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GLASGOW UNIVERSITY RADIOCARBON MEASUREMENTS IV

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INTRODUCTION

The following list and data presented previously (R., 1970, v. 12, p. 494-495) were obtained to investigate the transport of carbon between man and his environment (Harkness, 1970). These data constitute a study of contemporary variations of C^{14} concentrations *viz.*, Suess effect and bomb effect, as reflected in the tissues and food chain of the population of the United Kingdom (Harkness and Walton, 1969).

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

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SAMPLE DESCRIPTIONS

I. HUMAN C^{14} CONCENTRATIONS

A. Blood protein samples

The following C^{14} activities complete the series reported previously (R., 1970, v. 12, p. 494-495).

Blood protein, S Scotland

Sample no.	Sample date	δC^{14}‰	δC^{13}‰	Δ‰
GU-300	Oct. 1953	-2.9 ± 0.6	-27.7	-2.3 ± 0.7
GU-301	May 1954	-1.5 ± 0.6	-29.4	-1.4 ± 0.7
GU-302	Dec. 1955	-1.2 ± 0.5	-26.2	-0.9 ± 0.6
GU-303	June 1958	-2.0 ± 0.6	-28.5	-1.3 ± 0.6
GU-304	June 1969	52.4 ± 0.7	-31.5	54.4 ± 0.8

Comment: C^{14} concentrations in blood protein show a marked decrease from maximum values after 1968, correlating with the decline in atmospheric C^{14} concentrations.

B. Human tissue samples

An attempt has been made to investigate the distribution of bomb C^{14} in the human body. Apart from a composite sample of testes coll.

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in S England in 1969, the data relate to tissue obtained from a 37-year-old female inhabitant of Glasgow who died from coronary artery disease in September 1969.

Sample no.	Tissue	$\delta C^{14}‰$	$\delta C^{13}‰$	$\Delta‰$
GU-305	Testes	46.1 ± 0.7	−29.3	47.3 ± 0.8
GU-306	Brain	58.3 ± 0.7	−22.4	57.5 ± 0.8
GU-307	Liver	50.3 ± 0.8	−27.9	51.2 ± 0.8
GU-308	Kidney	52.9 ± 0.7	−20.5	51.5 ± 0.8
GU-309	Ovaries	53.5 ± 1.3	−28.2	54.5 ± 1.4
GU-310	Uterus	45.9 ± 0.7	−27.4	46.7 ± 0.7
GU-311	Muscle	55.5 ± 0.7	−26.6	56.0 ± 0.8
GU-312	Fat	48.2 ± 0.8	−30.4	49.8 ± 0.8
GU-313	Bone marrow	41.3 ± 0.8	−34.2	43.9 ± 0.8
GU-314	Bone collagen	25.7 ± 0.7	−27.6	26.4 ± 0.8
GU-315	Bone mineral	22.4 ± 0.7	−17.1	20.5 ± 0.8

Comment: carbon in the adult skeleton appears to be several years older than that in soft tissues. Results suggest the possible application of contemporary C^{14} concentrations in investigations of tissue renewal rates.

II. DIETARY C^{14} CONCENTRATIONS

A. Terrestrial food chain

Samples were selected from unpreserved foods produced in S Scotland.

Sample no.	Sample	Coll. date	$\delta C^{14}‰$	$\delta C^{13}‰$	$\Delta‰$
GU-316	Milk	July 1967	62.9 ± 0.8	−23.7	62.4 ± 0.9
GU-317	Milk	Sept. 1967	60.9 ± 0.8	−24.2	60.8 ± 0.8
GU-318	Beef	Aug. 1967	59.2 ± 0.7	−27.2	59.7 ± 0.8
GU-319	Milk	Aug. 1968	55.3 ± 1.2	−23.7	54.9 ± 1.2
GU-320	Potatoes	Sept. 1968	55.4 ± 1.1	−23.6	54.9 ± 1.1
GU-321	Beef	Aug. 1968	56.8 ± 0.8	−26.0	57.0 ± 0.9
GU-322	Cheese	July 1969	52.6 ± 1.2	−24.0	52.5 ± 0.9
GU-323	Beef	Nov. 1969	54.1 ± 0.7	−33.1	56.5 ± 0.8

Comment: results agree with contemporary tropospheric C^{14} concentrations monitored in this region (Walton *et al.* 1970).

B. Marine food chain

Zooplankton samples coll. in May 1969 using a conical net (26 mesh per linear in.). Hauls were oblique from 100 m depth to the surface. Fish samples were selected from a trawl made in Dec. 1968.

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Sample, site	$\delta C^{14}‰$	$\delta C^{13}‰$	$\Delta‰$
GU-324. Zooplankton (61° 03′ N Lat, 02° 46′ E Long)	7.4 ± 0.6	−31.6	8.8 ± 0.7
GU-325. Zooplankton (61° 03′ N Lat, 02° 46′ E Long)	7.8 ± 0.6	−27.2	8.2 ± 0.6
GU-326. Zooplankton (57° 25′ N Lat, 07° 00′ E Long)	11.3 ± 1.0	−27.0	11.8 ± 1.1
GU-327. Zooplankton (59° 15′ N Lat, 01° 45′ E Long)	9.5 ± 1.0	−27.2	10.0 ± 1.1
GU-328. Zooplankton (57° 00′ N Lat, 00° 00′ Long)	2.6 ± 0.7	−34.2	4.4 ± 0.8
GU-329. Zooplankton (60° 30′ N Lat, 00° 30′ W Long)	4.4 ± 0.6	−29.0	5.2 ± 0.7
GU-330. Zooplankton (58° 00′ N Lat, 03° 00′ E Long)	5.8 ± 1.0	−36.8	8.3 ± 1.1
GU-331. Cod muscle (57° 10′ N Lat, 1° 50′ W Long)	7.0 ± 0.4	−24.4	6.8 ± 0.5
GU-332. Skate muscle (57° 10′ N Lat, 1° 50′ W Long)	1.6 ± 0.5	−23.5	1.3 ± 0.6
GU-333. Whiting muscle (57° 10′ N Lat, 1° 50′ W Long)	10.8 ± 0.6	−22.1	10.2 ± 0.7

Comment: low C^{14} concentration in skate flesh probably reflects bottom feeding habits of this species.

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