

VIENNA RADIUM INSTITUTE RADIOCARBON DATES IX

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Measurements have continued with the same proportional counter system, pretreatment procedure, methane preparation, measurement, and calculation, as described previously (R, 1970, v 12, p 298-318). Uncertainties quoted are single standard deviations originating from standard, sample, background counting rates and half-life. No $^{13}\text{C}/^{12}\text{C}$ ratios were measured.

Sample descriptions have been prepared in cooperation with submitters.

ACKNOWLEDGMENTS

I express my thanks to Ing L Stein for excellent work in sample preparation, and to K Flandorfer for careful operation of the dating equipment.

SAMPLE DESCRIPTIONS

I. GEOLOGY, GLACIOLOGY AND BOTANY

A. Austria

VRI-569. Altenwörth, NÖ **7320 ± 110**

Split oak stem, with root stock, 10m long, 60cm diam, fossil drift wood of R Danube, overlain by 4m gravel, left bank 1km downstream from dam of Sta Altenwörth (48° 23' N, 15° 52' E), Lower Austria. Coll 1976 and subm by Henriette Meissinger, Schiffahrtsmuseum Spitz/Donau, NÖ.

VRI-571. St Pölten, NÖ **3830 ± 90**

Oak stem at 5 to 6m depth in gravel of R Traisen, pit Paderta, Viehofen near St Pölten (48° 13' N, 15° 38' E), Lower Austria. Coll 1976 and subm by Heinrich Fischer, Vienna.

VRI-516. Strobl, OÖ **5800 ± 110**

Peat from depth 2.20 to 2.35cm of bog Moosalmmoor near Lake Schwarzensee (47° 46' N, 13° 29' 10" E), near Strobl, Upper Austria. Coll and subm by D van Husen, Geol Inst, TU Vienna. *Comment* (DvH): dates 1st increase of *Fagus-Abies* in pollen diagram.

Seefeld series, OÖ

Organic samples in boring cores coll from different depths near pump sta in Seefeld (47° 50' N, 13° 33' E), Lake Attersee, OÖ. Coll 1975 and subm by Helmut Flögl, Reinhaltungsverband Attersee, Schörfling, OÖ.

General Comment (HF): exploration of soil chronology suggested by landslide.

VRI-543. 930 to 960cm **2770 ± 80**

Wood splinters and remnants of leaves from depth 930 to 960cm.

VRI-544. 740 to 930cm 2550 ± 120

Piece of branch in core between 740 to 930cm.

Mt Dachstein series, OÖ

Brown-moss-Dy of postglacial organic lacustrine deposition within doline: Lake Hirzkarsee, Mt Dachstein (47° 31' N, 13° 41' E), 1800m alt, Upper Austria. Coll 1977 and subm by Roland Schmidt, Limnolog Inst Österr Akad Wiss, Vienna.

General Comment (RS): dates postglacial climatic oscillation palynologically detected. No humic acids separation.

VRI-604. Hirzkarsee, 100 to 115cm 8210 ± 150

Sample from depth 100 to 115cm. *Comment (RS)*: age unexpectedly high.

VRI-605. Hirzkarsee, 120 to 135cm 9380 ± 140

Sample from depth 120 to 135cm. *Comment (RS)*: age unexpectedly high.

VRI-492. Totes Gebirge, Steiermark 31,200 ± 1100

Pollen, spores, and plant detritus 15 to 20cm below ground surface of Graf-Kesselstadt-Dom, Salzofenhöhle cave (47° 40' 45" N, 31° 35' 45" E), Totes Gebirge, Styria. Coll 1967, prepared and subm by Ilse Draxler, Geol BA, Vienna. *Comment (ID)*: dates cave bear layer. Already known dates: GRO-761, 34,000 ± 3000, charcoal from cultural layer in entrance hall; GRO-N-4628, >44,500, bones from entrance hall.

VRI-508. Ödensee, Steiermark 10,160 ± 130

Peat from bog NNE lake Ödensee between Kame terrace and end moraine (47° 34' 08" N, 13° 49' 36" E), Styria. Coll 1974 from depth 405 to 415cm and subm by D van Husen. *Comment (DvH)*: dates palynologically established climatic deterioration.

Mitterndorfer Becken series, Steiermark

Samples from different depths of bog between Kame terrace and end moraine ridge NE lake Ödensee (47° 33' 45" N, 13° 50' 20" E), Mitterndorfer Becken, Styria. Coll and subm by D van Husen.

General Comment (DvH): dates palynologically detected events. No humic acid separation (HF).

VRI-513. 395 to 405cm 6610 ± 110

Peat 395 to 405cm below surface. *Comment (DvH)*: dates immigration of copper-beech.

VRI-514. 180 to 200cm 3180 ± 90

Peat 180 to 200cm below surface. *Comment (DvH)*: dates beginning of *Carpinus* and culture pollen.

VRI-515. Base 11,500 ± 180

Gyttja and peat from base. *Comment* (DvH): dates beginning of peat growth coinciding with slope of *Pinus* max.

Stubaital series, Tirol

Peat from different horizons of Buntes Moor bog (46° 59' 27" N, 11° 08' 45" E), Fernaufener glacier, 2285m alt, Stubai Valley, Tyrol. Coll 1976 and subm by Gernot Patzelt, Geog Inst, Univ Innsbruck.

General Comment (GP): dates glacier oscillations.

VRI-456. 82 to 84cm 620 ± 80

Peat, depth 82 to 84cm, from undermost 2cm of peat band 11cm thick overlying loam sediment. *Comment* (GP): dates end of glacial max. Unknown origin of unacceptable young age.

VRI-457. 73 to 75cm 1270 ± 70

Peat, depth 73 to 75cm, from uppermost 2cm of same layer as VRI-456. *Comment* (GP): dates beginning of glacier max.

VRI-458. 45 to 47cm 450 ± 70

Peat, depth 45 to 47cm, from uppermost 2cm of 8cm thick peat layer. *Comment* (GP): dates beginning of glacier max.

VRI-459. 34 to 35cm 530 ± 70

Peat, depth 34 to 35cm, from 1 to 2cm thick peat layer in loamy washed in sediments. *Comment* (GP): dates end of same (VRI-458) glacier max.

VRI-460. 17 to 19cm <220

Peat, depth 17 to 19cm, from peat layer 2cm thick in loamy washed in sediments.

VRI-526. 72 to 76cm 1200 ± 150

Peat, depth 72 to 76cm, same horizon as VRI-457. *Comment* (GP): verifies VRI-457.

VRI-527. 103 to 108cm 1940 ± 150

Peat, depth 103 to 108cm, from uppermost 4cm of peat layer, 9 to 11cm thick, covered by washed in loamy sediment. *Comment* (GP): completes series VRI-11: 1890 ± 120 and VRI-15: 2280 ± 110 (R, 1970, v 12, p 303) sandwiching VRI-527.

Sölden series, Tirol

Cyperaceae peat from Wildmoos bog (46° 57' 00" N, 11° 01' 06" E) near Sölden, Tyrol. Coll 1975 and subm by Sigmar Bortenschlager, Botan Inst, Univ Innsbruck.

General Comment (SB): dates palynologically detected events. No humic acids separation.

VRI-461. 200 to 207cm **5750 ± 110**
Peat from depth 200 to 207cm. *Comment* (SB): pollen profile indicates human influence.

VRI-462. 245 to 252cm **6240 ± 110**
Peat from depth 245 to 252cm. *Comment* (SB): pollen profile indicates 1st human influence with distinct signs of woodland clearing.

VRI-463. 565 to 752cm **8780 ± 120**
Peat from depth 565 to 752cm. *Comment* (SB): dates beginning of fir curve.

Obergurgl series, Tirol

Samples from base of undisturbed bog 200 to 215cm thick, over ground moraine. Bog near Schönwieshütte shelter (46° 50' 45" N, 11° 00' 18" E), 2260m alt, near Obergurgl, Ötz Valley, Tyrol. Coll 1976 and subm by Gernot Patzelt.

General Comment (GP): samples completing Schönwies series VRI-230 (R, 1972, v 14, p 501), VRI-296-299 (R, 1974, v 16, p 279), date beginning of vegetational development in surroundings of bog and give min age for ice retreat.

VRI-528. Schönwies 6 **9300 ± 300**
Wood remnants.

VRI-529. Schönwies 7 **9590 ± 260**
Peat surrounding VRI-528.

B. Europe, Asia

Sarnthein I series, Italy

Cyperaceae peat from bogs outside of outermost end moraines of Egesen phase, Mt Villanders-Berg near Sarnthein, Italy. Coll by boring 1976 and subm by Sigmar Bortenschlager, Botan Inst, Univ Innsbruck.

General Comment (SB): dates palynologically detected events. No humic acids separation.

VRI-538. Rinderplatz 1 **11,790 ± 170**

Peat in contact with base gravel at depth 545 to 550cm from Rinderplatz bog (46° 38' 41" N, 11° 29' 40" E). *Comment* (SB): dates beginning of organic sedimentation and gives min age for ice retreat in this area. Age too low.

VRI-540. Rinderplatz 2 **10,030 ± 170**

Peat at depth 505 to 510cm from Rinderplatz bog. *Comment* (SB): dates final reforestation in this area.

VRI-541. Rinderplatz 3 **8480 ± 110**

Peat at depth 410 to 415cm from Rinderplatz bog. *Comment* (SB): dates decrease of *Pinus* and increase of *Picea* curve.

VRI-537. Malschötscher Hotter 8670 ± 130

Peat at depth 240 to 247cm from Malschötscher Hotter bog (46° 39' 58" N, 11° 27' 30" E). *Comment* (SB): dates beginning of organic sedimentation and gives min age for ice retreat in this area. Age >10,000 BP is expected.

Sarnthein 2 series, Italy

Cyperaceae peat from Dura-Bog (46° 48' 25" N, 11° 27' 35" E), Mt Villanders-Berg near Sarnthein, Italy. Coll by boring 1976 and subm by Sigmar Bortenschlager.

General Comment (SB): dates palynologically detected events. No humic acids separation.

VRI-550. 185 to 190cm 5450 ± 110

Peat at depth 185 to 190cm. *Comment* (SB): dates *Picea* max following herbaceous pollen max.

VRI-551. 90 to 95cm 2050 ± 70

Peat at depth 90 to 95cm. *Comment* (SB): dates renewed increase of *Pinus* and 1st signs of culture.

VRI-552. 50 to 55cm 1220 ± 80

Peat at depth 50 to 55cm. *Comment* (SB): dates *Pinus* max, rise of herbaceous curve, and increase of cereals and *Plantago*.

VRI-554. Natz, Italy 12,700 ± 200

Clay with gyttja from base of Sommersüss bog, depth 425 to 435cm, near Natz (46° 45' 39" N, 11° 40' 42" E), Italy. Coll by boring 1977 and subm by Hannes Müller and Alois Seiwald, Botan Inst, Univ Innsbruck. *Comment* (HM): dates beginning of organic sedimentation.

Canary Islands series, Spain

Charcoal from aboriginal fire places at different alts above recent sea level, near Parador (27° 45' N, 18° E), Hierro I., Canary Is., Spain. Coll 1976 and subm by Herbert Franz, Univ Bodenkultur, Vienna.

General Comment (HF): dates upper limit for last sea level max indicated by marine sediments and lava rubble reaching 2m above fireplaces.

VRI-564. Hierro I 990 ± 110

9.5m alt.

VRI-565. Hierro II 1390 ± 90

10m alt.

VRI-566. Hierro III 1220 ± 90

10.8m alt.

VRI-567. Hierro V 980 ± 70

Ca 11m alt, ca 100m N samples I and II.

Rawcun series, Afghanistan

Samples from vicinity of Rawcun (36° 59' 20" N, 73° 14' 20" E), 3230m alt, Wakhan Valley, Afghanistan. Coll 1975 and subm by Gernot Patzelt.

General Comment (HF): no humic acid separation.

VRI-524. Rawcun 1 3600 ± 80

Wood at base of lacustrine sediment deposited by Wakhan Valley R, temporarily dammed up by alluvial cone from steep side valley. *Comment* (GP): dates beginning of last lake damming.

VRI-525. Rawcun 5 1350 ± 60

Charcoal in burning horizon 5 to 10cm thick above 90cm sediment from dammed up lake and overlain by 50 to 70cm fine sand from artificial irrigation followed by recent soil. *Comment* (GP): gives min age for end of last lake damming and max age for beginning of artificial irrigation (agriculture?).

VRI-545. Kathmandu, Nepal 26,700 ± 800

Lignited wood from light gray loam horizon in steep profile wall on R Nakhu Khola S Kathmandu (26° 52' N, 85° 19' E), Nepal. Coll 1975 and subm by Herbert Franz. *Comment* (HF): dates sediments of former lake in Kathmandu basin.

VRI-506. Wadi Dawasir, Saudi Arabia 3 ± 0.3% modern

Calcareous crust on noncalcareous gravel 60cm below surface of fluvial terrace erosion of Wadi Dawasir (20° 40' N, 44° 30' E), Saudi Arabia. Coll 1975 and subm by Josef Zötl, Hydrogeol, TU Graz. *Comment* (JZ): dates fluvial terrace: 26,900 ± 900 BP is calculated with recent value 85% modern (Münnich & Vogel, 1959; Geyh & Schillat, 1966), max age 28,200 ± 900 BP with 100% modern.

VRI-572. Jeddah, Saudi Arabia 17,100 ± 300

Fossil reef corals 5km E of present Red Sea shoreline N Jeddah (21° 48' N, 39° 06' E), Saudi Arabia, following foot of N flank of SW-NE striking Quaternary basalt flow, small ridge rising ca 10m above coastal plain recently. Typical example of relief inversion by marine abrasion. Coll 1976 and subm by Josef Zötl. *Comment* (JZ): dates high sea level phase corresponding with coral growth.

VRI-573. Harrat al Kishb, Saudi Arabia 7.3 ± 0.3% modern

Carbonate weathering of young basalt tongue was dissolved, transported and precipitated in a recently dry basin at SE margin of Harrat al Kishb (22° 40' N, 41° 34' E), Saudi Arabia. Coll 1976 and subm by Josef Zötl. *Comment* (JZ): dates humid climate phase necessary for carbonate dissolution. Age 19,700 ± 400 follows with recent activity 85% modern (Geyh & Schillat, 1966; Münnich & Vogel, 1959).

II. ARCHAEOLOGIC SAMPLES

A. Austria

VRI-580. Böheimkirchen, NÖ 3150 ± 80

Bones in Pit 107, Böheimkirchen excavation (48° 12' N, 15° 45' E) near St Pölten, Lower Austria. Coll 1974 and subm by J W Neugebauer, Inst Ur-Frühgesch, Univ Vienna. *Comment* (JWN): absolute dating of archaeol classified material. Verifies VRI-496 (R, v 21, no. 1, p 118). Correction for de Vries effect (Suess, 1970) gives 1500 BC. Collagen extracted by method of R Longin (1971).

Hallstatt series, OÖ

Wood samples coll above, in, and below prehistoric path layer (Trampelschicht) at Place 05 of Kaiser-Josef-adit, Hallstatt salt mine (47° 34' N, 48° 57' 26" E), Upper Austria. Coll 1975 and subm by F E Barth, Naturhist Mus, Vienna.

General Comment (FEB): clue to development of Trampelschicht.

VRI-558. Sample 1 2990 ± 100

Twigs above Trampelschicht. *Comment* (FEB): age unexpectedly high.

VRI-559. Sample 2 2690 ± 100

Wood from Trampelschicht.

VRI-560. Sample 3 2570 ± 90

Wood below Trampelschicht.

VRI-568. Antlangkirchen, OÖ 330 ± 80

Wooden pump-tube, oak, discovered in bog near Antlangkirchen (48° 22' N, 13° 42' E), Schärding dist, Upper Austria. Coll 1956 and subm by Josef Reitingner, OÖ Landesmus, Linz. *Comment* (JR): fixes find chronologically. De Vries correction (Suess, 1970) gives AD 1480 to 1600.

B. Europe, Asia, Africa

Ptukh series, Afghanistan

Samples from village Ptukh (37° 01' 20" N, 73° 23' 30" E), 3500 alt, and surroundings, Wakhan Valley, Afghanistan. Coll 1975 and subm by Gernot Patzelt.

General Comment (GP): 1st chronologic exploration in this area. No humic acid separation.

VRI-523. Ptukh 1 1880 ± 70

Clayey peat, base sample from -100 to -95cm of peat profile 102cm deep (37° 00' 30" N, 73° 22' 10" E), 3300m alt, near Ptukh. *Comment* (GP): dates beginning of peat growth and with pollen analyses, gives insight into history of climate, vegetation, settlement, and agriculture.

VRI-518. Ptukh 2 **530 ± 70**

Charcoal, wood, and grass remains, filling material between stones of decayed irrigation channel "Old Waal" near Ptukh below silty sediments of irrigation water. *Comment (GP)*: dates erection of irrigation system and supposed beginning of settlement in this area.

VRI-519. Ptukh 3 **<300**

Stalks and roots of aquatic plants in silty sediment of destroyed artificial irrigation system "Old Waal" near Ptukh. *Comment (GP)*: dates end of artificial irrigation system and settlement.

VRI-521. Ptukh 4 **<260**

Plant remains in loam mortar of stone base of House Ruin 4 M in Ptukh. *Comment (GP)*: dates house bldg.

VRI-520. Ptukh 5 **<260**

Like VRI-521, Ruin 1 M.

VRI-595. Luqsor, Egypt **Modern**

Remains of hair and skin of horse –1m below dry sand and stone in necropolis of Theben, Luqsor, Qurna (25° 40' N, 33° 00' E), Asasif, Egypt. Coll 1970, subm by Manfred Bietak, Österr Archäol Inst, Cairo branch. *Comment (MB)*: dating for osteologic comparison. Preservation and location close to recent way may point to recent age. No pretreatment.

Correction

VRI-418-421, R, 1976, v 18, p 240, 241: Signs of statistical uncertainties should be exchanged.

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