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VIENNA RADIUM INSTITUTE RADIOCARBON DATES XV

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Measurements have continued with the same proportional counter system, pretreatment procedure, methane preparation and measurement, and calculation, as described previously (R, 1970, v 12, p 298–318). Uncertainties quoted are single standard deviations. No $^{13}C/^{12}C$ ratios were measured. Sample descriptions have been prepared in cooperation with submitters. Some dates have been calibrated using the correction tables of Klein *et al* (1982) and are reported with an asterisk (*) in the Comment.

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GEOLOGIC AND BOTANIC SAMPLES

Austria

Kolbnitz series, Kärnten

Peat from 5.2m thick profile of Egartermoor, Kilbnitz/Mölltal (46° 52′ 20″ N, 13° 17′ 46″ E), +750m, Carinthia. Coll 1983 by Friedrich Kral and Franz Egarter, subm by F Kral, Univ Bodenkultur, Vienna.

General Comment (FK): series dates palynologically determined events.

VRI-877. 125–135 **740 ± 60**

Heavily decomposed moss peat at 125 to 135cm depth. *Comment* (FK): dates beginning of human influence on woods.

VRI-878. 235–245 **2870 ± 80**

Wood peat with *Carex* at 235 to 245cm depth. *Comment* (FK): dates beginning of continuous settlement in Lower Möll Valley.

VRI-879. 300–310 **5310 ± 100**

Wood peat at 300 to 310cm depth. *Comment* (FK): dates beginning of abundant spread of common beech after glaciation.

VRI-880. 470–480 **8460 ± 110**

Sandy wood peat at 470 to 480cm depth. *Comment* (FK): dates beginning of abundant spread of spruce after glaciation.

VRI-881. Nieselach, Kärnten **31,600 ± 1300**

Stem of tree in sand below moraine above lignite layer; Nieselach (46° 36′ 30″ N, 13° 30′ 30″ E), Carinthia. Coll 1983 and subm by D van Husen, Tech Univ, Vienna. *Comment* (DvH): dates coarse sedimentation on lignite horizon (van Husen & Draxler, 1982).

VRI-824. Manhartsberg, NÖ **2550 ± 70**

Gray sandy clay mud at 45 to 50cm depth from layer 13cm thick, above say clay, overlain by clayey *Carex* peat, Seewiese am Manhartsberg (48° 32′ 20″ N, 19° 44′ E), +475m, Lower Austria. Coll 1983 and subm by Friedrich Kral. *Comment* (FK): early human influence on surrounding woods are palynologically determined; 815–435 BC*, points to Hallstatt period.

VRI-874. Marchegg, NÖ **5160 ± 90**

Carex peat at 105 to 115cm depth, from peat layer, 60cm thick, overlain by loam, underlain by coarse sand, Nanni Au bei Marchegg (48° 16′ 13″ N, 16° 53′ 48″ E), +145m, Lower Austria. Coll 1983 and subm by Friedrich Kral. *Comment* (FK): dates time when forests in this area were not influenced by humans, as palynologically proven.

VRI-826. Ebensee, OÖ **11,760 ± 300**

Wood at 160m depth below postglacial gravel washed by R Traun into Lake Traunsee, Ebensee (47° 48′ 06″ N, 13° 46′ 30″ E), Upper Austria. Coll 1983 from boring by Peter Baumgartner, subm by Hermann Kohl, OÖ Landesmus, Linz. *Comments* (HK): date is clue to sedimentation rate. (HF): no pretreatment.

VRI-827. Schön, OÖ **29,800 ± 1100**

Fossil peat or peat coal below ground moraine at 6m depth, Schön near Michldorf (17° 51′ 30″ N, 14° 09′ E), Upper Austria. Coll 1981 by boring, subm 1983 by Hermann Kohl. *Comments* (HK): palynology places sample in interstadial. Riss interstadial is possible because Riss glaciation was last one in area. Date confirms expectation of transposed bog of Würmian age. (HF): no pretreatment.

Wallersee series, Salzburg

Peat samples from Wengermoor bog (47° 55′ N, 13° 11′ E) near Weng at Wallersee, Salzburg. Coll 1983 by Robert Krisai and Gertrude Friese, subm by R Krisai, Univ Salzburg.

General Comment (RK): series establishes Wengermoor chronology.

VRI-842. Wengermoor V/1,1 **5470 ± 100**

Basal layer of raised bog peat at S part of bog (47° 55′ 28″ N). *Comment* (RK): dates beginning of growth of raised bog; with VRI-843, reveals that change to raised bog in whole Wengermoor was not simultaneous but proceeded from N to S.

VRI-843. Wengermoor II/2,1 **6990 ± 100**

Basal layer of raised bog peat at N part of bog (47° 55′ 45″ N). *Comment* (RK): same as VRI-842.

VRI-844. Wengermoor IV/1,5 **5260 ± 100**

Basal layer of raised bog at center of bog (47° 55′ 35″ N). *Comment* (RK): dates beginning of raised bog and supports pollen diagram.

VRI-845. Wengermoor IV/3,1 **8160 ± 120**

Basal layer of reed peat at center of bog (47° 55′ 35″ N). *Comment* (RK): dates both beginning of reed peat growth and beginning of marsh development in Wengermoor; supports pollen diagram.

VRI-871. Tenneck, Salzburg **420 ± 60**

Humus sample P-Tal 1730 in A-B profile separating underlying ground moraine and overlying moraine material 30cm below recent humus surface, Mt Tennengebirge (47° 32′ N, 13° 12′ 42″ E) near Tenneck, Salzburg. Coll 1983 and subm by Herbert Weingartner, Geog Inst, Univ Salzburg. *Comments* (HW, HF): date disagrees with assumed contribution to late glacial stratigraphy. HCl pretreatment only. Date may be influenced by non-separable younger humic acids and rootlets, but unrealistic admixture of <90% would be necessary to lower expected late glacial age of this date.

VRI-873. Filzmoos, Salzburg **3920 ± 80**

Carex peat at 175 to 185cm depth in profile ca 6.5m long at Wurzeralm, +1360m (47° 38′ 57″ N, 14° 17′ 12″ E) near Filzmoos, Salzburg. Coll 1981 by Friedrich Kral and Michael Oberforster, subm by F Kral. *Comment* (FK): dates early transient pasture activity palynologically recognized.

VRI-914. Bischofshofen, Salzburg **6120 ± 120**

Branch wood in ground moraine at base of terrace, +550m, end of Naglgraben valley (47° 23′ 45″ N, 13° 13′ 40″ E) near Bischofshofen, Salzburg. Coll 1984 by Heinz Slupetzky and Josef-Michael Schramm, subm by Heinz Slupetzky, Geog Inst, Univ Salzburg. *Comment* (HS): dates terrace.

St Jakob in Defereggen series, Osttirol

Wood peat from peat profile, 80cm thick, in bog near Erlsbacher bridge at St Jakob in Defereggen (46° 54′ 58″ N, 12° 15′ 15″ E), ;1570m, E Tyrol. Coll 1983 and subm by Friedrich Kral.

General Comment (FK): series dates palynologically determined events.

VRI-875. 38–45 **650 ± 60**

Carex wood peat at 38 to 45cm depth. *Comment* (FK): dates younger human influence in woods (burning ?) followed by generally unforested area up to present time.

VRI-876. 68–75 **2260 ± 70**

Sandy wood peat at 68 to 75cm depth. *Comment* (FK): dates older human influence on woods followed by transitory opening of woods.

Seibersdorf 1 series, Steiermark

Cyperaceae peat (contamination with younger roots possible) from middle part of bog profile near Seibersdorf (46° 44′ N, 15° 39′ 30″ E), ca +250m, Steiermark. Coll 1982 and subm by Friedrich Kral.

General Comments (FK): dates pollen diagram. (HF): no pretreatment.

VRI-801. Seibersdorf 30–40 **<250**

Peat at 30 to 40cm depth. *Comment* (FK): dates younger human influence.

VRI-802. Seibersdorf 52–60 **530 ± 60**

Peat at 52 to 60cm depth. *Comment* (FK): dates older human influence.

VRI-803. Seibersdorf 2, Steiermark **960 ± 60**

Detritus gyttja (contamination with younger roots possible) from middle part of profile of Attemsmoor (46° 44′ 20″ N, 15° 38′ 10″ E), ca +250m, near Seibersdorf, Styria. Coll 1982 by Friedrich Kral and Heinz Otto, subm by F Kral. *Comment* (FK): dates palynologically determined human influence; 1st increase in culturally associated pollen.

Kirchbichl series, Tirol

Heavily decomposed peat from bog profile (47° 36′ 36″ N, 12° 26′ 26″ E), Strandbad Kirchbichl, Tyrol. Coll 1983 by Burgi Wahlmüller, subm by Sigmar Bortenschlager, Univ Innsbruck.

General Comment (BW): dates pollen diagram.

VRI-816. 220–223 **4970 ± 90**

Peat at 220 to 223cm depth. *Comment* (BW): dates spread of *Abies*.

VRI-817. 357–360 **6110 ± 90**

Peat at 357 to 360cm depth. *Comment* (BW): dates beginning of absolute *Picea* domination.

VRI-818. 520–523 **8100 ± 120**

Peat at 520 to 523cm depth. *Comment* (BW): dates end of non-arboreal pollen.

VRI-828. Zillertal, Tirol **2920 ± 80**

Detritus *Radicella* peat in topmost layer (10 to 15cm) of bog (47° 01′ 33″ N, 11° 48′ 19″ E), +1875m, Waxeckalm, Zillertal, Tyrol. Coll 1982 by H Hüttemann, subm by Sigmar Bortenschlager. *Comment* (HH): dates modern glacial advance. Completes Zillertal series (R, 1984, v 26, p 443).

VRI-829. Kühtai, Tirol **1930 ± 60**

Brown moss *Sphagnum* peat 20 to 25cm deep in bog near Dortmunder hut (47° 12′ 20″ N, 11° 00′ 38″ E), +1880m, Kühtai, Tyrol. Coll 1983 by H Hüttemann, subm by Sigmar Bortenschlager. *Comment* (HF): dates *Picea* decrease in pollen diagram in assoc with cultural phase. Completes Kühtai series (R, 1984, v 26, p 443–444).

VRI-832. Telfs, Tirol **4050 ± 110**

Charcoal splinters (sample 1/83) in burning horizon, 5cm thick, at 150cm depth separating two secs of deposition in alluvial cone of rivulet Griessbach. Below burning horizon sand are limestone rubble and moraine, Telfs (47° 18′ N, 11° 04′ E), Tyrol. Coll 1983 in dredged ditch by Neuner, I Neuwinger, and G Heiss, subm by I Neuwinger, Forstl BVA, Innsbruck. *Comment* (IN): dates alluvial cone.

VRI-837. Heilig Kreuz, Tirol **6220 ± 120**

Charcoal at 200cm depth from charcoal horizon embedded in alluvial silt deposit of R Inn, overlain by 180cm mudflow-debris of R Weissenbach at Heilig Kreuz near Hall in Tirol, from foundation of house Reimichlstraβe 23b (47° 17′ 08″ N, 11° 29′ 39″ E), + 576m, Tyrol. Coll 1983 and subm by Gernot Patzelt, Univ Innsbruck. *Comment* (GP): dates time when Inn Valley level was 16m above present one at +560m.

VRI-882. Wattens, Tirol **9730 ± 120**

Pinus wood ca 500cm below surface of Inn Valley level embedded in ca 1m thick alluvial clay overlain by 400 to 500 cm Inn gravel. Foundation-trench of Swarovski Works 1 (47° 17′ 46″ N, 11° 36′ 00″ E), +551m, Wattens, Tyrol. Coll 1983 by Weis, Swarovski Co, subm by Gernot Patzelt. *Comment* (GP): outermost 20 to 22 rings near root stock of large tree was used for dating. Dates both former flood plain of R Inn and beginning of last gravel deposition up to present level.

Kiefersfelden series, Tirol

Wood from sediments of R Inn coll by boring in present flood plain with some houses, 500m N Kiefersfelden (47° 37′ 28″ N, 12° 11′ 14″ E), Tyrol. Coll 1983 by Gernot Patzelt.

General Comment: continues research of valley development and climate history of Inn Valley, begun with VRI-837 and -882, above.

VRI-910. Kiefersfelden 1 **1030 ± 60**

Wood at 5.1m depth.

VRI-911. Kiefersfelden 2 **1090 ± 70**

Wood from trunk, 1 to 1.5m thick, in same boring as VRI-910 at 6 to 8m depth.

ARCHAEOLOGIC AND HISTORIC SAMPLES

Austria

VRI-833. Villach, Kärnten **200 ± 70**

Wood from wooden bishop sculpture, 50cm high, of simple/primitive art. Sample is inventory of Mus Villach, Carinthia, bought 1914, subm by Dieter Neumann. *Comment* (DN): sculpture is either formal Archaic or Medieval art; AD 1525–1570, 1605–1815, 1840–1885, 1915–1950*.

Kamegg series, NÖ

Charcoal from excavation in area of Neolithic circular trench arrangement at Kamegg (48° 36′ 34″ N, 15° 39′ 23″ E), near Gars am Kamp, Lower Austria. Coll 1983, subm by Gerhard Trnka, Inst Ur- u Frühgeschichte, Univ Vienna.

VRI-896. Kamegg 1 **5700 ± 90**

Sample 221 from trench filling, cut 4/24m run/sec H, tr II, N portal; 1.8m depth. *Comment* (GT): culture of painted ceramics.

VRI-897. Kamegg 2 **38,700 $^{+4600}_{-2900}$**

Sample 184 in loamy soil development in loess, cut 4/59 to 60m run/sec F/planum 5–6; 2.1 to 2.2m depth. *Comment* (GT): dates soil development; important for comparison with Paleolithic sites.

VRI-823. See/Mondsee, OÖ **4660 ± 80**

Wood remnant (229/1–1983 See/Mondsee) of Neolithic lake dwelling at −2m at base of Mondsee near See (47° 48′ 16″ N, 13° 27′ 00″ E), Upper Austria. Coll 1983 by Union-Tauchclub Wels, subm by Johann Offenberger, Bundesdenkmalamt. *Comment:* date confirms Neolithic age.

VRI-825. Nußdorf/Attersee, OÖ **4310 ± 90**

Wood remnant (231/2–1983 Nußdorf) of Neolithic lake dwelling near Nußdorf (47° 52′ 42″ N, 13° 31′ 40″ E), Upper Austria. Coll 1983 by Union-Tauchclub Wels, subm by Johann Offenberger. *Comment:* date confirms Neolithic age.

VRI-831. Linz, OÖ **1830 ± 70**

Charcoal at 0.9 to 1m depth, excavated at Lessingstraße 28, Linz (48° 17′ N, 14° 20′ E), Upper Austria. Coll 1982, subm by Erwin M Ruprechtsberger, Stadtmus Linz. *Comment* (EMR): tentatively placed in 1st half of 1st century AD by finds of Terra sigillata in same layer that also bore iron slag; AD 20–255* agrees with expectation.

VRI-835. Voitsberg, Steiermark **210 ± 60**

Wood splinters with soil at cave in altar base of St Hemma church, 12km E of Voitsberg (47° 03′ 03″ N, 32° E), Styria. Coll 1983 and subm by Ernst Lasnik, Mus Köflach. *Comment* (EL): date disagrees with possibility that sample is relic of sacred tree in legend of Earl Wilhelm, husband of St Hemma.

St Jakob in Defereggen, Series 1, Osttirol

Remains of former copper mines, NE part of "Defereggen Knappengruben" area, 5 to 6km NNE of St Jakob in Defereggen (46° 55′ N, 12° 20′ E), Trögischbach Valley, SE Pregratter Törl, at +2575 to 2739m, E Tyrol. Coll 1983 by W Potacs, subm by Richard Pittioni; Inst Ur- u Frühgeschichte, Univ Vienna.

General Comment (RP): supplement for insufficient historic material.

VRI-838. Sample 1 **80 ± 60**

Charcoal at 30cm depth in bldg remains, E path to Pregratter Törl. *Comment* (HF): AD 1665 to 1940*.

VRI-839. Sample 2 **360 ± 50**

Fragments of wooden floor in bldg remains at 30cm depth. *Comment* (HF): AD 1415 to 1645*.

VRI-840. Sample 3 **330 ± 60**

Textile remains, presumably from ore bags, in dump material. *Comment* (HF): AD 1420 to 1655*.

Africa

Djaba series, Republic of Niger

Wood from ruins of settlement (Ksar) Djaba (21° 04′ N, 12° 17′ E), built of salt clay at border of Djado plateau, near Chirfa, Sahara. Coll 1982, subm by H Felber.

General Comment (HF): dates phases of construction. No NaOH pretreatment necessary.

VRI-809. Djaba 1 **280 ± 80**

Sample of beam above entrance opening in lower part of Ksar in present external wall. Coll 1982 by Dieter Stadtländer.

VRI-810. Djaba 2 **480 ± 70**

Sample of beam in present external wall at base of N part of Ksar exposed by collapse. Coll by Elfriede Felber. *Comment* (HF): AD 1345 to 1490*.

REFERENCES

Felber, Heinz, 1984, Vienna Radium Institute radiocarbon dates XIV: Radiocarbon, v 26, p 441–448.

Husen, D van and Draxler, I, 1982, Zur Ausbildung und Stellung der würmzeitlichen Sedimente im unteren Gailtal: Zeitschr Gletscherk Glazialgeol, v 16, p 85–97.

Klein, J, Lerman J C, Damon, P E, and Ralph, E K, 1982, Calibration of radiocarbon dates: tables based on the consensus data of the Workshop on Calibrating the Radiocarbon Time Scale: Radiocarbon, v 24, p 103–150.