

LOUVAIN NATURAL RADIOCARBON MEASUREMENTS VI

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The following list comprises a selected number of measurements made during 1966-67 with CH₄ at 3 atm pressure in a 0.6 L proportional gas-counter as previously described. The B.P. ages are based upon A.D. 1950 and are calculated with a half-life of 5570 yr. The quoted error consists of experimental standard deviation including the counting variations of the unknown sample, the modern standard, and the background.

Sample descriptions have been prepared in collaboration with the submitter.

Sincere thanks are due Prof. P. Capron for his constant guidance. Thanks are also due F. Frix for his help in laboratory work, and to G. Michotte for maintenance of electronics. Financial support has been provided by the Institut Interuniversitaire des Sciences Nucléaires, Brussels.

SAMPLE DESCRIPTIONS

The following series from the Bas-Luxembourg are described in the monograph of palynology (Coûteaux, 1967), establishing vegetational phases of Tardiglacial and Holocene periods, and studying geomorphological evolution of the country, particularly development of peat-bogs, travertine layers, and the "mardels." All samples were coll., subm., and pollen-analyzed by M. Coûteaux, Univ. of Louvain, Lab. of Palynology. The monograph also discusses other C¹⁴ dates previously published, namely Lv-56 (Louvain I), Lv-20-23 (Louvain II), Lv-30 (Louvain III), Lv-188 (Louvain V), Gr N-2868-2886 (Groningen V), Lv-72 (Mertens, 1960).

Stockem IV series

Samples from a bog at Stockem (49° 41' 00" N Lat, 5° 46' 20" E Long), Prov. of Luxemburg, Belgium, alt 370 m. Coll. 1964.

Lv-215. Stockem IV/3

4060 ± 140
2110 B.C.

Peat from 95 to 104 cm below ground surface, immediately above peat layer bottom. Pollen-dated to end of Atlantic period: higher values of *Alnus*, frequency of *Fagus* pollen lower than 1%. Date agrees with palynology.

Lv-214. Stockem IV/2

2030 ± 100
80 B.C.

Sandy peat from 87 to 94 cm. Same vegetation as in Lv-215, but with a small increase of *Fagus* up to 2.5%. Palynologically, Sub-Boreal age is expected; C¹⁴ date gives Sub-Atlantic age. Scarcity of *Fagus* is explained by acid substratum.

Lv-213. Stockem IV/1**1480 ± 110****A.D. 470**

Peat from 50 to 60 cm. Vegetation still similar. *Carpinus* pollen occurs sporadically. Date confirms Sub-Atlantic age of this phase.

Breidfeld I series

Samples from bog at Breidfeld (50° 07' 22" N Lat, 8° 05' 04" E Long), Luxemburg, alt. 440 m. Coll. 1964.

Lv-212. Breidfeld I/3**2560 ± 120****610 B.C.**

Peat from 28 to 35 cm. Pollen diagram shows, in curve of *Fagus*, maximum (45%) followed by steep decrease to 10%, while *Betula* rises. At the same time, corn pollen and signs of land occupation appear. Comparison with pollen diagrams of Wideumont and Namoussart (Bonenfant, 1965; Coûteaux, 1962a; Guebel, 1962), indicate that this level is not the 1st beech maximum (*Fagus sylvatica* -F I), but corresponds to an artificial regression of beech curve because of human activity, probably during La Tene I time. C¹⁴ date confirms the conjecture.

Lv-211. Breidfeld I/2**2680 ± 110****730 B.C.**

Peat from 35 to 39 cm, immediately below preceding sample. Pollen diagram shows beginning of *Fagus*-increase. Both dates are consistent with each other and with palynological age.

Lv-210. Breidfeld I/1**2350 ± 100****400 B.C.**

Peat from 39 to 46 cm, near base of peat. Pollen analysis: beginning of Sub-Atlantic period, immediately after time when *Fagus* definitively surpasses *Quercetum mixtum*, estimated age, 800 b.c. (Mullenders *et al.*, 1967). According to palynology, C¹⁴ date seems a little late.

Lv-240. Berdorf-Aesbaach IV**9670 ± 290****7720 B.C.**

Peat from Berdorf (49° 49' 10" N Lat, 8° 27' 12" E Long), Luxemburg, alt 190 m. From an 8-cm-thick peat lens in basis of travertine layer more than 5 m thick. Sample position: 4 to 8 cm in peat. Coll. 1965. Pollen analysis shows pine forest, first scattered then more and more dense, attributed to beginning of Pre-Boreal age. Date agrees with results of pollen analysis. Calcareous sediment at Berdorf has been accumulating since Pre-Boreal period; it proves holocene warming. *Comment*: sample not leached with NaOH because of calcareous protection *in situ*.

Lv-244. Muno-Amerois I**4790 ± 110****2840 B.C.**

Peat with small amounts of wood and rootlets from a bog, 146 cm thick, at Muno-Amerois (49° 44' 38" N Lat, 5° 07' 13" E Long), Prov. of Luxemburg, Belgium, alt 415 m. Sample from 116 to 130 cm depth. Coll. 1962. Pollen analysis shows end of an Atlantic phase rich in *Ulmus*. Sam-

ple taken just above elm fall, during small increase of *Corylus* attributed to CX of Dricot (1960). Nearby, in forest of Anlier, Mullenders and Knop point out a true maximum CX, the end of which is dated to 3170 B.C. (Lv-63, Louvain IV) and 2900 B.C. (Lv-51, Louvain III). Date indicates that in S Ardenne, elm fall date agrees with classical date of 3000 B.C. in NW Europe.

Sainte Marie sur Semois-Mauvais Ruisseau I series

Sample from bog of Mauvais Ruisseau (49° 40' 06" N Lat, 5° 33' 14" E Long) at Sainte Marie sur Semois, Prov. of Luxemburg, Belgium, alt 345 m. The 50-cm-thick peat layer is covered by 35 cm of clay. It is situated at 300 m from Roman road from Reims to Treves, archaeol. dated to 1st c. A.D. (Mertens, 1956), and at 700 m from important Roman villa. Coll. 1965.

Lv-261. Sainte Marie sur Semois **2000 ± 100**
Mauvais Ruisseau I/a **50 B.C.**

Peat from 55 to 60 cm below ground surface. Pollen diagram shows forest clearance phase just when *Fagus* tends to dominate. At same level, peat contains a piece of presumably Roman brick. C¹⁴ date confirms beech maximum F I is masked in pollen curve by Gallo-Roman forest clearance.

Lv-262. Sainte Marie sur Semois **2670 ± 100**
Mauvais Ruisseau I/b **720 B.C.**

Peat with many rootlets from 64 to 71 cm below ground surface. Pollen curve indicates 5th hazel maximum (*Corylus avellana*-C IV). At Rouge Ponceau, the same is dated to 1030 B.C. ± 170 (Lv-153, Louvain IV). In addition, Lv-211 (this list) shows that in 730 B.C. *Fagus* was increasing after decrease of *Corylus*. C¹⁴ date seems late presumably due to contamination by younger rootlets.

Sainte Marie Chevigny series

Wood samples (*Quercus*, id. by A. Munaut and J. Heim) from Sainte Marie Chevigny (49° 55' 39" N Lat, 5° 27' 21" E Long), Prov. of Luxemburg, Belgium, alt 470 m. From a beam with 116 tree-rings embedded in ballast of ancient road hidden in 84-cm-thick peat layer. Coll. 1964. C¹⁴ date confirms Roman origin of road, as found in Lv-30 (Louvain III). Pollen profile taken near beam. As at Sainte Marie sur Semois-Mauvais Ruisseau (Lv-261, this list), Gallo-Roman forest clearance partly masks beech maximum F I.

Lv-238. Sainte Marie Chevigny a **1990 ± 120**
 From 20 outer year-rings. **40 B.C.**

Lv-239. Sainte Marie Chevigny b **1800 ± 85**
 From 20 inner year-rings. **A.D. 150**

2080 ± 80**Lv-220. Beaufort-Birkenbach I****130 B.C.**

Peat from bog, 100 cm thick, at Beaufort (49° 50' 51" N Lat, 8° 18' 50" E Long), Luxemburg, alt 360 m. Sample taken from 58 to 69 cm depth. Coll. 1964. Dates 1st characteristic maximum F I in curve of beech.

Rodenbourg-Bretzboesch I series

Samples from bog of Bretzboesch (49° 41' 30" N Lat, 8° 17' 29" E Long) at Rodenbourg, Luxemburg, alt 285 m. Coll. 1965.

1620 ± 100**Lv-243. Rodenbourg-Bretzboesch I/c****A.D. 330**

Peat from 166 to 175 cm, at base of peat layer. End of beech maximum F I and beginning of *Carpinus* increase is reached at this level. At Beaufort, beech maximum F I is dated to 130 B.C. ± 80 (Lv-220, this list). Both samples yield dates consistent with each other and with results of pollen analysis. Filling-up of this "mardel" by peat formation thus began in Sub-Atlantic period, as at Bonnert, shown palynologically by Coûteaux (1962 b).

1440 ± 90**Lv-242. Rodenbourg-Bretzboesch I/b****A.D. 510**

Peat from 128 to 136 cm. Pollen diagram shows new increase of *Fagus*; *Carpinus* also rises. Radiocarbon age confirms beginning of 2nd beech maximum F II.

1330 ± 90**Lv-243. Rodenbourg-Bretzboesch I/a****A.D. 620**

Peat from 108 to 116 cm. *Fagus* alone dominates and *Carpinus* decreases. C¹⁴ date indicates continuation of 2nd beech maximum F II. Same level is dated at Rulles to A.D. 740 and A.D. 970 (Lv-182 and Lv-183, this list) and A.D. 860 at Tontelange-Faascht (Lv-56, Louvain I).

Rulles I series

Wood samples (*Fagus*, id. by A Munaut and J. Heim) embedded in bog at Rulles (49° 42' 31" N Lat, 5° 33' 07" E Long), Prov. of Luxemburg, Belgium, alt 375 m. Coll. 1963.

1210 ± 75**Lv-182. Rulles I/1****A.D. 740**

Large pieces of wood lying in peat layer from 39 to 47 cm below surface. At this level, pollen diagram shows increase of *Fagus*, which appears to be 2nd beech maximum F II. C¹⁴ age agrees with palynologic interpretation.

980 ± 120**Lv-183. Rulles I/2****A.D. 970**

Sample from another large piece of wood from same level as in Lv-182. Both pieces were entangled.

Lv-196. Rulles I/3**1730 ± 120****A.D. 220**

Twigs of beech from 72 cm in peat layer. In pollen curves, *Fagus* dominates, but seems partly attenuated by partial forest clearance, probably Gallo-Roman during 1st beech maximum F I. Date confirms interpretation. As at Rodenbourg (Lv-243, this list), peat formation in the "mardel" began during Atlantic period. Archaeologically, date proves that bottom of peat layer is not contemporary with two large pieces of beech thought by archaeologists (Loess, 1913) to be frame of prehistoric hut.

Orval series

Wood samples from Orval abbey (49° 38' 31" N Lat, 5° 20' 18" E Long) near Villers devant Orval, Prov. of Luxemburg, Belgium, alt 215 m. Coll. 1963.

Lv-83. Orval 1963 b**980 ± 110****A.D. 970**

Wood (*Fagus*, id. by A. Munaut) from floor of hut which appears to be (Gregoire, 1964) out-house of 1st Benedictine settlement at Orval in A.D. 1070. Date is consistent with interpretation.

Lv-84. Orval 1963 a**1040 ± 80****A.D. 910**

Pine stub (*Pinus silvestris*, id. by A. Munaut) *in situ* from peat layer between 2 travertine layers, 123 cm below ground surface. Pollen curve, in addition to discovery of stomata of *Pinus*, indicates that *Pinus* grew at Orval during Atlantic period. C¹⁴ date confirms palynologic interpretation.

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