4.5 Petrographic descriptions of pottery fabrics

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Methodology and summary of samples supplied

Twenty-one thin sections of twenty one sherd samples were provided for petrographical examination. The sherds were from two separate excavated sites and so these are treated separately. Initially each thin section was investigated using a x20 hand lens and the Geological Society of America rock-color chart and Leicester grain size chart. Each section was investigated using transmitted light petrography in plane polarised and crossed polarised light using x6.3 and x12.5 objectives with x12.5 eye pieces giving overall magnifications of x80, x155.

The emphasis of the report is on providing detailed petrographical characterisation of the sherds with some discussion on their manufacture and the geographical provenance of their raw materials.

Summary of the results

Tanquerel

Introduction

Petrography suggests that a number of sherds do not have a Sark origin indeed it is difficult to 'prove' any sherd has a Serquese origin. Based on the petrography of their non-plastics/temper the non-Sark vessels may have a Channel Islands origin or were manufactured in nearby mainland France.

The terms granite and granodiorite are used in the petrographical sense of a mineral assemblage and associated mineral textures rather than in any stricter petrological sense.

The sherd are considered within three components, clay (paste), non-plastics/temper and grog.

Origin of the raw materials

Clay component

Clay weathered from the rocks of Sark would be expected to be quartz- and plagioclase feldspar-rich with biotite; in areas where amphibolite crops out amphibole and plagioclase would be expected.

Two sherds 20 and 21 (Fabrics H and K) are unusual in having sponge-bearing clays, not known from Sark.

Sherd 15 (Fabric M) has a quartz-poor clay (perhaps suggesting that the clay is a residual weathered clay from a mafic/ultramafic rock and the mafic temper of the sherd would be consistent with that) that is highly unlikely from Sark.

Sherd 14 (Fabric M) has biotite-amphibole-feldspar-free clay so unlikely to have resulted from the weathering of any Sark rock.

Temper component

The main rock types cropping out on Sark are biotite- and other gneisses (quartz, plagioclase and biotite) and amphibolites (green amphibole and plagioclase) and diorite/granodiorite (amphibole, plagioclase and quartz). Minor rock types include potassium feldspar-bearing granite and meta-dolerite. All other rock types are very rare.

Amongst the possible/probable Sark manufactured sherds no Sark meta-dolerite or amphibolite was recognised and the Tanquerel sherds are almost exclusively tempered with a range of acidic metamorphic/igneous rocks.

Sherd 14 (quartz sand) and sherd 15 (altered fine-grained basic rock 'dolerite') and sherds 9, 20 and 21 (talc-bearing) are the exceptions.

Non-Sark Pots

Sherd 14 (Fabric M). Quartz sand or untempered

This is alone in being tempered with a very fine-grained quartz sand (the grain size is smaller than most clearly tempered quartz sand pots) or was manufactured using an untempered, very fine-grained, sandy clay. The absence of fine-grained amphibole and feldspar in the fabric of the pot mitigates against a clear Sark origin. However, there are fine-grained loess deposits on Sark, but as their petrography is unknown it is not possible to say if they would be a match this sherd. As with the majority of fine-grained quartz sand tempered pots a provenance is not possible.

Sherd 15 (Fabric M) Altered basic rock-bearing

This is tempered with an altered basic rock that retains relict clinopyroxene, within a quartz-poor clay. The meta-dolerite has the same grain size as the meta-dolerite dykes found on Sark but is less altered that almost all of them. The main paste is quartz-poor unlike almost all of the expected quartz-bearing to quartz-rich Sark clays.

Sherds 9, 20 and 21 (Fabrics F, H and K) Talc-bearing

Talc, although present, is rare on Sark only occurring in small rounded serpentine balls within gneiss, when it is associated with chlorite and actinolite. However, the original rock for these three sherds is a highly altered mafic-ultramafic rock unlike any present on Sark. Chlorite is not present in any of the sherds, suggesting that the temper is not from Sark.

Sherds 9 and 20 are very similar in having a bilithic talc schist and granite temper.

Sherd 21 which is monolithic (just talc-schist) is grogged with a variety of different grogs. It also has an unusual sponge-bearing clay/paste this is also present in some of the grog.

Granite-bearing

Sherd 10 (Fabric G) Muscovite and granite-bearing.

The sherd is tempered with coarse-grained muscovite flakes and granite clasts. The muscovite is probably separately sourced from the other components of the sherd. True granite has a very restricted occurrence on Sark and coarse-grained muscovite, if present, is rare.

Sherd 17 (Fabric O) 'Granite-' grog-bearing.

The sherd carries a number of different grogs including some grog with void spaces due to the loss of fossils fragments/organic matter, this grog looks like much Iron Age pot manufactured on the Jurassic Ridge in Britain. The rock temper is granitic and could be local or exotic, the presence of minor amounts of meta-sandstone and sulphide-bearing meta-sandstone suggest the clay is not from Sark.

Possible Sark Pots

Sherds 2, 8 and 16 (Fabrics A, E and N). Granite tempered

These three sherds are very similar in having a quartz-alkali feldspar granite temper. Granite, although present, is uncommon on Sark. Sherds 2 and 16 are very monolithic (their clast lithology is severely restricted) and clearly tempered. Sherd 8 is poorly manufactured and may not be tempered; the clay carries long biotite laths that may be from the widespread Sark biotite gneiss.

Probable Sark Pots

Sherds 4, 6, 12 (Fabrics B, D and L) Granodiorite tempered

These three sherds have a granodiorite temper and the clay in all three carries large biotite laths. They are monolithic although sherd 12 has possible biotite gneiss clasts in addition to granodiorite. Granodiorite composition rocks are quite common on Sark.

Sherd 11 (Fabric I) Biotite gneiss-bearing.
The sherd is tempered with biotite gneiss and altered granite. Biotite gneiss is widespread on Sark.

Manufacture

Temper
The presence of tempering was recognised based upon a number of criteria. A distinctly bimodal size distribution, between small non-plastics belonging to the clay and coarse non-plastics being the temper. This is taken to suggest size sorting during the manufacturing process.

Temper comprises a single or limited range of lithologies (the sherd is monolithic/bilithic) and the shape of the non-plastics suggests crushing. Angular non-plastics suggest crushed rock. Rounded non-plastics may be sieved sand but equally may be a naturally weathered component of potting clay that does not require tempering. Weathered rock clasts are more likely to be natural and so less likely to be temper than fresh rocks.

With the exception of sherd 14 and possibly sherd 8 all the vessels have the characteristics of being tempered, namely having non-plastics with a bimodal size distribution and with an essentially monolithc temper (or bilithic 9, 10 and 20), the larger temper rock clasts are generally angular to sub-angular.

The main non-plastic component in sherd 14 is very fine-grained quartz sand, its grain size is less than most sand-tempered vessels so sherd 14 may be untempered but a fired very fine-grained silty clay.

Sherd 8 is from a poorly made vessel. Although the larger clasts are monolithic in composition there is no clear bimodal size distribution between the non-plastics from the clay and temper.

Grog
Only two sherds (17 and 21) show clear evidence of grogging. Other sherds (notably 12) have very localised grog-like/clean, clay-rich areas but they are too few to have been intentionally added.
In sherd 21, grog from more than one vessel is present but all the grog shares characteristics of the main clay, perhaps suggesting that earlier vessels (now grog) and sherd 21 were manufactured using the same raw materials. One grog type carries quartz and linear burned out plant matter and is visually like much Iron Age pottery.

In sherd 17, grog from more than one vessel is present and indeed grog-in-grog may be present. One grog has abundant voids suggesting loss of fossil carbonate/organic material and is similar to much Iron Age pottery from the Jurassic Ridge. There is a difference between the grog and the main clay suggesting that the earlier vessels (now grog) may have been exotic.

Gaudinerie

Introduction

Unlike Tanquerel the seven pot sherds from Gaudinerie do not include any clearly exotic (non-Sark) pottery sherds and therefore a local (Sark) origin can be assumed.

Although the immediate solid geology/country rocks of the site are hornblende-rich gneiss and amphibolite, these have not been used to temper any pot. In addition, Sark meta-dolerite dykes, although perhaps used for the manufacture of polished stone axes, have not been quarried to provide temper.

The terms granite and granodiorite are used in the petrographical sense of a mineral assemblage and their associated mineral textures rather than in their stricter petrological sense.

The sherds are considered within two components, clay (paste) and non-plastics/temper and then in terms of their suggested manufacture.

Origin of the raw materials

Clay component

Clay, weathering from the main rock types of Sark, would be expected to be quartz- and plagioclase feldspar-rich with biotite; in areas where amphibolite crops out amphibole and plagioclase would be expected.

All seven sherds have large, often altered/weathered biotite laths in their clay together with feldspars and quartz and green amphibole although the last mineral is absent from sherds 1, 18 and 22. This might suggest different clay source(s) for the two groups of amphibole-bearing and amphibole-poor sherds.

The clays for all seven sherds are probably indigenous Sark clays.

Temper component

The main rock types cropping out on Sark are biotite and other gneisses (quartz plagioclase and biotite) and amphibolites (green amphibole and plagioclase) and diorite/granodiorite (textured amphibole, plagioclase and quartz). Minor rock types include potassium feldspar-bearing granite and meta-dolerite. All other rock types including minettes are very rare.

No Sark meta-dolerite or amphibolite was recognised as temper.

The sherds, with the exception of minette-tempered pot 5, are exclusively tempered with acid to intermediate metamorphic/igneous rocks. Pots 3 and 22 are tempered with diorite/granodiorite, pot 19 by weathered granodiorite, 18 by biotite gneiss and pot 1 is tempered with microcline-bearing granite.

Sherd 5 (Fabric D) Minette tempered

Sherd 5 is unusual in being minette-tempered, minette occurs on Sark as rare, thin dykes, for example at Congriere in the very north of the island.

Sherd 1 (Fabric A) Microcline-bearing granite

Microcline and other potassium feldspars (perthite) are absent or very minor within the main gneisses of Sark and so their presence is unusual. Sherd 1 is tempered with microcline-bearing granite, this is an uncommon lithology on Sark.

Sherd 18 (Fabric P) Biotite gneiss tempered

Sherd 18 is tempered with biotite gneiss, a widespread lithology cropping out throughout the island.

Sherd 3 (Fabric B) Granodiorite tempered

Sherd 3 is tempered with non-potassium feldspar-bearing granodiorite. Rocks of this composition crop out throughout the island. The presence of small meta-dolerite clasts in the clay confirm the local (Sark) origin for this pot.

Sherds 19 (Fabric P) and 22 (Fabric C) Granodiorite tempered

Sherds 19 and 22 are tempered with perthite or microcline-bearing granodiorite. Rocks of this composition crop out throughout the island but are minor in importance.

<u>Manufacture</u>

Grog

No sherd was recognised as being grogged.

Temper

The presence of tempering was decided based upon a number of criteria. A distinctly bimodal size distribution, between small non-plastics belonging to the clay and coarse non-plastics being the temper. This is taken to suggest some size sorting.

Temper comprises a single or limited range of lithologies (the pot is monolithic/bilithic) and the shape of the non-plastics suggests crushing as angular non-plastics suggest crushed rock. Rounded non-plastics may be sieved sand but equally may be a naturally weathered component of potting clay that does not require tempering. Weathered rock clasts are more likely to be natural and so less likely to be temper than fresh rocks.

Sherds 19 and 22 may not be tempered but manufactured from natural sandy clays overlying weathered granodiorite. Sherd 19 especially appears to be less tempered than any other pot sherd.

The other five sherds are tempered. Sherd 5 especially can be seen to be tempered, as the temper is distinctly different in composition from the clay fraction, this contrasts with most of the other tempered pots where the temper and clay fraction share many lithological characteristics.

Tanquerel Field Sample Descriptions

Exotic Vessels

Talc bearing

Sample 9. Fabric F. Trench 13: layer 382.

Macroscopic description

A talc schist-granite tempered vessel, probably exotic.

Sherd

The outer surface is micaceous, slightly rough to the touch and is a light brown (5YR 5/4 on the Geological Society of America rock-color chart) and the inner is very smooth, more micaceous and a pale yellowish-brown (10YR 6/2). The freshly broken surface shows a 3.0mm wide, outer, moderate reddish-brown (5YR 5/6) paste above a 4.0mm wide, light grey (N7), inner paste. Non-plastics are sparse and about 500µm in diameter and comprise approximately 5% by area. The cut surface shows a 4.0mm thick, moderate reddish-brown (10R 5/6) outer and a 4.0mm wide, yellowish-grey (5Y 7/2),

inner paste. Angular, glassy quartz and rounded, pink feldspar clasts show a quite tight size range 1000–1500 but up to 2000μm in diameter. They are unevenly distributed and make up 10% by area. The paste is slightly vuggy.

Thin section

The thin section shows a 3.0mm wide, light brown (5YR 5/6) above a 4.0mm wide, light olive-brown (5Y 6/6) paste. The non-plastics display a bimodal size distribution. The clay carries fine-grained grains 187–250μm in diameter and large, rounded to sub-angular, yellow-brown to colourless clasts 1000–1500μm in size but showing a wide size range up to 4.0mm in diameter. The rock clasts make up more than 10% by area and are fairly unevenly distributed.

Microscopic description

The non-plastics have a bimodal size distribution. The clay carries small quartz, altered potassium feldspar, unaltered to altered plagioclase, opaques, green amphibole, plus minor amounts of muscovite and clinozoisite.

Larger, discrete mineral grains include rounded, strained quartz and potassium feldspar plus biotite and biotite-muscovite laths. The main temper is bilithic with amphibole-talc-biotite-opaques schist and quartz-plagioclase/altered plagioclase and quartz-potassium feldspar granite. Other rock types including fine-grained, quartz-feldspar-biotite, quartz-muscovite schist; chert, quartzite and quartz cut by thin albite veins are rare.

Manufacture.

The bilithic (talc schist and granite) nature of the sherd suggests tempering as does the shape of the main, coarse-grained non-plastics.

Raw material origins.

The clay non-plastics and temper are slightly different in composition (rare, green amphibole occurs in the clay) but may have a common origin. The vessel is probably exotic as talc is rare on Sark and is only present in small, rounded, serpentine-rich balls.

Sample 20. Fabric H. Trench 2: layer 152.

Macroscopic description

A talc schist-granite tempered sherd in a sponge-bearing clay, probably exotic.

Sherd

The surfaces are smooth to the touch but pitted. The outer surface is a light olive-grey (5Y 5/1 on the Geological Society of America rock-color chart) and the inner, a medium dark grey (N4). The broken surface is a light olive-grey (5Y 6/1) but with very thin, lighter-coloured edges. Clasts are sparse, varied and up to 1.0mm in diameter within a silty matrix; they comprise <5% by area. The cut surface is an even light olive-grey (5Y 6/1). The non-plastics have a bimodal size distribution with rounded to sub-rounded, black and grey and rare, brown clasts showing a tight size range 1500–2000μm. They are fairly evenly distributed and make up 5–10% by area.

Thin section

The thin section has a uniform, dark yellowish-brown (10YR 3/2) paste with a very, very thin darker edge. The non-plastics display a bimodal size distribution. The clay carries fine-grained grains, <187μm in diameter, and larger, sub-rounded, pale yellow-brown rock and dark clasts, 500–750μm but up to 2.0 x 1.0mm in size. A very dark, elongated, clast is 2.0 x 0.2mm in size. The larger non-plastics are sparse being about 5% by area and are unevenly distributed.

Microscopic description

The non-plastics have a bimodal size distribution. The clay carries small, angular quartz, biotite, talc and green amphibole. Siliceous sponge fragments are common.

Larger, discrete mineral grains include strained quartz, altered plagioclase, green amphibole and potassium feldspar including perthite

The main temper is bilithic in composition with limonite-stained, amphibole-talc-biotite/phlogopite-opaques (euhedral pyrite) schist and quartz-altered plagioclase, granite. Other rock types including arkosic sandstone and meta-quartzite and quartz-potassium feldspar intergrowths where the perthitic feldspar carries abundant, blebby quartz grains. A little burned-out plant material and charcoal is present.

Manufacture.

The bilithic (granite and talc schist) nature of the sherd suggest tempering to a sponge-bearing clay.

Raw material origins

The clay non-plastics and temper are slightly different in composition as the clay carries sponge fragments. The vessel is exotic as talc is rare on Sark and is only present in small, rounded, serpentine-rich balls; sponge-bearing clays unrecorded from Sark.

Sample 21. Fabric K. Trench 11: layer 317.

A grogged and talc schist tempered in a sponge-bearing clay vessel, probably exotic.

Macroscopic description

Sherd

The surfaces are very, slightly gritty to the touch. The limonite-stained, outer surface is a greyish-orange (10YR 7/4 on the Geological Society of America rock-color chart) over a medium dark grey (N4), unstained surface and the inner surface is a pale yellowish-brown (10YR 6/2). The broken surface is dark grey (N3). The pale-coloured non-plastics show a tight size range, 375–500µm in diameter but rare laths are up to 2.0mm in length. The coarse-grained non-plastics constitute <10% by area. The cut surface is a uniform, medium dark grey (N4). The non-plastics have a bimodal size range with rounded to equant, grey quartz and white feldspar clasts 500–750µm in diameter. The clasts display a tight size range and make up about 5% by area.

Thin section

The thin section has a uniform, moderate olive-brown (5Y 4/4) paste. The non-plastics display a bimodal size distribution. The clay carries small grains <187µm in diameter and larger, sub-rounded, pale yellow-brown rock and dark grog clasts 500–750µm in size. Very dark/black, rounded grog is 1.0–2.5mm in size and carries 1.0 x 0.1mm size, linear voids, pale-coloured grog is 0.5mm and rock clasts are up to 2.0–2.5mm in diameter Grog and rock clasts are almost equal in number and make up about 5–10% by area and are fairly unevenly distributed. A large, rounded area may be a mudstone clast.

Microscopic description

The non-plastics have a bimodal size distribution. The clay carries small, angular to sub-rounded quartz plus trace amounts of biotite, talc and green amphibole. Siliceous sponge fragments are common and have a bimodal size distribution.

The main temper is monolithic with limonite-stained amphibole-talc-biotite/phlogopite-opaques (euhedral pyrite) schist. Other rock types include a large, rounded, possible siltstone clast. A little burned out plant material and a large charcoal clast are present.

The sherd is grogged with two different grogs. The majority of the grog comprises a very dark- fired clay with sparse quartz and abundant linear voids (cut grass), but rare, (larger) sponge, talc and biotite clasts are also present. Lesser amounts of a pale orange-yellow fired grog has rare quartz and small sponge fragments plus rare potassium feldspar and talc schist but no voids.

Manufacture

The sherd is tempered with two different grogs and with monolithic (talc schist) rock clasts added to an unusual siliceous sponge-bearing clay. The grog with linear voids is like much Iron Age pottery in mainland Britain.

Raw material origins

Both grog have sponge fragments in their pastes as does the main clay and so the main vessel and its temper may all have the same origin with regard to their raw materials. The vessel is exotic.

Sand tempered

Sample 14. Fabric M. Trench 5: layer 21.

A very fine-grained quartz-sand tempered or untempered sherd, possibly exotic.

Macroscopic description

Sherd

The surfaces are gritty to the touch and both are a pale yellowish-brown (10YR 6/2 on the Geological Society of America rock-color chart). Non-plastics are rare with 500μm in diameter, rounded quartz grains on the surfaces but these are post-depositional. The broken surface shows a 0.5mm wide, pale yellow-brown (10YR 6/2), outer paste above a 2.5mm thick, moderate reddish-orange (10R 5/6), inner paste. The cut surface shows a 3.0mm wide, light brown (5YR 5/4) core within 0.5mm thick, dark yellow-brown (10YR 4/2) margins. The paste is uniform with small voids and carries small non-plastics, <187μm in diameter.

Thin section

The thin section shows a uniform, light brown (5YR 5/6) paste. The clay carries abundant, very fine sand grains <187μm in diameter, that are >25% by area. Very rare rock clasts are up to 250μ in diameter and are <1% by area; darker fired/black, rounded areas are also present.

Microscopic description

A brown very, very clean clay has a uniform fabric. The clay carries abundant, rounded to sub-angular, monocrystalline quartz showing straight and inclined extinction together with trace amounts of muscovite, tourmaline, brown biotite/amphibole and altered plagioclase feldspar and very rare rock fragments that include fine-grained sandstone and quartz-mica rocks. Locally opaque areas carry sparse quartz.

Manufacture

The sherd is manufactured from a natural, fine-grained silty clay or is tempered with a very fine-grained quartz-rich sand. However, the grain size is less than most fine-grained sand tempered vessels.

Raw material origins

Provenancing quartz-tempered vessels is difficult. Unlike pottery of a local Sark manufacture there are no amphibole or feldspar clasts and there is nothing that suggests a local origin. Loess deposits are known from Sark but their composition is not well-known.

Possibly exotic vessels

Basic/Feldspathic

Sample 15. Fabric M. Trench 10: layer 225.

Macroscopic description

A monolithic, basic/feldspathic rock tempered sherd.

Sherd

The surfaces are very, very slightly gritty to the touch. The outer surface is a greyish-brown (5YR 3/2 on the Geological Society of America rock-color chart) and the inner is a greyish-orange (10YR 6/4). The broken surface shows a 5.0mm wide, pale yellow-brown (10YR 6/2), outer above a 1.0mm thick, light brown (5YR 5/6), inner paste. Non-plastics show a very tight size range. The cut surface shows a 4.0mm wide, greyish-orange (10YR 6/4), outer and a 2.0mm wide, light olive-grey (5Y 6/1), inner paste. Most sub-rounded to sub-angular, white clasts are fine-grained, 250–375μm in diameter but a single clast is 3.0 x 2.0mm in size. The clasts are fairly evenly distributed making up <10% by area.

Thin section

The thin section shows a 2.0mm wide, light brown (5YR 5/6) paste next to a 4.0mm wide, brownish-grey (5YR 3/1) paste. The non-plastics display a unimodal or bimodal size distribution. The clay carries fine-grained grains, 187–250μm in diameter, with colourless or pale brown, or rare, very fine-grained, grey, sub-angular clasts showing a wide size range from 375–750 but up to 1000μm in size. The rock clasts make up <10% by area and are unevenly distributed.

Microscopic description

A silty clay has a uniform fabric. The clay carries almost no quartz but has fine-grained amphibole and altered feldspar plus trace amounts of epidote, muscovite, biotite, zircon and opaques. Larger, monocrystalline grains include very green amphibole, plagioclase altering to fine-grained muscovite and epidote or to fine-grained epidote, rare, large muscovite laths and possible clinopyroxene; rounded quartz grains are rare.

Rock clasts are monolithic and comprise acicular, clinopyroxene aggregates, clinopyroxene altering to amphibole, much altered plagioclase surrounded by stubby, unaltered albite mosaics. Very rare, fine-grained quartz-unaltered plagioclase intergrowths occur but may be part of the main rock type.

Manufacture

The vessel is manufactured by adding an altered and epidotised, feldspathic-rich, basic rock temper to a quartz-poor clay.

Raw material origins

The basic rock is not from any Sark meta-dolerite dyke (clinopyroxene is too unaltered) nor is it from any Sark gneiss. The temper and clay have slight differences in their non-plastics as the clay carries (one) green amphibole and muscovite. It is not possible to confirm or deny a Sark origin but the clay is quartz-poor and this would be unusual for Sark. The clay and clasts may have the same origin.

Muscovite granite

Sample 10. Fabric G. Trench 13: layer 380.

A muscovite laths/granite tempered sherd, probably exotic.

Macroscopic description

Sherd

The surfaces are gritty to the touch. The outer surface is highly micaceous and is a light brown (5YR 6/6 on the Geological Society of America rock-color chart) and the inner is very micaceous and a dark grey (N3). The surfaces have abundant white mica flakes plus quartz clasts, they have a tight size range, 1000–1500μm in size and comprise approximately 10% by area. The broken surface shows a 3.0mm wide, outer, light brown (5YR 5/6) paste above a 5.0mm wide, very pale greyish-orange (10YR 8/4), inner paste. The cut surface shows a 1.0mm thick, light brown (5YR 6/4), outer edge above a 4.0mm thick, gradational, medium dark grey to black (N3 to N1), inner paste. The non-plastics have a bimodal size distribution. The clay has sparse, white, rounded, 2.0mm in diameter, sub-rounded granite plus white mica laths up to 1.5mm in length. The rock clasts have a tight size distribution, are fairly evenly distributed and make up 5–10% by area.

Thin section

The thin section shows a 3.0mm wide, dark grey (N3), inner paste below a 4.0mm wide, light brown (5YR 5/6) paste. The non-plastics display a bimodal size distribution as the clay carries fine-grained grains 187μm in diameter and clear, angular clasts up to 5.0 x 2.0mm in

diameter plus mica laths up to 2.0 x 0.5mm in size. The rock clasts make up about 10% by area.

Microscopic description

Sherd has a uniform fabric and the non-plastics have a bimodal size distribution. The clay carries abundant, rounded to sub-angular, monocrystalline quartz showing straight extinction together with small muscovite laths and feldspars. Larger, discrete mineral grains are angular and include much quartz, with strained extinction, alkali feldspar including rod and microcline perthite and muscovite laths.

Angular granite rock clasts include quartz-perthite/microcline and perthite-plagioclase intergrowths; these clasts only have trace amounts of fine-grained muscovite. The small grains in the clay and the clasts are similar in composition. Minor amounts of burned-out organics are present.

Manufacture

The bilithic (granite and muscovite flakes) nature of the sherd suggest tempering as does the angular shape of the coarse-grained clasts. It is possible that either a coarse-grained micaceous granite temper or more likely a granite temper and separate mica temper were added to the clay.

Raw material origins

The clay non-plastics and temper are similar in composition and so probably have a common origin. Coarse-grained muscovite is rare and granite is uncommon on Sark Therefore the vessel is probably not local in origin.

Grog granite

Sample 17. Fabric O. Trench 5: layer 23.

Macroscopic description

A grogged, quartz-feldspar/granite tempered sherd.

Sherd

The surfaces are smooth to the touch. The outer surface is a dark grey (N3 on the Geological Society of America rock-color chart) and the inner is a medium dark grey (N4) with some fine-grained, white mica. The broken surface shows a 1.5mm wide, light brown (5YR 6/4), outer above a 6.0mm wide, light olive-grey (5Y 6/1), inner paste. The surfaces have mixed clasts including rounded quartz, plus red and black clasts, they have a tight size range, about 750μm in diameter and make up about 5% by area. The cut surface is a uniform olive-grey (5Y 4/1). Glassy, rounded to sub-rounded quartz-altered feldspar clasts are 500–750 and rounded, black clasts are 1000μm in size and jointly make up about 10% by area. Brown grog is rare.

Thin section

The thin section has a uniform, dark yellowish-brown (10YR 4/2) paste. The non-plastics display a bimodal size distribution. The clay carries small grains 187 but up to 250μm in diameter and larger, single grains and rock and dark grog clasts are 500–1000μm in size, although some grog is up to 2.0mm in diameter. Small, pale brown, rounded grains are present. The larger non-plastics have a tight size range and make up about 5–10% by area. The paste in the dark grog carries fewer non-plastics than the main clay.

Microscopic description

A brown clay has a fairly uniform fabric and carries abundant, sub-angular, monocrystalline quartz together with trace amounts of muscovite, brown tourmaline, zircon, epidote/clinozoisite and unaltered to altered plagioclase feldspar. Larger, monocrystalline grains include much rounded quartz showing strained extinction, green, altered amphibole and potassium feldspar including perthite ± apatite. Minor amounts of rounded, orange-brown areas are present. The altered amphibole is unusual-looking.

Quartz-rich rock clasts include polycrystalline quartz/metamorphic quartz, rounded meta-sandstone, phyllite and pyrite-bearing meta-sandstone and rare chert. ‘Granite’ clasts include quartz-potassium feldspar-altered biotite-zircon and quartz-potassium feldspar-apatite intergrowths. Fine-grained, quartz-feldspar-epidote intergrowths and fine-grained epidote clasts are rare.

A number of distinct grog types occur, including angular, pale-fired grog with few non-plastics or just with void spaces (perhaps after fossil remains) and very rare grog with amphibole and polycrystalline quartz and voids. Most grog is very dark-fired with sparse

quartz grains ± void spaces; trace amounts of chert, plagioclase and muscovite can also be present. Some of this grog may itself carry grog. Very minor amounts of burned out plant matter and charcoal and iron-rich cutans are present.

Manufacture

The sherd is grogged with grog from one or perhaps two different vessels. It is manufactured from adding grog to a natural, fine-grained silty clay or, adding grog and quartz-rich sand to a clean clay.

Raw materials origin

The clay could be local. The rock fragments are granitic and so difficult to provenance. Some of the grog may be 'autogrog' and so also local but there are insufficient non-plastics to provenance. Some of the grog (if the linear voids be burned out fossil shell) may be from exotic pots.

Granite

Sample 16. Fabric N. Trench 2: layer353.

Macroscopic description

A monolithic granite tempered sherd.

Sherd

The surfaces are gritty to the touch. One surface is an olive-grey (5Y 5/1 on the Geological Society of America rock-color chart) and the other is a pale yellowish-brown to moderate reddish-orange (10YR 6/2 – 10R 5/6). The broken surface shows a 1.0mm wide, black (N1) paste above a 7.0mm thick, reddish-brown (10R 5/6) paste. The non-plastics are bimodal in size with large granite, quartz and feldspar clasts, 1000 µm in diameter, making up 5–10% by area and smaller clasts, 375µm in diameter, occupying 25% by area. The cut surface has a 2.0mm thick, dark grey (N3) outer and a 5.0mm wide, light brown (5YR 5/6) inner paste and shows a strong planar fabric. The non-plastics have a bimodal size distribution with smaller grains up to 500µm in diameter in the clay. White and pink, sub-angular to equant quartz-feldspar clasts are 1500–2000µm in size, unevenly distributed and make up about 5% by area.

Thin section

The thin section has a 5.0mm thick, light brown (5YR 5/4) paste next to a 2.0mm wide, dark grey (N3) paste. The non-plastics display a bimodal size distribution. The clay carries fine-grained grains <187μm in diameter and larger, angular, clear or cloudy or brown rock clasts 1000–1500μm in size. The larger non-plastics are <10% by area and evenly distributed showing a tight size range.

Microscopic description

A brown clay has a fairly uniform fabric and the non-plastics have a bimodal size distribution. The clay carries abundant, monocrystalline quartz and altered feldspar together with trace amounts of muscovite, epidote, green amphibole, biotite and unaltered plagioclase. Larger, monocrystalline grains include quartz, much feldspar altering to fine-grained, felted mica, potassium feldspar and unaltered plagioclase. All the feldspars show some alteration to white mica.

Granite clasts include quartz-potassium feldspar-epidote, quartz-altered potassium feldspar or quartz-altered plagioclase and altered plagioclase-unaltered patch perthite intergrowths.
Fine-grained, quartz-feldspar-epidote intergrowths, polycrystalline, metamorphic quartz and chert clasts are rare. There is very little mafic material (biotite/amphibole) in any of the rock clasts.

Manufacture

The angular temper is essentially monolithic and granitic (quartz- alkali feldspar and plagioclase) added to a local clay.

Raw materials origin

Both the temper and non-plastics in the clay are similar, although the clay has trace amounts of biotite and amphibole. The clay could have a Sark origin and the granite possibly local too although the granite clasts are not from any of the Sark gneisses that make up most of Sark.

Sample 2. Fabric A. Trench 13: layer 380.

Macroscopic description

A monolithic, granite tempered sherd.

Sherd

The surfaces are gritty to the touch. The outer surface is a greyish-black (N2 on the Geological Society of America rock-color chart) and the inner, a greyish-orange (10YR 6/4). Non-plastics on the surfaces have a bimodal distribution with large, 1000–1500µm in diameter, pale-coloured, angular granite clasts making up to 5% by area together with glassy quartz and orange quartz grains. Large clasts in total make up <10% by area and show a tight size range. The broken surface shows a 2.0mm wide, light brown (5YR 6/4), inner paste above a 7.0mm wide, medium grey (N5), outer paste. The cut surface shows an 8.0mm thick, medium dark grey (N4), outer above a 1.0mm thick, light brown (5YR 6/4), inner paste. The non-plastics have a bimodal size distribution with the clay having <<187µm size grains and the temper being 1000–2000µm in size. The monolithic, glassy quartz-white to pale pink, altered feldspar temper is sub-rounded to equant and quite evenly distributed and makes up 5–10% by area.

Thin section

The thin section shows a 9.0mm thick, brownish-grey (5R 3/1) paste with a 1.0mm thick, moderate yellowish-brown (10YR 5/4) edge. The non-plastics display a bimodal size distribution as the main clay carries sparse, fine-grained grains, <<187µm in diameter, with larger, mainly angular, altered feldspar clasts, 750µm and also about 2.0mm in size. Most altered feldspars show a grey core within yellow margins or are pale yellow but include a single, very dark brown clast is 2.0mm in in diameter. The monolithic clasts make up 5% by area and have a tight size range and are fairly evenly distributed.

Microscopic description

A sherd is very monolithic and the non-plastics have a bimodal size distribution. The main clay carries small, sparse, monocrystalline quartz together with small muscovite laths and trace amounts of altered feldspar, unaltered plagioclase and zircon. Larger, discrete mineral grains include quartz, alkali feldspar including microcline and perthite, altered feldspar, plus rare, altered biotite and big muscovite laths.

Granite rock clasts include sub-rounded to angular quartz-plagioclase-altered plagioclase-apatite-zircon-altered mafics, altered plagioclase-microcline, and quartz-altered potassium feldspar-muscovite/altered biotite intergrowths. Plagioclase alters to white mica or to yellow to dark brown, fine-grained, secondary minerals. Other rock types are rare but include

polycrystalline metamorphic quartz/quartzite, phyllite and rare, fine-grained basic lava. Very brown clasts are highly weathered/altered feldspar rather than grog.
Minor amounts of burned-out plant matter are present. Biotite is rare and green amphibole absent.

Manufacture
The monolithic (granite quartz-feldspar-minor mica) nature of the sherd suggest tempering as does the angular shape of the coarse-grained clasts. It is possible that a coarse-grained granite temper was added to the clay.

Raw material origins
The clay non-plastics and temper are similar in composition and so probably have a common origin. The raw materials are not from the widespread lithologies on the island (namely granodiorite or biotite gneiss).

Sample 8. Fabric E. Trench 2: layer 3.

Macroscopic description
A monolithic, granite tempered/untempered sherd.

Sherd
The outer surface is burnished but the inner is very slightly gritty to the touch. The outer surface is a greyish-black (N2 on the Geological Society of America rock-color chart) and the inner is a dark grey (N3). The broken surface is a pale yellowish-brown (10YR 5/2). The non-plastics have a wide size range and include sparse 'granite' up to 1.0mm in diameter and reddened quartz and comprise <5% by area. The cut surface shows two different clays or a very large, fired clay clast that has few non-plastics. It is a medium dark grey (N4) to brownish-grey (5YR 5/1) and has very thin, <1.0mm wide, black, outer and inner edges. White feldspar clasts are up 500 to 1000μm in diameter and make up between 5– 10% by area.

Thin section
The thin section has a uniform brownish-grey (5YR 4/1) paste. The non-plastics perhaps display a bimodal size distribution as the clay carries sub-rounded, colourless to pale yellow grains 375–750μm in diameter but rounded, grog/sedimentary clasts are up to 2.0mm in

diameter and a black, fractured clast is 2.0 x 0.5mm in size. The rock clasts make about 10% by area. A messy looking pot.

Microscopic description

A sherd has a uniform fabric and the non-plastics may have a bimodal size distribution. The clay carries plagioclase, rounded quartz and rare muscovite flakes. Larger, monocrystalline grains include rounded, unaltered potassium feldspar including perthite, large, altered biotite laths, rounded quartz, rare, colourless and green amphibole, large opaques and plagioclase altering to fine-grained muscovite and epidote/clinozoisite.

Granite is the main rock type comprising potassium feldspar (perthite)-quartz-altered epidotised plagioclase ± biotite, altered plagioclase-altered amphibole intergrowths. Plagioclase is altered to fine-grained white mica and to epidote. Rare, very fine-grained graphic granite and polycrystalline quartz and fine-grained epidote clasts are present. A single, very large, rounded, clast-supported, fine-grained sandstone has altered plagioclase quartz and epidote grains within it.

Manufacture

The almost monolithic nature of the sherd might suggest tempering by granite into a local clay. The vessel does not appear to be well-made and could be untempered.

Raw material origins

The clay non-plastics and temper are quite similar in composition and both may have a common origin on Sark.

Probable Sark Fabrics

Granodiorite

Sample 4. Fabric B. Trench 13: layer 395.

Macroscopic description

A monolithic, granodiorite tempered sherd.

Sherd

The surfaces are gritty to the touch. The outer surface is a moderate brown (5YR 5/4 on the Geological Society of America rock-color chart) and the inner a pale brown (5YR 6/2). The broken surface shows a 3.0mm wide, pale yellowish-brown core (10YR 6/2) within 3.0 and 2.0mm wide, light brown (5YR 6/4), outer margins. Abundant non-plastics have a wide size range 375–1000µm in size and include reddened, rounded, glassy quartz, yellow, cleaved feldspar and dark, shiny mafics. Some 'granite' clasts are up to 2mm in diameter and the larger clasts are up to 10–25% by area. The cut surface shows a 2.0mm wide, light olive-grey (5Y 6/1) core within 3.0mm wide, light brown (5YR 6/4) edges. The non-plastics show a bimodal size distribution with grains in the clay 250µm in diameter and larger, sub-angular to equant, grey-white-pink 'granite' and rare, shiny, black clasts with a wide size range 750–1500µm but up to 2.0mm in size. They are fairly evenly distributed and make up <10% by area.

Thin section

The thin section shows a 4.0mm wide, moderate brown (5YR 4/6) edge to a 3.0mm wide, central, pale yellowish-brown (10YR 6/2) paste and a 4.0mm wide, light brown (5YR 5/6) edge. The non-plastics display a strong, bimodal size distribution. The clay carries fine-grained grains, <187µm in diameter, with larger, mainly sub-rounded, cloudy or yellow-stained clasts, 750–1500µm but up to 3.0 x 1.0mm in size; 1.0mm in diameter, quartz and quartz-feldspar granodiorite clasts are rare but large, green amphibole is visible in some. The clasts make up < 10% by area and have a quite even distribution.

Microscopic description

A sherd has a uniform fabric and the non-plastics have a bimodal size distribution. The clay carries abundant, fine-grained, angular quartz together with altered biotite/amphibole, altered feldspar plus trace amounts of epidote. Larger, discrete mineral grains include rare, zoned, unaltered plagioclase, large, altered biotite and amphibole and dark brown, altered feldspar.

Weathered granodiorite is the main rock type comprising quartz-altered and zoned plagioclase-green amphibole-coarse-grained apatite ± zircon ± sphene or rare quartz-potassium feldspar-plagioclase-biotite or quartz-biotite intergrowths. Plagioclase is altered to fine-grained white mica and or fine-grained clinozoisite or if very weathered to brown

secondary minerals. Other rock types are very rare but include chert and polycrystalline meta-sandstone.

Manufacture

The almost monolithic nature of the sherd and angular clasts suggest tempering by perhaps crushed weathered granodiorite into a local clay.

Raw material origins

The clay non-plastics and temper are similar in composition and probably have a common origin on Sark.

Sample 6. Fabric D. Trench 13: layer 436.

Macroscopic description

A monolithic, granodiorite tempered sherd.

Sherd

The outer surface is perhaps burnished and is a patchy greyish-red (5R 4/2 on the Geological Society of America rock-color chart) and the inner is a brownish-grey (5YR 7/1); both are slightly micaceous. The broken surface has a 4.0mm thick, yellowish-grey (5Y 6/2) core within 1.0mm wide, moderate reddish-orange (10R 5/6) margins. The non-plastics have a tight size range and include pale weathered 'granite' up to 750μm in size, glassy quartz and dark clasts that comprise about 5–10% by area. The cut surface has a 3.0mm wide, moderate reddish-brown (10R 4/6), outer and a 3.0mm wide, light brown (5YR 6/4), inner paste. The non-plastics are polylithic, the clay has very fine grains <187μm in size and sparse, glassy quartz, cream-coloured feldspar and rare, black clasts show a wide size range, most are <500μm but range up to 1500μm in size. They are unevenly distributed and make up <5% by area.

Thin section

The thin section is a uniform, light brown (5YR 6/4) with a 1.0mm wide, moderate brown (5YR 3/4) margin. The non-plastics display a bimodal size distribution as the clay carries fine-grained grains, <187μm in diameter, with larger, clear, angular rock and sub-rounded to rounded, pale yellow clasts, 375–750μm in size; a large, rounded, yellow clast is 2.0 x 1.0mm in size. The larger clasts make up about 5% by area and have a quite even distribution.

Microscopic description

A sherd has a uniform fabric and the monolithic non-plastics have a bimodal size distribution. The clay carries much fine-grained, rounded quartz with rare muscovite flakes and epidote. Larger, monocrystalline grains include quartz, unaltered potassium feldspar including rare microcline, long biotite laths, green amphibole, opaques and unaltered to altered plagioclase altering to fine-grained muscovite and/or to epidote/clinozoisite.

Granodiorite is the main rock type comprising angular to sub-angular, quartz-altered and zoned plagioclase-green amphibole ± zircon ± opaques and quartz-perthite intergrowths. Other rock types are very rare but include chert and polycrystalline, metamorphic quartz. The granodiorite does not show any strong foliation.

Manufacture

The almost monolithic nature of the sherd suggest tempering by granodiorite into a local clay.

Raw material origins

The clay non-plastics and temper are quite similar in composition and probably have a common origin, this is on Sark.

Sample 12. Fabric L. Trench 13: layer 389.

Macroscopic description

A granodiorite tempered sherd.

Sherd

The outer surface is very micaceous and is a medium dark grey (N4 on the Geological Society of America rock-color chart) and is slightly gritty to the touch, the inner is smooth, micaceous and a brownish-grey (5YR 4/1). The broken surface is a pale yellowish-brown (10YR 5/2) with coarse-grained clasts including 5.0mm in diameter, reddened quartz, 1.0–2.0 mm in diameter granite, mica and black clasts. They have a wide size range and constitute 5–10% by area. The cut surface shows a uniform, pale yellowish-brown (10YR 5/2) paste with a 1.0mm wide, feintly reddened, inner edge. Irregularly distributed, sparse, large, white-glassy-dark ‘granite’ clasts are up to 1.5mm; rounded, red-orange, fine-grained, limonite-stained ‘grog’ clasts are 2.0mm and feldspar is 1.0mm in size. The non-plastics have a bimodal distribution with a fair size range and make up 5% by area.

Thin section

The thin section is a uniform, moderate brown (5YR 4/6). The non-plastics display a clear bimodal size distribution. The clay carries fine-grained grains <187μm in diameter and pale yellow, sub-angular to sub-rounded rock clasts 750–1000μm but up to 3.0mm in size and dark brown, rounded, clay-rich areas with very fine-grained quartz inclusions up to 2.0mm in diameter. The rock clasts make up about 5% and brown clay 1–2% by area.

Microscopic description

A sherd has a uniform fabric and the non-plastics may have a bimodal size distribution. The clay carries fine-grained, angular quartz and altered feldspar plus rare zircon, epidote and muscovite flakes. Larger, monocrystalline grains include rounded, very strained quartz and unaltered plagioclase or plagioclase altering to fine-grained muscovite, epidote or to fine-grained, yellow secondary minerals, green amphibole altering to brown secondary phases and large biotite laths.

Granodiorite is the main rock type comprising quartz-feldspar altering to muscovite-amphibole, quartz-amphibole-biotite, plagioclase-twinned amphibole intergrowths; some plagioclase is cut by later albite veinlets. Rare, polycrystalline quartz/meta-sandstone and chert, phyllite and biotite-bearing sandstone are present as is feldspar intergrown with blebby quartz and potassium feldspar altering to brown secondary minerals.

Rounded, dark-fired, clay-rich areas carry sparse quartz accompanied by trace amounts of white mica and altered feldspar. One large ‘clast’ has quartz, amphibole and altered feldspar and is similar to the main clay.

Possible bone and large, burned out plant matter are present as are rare, iron-rich cutans.

Manufacture

The close to monolithic nature of the large clasts suggest tempering by granodiorite into a local clay. The clay-rich areas are possibly too few to be intentional grogging.

Raw material origins

The clay non-plastics and temper granodiorite are quite similar in composition and hence both probably have a common origin on Sark.

Gneiss tempered

Sample 11. Fabric I. Trench 2: layer 3.

Macroscopic description

A biotite gneiss and minor granite tempered sherd.

Sherd

The outer surface is burnished greyish-black (N2 on the Geological Society of America rock-color chart) but the inner is gritty to the touch and is a medium dark grey (N4). The broken surface shows a 2.0mm wide, light brown (5YR 6/4) paste above a 5.0mm wide, greyish-black (N2) paste. The temper is monolithic, crushed, pale-coloured granite, with a tight size range, mainly 750–1000μm but up to 4.0mm in diameter and occupies <25% by area. The cut surface has a 2.0mm thick, dark yellowish-brown (10YR 4/2), outer and a 5.0mm thick, medium grey to black (N5 –N1) inner paste. White, altered feldspar and glassy quartz clasts are equant in shape, 1.0mm in size, evenly and quite densely distributed and show a tight size range. They occupy about 10% by area. The sherd is vuggy.

Thin section

The thin section has a 2.0mm wide, moderate brown (5YR 4/4) paste next to a 5.0mm wide, brownish-black (5YR 2/1) paste. The non-plastics display a clear, bimodal size distribution. The clay carries fine-grained, <250μm in diameter, grains and colourless to yellow, tabular clasts, 1.0 to 2.0mm in length; a single, blackened, burned out seed is present and one, 2.0mm long, feldspar lath is very altered and dark brown. The rock clasts are about 10% by area and fairly evenly distributed. The temper is monolithic.

Microscopic description

A sherd has a uniform fabric and the non-plastics have a bimodal size distribution. The clay carries angular quartz and altered feldspar plus rare zircon, epidote, amphibole and muscovite flakes. Larger, monocrystalline grains include rounded quartz and plagioclase altering to fine-grained muscovite, fine-grained epidote/clinozoisite or to brown, fine-grained, secondary minerals and potassium feldspar altering to fine-grained, brown, secondary minerals.

Gneiss/granite is the main rock type comprising quartz-altered feldspar ± amphibole ±biotite ± zircon, quartz-altered plagioclase, altered plagioclase-altered biotite and quartz-amphibole

intergrowths. Other rare, rock clasts include polycrystalline quartz/meta-sandstone and chert, feldspar intergrown with short, bladed muscovite or with euhedral epidote and potassium feldspar or quartz intergrown with mosaic albite. There is very little potassium feldspar and amphibole. A large burned out seed is present.

Manufacture

The close to monolithic nature of the large clasts suggest tempering by biotite gneiss and minor granite into a local clay. The temper is not granodiorite.

Raw material origins

The clay non-plastics and temper are slightly different in composition as the clay carries green amphibole. The main temper is altered and weathered gneiss and granite. Both probably are from Sark.

Gaudinerie Field Sample Descriptions

Sample 3. Fabric B. Trench 8: layer 90.

A monolithic, foliated granodiorite tempered sherd.

Macroscopic description

Sherd

The surfaces are very gritty to the touch and are a greyish-orange to light brown (10YR 7/4 to 5YR 4/6 on the Geological Society of America rock-color chart). The freshly broken surface shows a 5.0mm wide, greyish-black (N2) paste above a 4.0mm wide, light brown (5YR 5/6) paste. Non-plastics are angular, with a tight size range but are up to 4.0mm in diameter and include glassy quartz, feldspar and dark mafics; they comprise up to 10% by area. The cut surface shows a 6.0mm thick, greyish-orange (10YR 6/4) paste next to a medium grey (N5) grading into dark grey (N3) paste. The non-plastics have a bimodal size distribution with large, equant, white clasts 1.0–4.0mm in size plus glassy and black clasts 0.5mm in diameter. They have a fairly even distribution and make up about 5–10% by area.

Thin section

The thin section shows a 5.0mm wide, brownish-black (5YR 2/1) paste next to a 6.0mm thick, greyish-orange (10R 6/4) paste. The non-plastics display a strong, bimodal size distribution. The main clay carries fine-grained grains, <187µm in diameter, with larger, quartz-cloudy feldspar-green amphibole rock clasts, 750µm but up to 3.0mm in size. Rare, rounded, dark brown, very fine-grained lava clasts are up to 1.5mm in size. The sub-angular to sub-rounded clasts make up >5% by area and have a quite tight size range.

Microscopic description

A sherd has a uniform fabric and the non-plastics have a bimodal size distribution. The clay carries fine-grained quartz together with altered biotite, green amphibole, altered feldspar plus trace amounts of muscovite, apatite, zircon and epidote. Larger, discrete mineral grains include quartz, unaltered plagioclase, plagioclase altering to fine-grained muscovite and epidote, plus large, altered biotite and twinned amphibole.

Granodiorite/diorite is the main rock type comprising quartz-unaltered/altered plagioclase-green amphibole-biotite-opaques-coarse-grained apatite ± zircon ± sphene. Some quartz-altered plagioclase-amphibole clasts have a planar fabric. Plagioclase is altered to fine-grained white mica and or fine-grained clinozoisite. Other rock types are very rare but include polycrystalline quartz, chert, fine-grained epidote clusters and very altered, very fine-grained dolerite. Potassium feldspars were not recognised.

Manufacture

The almost monolithic nature of the sherd suggest tempering by foliated granodiorite (quartz-feldspar-amphibole-biotite) into a local clay.

Raw material origins

The clay non-plastics and temper are similar in composition hence probably have a common origin. A little weathered, fine-grained dolerite in clay is from one of the many meta-dolerite dykes found on Sark. Foliated granodiorite crops out in northern Sark as do many meta-dolerite dykes.

Sample 22. Fabric C. Trench ?: layer 80.

Macroscopic description

A diorite tempered sherd.

Sherd

The surfaces are gritty to the touch especially the outer. The outer surface is a light brown (5YR 6/6 on the Geological Society of America rock-color chart) and the inner is a greyish-black (N2). The surfaces have sparse, mixed granite, reddened quartz and black clasts with a wide size range, namely 750–2000μm; they make-up <5% by area. The broken surface shows a 1.0mm wide, outer, reddish-brown (10R 4/6) paste above a 9.0mm thick, very pale yellowish-brown (10YR 5/2) core and a <1.0mm wide, greyish-black (N2), inner margin. The cut surface shows a 5.0mm wide, moderate reddish-orange (10R 5/6), outer and 6.0mm wide, brownish-black (5YR 2/1), inner paste. The non-plastics have a bimodal size distribution with grains 250μm in diameter and larger, grey-white quartz and pink feldspar clasts 3.0–5.0mm in size and rare, black clasts up to 1.0mm in diameter. The non-plastics are monolithic have a tight size range and are very poorly distributed; they make up about 10% by area.

Thin section

The thin section has a 4.0mm thick, light brown (5YR 5/6) paste next to 4.0mm wide, black (N1) paste. The non-plastics display a bimodal size distribution. The clay carries fine-grained grains 250μm in diameter and larger, sub-angular quartz-feldspar-green amphibole rock clasts 1.0–4.0mm in size. The larger non-plastics are unevenly distributed, show a wide size range and are about 10% by area.

Microscopic description

The non-plastics have a bimodal size distribution. The clay carries, fine-grained, angular quartz plus altered feldspar including plagioclase and rare epidote. Larger, monocrystalline grains include quartz and abundant potassium feldspar and other feldspars altering to fine-grained muscovite and epidote plus rare, large muscovite and biotite laths and rounded opaques.

Diorite is the main rock type comprising quartz-biotite-green, twinned amphibole-altered feldspar, quartz-microcline-green amphibole-biotite-myrmekite, quartz-perthite, quartz-potassium feldspar-altered plagioclase intergrowths. A second, minor rock type comprises fine-grained, unaltered feldspar-stubby muscovite-euhedral epidote-apatite intergrowths. Rare, polycrystalline quartz/meta-quartzite, chert and fine-grained epidote clusters are

present. Locally darker fired, clay-rich areas carry sparse quartz and white mica; trace amounts of burned out plant matter and possible shell are present.

Manufacture

The nature of the large clasts suggest possible tempering by weathered diorite into a local clay.

Raw material origins.

The clay non-plastics and temper are similar in composition and probably have a common origin, on Sark.

Sample 19. Fabric P? Trench 2: unstratified.

A weathered diorite/granodiorite tempered/untempered sherd.

Macroscopic description

Sherd

The outer surface is burnished and is a greyish black (N2 on the Geological Society of America rock-color chart) and the inner is an olive-grey (5Y 5/1). The non-plastics are up to 375μm in diameter and some are 'shiny'. The freshly broken surface is black (N1 and the cut surface is a uniform medium dark grey (N4) with white, glassy quartz and dark clasts 250–375μm in diameter, they are unevenly distributed and make up about 5% by area.

Thin section

The thin section is a uniform greyish-black (N2) but with a slightly paler core. The non-plastics may have a unimodal or bimodal size distribution. The clay carries fine-grained grains <187μm in diameter and sparse, larger, colourless to pale yellow-brown, sub-rounded to sub-angular clasts including possible mudstone; these are 750–1500μm in size. The larger non-plastics are unevenly distributed and make up <5% by area.

Microscopic description

A pot has many highly weathered/altered clasts and the non-plastics may have a bimodal size distribution. The clay carries abundant, fine-grained, angular quartz plus altered plagioclase, green amphibole and rare epidote and muscovite flakes. Larger, monocrystalline grains include angular, strained quartz and abundant, altered, twinned plagioclase altering to fine-

grained muscovite and/or to yellow, fine-grained, secondary minerals, plus opaques and possible amphibole/biotite altering to brown secondary phases.

Granodiorite/diorite is the main rock type comprising altered plagioclase-green amphibole ± apatite, quartz-perthite and potassium feldspar-amphibole intergrowths. Rare, angular, polycrystalline quartz, meta-quartzite and phyllite clasts are present.

Manufacture

The nature of the large clasts suggest possible tempering by weathered granodiorite/diorite into a local clay. It is possible the sherd is untempered but made from a natural clay forming over weathering granodiorite/diorite.

Raw material origins

The clay non-plastics and temper are similar in composition and probably have a common origin; this is on Sark, perhaps northern Sark.

Biotite Gneiss

Sample 18. Fabric P. Trench 2: layer 14.

Macroscopic description

A weathered biotite gneiss tempered sherd.

Sherd

The sherd is friable. The outer surface is a greyish-orange (10YR 6/4 on the Geological Society of America rock-color chart) and the inner is a medium dark grey (N4). The broken surface has 2.0mm wide, greyish-orange (10YR 6/4), 3.0mm wide, dark grey (N3), 6.0mm wide dark yellowish-brown (10YR 4/2) and 1.0mm thick, greyish-orange (10YR 7/4) pastes. The dark, rounded, non-plastics are sparse and difficult to see. The cut surface shows 2.0mm thick, light brown (5YR 6/4) grading into 3.0mm wide, light olive-grey (5Y 5/1), 3.0mm thick, black (N1) and finally 1.0mm wide, brownish-grey (5YR 4/1) pastes. Rare, grey, equant quartz/'granite' clasts 500μm in diameter and very rare, dark brown, clay make up about 1% by area.

Thin section

The thin section has a 5.0mm thick, black (N1) next to a 5mm thick, greyish-brown (5YR 3/2) paste and the pot has a very open texture with rounded grog-like areas including one showing two different firing colours. The non-plastics may display a bimodal size distribution. The clay carries fine-grained grains <187μm in diameter and clear, angular quartz, 500–750μm in size and rounded, darker brown-fired grog-like areas 1500μm but up to 3.0mm in size. The larger non-plastics have a tight size range, are unevenly distributed and make up <5% by area.

Microscopic description

A sherd has many, highly weathered/altered clasts and the non-plastics may have a bimodal size distribution. The clay carries fine-grained, angular quartz plus altered feldspar, opaques and rare epidote and colourless amphibole. Larger, monocrystalline grains include angular, strained quartz and abundant, altered feldspar, altering to fine-grained muscovite and rare epidote but mainly to yellow to dark brown, fine-grained, secondary minerals.

Biotite gneiss is the main rock type comprising polycrystalline, strained quartz with minor biotite and quartz-biotite-plagioclase/altered feldspar intergrowths. Other, rare clasts include chert and quartz-muscovite intergrowths. A large, rounded rock clast comprises felted phyllosilicate, altered feldspar and opaques. Grog was not recognised and green amphibole is absent.

Manufacture

The close to monolithic nature of the large clasts suggest tempering by crushed, altered/weathered biotite gneiss into a local clay.

Raw material origins

The clay non-plastics and temper are quite similar in composition and both may originate from highly weathered biotite gneiss. The raw materials are local to Sark as biotite gneiss is the most common rock on Sark.

Gneiss/granite

Sample 7. Fabric E. Trench 3: layer 22.

Macroscopic description

A granite/gneiss tempered sherd.

Sherd

The limonite-stained surfaces are gritty to the touch and are pale yellowish-brown (10YR 6/2 on the Geological Society of America rock-color chart) with a little visible mica and glassy quartz. The angular non-plastics have a wide size range and are dominated by rounded quartz grains 500–750μm in size; they comprise < 5% by area. The broken and cut surfaces are a uniform, vuggy, dark grey (N3). The non-plastics have a bimodal size distribution with the paste having <187μm size grains and sparse, angular, glassy, white and pink feldspar clasts, within a tight size range, 500–750μm in size. They make up about 5% by area and are irregularly distributed.

Thin section

The thin section shows a uniform, dark grey (N3) paste and shows a strong, sub-parallel fabric with abundant, linear voids up to 1.0mm in length. The non-plastics perhaps display a bimodal size distribution as the clay carries sub-rounded to sub-angular, colourless to pale yellow grains, 375–500μm in diameter, showing quite a tight size range but with clasts up to 2.0 x 0.4mm in size. These rock clast make up about 5% by area.

Microscopic description

A sherd has a uniform fabric and the non-plastics have a bimodal size distribution. The dark, clean clay carries plagioclase, rounded quartz and rare muscovite flakes. Larger monocrystalline grains include rounded, unaltered potassium feldspar including patch perthite, altered/weathered biotite laths, rounded quartz, green amphibole, large opaques and plagioclase altering to fine-grained muscovite giving it a pale yellow body colour.

Granite/gneiss is the main rock type comprising potassium feldspar (perthite)-quartz-biotite and quartz-plagioclase intergrowths. Other rock types are rare but include coarse-grained, polycrystalline metamorphic quartz, rare graphic granite and chert.

Manufacture

The almost monolithic nature of the sherd non-plastics and angular shape of the clasts suggest tempering by granite/gneiss (quartz-feldspar-biotite) into a local clay. The temper may be

crushed rock rather than a natural sand. The main biotite gneiss is potassium feldspar poor suggesting the rock is more granitic in composition.

Raw material origins

The clay non-plastics and temper are not totally similar in composition as the clay has green amphibole laths not seen in any rock clast. However, both probably have a common origin and this is on Sark.

Sample 1. Fabric A. Trench 2: layer 14.

A monolithic, microcline-bearing granite tempered sherd.

Macroscopic description

Sherd

Both surfaces are quite micaceous. The outer surface is a dark grey (N3 on the Geological Society of America rock-color chart) and the inner is a medium, dark grey (N4). The surfaces have abundant white mica flakes plus quartz and feldspar clasts up to 2.0mm in size, the clasts have a tight size range, 1500–2000μm and comprise approximately 5–10% by area. The broken surface shows a 2.0mm wide, outer, greyish black (N2) above a 4.0mm wide, moderate reddish-brown (10R 5/6), inner paste and a <<1.0mm wide, medium dark grey edge. The cut surface shows a 5.0mm wide, brownish-black (5YR 4/1), outer paste above 2.0mm thick, light brown (5YR 6/4) and a 1.0mm wide, black (N1) inner pastes, the colour changes are gradational. The sherd shows a bimodal size distribution with grains in the clay up to 375μm in size. Angular, white and pink-white clasts, 2.0–4.0mm in diameter, are sparse and irregularly distributed; they cover < 10% by area. Some clasts are heavily weathered.

Thin section

The thin section shows a 6.0mm thick, moderate reddish-orange (10R 4/6) core within 1.0mm wide, greyish-red (10R 4/2) edges. The clay has been poorly mixed with ‘cleaner areas’. The non-plastics display a strong bimodal size distribution with the main clay carrying fine-grained grains, 187μm in diameter, with larger, mainly angular, quartz-feldspar rock clasts 1.0 - 4.0mm in size. The clasts make up 5% by area and have a tight size range.

Microscopic description

A sherd has a heterogeneous fabric but overall the non-plastics have a bimodal size distribution. There are two distinct clay areas, the main clay carries abundant, small, sub-angular, monocrystalline quartz together with many small muscovite laths and minor amounts of altered feldspar, unaltered plagioclase, biotite and chert. The other, less abundant, clay just carries sparse, fine-grained quartz grains. Larger, discrete mineral grains include quartz, alkali feldspar including microcline and perthite, altered feldspar, altered biotite laths and epidote. Granite rock clasts include quartz-potassium feldspar (perthite and microcline)-altered feldspar-muscovite, potassium feldspar/plagioclase-quartz-muscovite and microcline-biotite intergrowths. Plagioclase alters to epidote in some of these clasts. Other rock types are rare but include polycrystalline metamorphic quartz. The composition of the small grains in the main clay and the clasts are similar.

Minor amounts of burned out organics and charcoal are present as are possible collophane bone/scales. Green amphibole is absent and potassium feldspar is common, hence the rocks are not diorite/granodiorite.

Manufacture

The monolithic (granite) nature of the sherd, the bimodal size distribution and angular nature of the large non-plastics suggest tempering. It is possible that a coarse-grained granite temper was added to a clean/cleaned clay. There are signs of poor mixing of the clay.

Raw material origins

The clay non-plastics and temper are similar in composition and so probably have a common origin. Microcline-bearing granite is uncommon on Sark but is present.

Minette Tempered

Sample 5. Fabric D. Trench 4: layer 33.

Macroscopic description.

An almost monolithic, minette-tempered sherd.

Sherd

The outer surface is perhaps burnished and a medium, dark grey (N4 on the Geological Society of America rock-color chart) and the inner is a pale yellowish-brown (10YR 6/2), both are slightly micaceous. The angular, non-plastics have a wide size range and include white ?flint up to 2.0mm and rust-coloured clasts up to 1.0mm in diameter, most clasts are 375–1000μm in size and comprise about 5% by area. The broken surface is medium grey (N5) but the cut surface is a slightly patchy, medium grey (N5 –N6). More than one clay may be present; clay one has sparse, irregularly distributed, white quartz clasts up to 4.0mm in size although most are 750μm in diameter, a different clay has darker, equant 'granite' clasts up to 2.5mm in size but with a wide size range. A singe, very large grog/mudstone clast is round in shape. The non-plastics are >10% by area.

Thin section

The thin section is a dark yellow-brown (10YR 4/2) with a 0.1mm wide, darker rim. The non-plastics display a bimodal size distribution. The clay carries fine-grained grains, <187μm in diameter, with larger clasts 250–375μm in size; 1.0mm in diameter quartz, quartz-feldspar 'granite' clasts are rare. The clasts make up < 10% by area and are quite evenly distributed.

Microscopic description

A sherd has a uniform fabric and the non-plastics have a bimodal size distribution. The clay carries rounded, monocrystalline quartz together with biotite, altered plagioclase and alkali feldspar plus trace amounts of muscovite and epidote. Larger, discrete mineral grains include quartz, with strained extinction, alkali feldspar, altered feldspar, much altered biotite and some green amphibole.

The main rock type is minette comprising fine-grained intergrowths of biotite-alkali feldspar-opaques. Other rock types are rare but include quartz-altered feldspar-amphibole intergrowths, fine-grained, polycrystalline quartz and quartz-mica metamorphics. Small areas of darker fired clay look grog-like.

Manufacture

The almost monolithic nature of the sub-rounded to sub-angular, non-plastics strongly suggest tempering by minette into a local biotite-gneiss derived clay. The temper may not be crushed rock but natural sand.

Raw material origins

The clay non-plastics and temper are dissimilar in composition as the clay has green amphibole laths but amphibole is absent from the minette. However, both probably have a common origin. Minette dykes are uncommon on Sark the largest is north of Congrière in the very north of Sark.