

# LOUVAIN NATURAL RADIOCARBON MEASUREMENTS XI

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The following list comprises selected measurements obtained by counting methane at 3 atm pressure in a 0.6 L stainless steel counter. Sample preparation, counting procedure, and calculation method are described in previous lists. Dates are reported in terms of the Libby half-life. The quoted errors are the experimental standard deviations including uncertainty on samples and standards.

Descriptions and comments are based on information supplied by the submitters.

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## SAMPLE DESCRIPTIONS

### I. GEOLOGIC SAMPLES

#### Les Laubies series, France

Peat from Les Laubies (44° 28' N Lat, 3° 39' E Long), Dept. of Lozère, France, alt 1380 m. Holocene peat bog, 135 cm thick, on granitic substratum. Coll. 1969 by A. Pons and J. L. de Beaulieu; subm. by A. Pons, St. Jérôme Sci. Fac., Marseille. C<sup>14</sup> dates, related to pollen analysis, enable dating of Holocene forest phases on Lozère Mt. and correlation of other pollen diagrams from same region.

**Lv-514. Les Laubies, 20 cm** **1090 ± 110**  
**A.D. 860**

From 20 cm depth. Dates forest clearance of Lozère Mt. as either early Mediaeval or late Carolingian Empire.

**Lv-515. Les Laubies, 65 to 70 cm** **3590 ± 140**  
**1640 B.C.**

From 65 to 70 cm depth. At this level, increasing curve of *Fagus* pollen crosses decreasing curve of *Quercus*. C<sup>14</sup> date indicates that beech-forest expansion occurs earlier than in SW and N of France. But we cannot discard possibility of a stratigraphic hiatus in peat bog.

**Lv-516. Les Laubies, 135 cm** **8460 ± 190**  
**6510 B.C.**

From bottom of peat bog. Pollen analysis shows typical vegetation of end of Pre-Boreal period. C<sup>14</sup> date agrees with palynologic results.

**Lv-458. Braakman, Netherlands** **2480 ± 85**  
**530 B.C.**

Peat from Braakman at Hoek (51° 19' N Lat, 3° 45' E Long), Prov. of Zealand, Netherlands, alt 1 m. From 27.5 to 32.5 cm in pollen profile, at 1 m below ground surface. Coll. 1968, pollen analyzed and subm. by

A. V. Munaut, Univ. of Louvain. Dates last peat level before overlying marine sediment. Pollen diagram shows Sub-Atlantic horizon with 1st maximum of *Fagus* at 35 cm depth (Munaut, 1969).  $C^{14}$  date agrees with palynology.

**Lv-487. Landbruch I**

(a) **2580  $\pm$  90**

**630 B.C.**

(b) **2620  $\pm$  90**

**670 B.C.**

Peat after alkali pretreatment (a) and humate extract (b) from Valon du Landbruch (49° 40' N Lat, 5° 43' E Long) in military field of Lagland-Stockem, Prov. of Luxembourg, Belgium, alt 350 m. From 129 to 135 cm, Sub-Boreal/Sub-Atlantic transition in pollen profile. Coll. 1968, pollen-analyzed, and subm. by G. Woillard, Univ. of Louvain.  $C^{14}$  date confirms questionable interpretation of pollen diagram and proves that *Fagus* can also play an important part in Lorrain district. Nearby, at Stockem, it is impossible to precisely locate transition in pollen profile (Coûteaux, 1969).

**Herentals series**

Peat and humic matter from Herentals (50° 15' 22" N Lat, 4° 47' 58" E Long), Prov. of Antwerpen, Belgium, alt 10 m. Coll. 1967 by A. V. Munaut and E. Paulissen; subm. by A. V. Munaut.

**Lv-459. Herentals GN43/1**

**9940  $\pm$  120**

**7990 B.C.**

Peat from 50 to 55 cm depth in peat layer. Pollen diagram, by A. V. Munaut, shows, at this level, 1st increase of *Pinus* at beginning of Pre-Boreal period.  $C^{14}$  date closely agrees with palynology. *Comment*: NaOH-leach omitted for sample pretreatment.

**Lv-460. Herentals GN43/2**

**9090  $\pm$  160**

**7140 B.C.**

Peat from 10 to 17.5 cm showing beginning of continuous curve of *Corylus* at end of Pre-Boreal period.  $C^{14}$  date confirms pollen analytic results. *Comment*: NaOH-leach omitted.

**Lv-461. Herentals GN13**

**10,640  $\pm$  150**

**8690 B.C.**

Humic matter from a humus-rich clay layer overlain by a thin charcoal layer. Taken at 1 m depth, near pollen profile. Sample, 6 cm thick, represents the whole Alleröd horizon, but because of relative importance of charcoal in extracted organic matter, a date close to end of Alleröd would be expected.  $C^{14}$  date seems a little too young, probably because of humic contamination, but does not disprove palynologic interpretation.

II. ARCHAEOLOGIC SAMPLES

**Lv-499. Tavigny 65.Ta.03**

**1130  $\pm$  65**

**A.D. 820**

Charcoal from medieval chapel at Tavigny (50° 07' N Lat, 5° 51' E

Long), Prov. of Luxembourg, Belgium. From 80 cm depth in Tr. 65.I, Profile AB, nr.7. Coll. 1965 and subm. by J. Mertens, Univ. of Louvain. C<sup>14</sup> date proves chapel already existed during 9th century A.D., as recorded in archival texts, and agrees with a 1st burning that occurred some time after 1st burials around original chapel (Mertens and Matthijs, 1970).

#### **Alba Fucens series, Italy**

Charcoal from Alba Fucens (42° 05' N Lat, 13° 25' E Long), Prov. of Aquila, Italy. From Trench 67.VI in N zone of town center. Coll. 1967 and subm. by J. Mertens.

**Lv-365. Alba Fucens 67.AF.29** **1810 ± 80**  
**A.D. 140**

Charcoal from 2.00 m depth related to potsherds. Archaeol. context indicates 1st century B.C. to 1st century A.D.

**Lv-366. Alba Fucens 67.AF.21** **2190 ± 90**  
**240 B.C.**

From 1.20 m depth. Assoc. material archaeol. dated 2nd century B.C.

#### **Ordona series, Italy**

Charcoal samples from Ordona (41° 18' N Lat, 15° 37' E Long) Prov. of Foggia, Italy. Coll. 1967 by G. De Boe and 1969 by R. Iker and J. Papeleux; subm. by J. Mertens. Present samples continue previous series within general study of ancient Roman colony at Herdoniae.

**Lv-355. Ordona 67.OR.33** **2030 ± 75**  
**80 B.C.**

From 1.83 m depth, under walls of Roman basilica built during 1st century A.D. C<sup>14</sup> date agrees with archaeol. material.

**Lv-356. Ordona 67.OR.66** **2170 ± 65**  
**220 B.C.**

From filling of circular market at 3.10 m depth, built at beginning of 2nd century A.D. C<sup>14</sup> date proves that materials used for filling are from miscellaneous dates and origin.

**Lv-357. Ordona 67.OR.55** **1820 ± 75**  
**A.D. 130**

From under walls of Roman basilica. Date seems too young for basilica building.

**Lv-371. Ordona 67.OR.154** **1900 ± 60**  
**A.D. 50**

From 2.50 m depth in Tr. LXVIII, m.154, under Roman wall from 1st century A.D. construction. Charcoal assoc. with archaeol. material dated from 2nd and 1st centuries B.C.

**Lv-372. Ordona 67.OR.219** **2030 ± 90**  
**80 B.C.**

From Tr. LXVIII, m.72.50, dug across town. Sample related to archaeol. material from end of 1st century B.C. and 1st century A.D.

**Lv-373. Ordoná 67.OR.142****2210 ± 80****260 B.C.**

From Tr. LXVIII, at 3.20 m depth in center of town. C<sup>14</sup> date agrees with archaeol. context.

**Lv-501. Ordoná 69.OR.91****1780 ± 70****A.D. 170**

From Tr. 69.IV at 2.75 m depth near forum. Sample dates 1st occupation after new arrangement of forum. Archaeol. date is A.D. 120.

**Lv-500. Ordoná 69.OR.35****1780 ± 70****A.D. 170**

From 1.20 m depth in tavern along Roman forum. Confirms Lv-501.

**Cortailod series, Switzerland**

Wood piles from Bronze-age site of Petit Cortailod (46° 56' N Lat, 6° 51' E Long) at Cortailod, Canton Neuchâtel, Switzerland. From 1.50 m below present lake surface. Coll. 1968 and subm. by E. Borel, Cantonal Archaeol. Mus. of Neuchâtel. Site comprises 2 contiguous palafittic stas. shielded by a pile wall. Sta. 1 is open towards shore and Sta. 2, towards lake. Archaeol. estimations are 1300 to 600 B.C. for Sta. 1 and 1600 to 900 B.C. for Sta. 2 (Neuchateloise Geog. Soc., 1944); samples belong to last dwelling level. C<sup>14</sup> dates are surprisingly contemporary.

**Lv-452. Cortailod P1****2510 ± 90****560 B.C.**

Pile from Sta. 1.

**Lv-453. Cortailod P2****2470 ± 65****520 B.C.**

Other pile from Sta. 1.

**Lv-454. Cortailod P3****2520 ± 85****570 B.C.**

Pile from Sta. 2.

**Lv-455. Cortailod P4****2540 ± 85****590 B.C.**

Other pile from Sta. 2.

**Apamee series, Syria**

Samples from Apamee, now Qalaat-el-Moudiq (35° 25' N Lat, 36° 24' E Long), Prov. of Hama, Syria. Coll. 1966-67 by R. Donceel; subm. by J. C. Balty, Belgium Archaeol. Res. at Apamee de Syrie Center, Brussels. The town, built in 4th century B.C. was destroyed in 612 A.D. (Verhoogen, 1964). Excavations were made from 1930 to 1938 and since 1965.

**Lv-398. Apamee, Grave 22****1210 ± 70****A.D. 740**

Human bones from Grave 22 near Atrium church. Grave is built with a few stones, at 2.50 m below present ground surface, in thick filling above flag stones of a street. According to coins and potsherds, filling is

dated at 2nd half of 7th century A.D. C<sup>14</sup> date proves town was not entirely deserted after destruction in A.D. 612 (Lemaire and Balty, 1970).

**1590 ± 60**

**Lv-399. Apamee 1/11**

**A.D. 360**

Ashes from NW corner of Atrium church, close to foundation stones of wall of 5th century Christian church built on remains of a synagogue. C<sup>14</sup> date suggests that mosaics of A.D. 391-392 correspond to general improvement of synagogue rather than only a pavement renewal.

**1980 ± 90**

**Lv-405. Apamee 1/10**

**30 B.C.**

Charcoal from S part of Atrium church at 1.26 m below church level. Sampled layer is that of burned subjacent synagogue. Charcoal seems to originate from timber; erection date for synagogue estimated at end of 1st century B.C. or beginning of 1st century A.D. C<sup>14</sup> date is consistent with archaeol.

**1780 ± 80**

**Lv-404. Apamee 1/9**

**A.D. 170**

Ashes from NW corner of Atrium church, synagogue level. Probably from wainscot or door. Confirms 1st century A.D. as erection date of synagogue.

**1640 ± 70**

**Lv-402. Apamee 1/1**

**A.D. 310**

Charcoal from burned layer on floor of Rm. M in Triclinos bldg., at 2.50 m below present ground surface. Kind of mosaic work, indicates a 4th century date.

**1700 ± 70**

**Lv-403. Apamee 1/2**

**A.D. 250**

Charcoal from Rm. 0 in Triclinos bldg., at 2.50 m depth, from under a tile layer; sample seems to originate from roof timber. Room, enclosed in main building, was reconstructed during middle 5th century A.D. according to stone and mosaic work. C<sup>14</sup> date suggests that original timber was re-used.

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