolved by establishing a database of palaeomagnetic results in which each pole has a reliability grade (e.g., Briden and Duff, 1981; Halls and Pesonen, 1982; Roy, 1983). The purpose of this paper is to provide a complete catalogue (Table 2) of all published palaeomagnetic directions and poles from Fennoscandia (i.e., since 1957 when magnetic cleaning methods were developed), and to classify them using objective reliability criteria. In contrast to previous catalogues of Fennoscandian palaeomagnetic data (e.g., Piper, 1980a; Pesonen and Neuvonen, 1981), this one lists the data according to their tectonomagmatic source blocks or age provinces. This procedure allows any movements between cratons, tectonic blocks or microplates to be studied with palaeomagnetic techniques in much the same way as the relative movements between continents are studied.

The paper also seeks to compile the data into a modern, microcomputer-based data bank (see Pesonen and Torsvik, 1990), from which workers can easily and rapidly retrieve data for the applications they are interested in. The applications of these data vary. For example, some workers might be interested in tectonic applications of palaeomagnetism as outlined above (e.g., Pesonen et al., 1989), while others might use the data to study the behaviour of the Earth's magnetic field in the past (e.g., Nevanlinna and Pesonen, 1983). This paper aims at presenting the data in a readable table format following the method of Irving and McElhinny (e.g., Irving and Hastie, 1975; McElhinny and Cowley, 1978). This work, which exemplifies Scandinavian co-operation, is related to the European Geotraverse Project (EGT) and is a product of the Palaeomagnetic Working Group established at the Second EGT Study Centre held

in 1986 in Espoo (Finland) (e.g., see Hoffman, 1986, Pesonen, 1987a, and Pesonen et al., 1989).

## Sources of data

The primary source of data was the first computer catalogue of palaeomagnetic directions and poles from Fennoscandia published by Lähde and Pesonen (1985) and stored in the VAX-780 computer of the Geological Survey of Finland. However, this catalogue had several drawbacks. First, a thorough review of the literature revealed that about 20% of the data were not included. Second, the grading scheme of the palaeomagnetic poles used by Lähde and Pesonen was not rigorous enough (e.g., see Pesonen et al., 1989). Third, the data were not always organized according to tectonomagmatic block or geological period.

In the present study, we first examined all the available publications dealing with palaeomagnetic and radiometric age data on Fennoscandia, restricting the survey, however, to the period during which magnetic cleaning methods have been in use (i.e., only post-1957 data are used); the uncleaned data from before 1957 are considered unreliable. The Lähde-Pesonen catalogue was then critically reviewed and updated with new data.

Other very useful data sources for this work were the palaeopole catalogues of Irving and McElhinny and their co-workers (e.g., Irving and Hastie, 1975; McElhinny and Cowley, 1978). The data from the Soviet part of the Fennoscandian Shield were extracted from catalogues published by Kramov (see McElhinny et al., 1977).

## Recalculations

In many cases the palaeomagnetic directions, pole positions and statistical parameters had to be recalculated because they were not listed in the original papers, there were obvious errors in the original data or the data were presented in a format different from that preferred in this catalogue. Owing to these recalculations, our numerical data may occasionally differ from those given in the original papers. However, apart from a few instances these differences are small. Lähde and

Pesonen (1985) developed a software package to perform the necessary recalculations, and to double-check the results given in the original publications. For example, in some instances (e.g., entry Q05-005, Lie et al., 1969) the authors use the Fisher radius  $R$  for the mean direction in preference to the 95% confidence circle ( $\alpha_{95}$ ) used in this paper. Similarly, in a few instances (e.g., entry G02-008, Larson and Magnusson, 1976), the pole position is stated without the semi-axes ( $dp$ ,  $dm$ ) of the confidence oval. These can easily be calculated provided the required parameters (i.e.,  $\alpha_{95}$  and inclination of remanence) are given in the original papers. Further, about 10% of the papers do not report the latitude and longitude of the sampling site (e.g., Q03-005, Rother et al., 1987). These were calculated from the given palaeomagnetic direction ( $D$ ,  $I$ ) and pole position (PLAT,

PLON) using the numerical method of Lähde and Pesonen (1985). Users of this catalogue should remember that there is always a possibility of new errors arising from recalculations. We are confident, however, that the double-checking method has minimized the number of such errors.

### Source blocks

Figure 1 shows the block division of Fennoscandia used for the Precambrian palaeomagnetic data (Pesonen et al., 1989). There are 23 tectonomagmatic blocks or provinces. The division is primarily based on published geochronological, tectonic, structural and geophysical maps of Fennoscandia (e.g., Simonen, 1980; Eriksson and Henkel, 1983; Gorbunov et al., 1985; Gaál, 1986; Gorbatschev and Gaál, 1987). Block names

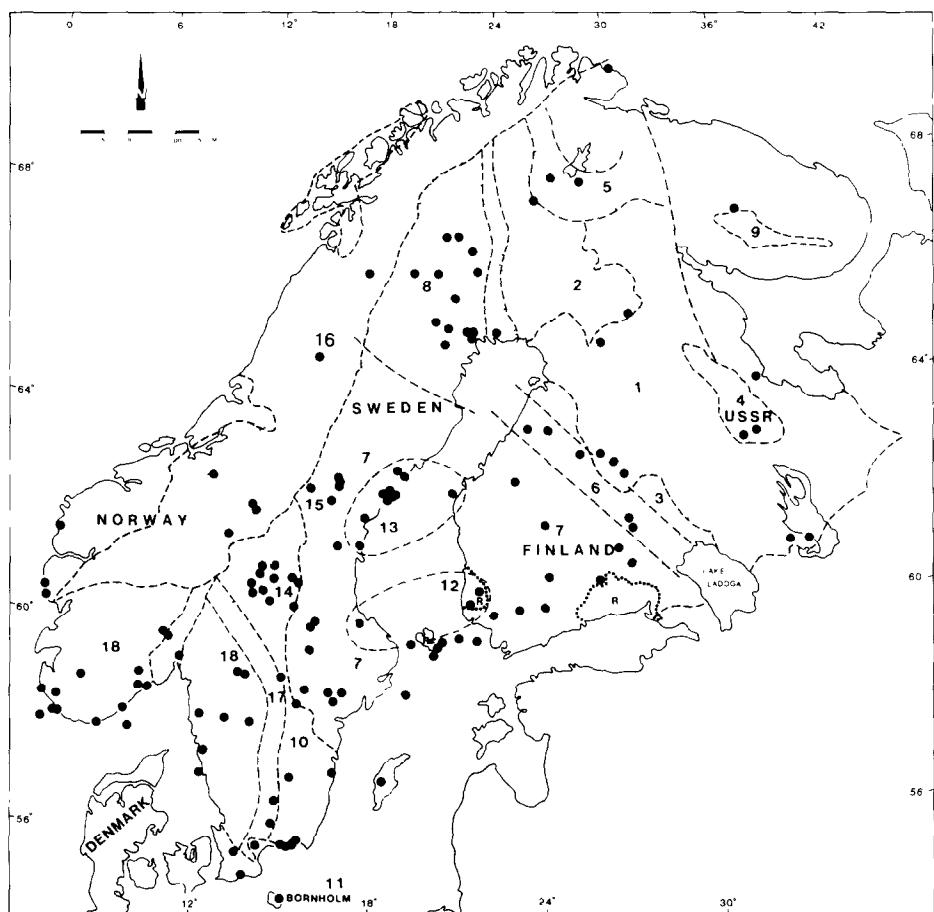


Fig. 1. The tectonomagmatic block division of Fennoscandia. The numbers and block names are in Table 1. Block 16 refers to the Bångfjället inlier and is marked here only approximately (without boundaries). See text and Pesonen et al. (1989).

and the corresponding database codes (block "keys") are listed in Table 1 and follow the nomenclature used by Bylund and Pesonen (1987) and Pesonen et al. (1989).

The catalogue itself is in Table 2, where each palaeomagnetic result yielding a palaeomagnetic pole is listed as a separate entry (i.e., one line). Each entry is assigned to a source area (block, magmatic province, geological period and so on) listed in Table 1. Note that the block division in Fig. 1 is not always unique with respect to the age of crystallization of the rocks or with respect to the age of magnetization. For example, "palaeomagnetically" the Sveconorwegian Province is considered Late Precambrian (ca. 1100–850 Ma) because the majority of the palaeomagnetic and isotopic data show a Sveconorwegian resetting between 1100 and 850 Ma B.P., even though the crystallization age of these rocks may be much older (ca. 1500–1600 Ma; see Bylund and Pesonen, 1987). Thus, the poles are sometimes listed by age of the source province and sometimes by the estimated age of the magnetization (e.g., the Sveconorwegian data). In numerous cases the magnetization age is considerably younger than the radiometric age (e.g., entry S03-013, Elming, 1985). This is a fundamental problem in palaeomagnetic databases, and it is therefore recommended that the catalogue be used with caution. It is vital always to study the results and interpretations of palaeomagnetic, radiometric and structural data as they appear in the original papers. For this reason, each entry is provided with an "abstract" (Appendix) giving the relevant background for the final interpretation of the magnetization ages and reliability grades.

Owing to the scarcity of data, rocks younger than ca. 670 Ma are listed by geological period. There are ten such periods in the Late Precambrian–Phanerozoic time interval (Table 1). The Quaternary data are omitted from the catalogue: they will be compiled separately together with archaeomagnetic and lake sediment data. The observation that the magnetization age and the crystallization or diagenetic age of the rock may differ also applies in particular to the Phanerozoic data. This is often the case when the primary age of the rocks is unknown, but there are good geological

reasons to believe that the magnetization age is reasonably well established (e.g., entry Q09-004, Lövlie and Mitchell, 1982).

### Explanation to the columns in the catalogue

The main headings in the catalogue (Table 2) (e.g., the Karelian Craton) indicate the block names (from Archaean to Late Precambrian) or geological periods (from Late Precambrian/Cambrian to Tertiary). Each block also has a number between slashes (e.g., block /1/, see Table 1) and a letter code (e.g., A01), which will be used as "keys" in the database (Pesonen and Torsvik, 1990).

#### *Column 1: No*

Each entry starts with an index number consisting of seven digits: the first three digits indicate the block (or province) code used in the database (e.g., A01) and the last three the entry number within the block or age group under consideration.

#### *Column 2: Rock unit and/or component, country*

This column gives the name of the rock unit and the remanence component. Country codes are given next, with the following abbreviations: *B* = Bornholm (Denmark), *F* = Finland, *N* = Norway, *S* = Sweden and *U* = Soviet Union.

#### *Columns 3 and 4: LAT, LON*

These columns give the geographic latitude ( $^{\circ}$ N) and longitude ( $^{\circ}$ E) of the sampling site. These data were often absent from the original publications. They were therefore calculated from the pole position (PLAT, PLON) and remanent magnetization direction (*D*, *I*) using the numerical method of Lähde and Pesonen (1985), assuming a geocentric axial dipole field (Irving, 1964, p.43).

#### *Column 5: B/N/n*

This column gives the number of studies or sites (*B*), the total number of samples (*N*) and the total number of specimens (*n*). An asterisk (\*) in front of one of these numbers indicates the

hierarchical level used in the statistical calculations of the Fisher parameters (see following columns; Fisher, 1953; Irving, 1964, p. 53).

#### *Column 6: p*

This column indicates the palaeomagnetic polarity (*p*) of the remanent magnetization. We have used the same definition for polarity as Pesonen and Neuvonen (1981), where *N* = normal polarity, *R* = reversed polarity, and *C* is the combined mean of these two polarity groups if both groups are present. If there is a significant (10°) difference in palaeomagnetic directions between the two polarities, the combined mean was not calculated. Note also that whenever the two polarities are listed together, the data from the original tables, and sometimes even from the figures (e.g., entries B03-002 and 003), were re-sorted into two polarities. The concept of "mixed polarity" (*M*) is generally avoided in this catalogue. However, in deformed sediments individual specimens sometimes reveal the two polarities superimposed during demagnetization. Separation into two discrete polarity groups is then difficult. In such instances, the data are listed as *M* polarity (e.g., entry Q05-002; Torsvik et al., 1987), and the mean direction and pole given refer to the dominant polarity.

#### *Column 7 and 8: D and I*

These columns give the declination (*D*) and inclination (*I*) of the natural remanent magnetization (NRM) after cleaning and after multicomponent analysis (if carried out).

#### *Column 9: α95*

$\alpha 95$  is the 95% confidence circle for the mean direction (Fisher, 1953). If the number of data (*B*, *N* or *n*) is less than three,  $\alpha 95$  is shown in parentheses.

#### *Column 10: k*

This column gives the precision parameter *k* (Fisher, 1953) and was calculated only when data

on more than two sites (or samples/specimens) were available.

#### *Column 11: age*

This column gives either the radiometric age, radiometric age interval or the estimated age of the rock or remanent magnetization. The error bars refer to the  $2\sigma$  level, and in most instances the ages were recalculated with the revised decay constants given by Steiger and Jäger (1977). We stress that it is often impossible to quote a single value for the age of remanent magnetization: the data merely provide some clues to the age of remanence acquisition. The abstracts fill in some of the background important for the age values used, but the reader is always advised to study the original sources of the isotope data.

#### *Column 12: m*

This column gives the radiometric dating method. The following abbreviations are used: *a* = geological age (stratigraphic or cross-cutting evidence), *b* = fission track, *c* =  $^{39}\text{Ar}$ - $^{40}\text{Ar}$ , *d* = K-Ar, *e* = Rb-Sr (mineral isochron), *f* = Rb-Sr (whole rock), *g* = U-Pb, *h* = Sm-Nd, *i* = Pb-Th and *j* = Pb-Pb.

Any supplementary minerals that have been used (e.g., biotite (*bi*), feldspar (*fp*), hornblende (*hb*), pyroxene (*px*), sphene (*sp*), muscovite (*mv*), zircon (*zr*), apatite (*ap*) and baddeleyite (*bd*)) are mentioned in the catalogue or in the abstracts.

#### *Column 13: PLAT, PLON*

This column gives the palaeomagnetic pole position ( $^{\circ}\text{N}$ ,  $^{\circ}\text{E}$ ) as calculated from the mean *D*, *I* by assuming an axial geocentric dipole field (Irving, 1964, p.43). The quoted palaeomagnetic pole does not always agree with the quoted direction, in which case the error is either in the mean direction, the calculated pole or the given site coordinates. These are all taken into consideration in the abstracts, and the entry is assigned a lower reliability than it would normally receive.

**Column 14: dp, dm**

This column gives the semi-axes for the 95% confidence oval of the pole (in degrees).

**Column 15: (A95)**

*A* is the 95% confidence circle of the pole when the calculation is based on site mean poles rather than site mean directions (see Irving, 1964, p. 70)

**Column 16: t**

This column gives the method of demagnetization, where: *a* = alternating field (a.f.), *t* = thermal and *c* = chemical.

**Column 17: g**

This column gives the modified Briden-Duff (Briden and Duff, 1981; Pesonen et al., 1989) reliability grade for the entry, ranging from *A*

(most reliable) to *D* (least reliable). See also the next section.

**Column 18: Ref.**

This column gives the key reference to the source of the original palaeomagnetic data. An asterisk (\*) indicates that a recalculation was made. The key reference to the radiometric age is given in the abstracts.

**Modified Briden-Duff Grading**

Each pole was graded into classes ranging from *A* to *D* on a modified Briden and Duff (1981) scale. The scheme is shown in Fig. 2. This scheme is not as rigorous as that used by Briden and Duff themselves because only about 10% of the Fennoscandian poles satisfy the class *A* criteria, and no more than about 30% the combined class *A-B* criteria. In our scheme we allocated the pole to the *B* category if five or more samples (instead of ten

All paleomagnetic data from Fennoscandia since 1957 and up to 1988, assessed from source references  
Some recalculations performed by present authors

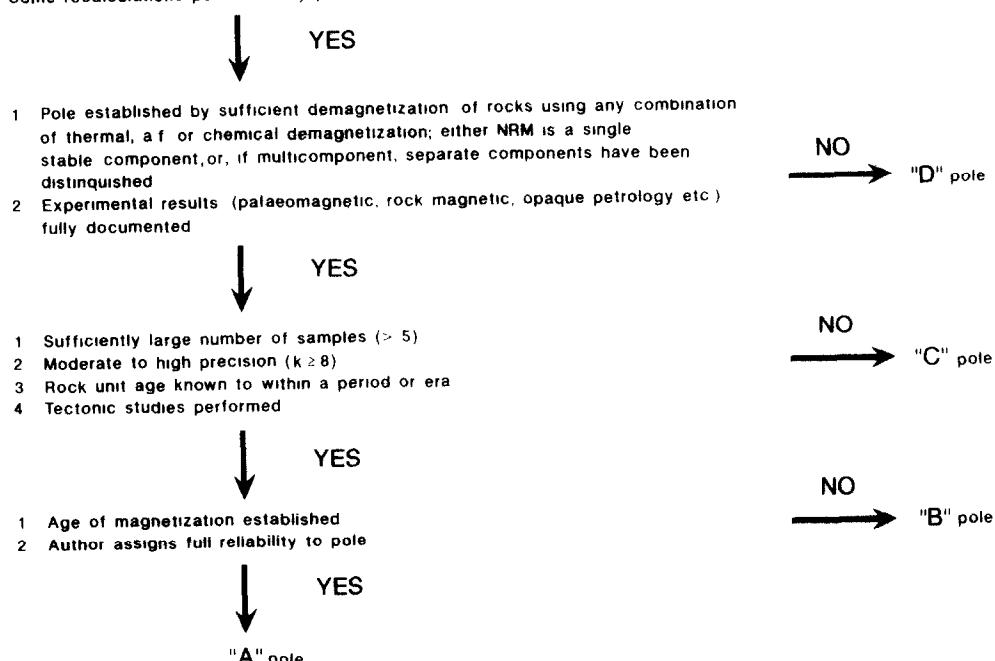


Fig. 2. The modified Briden-Duff grading scheme for the palaeomagnetic poles (see Briden and Duff (1981) and Pesonen et al. (1989)). Each pole has been ranked with this scheme by answering "yes" or "no" to the questions starting from the top and moving to the bottom.

as used by Briden and Duff) were available, as there often are in Fennoscandian studies. Similarly, a pole falls into the *B* category (but not *C*) if its Fisherian precision parameter *k* is higher than 8 (Briden and Duff used *k* > 10). We admit that there is no truly objective method of grading the poles, but we feel that our method is appropriate and adequate for the present purpose. In assigning the grade we also emphasize the way in which the original authors assessed their own data. Problems were frequently encountered when recalculating data from original tables, and occasionally even when extracting them from figures (e.g., entries Q09-002 and 003; Storetvedt et al., 1978). However, the recalculations were necessary in order to have all the published palaeomagnetic results in a consistent format to permit further studies of the data (e.g., Pesonen et al., 1989).

### Polarity definitions

In this catalogue we have used the polarity definitions of Pesonen and Neuvonen (1981). Because of the considerable gaps in the Precambrian APWP, the definition of "true" polarity is ambiguous. The polarity is normal (*N*) if the north-seeking paleomagnetic direction yields a pole in the Pacific or in the Canadian Arctic. Otherwise the polarity is reversed (*R*). This is a sound definition of polarity for the Phanerozoic data because the APWP migrates from the Pacific area to the present Magnetic North Pole in the Arctic without big jumps. The only exception in choosing the polarity is the Late Precambrian/Cambrian pole, because there is a large gap in the APWP between this pole and the Ordovician pole, and the polarity has not been well established (see discussion in Pesonen et al., 1989).

Note also that some workers (e.g., Abrahamsen, 1977; Irving and McGlynn, 1981; Poorter, 1981; Piper, 1987) have used polarity definitions which are different from those applied in this paper.

### Polarity asymmetry

Because one of the main applications of data catalogues is to study whether the *N* data differ from the *R* data (polarity asymmetry), we decided

to compute the mean palaeomagnetic directions for the two polarities separately. This was not always possible, however, owing to lack of data in the original papers. If the difference in mean directions is considerable (say, 10°) we did not calculate the combined mean direction but instead give the two different means in order not to lose the information on the polarity asymmetry (e.g., Pesonen and Neuvonen, 1981). In some cases the *N* and *R* data had to be digitized from original figures (e.g., entries S02-017 and S02-018; Fridh, 1979) to obtain the two mean directions.

### Towards a palaeomagnetic database

The catalogue presented in this paper forms the core source of data for the microcomputer-based palaeomagnetic database now under construction (e.g., Torsvik, 1986, 1987; Pesonen and Torsvik, 1990; Torsvik et al., 1990).

### Acknowledgements

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### Appendix

Karelian Craton /1/ A01, Archaean

*A01-001 Varpaisjärvi quartz diorite, F(A)*

Age:  $2680 \pm 3$  Ma, U–Pb (Zr) on quartz-dioritic pegmatoid (Paavola, 1985).

An Archaean basement unit cut by Nilsjäärvi diabase dykes I (see entry A01-006). Located at the SW border of the Karelian Craton (block 1) in Finland. Used as key pole for the beginning of the APWP of the Fennoscandian Shield by Pesonen and Neuvonen (1981), Bylund and Pesonen (1987) and Pesonen et al. (1989).

Ref: Neuvonen et al. (1981).

*A01-002 Nilsiä tonalitic dykes, F(B)*

Age: 1830–1860 Ma (U–Pb, Zr; Huhma, 1981).

Tonalitic dykes exposed within the Karelian Craton (block 1) are slightly older than or coeval with the Svecokarelian Haukivesi lamprophyres in the Raahe–Ladoga Belt (entry SO1-009).

Ref: Neuvonen et al. (1981).

*A01-003 Iisalmi gabbro–diorites, F(B)*

Age: ca. 2160 Ma (Paavola, pers. commun., 1984).

No observations that these gabbro–dioritic intrusions (Kauppinen, 1973) are cut by the Iisalmi diabase dykes (next entry A01-004). Large scatter in direction.

Ref: Neuvonen et al. (1981).

*A01-004 Iisalmi diabase dykes, F(C)*

Age: ca. 2160 Ma, geological evidence (see A01-003).

Only three samples from each site studied. The palaeopole lies close to the other Jatulian (2100 Ma) poles.

Ref: Neuvonen et al. (1981); see also Bylund and Pesonen (1987).

*A01-005 Nilsiä diabase dykes II, F(C)*

Age: Either Jatulian (ca. 2160 Ma) or Svecokarelian (ca. 1800 Ma) (Paavola, pers. commun., 1984; see also Pesonen, 1987b).

Since the dykes are metamorphosed, the direction of NRM probably represents a Svecokarelian overprint at ca. 1800 Ma. Two dykes studied.

Ref: Neuvonen et al. (1981); see also Bylund and Pesonen (1987).

*A01-006 Nilsiä diabase dykes I, F(B)*

Age: ca. 2160 Ma (Vaajoki, pers. commun., 1986).

These enstatite–augite dykes appear fresh and less altered than the Nilsiä dykes II (entry A01-005). They are therefore likely to be of Jatulian (ca. 2160 Ma) age (Paavola, pers. commun., 1984). A positive baked contact test on the Nilsiä quartz–diorite (A01-001) suggests that these dykes have preserved a primary NRM direction. However, the palaeomagnetic pole position is anomalous and implies a magnetization age of about 1700 Ma. Pesonen (1987b) suggests that the anomalous pole could be related to block rotations in the Nilsiä area as evident from changes in dyke orientation in the area (Paavola, 1985).

Ref: Neuvonen et al. (1981); Paavola (1985); Pesonen (1987).

**Central Lapland block /2/ JO1, Lapponian***J01-001 Kuusamo dykes and greenstones, F(B)*

Age: ca. 2160 Ma (U–Pb and K–Ar on sphene; Sakkö, 1971; Silvennoinen, 1985).

These Lapponian (Jatulian) sequences of basaltic–sedimentary rocks act as the basal cover of the 2.7 Ga old Archaean basement. The sequence is composed of dykes, sills, effusive basaltic rocks (greenstones) and sediments (quartzites). The basalts are spilitized, and the dykes are mostly albitic in composition. The tilt test is positive and thus the pole position, located on the “Jatulian APW loop” of Lähde and Pesonen (1985), is probably primary.

Ref: Neuvonen (1975); see also Lähde and Pesonen (1985) and Bylund and Pesonen (1987).

**Inlier in Central Karelia /1, 3/ J02, Jatulian–Svecofennian***J02-001 Taivalkoski–Syöte gabbro, F(C)*

Age:  $2440 \pm 34$  Ma (U–Pb, Zr; Kouvo, 1977).

Although the crystallization age of the gabbro is well established at about 2440 Ma, there are inconsistencies in the isotopic data at ca. 1900 Ma, suggesting a resetting of the Zr age during the Svecofennian orogeny (see Huhma, 1984; Mertanen et al., 1987). This intrusion is one of the Early Proterozoic layered intrusions in northern Finland, Sweden and the USSR. Palaeomagnetic data were obtained without multicomponent analysis of the NRM. This NRM direction most likely represents a Svecokarelian overprint direction, as suggested by more recent palaeomagnetic and age data, and by a negative tilt test for this component (Mertanen et al., 1987).

Ref: Neuvonen (1975).

*J02-002 Hyypia metadiabases, F(C)*

Age: 2200–2100 Ma (K–Ar; Sakkö, 1971).

Two vertical dykes studied. The NRM directions show large scatter, possibly suggesting an overprint due to the Earth's present magnetic field (PEF) (the dykes are much altered).

Ref: Neuvonen (1975).

*J02-003 Eno metadiabases, F(C)*

Age: No age data available, but the palaeomagnetic pole implies a Jatulian age (ca. 2100 Ma) for these dykes. A Jatulian age is also possible from field evidence.

Three vertical dykes studied. The NRM directions after a.f. cleaning are highly scattered and may be contaminated by the PEF.

Ref: Neuvonen (1975).

*J02-004 mean of metadiabases, F(B)*

Age: See J02-002 and J02-003; mean of entries J02-002 and 003.

Ref: Neuvonen (1975); Lähde and Pesonen (1985).

*J02-005 Vazhinka–Pukhta, upper reversed polarity, U(C)*

Age: ca. 1850–1950 Ma (Pb–Th and K–Ar data, together with stratigraphic evidence; Katseblin (1968a,b)).

Thermal demagnetization experiments have verified the existence of successive reversals in the Vazhinka–Pukhta sequence. Only three samples studied from the upper sequence (*R* polarity). Results probably corrected for tilt.

Ref: Katseblin (1968a,b); Lähde and Pesonen (1985).

*J02-006 Vazhinka–Pukhta, uppermost normal polarity, U(C)*

Age: See J02-005. Only four samples studied. Results probably corrected for tilt.

Ref: Katseblin (1968a,b); Lähde and Pesonen (1985).

*J02-007 Vazhinka–Pukhta upper normal polarity, U(D)*

Age: See J02-005. Number of sites and samples not given.

Ref: Katseblin (1968a,b); Lähde and Pesonen (1985).

*J02-008 Vazhinka–Pukhta, lower normal polarity, U(D)*

Age: See J02-005. Number of sites and samples not given.

Ref: Katseblin (1968a,b); Lähde and Pesonen (1985).

*J02-009 mean Vazhinka–Pukhta, normal polarity, U(C)*

Age: See J02-006. Mean of entries J02-006 to 008.

Data are probably tilt corrected. A baked contact test against a diabase sill (J02-011) was inconclusive. The palaeomagnetic direction suggests a Jatulian–Svecokarelian age of magnetization

Ref: Katseblin (1968a,b); Lähde and Pesonen (1985).

*J02-010 Shoksha sediments, U(B)*

Age: 1850–1950 Ma (Katseblin, 1968a,b).

These sediments are stratigraphically below the Vazhinka–Pukhta sediments. Data probably corrected for tilt.

Ref: Katseblin (1968a,b); Lähde and Pesonen (1985).

*J02-011 Onega–Rybreka sill, U(B)*

Age: Estimated age 1600–1800 Ma (McElhinny and Cowley, 1977). Data from the Khramov catalogue (McElhinny and Cowley, 1977) are probably the same as those reported in Katseblin (1968a), i.e. from a sill intruding and baking the

Vazhinka–Pukhta sediments (see J02-009). Inconclusive baked contact test: the baked sediment direction differs slightly from that of the sill. Compare with J02-012.

Ref: Katseblin (1968a); McElhinny et al. (1977).

*J02-012 Rybreka baked sediments, U(D)*

Age: See J02-009 and J02-011.

The direction of the baked sediments differ by about 20° from the baking sill (J02-011) and from the unbaked sediments (J02-009).

Ref: Katseblin (1968a,b); Lähde and Pesonen (1985).

**Inlier in Central North Karelia /4/ J03, Svecofennian***J03-001 Northern Karelia sandstone, U(C)*

Age: 1610–1870 Ma (McElhinny et al., 1977)

Ref: McElhinny et al. (1977)

*J03-002 Central Karelia sandstone (I), U(C)*

Age: No age data, but this sandstone unit may correlate with entry J03-001.

Ref: McElhinny et al. (1977)

*J03-003 Central Karelia sandstone (II), U(C)*

Age: 1610–1870 Ma (see J03-002). See entry J03-002.

Ref: McElhinny et al. (1977)

*J03-004 mean Central Karelia sandstones, U(C)*

Age: 1610–1870 Ma (see J03-003). Mean of entries J03-002 to 003

Ref: McElhinny et al. (1977).

*J03-005 Central Karelia dykes, U(B)*

Age: 1610–1870 Ma (estimated) (McElhinny et al., 1977).

Ref: McElhinny et al. (1977).

**Lapland Granulite Belt /5/ E01, Late Archaean–Svecofennian***E01-001 Akujärvi quartz-diorite, F(B)*

Age: 1900–1925 Ma (U–Pb, Zr; Meriläinen, 1976)

The NRM probably reflects uplift and cooling of the Svecokarelian orogeny affecting the Granulite Belt in northern Finland. Detailed thermal demagnetization studies reveal other, but less common, magnetization components.

Ref: Pesonen and Neuvonen (1981); Pesonen (in prep.).

*E01-002 Akujärvi pyroxene granulite (N), F(D)*

Age: No age data, but these rocks are the same as those in entry E01-001.

Only one sample measured. NRM direction (after a.f. demagnetization) consistent with that of E01-001.

Ref: Papunen et al. (1977).

*E01-003 Akujärvi pyroxene granulite (R), F(D)*

Age: No age data (see E01-002).

Only two samples measured, but the NRM (after a.f. cleaning) suggests reversed polarity (compare with E01-001 and E01-002).

Ref: Papunen et al. (1977).

*E01-004 Menesjärvi granulites, F(D).*

Age: No age data.

On the basis of palaeomagnetic data, Pesonen et al. (1989) argue that the Menesjärvi granulites represent a slightly deeper crustal level, and hence a slightly younger NRM, than the Akujärvi granulites within the Granulite Belt.

Ref: Papunen et al. (1977); Pesonen et al. (1989).

*E01-005 Laanila diabase dykes, F(B)*

Age:  $998 \pm 80$  Ma, Sm–Nd (Pesonen et al., 1986).

This dyke swarm is a manifestation of widespread Late Precambrian (Sveconorwegian) igneous activity in northern Fennoscandia. Three dykes trending NNE en-échelon were studied. The swarm is associated with a distinct negative aeromagnetic anomaly. Positive baked contact test. Rock magnetic (hysteresis) studies performed. Pole position suggests a Sveconorwegian age for the NRM with, however, a slight departure from the Sveconorwegian APW path, which led Pesonen (1987) to propose a microcontinental model for the evolution of the Sveconorwegian Province during the 1.2–0.9 Ga period.

Ref: Pesonen et al. (1986); Pesonen (1987b); Pesonen et al. (1989).

**Raahe–Ladoga block /6/ S01, Svecfennian***S01-001 Ylivieska gabbro (1), F(C)*

Age: 1884 Ma (U–Pb, Zr; Helovuori, 1979).

A synorogenic Svecfennian gabbro within the Raahe–Ladoga Belt.

Ref: Puranen (1960); see also Lähde and Pesonen (1985).

*S01-002 Ylivieska gabbro (2), F(B)*

Age: 1884 Ma (see S01-001).

According to Pesonen and Stigzelius (1972), the NRM (after a.f. demagnetization) is synorogenic to late orogenic

(Svecfennian). According to Mutanen (pers. commun., 1974), the gabbro is layered and yields a negative tilt test, suggesting that the NRM postdates the structural tilting. High-field a.f. demagnetization data often reveal evidence of superimposed components (see also entry S03-002; Elming, 1985) which have not been isolated.

Ref: Stigzelius (1970); Pesonen and Stigzelius (1972); Pesonen and Neuvonen (1981).

*S01-003 Pohjanmaa gabbro–diorites, F(B)*

Age: 1884 Ma (see S01-001)

According to Pesonen and Stigzelius (1972), these rocks record the same synorogenic to late orogenic cooling as the Ylivieska gabbro (entry S01-002). The diorites are magnetically harder and more stable than the gabbros.

Ref: Pesonen and Stigzelius (1972).

*S01-004 Kiuruvesi diabase dykes, F(C)*

Age: No age data.

From field evidence (Marttila, pers. commun., 1985) the Kiuruvesi–Pielavesi diabase dykes cut the Pielavesi and other synorogenic gabbros (see entry S01-010), but no baked contact test has been made to determine whether the dykes record primary intrusion NRM or synorogenic cooling NRM.

Ref: Neuvonen et al. (1981); Bylund and Pesonen (1987); Pesonen (1987b); this work.

*S01-005 Kiuruvesi gabbro–diorites, F(B)*

Age:  $1886 \pm 5$  Ma (U–Pb, Zr; Marttila, 1981).

These rocks are similar to the Rantasalmi diabases (see S01-007). The Kiuruvesi hypersthene diorites appear older than or coeval with the Kiuruvesi diabases (see S01-004).

Ref: Kauppinen (1973); Neuvonen et al. (1981).

*S01-006 mean Kiuruvesi intrusions, F(B)*

Age:  $1886 \pm 5$  Ma (see S01-005). Combined data of S01-004 and 005.

Ref: see S01-005.

*S01-007 Rantasalmi diabase dyke, F(C)*

Age: No age data.

Cross-cutting relationships suggest that these dykes are slightly older than the granodiorites and the nearby Haukivesi lamprophyres (S01-009) but younger than the Haukivesi quartzdiorites (S01-008). Estimated age ca. 1840–1880 Ma. The dykes trend NNE and are altered and cut by later faults. Palaeomagnetic data suggest that the dykes are coeval with the Iisalmi dykes (A01-004).

Ref: Neuvonen et al. (1981); Pesonen (1987).

*S01-008 Haukivesi quartz diorite, F(D)*

Age: No age data. Estimated age ca. 1880 Ma (Neuvonen et al., 1981).

These hypersthene quartz-diorites are slightly older than or coeval with the neighbouring Rantasalmi diabase dykes (see S01-007).

Ref: Neuvonen et al. (1981).

*S01-009 Haukivesi lamprophyres, F(A)*

Age: 1837–1840 Ma (U–Pb, Zr, whole rock/*ap*; Huhma, 1981; Neuvonen et al., 1981).

Geological data suggest that these lamprophyres are younger than the Rantasalmi diabases (S01-007) and the Haukivesi quartzdiorites (S01-008). The lamprophyres trend roughly N–S and are generally less than 2 m in width. They are often porphyritic and very fine grained and presumably represent shallow crystallization depths.

Ref: Kauppinen (1973); Neuvonen et al. (1981); Laukkanan (1987).

*S01-010 Pielavesi gabbro, F(B)*

Age: 1892±14 Ma (U–Pb, Zr; Helovuori, 1979; Aho, 1979).

This gabbro probably represent the same synorogenic (Svecofennian) intrusion pulse as the Pohjanmaa gabbros within the Raahe–Ladoga Belt. According to Marttila (pers. commun., 1985) this gabbro is cut by diabase dykes (entry S01-004).

Ref: Pesonen and Neuvonen (1981).

**Central Sweden–south Finland block /7/ S02, Svecofennian***S02-001 Seili gabbro anorthosites, F(D)*

Age: Estimated age ca. 1850 Ma (Lähde and Pesonen, 1985).

NRM very unstable and directions scattered.

Ref: Johnson (1979); Lähde and Pesonen (1985).

*S02-002 Seili amphibolites, F(D)*

Age: Estimated age ca. 1850 Ma (Lähde and Pesonen, 1985).

Very unstable.

Ref: Johnson (1979); Lähde and Pesonen (1985).

*S02-003 Åva migmatites, F(D)*

Age: Estimated age ca. 1850 Ma (Lähde and Pesonen, 1985).

The two samples studied show large scatter.

Ref: Johnson (1979); Lähde and Pesonen (1985).

*S02-004 Åva granites, F(D)*

Age: Estimated age 1800–1850 Ma (Johnson, 1979; Lähde and Pesonen, 1985).

Ref: Johnson (1979); Lähde and Pesonen (1985).

*S02-005 Åva granites, F(D)*

Age: No age data.

Only one sample studied yielding a Subjotnian *N* direction. See also S02-004.

Ref: Neuvonen (1970); this work.

*S02-006 Åva lamprophyres, F(C)*

Age: No age data.

The lamprophyres intrude the Åva Ring Formation (Åva granite, S02-004 and 005). Remanence directions resemble the intermediate NRM direction recorded in many Subjotnian dykes (Pesonen and Suominen, in prep.\*\*\*).

Ref: Johnson (1979); Lähde and Pesonen (1985)

*S02-007 Åva amphibolites, F(D)*

Age: Estimated age ca. 1850 Ma (Johnson, 1979)

Only two samples measured, but the direction is a typical Subjotnian *R* polarity (cf. entry B02-006), suggesting remagnetization at about 1600 Ma.

Ref: Johnson (1979); this work

*S02-008 Åva monzonites, F(C)*

Age: 1600–1830 Ma (U–Pb, Zr and geological evidence; Kouvo, pers. commun., 1981)

Directions scattered, but yield roughly a Subjotnian *N* polarity pole; could be due to remagnetization

Ref: Johnson (1979); Neuvonen (1970); Lähde and Pesonen (1985).

*S02-009 Åva monzonites, F(C)*

Age: 1670–1830 Ma (U–Pb, Zr; Neuvonen, 1970).

Directions scattered, but they plot close to Subjotnian *N* data (e.g., entry B02-005). See also entry SO2-008.

Ref: Neuvonen (1970).

*S02-010 Föglö granodiorite, F(D)*

Age: ca. 1890 Ma (U–Pb, Zr; Johnson, 1979; Suominen, 1987).

Only two samples studied yielding a Subjotnian *R* direction, suggesting remagnetization at around 1600 Ma.

Ref: Johnson (1979); this work.

*S02-011 Foglö gabbro, F(D)*

Age: Estimated age 1800 Ma (Johnson, 1979).  
 Only four samples studied yielding a Subjotnian *N* direction, suggesting remagnetization at around 1600 Ma  
 Ref: Johnson (1979); Lähde and Pesonen (1985).

*S02-012 Rådmansö gabbro, S(B)*

Age: ca. 1750 Ma (Rb–Sr; Welin, 1966); ca. 1475–1750 Ma on the basis of Piper's (1980a) interpretation of palaeomagnetic results

The gabbro intrudes Svecofennian granites and gneisses. The NRM resides in Ti-poor magnetite. Demagnetization (both a.f. and thermal) reveals stable end points.

Ref: Piper (1980a).

*S02-013 Rådmansö dyke, S(C)*

Age: 1475–1750 Ma (this dyke cuts the gabbro of entry S02-012). The NRM direction differs significantly from that of the gabbro and is of opposite (reversed) polarity.

Ref: Piper (1980a); Bylund and Pesonen (1987).

*S02-014 Uppsala metabasite dykes, S(B)*

Age: No age data.

NRM is of *N* polarity; cf. entry S02-013.

Ref: Piper (1980a).

*S02-015 Almunge metabasite dykes, S(C)*

Age: Probably ca. 1570 Ma (Kresten et al., 1977).

The NRM is of *R* polarity (see also S02-013) and may be a remagnetization due to the nearby Almunge alkaline rocks, which are dated at 1570 Ma (Kresten et al., 1977).

Ref: Piper (1980a).

*S02-016 Bo diorite, S(B)*

Age: from palaeomagnetic evidence, Piper (1980a) suggests an age of 1740–1880 Ma.

Although located close to the Hälleforsnäs dyke (B03-014, age ca. 1550 Ma), it does not seem to have been affected by the intrusion of this dyke. Instead, a Svecofennian direction is preserved. However, two haematite-bearing samples show a Sveconorwegian overprint (with an estimated direction of  $D = 290^\circ$ ,  $I = -35^\circ$ ), which is very close to the *hb* component of the Hälleforsnäs dyke (B03-015) and to the direction obtained from the nearby Bo dyke (P01-014) of Sveconorwegian age.

Ref: Piper (1980a); this work.

*S02-017 Nordangrå Örnsköldsvik dykes (R), S(B)*

Age:  $1850 \pm 130$  Ma (Rb–Sr, Fridh, 1979).  
 Reversed polarity dykes.  
 Ref: Fridh (1979); see also Bylund and Pesonen (1987) and this work.

*S02-018 Nordangrå Örnsköldsvik dykes (N), S(C)*

Age: See S02-017  
 Normal polarity dykes. Note that the reversal in this dyke swarm is very close to  $180^\circ$ .

Ref: Fridh (1979); see also Bylund and Pesonen (1987) and this work.

*S02-019 Örnsköldsvik dykes (C), S(B)*

Age:  $1850 \pm 130$  Ma (see S02-017; Fridh, 1979). Combined mean of S02-017 to S02-018.

Ref: Fridh (1979); Bylund and Pesonen (1987).

*S02-020 Häme dolerites, F(D)*

Age: 1550–1800 Ma (U–Pb, Zr; Laitakari, 1969).  
 The NRM is very soft and attributed to PEF contamination. Several dyke swarms of different ages are present.  
 Ref: Neuvonen (1967); Palmu (1982).

*S02-021 Keuruu N Dykes, F(A)*

Age: ca. 1880 Ma (U–Pb, Zr; Kouvo, pers. commun., 1981; Pesonen and Neuvonen, 1981).

The Keuruu dyke swarm strikes N315E with a subvertical dip. The width varies from a few centimetres to 100 m. Chilled margins are visible against Svecofennian granodiorite and gabbro. The texture is ophitic and the grain size is fine. The intrusion NRM was established with detailed demagnetization and a positive baked contact test. Demagnetization data, however, also occasionally reveal an intermediate component (i.e., a direction between *N* and *R*).

Ref: Pesonen and Neuvonen (1981); Palmu (1982); Pesonen (in prep.).

*S02-022 Keuruu R dykes, F(B)*

Age: See S02-021.

A group of *R* polarity dykes. Note the reversal asymmetry with S02-021. Positive baked contact test. The *R* direction is very close to that of S02-013 (Rådmansö dyke, *R* polarity) and S02-015 (Almunge dykes, *R* polarity; see also Bylund and Pesonen, 1987).

Ref: Pesonen and Neuvonen (1981); Palmu (1982); Pesonen (in prep.).

*S02-023 Keuruu R2 dyke, F(D)*

Age: See SO2-022.

This may be one of the above Keuruu R dykes (entry S02-022), but it is treated separately because the NRM direction is different (cf. SO2-022).

Ref. Lähde and Pesonen (1985); Pesonen (in prep.).

*S02-024 South Finland intrusions, F(B)*

Age. Geological evidence suggests an age of around 1880 Ma (Neuvonen, 1974)

Site mean NRM data after a.f. demagnetization fairly scattered, but record a typical Svecofennian *N* polarity direction

Ref: Grundström (1967); Neuvonen (1974).

*S02-025 Tammela intrusions, F(C)*

Age: ca. 1880 Ma (see SO2-024).

Only a.f. demagnetization studies; the inclination is quite steep compared with other synorogenic Svecofennian data (e.g., entry SO2-024).

Ref: Grundström (1967); Neuvonen (1974).

*S02-026 Mikkeli intrusions, F(C)*

Age: ca. 1880 Ma (see SO2-024).

Only a.f. demagnetization data.

Ref: Grundström (1967); Neuvonen (1974).

*S02-027 Hyvinkää gabbro, F(B)*

Age: 1875 Ma (U-Pb, Zr; Härmä, 1978).

Based on a.f. demagnetization data only. Petrophysical studies included.

Ref: Puranen (1973)

*S02-028 Luontari granodiorite, F(C)*

Age: 1765–1790 Ma (U-Pb, Zr; Kouvo, pers. commun., 1981) Undefomed rock unit apparently younger than the surrounding Svecofennian rocks. NRM stability varies.

Ref: Neuvonen (1978).

**North of Skellefteå block /8/ S03, Svecofennian***S03-001 Tarendö gabbro 1, S(C)*

Age: ca. 1850 Ma (Cornwell, 1968).

According to Elming (1985) the magnetization may refer to ca. 1757–1780 Ma, as suggested by Rb-Sr dating on the surrounding rocks. Study based on a.f. demagnetization only (maximum field 15 mT); cf. SO3-002.

Ref: Cornwell (1968)

*S03-002 Tarendö gabbro 2, S(A)*

Age: Age of ca. 1850 Ma often quoted in the literature, but the magnetization age may be ca. 1757±47 Ma to 1780 Ma based on Rb-Sr dating (see Elming, 1985). Note that thermal demagnetization data reveal a trend towards steep (positive) inclinations at high temperatures (see also Pesonen et al., 1989).

Ref: Elming (1982, 1985); Pesonen et al., (1989).

*S03-003 Tarendö gabbro 3 (sites 3 and 8), S(C)*

Age: ca. 1757–1780 Ma (see Elming, 1985).

Inclinations shallower than in entry S03-004. May reflect the end of slow cooling and uplift of the terrain.

Ref: Elming (1985).

*S03-004 Tarendö granitic dykes, S(C)*

Age: Estimated age ca. 1757 Ma (see S03-002).

These dykes cut the gabbro and are therefore coeval or slightly younger in age. Only five samples studied.

Ref: Cornwell (1968).

*S03-005 Tarendö acidic rocks, S(B)*

Age: Estimated age ca. 1850 Ma (see S03-002).

This entry includes the granitic, syenitic, mugmatitic and granitic dykes (S03-004) near the Tarendö gabbro. Only a.f. demagnetized (up to 15 mT).

Ref: Cornwell (1968).

*S03-006 Notträsk gabbro, S(A)*

Age: 1840±390 Ma (Rb-Sr; Welin et al., 1970)

Thermal demagnetization shows steepening of the inclination at higher temperatures.

Ref: Elming (1982, 1985).

*S03-007 Notträsk gabbro (site 7), S(D)*

Age: ca. 1840±390 Ma (Welin et al., 1970).

Only three samples studied, but they deviate markedly from the other sites in entry S03-006.

Ref: Elming (1982, 1985).

*S03-008 Notträsk gabbro (site 1), S(D)*

Age: ca. 1840±390 Ma (Welin et al., 1970)

The NRM of this site shows westerly declinations as does entry S03-003.

Ref: Elming (1982, 1985).

*S03-009 Svappavaara gabbro 1 (hc), S(C)*

Age: ca. 1725–1880 Ma (Rb–Sr and U–Pb (Zr), Skiöld, 1982).

The NRM of this gabbro may reflect the baking effect of the adjacent granites dated at  $1725 \pm 16$  Ma to  $1780 \pm 49$  Ma (Rb–Sr; Welin et al., 1970). A.f. and thermal demagnetization displays a general NRM trend from a moderate, gentle NNW direction to a steep NW direction. This entry consists of higher coercivity (*hc*) data.

Ref: Elming (1982, 1985), see also Pesonen et al. (1989).

*S03-010 Svappavaara gabbro 2 (lc), S(C)*

Age: 1725–1880 Ma (Rb–Sr and U–Pb (Zr); Welin et al., 1971, Skiöld; 1982).

This entry lists the low coercivity (*lc*) direction of the NRM. Ref: Elming (1982, 1985).

*S03-011 Vittangi gabbro 1, S(A)*

Age: ca. 1707–1880 Ma. Adjacent granodiorite gives an age of  $1707 \pm 77$  Ma (Rb–Sr; Skiöld, 1982).

Thermal demagnetization does not reveal a steepening of inclinations as in entry S03-003 and S03-009.

Ref: Elming (1982, 1985).

*S03-012 Vittangi gabbro 2, S(C)*

Age: 1707–1880 Ma (see S02-011)

Data from two sites. Compared to NRM directions of similar gabbro intrusions, these are anomalous.

Ref: Elming (1982, 1985).

*S03-013 Dundret gabbro (site 7), S(C)*

Age: 1890–1950 Ma (K–Ar; Magnusson, 1960). Similar ages obtained from volcanic rocks north of the Dundret gabbro, but the age may be too high; the adjacent Lina granite yields an age of  $1530 \pm 35$  Ma (Rb–Sr; Welin et al., 1971), which may represent the age of the NRM for the Dundret gabbro.

Two generations of magnetite were isolated in petrological studies. The final remanence direction was estimated using intersecting great circle methods.

Ref: Elming (1982, 1985).

*S03-014 Dundret gabbro R, S(B)*

Age: See S03-013.

*R* polarity sites 1, 3, 4 and 12.

Ref: Elming (1982, 1985); see also Piper (1980a) and entry S03-017.

*S03-015 Dundret gabbro (site 8), S(C)*

Age: See S03-013

Anomalous site H8.

Ref: Elming (1982, 1985).

*S03-016 Dundret gabbro (site 10), S(C)*

Age: See S03-013

Anomalous site H10.

Ref: Elming (1982, 1985).

*S03-017 Dundret basic rocks (R), S(C)*

Age: Not dated directly; ages of nearby rocks vary from 1850 Ma (U–Pb) to  $1530 \pm 35$  Ma (Rb–Sr; Welin et al., 1971; Skiöld, 1982; see also entry S03-013).

The NRM direction most probably reflects the time of cooling of the nearby Lina granites 1530 Ma ago. Both polarities are present; this entry lists the *R* polarity data. Demagnetization yields two components (low and high coercivity groups) which are not properly isolated; see also entries S03-013 to 016).

Ref: Piper (1980a).

*S03-018 Dundret basic rocks (N), S(C)*

Age: ca.  $1530 \pm 35$  Ma (Rb–Sr; Welin et al., 1971, see entry S03-017).

This entry lists the *N* polarity data.

Ref: Piper (1980a).

*S03-019 Kallax gabbro, S(C)*

Age: Not dated directly. According to Piper (1980a), however, this gabbro has the same history as the Svappavaara and Sangis gabbros (entries S03-009 and S03-027); hence the estimated age is ca. 1740 Ma.

The NRM most probably represents slow cooling and uplift of the terrane. Both low (*lb*) and high (*hb*) blocking temperature components are present; the *lb* component appears to be the younger (see also Store Lulevatnet gabbro, entries S03-030 and S03-031).

Ref: Piper (1980a).

*S03-020 Kallax gabbro (lb), S(B)*

Age: ca. 1740 Ma (see S03-019).

Low blocking temperature (*lb*) component.

Ref: Piper (1980a).

*S03-021 Kallax gabbro (hb), S(C)*

Age: ca. 1740–1880 Ma; probably slightly older than entry S03-020.

- High blocking temperature (*hb*) component.  
Ref: Piper (1980a).
- S03-022 Kallax gabbro 2, S(B)*
- Age: See entry S03-019.  
Ref: Piper (1980a); Lähde and Pesonen (1985).
- S03-023 Korsträsk gabbro, S(B)*
- Age: Not dated directly, but nearby rocks record ages between 1530 and 1770 Ma (see entry S03-018, Welin et al., 1971).  
NRM is composed of a single stable component.  
Ref: Piper (1980a).
- S03-024 Niemisel gabbro, S(B)*
- Age: ca. 1530–1770 Ma (see entry S03-018; Welin et al., 1971).  
A stable NRM component of *N* polarity.  
Ref: Piper (1980a).
- S03-025 Niemisel dykes, S(B)*
- Age: ca. 1530–1770 Ma; the dykes intrude the Niemisel gabbro (entry S03-024).  
The NRM is similar to that of the intruded gabbro.  
Ref: Piper (1980a); Bylund and Pesonen (1987).
- S03-026 mean Niemisel intrusions, S(B)*
- Age: ca. 1530–1770 Ma (see S03-024). Combined mean of S03-024 and 025).  
Ref: Piper (1980a); see also Pesonen and Neuvonen (1981).
- S03-027 Sangis gabbro 1, S(A)*
- Age:  $1840 \pm 390$  Ma (Rb–Sr; Welin et al., 1970); adjacent synorogenic granite has an age of 1772 Ma.  
The NRM is generally stable and hard, and the agreement of directions between sites is good. The dioritic rocks are magnetically softer than the gabbroic rocks (see opposite trend in entry S01-003). Petrological studies reveal the presence of secondary magnetite and haematite. The latter was formed when magnetite was oxidized to haematite (martitization).  
Ref: Elming (1982, 1985).
- S03-028 Sangis gabbro 2, S(C)*
- Age: ca. 1530–1770 Ma (Piper, 1980a, based on data in the literature).  
Sites 9, 10, 11, 13. Single component NRM.  
Ref: Piper (1980a).
- S03-029 Sangis gabbro (lb), S(C)*
- Age: 1530–1770 Ma (see S03-027).  
Site 11 represents low blocking temperature components (*lb*) in pyrrhotite.  
Ref: Piper (1980a); Lähde and Pesonen (1985).
- S03-030 Store Lulevatnet gabbro (hb), S(B)*
- Age: ca. 1530–1770 Ma (Rb–Sr, Welin et al., 1971)  
High blocking temperature (*hb*) data from sites 17, 18(ii) and 22(ii), residing in hemoilmenite.  
Ref: Piper (1980a).
- S03-031 Stora Lulevatnet gabbro (lb), S(B)*
- Age: 1530–1770 Ma (see entry S03-023 to -029).  
Low blocking temperature (*lb*) data from five sites.  
Ref: Piper (1980).
- S03-032 Jokkmokk basic rocks (lc), S(D)*
- Age: Not directly dated, but may be of the same age as the older Lina granites, ca.  $1780 \pm 49$  Ma (Rb–Sr, Welin et al., 1971).  
Highly scattered low coercivity (*lc*) data.  
Ref: Piper (1980a).
- S03-033 Jokkmokk basic rocks (hc), S(C)*
- Age: ca.  $1780 \pm 49$  Ma (see S03-032).  
High coercivity (*hc*) data.  
Ref: Piper (1980a).
- S03-034 Jokkmokk basic rocks, S(C)*
- Age: ca.  $1780 \pm 49$  Ma (see entry S03-032) or 1530 Ma (see entry S03-035).  
Anomalous NRM direction which could represent the youngest magnetization event at 1530 Ma in the area.  
Ref: Piper (1980a).
- S03-035 Vuollerim gabbro, S(D)*
- Age: ca. 1530–1770 Ma, geological estimate (see S03-030).  
Mean direction obtained from three weakly magnetized specimens from a single site (27).  
Ref: Piper (1980a).
- S03-036 Vuollerim gabbro, S(C)*
- Age: See S03-035.  
Site with a slightly different direction from that in S03-035.  
Ref: Piper (1980a).

**S03-037 Harads amphibolites, S(D)**

Age: ca. 1530–1770 Ma (Welin et al., 1971)

The directions of NRM reveal a large scatter possibly due to local tectonic disturbances.

Ref: Piper (1980a).

**Kola block /9/ S04, Archaean–Svecfennian****S04-001 Kola gabbro-norites, U(B)**

Age: Estimated age 1610–1870 Ma (McElhinny and Cowley, 1977).

These gabbros are located in a presumably Svecfennian inlier in the Kola Craton. Data from the Khramov catalogue. The NRM direction and pole imply a Svecfennian age for remanent magnetization.

Ref: McElhinny et al. (1977).

**Inlier in NW Sweden /16/ S05, Svecfennian****S05-001 Bångsjället Complex, S(D)**

Age:  $1520 \pm 140$  Ma (Rb–Sr, Hahlbrauch, 1982)

There is a discrepancy between the given NRM direction and the pole position in the original paper. The correct pole (recalculated) is given here, assuming that the NRM direction given by Hahlbrauck (pers. commun., 1984) is correct.

Ref: Hahlbrauck (1982; pers. commun., 1984); Lähde and Pesonen (1985).

**Central–north Lapland block /2/ S06, Lapponian–Svecokarelian****S06-001 Alliutto gabbro, F(D)**

Age: Estimated age ca. 1900 Ma (Meriläinen, 1976).

Only two samples studied during reconnaissance.

Ref: Papunen et al. (1977).

**S06-002 Tshokkoauvi gabbro, F(C)**

Age: ca. 1900 Ma (see S06-001).

The NRM direction is consistent with the directions of the neighbouring Granulite Belt (see entry E01-004).

Ref: Papunen et al. (1977).

**TSGB Belt /10/ B01, Subjotnian****B01-001 Loftahammar gabbro, S(B)**

Age: ca. 1465–1845 Ma (K–Ar, Rb–Sr, U–Pb; Åberg, 1978; Priem and Bakker, 1973; Priem et al., 1969).

The NRM was probably acquired during uplift and cooling of the body, and the lower age limit represents the magnetization age.

Ref: Poorter (1976).

**B01-002 Öje basalts, S(B)**

Age: 745–931 Ma (K–Ar; Priem et al., 1968). The ages are probably too low, as these basalts form inliers within the Subjotnian Dala metasediments (sandstones), whose ages range between 1250 and 1650 Ma (see entry B01-005).

Ref: Mulder (1971).

**B01-003 Upper Dala porphyries, S(B)**

Age: 1570–1635 (Rb–Sr; Priem et al., 1968; Welin and Lundqvist, 1970).

Reliable palaeomagnetic data from only two phenocryst-rich porphyritic sites from the Upper Dala Series.

Ref: Mulder (1971).

**B01-004 Upper Dala volcanics, S(C)**

Age: ca. 600–900 Ma (K–Ar; Priem et al., 1968); this age may be too low (see B01-002).

This is a combined result of Upper Dala porphyries, Öje basalts and Subjotnian dolerites of the Dala Complex. The authors interpreted the result as a Caledonian overprint, an interpretation that has subsequently been refuted by Pesonen and Neuvonen (1981) and Bylund (1985).

Ref: Priem et al. (1968).

**B01-005 Dala sandstones (N), S(C)**

Age: Not dated, but constrained by geological evidence to between ca. 1250 and 1650 Ma. The unit is generally referred as “Jotnian Dala sandstone”, but palaeomagnetic data indicate an age in the range 1500–1600 Ma (i.e., Subjotnian).

Two magnetic directions were observed, one with a gentle northerly or southerly direction and one with moderately steep directions. Both groups have reversals. The entry lists the shallow northerly normal polarity data, presumably representing the time of deposition–lithification of the sandstone.

Ref: Piper and Smith (1980); this work.

**B01-006 Dala sandstones (R), S(C)**

Age: See B01-005.

Reversed polarity data.

Ref: Piper and Smith (1980).

**B01-007 Dala sandstones (IR), S(C)**

Age: See B01-005.

Reversed polarity intermediate directions.

Ref: Piper and Smith (1980); this work.

*B01-008 Dala sandstones (IN), S(C)*

Age: See BO1-005.  
 Normal polarity intermediate directions.  
 Ref: Piper and Smith (1980); this work.

*B01-009 Dala Subjotnian lavas, S(A)*

Age 745–931 Ma (K–Ar; Priem et al., 1968).  
 Located within the Dala sandstones, these lavas are probably similar to those studied by Mulder (1971) and Priem et al. (1968) (see entries BO1-002 and BO1-004).  
 The magnetic direction, with dual polarity, is believed to date the time of deuterian–hydrothermal alteration of the lavas to around 1500–1600 Ma ago.  
 Ref: Piper and Smith (1980).

**South Finland block /7/ B02, Subjotnian***B02-001 Åva diabase dykes, F(C)*

Age. ca 1550 Ma (on geological grounds).  
 Data from two diabase dykes with normal polarity.  
 Ref: Neuvonen (1970).

*B02-002 mean Åva intrusions, F(B)*

Age: ca. 1550 Ma (on geological grounds).  
 Data from fifteen sites representing Åva intrusions (granites, porphyries and diabase dykes). All with normal polarity.  
 Ref: Neuvonen (1970).

*B02-003 Korsö dykes(R), F(C)*

Age:  $1600 \pm 30$  Ma (U–Pb, Zr; Rb–Sr; Suominen, 1987)  
 Two samples (from two dykes).  
 Ref: Neuvonen (1970); Pesonen and Neuvonen (1981), Pesonen et al. (1985a).

*B02-004 Kumlinge dykes, F(B)*

Age: 1565–1599 Ma (U–Pb, Zr; Rb–Sr; Suominen, 1987).  
 Data from three *R* polarity dykes.  
 Ref: Neuvonen and Grundström (1969); see also Pesonen and Neuvonen (1981).

*B02-005 Föglö dykes, F(A)*

Age. 1523–1553 Ma (U–Pb, Zr; Rb–Sr; Suominen, 1987).  
 Normal polarity data from eight dykes.  
 Ref: Neuvonen and Grundström (1969).

*B02-006 Kumlinge – Brändö dykes, F(A)*

Age: 1550–1601 Ma (U–Pb, Zr; Rb–Sr, Suominen, 1987, Pesonen et al., 1985a; Pesonen and Suominen, in prep.)

A further study of the *R* polarity dykes listed in BO2-004 Positive baked contact test. Demagnetization studies indicate that a third group of dykes with intermediate directions exists in the area. Field evidence suggests that dykes with reversed polarity (this entry) are slightly older than those with normal polarity (B02-007), and that the dykes are coeval with or slightly younger than the Åland rapakivi granite (entry B02-018). With one exception (Kungsholm dyke), these dykes have not been observed cutting the Åland rapakivi granite (entry B02-018).

Ref: Pesonen and Neuvonen (1981); Pesonen et al. (1985a), Pesonen and Suominen (in prep.)

*B02-007 Föglö–Sottunga dykes, F(A)*

Age: 1523–1553 Ma (see BO2-005)

Positive baked contact test

Ref: Pesonen and Neuvonen (1981); Pesonen et al. (1985a); Pesonen and Suominen (in prep.)

*B02-008 Eckerö dykes, F(D)*

Age: Not dated, but probably of Subjotnian age

Data originally from Neuvonen and Grundström (1969). The samples were later demagnetized by Pesonen (1983, unpublished data). The NRM direction is unlike the other Subjotnian or Jotnian directions in the Åland archipelago (e.g. entries B02-006 and G01-006)

Ref: Neuvonen and Grundström (1969), Pesonen (1983, unpublished data)

*B02-009 Kuusaari dolerite, F(A)*

Age: 1670–1630 Ma (Vaasjoki, 1977).

The NRM reflects reheating caused by the nearby Ahvenisto rapakivi massif. The direction (*R* polarity) is close, but of opposite polarity, to that of the Åland rapakivi massif (*N* polarity; entry B02-018).

Ref: Neuvonen (1978).

*B02-010 Makarla quartz-dolerite, F(C)*

Age: No age data, but estimated to be 1500–1600 Ma old on palaeomagnetic and geological evidence. Data considered preliminary.

Ref: Neuvonen (1965).

*B02-011 Norra Betesön dyke, F(C)*

Age: No age data, but estimated to be ca. 1600 Ma old. Positive baked contact test Palaeomagnetic data used to

calculate the depth of erosion to have occurred since the intrusion of this dyke.

Ref: Palmu (1982)

#### *B02-012 Föglö–Bergskär dyke, F(D)*

Age: 1523–1553 Ma (U–Pb, Zr; Rb–Sr; Suominen, 1987).

Only two samples studied. The NRM direction is typical of that found in other Subjotnian normal polarity dykes.

Ref: Johnson (1979).

#### *B02-013 Föglö uralite-porphyrite, F(D)*

Age: Not dated, but is thought to be Subjotnian (Johnson, 1979)

Only two samples studied. The NRM direction agrees with that of the other Subjotnian *R* polarity dykes (e.g., entry BO2-006).

Ref: Johnson (1979).

#### *B02-014 Kumlinge–Bergskär dyke, F(D)*

Age:  $1599 \pm 26$  Ma (Rb–Sr; Suominen, 1987).

Only two samples studied; the NRM direction agrees with that of the other Subjotnian *R* polarity dykes.

Ref: Johnson (1979).

#### *B02-015 Korsö dyke, F(D)*

Age:  $1599 \pm 26$  Ma (Rb–Sr; Suominen, 1987).

Two samples studied from a 150 m thick dyke with *R* polarity (see also BO2-003).

Ref: Johnson (1979).

#### *B02-016 Vest Sederholm dyke, F(D)*

Age: Not dated, but thought to be Subjotnian (Suominen, 1987).

Only two samples studied.

Ref: Johnson (1979).

#### *B02-017 mean Brändö R dykes, F(C)*

Age: ca. 1550 Ma (see BO2-013 to 016).

The mean of four *R* polarity dykes

Ref: Johnson (1979); this work.

#### *B02-018 Åland rapakivi granite, F(C)*

Age: 1589–1659 Ma (U–Pb, Zr; Suominen, 1987; Vaasjoki, 1977).

Six samples from the Åland rapakivi massif.

Ref: Johnson (1979); Pesonen and Neuvonen (1981); Lähde and Pesonen (1985).

#### *B02-019 Maaria quartz-diorite, F(C)*

Age: Not dated.

Data considered preliminary, but yield a Subjotnian *R* polarity direction

Ref: Neuvonen (1965).

#### *B90-020 SE quartz-porphyry dykes, F(B)*

Age: 1617–1638 Ma (U–Pb, Zr; Neuvonen, 1986)

Normal polarity data from Subjotnian dykes in southeastern Finland. These dykes, with *N* polarity, are related to the Wiborg, Ahvenisto and Suomenniemi rapakivi bodies, which they cut with chilled margins. Dykes with *R* polarity also exist but they reveal a large scatter of NRM directions (Neuvonen, 1987, unpublished data).

Ref: Neuvonen (1986).

### South-central Sweden block /7/ B03, Subjotnian

#### *Bo3-001 Ragunda rapakivi granite, S(B)*

Age:  $1291 \pm 30$  Ma (Rb–Sr; Kornfält, 1976).

The Ragunda Formation comprises anorthosite and gabbro intrusions intruded by granite and syenites. The formation is also cut by two generations of dolerite dykes (see entries BO3-005 to 009).

The data were recalculated by Lähde and Pesonen (1985) and divided into normal and reversed polarity groups.

Ref: Piper (1979a); Lähde and Pesonen (1985); Bylund and Pesonen (1987).

#### *B03-002 Ragunda Formation (R), S(B)*

Age: See BO3-001. Mean of the *R* polarity sites.

Ref: Piper (1979a); Lähde and Pesonen (1985).

#### *B03-003 Ragunda Formation (N), S(A)*

Age: See BO3-001.

Mean of the normal polarity sites. Note that the division into *N* and *R* sites is not always straightforward because there are a few sites where the direction shifts from *N* to *R* polarity, and vice versa (see Piper, 1979a).

Ref: Piper (1979a); Lähde and Pesonen (1985).

#### *B03-004 mean Ragunda Formation, S(A)*

Age: See BO3-001.

Combined mean of the *N* and *R* polarity directions.

Ref: Piper (1979a); Lähde and Pesonen (1985).

*B03-005 post-Ragunda dykes (R), S(B)*

Age: Estimated age ca. 1250–1320 Ma.

Reversed polarity data from the E–W and NW–SE trending dykes that cut the Ragunda Formation. The poles define the end of the Subjotnian APW loop. The reversal is nearly perfect ( $180^\circ$ ).

Ref: Piper (1979a); Lähde and Pesonen (1985); this work

*B03-006 post-Ragunda dykes (N), S(C)*

Age: See BO3-005.

Normal polarity data.

Ref: Piper (1979a); Lähde and Pesonen (1985); this work.

*B03-007 mean post-Ragunda dykes (C), S(B)*

Age: See B03-005 and 006.

Combined mean of the N and R polarity data (entries BO3-005 and 006).

Ref: Piper (1979a); Lähde and Pesonen (1985); this work.

*B03-008 Ragunda dykes (R), S(C)*

Age: Not dated, but the estimated age is ca. 1290 Ma.

Mean of the R polarity dykes.

Ref: Piper (1979a); Lähde and Pesonen (1985); this work.

*B03-009 Ragunda dykes (N), S(C)*

Age: See BO3-008.

Mean of the N polarity dykes.

Ref: Piper (1979a); Lähde and Pesonen (1985); this work.

*B03-010 mean Ragunda dykes (C), S(C)*

Age: See BO3-008.

Combined mean of the N and R polarity data (entries BO3-008 and 009).

Ref: Piper (1979a); Lähde and Pesonen (1985); this work.

*B03-011 E–W dykes I, S(B)*

Age: 1510–1560 Ma (Rb–Sr; Patchett, 1978).

This entry comprises data from the large E–W trending Breven and Hälleforsnäs dykes and from the smaller Eskilstuna dyke swarm. Both isotopic and palaeomagnetic studies imply that these dykes were to some extent affected by the Sveconorwegian orogeny (see entries BO3-015 and PO1-014). However, the characteristic stable component listed here records a primary intrusion age.

Ref: Bylund (1985); Patchett (1978).

*B03-012 E–W dykes II, S(C)*

Age: Not dated. Estimated age ca. 1510–1560 Ma (Bylund, 1985).

The anomalous NRM may include two or more components not distinguished by a f. and thermal treatments. This could be the reason for the anomalous palaeomagnetic directions

Ref: Bylund (1985).

*B03-013 Tuna dykes, S(B)*

Age:  $1371 \pm 50$  Ma (Rb–Sr; Patchett, 1978)

The Tuna dykes comprise dolerites and quartz-porphries with a NNE strike. They cut the Svecofennian granites and leptites in the southern Dala Province. Only N polarity dykes.

Ref: Bylund (1985)

*B03-014 Hälleforsnäs dyke (A), S(B)*

Age:  $1518 \pm 38$  Ma (Rb–Sr; Patchett, 1978).

This A component is considered to represent the time of initial cooling of the dyke (see also BO3-015).

Ref: Piper (1980a).

*B03-015 Hälleforsnäs dyke (hb), S(D)*

Age: This overprint has not been dated.

The entry, based on data from one site only, lists the high blocking temperature (hb) direction, which probably records the Sveconorwegian remagnetization undergone by this dyke about 900–1000 Ma ago (see also entries BO3-011, PO1-014 and PO3-047).

Ref: Piper (1980a).

*B03-016 Nordingrå basic dykes (3), S(B)*

Age: Estimated age ca. 1500–1600 Ma (i.e., Subjotnian) (Fridh, 1979).

The Nordingrå diabase dyke swarm (3) strikes E–W with vertical dips. The dykes are very fine grained. The characteristic NRM direction is anomalous, possibly being older than 1600 Ma, perhaps late Svecofennian (ca. 1750 Ma old).

Ref: Fridh (1979); Lähde and Pesonen (1985).

*B03-017 Nordingrå gabbro–anorthosite (R), S(A)*

Age: 1385–1550 (Rb–Sr and U–Pb (Zr); Kornfält, 1976; Welin and Lundqvist, 1984).

Both polarities occur in this formation: the R polarity sites tend to be closer to the centre of the formation than the N polarity sites, suggesting that the R pole is slightly younger than the N pole.

Ref: Piper (1980b); Lähde and Pesonen (1985).

*B03-018 Nordingrå gabbro-anorthosite (N), S(A)*

Age. See BO3-017

*N* polarity data, may be slightly older than the *R* polarity data

Ref: Piper (1980b); Lähde and Pesonen (1985).

*B03-019 mean Nordingrå gabbro-anorthosite (C), S(A)*

Age: See BO3-017.

Combined mean of the *N* and *R* polarity data (entries BO3-017 and 018).

Ref: Piper (1980b); Lähde and Pesonen (1985).

*B03-020 Nordingrå granite (R), S(B)*

Age: Not dated, but an age of ca. 1385–1550 Ma is estimated on geological grounds. This granite is considered slightly younger than the Nordingrå gabbro-anorthosite (entry BO3-017).

Both polarities are present and this entry lists the *R* polarity data.

Ref: Piper (1980b); Lähde and Pesonen (1985).

*B03-021 Nordingrå granite (N), S(B)*

Age: See BO3-020.

*N* polarity data.

Ref: Piper (1980b); Lähde and Pesonen (1985).

*B03-022 mean Nordingrå granite (C), S(A)*

Age: See BO3-020

Combined mean of the *N* and *R* polarity entries (BO3-020 and 021).

Ref: Piper (1980b); Lähde and Pesonen (1985).

*B03-023 Gävle granite, S(B)*

Age: Not dated, but a Subjotnian age (ca. 1385–1550 Ma) is assumed on palaeomagnetic grounds. This rapakivi granite is cut by post-Jotnian Gävle and Nordingrå dolerites (entry G01-005).

Only *N* polarity sites.

Ref: Piper (1980b).

**Bornholm block /11/ R01, Jotnian–Sveconorwegian***R01-001 Kjeldseå dyke, D(B)*

Age: ca. 1000–1400 Ma (K–Ar; Larsen, 1977; quoted in Abrahamsen, 1977).

Data from vertical N–S to NE–SW trending dolerite dykes on the northeast coast of the island of Bornholm in the

southern Baltic Sea. Unlike the other Bornholm dykes, this dyke is of reversed polarity and intrudes a mylonitized zone

Ref: Schönemann (1972).

*R01-002 Vaseå dyke, D(B)*

Age: ca. 1200 Ma (estimated age: Abrahamsen, 1977).

The dyke is strongly altered and the magnetization may represent a remagnetization event around 1200–1000 Ma ago.

Ref: Abrahamsen (1977).

*R01-003 Vigehavn dyke, D(C)*

Age: Not dated, but estimated age ca. 1200 Ma (Abrahamsen, 1977).

The NRM shows a clear trend from the magnetic field direction of the Earth's present field direction towards that of the Jotnian type (= CSDG). Thus, an age of 1200 Ma is plausible, but a Palaeozoic overprint is also possible.

Ref: Abrahamsen (1977).

*R01-004 Bölkshavn dyke, D(B)*

Age: Not dated; estimated age ca. 1200 Ma (i.e. Jotnian).

The dyke is characterized by the *A* component; the direction is either Jotnian (ca. 1200 Ma) or Palaeozoic.

Ref: Abrahamsen (1977).

*R01-005 Bölkshavn dyke (B), D(C)*

Age: Not dated, the estimated age for this (*B*) overprint is 800–1000 Ma (i.e., Sveconorwegian).

The high-coercivity component is probably due to a Sveconorwegian overprint.

Ref: Abrahamsen (1977).

*R01-006 Listed dyke, D(B)*

Age: Not dated, but cut by the Early Cambrian Nexö sandstone dykes. The dyke intrudes a mylonitized fracture. The mylonization (and dyke?) may be of Sveconorwegian (i.e., ca. 800–1000 Ma) age. The characteristic NRM component is shown here; see also entry R01-007 for a presumably Palaeozoic overprint.

Ref: Abrahamsen (1977).

*R01-007 Listed overprint, D(D)*

Age: Estimated age: Palaeozoic.

See entry R01-006 for the characteristic component in this dyke.

Ref: Abrahamsen (1977).

### Central Scandinavian dolerite (CSDG) Complexes, Jotnian

These entries comprise data from diabase (dolerite) sills and dykes, from flat-lying dolerite sheets and lopoliths, and also from Jotnian sandstones intruded by the dolerite bodies. These complexes, collectively known as the Central Scandinavian Dolerite Group (CSDG), correspond in age to the MacKenzie and late Gardar igneous activities in North America and Greenland respectively. The CSDG is divided into four complexes: the Satakunta (S), Ulvö (U), Dala (D) and Jämtland (J) complexes. The Dala Complex includes groups of dolerites (the Dala Anomalous Dykes in the catalogue) of contemporary or older age that display NRM directions differing from those of the four CSDG groups. Note that in entries B01-005 to 008 the Dala sandstone data are treated as Sub-jotnian rather than Jotnian.

#### CSDG—Satakunta Complex /12/ G01, Jotnian

##### G01-001 Satakunta sandstone, F(B)

Age: 1300–1370 Ma (K–Ar; Kouvo, 1976; Simonen, 1980), and geological evidence.

This almost flat-lying Jotnian sandstone in southwestern Finland has resisted erosion because it was deposited in a NW–SE trending graben. The sandstone is cut by the Satakunta dolerites, sills and sheets (see entries G01-002 and 003).

Ref: Neuvonen (1974)

##### G01-002 Satakunta sills, F(D)

Age: 1263 Ma (U–Pb, Zr; Suominen, 1987; Hämäläinen, 1987).

This entry is part of a much larger collection (entry G01-003), but is listed separately so that any difference in remanence direction between sills and dykes can be studied. Comparison with G01-003 reveals no evidence for such a difference.

Ref: Neuvonen (1965), see also Pesonen (1987).

##### G01-003 Satakunta dolerite dykes, F(A)

Age: ca 1240 Ma (U–Pb, Zr; Suominen, 1987; Hämäläinen, 1987).

These dykes cut the basement migmatites, the Satakunta sandstone (G01-001) and the Laitila rapakivi massif. The dykes trend nearly N–S, and are either vertical or dip steeply to west and show chilled margins. Positive baked contact test (Pesonen, 1985, unpublished data).

Ref: Neuvonen (1965); Bylund and Pesonen (1987).

##### G01-004 Vaasa dolerites, F(A)

Age: 1225–1270 Ma (Rb–Sr; U–Pb (Zr); Suominen, 1987; Neuvonen, 1966; Aro, 1987).

The dolerite sheets/dykes strike roughly NNE–SSW cutting the migmatitic basement rocks in the Vaasa archipelago. The dolerites are undeformed

Ref: Neuvonen (1966).

##### G01-005 Gävle dolerite, S(B)

Age: Estimated age is 1200–1300 Ma. The dolerite cuts the Subjotnian Gävle rapakivi granite (entry B03-023).

Possibly a sill.

Ref: Poorter (1976).

##### G01-006 Märket dolerites, F(A)

Age:  $1265 \pm 6$  Ma (U–Pb, Zr; Suominen, 1987).

These well-preserved olivine dolerites cut the Åland rapakivi massif in the Eckerö area (entry B02-018).

Both sills and dykes are present, the dolerite on Märket Island being a sill.

Ref: Neuvonen and Grundström (1969).

#### CSDG—Ulvö Complex /13/ G02, Jotnian

##### G02-001 Nordingrå sandstone, S(D)

Age: Estimated age ca. 1300 Ma (from geological evidence).

Magnusson (1983) lists data from five sites, but he points out that three of them were probably remagnetized by the intruding Ulvö–Nordingrå dolerite (entry G02-007 to 009). Two sites reveal different directions, however, and are here assumed to represent the characteristic magnetization of the sandstone. Data uncorrected for structural dip.

Ref: Magnusson (1983); this work.

##### G02-002 Väster–Norrländ dolerites, S(A)

Age: 1213–1270 Ma (K–Ar; Welin and Lundqvist, 1975).

Data mainly from previous studies but some new data also included. These dolerites intrude the Svecofennian basement, the Nordingrå sandstone (G02-001), and also the Nordingrå granite (B03-020) and the Nordingrå gabbro–anorthosite (B03-019), yielding a positive baked contact test (see entries G02-006 and G02-010). The dolerites appear as sheets, lopoliths, sills and dykes with rhythmic igneous layering. Composition is alkali olivine basaltic. NRM often shows excursions to shallow inclinations

Ref: Piper (1979b).

##### G02-003 Gnarp sills, S(B)

Age: 1213–1270 Ma (estimated by Piper, 1979b).

Possibly the southern part of the Nordingrå dolerite sill (entry G02-007).

Ref: Piper (1979b).

**G02-004 Gnarp dolerite dyke, S(B)**

Age:  $1245 \pm 20$  Ma (Poorter, 1976; Welin and Lundqvist, 1975)

Located in the southern part of the Ulvö Complex (see G02-003).

Ref: Poorter (1976).

**G02-005 Nordingrå basic dykes (2), S(C)**

Age: Not dated. A Jotnian age is inferred from palaeomagnetic data.

Ref: Fridh (1979).

**G02-006 Nordingrå Jotnian overprints, S(A)**

Age: ca. 1250 Ma, on geological and palaeomagnetic basis.

The NRM is an overprint isolated in the Nordingrå rapakivi granites and gabbro-anorthosites and is attributed to baking by the Nordinrå and Västernorrland dolerites (entries G02-002 and G02-007).

Ref: Piper (1980b).

**G02-007 Nordingrå dolerites, S(B)**

Age:  $1245 \pm 20$  Ma (K-Ar; Welin and Lundqvist, 1975).

This olivine-dolerite sheet, which intrudes the Nordingrå sandstone (entry G02-001), is tectonically undeformed and shows igneous layering. On the basis of palaeomagnetic data it appears to be slightly younger than the Gnarp dolerite (entries G02-003 and 004) and the Gävle dolerite (G01-005).

Ref: Poorter (1976).

**G02-008 Ulvö dolerite dykes, S(B)**

Age:  $1215 \pm 20$  Ma (Larson and Magnusson, 1976).

Data from dolerite dykes and sheets.

Ref: Larson and Magnusson (1976).

**G02-009 Ulvö dolerites, S(B)**

Age:  $1215 \pm 20$  Ma (Welin and Lundqvist, 1975).

Data from dolerite dykes and lopolith with igneous layering. Authors estimate that cooling of the lopolith lasted for about 10,000 years; the secular variation has thus probably been averaged out.

Ref: Magnusson and Larson (1977); see also G02-008.

**G02-010 Nordingrå baked anorthosite, S(B)**

Age: Estimated age ca. 1245 Ma (Magnusson, 1983).

Sites in the Nordingrå gabbro-anorthosite which, according to Magnusson (1983), were remagnetized by post-Jotnian dolerites (G02-007) (compare with entry BO3-017).

Ref: Magnusson (1983); this work.

**CSDG—Dala Complex /14/ G03, Jotnian****G03-001 Särnå dolerites, S(A)**

Age:  $1215-1290$  (Rb-Sr; Patchett, 1978).

These dolerites cut the Subjotnian Dala sediments (entry B01-005 to 008).

The dykes trend SE-NW and are composed of olivine-dolerite. Both dykes and sills are present.

Ref: Piper and Smith (1980b).

**G03-002 Dala dolerites, S(D)**

Age: Not dated. The estimated age is 1200 Ma (Dyrelius, 1970).

A preliminary study (see entry G03-001)

Ref: Dyrelius (1970).

**G03-003 Lybergsgnupen dolerite, S(C)**

Age: Not dated. The characteristic NRM direction suggests a Jotnian age for this dolerite.

Ref: Mulder (1971).

**G03-004 Älvdalsåsen dolerite sill, S(B)**

Age:  $1231 \pm 18$  Ma (Rb-Sr; Patchett, 1978).

Ref: Bylund (1985).

**G03-005 Mossi dolerite sill, S(D)**

Age:  $1217 \pm 18$  Ma (Rb-Sr; Patchett, 1978).

The characteristic NRM directions show large scatter.

Ref: Bylund (1985).

**CSDG—Jämtland Complex /15/ G04, Jotnian****G04-001 Sundsjö dolerite, S(C)**

Age:  $1156-1213$  Ma (Rb-Sr; Patchett, 1978).

Acid rheomorphic dyke in the dolerite gives the same NRM direction as the dolerite.

Ref: Bylund (1985).

**G04-002 Gimån dolerite, S(B)**

Age:  $1179-1229$  Ma (Rb-Sr; Patchett, 1978).

Ref: Bylund (1985).

**CSDG—Dala Anomalous Dykes /14/ G05, Jotnian-Sub-jotnian**

This group consists of data from six dykes in the Dala Province which yield deviating palaeomagnetic directions with

respect to the other CSDG data. The cause of these deviations is not clear, but three explanations have been offered by Bylund and Pesonen (1987): (i) the anomalous directions reflect Caledonian overprints, (ii) the overprints are due to the Siljan impact event or (iii) the dykes are not Jotnian, but Subjotnian, in age (ca. 1550 Ma old), i.e., there are several generations of dolerite in the area.

*G05-001 Emådalen dolerite sills, S(C)*

Age:  $1223 \pm 36$  Ma (Rb–Sr; Patchett, 1978).

This dolerite sill is partly monzonitic. No difference is observed in magnetic directions between the monzonitic and doleritic parts of the sill.

Ref: Bylund (1985).

*G05-002 Ålbo dolerite sills, S(C)*

Age:  $1215 \pm 18$  Ma,  $1290 \pm 63$  Ma (Rb–Sr; Patchett, 1978).

NRM directions obtained from rheomorphic acid dyke within the dolerite agree with those of the dolerite.

Ref: Bylund (1985).

*G05-003 Bunkris dolerite, S(C)*

Age:  $1516 \pm 62$  Ma,  $1546 \pm 84$  Ma (Rb–Sr; Patchett, 1978). Patchett (1978) places little confidence in the age data. However, the palaeomagnetic direction favours a Subjotnian rather than a Jotnian age for this dyke.

Ref: Bylund (1985); see also Bylund and Pesonen (1987).

*G05-004 Bunkris dolerite, S(C)*

Age: See G05-003.

This is an earlier study on the same dolerite as G05-003.

Ref: Mulder (1971).

*G05-005 Glysjön dolerite, S(C)*

Age: Not dated, but according to geological maps (Hjelmqvist, 1966), this dyke is a continuation of the Bunkris dyke (G05-003).

Ref: Bylund (1985).

*G05-006 Glysjön dolerite, S(C)*

Age: See G05-005.

An earlier study on the Glysjön dolerite. See G05-005.

Ref: Mulder (1971).

*G05-007 Ämån dolerite, S(C)*

Age: Not dated.

Ref: Mulder (1971).

**East of Protogine Zone /10/ P01, Sveconorwegian**

This group comprises data from dolerite dykes that trend parallel to, but are situated east of, the Protogine Zone (PZ), which marks a tectonic boundary between the Sveconorwegian and Svecocenonian Provinces (Fig. 1). They yield Rb–Sr ages between ca. 875 and 995 Ma (Patchett, 1978). Both normal and reversed polarities are present and all data are from Sweden (see also entry E01-005, the Laanila dykes in Finland).

*P01-001 Karlshamn dolerite, S(B)*

Age:  $871 \pm 936$  Ma (Rb–Sr; Patchett, 1978).

Palaeomagnetically this dolerite is slightly anomalous with respect to other dykes in the group. It may be slightly older, i.e., of early Sveconorwegian age (ca. 1000 Ma).

Ref: Patchett and Bylund (1977).

*P01-002 Karlshamn hyperite-dolerite, S(B)*

Age: See P01-001.

An earlier study on the Karlshamn dolerite.

Ref: Poorter (1975).

*P01-003 Väby dolerite, S(C)*

Age: Not dated. The palaeopole plots on the late Sveconorwegian part of the APW loop in contrast to the pole of the neighbouring Karlshamn dolerite (P01-001).

Ref: Patchett and Bylund (1977).

*P01-004 Årby dolerite, S(C)*

Age:  $995 \pm 65$  Ma (Rb–Sr; Patchett, 1978).

Ref: Patchett and Bylund (1977).

*P01-005 Falun dolerite, S(B)*

Age:  $966 \pm 20$  Ma (Patchett, 1978).

Ref: Patchett and Bylund (1977).

*P01-006 Tärnö dolerite, S(C)*

Age:  $871 \pm 21$  Ma (Rb–Sr; Patchett, 1978). The Rb–Sr ages on the unbaked country rock near this dyke are about 1650 Ma (Patchett, 1978), suggesting that they (and the palaeomagnetic data) refer to intrusion ages and not Sveconorwegian cooling and uplift ages.

Sandstone inclusions in the dolerite record the same directions as the dolerite.

Ref: Patchett and Bylund (1977).

*P01-007 Bräkne – Hoby dolerite, S(C)*

Age: 880–975 Ma (Rb–Sr; Patchett, 1978).  
 Ref: Patchett and Bylund (1977).

*P01-008 Fjöd dolorite, S(C)*

Age:  $924 \pm 26$  Ma (Sm–Nd; Johansson and Johansson, 1988).

This dyke is also known as the Lösen dyke.  
 Ref: Patchett and Bylund (1977).

*P01-009 Nilstorp dolorite sill, S(C)*

Age:  $984 \pm 47$  Ma (Rb–Sr; Patchett, 1978).  
 Ref: Patchett and Bylund (1977)

*P01-010 Väby – Ronneby hyperite – dolorite, S(C)*

Age: Not dated.  
 The same dolorite as P01-003. Although mainly of reversed polarity, one sample shows a normal polarity direction.  
 Ref: Poorter (1975).

*P01-011 Ejen dolorite, S(C)*

Age: Not dated.  
 Ref: Bylund (1985).

*P01-012 Mårsätter dolorite, s(c)*

Age: Not dated.  
 Ref: Bylund (1985).

*P01-013 Nornäs dolorite, S(C)*

Age: 901–933 Ma (Rb–Sr; Patchett, 1978).  
 The same dyke as P01-015.  
 Ref: Bylund (1985).

*P01-014 Bo dyke, S(C)*

Age: Not dated. Probably Sveconorwegian (see also BO3-015).  
 Ref: Piper (1980a).

*P01-015 site 43 dolorite, S(C)*

Age: 901–933 Ma (Patchett, 1978).  
 This site is probably the same as in entry P01-013 (Nornäs dyke).  
 Ref: Piper and Smith (1980a).

**Within Protogine Zone /17/ P02, Sveconorwegian**

This group comprises syenites and dolerites ('hyperites') in southernmost Sweden. They intrude the PZ and strike parallel to it. The syenites yield Rb–Sr and Sm–Nd ages of ca. 1200 Ma. The dolerites are apparently of two generations. One is contemporaneous with the syenites and is ca. 950 Ma old (Klingspor, 1976; Patchett, 1978; Johansson, L., 1988; Johansson, Å., 1988; Johansson and Johansson, 1988). The K–Ar ages of the dolerites range from 560 Ma to the peak at ca. 980 Ma. The palaeomagnetic data indicate that the syenites and the older dolerites were remagnetized at the time of intrusion of the younger dykes (Bylund, 1981).

*P02-001 Scania hyperite – dolorites, S(A)*

Age: 563–1595 Ma (K–Ar);  $1565 \pm 230$  Ma (Rb–Sr; Klingspor, 1976).

Dykes vary in width from a few centimetres up to 300 metres. They are nearly vertical and strike approximately NNE parallel to the PZ.

Ref: Bylund (1981).

*P02-002 Scania syenites, S(B)*

Age:  $1184 \pm 38$  (Rb–Sr; Klingspor, 1976).

The NRM of the syenites is very similar to that of the hyperite–dolerites (entry P02-001) and probably records the Sveconorwegian remagnetization.

Ref: Bylund (1981).

*P02-003 mean Scania intrusives, S(A)*

Age: See P02-001 and 002.

Combined mean of the hyperite–dolerites and syenites.

Ref: Bylund (1981); Lähde and Pesonen (1985).

*P02-004 Hägghult hyperite – dolorite, S(B)*

Age: 835 Ma (K–Ar; Priem et al., 1968).

A detailed profile across this hyperite was made by Mulder (1971) to study the palaeosecular variation during the cooling of this dyke. The dyke is probably one of the ca. 950 Ma old dykes (Johansson, pers. commun., 1989).

Ref: Mulder (1971).

*P02-005 Osby hyperite – dolorite, S(C)*

Age: 871 Ma (K–Ar; Priem et al., 1968).

Ref: Mulder (1971).

*P02-006 Hjortsjö hyperite – dolorite, S(C)*

Age:  $1573 \pm 50$  Ma (K–Ar; Priem et al., 1968).

Ref: Mulder (1971).

*P02-007 Målaskog hyperite-dolerite, S(C)*

Age:  $886 \pm 45$  Ma (K-Ar; Priem et al., 1968).  
Ref: Mulder (1971).

*P02-008 Kristinehamn hyperite-dolerite, S(C)*

Age:  $1516 \pm 50$  Ma (K-Ar; Priem et al., 1968). Although this dyke has a great (i.e., Subjotnian) K-Ar age, the palaeomagnetic direction is very similar to that of Målaskog dyke (entry P02-007), indicating Sveconorwegian resetting at around 900 Ma.

Ref: Mulder (1971).

*P02-009 mean N hyperite-dolerites, S(B)*

Age: 835–1573 Ma; see P02-004 to 006.

Mean of *N* polarity hyperite-dolerites.

Ref: Mulder (1971); Lähde and Pesonen (1985); Bylund and Pesonen (1987).

*P02-010 mean R hyperite-dolerites, S(B)*

Age: 886–900 Ma (see P02-007 and 008).

Mean of *R* polarity hyperite-dolerites.

Ref: Mulder (1971); Lähde and Pesonen (1985); Bylund and Pesonen (1987).

**West of Protogne Zone /18/ P03, Sveconorwegian**

These data comprise entries from a variety of areas and rock types from the Sveconorwegian Province proper. They range in age from ca. 850 Ma to ca. 1050 Ma. The NRM in many of these rocks probably records the uplift and cooling of the province during and after the peak of the Sveconorwegian orogeny. Both polarities are present.

*P03-001 Rogaland anorthosites, N(B)*

Age: 842–945 Ma (K-Ar; Rb-Sr; Stearn and Piper, 1984).

Samples from an area not affected by the Egersund dykes (entry P03-026).

Ref: Poorter (1972a).

*P03-002 Rogaland migmatites, N(C)*

Age:  $927 \pm 26$  Ma,  $983 \pm 88$  Ma (Rb-Sr). The Rb-Sr mineral ages range from 850 to 900 Ma and are interpreted as representing cooling due to post-tectonic uplift of the terrain. Versteeve (1975).

Ref: Poorter (1972a).

*P03-003 mean Rogaland basement rocks, N(C)*

Age: 842–945 Ma (Rb-Sr; Versteeve, 1975).

Ref: Poorter (1972a); see also Lähde and Pesonen (1985).

*P03-004 Rogaland farsundite north, N(A)*

Age:  $944 \pm 977$  Ma (U-Pb, Zr),  $860 \pm 30$  Ma (Rb-Sr) Versteeve (1975).

The NRM directions show an elongated E-W pattern which may represent APW during slow uplift and cooling.

Ref: Stearn and Piper (1984).

*P03-005 Rogaland farsundite south, N(A)*

Age: 944–977 Ma (U-Pb, Zr, Versteeve, 1975).

Magnetic directions in the south are steeper (upwards) and more scattered than in the north (entry P03-004).

Ref: Stearn and Piper (1984).

*P03-006 mean Rogaland farsundite, N(A)*

Age: See P03-004 to 005.

Mean of data from farsundites (entries P03-004 and 005).

Ref: Stearn and Piper (1984).

*P03-007 Farsund migmatites, N(C)*

Age:  $927 \pm 26$  Ma,  $983 \pm 88$  Ma (Rb-Sr; Versteeve, 1975). Ages and the palaeomagnetic data are attributed to cooling during the post-tectonic uplift of the terrane.

Ref: Stearn and Piper (1984).

*P03-008 Hidra body, N(B)*

Age: A Sveconorwegian age is assumed on geological evidence.

Ref: Stearn and Piper (1984).

*P03-009 Garsaknat body, N(A)*

Age:  $902 \pm 30$  Ma (Rb-Sr; Versteeve, 1975).

Ref Stearn and Piper (1984).

*P03-010 Garsaknat migmatites, N(C)*

Age: Not dated.

Only two sites were sampled, but the NRM direction is typical of Sveconorwegian *R* polarity.

Ref: Stearn (1979).

*P03-011 Aana-Sira massif, N(B)*

Age: Not dated, but geological evidence indicates the same age as entry P03-004 (Rogaland farsundite).

Ref: Stearn and Piper (1984).

*P03-012 Haaland – Helleren massif, N(B)*

Age: Not dated (see P03-004).  
 Ref: Stearn and Piper (1984).

*P03-013 Haaland – Helleren anomalous sites, N(C)*

Age: Not dated.  
 Data from three sites with more gentle inclinations than in the majority of sites.  
 Ref: Stearn (1979); Stearn and Piper (1984); Lähde and Pesonen (1985).

*P03-014 Bjerkrem – Sogndal lopolith (1), N(A)*

Age:  $842 \pm 30$  Ma (Rb–Sr),  $945 \pm 40$  (U–Pb, Zr). Versteeve (1975).

This lopolith intruded in four phases with slightly different lithologies (mainly anorthosites and norites; see also entries P03-015 to 017).

Ref: Stearn and Piper (1984).

*P03-015 Bjerkrem – Sogndal lopolith (2,3), N(A)*

Age: 842–945 Ma (see P03-014).  
 Data from monzonitic part of the lopolith.  
 Ref: Stearn and Piper (1984).

*P03-016 Bjerkrem – Sogndal lopolith (4), N(A)*

Age: 842–945 Ma (see P03-014).  
 Data from the quartz-monzonitic part of the lopolith.  
 Ref: Stearn and Piper (1984).

*P03-017 Bjerkrem – Sogndal lopolith, N(A)*

Age:  $842 \pm 30$  Ma,  $945 \pm 40$  Ma (Rb–Sr; Versteeve, 1975).  
 An earlier study on this lopolith; see P03-014 to 016.  
 Ref: Poorter (1972a).

*P03-018 anorthosite complex, N(A)*

Age: 842–945 Ma (see P03-014).  
 Ref: Stearn and Piper (1984).

*P03-019 anorthosite anomalous sites, N(B)*

Age: 842–945 Ma (see P03-016).  
 Data with slightly gentler inclinations than in entry P03-018.  
 Ref: Stearn and Piper (1984); Lähde and Pesonen (1985).

*P03-020 Nerset – Gumøy hyperite body, N(B)*

Age: Not dated.  
 Ref: Stearn (1979).

*P03-021 Brattön igneous rocks, S(B)*

Age: Not dated, but surrounding mica-schists yield K–Ar ages of 1005 Ma and 1030 Ma (Magnusson, 1960; Broch, 1964).

Ref: Stearn and Piper (1984).

*P03-022 Brattön dyke, S(C)*

Age: See P03-021.

This dyke extends to the Brattön intrusion (entry P03-021) and is considered younger than it. The dyke strikes ca. N70E and represents the latest stages of tectono-magmatic processes in the Brattön–Älgön area.

Ref: Stearn and Piper (1984).

*P03-023 Älgön igneous rocks, S(A)*

Age: ca. 1005–1030 Ma (see P03-021).  
 Ref: Stearn (1979).

*P03-024 mean Brattön and Älgön rocks, S(A)*

Age: 1005–1030 Ma (see P03-021).  
 The site mean poles form a small APW segment, with the Brattön poles in the northern part and the Älgön poles in the southern part. The dyke pole (P03-022) is considered a virtual geomagnetic pole (VGP) and younger than the other Brattön–Älgön poles.

Ref: Stearn and Piper (1984).

*P03-025 Tuve dolerite, S(B)*

Age: Geological and palaeomagnetic data indicate a Sveconorwegian age.

The dyke strikes WNW and is from a few centimetres to 200 m thick. The dyke is strongly altered but the alteration may be late deuterian.

Ref: Abrahamsen (1974).

*P03-026 Egersund dykes, N(B)*

Age: 842–945 Ma reported by Storetvedt and Gidskehaug (1968). Sundvoll (1987) has recently reported a Rb–Sr age of 630 Ma for these dykes, but it is still uncertain whether Sundvoll's data are from the same dykes as those studied palaeomagnetically. The palaeomagnetic data suggest that the Egersund dykes are of Sveconorwegian age (i.e., ca 850 Ma old). See discussion in Pesonen et al., 1989).

The dykes intrude the Egersund anorthosite, strike ESE and are vertical. Their widths range from 1 to 30 m. They are unaltered olivine-bearing dolerites with chilled margins against all the other rocks they cut.

Ref: Poorter (1972a)

*P03-027 Egersund dykes, N(B)*

Age: See P03-026.

This is an earlier study on Egersund dykes (see P03-026).

Ref: Storetvedt (1966a,b), Storetvedt and Gidskehaug (1968)

*P03-028 Egersund anorthosite, N(B)*

Age. Not dated, but estimated age ca. 842–945 Ma.

These data were correlated with those from the Allard Lake anorthosite in the Grenville Province of North America using the Bullard et al. (1965) reconstruction. The polarity of the anorthosite is normal, in contrast to the reversed polarity of the Egersund dykes (see P03-026).

Ref: Hargraves and Fish (1972).

*P03-029 Egersund anorthosite, N(C)*

Age: See p03-028.

Data taken from an abstract giving only the pole position. The corresponding NRM direction listed in the catalogue was recalculated by Lähde and Pesonen (1985).

Ref: Murthy and Deutsch (1974); Lähde and Pesonen (1985).

*P03-030 Egersund farsundite, N(A)*

Age:  $977 \pm 36$ ,  $944 \pm 84$  Ma (U–Pb, Zr; Versteeve, 1975).

Ref: Murthy and Deutsch (1975).

*P03-031 migmatites combined, N(B)*

Age. See P03-007.

Combined data from three sites in migmatites bordering the Farsundite (P03-004) and Garsaknat (P03-009) bodies in the Rogaland igneous complex.

Ref: Stearn and Piper (1984).

*P03-032 Bamble intrusions (A1,N), N(A)*

Age: 975–1120 Ma (K–Ar; O’Nions, 1969).

The Bamble area is situated in southern Norway. The rocks studied are mainly basic igneous rocks, amphibolites and hyperites that intrude a high-grade metamorphic basement. K–Ar dates are in the range 950–1080 Ma. The older ages are inferred to represent temperatures of 650–700°C. A Rb–Sr whole rock isochron gives an age of  $1139 \pm 100$  Ma and is

interpreted as representing the thermal maximum of the orogeny, ca. 150–200 Ma before the final stages of cooling and uplift. Data are divided into *N* and *R* polarities. This entry lists the combined data from *A1* sites with *N* polarity (Stearn and Piper, 1984) and sites TPB, TPC/TPD and TPE of Poorter (1975).

Ref: Poorter (1975); Stearn and Piper (1984).

*P03-033 Bamble intrusions (A1,R), N(D)*

Age: See P03-032

*R* polarity data from *A1* sites including site TPL of Poorter (1975).

Ref: Poorter (1975); Stearn and Piper (1984).

*P03-034 Bamble intrusions (A2,N), N(A)*

Age: See P03-032.

Combined data from *A2* sites of *N* polarity (Stearn and Piper, 1984) and site TPK of Poorter (1975).

Ref: Poorter (1975); Stearn and Piper (1984).

*P03-035 Bamble intrusions (A2,R), N(C)*

Age: See P03-032

Combined data from *A2* sites of *R* polarity.

Ref: Stearn and Piper (1984).

*P03-036 Bamble intrusions (A3,N), N(B)*

Age: See P03-032.

Combined data from *A3* normal polarity sites of Stearn and Piper (1984) and site TPA of Poorter (1975).

Ref: Poorter (1975); Stearn and Piper (1984).

*P03-037 Bamble intrusions (A3,R), N(D)*

Age: See P03-032.

Only one site in this *R* polarity entry.

Ref: Stearn and Piper (1984).

*P03-038 Bamble intrusion (B1,R), N(A)*

Age: 975–1120 Ma; see P03-032.

Data from *B* sites of Stearn and Piper (1984) with slightly different *R* polarity directions from those in *A* sites.

Ref: Stearn and Piper (1984).

*P03-039 Bamble – Kongsberg amphibolites, N(A)*

Age: 975–1120 Ma (K–Ar; O’Nions, 1969)

Combined directions from amphibolites and hyperites. One site (TPL) has both polarities and hence mixed polarity entry.

Ref: Poorter (1975).

*P03-040 west Sweden minor dykes (N), S(B)*

Age: Not dated, but U-Pb (Zr) data on a nearby hyperite gives an upper age of 1550 Ma. The lower intercept at 880 Ma indicates a metamorphic event at 800–1000 Ma (Welin et al., 1980).

This entry is the mean of two *N* polarity sites

Ref: Stearn and Piper (1984)

*P03-041 west Sweden minor dykes (R), S(B)*

Age: See P03-040.

Mean of five *R* polarity sites including some data from Mulder's (1971) earlier study (site MZS).

Ref: Mulder (1971); Stearn and Piper (1984); Lähde and Pesonen (1985).

*P03-042 west Sweden Palaeozoic overprint, S(C)*

Age: Palaeozoic overprint. Low-coercivity data on minor dykes from three sites in W Sweden minor dykes yield an overprint direction which can be of Palaeozoic age.

Ref: Stearn and Piper (1984); Lähde and Pesonen (1985).

*P03-043 Hunnalen dykes, N(A)*

Age: 842–950 Ma (Poorter, 1972a).

These dykes trend N60E and are clearly more highly altered than the Egersund dykes (entry P03-026). Although no baked contact test results are available, the ages most likely refer to the time of uplift and cooling of the terrane, rather than to the time of intrusion.

Ref: Poorter (1972a).

*P03-044 SW Swedish amphibolites (H, W), S(D)*

Age: Not dated.

Comprises sites ZPH and ZPW of Poorter (1975). Large scatter in NRM directions, but the mean clearly shows a Sveconorwegian pole on the APWP. Both polarities are present, hence mixed polarity.

Ref: Poorter (1975).

*P03-045 SW Swedish amphibolites (W2), S(C)*

Age: Not dated.

Data from site ZPW of Poorter (1975). Both polarities are present, hence mixed polarity.

Ref: Poorter (1975).

*P03-046 mean SW Swedish amphibolites, S(C)*

Age: Not dated.

The mean of entries P03-044 and 045.

Ref: Poorter (1975).

*P03-047 Hälleforsnäs dyke (component b), S(C)*

Age: The dyke is dated to  $1518 \pm 38$  Ma (entry B03-014) but has been affected by later events. This isolated high-coercivity component is probably of Sveconorwegian age (ca. 900 Ma) according to APW interpretation. See also entry PO1-014.

Ref: Piper (1980b)

**Late Precambrian/Cambrian Q02***Q02-001 Norway sparagmites, N(D)*

Age: Stratigraphically, of Late Precambrian age.

A preliminary study without demagnetization treatments. Both polarities are, however, present

Ref: Harland and Bidgood (1959).

*Q02-002 Nexö sandstone, D(B)*

Age: From stratigraphic evidence, a Late Precambrian–Cambrian age is inferred. An error made in the original paper was later corrected by Prasad and Sharma (1980). The corrected value is used in this catalogue

Ref: Prasad and Sharma (1978, 1980).

*Q02-003 Fen carbonatite complex, N(B)*

Age:  $533 \pm 15$  Ma (Rb–Sr),  $413\text{--}605$  Ma (K–Ar). Brock (1964) and Priem et al. (1968). Dolerite dykes cutting the Fen complex yield ages of 243–250 Ma (K–Ar; Priem et al., 1968).

Samples collected from haematite-enriched carbonatite. NRM probably of Late Cambrian age. One-directional grouping (see also entry Q04-005) provides evidence for a later (Palaeozoic) overprint in the Fen complex.

Ref: Poorter (1972b)

*Q02-004 Alnö Complex B, N(C)*

Age:  $545\text{--}589$  Ma (K–Ar; Doig, 1970; Welin et al., 1972; Kresten et al., 1977),  $553 \pm 6$  Ma (Rb–Sr; Brueckner and Rex, 1979).

Magnetic directions of carbonatitic rocks divided into two groups (*A* and *B*) by the author. This entry lists the group *B* data (all of normal polarity).

Ref: Piper (1981).

*Q02-005 Alnö Complex A (R), N(B)*

Age: See Q02-004.

Gentle westerly (*R* polarity) directions.

Ref: Piper (1981); Lähde and Pesonen (1985).

*Q02-006 Alnö Complex A (N), N(B)*

Age: See Q02-004N polarity data.

Ref: Piper (1981); Lähde and Pesonen (1985).

*Q02-007 Båtsfjord dykes, N(B)*

Age: 640 Ma (K-Ar; Beckinsale et al., 1976).

These vertical, NNE-trending dykes intrude the Barents Sea Group sediments in the Varanger Peninsula of Finnmark and are of Late Precambrian age. The dykes are slightly altered, but do not show quenching effects. The alteration occurred much later, perhaps related to Palaeozoic metamorphism. The palaeomagnetic pole of this dyke swarm was interpreted by Kjöde et al. (1980) as indicating dextral movement of more than 1000 km along the Trollfjord-Komagelv fault after intrusion of the dykes. See also Pesonen et al. (1989) for a different interpretation.

Ref: Kjöde et al. (1978); Kjöde (1980); Pesonen et al. (1989)

*Q02-008 Kongsfjord dykes, N(D)*

Age: Inconclusive radiometric data give ages in the 935–1946 Ma range. However, these dykes intrude the Late Precambrian Barents Sea Group and are thus probably of Late Precambrian-Cambrian age (Beckinsale et al., 1975). Most samples are magnetically unstable. Three samples show consistent directions which agree with that of the Båtsfjord dykes (entry Q02-007).

Ref: Kjöde et al. (1978); Kjöde (1980); Lähde and Pesonen (1985)

**Ordovician Q03***Q03-001 Swedish limestones, S(C)*

Age: Ordovician. Biostratigraphic evidence (Claesson, 1977). Sampled from the provinces of Närke, Östergötland and Öland in southern Sweden. The steeply inclined, fairly stable direction identified probably represents an unresolved multi-component system.

Ref: Claesson (1978).

*Q03-002 Sulitjelma gabbro (R), N(D)*

Age: Early-Middle Ordovician on stratigraphic evidence. An age of  $443 \pm 16$  Ma (Rb-Sr; Wilson, 1972) obtained for the related Furulund granite gives the minimum age for this gabbro. The peak of metamorphism, however, appears to have occurred during the Wenlockian (ca. 430–420 Ma) or Ludlowian (ca. 420–415 Ma). Both polarities are present. The R polarity mean (with a large scatter) was calculated from the author's original tables.

Ref: Piper (1974); Lähde and Pesonen (1985).

*Q03-003 Sulitjelma gabbro (N), N(D)*

Age: See Q03-002.

Mean of the N polarity data, as recalculated from the original publication

Ref: Piper (1974); Lähde and Pesonen (1985).

*Q03-004 mean Sulitjelma gabbro (C), N(C)*

Age: See Q02-002.

Combined mean of the N and R polarity data

Ref: Piper (1974); Lähde and Pesonen (1985).

*Q03-005 Asköy pluton (A1), N(B)*

Age: The NRM is interpreted as having been acquired during Late Ordovician metamorphic resetting (Rother et al., 1987).

This entry lists the group A1 data, which are less distinct than the group B data (see entry Q05-011). Both polarities are present in this pluton

Ref: Rother et al. (1987)

**Silurian Q04***Q04-001 Oslo igneous rocks (A), N(D)*

Age: K-Ar dates yield ages of about 424 Ma (Versteeve, 1975; Dons and Larsen, 1978).

These rocks are products of the Oslo igneous episode. Samples were taken in the southern and western parts of the Oslo Rift. Palaeomagnetic direction and pole were calculated by Lähde and Pesonen (1985) from fig. 2 of the author's original paper (Storetvedt et al., 1978). It is uncertain whether the direction should be corrected for tectonic tilt, as was done for the younger B pole of the same formation (entry Q06-001) in the same study.

Ref: Storetvedt et al. (1978); Lähde and Pesonen (1985).

*Q04-002 Särv nappe dolerites (A), S(C)*

Age: 665 Ma ( $^{40}\text{Ar}$ - $^{39}\text{Ar}$ ; Claesson and Roddick, 1983),  $720 \pm 225$  Ma (Rb-Sr; Claesson, 1976), 599–2576 Ma (K-Ar; Claesson, 1976; Point et al., 1976).

Palaeomagnetic data from the NNW-trending Ottfället dykes, which have been translated with the Särv nappe, part of the Scandinavian Caledonides. The dykes are compositionally abyssal tholeiites and not oceanic. They are probably related to the early stages of the opening of the Iapetus Ocean. The nappe movement probably took place in Silurian-Early Devonian times.

Ref: Bylund and Zellman (1980).

*Q04-003 Särv nappe dolerites (B), S(C)*

Age: See Q04-002

This entry lists data from dolerites of the main part of the Särv nappe. The NRM is interpreted as representing the remagnetization during the nappe translation roughly in Silurian-Devonian times (syntectonic). However, the authors point out that the  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  data of Claesson and Roddick

(1976) suggest a Late Precambrian age for these dolerites and that the magnetization may be primary, but anomalous due to nappe rotations.

Ref: Bylund and Zellman (1980).

#### *Q04-004 Röysing dyke (PC), N(C)*

Age: See Q04-002.

This dyke intrudes an outlier of the Särv nappe and belongs to the group of Särv nappe dolerites (see entries Q04-002 and 003).

Ref: Bylund and Zellman (1980)

#### *Q04-005 Fen Complex overprint, N(C)*

Age: Estimated age for this overprint is ca. 370–570 Ma (see Storetvedt, 1973) and entry Q02-003.

Both polarities are present, but only the R polarity mean is listed here (the estimated N polarity mean direction is  $D = 30^\circ$ ,  $I = -10^\circ$ ). This overprint is probably related to the metasomatism in the Fen Complex during Silurian time.

Ref: Storetvedt (1973); Lähde and Pesonen (1985).

#### *Q04-006 Ringerike sandstone, N(D)*

Age: Middle–Late Silurian, based on biostratigraphy. High-temperature component estimated by Lähde and Pesonen (1985) from original data.

Ref: Storetvedt et al. (1967, 1978); Lähde and Pesonen (1985).

#### *Q04-007 Ringerike sandstone (hb), N(A)*

Age: Probably mid-Late Silurian on palaeomagnetic evidence (Douglass and Kent, 1986).

High blocking temperature data isolated by detailed thermal demagnetization. Both polarities are superimposed in the same samples. Positive fold test. One of the few mid-Palaeozoic key poles from Fennoscandia.

Ref: Douglass and Kent (1986).

#### *Q04-008 Gotland Follingbo limestone, S(C)*

Age: Middle–Late Silurian on biostratigraphic evidence (Claesson, 1979). The author is sceptical about the results owing to the weak NRM in these rocks, but argues that the magnetization could be of Late–Middle Silurian age.

Ref: Claesson (1979).

#### *Q04-009 Gotland Dacker limestone, S(C)*

Age: Middle Silurian on biostratigraphic evidence (Claesson, 1979).

Weak NRM intensities (see entry Q04-008).

Ref: Claesson (1979).

#### *Q04-010 Gotland Medbys limestone, S(C)*

Age: Late Silurian on biostratigraphic evidence (Claesson, 1979).

Ref: Claesson (1979).

#### *Q04-011 Scania limestone, S(C)*

Age: Late Silurian on biostratigraphic evidence

Ref: Claesson (1979)

#### *Q04-012 Fongen–Hyllingen gabbro (P1), N(B)*

Age: Probably Late Silurian, biostratigraphy.

The studied rocks include gabbro, amphibolitized gabbro and trondhjemite. Two palaeomagnetic directions established (see also entry Q05-004). The anomalous palaeomagnetic direction in this entry is attributed to either a geomagnetic excursion or to a rotation by ca.  $90^\circ$  of the gabbro around a vertical axis during late Caledonian time.

Ref: Abrahamsen et al. (1979); Abrahamsen (1985).

#### Devonian Q05

##### *Q05-001 Röragen sandstone, N(B)*

Age: Early Devonian on biostratigraphic evidence. No tectonic or magnetic age control.

Ref: Storetvedt and Gjellstad (1966); Storetvedt et al. (1967)

##### *Q05-002 Håsteinen sandstone (A), N(A)*

Age: Devonian on stratigraphic evidence.

Study on Devonian sandstone and its substrata. A post-tectonic magnetization component isolated from both sandstones and the basement. Negative tilt test. Magnetic fabric studies show penetrative cleavage. Both polarities present and superimposed in the same specimens, hence mixed polarity.

Ref: Torsvik et al. (1987).

##### *Q05-003 Håsteinen sandstone (B), N(B)*

Age: The age of the B component is probably Mesozoic as it was isolated from samples from shear zones activated during Mesozoic movements.

Bipolar stable magnetization.

Ref: Torsvik et al. (1987).

##### *Q05-004 Fongen–Hyllingen gabbro (P2), N(B)*

Age: Probably Early Devonian (estimated).

This magnetic direction in the Fongen–Hyllingen gabbro is less well defined than the P1 component (entry Q04-012). It may also represent post-intrusion tectonic movements as discussed in Abrahamsen (1985).

Ref: Abrahamsen et al. (1979); Abrahamsen (1985).

*Q05-005 Kvamshesten Old Red Sandstone (R), N(B)*

Age: Middle–Late Devonian on biostratigraphic evidence.

This entry (reversed polarity) is probably an overprint acquired during diagenesis. The palaeopole deviates by more than 15° from other Devonian palaeopoles.

Ref: Lie et al. (1969).

*Q05-006 Kvamshesten Old Red Sandstone (N), N(D)*

Age: See Q05-005.

Normal polarity data from two samples.

Ref: Lie et al. (1969).

*Q05-007 Kvamshesten Old Red Sandstone, N(A)*

Age: See Q05-005. The NRM is probably of syntectonic age, recording thrust movements during Late Devonian–Early Carboniferous times.

The fold test is negative, but 30% unfolding was applied to the data. Magnetic fabric and crystallinity studies were also conducted

Ref: Torsvik et al. (1986).

*Q05-008 Ytteröy lamprophyre, N(C)*

Age:  $363 \pm 15$  Ma (K–Ar; Priem et al., 1968), 256 Ma (Rb–Sr, biotite), 370 Ma ( $^{39}\text{Ar}$ – $^{40}\text{Ar}$ ; Mitchell and Roberts, 1987)

Results based on two samples only. New palaeomagnetic data suggest Permian rather than Devonian age (Torsvik, pers. commun., 1989).

Ref: Storetvedt (1967).

*Q05-009 Hornelen sandstone (A), N(A)*

Age: Upper–Lower Devonian (fossil evidence).

Two palaeomagnetic directions isolated, both of dual polarity. Group A arguably of synfold origin (20% unfolding applied) and of Late Devonian to Early Carboniferous age. Magnetic fabric study included.

Ref: Torsvik et al. (1987)

*Q05-010 Hornelen Old Red Sandstone (B), N(B)*

Age. See Q05-009.

Group B data related to Mesozoic faulting and shearing. Both polarities present. Magnetic fabric studies included.

Ref: Torsvik et al. (1987).

*Q05-011 Asköy pluton (B), N(C)*

Age: Palaeomagnetic data indicate Late Devonian age.

Less well established group B data from the Asköy pluton (see entry Q03-005). Dual polarity.

Ref: Rother et al. (1987).

**Carboniferous***Q06-001 Oslo igneous rocks (B), N(B)*

Age: Although not directly dated, the rocks of this entry are considered to be of Late Carboniferous–Permian–Jurassic age (see also entries Q04-001, Q06-011, Q07-008, Q08-001 and Q09-002 to 003). According to the authors, the magmatic activity, which propagated from S to N, was initiated during Carboniferous and ended with dyke activity in Jurassic and Tertiary times. Generally, palaeomagnetic data with gentle inclinations are taken as Carboniferous while those with intermediate inclinations are considered as Permian. This entry lists the R polarity data on sediments interbedded in and baked by lavas. Tilt correction applied.

Ref: Storetvedt et al. (1978); this work

*Q06-002 Särna alkaline body (1), S(B)*

age:  $287 \pm 14$  Ma (Rb–Sr; Bylund and Patchett, 1977)

Study made on an isolated peralkaline syenite site.

Ref: Smith and Piper (1979)

*Q06-003 Särna alkaline body (2), S(B)*

Age: See Q06-002.

Three sites studied (see Q06-002)

Ref: Bylund and Patchett (1977)

*Q06-004 mean Särna alkaline body, S(A)*

Age: See Q06-002.

Combined mean of two studies on Särna alkaline body (entries Q06-002 and 003).

Ref: Smith and Piper (1979).

*Q06-005 E Västergötland sill, S(B)*

Age:  $287 \pm 15$  Ma (K–Ar; Priem et al., 1968).

These dolerite sills cover the Early Palaeozoic sediments. See also entry Q07-017 for slightly younger ages from the western part of Västergötland County.

Ref: Mulder (1971).

*Q06-006 Scania dolerites (A), S(A)*

Age: K–Ar ages range from 200 to 425 Ma; average age ca 300 Ma (Klingspor, 1976).

The dykes strike NW–SE and cut Precambrian gneisses and Lower Palaeozoic sediments. The dolerites are slightly older than the melaphyses (entry Q07-001). Two studies have been made on these dolerites (see also Q06-007).

Ref: Mulder (1971).

*Q06-007 Scania dolerites (B), S(A)*

Age: See Q06-006.  
Ref: Bylund (1974).

*Q06-008 Kragerö dykes, N(C)*

Age: Probably Late Carboniferous or Early Permian, palaeomagnetic evidence.

See also entries Q11-002 and 003.

Ref: Storetvedt (1968); Lähde and Pesonen (1985)

*Q06-009 Stabben sill (hb), N(B)*

Age:  $297 \pm 8$  Ma (Rb-Sr, whole rock; Råheim, 1974).

This study deals with a profile through a single syenite sill. Two magnetization directions established. This entry lists the high blocking temperature (*hb*), presumably a primary component of Carboniferous age. See also entry Q06-010.

Ref: Sturt and Torsvik (1987).

*Q06-010 Stabben sill (lb), N(B)*

Age: Magnetization probably of Mesozoic/Tertiary age (see Q01-010).

This entry lists the low blocking temperature component of *N* polarity, which overprints the *R* polarity *hb* component listed in entry Q06-010.

Ref: Sturt and Torsvik (1987).

*Q06-011 Oslo graben lavas, N(D)*

Age: Probably Carboniferous, based on palaeomagnetic data.

Data from three sites listed in abstract by Douglass and Kent (1986) without statistics

Ref: Douglass and Kent (1986).

**Permian***Q07-001 Scania melaphyres, S(A)*

Age: 250–285 Ma (K-Ar; Klingspor, 1976).

Some of the melaphyre dykes are altered by post-intrusion autometamorphism.

Ref: Bylund (1974).

*Q07-002 Sunnhordland dykes (R), N(B)*

Age: Three episodes of dyke intrusions according to K-Ar dating: (i) 275 Ma, (ii) 220 Ma and (iii) 160 Ma (Faerseth et al., 1976). The *R* polarity data were calculated from intersecting great circles yielding a Permian palaeopole (see also entry Q09-001).

Ref: Lövlie (1981).

*Q07-003 Arendal diabases (A), N(C)*

Age: Permian age for these dykes inferred from geological evidence (cross-cutting relationships) and from palaeomagnetic data. The palaeomagnetic directions of the Arendal diabases are divided into five groups according to inclinations, and are probably post-Permian remagnetization effects. Both diabases and lamprophyres are present. Dykes intruded fracture zones that were active before and after the intrusions. This entry lists the group *A* data, which are probably of Early Permian age.

Ref: Halvorsen (1972); Lähde and Pesonen (1985).

*Q07-004 Arendal diabases (B), N(B)*

Age: See Q07-003.

Steeper (reversed) inclination than in Q07-003. This may be due to post-Permian overprint.

Ref: Halvorsen (1972); Lähde and Pesonen (1985).

*Q07-005 Arendal diabases (C), N(B)*

Age: See Q07-003. Magnetization probably of Late Carboniferous-Early Permian age.

Ref: Halvorsen (1972); Lähde and Pesonen (1985).

*Q07-006 Arendal diabases (D1), N(B)*

Age: See Q07-003. Magnetization may be a post-Permian overprint.

Ref: Halvorsen (1972); Lähde and Pesonen (1985).

*Q07-007 Arendal diabases (D2), N(B)*

Age: See Q07-003.

This entry has the steepest (reversed) inclinations and may represent a post-Permian overprint.

Ref: Halvorsen (1972); Lähde and Pesonen (1985).

*Q07-008 Oslo igneous rocks (I), N(B)*

Age: Permian (estimated).

Samples taken in two areas of the Oslo igneous province. Several rock types present. The data in this entry are the mean of all the data of a variety of rock types. The data are dip corrected.

Ref: Van Everdingen (1960).

*Q07-009 Ny-Hellesund dykes, N(A)*

Age: 255–380 Ma (K-Ar; Halvorsen, 1970).

The diabases occur as both dykes and sills.

Ref: Halvorsen (1970; 1972).

*Q07-010 Gjerdingen larvikite, N(C)*

Age: Not dated, but a Permian age assumed on palaeomagnetic evidence

Rocks demagnetized only to 15 mT. This study is part of a larger study of magnetic anomalies related to the larvikite. The mean direction and statistics recalculated by Lähde and Pesonen (1985) from fig. 6 of original publication.

Ref: Kristoffersen (1973); Lähde and Pesonen (1985).

*Q07-011 Bohuslän dykes (RPM), S(B)*

These dykes are due to widespread NNW or N-S trending Permian dyke activity in the Bohuslän Province on the west coast of Sweden. Possibly related to events in the Oslo Rift. Multiple intrusions are present, and the grouping is based on intrusion types.

Age: Not dated, but a Permian age assumed on palaeomagnetic basis.

This entry lists the marginal rhomb-porphyry dyke data. Geological evidences suggest that the RPM dykes are older than the RPC dykes (entry Q07-012). Positive baked contact test

Ref: Thorning and Abrahamsen (1980); Lähde and Pesonen (1985)

*Q07-012 Bohuslän dykes (RPC), S(B)*

Age: See Q07-011. Central parts of the rhomb-porphyry dykes considered the youngest dykes in the area.

Ref: Thorning and Abrahamsen (1980); Lähde and Pesonen (1985)

*Q07-013 mean Bohuslän dykes (RP), S(A)*

Age: Permian, see Q07-011.

Mean of Bohuslän rhomb-porphyry dykes (entries Q07-011 and 012)

Ref: Thorning and Abrahamsen (1980); Lähde and Pesonen (1985)

*Q07-014 Bohuslän porphyry dykes (PD), S(B)*

Age: Not dated, but considered to be Permian on palaeomagnetic evidence.

These porphyry dolerites strike NNW and are up to 10 m thick. They show chilled margins against the granitic wall rocks.

Ref: Thorning and Abrahamsen (1980); Lähde and Pesonen (1985)

*Q07-015 Bohuslän dolerite dykes (D), S(B)*

Age: See Q07-011. Probably slightly older than Q07-011 and 012? For geological reasons the inferred age order is Q07-015 (oldest), Q07-014 (intermediate), Q07-011 (youngest).

Large scatter in direction. These dolerite dykes are very narrow.

Ref: Thorning and Abrahamsen (1980); Lähde and Pesonen (1985)

*Q07-016 mean Bohuslän dykes (RP,PD,D), S(A)*

Age: See Q07-011.

Mean of entries Q07-013 to 015. A possible trend in the palaeopoles of the Bohuslän dykes indicated by steepening of inclinations from RPM over RPC to PD and to P.

Ref: Thorning and Abrahamsen (1980); Lähde and Pesonen (1985).

*Q07-017 W Västergötland sill, S(B)*

Age:  $282 \pm 50$  Ma (K-Ar; Priem et al., 1968) See also entry Q06-005 The age difference between these intrusions is so small that they may belong to the same intrusion period

Ref: Mulder (1971).

*Q07-018 Brumunddal lavas, N(C)*

Age: Not dated, but the lavas belong to the Permian Oslo Rift.

Data in this entry were recalculated from fig. 5 (Storetvedt and Petersen, 1970, p. 576), and are after 50% unfolding as proposed by the authors. See also entries Q08-002 to 004.

Ref: Storetvedt and Petersen (1970), this work

**Triassic Q08***Q08-001 Oslo igneous rocks (II), N(C)*

Age. Not dated, but ages of nearby igneous rocks are  $276 \pm 2$  Ma (Heier and Compston, 1969). K-Ar ages group in the intervals 260–270 Ma and 230–240 Ma (Ineson et al., 1975). For further discussion of radiometric ages, see Sundvoll (1978).

This entry lists the R polarity data, which are probably Triassic or Jurassic.

Ref: Storetvedt et al. (1978); Lähde and Pesonen (1985).

*Q08-002 Brumunddal lavas (R), N(C)*

Age. Not dated, but a Triassic magnetization age is inferred from palaeomagnetic data (Storetvedt and Petersen, 1970)

These data on reversed polarity were recalculated in this work from fig 5 (Storetvedt and Petersen, 1970, p.576), as these authors do not list the data according to polarities.

Ref: Storetvedt and Petersen (1970), this work

*Q08-003 Brumunddal lavas (N), N(C)*

Age: See Q08-002.

This entry lists the N polarity data as recalculated from fig. 5 (Storetvedt and Petersen, 1970, p.576), and are after 50% unfolding.

Ref: Storetvedt and Petersen (1970); this work.

*Q08-004 Brumunddal lavas (C), N(C)*

Age: See Q08-002.

This entry is the combined mean of *N* and *R* polarity data listed by Storetvedt and Petersen (1970).

Ref: Storetvedt and Petersen (1970); this work

**Jurassic***Q09-001 Sunnhordland alkaline dykes (N), N(B)*

Age: Three episodes of dyke intrusion reported: at 275 Ma, 220 Ma and 160 Ma (K-Ar; Faerseth et al., 1976). On palaeomagnetic evidence, the *N* polarity component is younger than the *R* polarity component (see entry Q07-002).

Ref: Lövlie (1981).

*Q09-002 Oslo dyke rocks (R), N(C)*

Age: Palaeomagnetic direction suggests a Mesozoic, possibly Jurassic, age.

The dykes trend NNW-SSE and NNE-SSW.

Ref: Storetvedt et al. (1978); Lähde and Pesonen (1985).

*Q09-003 Oslo dyke rocks (N), N(C)*

Age: See Q09-002. Palaeomagnetic data suggest a Jurassic age for the *N* polarity data listed in this entry.

Ref: Storetvedt et al. (1978); Lähde and Pesonen (1985).

*Q09-004 Sotra dykes, N(B)*

Age: Probably ca. 250 Ma old on palaeomagnetic evidence (Lövlie and Mitchell, 1982).

These dykes record a stable NRM, which is interpreted as representing the blocking of remanence during uplift related to Kimmerian (ca. 160–150 Ma) basin development in the North Sea region. Negative baked contact test (see Q09-005). The magnetization could thus be of Middle–Late Mesozoic age.

Ref: Lövlie and Mitchell (1982).

*Q09-005 Sotra baked rocks, N(C)*

Age: See Q09-004.

Negative baked contact test (cf. Q09-004).

Ref: Lövlie and Mitchell (1982).

**Cretaceous***Q10-001 Scanian basalts (N), S(A)*

Age: 81–169 Ma (K-Ar; Prinzlau and Larsen, 1972; Klingspor, 1976), Middle–Late Jurassic on fossil evidence. Volcanism in Scania probably started in the Middle–Late Jurassic and ended in the Cretaceous.

These basalts have both polarities but the reversal is not exactly 180°. No correlation found between K-Ar ages and polarity. The entry lists the *N* polarity site mean data. Data in the catalogue are from Bylund (1981), and include data from Bylund (1973), Schweitzer (1975) and unpublished results (Bylund, in prep.). Schweitzer also carried out palaeointensity determinations.

Ref: Bylund (1981)

*Q10-002 Scanian basalts (R), S(C)*

Age: See Q10-001. *R* polarity data.

Ref: Bylund (1981).

*Q10-003 mean Scanian basalts, S(B)*

Age: See Q10-001.

Combined *R* and *N* polarity means.

Ref: Bylund (1981).

*Q10-004 Lappajärvi impact structure, F(C)*

Age:  $77.3 \pm 0.4$  Ma ( $^{40}\text{Ar}$ - $^{39}\text{Ar}$ ; Jessberger and Reimold, 1980).

The NRM was probably acquired during (rapid) cooling of impact melt rocks. The direction is therefore a spot-reading of the Earth's magnetic field and hence the pole position (implying an age of ca. 200 Ma on the European APWP curve) is a VGP. On the other hand, the anomalous NRM direction may suggest that a post-impact tectonic tilt is uncorrected.

Ref: Pesonen et al. (1984); Pesonen (in prep.).

**Tertiary Q11***Q11-001 Dellen impact structure, S(B)*

Age: Not dated, but thought to be of Tertiary age. Data from impact rocks may represent only a spot-reading of the Earth's magnetic field (see entry Q10-004).

Ref: Bylund (1974).

*Q11-002 Kragerö dykes B(R), N(B)*

Age: Not dated. Tertiary age estimated from palaeomagnetic pole interpretation.

Both polarities are present and the reversal is symmetric. This entry lists the *R* polarity data.

Ref: Storetvedt (1968).

*Q11-003 Kragerö dykes A(N), N(C)*

Age: See Q11-002.

This entry lists the *N* polarity data.

Ref: Storetvedt (1968).

TABLE I

Tectonomagnetic blocks and their numbers, and the applied codes (keys) for the Fennoscandian palaeomagnetic database

No	Name of tectonic block, magmatic province or geological period	Block number	Geological era or period	Age interval (Ma)	Database-code (block key)
Precambrian data					
Late Precambrian–Phanerozoic data					
1.	Karelian Craton	/1/	Archaean	2600	A01
2.	Central Lapland block	/2/	Iapponian	2600–2350	J01
3.	South Karelian block	/3/	Jatulian–Svecofennian	2200–1700	J02
4.	North Central Karelian block	/4/	Svecofennian	1900–1700	J03
5.	Lapland Granulite Belt (LGB)	/5/	Late Archaean–Svecofennian	2700–1700	E01
6.	Raaine–Ladoga block	/6/	Svecofennian	1950–1700	S01
7.	Central Sweden–South Finland block	/7/	Svecofennian	1950–1700	S02
8.	North of Skellefteå block	/8/	Svecofennian	1950–1700	S03
9.	Kola block	/9/	Archaean–Svecofennian	2900–1700	S04
10.	Inlier in NW Sweden	/16/	Svecofennian–Subjotnian	1950–1500	S05
11.	Central–North Lapland block	/2/	Iapponian–Svecofennian	2450–1700	S06
12.	Trans-Scandinavian Granite Porphyry Belt (TSGB)	/10/	Subjotnian	1650–1300	B01
13.	Southern Finland block	/7/	Subjotnian	1650–1300	B02
14.	South Central Sweden block	/7/	Subjotnian	1650–1300	B03
15.	Bornholm island	/11/	Subjotnian–Sveconorwegian	1300–850	R01
16.	CSDG–Satakunta complex	/12/	Jotnian	1300–1100	G01
17.	CSDG–Ulvo complex	/13/	Jotnian	1300–1100	G02
18.	CSDG–Dala complex	/14/	Jotnian	1300–1100	G03
19.	CDSG–Jämtland complex	/15/	Jotnian	1300–1100	G04
20.	CDSG–anomalous sites	/14/	Subjotnian–Jotnian	1650–800	G05
21.	East of Protogine Zone	/10/	Sveconorwegian	1100–800	P01
22.	Within Protogine Zone	/17/	Sveconorwegian	1100–800	P02
23.	West of Protogine Zone	/18/	Sveconorwegian	1100–800	P03
24.	Late Precambrian/Cambrian				
25.	Ordovician			640–505	Q02
26.	Silurian			505–438	Q03
27.	Devonian			438–408	Q04
28.	Carboniferous			408–360	Q05
29.	Permian			360–386	Q06
30.	Triassic			286–248	Q07
31.	Jurassic			248–213	Q08
32.	Cretaceous			213–144	Q09
33.	Tertiary			144–65	Q10
				65–2	Q11

Number between slashes refer to tectonomagnetic blocks as shown in Fig. 1 (see also Pesonen et al., 1989). Age intervals refer to approximate age intervals (in Ma) of the blocks. Database codes (block keys) are used in the catalogue and also in the abstracts. Same codes will be used in the microcomputer-based database presently being compiled (see Pesonen and Torsvik, 1990).

**TABLE 2**  
**Palaeomagnetic directions and poles from Fennoscandia: Archaean to Tertiary**

No	Rock unit and/or component, country	LAT	LONG	B/N/n	P	D	I	$\lambda_{95}$	$\nu$	age	m	PLAT	PLON	dp (A95)	dm	t	$\kappa$	Ref	
KARELIAN CRATON (A01), ARCHAEO																			
A01-001	Varpaisjärvi quartz diorite, F	63.4	27.0	*6/12/64	N	305.0	4.7	139	2680±3	g	63.9	313.0	7.5	8.4	a,t	A	Neuvonen et al. (1981)		
A01-002	Näslia tonalitic dykes, F	63.2	28.2	*5/6/59	N	355.0	4.7	271	1830-1860	g	48.4	220.8	3.3	5.6	a,t	B	Neuvonen et al. (1981)		
A01-003	Näslia gabbro-diorites, F	63.6	27.3	*6/64	N	328.0	36.0	16.1	-	a	42.0	249.0	10.9	18.7	—	B	Neuvonen et al. (1981)		
A01-004	Ilisalmi diabase dykes, F	63.7	27.5	*4/12	N	339.0	55.0	14.0	44	—	a	59.0	241.0	14.0	19.9	a	C	Neuvonen et al. (1981)	
A01-005	Näslia diabase dykes II, F	63.4	27.9	*2/2	N	344.0	36.0	(7.3)	—	1890-2100	a	45.0	229.0	(4.9)	8.5	a	C	Neuvonen et al. (1981)	
A01-006	Näslia diabase dykes I, F	63.4	27.9	*1/17/140	N	15.0	38.0	5.4	/3	-	2160	a	47.1	187.8	j,h	6.4	a	H	Neuvonen et al. (1981)
CENTRAL LAPLAND BLOCK (J01), LAPTONIAN																			
J01-001	Kuusamo dykes & greenstones, F	66.1	29.3	*4/47	N	342.0	43.0	14.9	39	-2160	g,d	47.3	233.7	11.4	18.5	a	B	Neuvonen (1975)	
SOUTH KARELIAN BLOCK (J02), JATULIAN																			
J02-001	Tarvalkoski-Syöte gabbro, F	65.6	27.9	*3/31	N	1.0	38.1	30.0	18	-2430	g	45.6	206.6	21.0	35.4	a	a	Neuvonen (1975)	
J02-002	Hyytälä metadikeses, F	62.4	30.3	*2/19	N	353.0	68.0	(24.5)	—	2100-2200	g	78.0	232.0	(34.5	41.0)	a	C	Neuvonen (1975)	
J02-003	Eno metabaseses, F	62.9	30.0	*3/31	N	7.0	55.0	47.0	8	2100-2200	g	62.3	197.7	47.3	66.7	a	C	Neuvonen (1975)	
J02-004	Keur metadikeses, F	62.7	30.2	*2/5/50	N	1.0	62.2	—	—	2100-2200	g	70.8	208.1	(42.5)	a	C	Neuvonen (1975)		
J02-005	Vazhinka-Pukhta upper, R, U	61.5	34.0	-*3	R	165.0	-15.0	8.0	239	1850-1950	a,i	36.0	232.2	4.2	8.2	a,t	C	Katsenlin (1968), *	
J02-006	Vazhinka-Pukhta uppermost, N, U	61.5	34.0	-/*4	N	345.0	21.0	8.0	130	1850-1950	a,i	38.2	232.9	4.4	8.4	a,t	C	Katsenlin (1968), *	
J02-007	Vazhinka-Pukhta upper, N, U	61.5	34.0	—	N	341.0	23.0	—	—	1850-1950	a,i	38.6	238.0	—	—	a,t	D	Katsenlin (1968), *	
J02-008	Vazhinka-Pukhta lower, N, U	61.5	34.0	—	N	350.0	39.0	—	—	1850-1950	a,i	49.9	228.5	—	—	a,t	D	Katsenlin (1968), *	
J02-009	Keur Vazhinka-Pukhta N, U	61.5	34.0	*3/57	N	348.0	30.0	5.0	20	1850-1950	a,i	40.0	231.0	3.0	5.0	a,t	C	Katsenlin (1968), *	
J02-010	Shoksha sediments, U	61.5	35.5	-/*29	N	344.0	46.0	3.5	58	1850-1950	a,i	50.2	240.3	1.9	4.5	a,t	B	Katsenlin (1968)	
J02-011	Onega-Rybrenka sill, U	61.3	35.5	15/*15	N	348.0	8.0	2.0	56	1600-1800	a	32.0	230.0	1.0	2.0	a,t	B	McElhinny & Van der Voo (1977)	
J02-012	Rybrenka baked sediments, U	61.5	34.0	1/*4	N	8.0	38.0	—	—	1600-1800	a	49.5	202.5	—	—	a,t	D	Katsenlin (1968), *	
NORTH-CENTRAL KARELIAN BLOCK (J03), JATULIAN																			
J03-001	Northern Karelia ss., U	64.5	34.0	*2/7	N	359.0	58.0	(7.0)	—	1610-1870	a	65.0	217.0	(8.0	10.0)	a	C	McElhinny & Van der Voo (1977)	
J03-002	Central Karelia ss. (I), U	63.5	34.0	*3/14	N	331.0	60.0	5.0	33	1610-1870	a	62.0	264.0	5.0	7.0	a	D	McElhinny & Van der Voo (1977)	

TABLE 2 (continued)

No	Rock unit and/or component, country	LAT	LON	B/N/n	p	D	I	195	k	age	m	PLAT	PLON	dP (495)	dM	t	ε	Ref.
J03-003	Central Karelia ss., U	64.0	34.0	*5/5	N	344.0	52.0	16.0	11	1610-1870	a	57.0	239.0	15.0	21.0	a	C	McElhinny & Cowley (1977)
J03-004	Mean Central Karelia ss., U	63.8	34.0	*2/8/19	N	338.2	56.4	-	-	1610-1870	e	60.1	230.6	(29.9)	-	a	C	McElhinny & Cowley (1977)
J03-005	Central Karelia dykes, U	63.5	33.5	2/*12	N	345.0	42.0	6.0	26	1610-1870	a	49.0	235.0	5.0	7.0	a	B	McElhinny & Cowley (1977)
LAPLAND GRANULITE BELT (E01), LATE ARCHAEN-SVECOFENNIAN																		
E01-001	Akujarvi quartz-diorite, F	68.6	27.8	2/*10	N	330.0	40.9	6.0	64	-1925	g	41.3	245.5	4.0	7.0	a,t	B	Pesonen & Neuvonen (1981)
E01-002	Akujarvi pyroxene granulite, F	68.6	27.8	2/*2	R	109.5	-15.5	-	-	-1925	g	14.4	282.4	-	-	a	D	Papunen et al. (1977)
E01-003	Akujarvi pyroxene granulite, F	68.6	27.8	1/*1	N	320.0	41.0	-	-	-1925	g	36.9	257.0	-	-	a	D	Papunen et al. (1977)
E01-004	Menesjärvi granulite, F	68.8	26.4	2/*2	N	338.0	27.0	(7.9)	-	-1925	g	33.8	232.2	(4.7	8.6)	a	D	Papunen et al. (1977)
E01-005	Laanila diabase dykes, F	68.4	27.7	*3/18	N	348.6	-42.5	6.2	29	998±80	h	-3.5	218.1	5.0	8.0	a,t	B	Pesonen et al. (1986)
RAAHE-LADOGA BLOCK (S01), SVECOFENNIAN																		
S01-001	Ylivieska gabbro 1, F	64.1	24.3	-/*13	N	341.0	41.0	4.0	145	-1884	g	47.0	231.0	3.0	4.9	-	C	Puranen (1960)
S01-002	Ylivieska gabbro 2, F	64.0	24.3	*5/42	N	311.0	38.2	6.8	129	-1884	g	43.3	232.4	4.8	8.1	a	B	Pesonen & Stigzelius (1972)
S01-003	Pohjamaa gabbro-diorites, F	64.1	24.6	*5/45	N	332.3	29.2	13.4	34	-1884	g	37.9	239.1	8.2	14.8	a	B	Pesonen & Stigzelius (1972)
S01-004	Kiuruvesi diabase dykes, F	63.6	26.5	*3/34	N	337.7	38.8	26.0	24	-	a	45.7	236.8	18.4	31.0	a	C	Neuvonen et al. (1981), *
S01-005	Kiuruvesi gabbro-diorites, F	63.6	26.5	*3/35	N	341.0	30.0	5.0	61.0	1885±5	a	40.7	230.9	3.1	5.5	a	C	Neuvonen et al. (1981), *
S01-006	Mean Kiuruvesi intrusions, F	63.6	26.5	*6/69	N	338.0	35.0	10.0	46	1886±5	g	43.1	235.2	6.6	11.5	a	B	Neuvonen et al. (1981)
S01-007	Kantasalmi diabase dyke, F	62.3	28.3	1/*10	N	349.0	49.0	7.0	46	1840-1880	a	57.0	225.9	6.1	9.2	a	C	Neuvonen et al. (1981), *
S01-008	Haukkavesi quartz diorite, F	62.2	28.3	*2/21	N	346.4	41.5	452.8)	-	-1880	j	59.9	225.2	(39.3	64.5)	a	D	Neuvonen et al. (1981), *
S01-009	Haukkavesi lamprophyres, F	62.1	28.4	*12/25	N	348.0	38.0	3.1	19.2	1837-1840	g	48.0	225.0	2.2	3.7	a	A	Neuvonen et al. (1981)
S01-010	Pielavesi gabbro, F	63.6	27.6	*5/20	N	334.2	23.8	3.8	404	1832±14	g	35.9	238.2	2.2	4.1	a,t	B	Pesonen & Neuvonen (1981)
CENTRAL SWEDEN-SOUTH FINLAND BLOCK (S02), SVECOFENNIAN																		
S02-001	Seili gabbro-anorthosites, F	60.2	21.9	*94/94	N	6.2	45.6	10.5	3	-1850	a	56.6	191.9	4.5	11.5	a,t	B	Johnson (1979)
S02-002	Seili amphibolites, F	60.1	22.4	*47/47	N	4.4	54.5	15.0	,	-1850	a	64.7	192.0	14.9	21.2	a,t	D	Johnson (1979)

TABLE 2 (continued)

No	Rock unit and/or component, country	LAT	LON	B/N/n	P	D	I	$\pm 95$	K	$\pm 95$	m	PLAT	PLON	$\pm 95$	dm	t	$\pm$	Ref.
S02-003	Ava migmatites, F	60.4	21.1	1/*2	N	7.0	49.0	(23,7)	-	-1850	a	59.1	189.2	(20.7	31.3)	a,t	D	Johnson (1979), *
S02-004	Ava granites, F	60.5	21.1	2/*4	N	18.7	49.8	41.6	38	-1800	a	57.7	170.0	37.0	55.5	a,t	D	Johnson (1979), *
S02-005	Ava granites, F	60.6	21.1	*1/1	N	20.2	2.0	-	-	a	28.4	178.0	-	-	-	a	D	Neuvonen (1970), *
S02-006	Ava leucophyres, F	60.5	21.0	4/*8	N	16.0	51.0	16.2	13	-	a	59.3	173.7	14.8	21.9	a,t	C	Johnson (1979), *
S02-007	Ava amphibolites, F	60.4	21.1	1/*2	R	175.0	-10.0	-	-	-1850	a	34.5	207.1	-	-	a,t	D	Johnson (1979), *
S02-008	Ava monzonites, F	60.4	21.0	2/*4	N	16.0	3.8	25.7	97	1660-1830	a,a	30.2	182.5	12.9	25.7	a,t	C	Johnson (1979), *
S02-009	Ava monzonites, F	60.6	21.1	12/*12	N	26.0	31.0	17.0	7	1670-1830	g	42.3	166.5	10.6	19.0	a	C	Neuvonen (1970), *
S02-010	Foglo granodiorite, F	59.9	20.1	1/*2	R	183.0	52.0	(14.7)	-	-1890	a	-2.9	197.5	(13.8	20.1)	a,t	D	Johnson (1979), *
S02-011	Foglo Gabbros, F	60.0	20.4	2/*4	N	348.0	5.0	-	-	-1800	a	31.8	214.6	-	-	a,t	D	Johnson (1979), *
S02-012	Rädmanso gabbro, S	59.3	19.0	*11/71	N	358.3	11.5	8.3	31	1475-1750	a	36.1	201.1	4.3	8.5	a,t	B	Piper (1980a)
S02-013	Rädmanso dyke, S	59.3	19.0	1/*9	R	106.0	28.0	25.6	5	1475-1750	a	-5.0	268.0	15.0	27.0	a,t	C	Piper (1980a)
S02-014	Uppala metabasite dykes, S	59.3	18.0	*4/23	N	1.7	30.6	9.7	90	-	a	47.0	195.0	6.0	11.0	a,t	B	Piper (1980a)
S02-015	Almunge metabasite dykes, S	59.3	18.0	1/*10	R	104.0	9.0	9.9	25	-	a	3.0	274.0	5.0	10.0	a,t	C	Piper (1980a)
S02-016	Bo diorite, S	58.5	15.6	1/*8	N	4.4	46.4	7.5	55	1740-1880	a	59.0	188.0	6.0	10.0	a,t	B	Piper (1980a)
S02-017	Nordanå Ornskoldsvik dykes (R), S	62.4	18.4	*12/12	R	167.7	-58.8	8.2	29	185C+130	a	65.0	231.9	9.1	12.2	a,t	B	Fridh (1979), *
S02-018	Nordanå Ornskoldsvik dykes (N), S	62.4	18.4	*4/4	N	345.8	63.4	6.8	30	185C+130	a	66.2	223.3	21.6	27.1	a,t	C	Fridh (1979), *
S02-019	Nordanå Ornskoldsvik dykes (C), S	62.4	18.4	*16/16	C	167.3	-59.9	6.7	30	185C+130	e	67.0	223.0	7.7	10.2	a,t	B	Fridh (1979), *
S02-020	Hanne dolerites, F	61.4	24.8	*19/174	N	48.0	78.0	7.2	23	155C-1800	g,e	67.3	72.2	13.0	14.0	a,t	D	Neuvonen (1967)
S02-021	Keuruu N dykes, F	62.3	24.7	*11/34	N	349.9	33.4	6.5	49	-1880	a,a	45.4	218.4	4.0	7.0	a,t	A	Pesonen & Neuvonen (1981)
S02-022	Keuruu N dykes, F	62.3	24.7	*3/12	R	133.6	-15.9	2.9	1694	-1880	a,a	26.3	257.8	2.0	3.0	a,t	B	Pesonen & Neuvonen (1981)
S02-023	Keuruu R2 dyke, F	62.3	24.7	1/*2	R	166.2	-14.3	(35.3)	-	-1880	a,a	34.0	221.3	(18.5	36.1)	a,t	D	Lahde & Pesonen (1985)
S02-024	South Finland intrusions, F	60.6	22.4	*7/82	N	329.0	29.0	16.6	14	-1880	a	39.7	242.6	10.0	18.3	a	B	Grundstrom (1967)
S02-025	Tammela intrusions, F	60.7	23.7	2/*8	N	323.8	50.9	3.7	259	-1880	a	52.5	259.4	3.3	4.9	a	C	Grundstrom (1967)
S02-026	Mikkeli intrusions, F	61.7	27.3	2/*10	N	344.8	44.6	12.2	17	-1880	a	53.1	230.3	9.7	15.4	a	C	Grundstrom (1967)
S02-027	Hyrykkää gabbro, F	60.6	24.6	-/*11	N	329.5	36.1	7.3	33	-1875	g	44.1	246.2	4.9	8.5	a	B	Puranen (1973)
S02-028	Luontari granodiorite, F	61.4	28.0	*25/211	N	5.0	58.0	7.0	16	1755-1790	g	67.0	198.0	8.0	10.0	a,t	C	Neuvonen (1975)
NORTH OF SKELLEFTEÅ BLOCK (S03), SVECOFENNIAN																		
S03-001	Tärendö gabbro 1, S	67.1	22.5	*5/17	N	340.0	41.0	14.0	30	1757±43	a,a	45.0	228.0	10.0	17.0	a	C	Örnwall (1968)
S03-002	Tärendö gabbro 2, S	67.1	22.5	*5/18	N	339.3	41.5	4.4	303	1757±43	a,a	44.9	229.6	3.3	5.4	a,t	A	Örnwall (1968)
S03-003	Tärendö gabbro 3 (sites 3 & 8), S	67.2	22.6	*2/5	N	310.2	23.8	(52.2)	-	1780±49	a,a	26.3	258.9	{29.7}	55.7	a,*	E, T, A	Örnwall (1968)
S03-004	Tärendö granite dykes, S	67.1	22.5	1/*5	N	333.0	51.0	10.0	90	-1757	a	51.2	240.5	9.1	13.5	a	C	Örnwall (1968)
S03-005	Tärendö acid rocks, S	67.1	22.5	*3/12	N	324.0	42.0	18.0	51	-1757	a	41.7	248.4	13.6	22.1	a	B	Örnwall (1968)

TABLE 2 (continued)

No	Rock unit and/or component, country	LAT	LON	B/N/n	P	D	I	$\alpha_{95}$	K	age	m	PLAT	PLON	dp (A95)	dm	t	s	Ref.
S03-006	Nottrask gabbro, S	65.9	21.8	*5/22	N	346.2	35.0	3.6	460	1840 ± 390	e	42.6	219.7	2.4	4.1	a,t	A	Elming (1985)
S03-007	Nottrask gabbro (site 7), S	65.9	21.8	1/*3	N	3.1	39.3	4.4	792	1840 ± 390	b,e	46.3	197.7	3.1	5.2	a,t	D	Elming (1985)
S03-008	Nottrask gabbro (site 1), S	65.9	21.8	1/*2	N	318.4	-3.1	(40.5)	-	-1800	b,e	16.3	245.6	(30.3	40.6)	a,t	D	Elming (1985)
S03-009	Svappavaara gabbro 1 (hc), S	67.8	21.2	*4/17	N	336.4	51.9	5.4	293	1725-1880	g,e	52.2	234.6	5.0	7.3	a,t	C	Elming (1985)
S03-010	Svappavaara gabbro 2 (lc), S	67.7	21.2	*3/9	N	354.8	55.0	27.7	21	1725-1880	g,e	57.7	209.1	27.9	39.3	a,t	C	Elming (1985)
S03-011	Vittangi gabbro 1, S	67.7	21.6	*8/26	N	339.5	39.1	5.4	107	1707-1880	e	42.6	227.9	3.8	6.4	a,t	A	Elming (1985)
S03-012	Vittangi gabbro 2, S	67.7	21.6	*2/8	N	343.1	5.8	(7.3)	-	1707-1880	e	24.2	220.3	(3.7	7.3)	a,t	C	Elming (1985)
S03-013	Dundret gabbro (7), S	67.9	20.7	1/*5	N	14.7	12.6	16.0	24	1890-1950	d	28.4	183.9	8.3	16.3	a,t	C	Elming (1985)
S03-014	Dundret gabbro R, S	67.9	20.6	*4/15	R	192.5	2.5	7.7	143	1890-1950	d	21.1	187.2	3.9	7.7	a,t	B	Elming (1985)
S03-015	Dundret gabbro (site 8), S	67.9	20.7	1/*3	R	201.1	-34.1	34.9	14	1890-1950	d	39.7	174.3	22.8	40.0	a,t	C	Elming (1985)
S03-016	Dundret gabbro (site 10), S	67.8	20.7	1/*3	N	283.5	3.0	36.2	13	1890-1950	d	6.6	278.7	18.1	36.3	a,t	C	Elming (1985)
S03-017	Dundret basic rocks (R), S	67.1	20.6	*3/26	R	171.6	30.2	50.0	7	1530 ± 35	e,a	6.4	208.7	30.9	55.5	a,t	C	Piper (1980a)
S03-018	Dundret basic rocks (N), S	67.1	20.6	1/*5	N	20.0	27.0	34.1	6	1530 ± 35	e,a	34.0	172.0	20.0	37.0	a,t	C	Piper (1980a)
S03-019	Kallax gabbro, S	65.8	22.0	1/*6	N	353.0	30.0	3.1	477	-1740	a	40.0	211.0	2.0	3.0	a,t	C	Piper (1980a)
S03-020	Kallax gabbro (lb), S	65.8	22.0	1/*8	N	317.0	40.0	4.9	128	-1740	a	39.0	257.0	4.0	6.0	a,t	B	Piper (1980a)
S03-021	Kallax gabbro (hb), S	65.8	22.0	1/*5	N	293.0	35.0	9.1	72	-1740	a	27.0	279.0	6.0	10.0	a,t	C	Piper (1980a)
S03-022	Kallax gabbro 2, S	65.8	22.0	1/*6	N	347.0	52.0	3.6	353	-1740	a	57.0	222.0	2.0	5.0	a,t	B	Piper (1980a)
S03-023	Korstrask gabbro, S	65.7	20.9	1/*10	N	5.0	47.0	7.0	48	1530-1770	d,e,f	53.0	194.0	6.0	9.0	a,t	B	Piper (1980a)
S03-024	Niemisel zebiore, S	66.0	22.1	*2/14	N	337.9	37.0	(14.9)	-	1530-1770	d,e,f	42.4	230.6	(10.2	17.5)	a,t	B	Piper (1980a), *
S03-025	Niemisel dykes, S	66.0	22.1	*2/10	N	342.8	32.8	(35.4)	-	1530-1770	a	40.5	223.8	(22.7*	40.1)	a,t	C	Piper (1980a), *
S03-026	Mean Niemisel intrusions, S	66.0	22.1	*4/24	N	340.0	35.0	8.8	110	1530-1770	e,f	41.0	227.0	6.0	10.0	a,t	B	Piper (1980a)
S03-027	Sangis gabbro 1, S	65.9	23.4	*11/35	N	358.5	39.5	2.8	264	1840 ± 390	e	46.5	205.4	2.0	3.4	a,t	A	Elming (1985)
S03-028	Sangis gabbro 2, S	65.8	23.5	*4/30	N	357.0	26.0	18.7	25	1530-1770	e	38.0	207.0	11.0	20.0	a,t	C	Piper (1980a)
S03-029	Sangis gabbro (lb), S	65.8	23.5	1/*6	N	333.0	-2.0	17.9	15	1530-1770	e	8.0	230.0	10.0	19.0	a,t	C	Piper (1980a), *

TABLE 2 (continued)

No	Rock unit and/or component, country	LAT	LON	B/N/n	P	D	I	95%	k	Age	n	PLAT	PLIN	dp (195)	dm	t	d	Ref
S03-030	Store Lulevatnet gabbro (lb), S	67.5	19.5	*3/18	N	345.0	33.6	16.3	58	1530-1770	c	40.0	221.0	11.0	19.0	a,t	B	Piper (1980a)
S03-031	Store Lulevatnet gabbro (lb), S	67.2	19.4	*5/34	N	359.0	1.0	7.5	105	1530-1770	a,b	23.0	200.0	4.0	8.0	a,t	B	Piper (1980a); *
S03-032	Jokkmokk basic rocks (lc), S	66.6	19.7	*2/9	N	307.5	-6.5	(23.6)	-	1780±49	c,b	10.9	253.5	(37.2)	78.2	a,t	D	Piper (1980a)
S03-033	Jokkmokk basic rocks (hc), S	66.6	19.7	*2/11	N	349.0	33.0	(4.2)	-	1780±49	a,b	41.0	214.0	(3.0)	5.0	a,t	C	Piper (1980a)
S03-034	Jokkmokk basic rocks, S	66.6	19.7	*3/3	N	11.0	-12.0	12.9	52	1532-1740	a	17.0	189.0	7.0	13.0	a,t	C	Piper (1980a)
S03-035	Västbergs gabbro, S	66.4	20.4	1/*3	N	359.0	42.0	20.3	38	1530-1770	a	48.0	202.0	15.0	25.0	a,t	D	Piper (1980a)
S03-036	Västbergs gabbro, S	66.4	20.4	1/*6	N	358.0	4.0	10.7	40	1530-1770	a	24.0	224.0	5.0	10.0	a,t	C	Piper (1980a)
S03-037	Härads amphibolites, S	66.1	21.0	1/*7	N	3.0	31.0	26.9	6	1530-1770	b	41.0	197.0	17.0	30.0	a,t	D	Piper (1980a)
KÖLA BLOCK (S04), ARCHAIC SVECOFENNIAN																		
S04-001	Köla gabbro-norites, U	67.5	35.5	-/*12	N	354.0	32.0	14.0	8	1610-1870	a	40.0	223.0	8.9	15.8	a	B	McElhinny & Cowen 1984
IMULER NW SWEDEN (S05), SVECOFENNIAN																		
S05-001	Bångsfjället complex, S	65.4	15.1	2/*12	R	229.5	69.0	3.9	11G	1520±140	d	-33.8	161.2	5.6	6.5	a	D	Hanibauck (1943); *
CENTRAL-NORTH LAPLAND BLOCK (S06), LAPPONIAN-SVECOFENNIAN																		
S06-001	Alluvialtto gabbro, F	68.4	25.7	1/*2	N	72.0	67.0	(43.1)	-	~1900	a	51.4	106.8	(59.1)	71.4	a	C	Papunen et al. 1977;
S06-002	Täckkärrvi gabbro, F	68.5	22.2	4/*5	N	357.6	24.5	28.0	8	-1900	a	34.4	204.8	16.1	30.0	a	C	Papunen et al. 1977;
JSGB-BELT (R01), SUBJOTNIAN																		
R01-001	Lottahammar gabbro, S	57.6	16.7	*5/26	N	16.3	-15.3	4.6	280	1465-1845	e,g,d	23.0	179.0	2.4	4.7	a,t	A	Poorter (1975);
R01-002	Oje basalts, S	61.0	13.5	2/*11	N	7.0	6.0	10.0	584	745-931	d	31.8	185.3	5.0	13.0	a,L	B	Mulder (1971);
R01-003	Upper Dale porphyries, S	61.5	14.0	2/*11	N	17.0	-9.0	42.5	37	605-1635	d,e	22.7	175.6	21.6	42.9	a,t	B	Mulder (1971);
R01-004	Upper Dale volcanics, S	61.5	14.0	*3/27	N	18.0	-1.0	27.0	22	745-931	d	27.0	174.0	14.0	27.0	a,t	D	Poorter (1975);
R01-005	Dale sandstones (M), S	61.2	13.2	*3/12	N	7.4	6.9	29.1	13	1500-1600	a	32.1	184.5	14.7	29.3	a,t	C	Piper & Smith (1980); *
R01-006	Dale sandstones (R), S	61.0	13.2	*3/15	R	230.8	-12.9	17.0	49	1500-1600	a	33.3	168.2	9.2	18.1	a,t	C	Piper & Smith (1980); *
R01-007	Dale sandstones (IR), S	61.0	13.2	*5/20	R	157.0	34.0	12.0	42	1500-1600	a	-7.7	215.3	7.8	13.7	a,t	C	Piper & Smith (1980); *
R01-008	Dale sandstones (IR), S	61.0	13.2	1/*6	N	310.0	-27.9	4.2	280	1500-1600	a	4.4	241.2	2.5	4.6	a,t	C	Piper & Smith (1980); *
R01-009	Dale Subjotnian lavas, S	61.4	13.2	*6/46	N	4.0	-2.2	10.7	26	745-931	d	27.3	198.7	5.3	19.7	a,t	D	Poorter (1975); *

TABLE 2 (continued)

No	Rock unit and/or component, country	LAT	LONG	B/n	P	D	I	-95	K	age	m	PLAT	PLON	dp (A95) dm	t	g	Ref.
SOUTH FINLAND BLOCK (B02), SUBJOTNIAN																	
B02-001	Ava diabase dykes, F	60.6	21.1	*2/2	N	18.0	18.0	—	—	-1550	a	36.9	178.7	—	—	a,t	C Neuvoonen (1963)
B02-002	Mean Åva intrusions, F	60.6	21.1	*15/15	N	25.0	27.0	15.0	7	-1550	a	41.0	169.0	9.0	17.0	a,t	B Neuvoonen (1959)
B02-003	Korao dykes (R), F	60.4	21.0	*2/2	R	188.0	24.0	(24.3)	—	1600±30	e,g	16.7	192.8	(15.0)	26.0)	a,t	C Neuvoonen (1969)
B02-004	Kumlinge dykes, F	60.3	20.8	*3/15	R	191.6	29.4	21.4	34	1555±159	e,g	13.4	189.3	13.1	23.6	a,t	B Neuvoonen & Grundstrom (1969)
B02-005	Foglo dykes, F	60.6	20.6	*8/56	N	12.0	4.0	11.5	24	1523±1553	e,g	31.3	186.5	5.8	11.5	a,t	A Neuvoonen & Grundstrom (1969)
B02-006	Kumlinge-Brando dykes, F	60.3	20.8	*7/25	R	198.6	30.2	7.9	60	1550±1559	e,g	12.2	182.0	5.0	9.0	a,t	A Pesonen & Neuvoonen (1981)
B02-007	Foglo-Sotungsa dykes, F	60.0	20.6	*6/25	N	11.2	-2.8	12.7	29	1523±1553	e,g	27.9	187.5	6.0	13.0	a,t	A Pesonen & Neuvoonen (1981)
B02-008	Eckero dykes, F	60.1	19.7	2/*2	R	212.5	-42.5	—	—	a	48.0	152.8	—	—	a,t	D Neuvoonen & Grundstrom (1969)	
B02-009	Kuusnari dolerite, F	61.2	26.7	*8/74	R	195.0	10.0	14.0	17	1630±1670	g	22.0	190.0	7.0	14.0	a,t	A Neuvoonen (1978)
B02-010	Makarla quartz dolerite, F	60.5	22.5	1/*4	N	23.0	7.0	16.0	20	1500±1600	a	30.0	175.0	6.0	16.0	a	C Neuvoonen (1965)
B02-011	Norra Bettnon dyke, F	60.1	20.7	1/*11	N	19.3	29.1	10.1	24	1550±1600	a	43.3	174.8	6.1	11.1	a,t	B Palma (1982)
B02-012	Foglo Bergskar dyke, F	60.0	20.6	1/*2	N	8.0	8.0	(8.3)	—	1523±1553	g,e	33.7	191.0	(4.2	8.4	a,t	D Johnson (1979), *
B02-013	Foglo uranite-porphyrite, F	59.9	20.1	1/*2	R	198.0	16.0	(2.1)	—	g,e	20.4	181.0	(1.1	2.2)	a,t	D Johnson (1979), *	
B02-014	Kumlinge-Bergskar dyke, F	60.3	20.8	1/*2	R	192.0	43.0	(14.6)	—	1599±26	e	4.1	189.9	(11.2	18.1)	a,t	D Johnson (1979), *
B02-015	Korso dykes, F	60.4	21.0	1/*2	R	182.0	28.0	(14.7)	—	1599±26	e	14.7	199.0	(8.8	16.1)	a,t	D Johnson (1979), *
B02-016	Vest Sederholm dyke, F	60.4	21.0	1/*2	R	198.0	14.0	(2.6)	—	e	21.0	181.8	(1.4	2.7)	a,t	D Johnson (1979), *	
B02-017	Mean Brando R dykes, F	60.3	20.7	*4/8	R	192.8	25.4	17.3	29	-1550	g,e	15.6	187.7	10.0	18.6	a,t	C Johnson (1979), *
B02-018	Aland rapakivi granite, F	60.5	22.3	1/*6	N	5.8	-18.8	18.8	14	1589±1659	g,a	19.5	194.4	15.0	18.0	a,t	C Johnson (1979), *
B02-019	Maaria quartz diorite, F	60.5	22.3	1/*6	R	232.0	11.0	30.0	4	—	a	13.0	148.0	15.0	30.0	a	C Neuvoonen (1965)
B02-020	SE quartz porphyre dykes, F	51.3	26.8	*9/21	N	26.9	9.9	13.2	16	161±1638	g	30.0	175.0	6.6	13.3	*a,t	B Neuvoonen (1986)

TABLE 2 (continued)

No	Rock unit and/or component <sup>a</sup> , country	LAT	LON	B/N/n	P	D	I	φ	η	κ	age	m	PLAT	PLON	dp (A95) dm	t	g	Ref.
SOUTH-CENTRAL SWEDEN BLOCK (B03), SUBDIVISION																		
B03-001	Ragunda pegmatitic granite, S	63.3	16.1	*4/21	N	12.7	41.8	21.1	20	1292±30	e	49.1	171.0	15.9	26.0	a,t	B	Piper (1970a), *
B03-002	Ragunda formation (R), S	63.3	16.1	*4/26	R	201.5	-46.2	17.5	29	1292±30	e	53.2	163.7	15.0	22.9	a,t	B	Piper (1970a), *
B03-003	Hagunda formation (H), S	63.3	16.1	*11/61	N	18.2	44.9	8.9	28	1292±30	e	51.3	169.5	7.1	11.2	a,t	A	Piper (1970a), *
B03-004	Neon Ragunda formation (C), S	63.3	16.1	*15/67	C	14.5	45.7	6.9	31	1292±30	e	51.6	166.6	5.7	8.9	a,t	A	Piper (1970a), *
B03-005	Post-Ragunda dykes (R), S	63.3	16.1	*9/47	R	181.9	20.4	18.6	9	1250±130	e	16.2	194.2	10.2	19.5	a,t	B	Piper (1970a), *
B03-006	Post-Ragunda dykes (R), S	63.3	16.1	*3/17	N	1.0	-32.2	30.0	18	1250±130	e	9.2	195.1	19.1	33.8	a,t	C	Piper (1970a), *
B03-007	Neon Post-Ragunda dykes (C), S	63.3	16.1	*12/64	C	181.7	23.5	16.3	10	1250±130	e	14.5	194.4	8.1	15.3	a,t	B	Piper (1970a), *
B03-008	Ragunda dykes (R), S	63.3	16.1	1/*6	R	187.3	-63.9	9.1	56	-1292	a	71.8	179.5	11.5	14.5	a,t	C	Piper (1970a), *
B03-009	Ragunda dykes (N), S	63.3	16.1	*3/18	N	27.0	58.5	29.3	19	-1292	a	61.0	149.5	32.2	43.4	a,t	C	Piper (1970a), *
B03-010	Neon Ragunda dykes, S	63.3	16.1	*4/24	C	22.6	60.2	18.7	25	-1292	a	64.1	154.5	21.5	28.4	a,t	C	Piper (1970a), *
B03-011	Em-dykes I, S	59.2	16.2	*35/	N	359.5	-6.2	8.2	10	1510±150	e	27.7	196.8	4.1	8.2	a,t	B	Bylund (1985)
B03-012	Em-dykes II, S	59.2	16.2	*18/	N	11.1	61.3	16.1	13	1510±150	c	61.7	176.1	9.3	13.7	a,t	C	Bylund (1985)
B03-013	Tunn dykes, S	60.5	15.3	3/*9	N	14.8	-18.1	9.6	30	1371±50	e	21.1	180.4	5.2	10.0	a,t	B	Bylund (1985)
B03-014	Hallsforsås dyke (A), S	59.1	16.7	1/*13	N	26.0	-1.6	9.3	21	1518±38	e	27.0	167.0	5.0	9.0	a,t	B	Piper (1980a), *
B03-015	Hallefermarks dyke (nb), S	59.1	16.7	1/1	N	300.0	-32.0	-	-	-	a	-0.6	252.5	-	-	a,t	D	Piper (1980a), *
B03-016	Nordangrå basic dykes (3), S	61.9	18.4	*7/7	N	1.1	23.0	9.2	44	1500±150	a	40.0	197.0	5.2	9.8	a,t	B	Fridh (1979), *
B03-017	Nordangrå gabбро anorthosite (N), S	62.9	18.6	*7/39	R	231.3	-34.7	12.4	25	1385±150	c,g	34.1	135.7	8.2	14.3	a,t	A	Piper (1980b), *
B03-018	Nordangrå gabбро anorthosite (N), S	62.9	18.6	*12/63	N	44.7	37.6	5.9	55	1380±150	e,g	38.5	141.6	4.1	6.9	a,t	A	Piper (1980b), *
B03-019	Neon Nordangrå gabбро anorthosite, S	62.9	18.6	*19/108	C	48.0	37.1	5.3	44	1385±150	e,g	36.9	138.1	3.6	6.2	a,t	A	Piper (1980b), *
B03-020	Nordangrå granite (R), S	62.9	18.6	*19/19	R	229.7	-21.5	16.5	5	1395±150	a	27.5	141.1	9.2	17.4	a,t	B	Piper (1980b), *
B03-021	Nordangrå granite, (N), S	62.9	18.6	*9/9	N	34.5	31.7	17.4	10	1385±150	a	36.4	154.9	11.0	19.5	a,t	B	Piper (1980b), *
B03-022	Neon Nordangrå granite, S	62.9	18.6	*28/28	C	221.3	-25.1	13.3	5	1395±150	a	2.5	149.0	7.7	14.3	a,t	A	Piper (1980b), *
B03-023	Gavle granite, S	60.7	17.2	*12/12	N	25.9	17.3	13.4	11	-	a	34.7	165.0	7.2	13.9	a,t	B	Piper (1980b), *

TABLE 2 (continued)

No.	Rock unit and/or component, country	LAT	LON	B/N/n	P	D	I	$\alpha_{95}$	K	age	m	PLAT	PLON	dp (A95)	dm	t	$\alpha$	Ref.
BORNHOLM BLOCK (R01), JOTNIAN-SVECONORWEGIAN																		
R01-001	Kjeldseå dyke, D	55.0	15.0	*3/11	R	193.0	45.0	8.0	28	1000-1400	a,d	7.0	179.0	6.0	10.0	a	B	Schonemann (1972)
R01-002	Vaseå dyke, D	55.4	15.2	*11/22	N	80.6	-44.2	8.9	28	-1200	a	-16.0	127.8	6.3	10.0	a	B	Abrahamsen (1977)
R01-003	Væghavn dyke, D	55.1	14.9	*7/14	N	35.8	-25.7	6.1	97	-1200	a	15.0	158.8	3.6	6.6	a	C	Abrahamsen (1977)
R01-004	Bolshavn dyke (A), D	55.1	15.0	*9/35	N	42.2	-25.5	8.9	34	-1200	a	12.8	152.9	6.2	9.6	a	B	Abrahamsen (1977)
R01-005	Bolshavn dyke (B), D	55.1	15.0	1/*6	N	332.9	-20.1	13.5	26	800-1000	a	20.7	223.6	7.4	14.1	a	C	Abrahamsen (1977)
R01-006	Laisted dyke, D	55.1	15.0	*12/44	N	306.6	-13.8	4.1	39	800-1000	a	13.8	250.1	2.1	4.2	a	B	Abrahamsen (1977)
R01-007	Listed overprint, D	55.1	15.0	1/*4	R	280.0	70.0	-	-	Palaeozoic	a	46.2	318.2	-	-	a	D	Abrahamsen (1977), *
CSDG-SATAKUNTA COMPLEX (G01), JOTNIAN																		
G01-001	Satakunta sandstone, F	61.2	22.0	*10/42	N	24.0	-41.0	10.0	24	1300-1370	d,a	3.0	180.0	8.0	12.0	a,t	B	Neuvonen (1974)
G01-002	Satakunta sills, F	61.2	22.0	*3/9	N	35.5	-34.0	-	-	-1263	a	5.3	168.5	-	-	a,t	D	Neuvonen (1965), *
G01-003	Satakunta dolerite dykes, F	61.2	22.0	*18/18	N	46.0	-34.0	4.0	60	-1240	8	2.0	158.0	3.0	5.0	a,t	A	Neuvonen (1965), *
G01-004	Vaasa dolerite dykes, F	63.0	20.9	*15/108	N	38.0	-29.0	5.0	54	1225-1270	8	7.0	164.0	3.2	5.5	a,t	A	Neuvonen (1965)
G01-005	Gavle dolerite, S	60.5	17.1	2/*15	N	48.5	-24.3	4.0	104	-	a	7.0	150.0	2.0	4.0	a,t	B	Poorter (1976)
G01-006	Market dolerites, F	60.3	19.3	*8/38	N	60.0	-40.0	9.2	36	-1270	8	-5.9	145.5	7.0	11.0	a,t	A	Neuvonen & Grundstrom (1959)
CSDG-Ulvo complex (G02), JOTNIAN																		
G02-001	Nordangrå sandstone, S	62.9	18.6	2/*2	N	50.8	-12.1	(24.6)	-	-1300	a	10.9	146.9	(12.7	25.0)	a	D	Magnusson (1983)
G02-002	Väster-Nordanland dolerites, S	62.9	18.3	*43/252	N	47.8	-45.5	2.6	71	1213-1270	d	-7.5	156.5	2.1	3.3	a,t	A	Piper (1979b)
G02-003	Grarp silts, S	62.1	17.3	*2/12	N	59.8	-47.7	6.4	1509	1213-1270	a,e	-12.7	146.4	(5.4*	8.3)	a,t	B	Piper (1979b)
G02-004	Grarp dolerite dyke, S	61.9	17.2	1/*6	N	45.8	-51.8	8.0	78	1245-220	d	-11.0	159.0	7.0	10.0	a,t	B	Poorter (1976)
G02-005	Nordangrå basic dykes (2), S	62.8	18.4	*9/9	N	32.1	-33.5	15.5	11	-	a	5.0	168.0	10.1	17.7	a,t	C	Fridh (1979), *
G02-006	Nordangrå post-Jotnian over., S	62.9	18.6	*15/80	N	45.1	-39.4	4.3	93	-1250	d	-2.3	157.4	3.1	5.2	a,t	A	Piper (1990b)
G02-007	Nordangrå dolerites, S	62.7	18.3	2/*12	N	45.6	-42.5	7.0	37	1245-220	d	-5.0	158.0	5.0	9.0	a,t	B	Poorter (1976)
G02-008	Ulvo dolerite dykes, S	63.7	18.8	20/*20	N	50.4	-38.7	5.2	40	1215-220	d	-4.0	153.0	4.0	6.0	a,t	B	Larson & Magnusson (1976)
G02-009	Ulvo dolerite dykes, S	63.5	18.2	32/*32	N	40.0	-35.8	7.9	11	1215-220	d	1.0	161.0	5.0	9.0	a	B	Magnusson & Larson (1977)
G02-010	Nordangrå baked anorthosite, S	62.9	18.6	*9/20	N	47.5	-32.1	7.5	39	-1245	a	-1.6	153.9	5.0	8.0	a	B	Magnusson (1983)

TABLE 2 (continued)

No.	Rock unit and/or component, country	LAT	LON	B/N/n	p	D	I	095	k	age	m	PLAT	PLON	dp	(A95) dm	t	g	Ref.
CSDG-DALA COMPLEX (603), JOTMAN																		
003-001	Sarna dolerites, S	61.0	13.0	5/*27	N	36.5	-33.1	4.4	301	1215-1290	d	5.3	158.6	2.8	5.0	a,t	A	Piper & Smith (1980)
003-002	Dala dolerites, S	61.0	13.0	1/*5	N	85.0	-27.0	25.0	6	-1200	a	-10.0	115.0	15.0	27.0	a	D	Dyrellus (1970)
003-003	Lybergsguppen dolerite, S	60.8	13.7	5/*5	N	31.0	-42.0	10.0	62	-	a	1.3	165.7	7.5	12.3	a,t	C	Mulder (1971)
003-004	Alvdalsåsen dolerite sill, S	61.4	13.8	11/*11	N	49.5	-37.6	5.3	74	1231±8	e	1.4	148.6	3.7	6.2	a,t	B	Bylund (1985)
003-005	Mossi dolerite sill, S	61.6	13.8	5/*5	N	45.3	-24.0	35.1	6	1217±18	e	7.8	151.3	20.3	37.4	a,t	D	Bylund (1985)
CSDG-JÄMTLAND COMPLEX (604), JÖTMAN																		
004-001	Sundsjö dolerite, S	63.0	15.1	5/*5	N	40.2	-52.2	16.7	22	1156-1213	e	-111.0	161.5	15.7	22.9	a,t	C	Bylund (1985)
004-002	Gimån dolerite, S	62.8	16.0	18/*18	N	51.4	-41.2	8.1	19	1179-1229	e	-5.4	150.0	6.0	9.9	a,t	B	Bylund (1985)
CSDG-DALA ANOMALOUS DIKES (605), JÖTMAN-SUBJÖTMAN																		
005-001	Emmådalen dolerite sills, S	61.3	14.7	7/*7	N	2.3	-2.7	15.7	16	1223±36	c	27.3	192.2	7.9	15.7	a,t	C	Bylund (1985)
005-002	Alvhö dolerite sills, S	61.4	14.8	5/*5	N	23.6	-16.4	12.1	41	1215-1290	e	17.8	170.2	6.4	12.5	a,t	C	Bylund (1985)
005-003	Bunkris dolerite, S	61.5	13.5	16/*10	N	1.5	-6.7	3.3	218	1516-1546	e	24.1	191.9	1.7	3.3	a,t	C	Bylund (1985)
005-004	Bunkris dolerite, S	61.4	13.5	4/*4	N	340.0	-6.0	17.0	38	1516-1546	e	24.3	215.5	8.5	17.0	a,t	C	Mulder (1971)
005-005	Glysjön dolerite, S	61.5	13.3	6/*6	N	11.1	16.9	8.2	68	-	a	35.4	171.4	4.4	8.5	a,t	C	Bylund (1985)
005-006	Glysjön dolerite, S	61.5	13.8	5/*5	N	21.0	15.0	6.0	148	-	a	33.9	168.0	3.2	6.2	a,t	C	Mulder (1971)
005-007	Åmän dolerite, S	61.4	14.7	5/*5	N	28.0	4.0	7.0	138	-	a	27.1	163.0	3.5	7.0	a,t	C	Mulder (1971)
EAST OF PROTIGINE ZONE (P01), SWECONNEGLIAN																		
P01-001	Karlsbäck dolerite, S	56.0	15.0	1/*9	R	130.0	81.0	4.8	116	871-936	e	-43.2	213.5	8.9	9.5	a,t	B	Patchett & Bylund (1974)
P01-002	Karlsbäck hyperite dolerite, S	56.2	14.9	1/*8	R	148.0	81.0	2.0	1182	871-936	e	-40.0	207.0	4.0	4.0	a,t	B	Poorter (1975)
P01-003	Väby dolerite, S	56.0	15.0	1/*3	R	123.0	27.2	-	-	-	-	5.0	249.6	-	-	a,t	C	Patchett & Bylund (1974)
P01-004	Ärby dolerite, S	59.0	16.5	1/*6	R	142.5	52.5	7.0	93	995±65	e	-7.3	227.4	6.8	9.5	a,t	C	Patchett & Bylund (1974)
P01-005	Falun dolerite, S	60.5	15.5	1/*10	R	131.5	46.0	5.6	75	966±20	e	-6.1	237.6	4.6	7.1	a,t	B	Patchett & Bylund (1974)
P01-006	Tärnö dolerite, S	56.0	15.0	1/*5	N	313.0	-42.0	4.8	255	871±21	e	0.3	237.0	3.6	5.9	a,t	C	Patchett & Bylund (1974)
P01-007	Härne-Högy dolerite, S	56.0	15.0	1/*7	N	309.0	4.0	6.1	99	860-875	e	22.0	252.0	3.1	6.1	a,t	C	Patchett & Bylund (1974)
P01-008	Färgö dolerite, S	56.0	15.5	1/*6	N	313.0	3.0	5.4	155	924±26	h	23.3	248.9	2.7	5.4	a,t	C	Patchett & Bylund (1974)
P01-009	Nilstorp dolerite sill, S	57.5	15.0	1/*6	N	315.0	-27.0	9.7	49	984±47	e	9.0	238.5	5.8	10.6	a,t	C	Patchett & Bylund (1974)
P01-010	Väby-Rönneby hyperite dolerite, S	56.2	15.2	1/*4	R	137.0	33.0	10.0	79	-	a	9.0	236.0	7.0	11.0	a,t	C	Poorter (1975)
P01-011	Ején dolerite, S	60.7	14.2	1/*6	R	127.6	23.7	9.5	43	-	a	6.5	246.0	4.8	9.1	a,t	C	Bylund (1985)
P01-012	Mårsätter dolerite, S	58.8	15.1	1/*5	R	94.0	59.4	14.2	30	-	a	-31.1	258.5	18.0	19.5	a,t	C	Bylund (1985)
P01-013	Nornas dolerite, S	61.5	13.2	4/*4	R	365.0	71.3	6.5	203	901-933	e	71.2	281.7	9.9	11.4	a,t	C	Bylund (1985)
P01-014	Bo dyke, S	59.2	15.3	1/*9	N	305.3	-40.9	13.7	15	-	a	-4.0	244.0	10.0	17.0	a,t	-	Piper (1985)
P01-015	Söle 43 dolerite, S	61.5	13.2	6/*6	N	0.4	82.2	3.1	459	901-933	e	-76.8	193.7	5.9	6.0	a	C	Piper & Smith (1985)

TABLE 2 (continued)

No	Rock unit and/or component, country	LAT	LON	B/N/n	p	D	I	196	k	22*	n	PLAT	PLON	dp (195) dm	t	E	Ref.
WITHIN PROTODINE ZONE (PO2), SWEDEN/AFGHAN																	
PO2-001	Scania hyperite dolerites, S	56.1	13.9	*9/78	N	290.5	-85.1	4.6	114	563-1555	d,e	-51.7	208.7	9.4	9.5	a,t	A Sylund (1981)
PO2-002	Scania synsites, S	56.1	13.9	*5/43	N	303.5	-81.5	7.0	120	563-1555	d,e	-45.0	213.6	10.1	13.6	a,t	B Bylund (1981)
PO2-003	Mean Scania intrusives, S	56.1	13.9	*14/122	N	297.2	-83.7	3.7	115	563-1555	d,e	-49.1	210.7	7.1	7.3	a,t	A Bylund (1981)
PO2-004	Hægghult hyperite dolerite, S	56.5	14.5	-/*50	N	327.5	-74.5	1.0	338	-835	d	-30.0	211.0	2.0	2.0	a,t	B Mulder (1971)
PO2-005	Oaby hyperite dolerite, S	57.0	14.5	-/45	N	337.0	-53.0	6.0	163	-871	d	-20.2	213.9	6.0	8.0	a,t	C Mulder (1971)
PO2-006	Hjortsjö hyperite dolerite, S	56.7	14.5	-/5*	N	321.0	-71.5	2.0	137	900-1573	d	-27.0	215.0	3.0	4.0	a,t	C Mulder (1971)
PO2-007	Mälarskog hyperite dolerite, S	57.0	14.5	-/5*	R	124.0	51.0	2.0	1892	-886	d	-9.9	239.0	2.0	3.0	a,t	C Mulder (1971)
PO2-008	Kristinehamn hyperite dolerite, S	59.5	14.5	-/5*	R	128.0	39.0	7.0	117	-900	d	-1.9	241.5	5.0	8.3	a,t	C Mulder (1971)
PO2-009	Mean N hyperite dolerites, S	56.7	14.5	*3/50	N	331.9	-62.1	-	27	835-1573	d	-19.0	213.3	(26.1)	a,t	B Bylund & Personen (1987)	
PO2-010	Mean R hyperite dolerites, S	58.3	14.5	*2/10	R	126.9	45.4	-	-	886-900	d	-5.9	240.3	(18.4)	a,t	B Bylund & Personen (1987)	
WEST OF PROTODINE ZONE (PO3), SWEDEN/NEGAN																	
PO3-001	Rogaland anorthosites, N	58.5	6.0	*3/22	N	318.0	-58.0	12	842-945	a	-13.3	218.5	41.0	56.0	a,t	B Poorter (1972a)	
PO3-002	Rogaland mica-schists, N	58.6	6.9	*7/27	N	296.0	-70.0	11.0	29	842-945	a	-37.3	231.8	16.0	19.0	a,t	C Poorter (1972a)
PO3-003	Mean Rogaland basement rocks, N	58.5	6.3	*3/19/94	N	292.0	-71.0	25.6	24	842-945	a	-31.0	225.9	39.0	45.0	a,t	C Poorter (1972a)
PO3-004	Rogaland farsundite (N), N	58.3	6.8	*11/75	N	277.3	-73.2	3.5	1/4	944-977	g	-43.9	232.2	5.6	6.2	a,t	A Stearn & Piper (1984)
PO3-005	Rogaland farsundite (S), N	58.3	6.8	*6/36	N	233.7	-84.3	7.5	81	944-977	g	-53.4	207.8	14.5	14.7	a,t	A Stearn & Piper (1984)
PO3-006	Mean Rogaland farsundite, N	58.3	6.8	*17/111	N	270.8	-77.6	9.3	72	944-977	g	-50.7	226.5	7.4	7.9	a,t	A Stearn & Piper (1984)
PO3-007	Farsund magnetites, N	58.3	6.8	-/7*	N	244.9	-71.2	5.9	157	927-983	e	-56.0	252.4	9.0	10.3	a,t	C Stearn & Piper (1984)
PO3-008	Hydro body, N	56.3	6.5	*12/72	N	291.8	-76.6	5.8	56	-	a	-43.1	219.7	10.1	10.8	a,t	B Stearn & Piper (1984)
PO3-009	Garsakrat body, N	58.3	6.6	*6/48	N	294.9	-74.5	6.2	80	902±30	e	-39.6	221.4	10.2	11.3	a,t	A Stearn & Piper (1984)
PO3-010	Garsakrat magnetites, N	58.3	6.6	*2/13	N	267.0	-71.5	(33.8)	57	-	a	-46.3	240.0	51.9	59.2	a,t	C Stearn (1973)
PO3-011	Aana-Sura massif, N	58.5	6.4	*11/65	N	326.5	-83.0	6.5	51	-	a	-46.3	197.4	12.4	12.6	a,t	B Stearn & Piper (1984)
PO3-012	Hearland-Helleberg massif, N	58.5	6.7	*9/34	N	304.7	-77.4	5.2	99	-	a	-40.1	212.5	9.1	9.7	a,t	B Stearn & Piper (1984)
PO3-013	Hearland-Helleberg anorthosites, N	58.5	6.1	*5/18	N	294.7	-40.2	14.5	73	-	a	-7.5	243.7	10.6	17.5	a,t	C Stearn (1973)
PO3-014	Bjerkreim-Sognal lepolith (1), N	58.3	5.4	*11/54	N	298.9	-76.3	5.7	65	842-945	e	-40.9	216.9	9.7	10.5	a,t	A Stearn & Piper (1984)
PO3-015	Bjerkreim-Sognal lepolith (2a), N	58.3	6.4	*10/61	N	296.1	-80.8	5.8	71	842-945	e	-47.6	210.6	10.7	11.1	a,t	A Stearn & Piper (1984)
PO3-016	Bjerkreim-Sognal lepolith (4), N	58.3	6.4	*15/34	N	294.6	-78.0	3.4	128	842-945	a	-43.5	215.0	6.0	6.4	a,t	A Stearn & Piper (1984)
PO3-017	Bjerkreim-Sognal lepolith, N	58.5	6.3	*9/45	N	283.0	-73.0	8.0	45	842-945	a	-41.8	229.3	13.0	1d.0	a,t	A Poorter (1972a)
PO3-018	Anorthosite complex, N	58.5	6.4	*76/-	N	299.5	-78.5	2.0	70	942-945	e	-43.5	213.7	3.5	3.7	a,t	A Stearn & Piper (1984)
PO3-019	Anorthosite anomalous sites, N	58.3	6.3	-/5	N	302.9	-46.4	7.5	106	842-945	e	-6.8	235.7	5.9	9.4	a,t	B Stearn & Piper (1984)
PO3-020	Nensel-Gumby hyperite body, N	59.2	9.4	*8/48	N	331.7	-42.5	8.4	44	-	d	3.0	215.0	6.0	10.0	a,t	B Stearn (1973)
PO3-021	Breton igneous rocks, S	57.6	12.0	*5/25	N	306.1	-18.4	6.3	150	1005-1030	d	10.0	246.0	3.4	6.6	a,t	B Stearn (1973)

TABLE 2 (continued)

No	Rock unit and/or component, country	lat	lon	D/N/a	P	R	I	-95	K	age	n	PLAT	PLON	dP (AS5) dm	t	R	Ref
P03-022	Braffton dykes, S	57.4	11.5	-7/5	N	296.4	-51.3	7.2	100	1005-1030	d	-14.0	243.0	7.0	11.0	a,t	C Stearn & Paper (1984)
P03-023	Algon igneous rocks, S	57.3	11.9	*6/36	N	295.0	-28.1	2.3	876	1005-1030	d	0.0	253.0	1.0	3.0	a,t	A Stearn (1974)
P03-024	Keen Bratton & Algon rocks, S	57.2	11.3	*11/61	N	200.4	-23.8	4.9	89	1005-1030	d	5.0	249.0	3.0	5.0	a,t	A Stearn & Paper (1984)
P03-025	Tyre dolerite, S	57.3	11.8	11/10	R	119.3	56.0	2.0	490	800-300	a	-17.0	238.9	2.0	3.0	a	B Norahansen (1974), B Poorter (1972a)
P03-026	Egersund dykes, N	58.4	6.2	*4/35	R	119.0	61.0	14.0	44	842-945	a	-22.4	230.6	16.0	21.0	a,t	B Poorter (1972a)
P03-027	Egersund dykes, N	55.0	6.0	*4/35	R	114.0	61.5	11.8	37	842-945	a	-28.6	232.0	15.0	18.0	a	B Storrevoldt (1966a), B Hargraves & Nash (1972)
P03-028	Fjellstrand amphibolites, N	58.0	6.1	*5/16	N	315.4	-81.9	8.0	92	842-945	a	-42.0	200.0	15.1	15.5	a	B Hargraves & Nash (1972)
P03-029	Egersund amphibolite, N	55.0	6.1	-7/26	N	317.8	-76.8	4.6	36	842-945	a	-37.0	207.0	8.0	8.0	a	C Martyn & Deutsch (1974)
P03-030	Fjellstrand felsic dikes, N	58.1	7.2	*7/35	N	341.0	-82.7	5.0	142	842-945	a	-43.3	194.0	9.0	10.0	a,t	A Martyn & Deutsch (1975)
P03-031	Migmatites eastward, N	58.3	6.6	*3/18	N	256.6	-71.7	13.2	8	842-945	a	-49.6	243.6	20.4	23.2	a,t	B Stearn & Paper (1984)
P03-032	Zeblele intrusions (A1, N), N	58.9	9.5	*10/71	N	347.1	-41.4	7.7	41	975-1120	d	6.6	201.4	5.7	9.4	a,t	A Stearn & Paper (1984)
P03-033	Sample intrusions (A1, R), N	58.9	9.5	*1/16	R	389.0	53.0	~	~	975-1120	d	-2.8	182.0	~	~	a,t	D Stearn & Paper (1984)
P03-034	Hamble intrusions (A2, N), N	58.9	9.5	*16/107	N	327.5	44.3	3.5	11.2	975-1120	a	0.9	218.4	2.8	6.0	a,t	A Stearn & Paper (1984)
P03-035	Hamble intrusions (A2, R), N	58.9	9.5	*3/16	R	139.9	39.7	42.6	31	975-1120	a	1.1	212.6	15.7	26.6	a,t	C Stearn & Paper (1984)
P03-036	Hamble intrusions (A3, N), N	53.9	9.5	*5/28	N	305.4	-64.1	11.7	34	975-1120	a	-23.9	227.9	14.9	18.7	a,t	B Stearn & Paper (1984)
P03-037	Hamble intrusions (A3, R), N	53.9	9.5	*1/4	R	127.1	-64.4	~	~	975-1120	a	-23.7	226.6	~	~	a,t	D Stearn & Paper (1984)
P03-038	Hamble intrusions (B1, R), N	53.9	9.5	*6/37	R	225.3	-35.7	8.4	65	975-1120	a	39.2	129.9	5.6	9.7	a,t	A Stearn & Paper (1984)
P03-039	Beedle-Kongsgård amphibolites, N	55.2	8.2	6/48	N	135.0	-57.0	6.0	15	975-1120	d	-8.0	209.0	6.3	9.0	a,t	A Poorter (1975), *
P03-040	West-Sweden minor dykes (N), S	59.4	14.0	*2/12	N	428.5	-50.0	(112.0)	~	880-1550	s	-11.7	207.1	(22.0)	23.0	a,t	A Stearn & Paper (1984)
P03-041	West-Sweden minor dykes (R), S	59.4	11.7	*5/34	R	133.9	76.9	13.6	32	880-1550	s	-46.8	225.4	23.6	25.3	a,t	B Stearn & Paper (1984)
P03-042	West-Sweden Palaeozoic overprint, S	59.4	14.0	*3/21	R	182.1	-48.4	23.3	29	~	a	24.9	191.4	11.8	23.5	a,t	C Stearn & Paper (1984)
P03-043	Hummelåsen dykes, N	58.9	6.9	*8/37	N	332.0	-75.0	5.0	134	842-950	a	-34.0	208.0	8.0	9.0	a,t	A Poorter (1972a)
P03-044	SW Swedish amphibolites (R), N, S	57.1	12.9	*2/24	N	265.1	-70.9	(38.5)	~	~	a	-44.5	245.6	103.6	101.9	a,t	B Poorter (1975), *
P03-045	SW Swedish amphibolites (R2), S	57.3	13.2	1/46	N	64.0	-75.0	22.3	10	~	a	-34.0	170.0	37.0	40.0	a,t	C Poorter (1975), *
P03-046	Mean SW Swedish amphibolites, S	57.1	13.0	*3/20	N	289.9	-80.2	34.3	14	~	a	-37.1	218.9	64.2	57.0	a,t	D Poorter (1975), *
P03-047	Hallerödsnäs dyke (Bump 1), S	58.1	15.7	1/16	R	115.1	32.1	12.2	15	1218.38	e	29.0	274.0	8.0	14.0	a,t	E Poorter (1975b)

TABLE 2 (continued)

No	Rock unit and/or component, country	LAT	LONG	B/N/n	P	D	I	$\alpha_95$	K	age	m	PLAT	PLON	dp (A95) dm	t	g	Ref.
LATE PRECAMBRIAN/CAMBRIAN (Q02)																	
Q02-001	Norway spargmites, N	60.5	10.4	7/*7	M	191.0	21.0	24.0	7	600-700	a	18.0	179.0	13.3	25.3	-	D Harland & Bidgood (1959)
Q02-002	Nexo sandstone, D	54.2	15.3	*14/77	R	226.0	-30.0	11.5	13	500-600	a	38.0	134.0	7.0	11.0 a,t,c	A Prasad & Sharma (1980a)	
Q02-003	Fen carbonatite complex, N	59.3	9.3	19/*19	M	205.0	-56.0	3.0	138	530-600	e,d	63.0	142.0	3.1	4.3 a,t	B Foorter (1972b)	
Q02-004	Alno complex B, S	62.5	17.5	*6/39	N	348.4	75.8	11.1	37	545-589	d,f	84.7	299.7	18.8	20.4 a,t	C Piper (1991), *	
Q02-005	Alno complex A (R), S	62.5	17.5	*7/46	R	291.4	7.0	15.2	17	545-589	d,f	12.9	269.3	7.7	15.3 a,t	B Piper (1981), *	
Q02-006	Alno complex A (N), S	62.5	17.5	*14/88	N	99.9	6.1	14.0	9	545-589	d,f	1.8	277.3	7.1	34.1 a,t	B Piper (1981), *	
Q02-007	Bætfjord dykes, N	70.7	29.8	*6/34	N	84.5	60.6	4.4	232	-640	d	40.6	108.2	5.1	6.7 a,t	B Kjøde (1980)	
Q02-008	Kongsvold dykes, N	70.9	29.6	3/*3	N	90.0	20.0	"	-	-	-	49.8	95.4	-	-	D Kjøde (1980), *	
ORDOVICIAN (Q03)																	
Q03-001	Swedish limestones, S	59.9	15.7	*73/73	N	132.0	70.0	2.2	58	-	a	30.0	46.0	3.3	3.8 a,t	C Claesson (1978)	
Q03-002	Sultjelma gabbro (R), N	67.2	15.4	*3/17	R	184.5	15.4	65.8	4	443±16	e	14.9	190.8	34.7	67.6 a	D Piper (1974), *	
Q03-003	Sultjelma gabbro (N), N	67.2	15.4	*3/18	N	25.5	-15.0	50.0	7	443±16	e	13.0	169.4	26.3	51.3 a	C Piper (1974), *	
Q03-004	Meat Sultjelma gabbro (c), N	67.2	15.4	*6/35	C	195.0	15.0	28.0	6	443±16	e	14.4	180.0	14.7	28.7 a	C Piper (1974)	
Q03-005	Askøy pluton (A1), N	60.7	5.6	3/*12	M	318.0	8.0	10.0	17	444±74	c,f	25.0	233.0	5.0	10.0 a,t	B Røther et al. (1987)	
SILURIAN (Q04)																	
Q04-001	Oslo igneous rocks (A), N	59.7	10.4	17/*17	R	199.0	14.3	8.3	19	-424	d	21.2	169.2	4.3	8.5 t	D Storetvedt et al. (1978), *	
Q04-002	Sarv nappe dolerites (A), S	62.6	12.9	*5/53	R	284.6	20.3	17.8	19	595-720	e,d	16.0	274.7	9.8	18.7 a	C Bylund & Zellman (1980)	
Q04-003	Sarv nappe dolerites (B), S	62.6	12.9	*14/141	N	21.4	-9.1	12.4	11	595-720	e,d	21.0	170.0	6.3	12.5 a	C Bylund & Zellman (1980)	
Q04-004	Røysing dyke (Pc), S	62.6	12.9	7/*7	N	16.0	-20.3	12.1	26	595-720	d	15.9	176.5	6.7	12.7 a	C Bylund & Zellman (1980)	
Q04-005	Pen complex overprint, N	61.0	12.0	*7/30	R	210.0	19.0	"	-	-37.0	e,d	20.0	160.0	-	-4.1	C Storetvedt (1973)	
Q04-006	Ringerike sandstone, N	60.0	10.0	*10/10	N	31.0	-11.0	"	-	a	21.0	159.0	-	-	D Storetvedt et al. (1967)		
Q04-007	Ringerike sandstone (b), N	60.0	10.0	*9/35	M	22.0	-20.0	"	-	j	-	"	-	-	A Douglass & Kent (1986)		
Q04-008	Gotland Föllinge limestone, S	57.5	18.5	1/*6	N	32.0	-11.0	6.0	126	-	3	21.0	164.0	3.1	6.1 a	C Claesson (1979)	
Q04-009	Gotland Dacker limestone, S	57.5	18.5	1/*23	N	28.0	-8.0	2.0	230	-	d	19.0	169.0	1.1	2.1 a	C Claesson (1979)	
Q04-010	Gotland Medby's limestone, S	57.5	18.5	1/*6	N	25.0	-14.0	8.0	71	-	a	23.0	171.0	4.2	8.2 a	C Claesson (1979)	
Q04-011	Scania limestone, S	55.5	15.5	1/*9	N	30.0	-15.0	6.0	75	-	d	22.0	161.0	13.2	6.2 a	C Claesson (1979)	
Q04-012	Forsten-Hyllingen gabbro (P1), N	63.1	11.6	*8/60	R	325.0	-21.0	7.9	56	-	a	11.2	226.7	4.4	8.3 a,t	B Abramshagen et al. (1979)	

TABLE 2 (continued)

No.	Rock unit and/or component, country	LAT	LONG	B/N/n	P	D	I	1995	K	age	n	PLAT	PLON	dP (A95)	dM	t	g	Ref.	
DEVONIAN (905)																			
Q05-001	Rorogen sandstone, N	62.0	12.0	*8/8	R	210.0	9.0	15.0	-	3	19.0	160.0	7.6	15.1	a,t	B	Storevedt et al. (1967)		
Q05-002	Hästeinen sandstone (A), N	61.6	5.4	-/-10	M	210.0	18.0	9.0	23	-	3	16.0	155.0	5.0	10.0	a,t	A	Torsvik et al. (1987)	
Q05-003	Hästeinen sandstone (B), N	61.6	5.4	-/+5	M	47.0	59.0	7.0	71	-	3	54.0	111.0	8.0	11.0	a,t	B	Torsvik et al. (1987)	
Q05-004	Fønogen-Hyllingen gabbro (P2), N	63.1	11.6	*8/32	R	237.0	6.0	9.3	36	-	4	11.5	132.9	4.7	9.3	a,t	B	Astrahanskiy et al. (1979)	
Q05-005	Kvamshesten old red ss (N), N	61.4	5.6	3/-*41	R	194.0	12.0	9.3	7	-	3	22.0	170.0	4.5	9.5	a,t	B	Lier et al. (1969), *	
Q05-006	Kvamshesten old red ss (N), N	61.4	5.6	1/-*2	N	12.0	33.0	-	-	-	3	45.8	169.1	-	-	a,t	D	Lier et al. (1969), *	
Q05-007	Kvamshesten old red ss, N	61.4	5.4	-/-*13	R	218.0	3.0	9.7	16	-	3	21.0	144.0	5.0	10.0	a,t	A	Torsvik et al. (1986)	
Q05-008	Ytterby lamprophyre, N	63.1	11.0	*2/10	R	230.0	14.0	(8.5)	-	256.0	170	a,d	39.0	159.9	(5.0)	9.4	t	C	Storevedt (1967)
Q05-009	Hornelen sandstone (A), N	61.8	5.3	1/-*20/-	M	216.0	21.0	9.2	12	-	3	12.0	147.0	5.0	10.0	a,t	A	Torsvik et al. (1987)	
Q05-010	Hornelen sandstone (B), N	61.8	5.3	1/-*14/-	M	022.0	54.0	10.1	14	-	3	59.0	149.0	10.0	14.0	a,t	B	Torsvik et al. (1987)	
Q05-011	Askøy pluton (B1), N	60.7	5.6	-/-*35	M	25.0	-22.0	4.0	45	-	3	16.0	160.0	? Q	3.7	a,t	C	Ringnes et al. (1987)	
CARBONIFEROUS (906)																			
Q06-001	Oslo igneous rocks (B), N	59.7	10.4	39/-*39	R	203.5	-24.3	8.8	8	-	3	39.9	159.9	5.0	9.4	t	B	Storevedt et al. (1974)	
Q06-002	Sarna alkaline body (2), S	61.7	12.9	-/-*8	R	202.3	-24.4	8.8	41	287.14	e	38.1	166.4	3.9	7.3	a,t	B	Smith & Parker (1974)	
Q06-003	Sarna alkaline body (1), S	61.7	12.9	*3/11	R	200.0	-22.4	11.0	18	287.14	e	38.5	164.7	5.0	9.4	a,t	B	Bylund & Patchett, 1974	
Q06-004	Neur-Sarna body, S	61.7	12.9	-/-19	R	201.1	-23.2	6.9	25	287.14	c	38.0	167.0	6.0	12.0	a,t	A	Smith & Parker (1974), *	
Q06-005	E-Västeråsland sill, S	58.5	13.5	*5/51	R	197.0	-2.0	4.0	467	287.15	d	31.0	174.0	2.0	4.0	a,t	B	Maalder (1971)	
Q06-006	Scania dolerites (A), S	55.5	13.5	*6/43	R	190.0	-11.0	11.0	36	-300	a	37.0	174.0	5.7	11.2	a,t	A	Bylund (1974a)	
Q06-007	Scania dolerites (B), S	55.5	13.5	*13/106	R	199.5	-15.0	6.5	42	-300	a	38.5	168.5	3.4	6.7	a,t	A	Bylund (1974a)	
Q06-008	Krageröd dykes, N	58.9	9.5	*3/9	R	200.0	-41.4	15.8	62	-	3	52.1	158.4	11.8	19.3	a,t	C	Storevedt (1986), *	
Q06-009	Stabben sill (hb), W	63.3	8.5	-/-1/*33	R	192.0	-12.0	2.4	-	297.8	a	32.1	174.4	1.0	2.0	a,t	B	Storevedt & Torsvik (1986)	
Q06-010	Stabben sill (lb), W	63.3	8.5	-/-1/*26	N	8.0	61.0	4.5	-	3	68.2	172.3	5.0	7.0	a,t	B	Storevedt & Torsvik (1986)		
Q06-011	Oslo Graben lavas (hb), N	60.0	10.0	*3/-	R	204.0	-34.0	-	-	-	3	-	-	-	a,t	D	Douglas & Son (1986)		

TABLE 2 (continued)

No.	Rock unit and/or component, country	LAT	LONG	B/N/n.	p	D	I	-95	k	age	m	PLAT	PLON	dp (A95) dm	t	g	Ref.
PERMIAN (Q07)																	
Q07-001	Scania metapelites, S	55.5	13.5	*8/49	R	193.5	-38.0	11.0	23	250-285	d	54.0	171.5	7.7	13.0	a,t	A Bylund (1974a)
Q07-002	Sunnerstrand dykes (R), N	60.5	4.7	-/*20	R	198.0	-27.0	5.8	-	160-275	d	43.0	162.0	-	-	a,t	B Lovlie (1981)
Q07-003	Arendal diabases (A), N	58.4	8.8	3/*4/14	R	200.2	-27.5	5.2	309	-	a	43.6	161.3	3.1	5.7	a,t	C Halvorsen (1972), *
Q07-004	Arendal diabases (B), N	58.4	8.8	1/*17/84	R	213.9	-39.5	8.9	75	-	a	46.6	140.2	6.4	10.7	a,t	B Halvorsen (1972), *
Q07-005	Arendal diabases (C), N	58.4	8.8	1/*17/84	R	207.9	-22.1	3.7	96	-	a	38.5	152.9	2.1	3.9	a,t	B Halvorsen (1972), *
Q07-006	Arendal diabases (D1), N	58.4	8.8	1/*7/74	R	222.9	-35.2	7.4	67	-	a	40.2	131.6	4.9	8.5	a,t	B Halvorsen (1972), *
Q07-007	Arendal diabases (D2), N	58.4	8.8	1/*12/53	R	209.5	-45.7	7.0	40	-	a	52.6	142.6	5.7	8.9	a,t	B Halvorsen (1972), *
Q07-008	Ostlo igneous rocks (I), N	59.7	10.4	*23/27	R	203.6	-36.2	1.0	773	-270	a	38.6	160.7	1.0	1.2	a,t	B von Everdingen (1960)
Q07-009	Ny-Halsjord dykes, N	58.0	7.8	*14.39	R	202.0	-18.9	2.9	284	255-380	d	62.0	142.6	7.4	10.4	a,t	A Halvorsen (1970)
Q07-010	Gjerdangen larvikite, N	60.1	10.5	*40/40	R	197.0	-45.0	-	-	a	54.5	163.7	-	-	a	C Kristoffersen (1973), *	
Q07-011	Bohuslan dykes (RPM), S	58.6	11.3	-/*16	R	196.0	-27.9	8.8	19	-	a	44.7	169.2	5.2	9.5	a	B Thorning & Abrahamsen (1980), *
Q07-012	Bohuslan dykes (RPC), S	58.6	11.3	-/*44	R	198.0	-32.7	3.6	37	-	a	47.2	155.6	2.3	4.1	a	B Thorning & Abrahamsen (1980), *
Q07-013	Mean Bohuslan dykes (RP), S	58.6	11.3	*8/101	R	199.0	-31.8	6.6	72	-	a	46.4	164.5	4.2	7.4	a	A Thorning & Abrahamsen (1980), *
Q07-014	Bohuslan porphyry dykes (PD), S	58.6	11.3	*3/26	R	190.0	-44.9	20.9	36	-	a	57.1	174.6	16.6	26.3	a	B Thorning & Abrahamsen (1980), *
Q07-015	Bohuslan dolerite dykes (D), S	58.6	11.3	*5/28	R	198.0	-45.0	29.1	8	-	a	55.6	161.9	23.2	36.7	a	B Thorning & Abrahamsen (1980), *
Q07-016	Mean Bohuslan dykes (RP, PD, D), S	58.6	11.3	*16/155	R	197.0	-38.0	8.6	19	-	a	51.0	165.5	6.0	12.7	a	A Thorning & Abrahamsen (1980), *
Q07-017	W-Västergötland sill, S	58.6	12.5	2/*33	R	202.0	-17.0	6.3	1596	282±50	d	38.0	166.0	3.4	6.5	a,t	B Mulder (1971)
Q07-018	Brumunddal lavas, N	61.0	11.0	*9/-	R	215.3	-50.8	5.7	83	-	a	52.6	136.8	4.0	7.0	a,t	C Storetvedt & Petersen (1970), *
TRIASSIC (Q08)																	
Q08-001	Ostlo igneous rocks (II), N	59.7	10.4	9/*9	R	194.8	-48.0	6.4	65	-	a	57.7	165.7	5.5	8.4	t	C Storetvedt et al (1978), *
Q08-002	Brumunddal lavas (R), N	61.0	11.0	6/*8	R	209.5	-65.2	3.9	201	-	a	68.2	126.7	3.0	* 5.0	a,t	C Storetvedt & Petersen (1970), *
Q08-003	Brumunddal lavas (N), N	61.0	11.0	6/*7	N	34.9	60.3	4.1	213	-	a	61.1	128.1	3.0	5.0	a,t	C Storetvedt & Petersen (1970), *
Q08-004	Brumunddal lavas (C), N	61.0	11.0	*14/-	C	219.2	-54.2	-	177	-	a	53.9	129.3	3.0	5.0	a,t	C Storetvedt & Petersen (1970), *

TABLE 2 (continued)

No.	Rock unit and/or component, country	LAT	LONG	B/N/n	F	D	I	95	k	age	m	PLAT	PLON	dP (1995)	dM	t	g	Ref.
JURASSIC (Q09)																		
Q09-001	Sunnhordland alkaline dykes (N), N	60.5	4.7	*9/45	N	47.8	43.9	5.0	106	-	a	46.0	117.0	4.4	6.6	a,t	B	Lovlie (1981)
Q09-002	Oslo dyke rocks (R), N	59.7	10.4	47/4	R	105.8	68.7	10.0	86	-	b	78.3	130.4	14.1	16.9	t	c	Storsetvedt (1981), *
Q09-003	Oslo dyke rocks (N), N	59.7	10.4	47/4	N	11.8	63.5	5.6	270	-	a	71.8	159.1	7.1	8.3	-	d	Storsetvedt (1981), *
Q09-004	Sotra dykes, N	60.5	4.0	-7/49	N	19.5	59.1	2.3	487	-250	d	66.0	145.0	3.0	4.8	a,t	B	Lovlie & Mørkved (1981)
Q09-005	Sotra baked rocks, N	60.5	4.0	-7/49	N	1.0	53.4	6.7	17	-250	d	51.4	182.1	6.0	9.0	a,t	C	Lovlie & Mørkved (1981)
CRETACEOUS (Q11)																		
Q10-001	Scanian basalts (N), S	56.0	13.5	*12/-	R	36.2	66.6	8.6	26	81-134	d	66.0	104.0	11.7	14.2	a,t	A	Bylund (1981)
Q10-002	Scanian basalts (R), S	56.0	13.5	*6/-	R	230.4	-76.2	11.7	15	81-112	d	60.0	65.0	37.2	32.7	a,t	c	Bylund (1981)
Q10-003	Myrn Scanian basalts, S	56.0	13.5	*18/-	C	41.0	69.2	7.7	21	81-134	d	66.5	92.0	11.2	13.1	a,t	B	Bylund (1981)
Q10-004	Lappajärvi impact structure, F	63.2	23.6	*6/25	N	33.6	59.2	11.4	36	77.1±0.4	c	59.5	147.1	12.7	17.0	a,t	C	Pesonen et al. (1984)
TERTIARY (Q11)																		
Q11-001	Deilen impact structure, S	61.9	16.5	77/20	N	15.0	61.0	2.8	135	-	a	68.0	165.0	3.3	4.3	a	B	Bylund (1974b)
Q11-002	Kragerø dykes B (R), N	58.9	9.5	*47/11	R	194.2	-67.8	10.4	79	-	a	78.5	138.0	14.6	17.4	a,t	B	Storsetvedt (1981), *
Q11-003	Kragerø dykes A (N), N	58.9	9.5	*2/6	N	11.5	56.0	-	-	-	a	77.5	151.7	-	-	a,t	C	Storsetvedt (1981), *

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