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Chemical analyses from the Gardar Igneous Province, South Greenland

compiled by

W. Stuart Watt

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CHEMICAL ANALYSES FROM THE GARDAR IGNEOUS PROVINCE, SOUTH GREENLAND

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Abstract

A compilation is presented of all available rock analyses (138) from the alkaline Gardar igneous province of South Greenland with the exception of those from the peralkaline Ilímaussaq intrusion. The analyses are accompanied by a brief description of the geological setting of the province and the major units within it. Variation diagrams are included to show trends and affinities in the province and are accompanied by similar diagrams from other alkaline provinces. A planimetric study shows that syenite is dominant in the province.

Zusammenfassung

Eine Zusammenstellung aller 138 vorhandenen Gesteinsanalysen der alkalischen Gardar Erstarrungsgesteinsprovinz des Präkambriums Südgrönlands wird gegeben. Nicht angeführt jedoch sind die Analysen der peralkalischen Ilímaussaq Intrusion.

Die Provinz besteht aus Intrusivkomplexen, in denen untersättigte und gesättigte Syenite, sowie mächtige regionale gabbroide Gangschwärme herrschen. Die Resultate der planimetrischen Analysen sind in Tafel I gegeben. Eine suprakrustale Serie von mindestens 2400 m Sandstein und basaltischen Laven liegt auf dem ketilidischen Granitsockel. Altersdaten einiger späterer Intrusionen ergaben 1250 bis 1000 m.y. Die Provinz wird durch mächtige ESE-streichende Störungen mit Sinistralversetzungen begrenzt.

Die Analysen wurden in Diagramme mit $\sum$Fe-Mg-alk und Na-K-Ca als Spitzen projiziert (Abb. 3 4). Ein ähnliches Diagramm (Abb. 6) wird für die grossen Syenogabbrogänge angegeben und zeigt den Differentiationstrend der Gabbros. Von diesem Diagramm kann abgeleitet werden, dass das gabbroide Stammagma eine Zusammensetzung ähnlich der Analyse 112 hatte.

Das K-Na-Ca Diagramm zeigt eine Unterteilung der Gesteine in zwei Gruppen, die untersättigten und übersättigten Typen entsprechen. Diese Zweiteilung wurde von Upton (1960) unter Zuhilfenahme der Temperaturbarriere im System $NaAlSiO_4$ - FeO - SiO_2 erklärt und von Sørensen (1965) durch die Temperaturbarriere im System $NaAlSiO_4$-$KAlSiO_4$-SiO_2.

РЕЗЮМЕ

В. Стюарт Уатт

Химические анализы магматической провинции Гардар, Южная Гренландия.

В этой работе представлены все имеющиеся (в количестве 138) анализы пород из докембрийской щелочной провинции Гардар (Южная Гренландия), за исключением ультращелочных пород интрузивного массива Илимауссак.

Провинция Гардар состоит из интрузивных комплексов с преобладанием насыщенных и недосыщенных сиенитов, а также широко распространенных систем габбровых даек.

Результаты планиметричских изученей приведены в таблце 1.

Толщи песчаников и базальтовых лав, общей мощностью не менее 2400 м, перекрывают более древний гранитный фундамент Кателидиевого возраста. Возраст некоторых более древних интрузий колеблется в пределах 1250 - 1000 млн. лет. Провинция оконтурена обширными левосторонними сдвигами восточно-юговосточного простирания.

Анализы выражены в диаграммах с $\sum$Fe-Mg-щелочи и Na-K-Ca по вершинам треугольников (фигуры 3 и 4). Подобная диагрмма дана также для больших сиено-габбровых даек, которая выражает тенденцию габбро к дифференциации. По этим диаграммам было вычислено, что состав исходной магмы был подобен составу, полученному анализом 112.

Na-K-Ca диаграмма показывает подразделение типов пород на две группы: в первую из них входит недосыщенный, а во вторую пересыщенный типы. Такое подразделение объясняется влиянием температурного барьера в системе $NaAlSiO_4$-FeO-SiO_2, согласно Аптону (Upton, 1960), а по Сёренсену (Sørensen, 1965) - в системе $NaAlSiO_4$-$KAlSiO_4$-SiO_2.

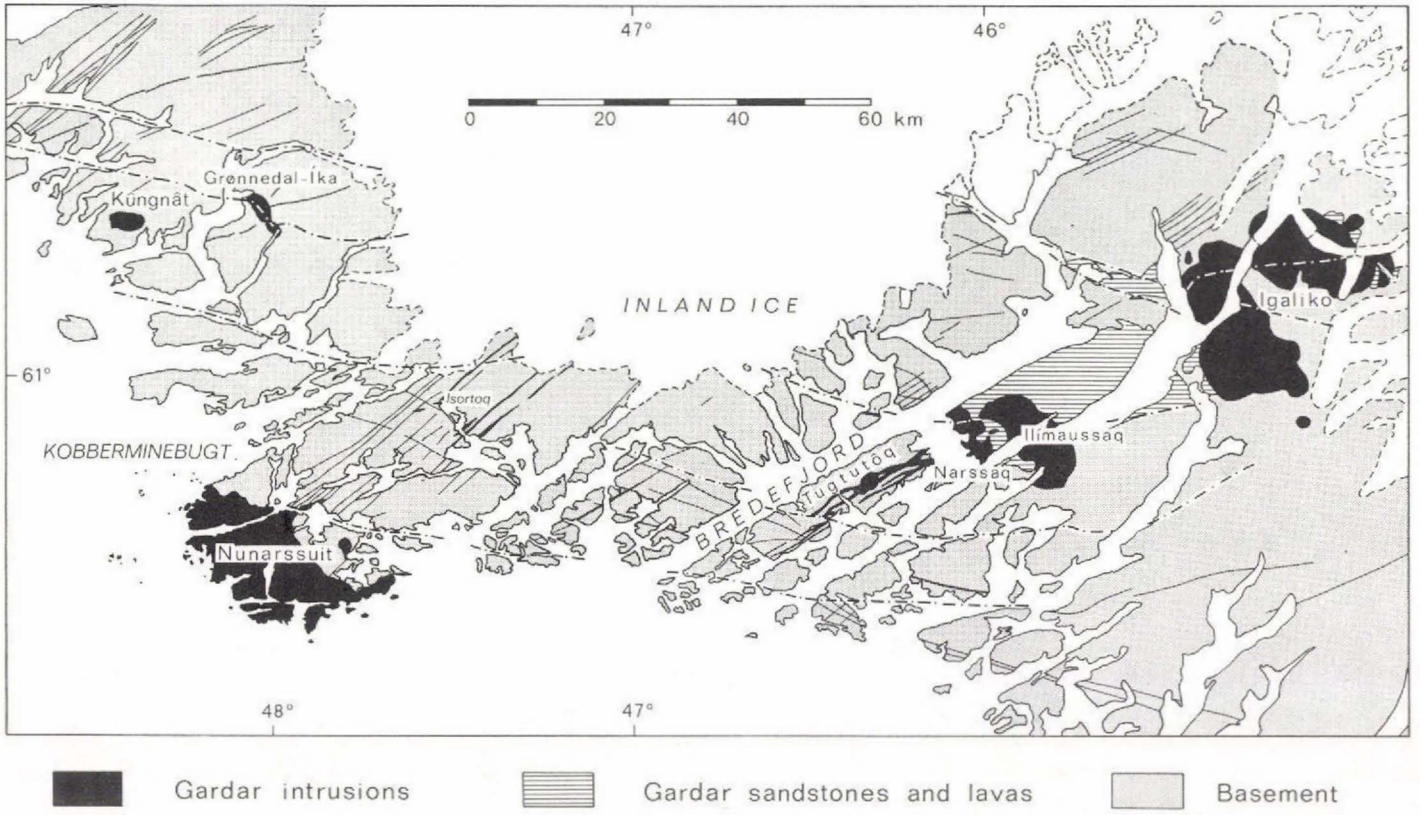

Fig. 1. Sketch map of part of South Greenland showing the main intrusions and dyke swarms in the Gardar igneous province.

INTRODUCTION

This paper is a presentation of chemical analyses made on igneous rocks of the Gardar province in southern Greenland and includes all analyses available to November 1965 with the exception of those from the peralkaline Ilímaussaq intrusion.

Many of the analyses are unpublished and have been made in the geochemical laboratories of the Geological Survey of Greenland. The author is indebted to all those who supplied unpublished analyses for this compilation. The techniques used are given and discussed by the analyst in a separate report (Borgen, in prep.).

Mapping of the Gardar rocks is now complete and the first accounts of most of the intrusions are available.

A general account of the Precambrian Gardar alkaline province, together with a brief discussion of the magmatic evolution of the province, has been given by Sørensen (1965). Ferguson and Pulvertaft (1963) summarize the main features of the layering seen in many Gardar intrusions. Ussing (1912) gave a comprehensive account of all that was known of the province at that date and much of the work since then has been concentrated on the mineralogy and petrochemistry of the Ilímaussaq intrusion. This intrusion has been excluded from this compilation as the analyses are readily available in the recent papers by Hamilton (1964) and Ferguson (1964).

The province has been known for many years, mainly as a source of rare minerals associated with the alkaline rocks. K. L. Giesecke was probably the first to describe the rare rock types from the area and brought back samples. Systematic mapping of the province was not started until the Geological Survey of Greenland began detailed mapping in the area in 1955.

REGIONAL SETTING

The Gardar province, consisting of a number of intrusive centres, regional dyke swarms and basalt flows of more restricted distribution, was emplaced into an older basement complex of gneiss and granite (Wegmann, 1938; Allaart, 1964). Only the north-west extent of the province is known; elsewhere it is bounded by sea or ice so that its real extent cannot be ascertained. There is no definite evidence of the province extending to the east coast of Greenland. The main concentration of Gardar igneous rocks lies within an elongated area approximately 210 km in an east-west direction and 60 km from north to south.

Structurally the province is noteworthy for large ESE-trending transcurrent faults showing sinistral displacement (see map, fig. 1). Berthelsen (1961) estimates that there has been a total sinistral displacement of 25 km of the area to the north of the province relative to that to the south.

Prominent transcurrent faulting in ESE and N-S directions has been suggested as having influenced the siting of some of the intrusion, e.g. Nunarssuit (Harry and Pulvertaft, 1963). The Nunarssuit and Igaliko complexes straddle major ESE faults.

The regional dyke swarms are not grouped radially around central complexes, hence probably the dykes are not associated with isolated magma chambers.

GEOLOGICAL HISTORY OF THE PROVINCE

The Gardar period in southern Greenland was a time of sedimentation and igneous activity. The sediments, consisting mainly of coarse arkosic sandstones, are intercalated with lavas and sills (Poulsen, 1964). The main phase of volcanism started with the formation of agglomerate vents followed by the extrusion of basic lavas with alkali tendencies (Stewart,

1964). Some, at least, of the major east-south-east transcurrent faults, which controlled the early sedimentation, were initiated in the preceding plutonic phase and remained active throughout the main phase of Gardar dyke intrusion (Henriksen, 1960). The relationship between dykes and faults indicates that periods of tension alternated with periods of compression and transcurrent faulting.

The igneous intrusions of the Gardar can be arbitrarily divided into three groups (Bridgwater, 1965 amplifying Upton, 1960). a) Early Gardar in which nepheline syenite, carbonatites, lamprophyres and microsyenites predominate - the Grønnedal - Íka complex belongs here; b) Mid-Gardar, characterized by several generations of olivine dolerite, trachydolerite, microsyenite dykes and giant composite syeno-gabbro dykes. Many of the dykes contain large masses of anorthosite and labradoritic feldspar (the "big feldspar dykes"); these have a dominant NE or ENE trend. The Narssaq intrusive complex may also belong here. c) Late Gardar, characterized by the major alkaline complexes - Kûngnât, Nunarssuit with Puklen, Tugtutôq central complex and Ilímaussaq. The Igaliko syenite complex and the Ivigtut granite are of uncertain chronological position. The Ivigtut granite probably belongs to the late part of the mid-Gardar while the Igaliko complex was intruded over a long period of time as early centres are intersected by most of the Gardar dykes but a late centre truncates these dykes. Similarly, the age relations of the basalts of the extrusive phase are not certain but these lavas may belong to the mid-Gardar period of dyke intrusion.

Reliable age determinations are limited to later Gardar rocks and range from 1,255 m.y. for the Ivigtut granite (Moorbath and Pauly, 1962) to 1,020 m.y. for the agpaitic rocks of Ilímaussaq (modified from Moorbath et alia, 1960) (Bridgwater, 1965).

DESCRIPTION OF THE MAIN GARDAR INTRUSIONS AND EXTRUSIVES

The intrusive centres, which are shown in fig.1, are now briefly described in geographical order from west to east. Each description is followed by reference to the main work on the intrusion with an indication of whether the work contains rock and trace element analyses:

* rock analysis with major elements,
† trace element analysis.

Sample (and analysis) numbers from each intrusion are given for use as a cross-reference in association with the tables.

Kûngnât

The Kûngnât alkaline complex (Upton, 1960) is a late Gardar oversaturated syenitic intrusion. It consists of three syenite bodies intruded with progressive easterly shift of centre and succeeded by an alkali gabbro ring-dyke. They were intruded in order of increasing basicity.

The earliest syenite intrusion consists of quartz syenite with fayalite and ægirine-augite. The second syenite forms the western layered syenite intrusion with inwardly directed rhythmic banding, feldspar lamination, cryptic layering and an overall increase in mafic index from top to bottom. The syenite grades upwards from a quartz-free to a quartz-bearing type. The ultimate differentiate is represented by transgressive riebeckite-astrophyllite granite sheets. The eastern, and third, syenite is also cryptically layered in its central part from a basic to a less basic type of quartz syenite.

The ring-dyke consists of a suite of gabbroic and syeno-gabbroic rocks thought to have been derived by the fractionation of alkali basalt magma at depth with some syenite contamination.

Upton, 1960 * † (map of complex)

Samples: Analysis No. (Sample No.)

1 (26272)	29 (C - 4)	89 (C - 6)
5 (C - 5)	37 (26135)	107 (26040)
27 (27647)	38 (26005)	127 (27685)
		139 (26042)

Grønnedal - Íka

The Grønnedal - Íka complex (Callisen, 1943; Emeleus, 1964) consists of predominantly foyaitic nepheline syenites and carbonatite. It is intruded by numerous doleritic, trachytic and phonolitic dykes. Before distortion of the complex by faulting and dyke intrusion it had a relatively simple structure consisting of two series of laminated and layered syenites with centrally-directed structures and separated by a raft of gneiss, and a later central stock of porphyritic xenolithic syenite. The nepheline syenites were intruded by a late central plug of xenolithic carbonatite.

Callisen, 1943 *
Emeleus, 1964 † (map of complex)

Samples: Analysis No. (Sample No.)

52 (C - 3)	59 (27099)	66 (27159)
55 (C - 2)	62 (27182)	
56 (27137)	65 (C - 1)	

Ivigtut granite

The Ivigtut granite is an alkali granite stock about 300 m across. In the top of the stock a cryolite-bearing pegmatite was developed. The cryolite has now been removed by mining. The granite stock is surrounded by an intrusion breccia. The granite contains ægirine-augite and soda amphibole.

Berthelsen, 1962 (sketch map of district)
No analysis of the granite has been made.

Nunarssuit intrusive complex

The Nunarssuit complex is a large (45 x 25 km) complex with an abundance of augite syenite. The main members are: the Alángorssuaq gabbro, an olivine gabbro and probably the oldest member of the complex; a biotite granite; two masses of augite-fayalite syenite, viz. the Nunarssuit syenite and the Kitsigsut syenites; the Helene granite with clinopyroxene and occasionally fayalite; the soda granites of Malenefjeld and Kitdlavât. The Kitdlavât granite and various small bodies of aenigmatite-bearing soda granite were intruded into the Nunarssuit syenite. The Malenefjeld granite resembles

these soda granites and, though nowhere in contact with the main complex, is considered a part of it.

Mafic mineral layering is well-developed in certain places in the complex and is present in most of the members.

Harry and Pulvertaft, 1963 * (map of complex including the Puklen intrusion)

Samples:	Analysis No.	(Sample No.)			
2	(30268)	30	(30893)	35	(39470)
6	(30173)	31	(39415)	36	(39458)
7	(20679)	32	(30339)	103	(30106)
28	(31095)	34	(20609)		

Puklen intrusion

The Puklen intrusion is a small elongated complex situated to the east of the Nunarssuit complex. The four component members of the intrusion are augite syenite, quartz syenite, soda granite and granophyre, emplaced in that order. The syenites together form an outer ring. The intrusion is probably co-magmatic with the nearby Nunarssuit complex.

No analysis from the intrusion has been made.

Tugtutôq central complex

The ring complex of central Tugtutôq consists of 5 units of saturated syenites and alkali granite intruded with increasing acidity and volatile content, followed by a stock of perthositic syenite.

Upton, 1962 (map of ring complex)
Upton, 1964a * (map of ring complex)

Samples:	Analysis No.	(Sample No.)			
16	(40589)	17	(50272)	24	(50345)

Narssaq intrusive complex

The early olivine gabbro of the complex is connected with the olivine gabbro giant dykes of Tugtutôq. The main part of the complex consists of quartz syenite and pyroxene syenite followed by alkali granite.

Small ultrabasic bodies (magnetite-pyroxenite of Ussing) occur within the Narssaq gabbro.

Ussing, 1912 *
Upton, 1964b * †
Stewart, unpublished

Samples: Analysis No. (Sample No.)

3 (61851)		gabbro	101 (U - 18)
10 (61848)			104 (30765)
18 (50845)		pyroxenite	130 (40550)
19 (40354)			131 (30770)
21 (50843)			132 (63876)
39 (61856)			133 (U - 19)

Ilímaussaq intrusion

The Ilímaussaq intrusion is a peralkaline syenitic intrusion. It is rich in chlorine and zirconium and this is expressed by the abundant development of sodalite and eudialyte.

The intrusion consists of three parts: a partial, marginal rim and roof of augite syenite; the major part of peralkaline (agpaitic) composition; a small sheet of alkali granite.

Numerous analyses from the intrusion were collected by Hamilton (1964).

Ussing, 1912 * (early map of intrusion)
Sørensen, 1958
Ferguson, 1964 * (map of whole intrusion)
Hamilton, 1964 * † (map of northern part of intrusion)

Igaliko complex

The Igaliko complex is a large nepheline syenite complex composed of four main intrusions.

Ussing, 1912 *
Emeleus and Harry, unpublished

Samples: Analysis No. (Sample No.)

58 (U - 28) 64 (U - 27) 68 (U - 26)
61 (U - 25)

Klokken intrusion

This is a small, oval, layered mass of alkali gabbro and augite syenite lying close to the Igaliko complex. It may be regarded as a part of that complex.

Ellitsgaard-Rasmussen, unpublished

Giant dykes

Some of the north-easterly dykes are of considerable thickness, those on Tugtutôq reaching nearly one kilometre. Many of these giant dykes are composite. On Tugtutôq the earliest, the Hviddal composite dyke, has narrow syeno-gabbro margins and a centre grading north-eastwards from augite syenite to nepheline syenite. The later olivine gabbro dykes are regarded as cryptically layered intrusions and one dyke is composite with a centre of syeno-gabbro at Krydssø, and further east, a median intrusion, the Assorutit quartz syenite.

In the Isortoq area the giant dykes are gabbroic with central portions of syenite. The Eqaloqarfia dyke in Nunarssuit is gabbroic and shows striking layering (Pulvertaft, 1965). A pair of giant dykes showing banding also occurs to the north of Narssarssuaq (Walton, 1965).

Upton, 1962	(map of Tugtutôq)
Upton, 1964b *	(sketch map of Tugtutôq)
Pulvertaft, 1965 *†	(map of Eqaloqarfia dyke)
Walton, 1965	

Samples: Analysis No. (Sample No.)

Eqaloqarfia dyke					
44	(23144)	98	(61226)	51	(30676)
92	(20645)	99	(61228)	60	(30681)
106	(20636)	100	(61157)	87	(40551)
112	(20632)	115	(61187)	101	(U-18)
		128	(61186)	104	(30765)
Isortoq area		Tugtutôq		110	(50033)
44	(25114)	20	(50216)	113	(40452)
45	(61267)	47	(50241)	114	(40430)
46	(61133)	48	(30640)	117	(30684)
69	(61162)	49	(30743)		
86	(61158)	50	(30714)		

Dyke rocks

Dyke rocks of Gardar age are found over a wider area than the intrusive complexes. Olivine dolerites occur at least as far north as Frederikshåb Isblink and southwards to Kap Farvel.

The dykes are most numerous in three ENE-trending zones, through Ivigtut, Nunarssuit and Tugtutôq - Igaliko respectively. The dolerites are the most widespread and largest dykes; alkali dykes are generally thin and largely confined to the Ivigtut and Tugtutôq - Igaliko areas.

Anorthosite xenoliths in the dykes are widespread and occasionally make up 80% by volume of a dyke.

Bridgwater and Harry, in prep.
Upton, 1965 *

Samples:	Analysis No.	(Sample No.)			
comendite	8	(50187)	43	(44898)	
	11	(U-24)	53	(U-29)	
	12	(33511)	73	(61102)	
	22	(50136)	75	(45458)	
	23	(45537)	76	(61114)	
	24	(50345)	77	(U-20)	
	25	(50226)	82	(U-23)	
	26	(33506)	83	(U-22)	
rhomb-porphyry	40	(38186)	anorthosite 84	(50221)	
	41	(25350)	85	(40523)	
	42	(25183)	dolerite 90	(32364)	
			93	(45501)	

dolerite	94	(25194)
	95	(32369)
	102	(-)
lamprophyre (camptonite)	105	(45305)
	108	(U-21)
	118	(50853)
	120	(45202)
	122	(50069)
	123	(50071)
	124	(50070)
	125	(50068)
	126	(30653)

Gardar supracrustals

Intercalated basaltic lavas and sandstones with sills occur in the area between Ilímaussaq and Igaliko. The lower part of the succession is predominantly continental sandstones and in the upper part lavas dominate.

Extrusive rock types

Basalt is the dominant rock type in the extrusives that have been preserved. Among the basalts one trachytic flow has been identified and

there are a few trachytic sills (Stewart, 1964). However, the considerable development of olivine dolerite in the dyke swarms strongly suggests a preponderance of basaltic extrusives in any lavas these may have fed, with subsidiary trachytes. If the dykes were feeders, and if there is a direct relation between the volume of lava extruded and the aerial extent of the feeder dykes, the extruded rocks were predominantly basalts (70%) with lesser amounts of trachyandesitic and trachytic lavas, and only minor amounts of acid lava.

Former extent of the supracrustal rocks

The lavas and sediments occupy only a small area in the province. They are practically restricted to an area bounded by faults which have had a considerable vertical movement. The sandstone has been deposited in a basin. The northernmost sandstone exposures are believed to be close to the margin of this basin (Poulsen, 1964); volcanic breccias without sandstone fragments occur outside this area.

Xenoliths of basalt and sandstone have been identified in some of the Tugtutôq diatremes (Upton, 1962), and Pulvertaft and Upton (personal communications 1965) are now of the opinion that the raft zones of xenoliths in Nunarssuit and Kûngnât may well be Gardar supracrustal rocks.

Blocks of sandstone occur along the ice margin to the west and north, at least as far as Sermiligârssuk, suggesting that there are other basins of deposition to the north completely covered by ice.

These pieces of information, together with the great regional swarms of dykes, some of which may have reached the surface, suggest that the supracrustal rocks of sandstone and basalt may originally have been of much greater extent.

Ussing, 1912 *
Poulsen, 1964
Stewart, 1964, unpublished thesis * (map)

Samples: Analysis No. (Sample No.)

67 (50941)	96 (39941)	111 (40279)
91 (39340)	97 (39944)	

PLANIMETRIC STUDY

A planimetric estimate of the areas at present occupied by the various rock types in the Gardar province gives the provisional results in table 1 and fig. 2. There is a marked preponderance of nepheline syenite.

Table 1
Areal Extent of
the Principal Rock Types of the Gardar Province

	Area		
	km^2	%	%
†Supracrustal rocks			
Sediments	155.5	55.5	
Lavas	124.5	44.5	
	280	100	19
Plutonic rocks			
Granite	155	12.7	
Quartz syenite	15	1.2	
Syenite	385	31.5	
Nepheline syenite	428	35.1	
Gabbro *.....	157	12.9	
Agpaites	72	5.9	
Varia	9	0.7	
	1221	100	81
Total all rocks	1501		100

† There is an approximately equal thickness of sediments and volcanic rocks.

* Includes the NE-trending dyke swarm to the NE of Nunarssuit (52 km^2) and the Giant dykes of Tugtutôq (90 km^2); no attempt has been made to include dykes from other parts of the area.

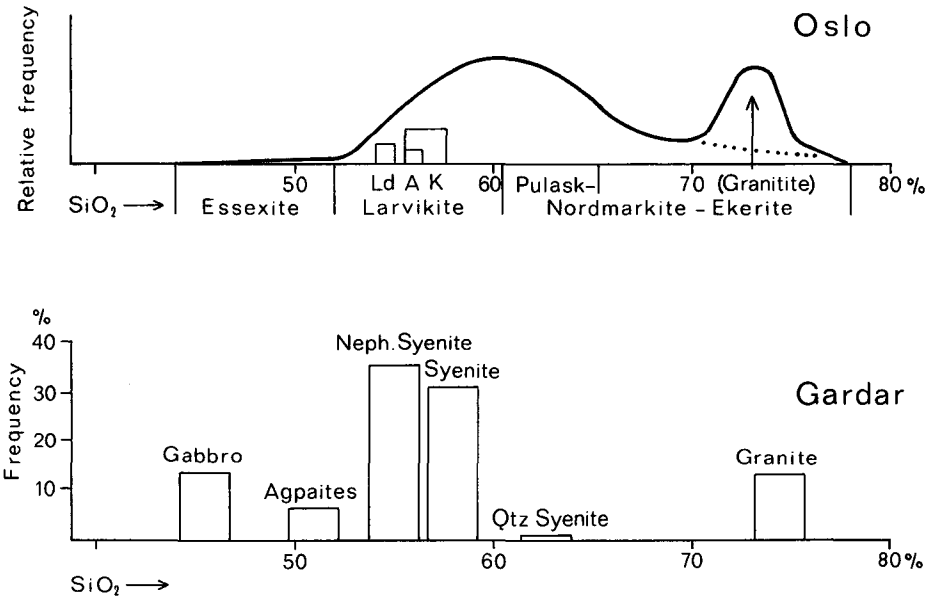

Fig. 2. Histogram of the relative abundance of the different intrusive rock types in the Gardar province. The frequency distribution of the Oslo subvolcanic rocks, as given by Barth (1945), is given for comparison. Ld = lardalite [nepheline syenite], A = akerite [augite syenite], K = kjeldsåsite [augite monzonite].

This is due to the large nepheline syenite intrusions of Igaliko. Areally this is matched by the Nunarssuit complex which has a large augite syenite component and much granite. Gabbro is practically confined to the giant dykes of Tugtutôq and the various dyke swarms; the Alángorssuaq gabbro forms only 3.5% of the total gabbro measured though it and the Narssaq gabbro are relatively early intrusions and the larger part of both may have been removed by later syenite intrusions. A planimetric estimate of the dykes has only been attempted on the Nunarssuit dyke swarm and the Tugtutôq giant dykes. The other large swarm is that trending ENE across Tôrnârssuk and to the north of Ivigtut: it is estimated at one third the area of the Nunarssuit swarm.

It is of interest to note the scarcity of rock types between quartz syenite and granite. The method of depicting the rock types on the frequency diagram accentuates the gap, the columns being drawn on the average SiO_2%

Table 2

Comparison of the Frequency of Rock Types in the Gardar Province with that in the Oslo Province

GARDAR	%	%	%	%	OSLO *
Sediments	10		20		Sedimentary rocks
Lavas	9		17		Volcanic rocks
		19		37	
Plutonic rocks					Plutonic rocks
Gabbro	12.9		0.3		Oslo-essexite [alkali gabbro]
-			5.0		Kjeldsåsite [augite monzonite]
Syenite	31.5		32.8		Larvikite [augite syenite]
Nepheline syenite	35.1		1.3		Lardalite [nepheline syenite]
Quartz syenite	1.2		28.0		Nordmarkite [quartz syenite]
Granite	12.7		16.1		Ekerite [ægirine granite]
			16.5		Granitite [biotite granite]
Agpaites	5.9				
Varia	0.7				
	100		100		
		81		63	

* Oslo figures from Barth (1945 & 1955).

of the rock type. A scarcity of similar rock types occurs in the Oslo province (fig. 2), but here the relative abundance of granite is explained by the presence of the later Drammen granite: no comparable later granite is known to occur in the Gardar, the Helene granite (which accounts for half of the granite area) being contemporaneous with the rest of the Nunarssuit complex.

Rock types between gabbro and syenite are also scarce. The agpaitic rocks are extreme differentiates whose mean silica percentage falls between figures for gabbro and syenite but the agpaites do not genetically belong here.

falls between the calcic ends of the two main syeno-gabbro Na - K - Ca curves on fig. 6 and on the extension of the $\sum$Fe - Mg - alk curves in the same figure; this dolerite has a Fe_2O_3/FeO ratio of 0.24 (the most reduced Gardar rock is the chill (30653) of the camptonite sill on Tugtutôq where the Fe_2O_3/FeO ratio is only 0.155). The dyke does, however, have a rather too high combined water content.

While an alkali basaltic parental magma is envisaged for the gabbroic rocks of the province and their obvious derivatives, it is not easy to explain the large undersaturated and saturated syenites of the province as derived by differentiation of such a magma. The quantity of gabbro in the province is small compared to the total amount of syenite and the large syenite masses are not obviously connected with gabbro.

Sørensen (1965) suggests that the Gardar rocks were developed by fractionation of an alkaline olivine basalt in deep crustal reservoirs. Upton (1960) earlier applied this to the Kûngnât intrusion, magma fractions being intruded to higher levels from a deep level reservoir that was tapped successively from the top downwards. This fractionation at depth led to a stratified reservoir with a lower part of olivine gabbro and an upper of syenitic magma.

Small amounts of alkali granite are associated with many of the intrusions. From the field evidence these may be explained as late differentiates. However, this explanation cannot be applied to the large granites - the Helene granite and Malenefjeld alkali granite.

The intrusions may be broadly divided into two; those with slightly undersaturated syenites containing nepheline (Igaliko, Grønnedal, Hviddal dyke of Tugtutôq) contrasting with those containing saturated to slightly oversaturated syenites (Kûngnât, Nunarssuit, Puklen, Tugtutôq central complex). Such a division is possibly explainable by high thermal barriers such as exist in the systems $NaAlSiO_4$ - FeO - SiO_2 (mentioned by Upton, 1960), $NaAlSiO_4$ - $KAlSiO_4$ - SiO_2 (suggested by Sørensen, 1965). The system Na_2O - Al_2O_3 - SiO_2 (Schairer and Bailey, 1962) is also relevant to this discussion.

VARIATION DIAGRAMS

Variation diagrams have been constructed with ionic weight percent at the apices. ($Fe^{''} + Fe^{'''}$) - Mg - alk and Na - K - Ca diagrams have been chosen to facilitate direct comparison with those of Nockolds and Allen (1954). The diagrams have been composed in different ways. Those of figs. 3 and 4 include all the Gardar analyses. In fig. 5 have been plotted the means of different rock types presented in table 3. Syeno-gabbro dykes only have been plotted in fig. 6 and here each line joins analyses from the same dyke.

The Na - K - Ca curves from all three diagrams are more or less coincident: the $\sum$Fe - Mg - alk family of curves from the syeno-gabbro dykes is slightly displaced towards the $\sum$Fe apex compared to the $\sum$Fe - Mg - alk curves in the other two diagrams.

The plots on the Na - K - Ca diagram (fig. 4) of all the analyses show considerable scattering about both the calcic and alkali ends. At the alkali end it is possible to construct two curves through the greatest concentration of points, one more soda-rich than the other, that correspond to saturated and undersaturated end members. This division into potash- and soda-rich members is also present in the diagram of the mean analyses (fig. 5) but is not so apparent as the soda-rich (undersaturated) members are represented by a single point. Whether the curves represent two distinct magma series, which cannot be distinguished at the basic end, or whether it represents a single parental magma that differentiated along two different paths is not determinable on the present evidence.

The syeno-gabbro dykes of the Isortoq area and Tugtutôq illustrate the differentiation of an initial gabbroic magma (fig. 6). Each line joins analyses from the same dyke. The dykes clearly form a family but differ from each other to a slight extent.

Upton (1965) has argued that the parental alkali basalts of the Tugtutôq area were intruded in a reduced condition. Several other analyses of gabbros show the iron in a considerably reduced condition. The basic end of the curves in figs. 3, 4 and 5 is believed to be close to the Gardar parental magma. The analysis of the sample 20632 (analysis no. 112) from the dolerite part of the Eqaloqarfia dyke (Pulvertaft, 1965) probably most closely represents the parental magma for the following reasons: the plot of the analysis

Table 3

Mean Analyses of Gardar Rock Types

	Granite	Qz Syenite	Microsyenite	Syenite	Syeno-gabbro 1
SiO_2	73.98	63.77	61.48	58.26	56.89
TiO_2	0.30	0.75	0.74	1.31	1.32
Al_2O_3	11.91	15.73	14.43	16.45	15.53
Fe_2O_3	1.59	2.07	3.95	1.52	2.77
FeO	1.75	4.01	4.65	5.70	6.05
MnO	0.06	0.15	0.20	0.15	0.18
MgO	0.07	0.33	0.30	0.87	0.84
CaO	0.59	1.60	1.62	3.48	3.33
Na_2O	4.46	5.52	6.46	5.52	5.92
K_2O	4.81	5.39	4.72	5.01	5.17
P_2O_5	0.04	0.14	0.14	0.37	0.36
CO_2	0.03	0.06	0.59	0.87	0.83
H_2O^+	0.41	0.48	0.71	0.49	0.81

Granite	mean of 6 analyses. Nos. 1 to 3 & 5 to 7.
Quartz Syenite	mean of 6 analyses. Nos. 16 to 21.
Microsyenite	mean of 5 analyses. Nos. 22 to 26.
Syenite	mean of 13 analyses. Nos. 27 to 39.
Syeno-gabbro 1	mean of 3 analyses in the syenitic range. Nos. 44 to 46.

Table 3 cont.

Mean Analyses of Gardar Rock Types cont.

	Nepheline Syenite	Syeno-gabbro 2	Gabbro plus norm. neph.	Gabbro minus norm. neph.
SiO_2	54.76	50.16	45.95	47.08
TiO_2	0.80	2.97	2.81	2.06
Al_2O_3	18.74	14.63	16.50	16.12
Fe_2O_3	3.55	3.36	3.12	4.68
FeO	4.03	9.18	10.29	9.00
MnO	0.17	0.20	0.17	0.18
MgO	0.52	2.64	5.73	6.13
CaO	2.46	6.35	7.97	8.79
Na_2O	7.81	5.01	3.90	3.09
K_2O	5.44	3.28	1.35	0.97
P_2O_5	0.22	1.19	0.87	0.35
CO_2	0.32	-	0.04	0.02
H_2O^+	1.17	1.03	1.30	1.53

Nepheline syenite mean of 19 analyses. Nos. 47 to 69 minus dyke rocks, nos. 54, 57, 63 & 67.

Syeno-gabbro mean of 3 analyses in the gabbroic range. Nos. 69, 86 & 87.

Gabbro with normative nepheline mean of 21 analyses.

Gabbro without normative nepheline mean of 8 analyses.

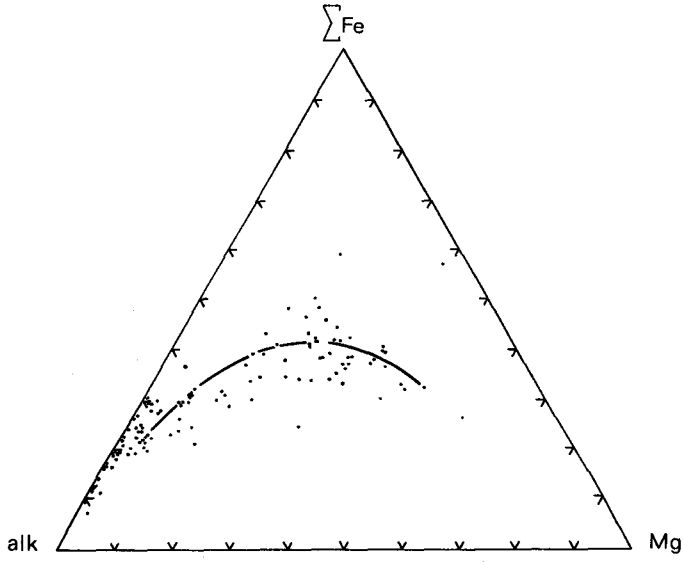

Fig. 3. Variation diagram based on 125 analyses of Gardar rocks. The smooth curve drawn through the points approximately represents the generalized trend of differentiation.

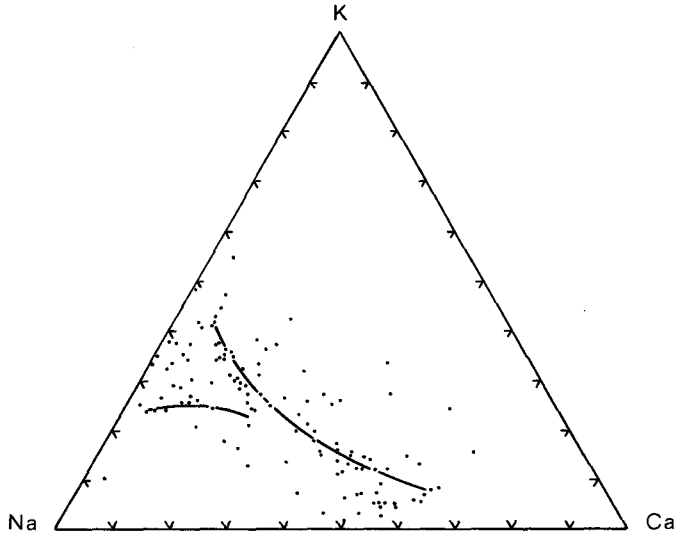

Fig. 4. Variation diagram based on 125 analyses of Gardar rocks. The smooth curve drawn through the points approximately represents the generalized trend of differentiation.

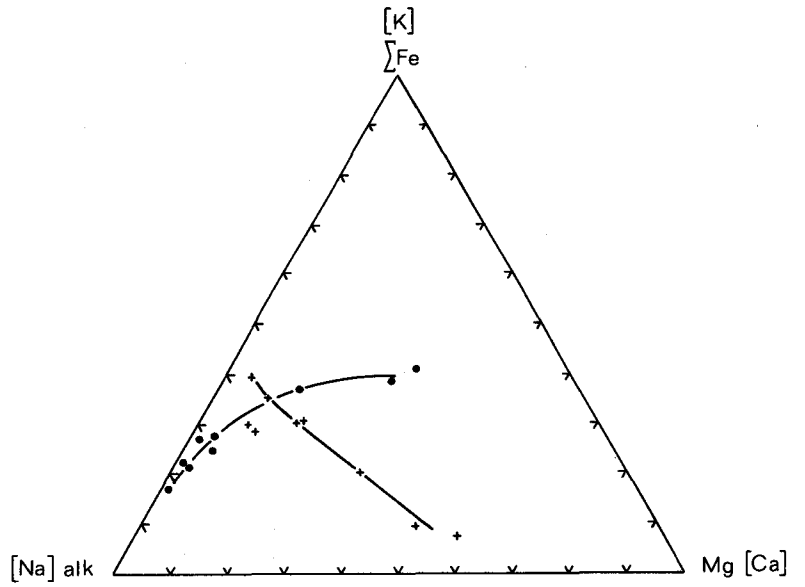

Fig. 5. A variation diagram of the means of the Gardar analyses (table 3).

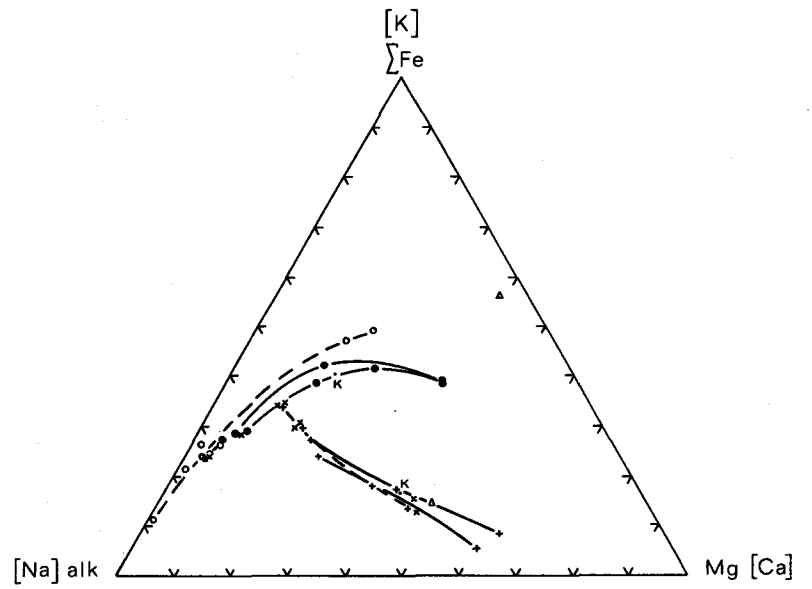

Fig. 6. Variation diagram of analyses from Gardar syeno-gabbro dykes. Dashed line (open circles & diagonal crosses) Hviddal composite dyke of Tugtutôq; solid lines (filled circles & upright crosses) dykes in the Isortoq area. K = Krudssø syeno-gabbro; triangles = a cumulate from Isortoq.

COMPARISON WITH OTHER PETROGRAPHIC PROVINCES

The majority of publications on the Gardar until now have been on individual intrusions, and many of these papers have presented only maps and petrographic descriptions. Thus, when comparisons have been made with rocks of other provinces, the comparisons have applied only to individual intrusions of the Gardar, or even only to individual members of an intrusion, and have been based largely on petrography. However similar individual Gardar intrusions may be to intrusions in other provinces, the similarities need not extend to the province as a whole.

There are other criteria by which the Gardar province as a whole may be compared with other provinces, for example, areal percentage and variation diagrams. A few of the more common comparisons will now be looked at using these criteria.

Certain granite members of individual Gardar intrusions are petrographically similar to the granites of New England and Nigeria. A variation diagram of the White Mountain magma series of New England is given as fig. 7a and is drawn on the same coordinates as the variation diagrams for the Gardar (figs. 2 - 6). The White Mountain magma series has a flat $\sum$Fe - Mg - alk curve, i.e. a very constant Fe: Me ratio, while the Gardar has an arched curve. The areal proportions of the different rock types is also markedly different. The Gardar province consists dominantly of saturated and undersaturated syenites (table 1 and fig. 2) while the New England province is dominantly alkali granite (granite and granite porphyry 70%).

Frequent comparisons have been made between the Gardar and the Oslo igneous province. The areal extent of the dominant plutonic rocks in the Oslo province is given in table 2 and fig. 2. These show that a striking difference between these provinces is the much greater areal extent of nepheline syenite in the Gardar. Rhomb-porphyry lavas (trachyandesitic) are the dominant extrusives in the Oslo area. Rhomb-porphyry dykes occur in the Gardar, but no estimate of the original extent and composition of corresponding extrusives can be given.

The variation diagram for the Oslo rocks (constructed from mean analyses calculated by Brøgger, 1933) (fig. 7b) has similar flat curves to that for the White Mountain magma series and contrasts with that of the

Gardar. The Oslo curves indicate a fairly constant Fe: Mg ratio with considerably less total iron than in the Gardar.

The similarity between the alkali granite of Ilímaussaq and certain riebeckite-bearing granites of the Ampasindava alkaline province has been pointed out by Hamilton (1964). The Ampasindava province, situated about the peninsula of that name in northern Madagascar, consists largely of saturated alkali syenites and granites with only minor amounts of nepheline syenite and gabbro (Nosy-Komba) (Lacroix, 1922; Donnot, 1963). The variation diagram (fig. 7d) shows the province to have the least total iron percentage of the provinces examined, and considerably less than the Gardar.

Thus the variation diagrams for provinces which have been most often mentioned in comparisons with the Gardar are not like those of the Gardar, nor are the areal percentages of the exposed rocks similar. In view of this it might be asked just what are the most useful means of comparing igneous provinces. A search for general similarities in geological and geochemical phenomena throughout the world is an essential part in the course of discovering the underlying geological processes. However, it would be unwise to point to similarities hastily on the basis of only one approach as misleading comparisons may result.

The approach in this paper has an important limitation in that the analyses are dominated by the coarse rock types, though it is believed that the main outline is correct and only minor details will be changed with further work. The plots in the Na - K - Ca diagram (fig. 4) suggest that there might be two series, an undersaturated and a saturated. Considerably more work is required to determine where these diverge or, if they run parallel, to distinguish them.

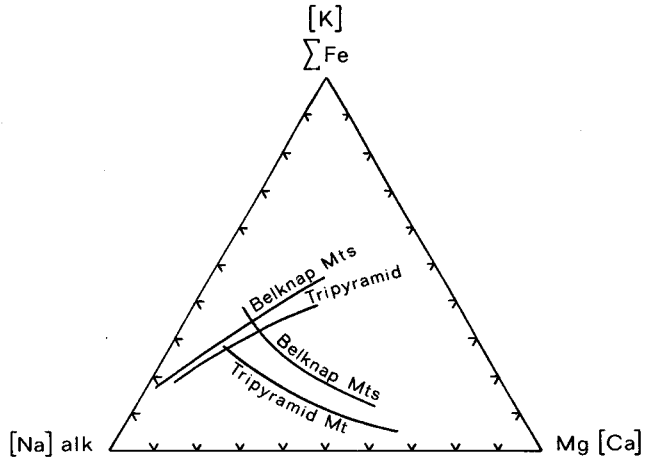

Fig. 7a. Variation diagram of the White Mountain magma series, New Hampshire. The diagram is constructed from analyses from Chapman and Williams (1935).

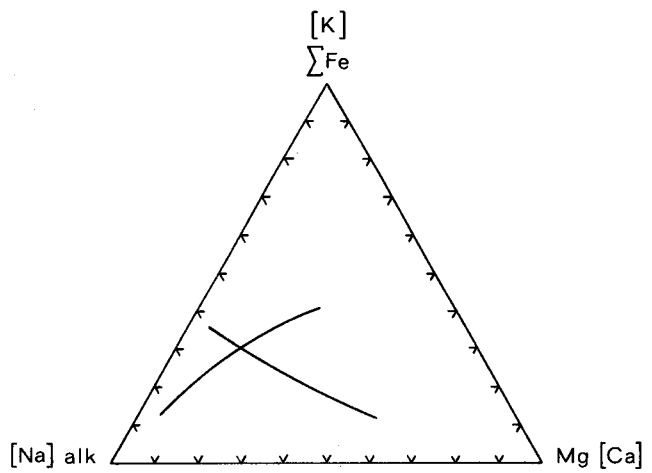

Fig. 7b. Variation diagram of the Oslo igneous province. The diagram is constructed from means compiled by Brøgger (1933).

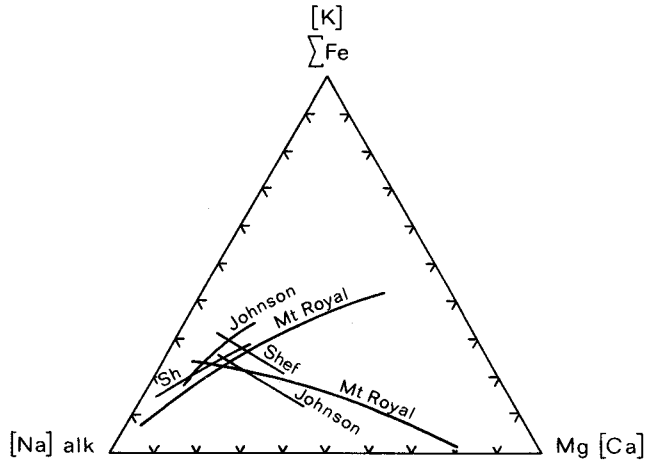

Fig. 7c. Variation diagram for three of the igneous centres of the Monteregian Hills igneous province. The lines join analyses from the same intrusion. The analyses from the compilation by Faessler (1962)

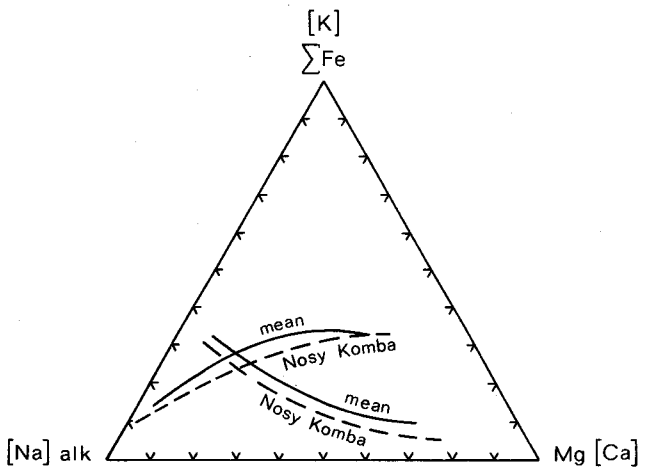

Fig. 7d. Variation diagram of the Ampasindava alkaline igneous province of northern Madagascar. The diagram is constructed from the means of groups of analyses given by Lacroix (1922) and joined by a smooth curve. The dashed line is drawn through the points for the available analyses of the Nosy-Komba intrusion.

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Gardar province, South Greenland

* contains chemical analyses

† contains trace element data

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TABLES OF ANALYSES

The analyses are grouped approximately according to rock type and decreasing silica content. The name given to a rock is that assigned by the collector or author of the published analysis; all amendements to this are given in square brackets.

The name of the sample localities are the modern names. Where these names differ to those originally published, the latter are given in square brackets.

C. I. P. W. weight norms have been calculated by the compiler with the exception of those marked § which are quoted from the original publication without recalculation.

The following abbreviations have been used in the tables:

n. d.	radical or element not determined
nil	radical or element not detected
tr	trace

	1	2	3	4	5	6	7	8
	26272	30268	61851	26498	C - 5	30173	20679	50187
SiO_2	76.33	72.31	71.18	69.14	68.92	74.72	74.66	75.85
TiO_2	0.14	0.57	0.31	0.32	0.32	0.28	0.23	0.32
Al_2O_3	12.54	10.28	11.94	12.39	14.81	12.55	11.32	10.47
Fe_2O_3	0.73	3.64	2.05	4.46	1.83	0.33	1.27	2.27
FeO	0.89	2.38	2.30	2.52	2.43	1.61	1.17	2.44
MnO	0.02	0.06	0.11	0.13	0.07	0.04	0.05	0.07
MgO	0.00	0.00	0.1	0.03	0.08	0.22	0.00	0.00
CaO	0.00	0.75	0.63	0.05	0.46	0.87	0.97	0.29
Na_2O	4.92	4.80	4.46	5.75	5.61	3.59	4.10	5.04
K_2O	4.06	4.80	5.21	4.42	5.29	5.00	5.30	2.71
P_2O_5	0.00	0.06	0.05	0.03	tr	0.09	0.04	0.02
CO_2	-	0.00	0.00	-	0.00	0.19	0.00	-
H_2O^+	0.11	0.62	0.81	0.49	0.10	0.48	0.42	0.26
H_2O^-	0.05	*	0.04	0.06	0.03	0.01	*	0.09
ZrO_2	-	-	-	-	0.17	-	-	-
BaO	-	-	0.0 †	-	0.06	-	-	-
S	-	-	-	-	0.01	-	-	-
F	-	nil	-	-	-	0.21	nil	-
	99.79	100.27	99.19	99.79	100.19	100.19	99.53	99.83
O for F						0.09		
						100.10		

	1	2	3	4	5	6	7	8
	26272	30268	61851	26498	C - 5	30173	20679	50187
Q	31.8	27.9	24.2	19.8	14.5	32.7	30.8	35.4
or	24.0	28.4	30.8	26.1	31.3	29.6	31.3	16.0
ab	41.6	26.0	32.3	39.0	46.6	30.3	28.6	38.7
an	-	-	-	-	-	1.6	-	-
ac	-	10.5	4.7	8.4	0.7	-	3.7	3.5
ns	-	0.6	-	-	-	-	0.4	-
C	-	-	-	-	-	0.6	-	-
di	-	3.3	2.8	-	2.0	-	3.3	1.3
wo	-	-	-	-	-	-	0.5	-
hy	0.8	1.7	2.1	2.8	1.8	2.8	-	2.4
mt	1.1	-	0.6	2.3	2.3	0.5	-	1.6
il	0.3	1.1	0.6	0.6	0.6	0.5	0.4	0.6
fr	-	-	-	-	-	0.8	-	-

1 26272 Riebeckite astrophyllite granite. Kûngnât.
2 30268 Soda granite. Nunarssuit.
3 61851 Alkali granite. Narssaq.
4 26498 Grorudite. Kûngnât.
5 C - 5 Arfvedsonite granite. Kûngnât.
6 30173 Biotite granite. Alángorssuaq.
7 20679 Granite (Helene granite). Nunarssuit.
8 50187 Comendite, chilled facies of dyke. Tugtutôq.

* Analysis on sample dried at 110°C for 2 hours.
† BaO $< 0.02\%$

	9	10	11	12	13	14	15	16
	38950	61848	U - 24	33511	38942	15654	25351	40589
SiO_2	74.2+	73.98	73.68	73.28	72.7+	72.6+	65.52	66.45
TiO_2	0.1	0.37	0.57	0.52	0.1	0.2	0.67	0.34
Al_2O_3	13.7	11.39	11.05	9.33	13.9	13.6	12.80	15.89
Fe_2O_3	0.0	4.72	3.93	4.40	0.2	0.7	1.08	1.03
FeO	1.3	1.15	1.45	2.52	1.8	2.3	4.58	3.07
MnO	0.0	0.15	tr	0.14	0.1	0.1	0.11	0.12
MgO	0.2	0.06	nil	0.30	0.1	0.2	2.21	0.00
CaO	0.8	0.72	0.48	0.16	1.0	0.8	3.54	0.89
Na_2O	4.0	3.00	5.20	4.40	4.1	3.3	5.80	6.03
K_2O	4.9	3.63	4.05	4.15	4.9	5.1	2.61	5.49
P_2O_5	0.0	0.03	nil	0.00	0.0	0.0	0.31	0.02
CO_2	0.0	0.00	-	-	1.0	-	nil	0.00
H_2O^+	0.0	0.83	0.08	0.85	0.1	0.6	1.07	0.31
H_2O^-		0.07	0.17	0.07			*	0.07
ZrO_2	-	-	0.24	-	-	-	-	-
BaO	-	0.0†	-	-	-	-	-	-
Cl	-	-	tr	-	-	-	-	-
	99.2	100.10	100.90	100.12	100.0	99.5	100.30	99.71

	9	10	11	12	13	14	15	16
	38950	61848	U - 24	33511	38942	15654	25351	40589
Q	29.1	41.0	29.2	32.6	28.5	30.4	12.0	7.5
or	29.0	21.5	23.9	24.5	29.0	30.2	15.5	32.5
ab	33.8	25.4	34.2	24.8	34.6	27.9	49.0	51.0
an	4.0	3.6	-	-	-	4.0	1.2	-
C	0.4	1.2	-	-	1.9	1.2	-	-
Z	-	-	0.4	-	-	-	-	-
ac	-	-	8.6	10.9	-	-	-	-
wo	-	-	0.2	-	-	-	-	-
di	-	-	1.7	0.7	-	-	11.9	3.9
hy	2.9	0.2	-	3.6	3.6	3.8	6.0	2.1
mt	-	3.1	1.4	0.9	-	1.0	1.6	1.5
il	-	0.7	1.1	1.0	-	0.4	1.3	0.7
ap	-	-	-	-	-	-	0.7	-
hm	-	2.6	-	-	-	-	-	-

9	38950	Granophyre. Tôrnâssuk.
10	61848	Quartz porphyry. Narssaq.
11	U - 24	Comendite (quartz-porphyry). Ilímaussaq.
12	33511	Comendite. Ilímaussaq.
13	38942	Granophyre. Tôrnârssuk.
14	15654	Granophyre. Sermersût.
15	25351	Granitic vein. Eqalugssuit taserssuat, (Isortoq area).
16	40589	Quartz syenite (alkali granite). Unit 4 ring-dyke, Tugtutôq.

* Analysis on sample dried at 110°C for 2 hours.

† BaO < 0.02%

\+ Rapid analysis.

	17	18	19	20	21	22	23	24
	50272	50845	40354	50216	50843	50136	45537	50345
SiO_2	65.62	64.48	61.86	60.64	60.45	64.22	61.1	60.75
TiO_2	0.31	0.62	1.00	0.99	1.18	0.73	0.7	1.05
Al_2O_3	15.72	15.57	15.01	15.37	16.05	12.87	13.7	15.28
Fe_2O_3	1.33	3.28	3.96	1.36	1.31	3.57	4.4	1.63
FeO	3.21	3.74	3.51	5.49	4.86	4.18	4.8	6.17
MnO	0.13	0.15	0.17	0.15	0.15	0.19	0.2	0.20
MgO	0.02	0.09	0.59	0.42	0.89	0.00	0.0	0.63
CaO	0.68	0.82	1.71	3.05	2.40	1.21	2.1	2.19
Na_2O	6.03	5.43	5.01	5.15	5.17	4.93	7.1	5.18
K_2O	4.93	5.41	5.35	5.35	5.54	6.03	4.4	5.54
P_2O_5	0.02	0.06	0.20	0.20	0.33	0.06	0.0	0.25
CO_2	n.d.	0.00	0.00	0.36	0.00	1.14	0.2	n.d.
H_2O^+	0.36	0.36	0.53	0.71	0.60	0.59	0.5	0.82
H_2O^-	0.10	0.18	0.14	0.12	0.20	0.13	*	0.21
BaO	-	0.0†	0.07	-	0.29	n.d.	-	-
	98.46	100.19	99.11	99.36	99.42	99.85	99.2	99.90

	17	18	19	20	21	22	23	24
	50272	50845	40354	50216	50843	50136+	45537	50345
Q	8.8	9.2	8.2	2.6	2.1	11.8	0.7	1.8
or	29.1	32.0	31.6	31.6	32.8	35.6	26.0	32.8
ab	51.0	45.9	42.3	43.5	43.7	32.5	45.8	43.8
an	1.2	2.1	2.6	3.0	4.2	-	-	2.1
ac	-	-	-	-	-	8.0	12.5	-
di	1.9	4.4	4.9	8.7	4.8	-	8.2	7.7
hy	3.4	-	0.9	4.1	5.9	6.2	3.6	6.2
mt	1.9	4.8	5.8	2.0	1.9	1.1	0.1	2.4
il	0.6	1.2	1.9	1.9	2.3	1.4	1.3	2.0
ap	-	-	-	-	0.8	-	-	-

17	50272	Quartz syenite. Unit 5 ring-dyke, Tugtutôq.
18	50845	Quartz ænigmatite syenite. Narssaq.
19	40354	Augite syenite (Dyrnæs syenite). Narssaq.
20	50216	Quartz syenite. Assorutit intrusion, Tugtutôq.
21	50843	Augite syenite (Sermilik syenite). Narssaq.
22	50136	Porphyritic microsyenite dyke, chilled facies. Tugtutôq.
23	45537	Spherulitic riebeckitic trachyte. Qaersuarssuk.
24	50345	Microsyenite. Unit 1, central complex, Tugtutôq.

* Analysis on sample dried at 110°C for 2 hours.

† BaO < 0.02%

\+ CO_2 > available CaO for sec. cc - excess CO_2 ignored.

	25	26	27	28	29	30	31	32
	50226	33506	27647	31095	C - 4	30893	39415	30339
SiO_2	60.42	60.23	62.98	61.17	60.42	59.48	59.35	59.13
TiO_2	0.98	0.28	0.38	1.04	0.57	0.95	1.15	1.06
Al_2O_3	16.55	13.62	16.45	16.10	18.24	15.12	18.10	16.90
Fe_2O_3	2.66	7.47	1.07	2.00	0.60	2.27	0.28	1.45
FeO	3.91	4.17	3.73	4.37	4.69	6.25	4.85	5.16
MnO	0.17	0.28	0.09	0.16	0.09	0.17	0.11	0.15
MgO	0.63	0.28	0.11	0.66	0.48	0.76	0.70	0.76
CaO	1.87	0.74	2.52	2.69	2.51	3.26	2.85	3.75
Na_2O	5.36	9.65	5.94	5.40	5.76	5.56	5.67	5.70
K_2O	5.84	1.76	6.09	5.60	5.71	5.45	5.00	5.00
P_2O_5	0.29	0.13	0.05	0.34	0.15	0.21	0.35	0.45
CO_2	0.44	-	n.d.	0.00	0.34	0.00	0.55	0.00
H_2O^+	0.78	0.90	0.40	0.72	0.21	0.60	1.08	0.32
H_2O^-	0.19	0.05	0.26	*	0.15	*	0.04	*
BaO	0.12	-	tr	-	0.18	-	-	-
S	0.04	-	-	-	0.05	-	-	-
F	-	-	0.07	nil	-	nil	-	nil
	100.25	99.56	100.14	100.25	100.15†	100.08	100.08	99.83
O for S & F	0.01‡		0.03		0.03			
	100.24		100.11		100.12			

	25	26	27	28	29	30	31	32
	50226	33506	27647	31095	C - 4	30893	39415	30339
Q	2.5	-	-	2.1	-	-	-	-
or	34.5	10.4	36.0	33.1	33.8	32.3	29.6	29.6
ab	45.3	58.9	50.1	45.6	46.6	43.9	48.0	46.2
an	3.8	-	0.2	3.1	7.0	0.1	8.4	5.7
ne	-	0.7	0.1	-	1.1	1.7	-	1.1
C	-	-	-	-	-	-	0.3	-
ac	-	18.9	-	-	-	-	-	-
di	0.7	3.2	10.5	6.9	2.9	13.9	-	8.6
hy	4.9	-	-	3.1	-	-	6.6	-
ol	-	4.5	0.1	-	5.2	2.3	1.5	3.3
mt	3.9	1.4	1.6	2.9	0.9	3.3	0.4	2.1
il	1.9	0.5	0.7	2.0	1.1	1.8	2.2	2.0
ap	0.7	-	-	0.8	-	-	0.8	1.1
fr	-	-	0.3	-	-	-	-	-

25	50226	Porphyritic microsyenite dyke, centre. Tugtutôq.
26	33506	"soda-syenite" A dyke . Ilímaussaq.
27	27647	Syenite, western lower unlaminated group. Kûngnât.
28	31095	Syenite (Nunarssuit syenite). Nunarssuit.
29	C - 4	Augite hornblende syenite. Kûngnât.
30	30893	Syenite (Nunarssuit syenite). Nunarssuit.
31	39415	Syenite (Kitsigsut syenite, pale variety). Nunarssuit.
32	30339	Syenite (Kitsigsut syenite). Nunarssuit.

* Analysis on sample dried at 110°C for 2 hours.

† ZrO_2 = 0.00.

‡ Not quoted in original.

	33	34	35	36	37	38	39	40
	U - 17	20609	39470	39458	26135	26005	61856	38186
SiO_2	58.17	58.07	58.00	57.41	57.24	55.92	55.8	58.85
TiO_2	2.09	1.18	1.62	1.60	1.68	2.18	1.6	1.25
Al_2O_3	16.07	16.01	17.05	17.22	17.14	14.22	16.9	15.05
Fe_2O_3	1.30	1.23	1.70	1.69	2.74	1.60	2.0	2.81
FeO	5.04	7.28	6.25	6.25	4.32	10.36	6.1	5.72
MnO	0.07	0.17	0.16	0.15	0.11	0.29	0.2	0.16
MgO	1.20	0.76	0.86	1.03	1.55	0.75	1.8	1.13
CaO	3.42	4.06	3.52	4.13	3.95	3.83	5.1	2.92
Na_2O	7.41	5.70	5.50	5.20	4.56	4.98	4.9	4.35
K_2O	4.65	4.20	4.50	4.36	6.02	4.86	4.2	5.55
P_2O_5	0.42	0.37	0.45	0.49	0.30	0.54	0.7	0.39
CO_2	nil	0.00	0.12	0.14	0.00	n.d.	0.0	-
H_2O^+	0.41	0.38	0.44	0.41	0.20	0.54	0.7	1.01
H_2O^-	0.19	*	0.04	0.12	0.21	0.13	*	0.14
ZrO_2	-	-	-	-	-	-	0.0+	0.07
BaO	-	-	-	-	0.06	0.18	0.0+	-
SrO	-	-	-	-	-	-	0.1+	-
S	‡	-	-	-	0.09	-	-	-
F	-	nil	-	-	-	0.22	-	-
	100.44	99.41	100.21	100.20	100.17	100.60	100.1	99.40
O for S & F					0.03†	0.09		
					100.14	100.51		

	33	34	35	36	37	38	39	40
	U - 17	20609	39470	39458	26135	26005	61856	38186
Q	-	-	-	-	-	-	-	4.0
or	27.5	24.9	26.6	25.8	35.6	28.8	24.9	32.8
ab	40.2	47.0	46.5	44.0	37.1	41.2	41.4	36.8
an	-	5.7	8.5	10.7	8.5	2.1	11.7	5.1
ne	8.9	0.7	-	-	0.8	0.5	-	-
ac	3.7	-	-	-	-	-	-	-
ns	0.4	-	-	-	-	-	-	-
di	12.0	10.5	4.5	4.9	7.5	10.8	7.7	5.9
hy	-	-	4.4	6.2	-	-	1.1	6.3
ol	2.0	5.7	2.4	1.2	2.1	8.3	5.1	-
mt	-	1.8	2.5	2.5	4.0	2.3	2.9	4.1
il	4.0	2.3	3.1	3.0	3.2	4.2	3.0	2.4
ap	1.0	0.9	1.1	1.2	0.7	1.3	1.7	0.9
fr	-	-	-	-	-	0.8	-	-
pr	-	-	-	-	0.3	-	-	-

33 U - 17 Nordmarkite syenite . Narssaq
34 20609 Syenite (Nunarssuit syenite). Nunarssuit.
35 39470 Pegmatite syenite (Kitsigsut syenite). Nunarssuit.
36 39458 Syenite (Kitsigsut syenite, dark variety). Nunarssuit.
37 26135 Syenite, eastern border group. Kûngnât.
38 26005 Syenite, western lower layered series. Kûngnât.
39 61856 Black larvikitic syenite. Narssaq.
40 38186 Rhomb-porphyry, margin of big feldspar dyke. Ujarasugssuk (Isortoq area).

* Analysis on sample dried at 110°C for 2 hours.
\+ Determined by X-ray.
‡ Cl and SO_3 given as nil.
† Not quoted in original.

	41	42	43	44	45	46	47	48
	25350	25183	44898	25114	61267	61133	50241	30640
SiO_2	58.13	58.07	57.57	57.45	57.06	55.15	58.53	57.51
TiO_2	1.28	1.30	1.50	1.36	0.99	1.58	0.71	0.54
Al_2O_3	16.70	16.34	14.61	15.41	15.43	15.47	17.42	16.54
Fe_2O_3	2.22	2.70	1.53	4.07	2.35	1.84	3.08	4.32
FeO	4.51	4.27	7.49	5.03	5.36	7.64	4.56	4.56
MnO	0.14	0.16	0.23	0.18	0.16	0.19	0.17	0.20
MgO	1.72	1.42	1.33	0.75	0.54	1.20	0.47	0.27
CaO	4.54	3.53	3.35	3.48	2.38	4.06	2.43	2.37
Na_2O	4.99	4.58	4.54	5.73	6.00	5.90	5.82	6.15
K_2O	3.84	5.62	4.92	4.97	5.80	4.65	5.74	5.89
P_2O_5	0.39	0.58	0.53	0.39	0.20	0.50	0.16	0.10
CO_2	nil	-	-	nil	2.5	0.0	n.d.	0.00
H_2O^+	0.94	0.79	1.50	0.90	0.54	1.00	0.64	1.19
H_2O^-	*	0.08	0.32	*	*	*	0.08	0.20
ZrO_2	-	0.06	0.05	-	-	-	-	-
	99.40	99.50	99.47	99.72	99.31	99.18	99.81	99.84

	41	42	43	44	45	46	47	48
	25350	25183	44898	25114	61267+	61133	50241	30640
Q	2.9	1.6	1.8	-	-	-	-	-
or	22.7	33.3	29.1	29.4	34.3	27.5	34.0	34.9
ab	42.2	38.7	38.4	45.6	44.2	37.1	42.4	39.6
an	11.8	7.4	4.9	1.6	-	2.0	4.4	0.1
ne	-	-	-	1.5	1.5	6.9	3.7	6.7
ac	-	-	-	-	3.3	-	-	-
di	6.9	5.3	7.1	11.2	-	12.9	6.6	9.5
wo	-	-	-	-	-	-	-	0.3
hy	5.4	4.7	10.1	-	-	-	-	-
ol	-	-	-	0.1	6.9	5.0	2.0	-
mt	3.2	3.9	2.2	5.9	1.7	2.7	4.5	6.3
il	2.4	2.5	2.9	2.6	1.9	3.0	1.4	1.0
ap	0.9	1.4	1.2	0.9	-	1.2	-	-

41	25350	Larvikitic syenite dyke, centre. Eqalugssuit taserssuat (Isortoq area).
42	25183	Rhomb-porphyry dyke, Eqalugssuit taserssuat (Isortoq area).
43	44898	Alkali big feldspar dyke, margin. Isortoq.
44	25114	Syeno-gabbro dyke. Isortoq.
45	61267	Syenitic end of syeno-gabbro dyke, centre. Isortoq.
46	61133	Syeno-gabbro dyke. Kûtsiaq.
47	50241	Nepheline syenite, Hviddal composite dyke. Tugtutôq.
48	30640	Nepheline syenite, Hviddal composite dyke. Tugtutôq.

* Analysis on sample dried at 110°C for 2 hours.

\+ $CO_2 >$ available CaO for sec. cc - excess CO_2 ignored.

	49	50	51	52	53	54	55	56
	30743	30714	30676	C - 3	U - 29	48317	C - 2	27137
SiO_2	57.03	56.53	56.48	56.65	56.90	56.07	55.65	55.60
TiO_2	1.14	1.29	0.09	0.21	1.09	0.68	0.15	0.33
Al_2O_3	17.48	16.61	20.05	20.98	16.34	17.50	19.79	18.79
Fe_2O_3	1.97	1.66	3.86	2.58	3.61	3.89	4.98	2.06
FeO	5.54	7.10	0.77	2.19	5.72	3.57	3.03	6.27
MnO	0.16	0.19	0.10	0.09	tr	0.18	0.15	0.20
MgO	0.68	0.83	0.05	0.53	0.22	0.66	0.52	0.49
CaO	3.28	3.41	1.16	1.41	2.21	2.77	1.40	0.10
Na_2O	5.84	5.98	10.37	7.54	8.10	6.93	7.60	5.67
K_2O	5.00	5.22	5.42	6.64	4.96	5.37	5.27	8.15
P_2O_5	0.29	0.36	0.02	0.13	0.17	0.22	0.22	0.00
CO_2	n.d.	n.d.	n.d.	0.10	n.d.	nil	0.28	0.30
H_2O^+	1.59	0.94	1.65	0.83	1.10	2.21	0.82	1.23
H_2O^-	*	0.08	*	0.11	0.08	*	0.04	0.14
ZrO_2	-	-	-	0.06	-	-	tr	0.05
BaO	-	-	-	0.12	-	-	0.09	0.02
S	0.06	0.08	0.02	0.02	-	-	0.03	0.05
Cl	0.01	0.02	0.14	-	tr	-	-	0.10†
	100.07	100.30	100.18	100.19	100.50	100.05	100.02	99.55
O for S & Cl	0.02	0.03	0.05					
	100.05	100.27	100.13					

	49	50	51	52	53	54	55	56
	30743	30714	30676	C - 3	U - 29	48317	C - 2	27137
or	29.6	30.9	32.1	39.3	29.4	31.8	31.2	48.2
ab	41.7	37.3	24.5	29.3	30.2	36.8	40.1	25.0
an	6.7	3.0	-	3.8	-	0.8	3.8	0.5
ne	4.2	7.2	26.2	18.6	14.1	11.8	13.1	10.5
hl	-	-	0.2	-	-	-	-	-
nc	-	-	-	-	-	-	-	0.7
C	-	-	-	-	-	-	0.2	1.1
ac	-	-	11.1	-	10.4	-	-	-
ns	-	-	0.3	-	0.1	-	-	-
di	6.7	10.1	2.7	2.2	9.7	8.0	-	-
wo	-	-	1.2	-	-	1.4	-	-
ol	3.9	5.0	-	1.3	3.2	0.1	2.1	8.3
mt	2.9	2.4	-	3.7	-	5.6	7.2	3.0
il	2.2	2.5	-	0.4	2.1	1.3	0.3	0.6
ap	0.7	0.8	-	-	-	-	0.5	-
pr	-	0.2	-	-	-	-	-	-

49	30743	Nepheline syenite, Hviddal composite dyke. Tugtutôq.
50	30714	Nepheline syenite, Hviddal composite dyke. Tugtutôq.
51	30676	Foyaitic syenite, eastern Hviddal composite dyke. Tugtutôq.
52	C - 3	Foyaite. Grønnedal - Íka complex.
53	U - 29	Hedrumite. Igaliko.
54	48317	Nepheline syenite dyke with anorthosite fragments. Igaliko Fjord.
55	C - 2	Nepheline syenite porphyry. Grønnedal - Íka complex.
56	27137	Nepheline syenite. Grønnedal - Íka complex.

* Analysis on sample dried at 110°C for 2 hours.

† Quoted as Cl_2 not Cl.

	57	58	59	60	61	62	63	64
	45457	U - 28	27099	30681	U - 25	27182	60037	U - 27
SiO_2	54.85	54.58	54.57	54.17	53.53	52.80	51.77	51.31
TiO_2	0.44	0.62	0.44	0.37	0.44	0.25	2.43	1.20
Al_2O_3	17.04	20.43	16.94	19.34	19.69	17.92	15.35	21.54
Fe_2O_3	4.66	2.08	6.22	6.00	5.09	4.60	3.95	3.68
FeO	4.36	3.39	1.98	1.86	2.83	3.55	6.25	3.37
MnO	0.20	tr	0.26	0.17	0.24	0.25	0.19	0.41
MgO	0.25	tr	0.80	0.24	nil	0.79	2.49	0.18
CaO	2.42	1.56	2.58	1.74	1.87	4.32	6.16	1.39
Na_2O	7.93	10.70	7.48	7.71	9.61	6.98	5.02	9.25
K_2O	5.20	5.74	4.90	5.32	5.23	5.62	3.89	5.49
P_2O_5	0.12	tr	0.22	0.10	0.31	0.60	0.99	tr
CO_2	nil	-	0.85	n.d.	0.40	0.30	nil	0.15
H_2O^+	2.40	1.02	2.12	2.70	0.34	1.36	1.68	0.84
H_2O^-	*	0.12	0.17	0.12	0.25	0.14	*	
ZrO_2	-	-	0.15	-	-	0.11	-	-
BaO	-	-	0.07	-	-	0.01	-	-
S	-	-	0.05	0.02	-	0.03	-	-
Cl	-	-	-	0.02	0.04	-	-	0.17
	99.87	100.24	99.80	99.88	99.87	99.63	100.17	98.98
O for S & Cl			0.02	0.01		0.01		0.04
			99.78	99.87		99.62		98.94

	57	58	59	60	61	62	63	64
	45457	U - 28	27099	30681	U - 25	27182	60037	U - 27
or	30.8	34.0	29.0	31.5	30.9	33.3	23.0	32.5
ab	26.7	17.1	38.7	35.2	23.1	25.6	34.1	21.8
an	-	-	-	2.4	-	0.9	7.8	1.7
ne	17.3	30.3	11.4	16.2	26.5	18.1	4.5	29.9
hl	-	-	-	-	-	-	-	0.3
ac	7.4	6.0	3.1	-	8.1	-	-	-
ns	-	2.5	-	-	-	-	-	-
di	10.5	6.9	4.3	1.3	4.2	9.5	13.3	3.7
wo	-	-	0.8	1.9	-	1.4	-	-
ol	0.8	1.2	-	-	0.6	-	3.1	0.4
mt	3.0	-	6.0	5.5	3.3	6.7	5.7	5.3
il	0.8	1.2	0.8	0.7	0.8	0.5	4.6	2.3
ap	-	-	-	-	0.7	1.4	2.4	-
hm	-	-	1.1	2.2	-	-	-	-

57	45457	Nepheline microsyenite. Qaersuarssuk.
58	U - 28	Nepheline-porphyry. Igaliko complex.
59	27099	Nepheline syenite. Grønnedal - Íka complex.
60	30681	Nepheline syenite, Hviddal composite dyke. Tugtutôq.
61	U - 25	Foyaite. Igaliko complex.
62	27182	Nepheline syenite (mafic), Grønnedal - Íka complex.
63	60037	Trachytic dyke with anorthosite fragments. Igaliko Fjord.
64	U - 27	Nepheline-porphyry. Igaliko complex.

* Analysis on sample dried at 110°C for 2 hours.

	65	66	67	68	69	70	71	72
	C - 1	27159	50941	U - 26	61162	44116	61109	42654
SiO_2	50.52	50.33	54.8	53.71	53.69	52.98	52.96	51.40
TiO_2	-	0.15	0.4	3.40	1.91	1.82	1.62	2.20
Al_2O_3	24.51	20.49	18.6	15.37	15.56	17.35	17.40	15.35
Fe_2O_3	2.15	4.13	5.8	3.28	2.03	3.74	4.13	2.16
FeO	2.72	3.57	1.8	5.72	7.86	5.23	4.06	7.13
MnO	0.10	0.31	0.3	0.14	0.17	0.14	0.15	0.12
MgO	0.15	0.63	0.2	1.58	1.48	2.38	2.59	2.43
CaO	1.83	3.87	2.1	5.20	4.67	5.81	5.85	5.19
Na_2O	11.24	9.48	7.9	6.84	5.95	4.73	4.39	6.24
K_2O	5.65	4.72	6.0	4.11	4.20	3.10	3.22	2.11
P_2O_5	0.21	0.08	0.1	0.52	0.70	0.73	0.64	1.11
CO_2	0.54	0.65	0.0	n.d.	0.0	nil	nil	2.20
H_2O^+	0.85	1.23	2.0	0.45	1.04	1.78	2.60	2.11
H_2O^-	0.21	0.08	*	0.33	*	*	*	*
ZrO_2	-	0.14	0.2†	-	-	-	-	-
BaO	-	0.00	0.0‡	-	-	-	-	-
S	tr+	0.05	-	-	-	-	-	-
Cl	0.03	-	-	-	-	-	-	-
	100.71	99.91	100.2	100.65	99.26	99.79	99.61	99.75
O for S & Cl	0.01	0.02						
	100.70	99.89						

	65	66	67	68	69	70	71	72
	C - 1	27159	50941	U - 26	61162	44116	61109	42654
Q	-	-	-	-	-	-	1.2	-
or	33.4	27.9	35.5	24.3	24.9	18.4	19.1	12.5
ab	9.4	16.6	28.2	34.6	35.6	40.0	37.1	52.7
an	-	-	-	-	3.3	16.9	18.2	4.6
ne	46.1	33.8	18.4	11.6	8.0	-	-	-
C	-	-	-	-	-	-	-	1.1
ac	0.5	1.0	4.1	1.5	-	-	-	-
di	5.0	11.0	1.1	13.9	13.1	5.9	5.3	-
wo	-	0.9	3.8	2.3	-	-	-	-
hy	-	-	-	-	-	5.0	5.6	6.0
ol	0.9	-	-	-	5.2	1.3	-	5.7
mt	2.9	5.5	5.6	4.0	3.0	5.4	6.0	3.1
il	-	-	0.8	6.5	3.6	3.5	3.1	4.2
ap	-	-	-	1.2	1.7	1.7	1.5	2.6
hm	-	-	0.5	-	-	-	-	-

65 C - 1 Nepheline syenite. Grønnedal - Íka complex.
66 27159 Nepheline syenite. Grønnedal - Íka complex.
67 50941 Phonolitic flow. Narssaq.
68 U - 26 Augite syenite. Igaliko complex.
69 61162 Syeno-gabbro. Ice margin north of Kûtsiaq.
70 44116 Big feldspar dyke, alkaline centre (including plagioclase megacrysts). Kûtsiaq.
71 61109 Big feldspar dyke, alkaline margin. Nunatak north of Eqalugssuit taserssuat (Isortoq area).
72 42654 Big feldspar dyke, margin. Tunugdliarfik.

* Analysis on sample dried at 110°C for 2 hours.
† Determined by X-ray.
‡ SrO and BaO = 0.0 (determined by X-ray).
\+ Quoted as SO_3 not S.

	73	74	75	76	77	78	79	80
	61102	42656	45458	61114	U - 20	61112	25352	42658
SiO_2	51.01	49.88	49.4	47.65	50.98	50.43	49.38	49.04
TiO_2	2.00	2.69	2.8	2.48	1.38	2.40	1.11	2.68
Al_2O_3	16.27	14.95	14.1	16.30	22.15	15.25	18.85	15.10
Fe_2O_3	2.57	3.59	4.3	3.03	1.04	2.97	2.15	4.24
FeO	8.36	7.34	8.5	10.00	4.25	9.35	7.56	6.72
MnO	0.16	0.12	0.3	0.18	tr	0.16	0.13	0.20
MgO	4.03	3.20	3.0	5.29	0.79	4.14	5.86	3.39
CaO	6.71	6.12	6.0	7.33	7.90	6.51	8.40	6.29
Na_2O	4.31	3.99	4.2	3.97	6.84	4.29	3.54	3.80
K_2O	2.28	4.19	2.9	1.66	2.71	2.29	0.97	3.83
P_2O_5	0.56	1.69	1.5	0.60	0.38	0.65	0.23	1.85
CO_2	0.00	nil	0.0	0.00	tr	nil	nil	nil
H_2O^+	0.80	2.19	2.2	0.60	1.22	1.36	1.50	2.38
H_2O^-	*	*	*	*	0.12	*	*	*
Cl	-	-	-	-	tr	-	-	-
	99.06	99.95	99.2	99.09	99.76	99.80	99.68	99.52

	73	74	75	76	77	78	79	80
	61102	42656	45458	61114	U - 20	61112	25352	42658
or	13.5	24.8	17.2	9.8	16.0	13.6	5.7	22.6
ab	36.4	32.6	35.5	30.6	25.1	36.3	29.9	32.1
an	18.3	10.5	11.0	21.7	21.7	15.5	32.6	12.8
ne	-	0.6	-	1.6	17.7	-	-	-
di	9.5	7.3	7.4	8.9	12.8	10.4	7.4	5.2
hy	1.2	-	8.4	-	-	1.4	5.1	4.0
ol	10.6	7.7	2.5	15.4	0.1	11.0	11.8	4.9
mt	3.7	5.2	6.2	4.4	1.5	4.3	3.1	6.2
il	3.8	5.1	5.3	4.7	2.6	4.6	2.1	5.1
ap	1.3	4.0	3.6	1.4	0.9	1.6	-	4.4

73	61102	Big feldspar dyke, groundmass. Nunatak north of Eqalugssuit taserssuat (Isortoq area).
74	42656	Big feldspar dyke, outer zone. Tunugdliarfik.
75	45458	Big feldspar dyke. Qaersuarssuk.
76	61114	Big feldspar dyke, margin. Nunatak north of Eqalugssuit taserssuat (Isortoq area).
77	U - 20	Essexite-porphyrite [alkaline gabbro with feldspar xenocrysts]. Narssaq.
78	61112	Late non-xenocryst-bearing part of big feldspar dyke. Nunatak north of Eqalugssuit taserssuat (Isortoq area).
79	25352	Gabbroic margin to larvikitic syenite dyke. Eqalugssuit taserssuat (Isortoq area).
80	42658	Big feldspar dyke, central part. Tunugdliarfik.

* Analysis on sample dried at 110°C for 2 hours.

	81	82	83	84	85	86	87	88
	61055	U - 23	U - 22	50221	40523	61158	40551	68953
SiO_2	46.04	49.64	47.79	52.78	52.54	48.20	48.08	47.70
TiO_2	2.24	4.25	3.82	0.42	0.49	3.21	3.76	2.42
Al_2O_3	15.85	13.74	16.88	27.08	25.20	14.49	13.70	14.05
Fe_2O_3	5.37	7.10	4.66	0.64	0.79	2.94	5.07	2.46
FeO	8.91	4.97	5.92	1.35	2.49	10.40	9.19	12.43
MnO	0.19	0.03	tr	0.03	0.05	0.20	0.22	0.22
MgO	6.04	1.58	1.51	1.03	1.60	2.97	3.45	5.48
CaO	8.57	4.88	5.58	10.77	10.45	6.93	7.38	9.37
Na_2O	3.50	6.33	7.76	4.50	4.50	4.80	4.22	2.80
K_2O	0.62	4.42	3.26	0.64	0.64	2.90	2.72	0.70
P_2O_5	0.39	1.57	0.76	0.23	0.25	1.43	1.45	0.39
CO_2	nil	n.d.	0.00	-	-	0.0	n.d.	nil
H_2O^+	2.09	0.81	1.17	0.47	0.72	0.90	1.15	1.05
H_2O^-	*	0.14	0.14	*	*	*	*	*
ZrO_2	-	-	-	-	-	-	-	-
BaO	-	0.21	-	-	-	-	-	-
Cl	-	-	nil	-	-	-	-	-
	99.81	99.67	99.25	99.94	99.72	99.37	100.39	99.07

	81	82	83	84	85	86	87	88
	61055	U - 23	U - 22	50221	40523	61158	40551	68953
or	3.7	26.1	19.3	3.8	3.8	17.2	16.1	4.1
ab	29.6	29.2	27.2	38.0	38.0	30.1	33.7	23.7
an	25.7	-	1.6	51.7	46.6	9.4	10.4	23.7
ne	-	9.1	20.8	-	-	5.7	1.1	-
ac	-	6.7	-	-	-	-	-	-
di	11.4	8.5	9.5	1.4	4.3	13.2	13.8	17.0
wo	-	1.2	3.8	-	-	-	-	-
hy	4.1	-	-	0.9	0.8	-	-	15.2
ol	10.1	-	-	1.6	3.1	9.3	6.4	5.3
mt	7.8	3.7	6.8	0.9	1.1	4.3	7.4	3.6
il	4.3	8.1	7.3	0.8	0.9	6.1	7.1	4.6
ap	0.9	3.7	1.8	-	-	3.4	3.4	0.9
hm	-	2.3	-	-	-	-	-	-
pr	-	-	-	-	-	-	-	-

81	61055	Anorthosite-bearing apophysis of big feldspar dyke, chill. Kobberminebugt.
82	U - 23	Porphyry. Ilímaussaq.
83	U - 22	Porphyrite (trachydolerite). Narssaq.
84	50221	Anorthosite (fresh). Assorutit, Tugtutôq.
85	40523	Anorthosite (fresh). Assorutit, Tugtutôq.
86	61158	Syeno-gabbro dyke, gabbroic part, Ice margin north of Ilorro.
87	40551	Gabbro, Krydssø syeno-gabbro. Tugtutôq.
88	68953	Olivine dolerite, chill. Neria, Frederikshåb.

* Analysis on sample dried at 110°C for 2 hours.

	89	90	91	92	93	94	95	96
	C - 6	32364	39340	20645	45501	25194	32369	39941
SiO_2	47.65	47.57	47.41	47.28	47.15	47.11	47.03	46.46
TiO_2	2.63	1.93	1.96	1.87	3.08	0.99	1.74	2.15
Al_2O_3	17.03	15.86	16.50	17.40	14.18	18.30	17.67	18.14
Fe_2O_3	2.24	1.80	7.42	3.71	2.80	0.90	1.41	10.91
FeO	11.75	11.21	4.82	8.23	11.82	10.63	11.42	2.37
MnO	0.11	0.17	0.22	0.14	0.21	0.15	0.20	0.13
MgO	4.73	6.78	5.85	6.05	5.23	8.60	7.12	4.80
CaO	7.00	8.87	6.77	8.69	8.06	8.42	8.83	8.65
Na_2O	3.94	3.26	3.77	4.20	3.80	3.11	3.50	3.58
K_2O	1.91	0.63	1.52	0.46	1.00	0.62	0.71	0.41
P_2O_5	0.54	0.33	0.22	0.34	0.60	0.20	0.28	0.37
CO_2	0.13	nil	0.00	0.00	0.0	0.0	0.0	0.00
H_2O^+	0.26	1.20	2.64	1.90	1.34	0.30	0.66	1.58
H_2O^-	0.08	*	0.51	*	*	*	*	0.27
ZrO_2	0.00	-	-	-	-	-	-	-
BaO	0.11	-	0.02	-	-	-	-	0.02
S	0.07	-	0.02	-	-	-	-	0.05
	100.18	99.61	99.65	100.27	99.27	99.33	100.57	99.89
O for S	0.04		0.01					0.03
	100.14		99.64					99.86

	89	90	91	92	93	94	95	96
	C - 6	32364	39340§	20645	45501	25194	32369	39941§
or	11.3	3.7	9.5	2.7	5.9	3.7	4.2	2.2
ab	29.2	27.6	30.9	32.0	32.1	24.2	24.9	30.4
an	23.1	26.7	23.4	27.2	18.7	34.1	30.4	32.3
ne	2.2	-	0.6	1.9	-	1.1	2.5	-
di	6.1	12.7	6.8†	11.5	14.5	6.3	9.6	6.4†
hy	-	3.6	-	-	1.2	-	-	5.1
ol	17.8	17.2	16.7	13.2	14.3	26.2	22.3	11.6
mt	3.3	2.6	4.4	5.4	4.1	1.3	2.0	4.9
il	5.0	3.7	3.8	3.6	5.9	1.9	3.3	4.1
ap	1.3	0.8	0.7	0.8	1.4	-	0.7	1.0
pr	0.1	-	-	-	-	-	-	0.1

89	C - 6	?Essexite. Kûngnât.
90	32364	Olivine dolerite, margin. Isortoq.
91	39340	Olivine basalt. Ilímaussaq peninsula.
92	20645	Gabbro, Eqaloqarfia dyke. Nunarssuit.
93	45501	Olivine dolerite. Qaersuarssuk.
94	25194	Troctolite dyke. Nunatak at head of Kobberminebugt.
95	32369	Olivine dolerite, centre Isortoq.
96	39941	Olivine basalt. Ilímaussaq peninsula.

* Analysis on sample dried at 110°C for 2 hours.

† The norm with $FeO:Fe_2O_3$ redistributed in the ratio 3:1.

§ Norm by J.W.S.

	97	98	99	100	101	102	103	104
	39944	61226	61228	61157	U - 18	-	30106	30765
SiO_2	46.44	46.66	46.38	45.84	46.10	45.77	45.70	45.65
TiO_2	1.86	2.88	1.31	1.94	3.34	1.64	3.02	2.52
Al_2O_3	17.01	12.82	15.45	16.31	18.59	16.77	18.85	21.24
Fe_2O_3	9.78	4.25	2.25	3.20	2.63	3.89	1.47	3.05
FeO	4.12	11.04	10.54	10.55	6.68	8.31	11.44	8.52
MnO	0.18	0.24	0.18	0.19	0.05	0.14	0.17	0.10
MgO	4.82	2.99	6.94	7.15	3.23	7.37	6.15	4.67
CaO	8.14	7.76	9.92	9.13	9.86	7.52	7.73	8.79
Na_2O	3.30	4.45	2.50	2.85	6.22	2.38	3.74	3.63
K_2O	1.26	2.90	1.13	0.75	0.63	1.78	0.99	0.75
P_2O_5	0.26	1.96	0.32	0.32	1.41	0.19	0.40	0.47
CO_2	0.00	0.0	nil	0.0	nil	1.7	0.06	n.d.
H_2O^+	2.07	0.94	1.46	0.94	0.80	2.51	0.48	0.59
H_2O^-	0.34	*	*	*	0.11	0.09	0.01	0.05
BaO	0.04	-	-	-	-	-	-	-
S	0.04	-	-	-	-	0.17‡	-	0.02
Cl	-	-	-	-	nil	-	-	0.02
	99.66	98.89	98.38	99.17	99.65	100.23	100.21	100.07
O for S & Cl	0.02					0.09		0.01
	99.64					100.14		100.06

	97	98	99	100	101	102	103	104
	39944 §	61226	61228	61157	U - 18	-	30106	30765
or	7.8	17.2	6.7	4.5	3.7	10.5	5.8	4.4
ab	27.8	28.0	21.1	24.1	28.5	20.1	25.4	28.0
an	27.8	6.4	27.6	29.4	20.9	26.6	31.7	39.4
ne	-	5.2	-	-	13.1	-	3.4	1.4
C	-	-	-	-	-	1.2	-	-
di	9.5 †	16.3	16.1	11.3	15.4	-	3.4	1.0
hy	-	-	2.1	2.7	-	21.7	-	-
ol	15.4	8.7	16.8	17.2	3.8	4.6	21.2	14.7
mt	5.1	6.2	3.3	4.6	3.8	5.6	2.1	4.4
il	3.5	5.5	2.5	3.7	6.4	3.1	5.7	4.8
ap	0.7	4.6	0.8	0.8	3.3	-	0.9	1.1

97	39944	Basalt. Ilímaussaq peninsula.
98	61226	Syeno-gabbro. Kûtsiaq.
99	61228	Syeno-gabbro, chill. Kûtsiaq.
100	61157	Syeno-gabbro, chill. Ice margin north of Ilorro.
101	U - 18	Essexite. Narssaq.
102	-	Olivine dolerite. Grønnedal - Íka complex.
103	30106	Olivine gabrro. Alángorssuaq.
104	30765	Olivine gabbro. Narssaq.

* Analysis on sample dried at 110°C for 2 hours.
‡ Quoted as Rest (S).
† The norm with $FeO:Fe_2O_2$ redistributed in the ratio 3:1.
§ Norm by J.W.S.

	105	106	107	108	109	110	111	112
	45305	20636	26040	U - 21	23144	50033	40279	20632
SiO_2	45.45	45.43	45.38	45.27	45.16	45.10	44.72	44.60
TiO_2	2.80	3.42	3.19	4.41	1.42	2.66	2.93	1.49
Al_2O_3	17.32	15.52	17.99	15.03	18.28	16.36	15.93	16.46
Fe_2O_3	3.23	3.14	3.09	4.04	2.60	1.55	9.72	2.28
FeO	10.21	9.87	11.92	9.10	7.57	12.30	6.57	9.44
MnO	0.18	0.18	0.18	tr	0.12	0.18	0.18	0.16
MgO	4.38	6.14	5.10	6.59	7.92	6.60	4.01	9.77
CaO	8.02	8.30	7.65	6.64	9.52	7.93	6.25	8.68
Na_2O	3.70	4.50	3.70	5.07	2.50	3.22	4.17	2.50
K_2O	1.80	0.30	0.91	1.08	1.01	1.14	2.31	0.85
P_2O_5	0.46	0.59	0.25	0.16	0.27	0.85	1.08	0.32
CO_2	0.0	0.00	n.d.	0.38	0.00	-	0.00	0.00
H_2O^+	2.10	2.12	0.35	1.85	2.78	1.98	1.85	2.06
H_2O^-	*	*	0.05	0.14	*	*	0.17	*
ZrO_2	-	-	-	-	-	-	0.00	-
BaO	-	-	0.10	-	-	-	0.05	-
S	-	-	-	†	-	-	0.04	-
F	-	-	0.03	-	-	-	-	-
Cl	-	-	-	sl. tr	-	-	-	-
	99.65	99.51	99.89	99.76	99.15	99.87	99.98	98.61
O for S & F			0.01 +				0.02 +	
			99.88				99.96	

	105	106	107	108	109	110	111	112
	45305	20636	26040	U - 21	23144	50033	40279	20632
or	10.6	1.8	5.4	6.4	6.0	6.7		5.0
ab	23.6	31.2	26.5	29.4	20.2	25.7		20.9
an	25.3	21.2	29.8	15.0	35.6	26.8		31.2
ne	4.2	3.7	2.6	7.3	0.5	0.8		0.1
di	9.6	13.2	6.8	12.5	9.4	5.9		8.0
ol	13.2	13.9	17.6	11.9	17.8	22.7		24.5
mt	4.7	4.6	4.5	5.9	3.8	2.3		3.3
il	5.3	6.5	6.1	8.4	2.7	5.1		2.8
ap	1.1	1.4	-	-	-	2.0		0.8

105	45305	Olivine dolerite. Qaersuarssuk.
106	20636	Gabbro, Eqaloqarfia dyke. Nunarssuit.
107	26040	Olivine gabbro, ring-dyke. Kûngnât.
108	U - 21	Diabase (trachydolerite), Ilímaussaq peninsula.
109	23144	Dolerite, Eqaloqarfia dyke. Nunarssuit.
110	50033	Gabbro, chill, Giant dyke. Tugtutôq.
111	40279	Basalt metamorphosed . Ilímaussaq peninsula.
112	20632	Dolerite, Eqaloqarfia dyke. Nunarssuit.

* Analysis on sample dried at 110°C for 2 hours.

\+ Not quoted in original.

† SO_3 quoted as none.

	113	114	115	116	117	118	119	120
	40452	40430	61187	68928	30684	50853	25345	45202
SiO_2	44.41	44.19	44.01	43.74	41.15	44.63	43.62	42.96
TiO_2	2.44	3.38	3.84	3.27	4.71	3.20	3.63	3.12
Al_2O_3	16.80	13.00	14.33	14.20	13.52	15.15	13.10	14.10
Fe_2O_3	1.97	3.61	3.36	3.20	5.03	3.71	5.55	3.37
FeO	12.95	13.22	12.28	12.50	13.13	5.00	9.32	6.87
MnO	0.22	0.27	0.21	0.24	0.25	0.18	0.21	0.18
MgO	8.26	3.19	5.04	4.59	4.12	6.08	3.78	7.91
CaO	7.42	7.76	7.60	7.55	7.34	7.42	7.40	9.78
Na_2O	3.10	3.85	3.97	3.85	3.53	4.13	3.95	1.80
K_2O	0.92	2.28	1.98	2.21	1.68	4.40	0.88	3.55
P_2O_5	0.65	2.88	1.66	1.72	3.13	0.72	1.62	0.53
CO_2	n.d.	nil	0.0	nil	n.d.	1.28	3.50	2.3
H_2O^+	0.79	2.36	1.26	2.17	1.03	3.29 †	3.78	2.80
H_2O^-	0.07	*	*	*	0.23	0.30	*	*
BaO	-	-	-	-	-	0.20	-	-
S	0.05	-	-	-	-	0.06	-	-
Cl	0.02	-	-	-	-	-	-	-
	100.07	99.99	99.54	99.24	98.85	99.75	100.34	99.27
O for S & Cl	0.02					0.03 +		
	100.05					99.72		

	113	114	115	116	117	118	119	120
	40452	40430	61187	68928	30684	50853	25345	45202
Q	-	-	-	-	-	-	6.8	-
or	5.5	13.5	11.7	13.1	10.0	26.0	5.2	21.0
ab	23.6	31.2	25.1	23.6	29.8	13.3	33.4	14.8
an	29.2	11.4	15.4	14.9	16.0	9.8	3.9	19.9
ne	1.4	0.8	4.6	4.9	-	11.7	-	0.2
C	-	-	-	-	-	-	4.2	-
di	2.8	7.0	9.6	9.5	-	11.3	-	8.5
hy	-	-	-	-	5.1	-	16.4	-
ol	27.7	15.4	15.9	16.4	13.2	7.8	-	14.8
mt	2.8	5.2	4.9	4.6	7.3	5.4	8.1	4.9
il	4.6	6.4	7.3	6.2	9.0	6.1	6.9	5.9
ap	1.5	6.8	3.9	4.1	7.4	1.7	3.8	1.2

113	40452	Gabbro, fine-grained marginal facies, Giant dyke. Tugtutôq.
114	40430	Pyroxenite syenite, Hviddal composite dyke. Tugtutôq.
115	61187	Syeno-gabbro, gabbroic end. Kûtsiaq.
116	68928	Dolerite, chill. Neria, Frederikshåb.
117	30684	Syeno-gabbro, Hviddal composite dyke. Tugtutôq.
118	50853	Camptonite. Narssaq.
119	25345	Lamprophyric dyke. Eqalugssuit taserssuat (Isortoq area).
120	45202	Lamprophyre, centre of dyke. Qaersuarssuk.

* Analysis on sample dried at 110°C for 2 hours.

\+ Not quoted in original.

† Total water erroneously quoted as H_2O^+ in Upton (1965).

	121	122	123	124	125	126	127	128
	45203	50069	50071	50070	50068	30653	27685	61186
SiO_2	41.96	43.39	43.08	42.63	41.85	40.72	39.98	26.75
TiO_2	2.48	3.04	3.04	2.98	3.26	3.92	5.15	8.3
Al_2O_3	10.60	16.39	15.77	15.93	16.09	16.40	9.16	5.27
Fe_2O_3	2.58	4.36	2.41	1.53	1.75	1.78	4.33	9.48
FeO	7.97	8.19	10.01	10.09	11.45	11.45	19.91	29.30
MnO	0.20	0.24	0.23	0.23	0.22	0.20	0.39	0.35
MgO	12.88	4.90	5.51	4.84	6.47	6.23	4.67	14.54
CaO	9.42	8.76	7.65	9.34	9.20	9.25	8.99	2.21
Na_2O	1.52	3.68	4.33	4.29	3.46	3.94	2.54	0.95
K_2O	1.88	1.80	2.51	2.47	1.78	0.71	1.75	0.55
P_2O_5	0.39	0.46	0.56	0.60	0.38	0.50	2.13	0.43
CO_2	4.04	1.64	0.68	1.85	0.91	0.20	-	nil
H_2O^+	3.72	2.98	4.10	3.10	2.94	4.41	0.59	0.4
H_2O^-	*	*	*	*	*	*	0.26	*
S	nil	0.25	0.16	0.29	0.21	0.20	-	-
	99.64	100.08	100.04	100.17	99.97	99.91	99.85	98.53
O for S		0.13	0.08	0.15	0.09	0.10		
		99.95	99.96	100.02	99.88	99.81		

	121	122	123	124	125	126	127	128
	45203	50069	50071	50070	50068	30653	27685	61186
or	11.1	10.6	14.8	14.6	10.5	4.2	10.3	3.2
ab	12.8	26.3	15.0	15.3	12.4	14.5	18.1	2.0
an	16.5	22.9	16.2	16.9	23.1	24.9	8.4	8.2
ne	-	2.6	11.7	11.4	9.1	10.2	1.9	3.3
C	-	-	-	-	-	-	-	0.1
di	1.8	5.9	11.4	11.5	11.8	13.6	18.9	-
hy	22.6	-	-	-	-	-	-	-
ol	12.5	11.4	14.4	12.6	18.0	16.1	20.3	50.8
mt	3.7	6.3	3.5	2.2	2.5	2.6	6.3	13.7
il	4.7	5.8	5.8	5.7	6.2	7.5	9.8	15.8
ap	0.9	1.1	1.3	1.4	0.9	1.2	5.0	1.0
pr	-	0.9	0.6	1.1	0.8	0.8	-	-

121	45203	Lamprophyre, margin of dyke. Qaersuarssuk.
122	50069	Camptonite sill, chilled upper margin. Igdlukasik by Tugtutôq.
123	50071	Analcite camptonite. Igdlukasik by Tugtutôq.
124	50070	Camptonite with dactylic ocelli. Igdlukasik by Tugtutôq.
125	50068	Camptonite, upper part of sill. Igdlukasik by Tugtutôq.
126	30653	Camptonitic, upper chilled margin of sill. Tugtutôq.
127	27685	Gabbro, ring-dyke. Kûngnât.
128	61186	Syeno-gabbro, mafic accumulation. Kûtsiaq.

* Analysis on sample dried at 110°C for 2 hours.

	129	130	131	132	133	134	135	136
	61634	40550	30770	63876	U - 19	61685	61710	61682
SiO_2	37.5	37.37	35.43	34.80	31.77	39.3	25.5	22.5
TiO_2	6.2	6.14	6.96	5.11	12.97	2.7	3.5	3.4
Al_2O_3	6.2	6.13	4.40	5.23	nil	7.9	3.2	4.2
Fe_2O_3	5.9	6.16	10.37	15.62	12.97	2.7	12.7	7.5
FeO	12.0	12.02	10.45	3.77	10.23	10.2	0.4	9.7
MnO	0.2	0.20	0.25	0.14	tr	0.2	0.3	0.2
MgO	13.1	15.08	14.95	14.71	15.77	7.1	12.3	12.7
CaO	7.2	11.60	13.32	15.10	12.20	9.8	14.7	13.1
Na_2O	0.2	0.97	0.17	0.48	2.69	tr	tr	tr
K_2O	4.9	0.97	1.22	1.47	0.54	0.9	1.8	1.1
P_2O_5	1.0	0.43	0.27	0.60	tr	1.3	2.0	0.5
CO_2	2.7	nil	nil	tr	n.d.	13.8	21.6	20.8
H_2O^+	1.6	2.37	1.69	2.0	0.60	3.3	0.9	2.1
H_2O^-	*	*	*	*	0.05	*	*	*
ZrO_2	tr	-	-	-	-	tr	tr	tr
BaO	0.6	-	-	-	-	0.5	0.1	0.4
SrO	0.2	-	-	-	-	0.2	0.3	0.5
	99.5	99.4	99.48	99.03	99.79	99.9	99.3	98.7

	129	130	131	132	133	134	135	136
	61634	40550	30770	63876	U - 19	61685	61710	61682
or	29.0	5.7	-	-	-			
ab	1.7	0.2	-	-	-			
an	1.5	9.5	7.6	7.8	-			
ne	-	4.3	0.8	2.2	-			
lc	-	-	5.7	6.8	-			
ac	-	-	-	-	20.1			
ks	-	-	-	-	0.9			
di	9.4	35.9	40.9	33.3	11.7			
hy	5.7	-	-	-	-			
ol	21.3	19.9	12.9	15.0	23.8			
cs	-	-	1.3	5.3	12.4			
mt	8.6	8.9	14.3	-	-			
il	11.8	11.7	13.2	8.0	21.6			
pf	-	-	-	1.6	2.7			
ap	2.4	1.0	0.6	1.4	-			
hm	-	-	0.5	15.6	6.0			

129	61634	Mica pyroxenite, altered. Narssarssuaq.
130	40550	Pyroxenite. Assorutit, Tugtutδq.
131	30770	Pyroxenite. Ungussivik by Narssaq.
132	63876	Pyroxenite. Narssaq.
133	U - 19	Magnetite pyroxenite. Narssaq.
134	61685	Carbonatized monchiquite. Narssarssuaq.
135	61710	Carbonatized lapilli tuff. Qagssiarssuk.
136	61682	Carbonatized mica-monchiquite. Narssarssuaq.

* Analysis on sample dried at 110°C for 2 hours.

	137	138		139
	61606	61740		26042
SiO_2	13.0	4.4		62.80
TiO_2	3.8	2.4		0.43
Al_2O_3	6.3	0.7		16.81
Fe_2O_3	3.9	4.1		0.97
FeO	18.7	0.5		3.81
MnO	0.5	0.5		0.10
MgO	11.9	7.2		0.19
CaO	10.4	40.1		2.52
Na_2O	tr	0.2		5.80
K_2O	0.7	0.1		5.82
P_2O_5	0.5	2.7		0.09
CO_2	24.5	36.4		-
H_2O^+	2.8	0.1		0.56
H_2O^-	*	*		0.17
ZrO_2	tr	-		-
BaO	1.3	0.1		tr
SrO	0.9	0.4	F	tr
	99.2	99.9		100.07

137	61606	Carbonatized nodular uncompahgrite. Qagssiarssuk.
138	61740	Carbonatized lava. Qagssiarssuk.

* Analysis on sample dried at 110°C for 2 hours.

139	26042	Quartz syenite. Kûngnât.

1 26272 Riebeckite astrophyllite granite.
Loc: Kûngnât, 3.2 km WNW from top of Kûngnât.
Analyst: B. I. Borgen.
Publ: Upton (1964a), Part II, p. 22.

2 30268 Soda granite.
Loc: Nunarssuit, east side of Malenefjeld.
Analyst: B. I. Borgen.
Publ: -

3 61851 Alkali granite.
Loc: Niaqornarssuaq. (Narssaq intrusive complex).
Analyst: H. B. Wiik.
Publ: -

4 26498 Grorudite (riebeckite ægirine microgranite).
Loc: Kûngnât, 3.3 km W by N from top of Kûngnât.
Analyst: D. Maynes.
Publ: -

5 C - 5 Arfvedsonite granite.
Loc: Kûngnât.
Analyst: E. Klüver.
Publ: -

6 30173 Biotite granite.
Loc: Alángorssuaq. Excavation near west side of large lake about 850 m east of termination of Angnikitsorssûp atâ, the inlet on SW side of Angnikitsorssuaq.
Analyst: B. Bruun.
Publ: -

7 20679 Granite - Helene granite.
Loc: Nunarssuit, east side of Helene Havn.
Analyst: B. I. Borgen.
Publ: -

8 50187 Comendite, chilled facies of dyke.
Loc: small island between Igdlutalik and Tugtutôq.
Analyst: D. Maynes.
Publ: Upton (1964a), Part II, p. 22

9 38950 Granophyre.
Loc: Peninsula between Kangerdluk and Ikerasak, Tôrnârssuk.
Analyst: M. Mouritzen.
Publ: Bondesen, E. (1960) unpublished thesis.

10 61848 Quartz porphyry.
Loc: 600 m NE of hill 380 m by Narssaq.
Analyst: H. B. Wiik.
Publ: -

11 U - 24 Quartz porphyry (comendite).
Loc: Ilímaussaq.
Analyst: C. Winther.
Publ. Ussing (1912), analysis 24, p. 224.

12 33511 Comendite.
Loc: Ilímaussaq.
Analyst: H. B. Wiik.
Publ: Hamilton (1964), table 10, p. 72.

13 38942 Granophyre.
Loc: Peninsula between Kangerdluk and Ikerasak Tôrnârssuk.
Analyst: M. Mouritzen.
Publ: Bondesen, E. (1960) unpublished thesis.

14 15654 Granophyre.
Loc: south side of Sermersût.
Analyst: M. Mouritzen.
Publ: Bondesen, E. (1960) unpublished thesis.

15 25351 Granitic vein cutting larvikitic syenite.
Loc: Eqalugssuit taserssuat, Isortoq area.
Analyst: Ib Sørensen.
Publ: -
Remarks: Larvikitic syenite dyke represented by 25350 (anal. 41) and 25352 (anal. 79).

16 40589 Quartz syenite (alkali granite).
Loc: north side of unit 4 ring-dyke, eastern centre, Tugtutôq.
Analyst: B. I. Borgen.
Publ: Upton (1964a), Part II, p. 36.

17 50272 Quartz syenite.
Loc: Unit 5 ring-dyke, eastern centre, Tugtutôq.
Analyst: D. Maynes.
Publ: Upton (1964a), Part II, p. 36.

18 50845 Quartz ænigmatite syenite.
Loc: 2500 m E from Nûngmiut. (Narssaq intrusive complex).
Analyst: H. B. Wiik.
Publ: -

19 40354 Augite syenite - Dyrnæs syenite.
Loc: Dyrnæs by Narssaq.
Analyst: H. B. Wiik.
Publ: -

20 50216 Quartz syenite.
Loc: north side of the Assorutit intrusion close to the coast, Tugtutôq.
Analyst: E. Godijn.
Publ: Upton (1964a), Part II, p. 10.

21 50843 Augite syenite - Sermilik syenite.
Loc: 1800 m E from Nûngmiut. (Narssaq intrusive complex).
Analyst: H. B. Wiik.
Publ: -

22 50136 Porphyritic microsyenite, chilled facies of 5 m dyke.
Loc: south coast of Qángue, Tugtutôq.
Analyst: B. I. Borgen.
Publ: Upton (1964a), Part II, p. 19.

23 45537 Spherulitic riebeckitic trachyte.
Loc: Mátâta nunâ, Qaersuarssuk.
Analyst: B. I. Borgen.
Publ: -

24 50345 Porphyritic microsyenite.
Loc: Unit 1 of the central complex, Tugtutôq.
Analyst: D. Maynes.
Publ: Upton (1964a), Part II, p. 28.

25 50226 Porphyritic microsyenite, central part of a 10 m "rhomb porphyry" dyke.
Loc: Arferssuaq, eastern Tugtutôq.
Analyst: B. I. Borgen.
Publ: Upton (1964a), Part II, p. 19.

26 33506 "soda-syenite" A [dyke].
Loc: Ilímaussaq.
Analyst: H. B. Wiik.
Publ: Hamilton (1964), table 10, p. 72.

27 27647 Syenite, western lower layered series, unlaminated group, Kûngnât.
Loc: Kûngnât, exposure in main glacier, west of Røverborg.
Analyst: B. Collett (except BaO and F [which are by B. G. J. Upton]).
Publ: Upton (1960), table 1, column 5, p. 88 (1 decimal) and table 7, column 1, p. 93 (2 decimals but summation incorrect).
Remarks: Spectrographic trace element data given in Upton (1960) p. 96.

28 31095 Syenite - Nunarssuit syenite.
Loc: ca. 1 1/2 km SW of Itivdliatsiaq, SE Nunarssuit.
Analyst: B. I. Borgen.
Publ: -

29 C - 4 Augite hornblende syenite (main type).
Loc: loose block, Kûngnât
Analyst: E. Klüver.
Publ: -

30 30893 Syenite - Nunarssuit syenite.
Loc: Nunarssuit, about 1 km west of Helene Havn.
Analyst: B. I. Borgen.
Publ: -

31 39415 Syenite - pale variety Kitsigsut syenite.
Loc: Indre Kitsigsut, Nunarssuit. NW side of island 600 m long immediately NW of Tulugartalik.
Analyst: B. Bruun.
Publ: Harry and Pulvertaft (1963), table 1, p. 22.

32 30339 Syenite - Kitsigsut syenite.
Loc: Ydre Kitsigsut, Nunarssuit.
Analyst: B. I. Borgen.
Publ: -

33 U-17 Nordmarkite [syenite].
Loc: west of Qáqarssuaq [Kakarsuak], Narssaq.
Analyst: C. Winther.
Publ: Ussing (1912), analysis 17, p. 196.
Remarks: Ussing describes the sample as atypical, (p. 195).

34 20609 Syenite - Nunarssuit syenite.
Loc: north coast of Amitsuarssuk, west Nunarssuit.
Analyst: B. I. Borgen.
Publ: -

35 39470 Pegmatite syenite - Kitsigsut syenite.
Loc: Indre Kitsigsut, island of 15 (in 15-20 islands almost joined) in NE Indre Kitsigsut group.
Analyst: B. Bruun.
Publ: -

36 39458 Syenite - dark variety Kitsigsut syenite.
Loc: Indre Kitsigsut, Nunarssuit. Island 200 m long about 1,800 m NW of anchorage at Tulugartalik.
Analyst: B. Bruun.
Publ: Harry and Pulvertaft (1963), table 1, p. 22.

37 26135 Syenite, eastern border group, Kûngnât.
Loc: Kûngnât, 1.4 km NE from top of Kûngnât.
Analyst: B. I. Borgen.
Publ: Upton (1964b), Part IV, table 3, column 4, p. 61.

38 26005 Syenite, western lower layered series, Kûngnât.
Loc: Kûngnât, 1250 m west of Røverborg.
Analyst: B. Collett (except for BaO and F [which are by B. G. J. Upton]).
Publ: Upton (1960), table 1, column 2, p. 88 (1 decimal) and table 6, column 1, p. 92 (2 decimals but summation incorrect).
Remarks: Spectrographic trace element data given in Upton (1960) p. 96.

39 61856 Black larvikitic syenite.
Loc: in river near Nûngmiut. (Narssaq intrusive complex).
Analyst: B. I. Borgen.
Publ: -
Remarks: The most basic of the Narssaq syenites.

40 38186 Rhomb-porphyry, margin of big feldspar dyke.
Loc: western end of Ujarasugssuk, Isortoq area.
Analyst: B. I. Borgen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 44116 (anal. 70) and 44898 (anal. 43).

41 25350 Larvikitic syenite dyke, centre.
Loc: Eqalugssuit taserssuat, Isortoq area.
Analyst: B. I. Borgen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 25352 (anal. 79).

42 25183 Rhomb-porphyry dyke.
Loc: Eqalugssuit taserssuat, Isortoq area.
Analyst: B. I. Borgen.
Publ: Bridgwater & Harry (in prep.).

43 44898 Alkali big feldspar dyke, margin.
Loc: near mouth of Isortoq.
Analyst: B. I. Borgen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 38186, (anal. 40) and 44116 (anal. 70).

44 25114 Syeno-gabbro dyke.
Loc: mouth of Isortoq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61267 (anal. 45).

45 61267 Syenitic end of syeno-gabbroic dyke, centre of dyke.
Loc: mouth of Isortoq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 25114 (anal. 44).

46 61133 Syeno-gabbro dyke.
Loc: Kûtsiaq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61226 (anal. 98) and 61228 (anal. 99).

47 50241 Nepheline syenite.
Loc: Hviddal composite dyke, Tugtutôq.
Analyst: D. Maynes.
Publ: Upton (1964b), Part IV, table 1, p. 59.

48 30640 Nepheline syenite.
Loc: Hviddal composite dyke, Tugtutôq.
Analyst: B. I. Borgen.
Publ: Upton (1964b), Part IV, table 1, p. 59.

49 30743 Nepheline syenite.
Loc: Hviddal composite dyke, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1964b), Part IV, table 1, p. 59.

50 30714 Nepheline syenite, westerly facies.
Loc: Hviddal composite dyke, Tugtutôq.
Analyst: R. Solli.
Publ: Upton (1964b), Part IV, table 1, p. 59.

51 30676 Foyaitic syenite.
Loc: eastern Hviddal composite dyke, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1964b), Part IV, table 1, p. 59.

52 C - 3 Foyaite. [?Upper Series of Emeleus 1964]
Loc: Íka. (Grønnedal - Íka complex).
Analyst: E. Klüver.
Publ: Callisen (1943), p. 61.

53 U - 29 Hedrumite.
Loc: Akuliaruseq, Igaliko Fjord [Akuliarusek].
Analyst: C. Winther.
Publ: Ussing (1912), analysis 29, p. 279.

54 48317 Nepheline syenite dyke with anorthosite fragments.
Loc: 1/2 km east from Hestespor Sø, south side of Kujatdleq, Igaliko Fjord.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Traces of Zr, Nb and Sr.

55 C - 2 Nepheline syenite porphyry [granular syenite of Lower Series of Emeleus (1964)]
Loc: Ekaluit (Grønnedal - Íka complex).
Analyst: E. Klüver.
Publ: Callisen (1943), p. 49.

56 27137 Nepheline syenite from lower foyaite of the Lower Series. Grønnedal - Íka complex.
Loc: 210 m elevation in the Radioelv. (Grønnedal - Íka complex).
Analyst: B. I. Borgen.
Publ: -

57 45457 Nepheline microsyenite.
Loc: south from Torssukátak, Qaersuarssuk.
Analyst: B. I. Borgen.
Publ: -

58 U - 28 Nepheline-porphyry (Nuk type).
Loc: Akuliaruseq, Igaliko Fjord [Akuliarusek].
Analyst: C. Winther.
Publ: Ussing (1912), analysis 28, p. 275.

59 27099 Nepheline syenite, Lower Series Granular syenite.
Loc: 1.6 km SW of huts at Eqaluit. Grønnedal - Íka complex.
Analyst: B. I. Borgen.
Publ: -

60 30681 Nepheline syenite.
Loc: Hviddal composite dyke, Tugtutôq.
Analyst: R. Solli.
Publ: Upton (1964b), Part IV, table 1, p. 59.

61 U - 25 Foyaite (Korok type).
Loc: Qôroq [Korok]. (Igaliko complex).
Analyst: C. Winther.
Publ: Ussing (1912), analysis 25, p. 235.

62 27182 Mafic nepheline syenite from the pyroxene-rich syenite of the Upper Series. Grønnedal - Íka complex.
Loc: ca. 100 m east of Tøffelsø.
Analyst: B. I. Borgen.
Publ: -

63 60037 Trachytic dyke with anorthosite fragments.
Loc: ca. 1 km up river on northern side of Akuliaruseq, Igaliko Fjord.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).

64 U - 27 Nepheline-porphyry (Fox Bay type).
Loc: Akuliaruseq, Igaliko Fjord [Akuliarusek].
Analyst: C. Detlefsen (CO_2 and Cl determined by C. Winther).
Publ: Ussing (1912), analysis 27, p. 275.

65 C - 1 Nepheline syenite.
Loc: Grønnedal. (Grønnedal - Íka complex).
Analyst: C. Winther.
Publ: Callisen (1943), p. 35.

66 27159 Nepheline syenite, marginal phase of the Lower Series foyaite. Grønnedal - Íka complex.
Loc: 150 m elevation, SW side of entrance to Grønnedal.
Analyst: B. I. Borgen.
Publ: -

67 50941 Phonolitic flow.
Loc: Narssaq Fjeld.
Analyst: B. I. Borgen.
Publ: -
Remarks: The flow occupies a very high position, occurring within the Porphyry Division of the Ilímaussaq Volcanic Member (Stewart, 1964 - thesis). It is lightly metamorphosed by adjacent intrusives.

68 U - 26 Augite syenite.
Loc: Niaqornârssuk, Qôroq [Niakornarsuk, Korok]. (Igaliko complex).
Analyst: C. Winther.
Publ: Ussing (1912), analysis 26, p. 243.

69 61162 Syeno-gabbro.
Loc: Ice margin north of Kûtsiaq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61157 (anal. 100) and 61158 (anal. 86).

70 44116 Alkaline centre to big feldspar dyke (sample includes plagioclase megacrysts).
Loc: 3 km east of Kûtsiaq.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 38186 (anal. 40) and 44898 (anal. 43).

71 61109 Alkaline margin to big feldspar dyke.
Loc: Nunatak, north of Eqalugssuit taserssuat, Isortoq area.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 61102 (anal. 73), 61112 (anal. 78) and 61114 (anal. 76).

72 42654 Margin of big feldspar dyke, 5 cm from contact.
Loc: mouth of Kûgssuaq into Tunugdliarfik.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 42656 (anal. 74) and 42658 (anal. 80).

73 61102 Big feldspar dyke, groundmass.
Loc: Nunatak north of Eqalugssuit taserssuat, Isortoq area.
Analyst: B. I. Borgen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 61109 (anal. 71), 61112 (anal. 78) and 61114 (anal. 76).

74 42656 Big feldspar dyke, outer zone 130 cm from contact.
Loc: mouth of Kûgssuaq into Tunugdliarfik.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 42654 (anal. 72) and 42658 (anal. 80).

75 45458 Big feldspar dyke.
Loc: south side of Patdlît, NE Qaersuarssuk.
Analyst: B. I. Borgen.
Publ: Bridgwater & Harry (in prep.).

76 61114 Big feldspar dyke, margin (sample includes anorthosite fragments).
Loc: Nunatak north of Eqalugssuit taserssuat, Isortoq area.
Analyst: B. I. Borgen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 61102 (anal. 73), 61109 (anal. 71) and 61112 (anal. 78).

77 U - 20 Essexite-porphyrite [alkaline gabbro with feldspar xenocrysts].
Loc: 450 m above sea level, Qáqarssuaq [Kakarsuak], near Narssaq.
Analyst: C. Winther.
Publ:Ussing (1912), analysis 20, p. 208.

78 61112 Late non-xenocryst-bearing part of xenocryst-bearing (big feldspar) dyke.
Loc: Nunatak north of Eqalugssuit taserssuat, Isortoq area.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 61102 (anal. 73), 61109 (anal. 71) and 61114 (anal. 76).

79 25352 Gabbroic margin to larvikitic syenite dyke.
Loc: Eqalugssuit taserssuat, Isortoq area.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 25350 (anal. 41).

80 42658 Big feldspar dyke, central part (sample taken 190 cm from the contact of a 1120 cm wide dyke).
Loc: mouth of Kûgssuaq into Tunugdliarfik.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).
Remarks: Same dyke as 42654 (anal. 72) and 42656 (anal. 74).

81 61055 Chill of anothosite-bearing apophysis of big feldspar dyke.
Loc: 8 km east of Kobberminebugt.
Analyst: Ib Sørensen.
Publ: Bridgwater & Harry (in prep.).

82 U - 23 Porphyry - Ilímaussaq porphyry.
Loc: top 1185 [Hatten], Ilímaussaq.
Analyst: C. Winther.
Publ: Ussing (1912), analysis 23, p. 220.

83 U - 22 Porphyrite (trachydolerite).
Loc: Taseq, Narssaq [Tasek].
Analyst: C. Winther.
Publ: Ussing (1912), analysis 22, p. 216.

84 50221 Anorthosite, fresh.
Loc: Assorutit, Tugtutôq.
Analyst: B. I. Borgen.
Publ: -

85 40523 Anorthosite, fresh.
Loc: Assorutit, Tugtutôq.
Analyst: B. I. Borgen.
Publ: -

86 61158 Syeno-gabbro, gabbroic part.
Loc: Ice margin north of Ilorro.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61157 (anal. 100) and 61162 (anal. 69).

87 40551 Syeno-gabbro - Krydssø syeno-gabbro.
Loc: ENE corner of the Krydssø intrusion, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1964b), Part III, table 3, p. 27.

88 68953 Olivine dolerite chill. NE generation.
Loc: 2 km south of west end of Tasiussap kujatdliup tasia, Neria area, Frederikshåb.
Analyst: Ib Sørensen.
Publ: -

89 C - 6 ? Essexite.
Loc: loose block in the scree, west Kûngnât.
Analyst: E. Klüver.
Publ: -

90 32364 Olivine dolerite, margin of dyke. ESE dolerite dyke generation.
Loc: 1 km west of head of Isortoq.
Analyst: B. I. Borgen.
Publ: -

91 39340 Olivine basalt - sparsely porphyritic, ophitic, from a thin flow intercalated in the Nunasarnaq Sandstone Member.
Loc: 550 m alt., 3.5 km from Nasanguaq on bearing 138°, Ilímaussaq peninsula.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.
Remarks: Horizon N.

92 20645 Feldspar-phyric gabbro - layered dyke.
Loc: Eqaloqarfia, Nunarssuit.
Analyst: B. I. Borgen.
Publ: Pulvertaft (1965), table 1, column 4, p. 36.

93 45501 Olivine dolerite. ESE dolerite dyke generation.
Loc: head of Atertûp ilua, SE Qaersuarssuk.
Analyst: B. I. Borgen.
Publ: -

94 25194 Troctolite.
Loc: Kînâqdlip kujalia, nunatak at head of Kobberminebugt.
Analyst: B. I. Borgen.
Publ: -

95 32369 Olivine dolerite, centre of dyke. ESE dolerite dyke generation.
Loc: 2 km west of head of Isortoq.
Analyst: B. I. Borgen.
Publ: -

96 39941 Olivine basalt - aphyric. Ipiutaq volcanic unit.
Loc: shore immediately west of northernmost extremety of Qeqertat, Ilímaussaq peninsula.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.
Remarks: This is the freshest of the three samples of Stewart's basalts [others 39340 (anal. 91) and 39944 (anal. 97)].
Horizon Ip.

97 39944 Basalt - "Star" basalt.
Loc: 550 m alt., on the ENE ridge of Nunasarnaq, Ilímaussaq peninsula.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.
Remarks: Horizon LB.

98 61226 Syeno-gabbro.
Loc: Kûtsiaq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61133 (anal. 46) and 61228 (anal. 99).

99 61228 Syeno-gabbro, chill.
Loc: Kûtsiaq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61133 (anal. 46) and 61226 (anal. 98).

100 61157 Syeno-gabbro, chill.
Loc: Ice margin north of Ilorro.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61158 (anal. 86) and 61162 (anal. 69).

101 U-18 Essexite.
Loc: Narssap ilua, Narssaq [= Panernak Bay].
Analyst: C. Winther.
Publ: Ussing (1912), analysis 18, p. 203.

102 - Olivine dolerite.
Loc: 64.5-64.6 m depth in drill hole 'T' at Jernhat, Grønnedal - Íka.
Analyst: A. H. Nielsen.
Publ: Emeleus (1964), table 3, p. 52.

103 30106 Olivine gabbro.
Loc. Alángorssuaq, 120 m from margin of the intrusion and 800 m SE of the northern extremety of the outcrop of the intrusion.
Analyst: B. Bruun.
Publ: Harry and Pulvertaft (1963), table 1, p. 22.

104 30765 Olivine gabbro, medium-grained, fresh.
Loc: Narssaq new harbour.
Analyst: R. Solli.
Publ: Upton (1964b), Part III, table 2, p. 24.

105 45305 Olivine dolerite. NE dolerite dyke generation.
Loc: Qaernertormiut, western Qaersuarssuk.
Analyst: B. I. Borgen.
Publ: -

106 20636 Gabbro - layered dyke.
Loc: Eqaloqarfia, Nunarssuit.
Analyst: B. I. Borgen.
Publ: -

107 26040 Olivine gabbro - ring-dyke, Kûngnât.
Loc: Kûngnât - eastern sector of the ring dyke. 1600 m NE from top of Kûngnât.
Analyst: B. Collett (except for BaO and F [which are by B. G. J. Upton]).
Publ: Upton (1960), table 5, p. 91 (1 decimal place); revised analysis Upton (1964b), Part III, table 2, p. 24.
Remarks: Spectrographic trace element data Upton (1960) table 11, p. 97.

108 U - 21 Diabase (trachydolerite).
Loc: Nunasarnaussaq [Nunasarnausak], south side of Tunugdliarfik.
Analyst: C. Winther.
Publ: Ussing (1912), analysis 21, p. 212.

109 23144 Dolerite.
Loc: Eqaloqarfia, Nunarssuit.
Analyst: B. I. Borgen.
Publ: Pulvertaft (1965), table 1, column 2, p. 36.

110 50033 Gabbro, chilled, minus plagioclase phenocrysts.
Loc: Giant dyke, Tugtutôq.
Analyst: B. I. Borgen.
Publ: -

111 40279 Basalt [metamorphosed].
Loc: 800 m E of top of Ilímaussaq (1390 m).
Analyst: B. I. Borgen.
Publ: -
Remarks: Somewhat metamorphosed and not representative of a normal Gardar magma. Upper Ilímaussaq Volcanic Series.

112 20632 Dolerite.
Loc: Eqaloqarfia, Nunarssuit.
Analyst: B. I. Borgen.
Publ: Pulvertaft (1965), table 1, column 1, p. 36.

113 40452 Olivine gabbro, fine-grained marginal facies, Giant dyke, Tugtutôq.
Loc: western Tugtutôq.
Analyst: R. Solli.
Publ: Upton (1964b), Part III, table 2, p. 24.

114 40430 Pyroxenite syenite.
Loc: Hviddal composite dyke at Itivdleq, central Tugtutôq.
Analyst: B. I. Borgen.
Publ: -

115 61187 Gabbroic end of syeno-gabbroic dyke.
Loc: Kûtsiaq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61186 (anal. 128).

116 68928 Dolerite, chill. NE generation.
Loc: 1 km east of lake 700 m, north side of Neria fjord, Frederikshåb.
Analyst: Ib Sørensen.
Publ: -

117 30684 Syeno-gabbro.
Loc: northern side of the Hviddal composite dyke towards its eastern extremety, Tugtutôq.
Analyst: E. Godijn.
Publ: Upton (1964b), Part III, table 1, p. 12.

118 50853 Camptonite.
Loc: Narssaq.
Analyst: H. B. Wiik.
Publ: Upton (1965), table 3, column E, p. 10.
Remarks: 1 m dyke.

119 25345 Lamprophyric dyke.
Loc: Eqalugssuit taserssuat, Isortoq area.
Analyst: Ib Sørensen.
Publ: -

120 45202 Lamprophyre, centre of dyke.
Loc: head of Kangerdluarssuk avangnardleq, Qaersuarssuk.
Analyst: B. I. Borgen.
Publ: Upton (1965), table 3, column D, p. 10.
Remarks: Margin of dyke 45203 (anal. 121).

121 45203 Lamprophyre, margin of dyke.
Loc: head of Kangerdluarssuk avangnardleq, Qaersuarssuk.
Analyst: Ib Sørensen.
Publ: -
Remarks: Centre of same dyke as 45202 (anal. 120).

122 50069 Camptonite sill, chilled upper margin.
Loc: Igdlukasik, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1965), table 1, column 2, p. 8.
Remarks: Same sill as 30653 (anal. 126), 50068 (anal. 125), 50070 (anal. 124) and 50071 (anal. 123).

123 50071 Analcite camptonite.
Loc: Igdlukasik, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1965), table 1, column 5, p. 8.
Remarks: Same sill as 30653 (anal. 126), 50068 (anal. 125), 50069 (anal. 122) and 50070 (anal. 124).

124 50070 Camptonite with dactylic ocelli.
Loc: Igdlukasik, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1965), table 1, column 4, p. 8.
Remarks: Same sill as 30653 (anal. 126), 50068 (anal. 125), 50069 (anal. 122) and 50071 (anal. 123).

125 50068 Camptonite, upper part of sill.
Loc: Igdlukasik, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1965), table 1, column 3, p. 8.
Remarks: Same sill as 30653 (anal. 126), 50069 (anal. 122), 50070 (anal. 124) and 50071 (anal. 123).

126 30653 Camptonitic, upper chilled margin of sill.
Loc: ca. 400 m south from west end of Store Pilesø, Tugtutôq.
Analyst: Geochemical Laboratory, Grant Institute of Geology, Edinburgh.
Publ: Upton (1965), table 1, column 1, p. 8.
Remarks: Same sill as 50068 (anal. 125), 50069 (anal. 122), 50070 (anal. 124) and 50071 (anal. 123). The sample shows the reduced condition typical of Gardar parental magma (?) (Upton, 1965 p. 11).

127 27685 Gabbro - ring-dyke, Kûngnât.
Loc: ca. 1/2 km SW from top of Kûngnât.
Analyst: D. Maynes.
Publ: -

128 61186 Syeno-gabbro, mafic accumulation.
Loc: Kûtsiaq.
Analyst: B. I. Borgen.
Publ: -
Remarks: Same dyke as 61187 (anal. 115).

129 61634 Altered mica pyroxenite.
Loc: on shore, 5.2 km from Narssarssuaq harbour on 350° bearing.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.

130 40550 Pyroxenite.
Loc: SW of Assorutit, Tugtutôq.
Analyst: B. I. Borgen.
Publ: -

131 30770 Pyroxenite.
Loc: Ungussivik Panernaq , by Narssaq.
Analyst: B. I. Borgen.
Publ: -

132 63876 Pyroxenite.
Loc: coast just NW of outskirts of Narssaq.
Analyst: B. I. Borgen.
Publ: -

133 U - 19 Magnetite pyroxenite.
Loc: Narssaq.
Analyst: C. Winther.
Publ: Ussing (1912), analysis 19, p. 205.

134 61685 Carbonatized monchiquite.
Loc: 400 m alt., 7 km north of Narssarssuaq harbour.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.

135 61710 Carbonatized lapilli tuff.
Loc: 1 km from KGH store on 170° bearing, Qagssiarssuk.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.

136 61682 Carbonatized mica-monchiquite with magnetite phenocrysts.
Loc: 550 m alt., 8 km from Narssarssuaq harbour on 350° bearing.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.

137 61606 Carbonatized nodular uncompahgrite.
Loc: 40 m alt., in Qordlortoq river, Qagssiarssuk.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.

138 61740 Carbonatized lava.
Loc: 80 m alt., 500 m from KGH store on 180° bearing, Qagssiarssuk.
Analyst: B. I. Borgen.
Publ: Stewart (1964) unpublished thesis.

139 26042 Quartz syenite, eastern border group, Kûngnât.
Loc: 1550 m ENE from top of Kûngnât.
Analyst: B. Collett (except for BaO and F [which are by B. G. J. Upton]).
Publ: Upton (1960), table 7, p. 93, and with BaO and F added, in table 4, p. 90.
Remarks: Spectrographic trace element data given in Upton (1960) p. 96.

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No. 5 The Precambrian geology of the Sârdloq area, South Greenland. 1966 by B. F. Windley. D.kr. 7.00.

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