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VIENNA RADIUM INSTITUTE RADIOCARBON DATES III

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Measurements have continued with the same proportional counter system, sample pretreatment procedure, methane preparation and measurement, and calculation using a half-life of 5568 ± 30 yr 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 C^{13}/C^{12} ratios were measured.

The following list presents most samples of our work in the last year. Sample descriptions have been prepared in cooperation with submitters.

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SAMPLE DESCRIPTIONS

I. GEOLOGY, GEOGRAPHY, SOIL SCIENCE, AND FORESTRY

A. Austria

VRI-198. Wallern, Bgld. **>37,000**

Stem wood from *Pinus* embedded in gravel, 7 m below ground, excavated at well-sinking in Wallern (47° 44′ N Lat, 16° 56′ E Long), Burgenland. Coll. 1970 by Sattler; subm. by W. Klaus, Paläontol. Inst., Univ. of Vienna.

Maria Luggau series, Kärnten

Amorphous charcoal mixed with mineral particles, rootlets and humus. Soil samples from different positions of Sahmalm ob Maria Luggau (46° 42′ N Lat, 12° 44′ 05″ E Long), Lesachtal, NW of Karnische Alpen, Carinthia. Coll. 1969 and subm. by I. Neuwinger, Forstliche Bundesversuchsanstalt, Imst.

General Comment (I.N.): samples coll. to determine deforestation time in extensively used pasture-heath.

VRI-187. Sahmalm, 1850 m **<220**

Charcoal horizon ca. 18 cm below surface under wet pasture soil over eluvial horizon A_e from an old podsol; 1850 m alt.

VRI-188. Sahmalm, 1860 m **<220**

Charcoal horizon ca. 15 cm below surface under heath pasture soil over eluvial horizon A_e from an old podsol; 1860 m alt.

VRI-189. Sahmalm, 1820 m **<220**

Charcoal horizon ca. 20 cm below surface under grass pasture soil over eluvial horizon A_e from an old podsol; 1820 m alt.

VRI-210. Gailtal, Kärnten **7790 ± 120**
5840 B.C.

Stem wood from depth 8 m in glacial or fluvial deposits of prehistoric landslip territory "Alte Schütt" (46° 34′ N Lat, 13° 45′ 30″ E Long), S of Mt. Dobratsch, lower Gail Valley, Carintha. Coll. 1958 and subm. by W. Neumann, Mus. der Stadt Villach. *Comment* (W.N.): dates stratigraphy of landslip territory (Till, 1907).

Matzendorf series, N.Ö.

Peat and gyttja from different depths of a profile, excavated near way-side between Matzendorf and Hölles (47° 53′ N Lat, 16° 12′ E Long), Lower Austria. Coll. 1970 and subm. by W. Klaus.

General Comments (H.F.): VRI-209 dated first gave a surprisingly young age. The result is explained by assumption that most of the heavily decomposed component removed by sodium hydroxide pretreatment is substance of the sample to be dated, whereas the less decomposed left over is essentially younger plant material grown into sample horizon. To preserve the older component no sodium hydroxide pretreatment was given the other samples. The C^{14} age inversion in series is evidence for influence of horizons by younger roots. VRI-209, 225 and 206 are surely older than overlying VRI-223. Younger material could not be separated (W.K.). No humic acid fractions were dated because of lack of sample material.

VRI-209. 112 to 115 cm **4700 ± 520**
2750 B.C.
Gyttja on gravel and clay, basis of peat layer.

VRI-225. 105 to 107 cm **6850 ± 110**
4900 B.C.
Peat and limestone.

VRI-206. 100 to 105 cm **8750 ± 150**
6800 B.C.
Peat.

VRI-223. 80 to 85 cm **9830 ± 120**
7880 B.C.
Peat.

VRI-224. 60 to 65 cm **7670 ± 120**
5720 B.C.
Peat.

VRI-211. 40 to 45 cm **3050 ± 90**
1100 B.C.

Baumkirchen series, Tirol

The finds (F. Fliri *et al.*, 1971; Felber, 1971) were excavated in clay pit (Fliri *et al.*, 1970) Baumkirchen (47° 18′ 25″ N Lat, 11° 34′ 19″ E Long), Tyrol. Subm. by F. Fliri, Geog. Inst., Univ. of Innsbruck.

31,000 ± 1300
29,050 B.C.

VRI-193/1. Find 4

Branch of *Pinus mugo* embedded in banded silt and clay in N part of pit, alt. 661 m, 3 m above surface of undisturbed banded silt and clay of doubtless primary sedimentation. Greatest quantity of fossil wood hitherto found in pit; discovered by slope sliding. Coll. 1970 by F. Fliri and F. Fliri, Jr.

29,700 ± 1100
27,750 B.C.

VRI-193/2. Find 4

Redating of VRI-193/1. *Comment* (F.F.): date consistent with VRI-161: 26,800 ± 1300 and VRI-173: 28,900 ± 700 (R., 1971, v. 13, p. 130.)

10,900 ± 160
8950 B.C.

VRI-194. Find 5

Wood (*Pinus*) embedded in blue silt slump on surface in N part of pit. Coll. 1970 by F. Fliri and H. Hilscher. *Comment* (F.F.): date comparable with VRI-94: 11,370 ± 150 (R., 1970, v. 12, p. 309).

30,600 ± 1300
28,650 B.C.

VRI-199. Find 6

Wood, presumably bark, carbonized and disc-shaped by pressure. The discs, a few mm thick and a few cm long were embedded in banded silt and clay (doubtless primary sedimentation) overlain by 35 m undisturbed silt and clay. In sample horizon, alt. 655 m, bands are heavily folded by sub-aquatic gliding in former lake. Coll. 1970 by F. Fliri. *Comment* (F.F.) : date consistent with VRI-161, 173, 193.

28,000 ± 1000
26,050 B.C.

VRI-226. Find 14

Twig, pressed to oval cross-section, excavated from banded silt and clay of primary sedimentation; alt. 661 m. Horizon of sample overlain by 28 m undisturbed banded silt and clay. VRI-193 found 120 m apart in same horizon. Coll. 1970 by F. Fliri and G. Patzelt. *Comment* (F.F.): date agrees with VRI-193.

>36,500

VRI-192. Goetzens, Tirol

Lignite-like remnants of dwarf willows in 2 to 3 m thick layer of alluvial and lacustrine sands and silt within Inntalterrasse gravel. Roadcut between Innsbruck and Goetzens (47° 14′ 45″ N Lat, 11° 19′ 14″ E Long), Tyrol; alt. 760 m. Coll. 1967 and 1969 by F. Mayr, Geol. Dept., Univ. of Montreal, Canada. *Comment* (F.M.): ponding of the Inn Valley W of Innsbruck is contemporaneous with one of the major glacial advances during the Hall phase of Würm glaciation (Mayr, 1968).

2330 ± 80
380 B.C.

VRI-205. Mieders, Tirol

Charcoal (conifer, probably *Juniperus* sp.; determined by H. Hilscher) from burning horizon in wind-blown silt overlain by gravel of

an alluvial cone (gradient 12°). Silt partly mixed with remnants of a paleosol. Site is on ice-contact stratified drift, within belt of the "Stainach"-endmoraines of the former Stubai Glacier. Stripping of the paleosol has been thought of as "Gschnitz" in age (Mayr and Heuberger, 1968, p. 159 and fig. 4, pt. 7). Sample found ca. 100 m WNW of establishment in gravel pit Mieders-Muehlthal (47° 09′ 28″ N Lat, 11° 22′ 24″ E Long), Tyrol; alt. 1020 m. Coll. 1970 and subm. by F. Mayr. *Comment* (F.M.): most of the charcoal is *in situ* and dates end of a period of soil wasting at lower end of an alpine valley.

Gurgler Rotmoos series, Tirol

Cyperaceae peat samples from bog Rotmoos, from different depths Rotmoostal (46° 50′ 30″ N Lat, 11° 01′ 30″ E Long), 2260 m alt., Ötztaler Alpen, Obergurgl, Tyrol. Coll. 1970 and subm. by S. Bortenschlager, Inst. f. Botan. Systematik and Geobotanik, Univ. of Innsbruck.

General Comment (S.B.): dates are for chronologic fixation of palynologically determined variations in climate and glacier-size (Bortenschlager, 1970). Continuation of Rotmoos series VRI-156 to 158 (Felber, 1971).

VRI-212. 50 to 53 cm — **1840 ± 80** / **A.D. 110**

VRI-213. 75 to 78 cm — **3140 ± 90** / **1190 B.C.**

VRI-214. 112 to 115 cm — **3880 ± 120** / **1930 B.C.**

VRI-215. 135 to 138 cm — **4110 ± 90** / **2160 B.C.**

VRI-230. Schönwies 1, Obergurgl, Tirol — **8960 ± 140** / **7010 B.C.**

Cyperaceous peat from base of bog profile, deposited on grus, near Schönwies-Hütte (46° 50′ 40″ N Lat, 11° 00′ 50″ E Long), Obergurgl, Tyrol. Coll. 1970 and subm. by S. Bortenschlager. *Comment* (S.B.): dates beginning of peat growth, following retreat of ice in Gurgl area, and larger glacier fluctuations at beginning of postglacial.

VRI-204. Matrei, Osttirol — **850 ± 70** / **A.D. 1100**

Trunk of larch, determined by H. Hilscher, Innsbruck, driftwood, sticking in bluffs of ancient Mellitzbach cone at alt. 935 m, 150 m N of bridge to Feld, 4.5 km S of Matrei (46° 57′ 45″ N Lat, 12° 33′ 12″ E Long), E Tyrol. Outcrop was 16 m above R. Isel, and 8 m below surface of ancient cone. Ca. 5/6 of trunk decayed, forming a cavity around it, the remainder being a hard and strong pole, 4.5 m long and up to 15 cm thick. Coll. 1970 and subm. by F. Mayr. *Comment* (F.M.): presumed to

date time when Mellitzbach broke through the "Gschnitz"-moraine of former Isel Glacier, which sealed the Mellitzgraben. Date is young for an "earliest post-Gschnitz alluvial cone" occupying glacial basin near the former terminus.

VRI-243. Rostocker Hütte-42, Venedigergruppe, Osttirol **590 ± 80 A.D. 1360**

Peat from 130 to 160 cm thick, undisturbed peat layer, covered by 42 cm loamy-sandy sediment. Sample taken immediately below sediment. Simonykees (Bortenschlager and Patzelt, 1970) (47° 03′ 19″ N Lat, 12° 18′ 07″ E Long), Venediger Group, East-Tyrol; alt. 2200 m. Coll. 1970 and subm. by G. Patzelt, Geog. Inst., Univ. of Innsbruck. *Comment* (G.P.): dates beginning of sedimentation and fixes a maximum for glacier advance. After correction for de Vries-effect, VRI-243 and VRI-178 (R., 1971, v. 13, p. 131) give limits of a glacier advance, previously unknown.

Schlatenkees II series, Venedigergruppe, Osttirol

Peat and wood from 110 cm thick bog outside lateral moraine of glacier Schlatenkees (Patzelt, 1967) (47° 06′ 54″ N Lat, 12° 26′ 48″ E Long) near lake Salzbodensee, Venediger Group, East-Tyrol; alt. 2135 m. Coll. 1970 and subm. by G. Patzelt.

VRI-248. Schlatenkees II-40 **670 ± 80 A.D. 1280**

Peat from depth 39 to 41 cm. *Comment* (G.P.): dates beginning of several disturbances in peat growth. Palynologic research will clarify if disturbances are due to climate deterioration and periods of glacial advance.

VRI-244. Schlatenkees II-105 **7180 ± 120 5230 B.C.**

Wood from base of bog from depth 105 cm. *Comment* (G.P.): age is minimum for underlying moraine.

B. Italy

VRI-229. Schabs, Italy **>36,900**

Slightly worn driftwood, branches of *Juniperus* sp., determined by H. Hilscher, in laminated silt of Schabs brickyard N of Brixen/Bressanone (46° 43′ N, 11° 40′ E), Italy. Silt overlain by sequence of flood deposits which, in turn, are cut by giant ice-wedge casts, depth 20 to 30 m. Site is covered by till of Mils age having W-E to NW-SE fabrics. The Würmeisstrom flowed S to SW. Coll. 1969 by P. Gasser; subm. by F. Mayr. *Comment* (F.M.): sediments indicate sample dates important substage within Mils (Mayr, 1968): lake began as soon as Eisack Glacier filled the Brixen Basin. This event was followed by sudden drainage of several ice-dammed lakes, by formation of giant ice-wedge-polygons, and, finally, by rise of alpine eisstromnetz to about Buehl extent.

II. ARCHAEOLOGIC SAMPLES

Austria

VRI-207. Frankenau, Bgld. **5660 ± 100 / 3710 B.C.**

Charcoal embedded in loess-loam in young Pleistocene gravel excavated from 70 to 85 cm depth of a Linearbandkeramik culture pit, Site 21; homogeneous contents, no disturbance. Frankenau, Dist. Oberpullendorf (47° 30′ N Lat, 16° 30′ E Long), Burgenland. Coll. 1970 and subm. by A. Ohrenberger, Burgenländisches Landesmus. *Comment* (A.O.): date not in contradiction with assumption of a temporal parallelism (Ohrenberger, 1969) of a Linearbandkeramik culture and Lengyel culture in Burgenland.

VRI-185. Heiligenkreuz b. Baden, N.Ö. **<220**

Charcoal from fire room of a furnace excavated in garden of abbey of Heiligenkreuz near Baden (48° 03′ N Lat, 16° 08′ E Long), Lower Austria. Coll. 1969 and subm. by R. Pittioni, Inst. f. Ur- und Frühgeschichte, Univ. of Vienna. *Comment* (R.P.): material covering furnace indicates late 15th or early 16th century.

VRI-191. Amstetten, N.Ö. **440 ± 80 / A.D. 1510**

Charcoal from thick burning layer mixed with loam, presumably from burnt log house, ca. 1 m below ground of Hauptplatz, Amstetten (48° 07′ N Lat, 14° 52′ E Long), Lower Austria. Coll. 1969 by L. Pelzl; subm. by R. Pittioni. *Comment* (R.P.): ceramic remnants of this layer suggest burning down of log houses of 14th to 15th centuries. Effect of heat on ceramic gives evidence of strong blaze. After correction for de-Vries-effect (Suess, 1965) date agrees with ceramic finding.

VRI-183. Enns, O.Ö. **<200**

Wood, part of water pipeline of brick well, from 5.5 m depth (Eckhart, 1969). Sample permanently under water. Enns, Ental 1 (48° 12′ 07″ N Lat, 14° 29′ E Long), O.Ö. Coll. 1968 and subm. by L. Eckhart, O.Ö. Landesmus, Linz. *Comment* (L.E.): well was supposedly part of drainage system of Roman amphitheatre from Enns-Lauriacum not discovered up to now. Date refutes supposition.

St. Lorenz series, O.Ö.

Wood, supposedly remnants from pile dwellings in S part of lake Mondsee, near so-called Auholz or Auholzspitz, St. Lorenz (47° 50′ N Lat, 13° 22′ E Long), Upper Austria. Chronologic order unknown for want of artifacts. Coll. 1970 and subm. by J. Offenberger, Bundesdenkmalamt, Vienna.

VRI-201. St. Lorenz 1 **Recent**

Piles from depth 3 m, 1 to 1.5 m projecting from lake bottom. Piles are comparatively thin (see VRI-202), the wood is hard.

VRI-202. St. Lorenz 2 **<210**

Pile from depth 2 m, taken at W end of potential pile dwelling. The 10 to 20 cm thick piles, projecting 10 to 30 cm from lake bottom, are bottle-shaped at upper end. Wooden tissue is soaked and spongy.

250 ± 70

VRI-203. St. Lorenz 3 **A.D. 1700**

Pile from depth 4.5 m from E-most point of survey: similar to VRI-202.

4250 ± 90

VRI-184. Bramberg am Wildkogel, Slzbg. **2300 B.C.**

Wood from one of several pieces of tree 10 m below ground. Bramberg am Wildkogel (41° 17′ N Lat, 12° 21′ E Long), Salzburg. Coll. 1965 by H. Hönigschmid; subm. by R. Pittioni. *Comment* (R.P.): site suggests trees could have been torn from the ground by a massive flood and deposited in the old bed of R. Salzach. Date is as expected.

VRI-174. St. Leonhard im Lavanttal, Kärnten **<270**

Wood from doorway arch of ruins of castle Peinhof near St. Leonhard im Lavanttal (46° 58′ N Lat, 14° 18′ E Long), Carinthia. Coll. 1969 by Ch. Sädtler; subm. by R. Pittioni. *Comment* (R.P.): after correction for deVries-effect (Suess, 1965) date is as expected: between 1420 and 1544, according to castle history.

3020 ± 100

VRI-196. Obergurgl-Poschach, Tirol **1070 B.C.**

Pieces of charcoal from burning horizon, 15 to 20 cm below A-horizon of eroded iron-humus-podsol at a windy location with *Alectoria ochrolenca* and *Loiseleuria procumbens*. Near Sta. of Forstliche Bundesversuchsanstalt, Obergurgl-Poschach (46° 53′ N Lat, 11° 03′ E Long), Alps of Ötztal, Tyrol, alt. 2180 m. Coll. 1969 by G. Heiss; subm. by I. Neuwinger, Forstliche Bundesversuchsanstalt, Imst. *Comment* (I.N.): date is part of study on forest history (Neuwinger, 1970).

VRI-197. Wien **<220**

Wood (*Pinus* sp.) from wooden pipe, part of old water supply line, excavated at Mariahilferstrasse, 2.5 m below present level; Vienna (48° 12′ N Lat, 16° 21′ E Long). Coll. 1970 and subm. by H. Bednar, Inst. f. Holzforschung, Hochschule für Bodenkultur, Vienna. *Comment* (H.B.): date is as expected.

CORRECTION

VRI-179, Rostocker Hütte series (R., v. 13, p. 132): Depth 170 cm should read 90 cm (G.P.).

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