

## VIENNA RADIUM INSTITUTE RADIOCARBON DATES XIII

HEINZ FELBER

Institut für Radiumforschung und Kernphysik der Österr Akademie  
der Wissenschaften, Vienna, Austria

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 originating from standard, sample, and background counting rates. No  $^{13}\text{C}/^{12}\text{C}$  ratios were measured. Sample descriptions have been prepared in cooperation with submitters.

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### SAMPLE DESCRIPTIONS

#### I. GEOLOGIC, LIMNOLOGIC, AND BOTANIC SAMPLES

##### *Austria*

#### **VRI-759. Opponitz, NÖ 8790 ± 130**

Gyttja from organic layer between calcareous tuff with mollusk shells in Haselgraben E Opponitz (47° 52' 40" N, 14° 49' 30" E), Lower Austria. Coll 1981 and subm by Ilse Draxler, Geol BA, Vienna. *Comments* (ID): palynology points to favorable Würm climatic phase. (HF): date contradicts palynology. No NaOH pretreatment.

#### **Lungötz series, Salzburg**

Peat with wood pieces from peat deposit cut by Lammer R, Lammerthal Valley, W Lungötz (47° 30' N, 13° 21' E), Salzburg. Coll 1981 and subm by Heinz Slupetzky, Geog Inst, Univ Salzburg. *General Comments* (HS): information on bog growth is expected. (HF): humic acid fraction was used for peat dating to eliminate wood detritus.

#### **VRI-736a. Sample I, peat 3510 ± 90**

Peat with sand from base (−3.5m) of peat layer, 3m thick, in 1st fluvial terrace of Lammer R, now above recent river bed, but in high water zone.

#### **VRI-736b. Sample I, wood Modern**

Wood in Sample I. *Comment* (HF): date shows nuclear weapons influence. Wood obviously washed in.

#### **VRI-737a. Sample II, peat 2320 ± 80**

Peat with sand from uppermost layer (−0.5m).

#### **VRI-737b. Sample II, wood 2180 ± 100**

Wood in Sample II.

**Gastein series, Salzburg**

Material from bottom of Unterer Bockhart-See, at present nearly completely drained for dam construction. Deep erosional gullies in exposed lake sediment provide access for sampling as much as 7m below sediment surface. Unterer Bockhart-See, 1845m asl, near Gastein (47° 04' 45" N, 13° 03' 10" E), Salzburg. Coll 1981 and subm by Friedrich Kral, Univ Bodenkultur, Vienna.

*General Comments* (FK): dates palynologically determined events. (HF): contaminating wood detritus excluded by use of NaOH extract only. The following sample depths are relative to sediment surface.

**VRI-760. BO II/0-8 1190 ± 80**

Sandy gyttja at 2.1m in zone with thin dark and light layers underlying coarse sand layer, 1.5m thick, possibly assoc with gold mining. *Comment* (FK): dates palynologically determined max in pasturing activity.

**VRI-761. BO II/125-135 3140 ± 90**

Sandy gyttja at ca 3.3m in dark-colored zone with few thin sand layers. *Comment* (FK): dates palynologically determined beginning of pasturing activity or 1st local human influence.

**VRI-762. BO II/130 3030 ± 120**

Pine cones in Sample VRI-761.

**VRI-763. BO II/182 3050 ± 90**

*Cembra* wood in Sample VRI-764.

**VRI-764. BO II/180-185 3480 ± 90**

Sandy gyttja at 3.9m in dark-colored zone with thin sand layers. *Comment* (FK): dates pasturing activity in outlying areas palynologically traceable by air-borne pollen. Younger stem, VRI-763, may have sunk ca 50cm in soft sediments to this older layer.

**VRI-765. BO III/8-12 4800 ± 90**

Sandy gyttja at ca 5.4m in dark zone without sand layers. *Comment* (FK): dates increase of *Abies* pollen.

**VRI-766. BO III/88-92 7180 ± 110**

Sandy gyttja at ca 6.2m in dark zone without sand layers. *Comment* (FK): dates max alt of timber line (*Pinus*, *Cembra*).

**VRI-767. BO III/165-175 9690 ± 360**

Gyttja with much sand at ca 7m in relatively light-colored zone with partly-coarse sand. *Comment* (FK): dates immigration and spread of *Alnus* and *Pinus*.

**VRI-781. BO I/40-50 1250 ± 80**

Sand with gyttja and wood detritus, with several dark and light layers, at 40 to 50cm. *Comment* (FK): dates beginning of present environ-

ment, nearly free of trees. Provides min age for underlying homogeneous coarse sand zone possibly related to gold and silver mining.

**VRI-782. BO II/55-65** **2080 ± 80**

Sandy gyttja and wood detritus interspersed with dark lake sediment at 2.6m. *Comment* (FK): dates beginning of corn pollen and wood regression in vicinity.

**Hochlantsch series, Steiermark**

Calcareous sinters at Mt Hochlantsch area, between Teichalm hut and Zechner Hube (47° 21' 50" N, 15° 26' 50" E), near Bruck an der Mur, Styria. Coll 1981 by Hannes Gollner, subm by H W Flügel, Inst Geol and Paläont, Univ Graz.

*General Comment* (HWF): dated to study temporal correlation between carbonate sinters in cleft of disturbance (Sample A) and in dissolving fissure of Devon lime (Sample B) that cross each other.

**VRI-771. Sample A** **1.9 ± 0.4% modern**

**VRI-772. Sample B** **26.4 ± 0.5% modern**

*Comment* (HF): recent value, 100% modern, provides max ages: Sample A: 31,700 ± 1600, Sample B: 10,700 ± 160 BP.

**Seefeld series, Tirol**

Peat from different depths of Katzenlochmoor at foot of Mt Hohe Munde (47° 20' 39" N, 11° 07' 16" E), near Seefeld, Tirol. Coll 1981 and subm by Sigmar Bortenschlager, Bot Inst, Univ Innsbruck.

*General Comment* (SB): dates pollen diagram.

**VRI-625. Base** **8630 ± 130**

Peat from base. *Comment* (SB): dates beginning of peat growth.

**VRI-628. 140-143** **8450 ± 120**

*Sphagnum* peat from depth 140 to 143cm. *Comment* (SB): dates *Picea* increase.

**VRI-626. 92-95** **7470 ± 120**

*Sphagnum* peat with *Eriophorum* from depth 92 to 95cm. *Comment* (SB): dates beginning of arboreal pollen decrease.

**VRI-627. 72-75** **7100 ± 180**

*Sphagnum* peat with *Eriophorum* from depth 72 to 75cm. *Comment* (SB): dates end of arboreal pollen decrease.

**Kirchbichl series, Tirol**

Detritus-gyttja in profile of former lake, Kirchbichl watering place (47° 30' 36" N, 12° 05' 26" E), Tirol. Coll 1981 by Burgi Wahlmüller; subm by Sigmar Bortenschlager.

*General Comments* (BW): dates pollen diagram. (HF): no humic acid separation.

**VRI-690. 453-460** **8050 ± 130**

Sample at depth 453 to 460cm. *Comment* (BW): dates spread of *Picea*.

**VRI-691. 670-677** **9070 ± 140**

Sample at depth 670 to 677cm. *Comment* (BW): dates end of clay deposition.

**VRI-692. 695-702** **9430 ± 130**

Sample at depth 695 to 702cm. *Comment* (BW): dates beginning of clay deposition.

**VRI-768. Kienberg, Tirol** **Modern**

Humic acids from lowest layer of  $O_f(O_h/A_h)$  horizon of Ranker on landslip block near Kienberg/Jerzens im Pitztal (47° 08' N, 10° 45' E), Tirol. Coll 1981, extracted and subm by Gerhard Heiss and Irmentraud Neuwinger, Forstl BVA, Innsbruck. *Comment* (IN): date of landslip was hoped for. (HF): date shows nuclear weapons influence.

**Telfs series, Tirol**

Soil from Griessbach alluvial cone, Telfs (47° 18' N, 11° 04' E), Tirol. Coll 1982 and subm by Irmentraud Neuwinger.

*General Comment* (IN): dates top layer of alluvial cone.

**VRI-769. Sample 102/82** **Modern**

Humic acids extracted from lowest layer of  $A_h$  horizon of Rendzina, -20 to -25cm, ca 20m E of VRI-741 (R, 1982, v 24, p 225). *Comment* (HF): date shows nuclear weapons influence.

**VRI-785. Sample 17a/82** **4250 ± 100**

Charcoal of buried  $A_h$  horizon, -80 to -100cm. *Comment* (HF): dendrochronol age, 2820 to 3240 BC (Suess, 1979).

**VRI-784. Sulzberg, Vorarlberg** **Modern**

Wood from plant layer, -50cm in lake marl, Unterlitten near Sulzberg (47° 32' N, 9° 55' E), Vorarlberg. Coll 1982 and subm by Ilse Draxler. *Comments* (ID): interval from Middle ages to present is expected from palynology. (HF): date shows nuclear weapons influence.

## CSSR

**Vysoke Tatry series**

Peat (VT-I-A) from bog near Trojhranne pless lake (49° 13' 15" N, 20° 13' 50" E), 1650m asl, Vysoke Tatry. Coll 1981 by Heinz Hüttemann; subm by Sigmar Bortenschlager.

*General Comment* (HH): dates pollen diagram.

**VRI-629. 110-100** **2290 ± 90**

*Sphagnum-Eriophorum* peat at depth, -110 to -100cm. *Comment* (HH): dates beginning of cultural phase.

**VRI-697. 155-150** **3640 ± 90**

*Sphagnum-Eriophorum* peat at depth, -155 to -150cm. *Comment* (HH): dates both EMW and *Pinus* increase and *Picea* decrease. No humic acid separation.

**VRI-698. 55-50** **890 ± 70**

Cyperaceae peat at depth, -55 to -50cm. *Comment* (HH): dates beginning of intensive human activity including land clearance. No humic acid separation.

#### **Riesengebirge series**

Peat and wood from Pancica bog near Elbebaude, 1325m asl (50° 46' 45" N, 15° 32' 30" E), Mt Riesengebirge. Coll 1982 by Heinz Hüttemann; subm by Sigmar Bortenschlager, Bot Inst, Univ Innsbruck.

*General Comments* (HH): dates pollen diagram. (HF): no humic acid separation.

**VRI-693. 180-185** **4710 ± 90**

*Sphagnum* peat at depth 180 to 185cm. *Comment* (HH): dates supposed burning horizon.

**VRI-694. 125-130** **4280 ± 90**

*Sphagnum* peat at depth 125 to 130cm. *Comment* (HH): dates 1st clearing activity.

**VRI-695. 85-90** **2460 ± 80**

Brown moss *Carex* peat at depth 85 to 90cm. *Comment* (HH): dates climax of intensive cultural phase.

**VRI-696. 25-30** **610 ± 80**

*Sphagnum-Trichophorum* peat at depth 25 to 30cm. *Comment* (HH): dates beginning of modern culture phase.

**VRI-707. 200** **4750 ± 90**

Root of pine at depth 200cm.

#### *Greece*

#### **Lailias series**

Samples of bog 1420m asl at Lailias (41° 16' 14" N, 23° 35' 30" E). Coll 1980 by A Gerassimidis; subm by Nikolaos Athanasiadis, Inst Forstbot, Aristotelion Univ, Thessaloniki.

*General Comment* (NA): dates pollen diagram. Pretreatments were unnecessary.

**VRI-746. 58-61** **250 ± 80**

*Carex-Sphagnum* peat with modern roots at depth 58 to 61cm.

**VRI-747. 127-132** **910 ± 80**

Dy with modern roots at depth 127 to 132cm.

**VRI-748. 175-200** **1870 ± 140**

Dy with coarse sand at depth 175 to 200cm.

#### **Flamboyro series**

Peat from bog near Flamboyro (40° 15' 24" N, 22° 09' 36" E), Mt Pieria, 1650m asl. Coll 1980 by A Gerassimidis; subm by Nikolaos Athanasiadis.

*General Comment* (NA): dates pollen diagram. Pretreatments were unnecessary.

**VRI-749. 48-52** **520 ± 80**

Peat with roots at depth 48 to 52cm.

**VRI-750. 120-125** **1960 ± 80**

Peat with roots and clay at depth 120 to 125cm.

#### **Kokkini Brissi-Pieria series**

Peat and dy at Kokkini Brissi (40° 17' 55" N, 22° 09' 38" E), Pieria Mt, 1420m asl. Coll 1981 by A Gerassimidis; subm by N Athanasiadis.

*General Comment* (NA): dates pollen analysis. No pretreatment.

**VRI-751. 63-68** **<200**

Clayey peat at depth 63 to 68cm; contaminated by rootlets.

**VRI-752. 170-175** **610 ± 80**

Clayey dy at depth 170 to 175cm; contaminated by rootlets.

## II. ARCHAEOLOGIC AND HISTORIC SAMPLES

### *Austria*

#### **Stillfried an der March series, NÖ**

Charcoal from different loci of W rampart cut of prehistoric bulwark on Kirchberg hill, Stillfried (48° 25' N, 16° 50' E), near Angern an der March, Lower Austria. Coll 1977 by C Eibner, Inst Ur- u Frühgesch, Univ Vienna.

**VRI-773. Sample ST 7225** **1950 ± 80**

W rampart cut, 140 to 150cm below level, 16.25m run, 140 to 160cm S of N profile 1980.

**VRI-774. Sample ST 7226** **2480 ± 80**

W rampart cut, below pit bldg, 14.5 to 15.5m run, 110 to 180cm S of N profile 1980.

**VRI-783. Geras, NÖ** **680 ± 80**

Human bones from burials at -175cm, excavated at S face of church of Stift Geras (48° 47' N, 15° 42' E), Dept Horn, Lower Austria. Coll 1982 and subm by Ambros Josef Pfiffig, Stift Geras. *Comments* (AJP): early slave settlement is suggested. Reconstruction of Stift Geras after 1650 disturbed burials. (HF): de Vries corrected age (Suess, 1970) is AD 1270 ± 80.

**VRI-739. Traunkirchen, OÖ** **2480 ± 90**

Wood remnants of prehistoric lake dwelling, -2m below water level from bottom of Lake Traunsee, near Traunkirchen (47° 51' N, 13° 47' E), Upper Austria. Coll 1981 and subm by Johann Offenberger, Bundesdenkmalamt, Vienna. *Comment* (JO): date points to Hallstatt period, de Vries-effect correction (Suess, 1970), including standard deviation, yields 800 to 600 BC.

**Hallstatt series, OÖ**

Samples from wooden rust overlain by Roman layer, -2m below Echerntalweg near S parking lot, Hallstatt (47° 33' 30" N, 13° 39' E), Oö. Coll 1980 by Hubert Unterberger, subm by Chr Farka, Bundesdenkmalamt, Vienna.

*General Comment* (HF): dates prove only some samples are of Roman origin.

**VRI-743. Hallstatt 1** **1670 ± 80**

*Comment* (HF): de Vries correction provides Roman date, AD 330 <sup>+ 90</sup> - 80 (Suess, 1970).

**VRI-744. Hallstatt 2** **<300****VRI-775. Attersee, OÖ** **4610 ± 100**

Wooden piling at bottom of Lake Attersee, -2m below water level, sample Abtsdorf II 197/1-1982, near Abtsdorf (47° 53' 48" N, 13° 31' 58" E), Upper Austria. Coll 1982 by Union Tauchklub Wels; subm by Johann Offenberger. *Comment* (JO): dates Neolithic lake dwelling.

**VRI-742. Innsbruck, Tirol** **300 ± 90**

Human bones, from -2m at N portal in great court of Hofburg Castle, Innsbruck (47° 17' N, 11° 25' E), Tirol. Coll 1981 at gas-line installation; subm by Werner Platzer, Anatom Inst, Univ Innsbruck. *Comments* (WP): loc of medieval cemetery, abandoned in AD 1501. (HF): de Vries correction (Suess, 1970) yields calendric date, AD 1480 <sup>+ 40</sup> - 30.

*Spain***Canary Islands series**

Shell remains from different depths of shell heap. Conchero El Julan, S of Hierro I, Canary Is. Coll 1982 by Herbert F Nowak; subm by Hans Biedermann, Inst Canarium, Hallein. *Comments* (HB): dated for study of Canarian Megalith culture. (HF): surface leaching pretreatment.

**VRI-777. El Julan 1** **1010 ± 80**

Depth -0.02 to -0.05m.

**VRI-778. El Julan 2** **1140 ± 80**

Depth -0.50 to -0.55m.

<b>VRI-779. El Julian 3</b>	<b>1260 ± 80</b>
Depth -0.98 to -0.99m.	
<b>VRI-780. El Julian 4</b>	<b>1420 ± 80</b>
Depth -1.09 to -1.10m.	

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