A PETROLOGICAL EXAMINATION OF THE DOWNPATRICK KILN POTTERY

M. McCorry

INTRODUCTION

A late 13th-century pottery kiln was excavated at Downpatrick, Co. Down in 1959 (Pollock and Waterman 1963). Since the final report included only typological descriptions of the pottery types, with a short appendix on a chemical analysis conducted by Hodges, it is intended to undertake a detailed petrological study to establish fabric types. In the interim period, this paper is offered as an aid to the identification of Downpatrick pottery and as a contrast with the Carrickfergus kiln material (McCorry 1979).

SURFACE GEOLOGY OF CO. DOWN

The area around Downpatrick (Fig. 1) is thickly covered with drift. Greywackes, slates and grits are exposed at Gallows Hill to the east of the town and in a quarry half a mile to the south. Elsewhere, the drift is composed of boulder clay, together with sand and gravel containing marine shells. Loamy alluvium with occasional layers of peat are found in the flood plain of the river Quoile and in some areas clay containing shells has been found in association with it.

THE POTTERY

A number of sherds was selected to represent some of the variation apparent in the kiln material and from these 19 were thin-sectioned. The texture of all sherds was gritty with a hackly fracture. Some were glazed while others were merely coated with a slip and the remainder had no surface treatment. The glazed sherds had grey (commonly 5YR 6/1) external surfaces and reddened (commonly 5YR 7/6) internal surfaces, while the unglazed sherds were red throughout. A few sherds showed unfused lead pellets on the inner faces. The reduced zone is due either to infiltration of CO_2 from a lead carbonate glaze into the clay or to a second firing in a reducing environment.

Inclusions were abundant and well sorted. Quartz, feldspar, light coloured rock fragments, laminated inclusions and some dark rock fragments could be seen with a hand lens while mica was detected in the normal hand-specimen. The most characteristic features of the sherds, however, were voids and semi-voids partially filled with soft white amorphous material, which is non-calcareous. There were three types; circular and of the order of 1 mm in diameter, rectangular, shell-like and larger irregularly shaped inclusions. In thin section, these inclusions show a wide reduction zone around the rim where the clay matrix has been bleached. This white material was analysed (Appendix 2 in Pollock and Waterman 1963) with the conclusion that the inclusions were most probably bauxite altered in the firing. Since this seems improbable taking into account the geology of the area, a sample was taken for X-ray fluorescence analysis. This gave contradictory results to the earlier analysis and showed high contents of Al_2O_3 and SiO_2 with smaller amounts of FeO, Fe_2O_3 and CaO. There were traces of MnO and K_2O but no Na_2O or MgO. This suggests perhaps an argillaceous limestone.

In thin section, the sherds show a relatively limited range of inclusions. Grain size varies from less than 0.1 mm to 4 mm with an average size of 0.5 mm. Table 1 shows the range of inclusions present in each of the thin sections and Table 2 the proportion of each inclusion present in the whole sample. The thin section description of the sherds is as follows:

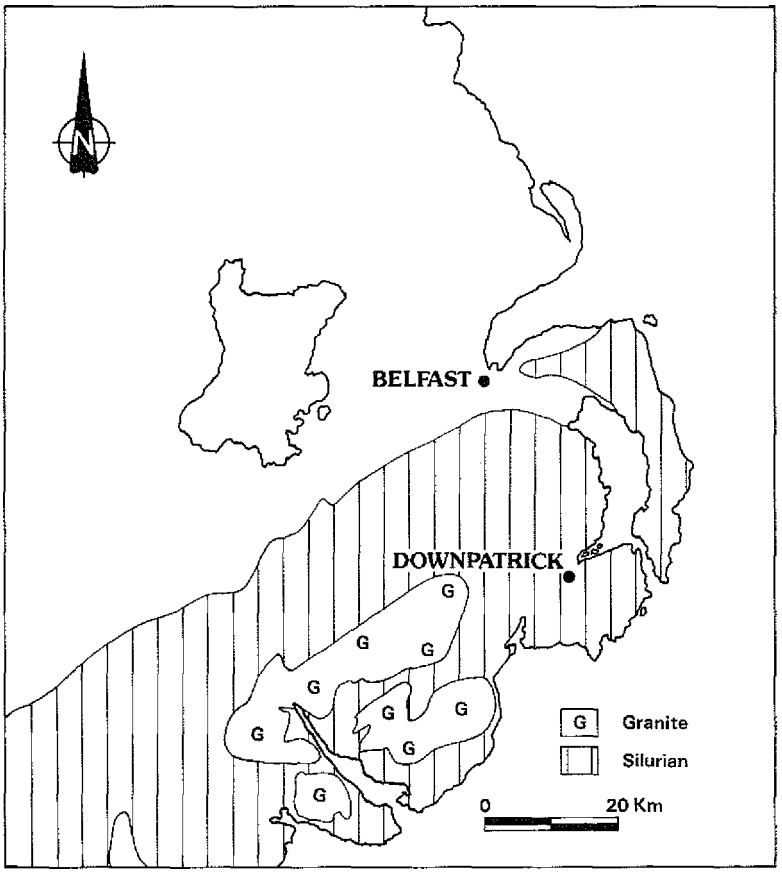

FIG. 1 Surface geology of County Down

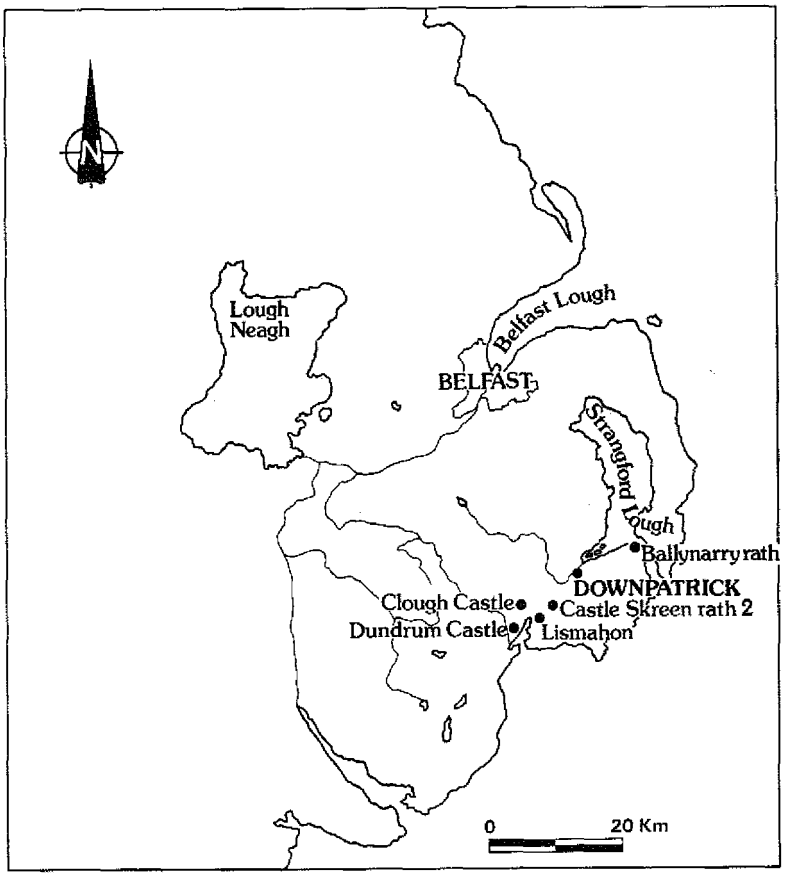

FIG. 2 The distribution of Down Patrick pottery

Inclusions present were pyroxene, zircon, tourmaline, feldspar, quartz and rock fragments.

Pyroxene	This occurs in each sherd but only as small (0.2 mm) and colourless fragments of augite.
Zircon	This is infrequent and occurs as tiny grains associated with quartz.
Tourmaline	This occurs both freely and in association with quartz, as small euhedral grains, pleochroic in greens.
Feldspar	Plagioclase is always present but as laths showing small twin extinction angles.
	Alkali feldspars are present as microcline and perthite, the latter being most abundant.
Quartz	This was always abundant and occurred in all sizes varying from rounded to sub-angular in shape. The grains were often cracked and tended to be free from inclusions.
Rock Fragments	The majority of these inclusions consisted of quartz/feldspar/mica/ore in various proportions. These were identified as greywackes, some being micritic. Mudstones were also present and granite fragments composed of biotite and quartz. The least abundant rock fragments seen were the basalt and diorite inclusions.

The inclusion types are fairly uniform throughout; fabric groupings are not particularly obvious although there are some variations in the amounts and types of inclusion present. However, they are consistent with the exposure and the content of the drift around Downpatrick. Downpatrick pottery has so far been recognised only from a small number of excavated sites in the region (Fig. 2). It has not been found at Carrickfergus.

REFERENCES

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TABLE 1

Sherd	No.	Py	Pl	Mn	A	T	G	B	D	S	Gr	Gw	Z	M	Voids/semi-voids
DPK P.S.	1	*	*	*		*				*	*	*			Rectangular
DPK P.S.	2	*	*	*		*				*	*	*		*	Irregular
DPK P.S.	3	*	*	*	*			*		*		*	*	*	Rectangular
DPK P.S.	4	*	*	*	*			*		*	*	*		*	None
DPK P.S.	5		*	*	*					*	*				Round
DPK P.S.	6	*	*	*	*				*	*	*				Round
DPK P.S.	7				*					*	*	*			Round & Rectangular
DPK P.S.	8		*	*	*					*	*				Rectangular
DPK P.S.	9	*	*		*	*				*	*				Irregular
DPK P.S.	10		*	*	*		*			*	*	*			Round
DPK P.S.	11		*	*	*					*		*			Round & Rectangular
DPK P.S.	12		*		*					*	*	*			None
DPK P.S.	13	*	*		*	*				*				*	None
DPK P.S.	14	*	*		*				*	*	*				Round
DPK P.S.	15	*	*		*					*		*			Irregular
DPK P.S.	16	*	*		*					*	*	*			None
DPK P.S.	18	*	*		*							*			Irregular/black
DPK P.S.	22		*	*	*	*				*		*		*	Irregular

TABLE 2

Type of Inclusion		% of Sample Containing Inclusion
Py	Pyroxene	62.5
Pl	Plagioclase	93.75
Mn	Microcline	56.25
A	Alkali feldspar	87.5
T	Tourmaline	25.0
G	Garnet	6.25
B	Basalt	12.5
D	Diorite	12.5
S	Sandstone	100.00
Gr	Granite	75.00
Gw	Greywacke	68.75
Z	Zircon	12.50
M	Mica	18.75