LOUVAIN NATURAL RADIOCARBON MEASUREMENTS VII

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The following list comprises selected measurements made during 1967-68. The method is essentially the same as previously described. A 0.6 L proportional gas-counter at 3 atm CH_4 pressure is used. Ages are given relative to A.D. 1950 and half-life of 5570 yr has been assumed. The quoted error is the experimental standard deviation and includes the uncertainty on the unknown sample, the modern standard and the background.

The description of each sample is based on information supplied to the laboratory by the submitters.

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SAMPLE DESCRIPTIONS

I. GEOLOGIC SAMPLES

Oorderen II series

Peat from Oorderen (51° 20' N Lat, 4° 19' E Long), Prov. of Antwerp, Belgium, alt 2 m. Holocene peat layer, 1.50 m thick, covered by clay of the Polders. Coll. 1963, pollen analyzed and subm. by A. Munaut, Univ. of Louvain, Lab. of Palynology and Dendrochronology. Pollen diagram is to be compared with those from Terneuzen and Zandvliet (Munaut, 1967).

$\begin{array}{c} 2220\pm70\\ 270\text{ B.C.} \end{array}$

Peat from 19 to 26 cm. Pollen diagram shows 2nd maximum of *Fagus* in beginning of Sub-Atlantic period. At Zandvliet a 2nd Sub-Atlantic maximum of *Fagus* is dated A.D. 940 (Lv-253, this list). Further investigations are necessary.

$\begin{array}{c} \textbf{2390} \pm \textbf{110} \\ \textbf{440 B.C.} \end{array}$

Lv-249. Oorderen II.2

Lv-248. Oorderen II.1

Peat from 40 to 45 cm. 1st Sub-Atlantic maximum of *Fagus*. Date agrees with those for same event at Terneuzen (Lv-117, Radiocarbon, 1964, v. 6, p. 163) and Zandvliet (Lv-254, this list).

3800 ± 70 1850 b.c.

Lv-250. Oorderen II.3

Peat from 60 to 65 cm. Just before Sub-Boreal decrease of Ulmus, not correlative with classical decrease. Same event is dated 1800 B.c. at Terneuzen (Lv-122, Radiocarbon, 1965, v. 7, p. 118) and 1840 B.c. at Zandvliet (Lv-255, this list).

Lv-251. Oorderen II.4

Peat from 110 to 115 cm. Pollen diagram shows at this level beginning of the Sub-Boreal increase of Ulmus. Date a little too old according to Lv-116 (Radiocarbon, 1964, v. 6, p. 163), Lv-123 (Radiocarbon, 1965, v. 7, p. 119) and Lv-256 (this list).

Zandvliet VIII series

Peat from Zandvliet (51° 21' N Lat, 4° 17' E Long), Prov. of Antwerp, Belgium, alt 2 m. Holocene peat layer, 3.5 m thick, under clay layer of the Polders. Coll. 1962, pollen analyzed and subm. by A. Munaut. Pollen diagram is correlated with those from Terneuzen and Oorderen (Munaut, 1967).

	1010 ± 90	
Lv-253. Zandvliet VIII.1	а.д. 940	
Peat from 50 to 55 cm. Pollen analysis indices of	1	

om 50 to 55 cm. Pollen analysis indicates 2nd Sub-Atlantic maximum of *Fagus*.

Lv-254. Zandvliet VIII.2

Peat from 100 to 105 cm, 1st Sub-Atlantic maximum of Fagus, dated 320 B.C. at Terneuzen (Lv-117, Radiocarbon, 1964, v. 6, p. 163) and 440 B.C. at Oorderen (Lv-249, this list).

T 077	Zandvliet VIII.3	3790 ± 160
Lv-255.		1840 в.с.

Peat from 165 to 170 cm, Sub-Boreal decrease of Ulmus. Date confirms Lv-122 (Radiocarbon, 1965, v. 7, p. 118) and Lv-250 (this list).

Lv-256. Zandvliet VIII.4

Peat from 235 to 240 cm. Pollen diagram shows Atlantic-Sub-Boreal transition, with the last increase of Ulmus. At Terneuzen, this transition is situated between 2330 B.C. (Lv-116, Radiocarbon, 1964, v. 6, p. 163) and 2640 B.C. (Lv-123, Radiocarbon, 1965, v. 7, p. 119).

Lv-260. Solwaster

Wood from peat bog at Solwaster (50° 31' N Lat, 5° 56' E Long), Sart lez Spa, Prov. of Liege, Belgium, alt 310 m. Found at 0.60 m depth in peat layer used for thermal baths of Spa. Coll. 1965 by Hensol; subm. by J. M. Deumer, Spa Monopole Soc.

II. ARCHAEOLOGIC SAMPLES

Pincevent series, France

Charcoal sediment from fabricated hearth of open-air prehistoric dwelling place at Pincevent (48° 22' 20" N Lat, 0° 33' 20" E Long), Dept. of Seine et Marne, France. Imbedded at 3.50 m below ground surface in clay horizon, 2 m thick, overlain by sand layer. At same level, Late Mag-

$\mathbf{2310} \pm \mathbf{100}$ 360 в.с.

 4480 ± 110

2530 в.с.

 $\mathbf{2350} \pm \mathbf{110}$

400 в.с.

4750 ± 140 2800 в.с.

dalenian industry (Leroi-Gourhan and Brezillon, 1967). Coll. 1964 and subm. by A. Leroi-Gourhan, Centre de Recherches Préhistoriques et Protohistoriques, Univ. of Paris (Sorbonne).

General Comment: samples are not pretreated. Organic matter, finely divided and adsorbed on clay, was chemically extracted by solubilization in NaOH and precipitation by HCl. Ages are thus minimum, because possible recent humic contamination is not removed. However, C-14 ages agree with archaeol.

Lv-291. Pincevent 1	$egin{array}{r} 10,920\pm540\ 8970\mathrm{B.c.} \end{array}$
Upper level of Hearth I.	
Lv-292. Pincevent 2	11,610 ± 400 9660 в.с.
Lower level of Hearth I.	
Lv-293. Pincevent 3	$11,\!310\pm330$ 9360 в.с.

Hearth III, contemporary and of same structure as Hearth I.

Kinshasa series, Congo

Series dates prehistoric industries in Kinshasa plain (Van Moorsel, 1968). Parts are publ. in Radiocarbon: 1962, v. 4, p. 95; 1964, v. 6, p. 160; 1965, v. 7, p 118. All dates agree with each other and with chronology of industries. Coll. 1965 by H. Van Moorsel, Prehistorical Mus. Lovanium Univ., Kinshasa; subm. by F. Gullentops, Univ. of Louvain.

$12,230 \pm 250$ 10,280 b.c.

Lv-287. Basoko

Charcoal from valley of Basoko R. (4° 21' S Lat, 15° 17' E Long), Prov. of Kinshasa, Congo. Charcoal imbedded at ca. 1.5 m depth in muddy yellow sand 3 m thick overlying polymorphous sandstone blocks. Sample related to evolving Middle Lupembian stone industry. Just above sandstone layer, Older Lupembian industry dated > 26,000 (Lv-163, Radiocarbon, 1965, v. 7, p. 121). In clay bank of river, Tshitolian horizon dated 9730 \pm 200 B.P. (Lv-164, Radiocarbon, 1965, v. 7, p. 121). Date agrees with other Middle Lupembian site at Cabu (Lv-166, Radiocarbon, 1965, v. 7, p. 121: 15,080 \pm 480 B.P.)

3870 ± 90 1920 b.C.

Ly-288. Kinsuka

Charcoal from Kinsuka (4° 20' 38" S Lat, 15° 12' 45" E Long), Prov. of Kinshasa, Congo. Imbedded at 2 m depth in 5-m-thick alluvion bank of Congo R. Nearby the top, Late Tshitolian remains. At base on red sandstone, a gravel layer with altered stone industry estimated Middle Lupembian. Sample, not directly related to prehistoric industry, gives minimum age to alluvions.

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Lv-289. Kizenzu

$\begin{array}{c} 6280 \pm 130 \\ 4330 \text{ b.c.} \end{array}$

Charcoal from Kizenzu (4° 24′ 51″ S Lat, 15° 19′ 51″ E Long), Prov. of Kinshasa, Congo. From 60 cm depth in marshy white sand. At same level, Late Tshitolian industry and old potsherds. Date agrees with other Late Tshitolian site at Gafula (Lv-45, Radiocarbon, 1962, v. 4, p. 97, and Lv-162, Radiocarbon, 1965, v. 7, p. 121) dated 5830 \pm 180 B.c. and 5750 \pm 110 B.c. Potsherds probably come from intrusive pottery; stratigraphy gives no evidence.

Sampont series

Wood substructure from Sampont (49° 40′ 50″ N Lat, 6° 09′ 55″ E Long), Prov. of Luxembourg, Belgium. Squared beams found at 1.40 m depth under several alluvion layers. In same site, 6 square piles, 1.50 m long, vertically driven in ground. Coll. 1966 and subm. by J. Noel. Attributed to road joining Roman road from Reims to Treves across "Marais de Vance" (Noel, 1967). Date also gives information about gravelly alluvions of the Semois R. (Coûteaux, 1967).

Lv-345. Sampont 1966 B Alder beam (<i>Alnus</i> , id. by J. Heim), <i>in situ</i> .	250 ± 100 a.d. 1700
Lv-346. Sampont 1966 C Oak beam, exhumed in 1963.	500 ± 100 a.d. 1450
Lv-347. Sampont 1966 D	730±90 A.D. 1220

From same beam as Lv-346.

Lv-290.Chaumont-Gistoux 4040 ± 90
2090 B.C.

Charcoal from Chaumont-Gistoux (50° 41' N Lat, 4° 42' E Long), Prov. of Brabant, Belgium. Found 1.10 m below ground surface, mixed with Michelsberg-type potsherds. Coll. 1965 by Y. Graff; subm. by A. Munaut. Charcoal is related to pollen diagram by A. Munaut, showing at this level Atlantic-Sub-Boreal transition. C-14 date agrees with archaeol. and palynological estimations.

Lv-301. Vaux sous Chèvremont

$\begin{array}{c} 1040\pm80\\ \text{a.d. 910} \end{array}$

Charcoal from feudal castle of Chèvremont (50° 36' N Lat, 5° 37' E Long) at Vaux sous Chèvremont, Prov. of Liège, Belgium, alt 196 m. Sample from burned horizon in Excavation V, 66 VC 23, at 1.30 m depth. Coll. 1966 by Papeleux; subm. by J. Mertens, Univ. of Louvain, Archaeol. Inst. Castle was destroyed in 10th century; C-14 date agrees with archaeol. Another sample from same site (Lv-228, Radiocarbon, 1966, v. 8,

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p. 254) is dated 540 \pm 80 B.P., probably because of presence of many recent rootlets.

Abbaye des Dunes series

Samples from Abbaye des Dunes at Koksijde (51° 06' 20" N Lat, 6° 05' 35" E Long), Prov. of W Flanders, Belgium, alt 10 m. Site was certainly occupied as early as High Middle ages. Abbey was definitively forsaken in A.D. 1579. Now archaeol. layer is overlain by 7 m sand. Coll. 1965-66 by P. Schittekat, Abbaye des Dunes; subm. by M. Parmentier, Univ. of Louvain.

$<\!260$ Lv-340. Abbaye des Dunes, Sample 2

Charred wood found at surface of archaeol. layer in cess-pit contemporaneous with abbey. Several glass articles were also found in pit (Parmentier, 1968).

 350 ± 120

а.р. 1600 Lv-341. Abbaye des Dunes, Sample 3

Wood from pale driven 1 m deep at N side of church.

 460 ± 100

А.D. 1490 Abbaye des Dunes, Sample 3 bis Lv-342. Collagen from bone found with Lv-341.

 520 ± 120

а.р. 1430 Lv-343. Abbaye des Dunes, Sample 4

Wood from humic layer, 1 m deep, date of which is assumed end of 16th century.

 $\mathbf{870} \pm \mathbf{140}$

а.р. 1080 Lv-348. Abbaye des Dunes, Sample 1

Wood from geogr. center of necropolis of High Middle ages at 2 m below archaeol. level. Central part of necropolis was again handled probably during beginning of 12th century. Date agrees with this assumption (Schittekat, 1968).

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