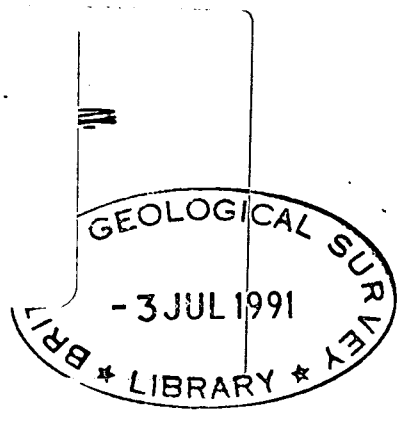
GEOLOGICAL SURVEY OF NORTHERN IRELAND

Open File Report No. 30

THE GEOLOGY OF THE TOOME DEVELOPMENT AREA



By

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PREFACE

The Toome Development Area was mapped during October 1970 for the Antrim and Ballymena Development Commission. The area is part of one-inch Sheet 27 (Cookstown) which is at present being remapped on a scale of six-inches to one mile.

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October 27, 1970.

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GEOLOGY OF THE TOOME DEVELOPMENT AREA

Introduction

Toome (Toomebridge) is a small village located mainly on the east (Antrim) bank of the River Bann, at the northern end of Lough Neagh. The village owes its existence to the road crossing of the River Bann carrying the Antrim-Cookstown trunk road (T8). A second bridge carries a minor road across the River Bann along the line of the former Cookstown Branch Railway. A bridge carrying the new Antrim-Castledawson trunk road will cross the River Bann just upstream of the existing structure. Boats passing from Lough Neagh to the River Bann travel along a canal at Toome, and through a lock at the weir controlling the level of Lough Neagh. The level of Lough Neagh is maintained at about 0.6 m (2 ft) above that of the River Bann. Local employment is provided by an eel fishery, diatomite manufacturers and sand and gravel merchants who dredge their product from the bed of Lough Neagh.

Physiography

The whole area is low lying and either flat or very gently undulating. Drainage is often poor although the River Bann no longer causes flooding. Between the T8 and the river there is a considerable amount of 'made ground'.

Geological Succession

Thick accumulation of drift completely obscures the solid formation which almost certainly consists entirely of Tertiary basalt. The drift formations are listed below.

Pleistocene and Recent	Peat
	Diatomite
	Lacustrine alluvium
	Raised lacustrine alluvium
	Raised gravel beach deposits
Glacial	Boulder clay

A selection of the many site investigation boreholes which have been put down in the Development Area is contained in the appendix.

Boulder Clay

Boulder clay forms gently undulating land mainly to the south of the T8 and also a narrow strip on either side of the main street of Toome. Borings show that it

underlies the other drift deposits. Excavations on a building site south-east of Toome House reveal that the upper 2 m (6 ft 6 in) of boulder clay are a stiff brown or grey clay with scattered basalt blocks. At greater depths the stone content increases. Boulder clay provides adequate foundations for most types of buildings.

Raised Lacustrine Alluvium and Gravel Beach Deposits

Lough Neagh formerly extended well beyond its present shores. South-east of Toome, outside the Development Area, a marked feature of about 30 m (100 ft) O.D. probably represents a late-glacial shoreline. Below the level of the shoreline the topography is either relatively much subdued or quite distinctly planed, with a gently slope towards the Lough. The gently undulating boulder clay within the Development Area has probably been partially planed by wave action during the period of high water level.

In post-glacial times the Lough stood at about 2.5 m (8 ft 3 in) above its present level and extensive deposits of lacustrine alluvium were laid down. Stiff light brown clay is exposed in a ditch at the sports ground in Toome and to the north-east of the village soft dark grey and brown clays form an extensive low lying area.

Marking the actual shoreline of that time is a raised beach extending east-north-east from the old railway line at Toome. The beach forms a ridge of about 1.5 m (5 ft) above the level of the clays, made up to two step-like features. The ridge is composed of loose sand and gravel and has the typical appearance of a storm beach, falling away behind (inshore). A tiny lagoon contained by the beach is marked by a flat of peaty clay.

Diatomite

To the north of Toome a change occurs in the nature of the lacustrine deposits as the River Bann is approached. Near the surface soft clay is replaced laterally by diatomite, overlain by alluvial clay or loose sand. The diatomite at Toome is a small part of a deposit extending down the valley of the River Bann as far as Kilrea. It is built up principally from the skeletons of diatoms with an admixture of clay and plant debris. The diatomite is thought to have been deposited in short-lived lakes soon after the ice age (Jessen, 1949, p.95); it forms part of an alluvial terrace adjacent to the River Bann and is probably contemporaneous with the lowest raised beach and alluvium of Lough Neagh.

In the river bank at Toome 80 cms (2 ft 6 in) of light brown diatomite is exposed becoming darker at depth due to an increasing organic content. It is underlain by a thin layer of peat. Augering shows that the diatomite thins out away from the river, although details have been obscured by old diatomite workings. On weathering and drying the diatomite becomes almost pure white.

Lacustrine Alluvium

The most recent deposits in Lough Neagh closely resemble those described above, except that diatomite is absent. Within the Development Area soft dark grey clays border the Lough and the canal, but are largely obscured by tipped material.

Peat

A small area of peat occurs to the east of Toome in Drumderg townland. The peat has been mostly cut off and is underlain by dark grey clay, probably of lacustrine origin. Formerly peat occurred overlying the lacustrine clay north-east of Toome. A 15 cm (6 in) layer of peat underlies the diatomite in the banks of the River Bann and much thicker peat is recorded in some of the boreholes listed in the appendix.

Apart from the boulder clay and raised gravel beach none of the drift deposits are suitable foundation materials unless adequate stabilization precautions are taken.

Economic Geology

Diatomite

Diatomite is the only deposit of economic importance lying within the Development Area. It is worked at Toome on the Co. Londonderry bank of the River Bann and is used for pipe insulation. Local production is 1,200-1,300 tons a year. On the Antrim bank at least some has already been cut off and most of the remainder will be sterilized during the construction of the new Antrim-Castledawson road. Any remaining diatomite is unlikely to be workable.

Water Supply

Domestic water supply was formerly obtained from wells sunk into boulder clay. Due to their predominantly silty and clayey nature the lacustrine deposits are unlikely to yield large quantities of water. However both Lough Neagh and Lough Beg are potential sources of large quantities of water.

Aggregates

Sand and gravel are produced in Toome and are readily available. Craigmore Quarries near Randalstown produce basalt aggregates and tarmacadam.

Reference

Jessen, K. 1949. Studies in late quaternary deposits and flora-history of Ireland. Proc. Roy. Irish Acad. 52B, No. 6.

APPENDIX

Summary of some site investigation borehole data from the Toome area

No. 1

	Thickness Ft	In
Sandy Silt	3	6
Peat	5	6
Fine sand and silt	17	0
Silty clay	9	0
Stiff boulder clay (continuing)	7	0

No. 2

	Thickness Ft	In
Soil and silt	1	4
Peat	12	8
Silt and sand	14	0
Boulder clay (continuing)	11	0

No. 3

Top soil	1	6
Peat	7	6
Sand and silt	45	0
Boulder clay (continuing)	1	6

No. 4

Peat	2	6
Silt and sand	22	6
Boulder clay (continuing)	1	0

No. 5

Boulder clay	27	0

No. 6

Boulder clay	28	0

No. 7

Boulder clay	38	0

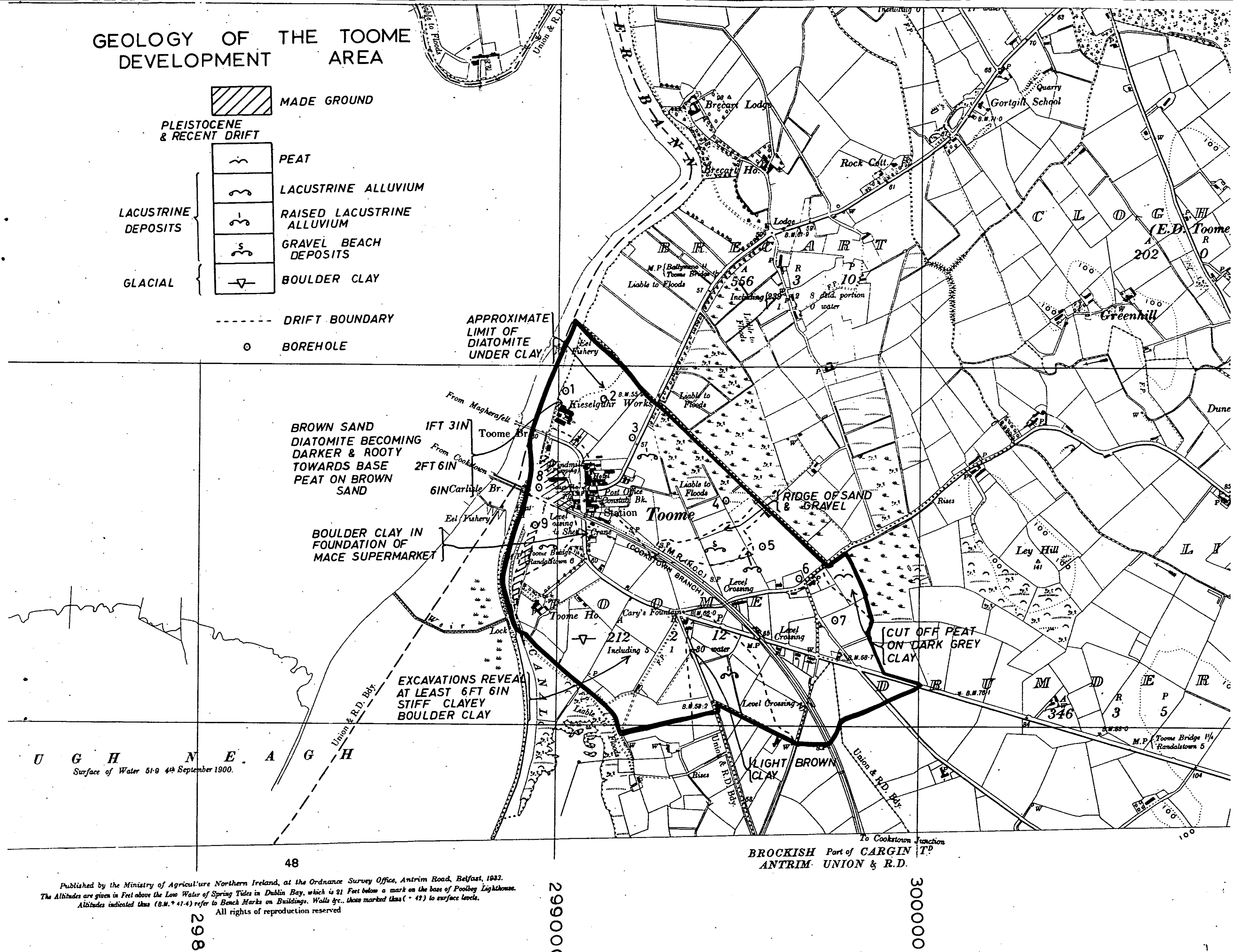
No. 8

Fill	10	6
Silt	9	6
Boulder clay (continuing)	20	0

No. 9

Fill	1	0
Sand	1	6
Silt and clay	29	6
Boulder clay (continuing)	1	6

October 27, 1970.


GEOLOGY OF THE TOOME DEVELOPMENT AREA
MADE GROUND
PLEISTOCENE & RECENT DRIFT
PEAT
LACUSTRINE ALLUVIUM
RAISED LACUSTRINE ALLUVIUM
GRAVEL BEACH DEPOSITS
BOULDER CLAY
LACUSTRINE DEPOSITS
GLACIAL
DRIFT BOUNDARY
BOREHOLE
APPROXIMATE LIMIT OF DIATOMITE UNDER CLAY
BROWN SAND 1FT 3IN
DIATOMITE BECOMING DARKER & ROOTY TOWARDS BASE 2FT 6IN
PEAT ON BROWN SAND 6IN
BOULDER CLAY IN FOUNDATION OF MACE SUPERMARKET
EXCAVATIONS REVEAL AT LEAST 6FT 6IN STIFF CLAYEY BOULDER CLAY
RIDGE OF SAND & GRAVEL
CUT OFF PEAT ON DARK GREY CLAY
LIGHT BROWN CLAY
Toome
Kieselguhr Works
Toome Ho
Brecart Lodge
Gortgill School
Greenhill
Ley Hill
Surface of Water 51·9 4th September 1900.
BROCKISH Part of CARGIN T^D
ANTRIM UNION & R.D.
298000
299000
300000

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Published by the Ministry of Agriculture Northern Ireland, at the Ordnance Survey Office, Antrim Road, Belfast, 1933.
The Altitudes are given in Feet above the Low Water of Spring Tides in Dublin Bay, which is 21 Feet below a mark on the base of Poolbeg Lighthouse.
Altitudes indicated thus (B.M.+ 47·4) refer to Bench Marks on Buildings. Walls &c., those marked thus (· 42) to surface levels.

ORIGINAL SIX INCH SURVEY IN 1878-9 BY F.W. EGAN.
RESURVEYED OCTOBER 1970 BY R.A.OLD. H.E.WILSON DISTRICT GEOLOGIST.