

GLASGOW UNIVERSITY RADIOCARBON MEASUREMENTS V

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INTRODUCTION

Operation of counting systems and preparation of results remain as described previously by Baxter *et al.* (1969), and Ergin *et al.* (1970).

ACKNOWLEDGMENTS

Financial support for the reported studies was provided by the Medical Research Council and the Natural Environment Research Council. Thanks are due to numerous organizations and individuals throughout the world who have assisted us in the supply of suitable samples. Our gratitude is again extended to the National Physical Laboratory for their continued provision of facilities for C^{13}/C^{12} measurement.

SAMPLE DESCRIPTIONS

I. ATMOSPHERIC CO_2 SAMPLES*A. Global distribution*

Data relate to research program of transport of C^{14} within the "dynamic" carbon reservoir (Walton *et al.*, 1970). CO_2 coll. by exposure of carbonate-free 8M KOH solution to atmosphere at ground level for each calendar month.

Lerwick, Scotland series

Samples coll. by Meteorologic Office in their ventilated East hut, Lerwick (60° 08' N Lat, 01° 11' W Long).

Lerwick series, 1969

Sample no.	Coll. date	$\delta C^{14}\%$	$\delta C^{13}\%$	$\Delta\%$
GU-334	Jan.	54.6 ± 2.1	-20.6	53.2 ± 2.2
GU-335	May	55.8 ± 2.0	-22.7	55.1 ± 2.0
GU-336	July	56.9 ± 2.2	-18.5	54.9 ± 2.0
GU-337	Oct.	53.1 ± 2.0	-19.6	51.4 ± 2.0

Gibraltar series

Samples coll. by Meteorologic Office, R.A.F., Gibraltar, in well ventilated room, adjacent to open window (36° 09' Lat, 05° 21' W Long).

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Gibraltar series, 1969

Sample no.	Coll. date	$\delta C^{14}\%$	$\delta C^{13}\%$	$\Delta\%$
GU-338	Jan.	52.9 ± 2.2	-19.2	51.1 ± 2.2
GU-339	April	55.5 ± 2.2	-21.4	54.4 ± 2.3
GU-340	July	54.8 ± 2.1	-22.2	53.9 ± 2.1
GU-341	Oct.	52.6 ± 1.5	-21.8	51.6 ± 1.5

Hong Kong series

Samples coll. by Meteorologic Office at Tates Cairn radar sta. in Stevenson screen which shelters samples from both rain and dry deposition (22° 18' N Lat, 14° 10' E Long).

Hong Kong series, 1969

Sample no.	Coll. date	$\delta C^{14}\%$	$\delta C^{13}\%$	$\Delta\%$
GU-342	Jan.	79.6 ± 2.5	-20.2	77.8 ± 2.5
GU-343	April	48.8 ± 2.2	-24.2	48.6 ± 2.2
GU-344	July	46.8 ± 2.0	-23.4	46.3 ± 2.0
GU-345	Oct.	53.8 ± 2.3	-21.0	52.6 ± 2.4

Pretoria series

Samples coll. by Atomic Energy Board, Pelindaba, Pretoria, in Stevenson screen housing a variety of meteorologic instruments (25° 45' S Lat, 28° 16' E Long).

Pretoria series, 1969

Sample no.	Coll. date	$\delta C^{14}\%$	$\delta C^{13}\%$	$\Delta\%$
GU-346	Jan.	52.2 ± 2.2	-23.7	51.8 ± 2.2
GU-347	April	48.8 ± 2.1	-24.5	48.7 ± 2.1
GU-348	July	49.9 ± 2.2	-22.0	49.0 ± 2.2
GU-349	Oct.	49.3 ± 2.2	-23.2	48.8 ± 2.2

Stanley, Falkland Islands series

Samples coll. outdoors by Meteorologic Office, Stanley, Falkland Is., in meteorologic thermometer screen (51° 42' S Lat, 57° 52' W Long).

Stanley series, 1969

Sample no.	Coll. date	$\delta C^{14}\%$	$\delta C^{13}\%$	$\Delta\%$
GU-350	Jan.	51.1 ± 2.2	-24.7	51.0 ± 2.2
GU-351	April	49.7 ± 2.5	-24.9	49.7 ± 2.5
GU-352	July	50.2 ± 1.5	-23.5	49.7 ± 1.5
GU-353	Oct.	46.6 ± 2.0	-24.5	46.5 ± 2.0

B. Urban variations

The reported C^{14} activities were measured during a study of combustion product CO_2 levels in urban air viz., local Suess effect (Walker, 1969).

Samples were coll. during Jan. 1969 through exposure of 8 M KOH at selected sites within a 30-mi. radius of Glasgow, Scotland ($55^\circ 50' N$ Lat, $04^\circ 16' W$ Long).

Urban CO_2 , Glasgow area

Sample no.	Coll. site no.	District	$\delta C^{14}\%$	$\delta C^{13}\%$	$\Delta\%$
GU-354	1	Beith	50.9 ± 1.1	-23.2	50.3 ± 1.2
GU-355	2	Mauchline	49.7 ± 1.0	-23.0	49.1 ± 1.1
GU-356	3	Mauchline	46.3 ± 0.5	-24.4	46.2 ± 0.6
GU-357	4	Newton Mearns	47.9 ± 1.0	-23.9	47.6 ± 1.1
GU-358	5	Newton Mearns	47.1 ± 0.9	-24.5	46.9 ± 1.0
GU-359	6	Newton Mearns	41.6 ± 0.8	-23.7	41.2 ± 0.9
GU-360	7	Central Glasgow	41.4 ± 0.9	-23.2	40.9 ± 1.0
GU-361	8	Central Glasgow	40.4 ± 0.9	-23.3	39.9 ± 1.0
GU-362	9	Central Glasgow	39.4 ± 1.1	-23.0	38.9 ± 1.2
GU-363	10	Riddrie	38.6 ± 1.1	-21.7	37.7 ± 1.2
GU-364	11	Riddrie	23.1 ± 0.9	-23.5	22.7 ± 1.0
GU-365	12	Wishaw	27.5 ± 0.9	-23.4	27.1 ± 1.0

Comment: data correlate with geographic distribution of industry and prevailing wind pattern. The importance of careful site selection in global C^{14} studies is emphasized by up to ca. 23% excess 'fossil' CO_2 in air at certain locations.

II. SOIL CARBON

Data relate to profile coll. from non-calcareous, imperfectly drained Brown Forest soil belonging to the Lanfine Association. Samples coll. Jan. 1970 in vicinity of Doonbank Farm, Ayr, Scotland ($55^\circ 28' N$ Lat, $04^\circ 38' W$ Long). Natl. Grid Ref. NS 327184.

Samples were sieved (1 mm mesh) and washed several times in 2 M HCl to remove organic debris (Gunning, 1970).

Doonbank Farm series

Sample no.	Soil fraction	Coll. depth	$\delta C^{14}\%$	$\delta C^{13}\%$	$\Delta\%$
GU-366	Alkali sol. carbon	0- 3 cm	-0.3 ± 0.5	-31.4	1.0 ± 0.7
GU-367	Alkali insol. carbon	0- 3 cm	-0.6 ± 0.6	-30.5	0.5 ± 0.8
GU-368	Total carbon	0- 3 cm	7.6 ± 0.7	-29.0	8.4 ± 0.8
GU-369	Total carbon	8-10 cm	-4.4 ± 0.6	-30.5	-3.4 ± 0.8
GU-370	Total carbon	13-15 cm	-12.8 ± 0.7	-29.5	-12.1 ± 0.9
GU-371	Total carbon	23-25 cm	-24.3 ± 0.5	-27.8	-23.6 ± 0.8
GU-372	Total carbon	40-45 cm	-32.9 ± 0.6	-28.8	-32.4 ± 0.8

Comment: presence of 'bomb' C^{14} is evident in all surface samples, although enrichment is small. Temporal variations of such C^{14} activities may afford a measure of the rates of mineralization and transport of organic carbon in soils.

III. GEOLOGIC SAMPLES

8950 \pm 90
7000 B.C.

GU-373. Dundonald Burn, Irvine

Organic mud exposed in bank of Dundonald Burn, ($55^{\circ} 36' N$ Lat, $04^{\circ} 38' W$ Long), Natl. Grid Ref. NS 337372, 290 m N of Shewalton Bridge, near Irvine, Ayrshire, Scotland. Sample is top 5 cm of organic mud ca. 30 cm thick, overlain by sand, and underlain by gravelly till. Top of organic mud is at alt 6.2 m (Newlyn). Coll. 1966 and subm. by W. G. Jardine, Dept. Geol., Univ. Glasgow. *Comment* (W. G. J.): date is a more accurate maximum for beginning of main Flandrian marine transgression in central Ayrshire than date for wood from near middle or base of same bed of organic mud (Q-642: 9575 ± 150 , Godwin and Willis, 1962).

2027 \pm 108
77 B.C.

GU-374. Hollanbank Cottage

Marine shells (*Cardium* sp.) from emerged shell ridge 50 m N of Hollanbank Cottage, Kirkcudbrightshire, Scotland, ($54^{\circ} 52' N$ Lat, $04^{\circ} 22' W$ Long), Natl. Grid Ref. NX 482555. From alt. 5.24 m (Newlyn) 46 cm below top of shell ridge. Coll. 1966 and subm. by W. G. Jardine. *Comment* (W.G.J.): date indicates time of shell-ridge formation. It is close to age of shell layer within laminated fine sand at similar alt. at Crook of Baldon on W side of Wigtown Bay (I-5068: 2290 ± 95 , in press).

7812 \pm 131
5862 B.C.

GU-375. Newbie Mains Borehole

Organic mud from undisturbed sample from borehole 500 m NNW of Newbie Mains Farm, Dumfriesshire, Scotland, ($54^{\circ} 58' N$ Lat, $03^{\circ} 17' W$ Long), Natl. Grid Ref. NY 171651. Organic mud, 10 cm thick, occurs

within marine fine sand/sand sequence. Top of organic mud at alt. 4.57 m (Newlyn). Coll. 1967 and subm. by W. G. Jardine. *Comment* (W.G.J.): date is consistent with others for organic deposits assoc. with Carse deposits in E part of Solway Firth area (Q-637: 8135 ± 150 , Godwin and Willis, 1962; GU-64: 7254 ± 101 , Baxter *et al.*, 1969). Supports suggestion that penetration of kettles in this area by Flandrian transgressive sea was diachronous (Jardine, in press).

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