

BERN RADIOCARBON DATES V

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This list includes about half of the samples measured during the last year. Many studies need further investigation and the results will be published later when additional information will make better interpretations possible.

The equipment and the technique is essentially the same as described earlier (Bern IV).

Reliable results on CO₂ samples extracted out of ice are obtained with the small counter mentioned in Bern IV.

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USA CRREL, the University of Bern and the Swiss Glacier Commission conducted a joint research project during March-April 1964 in the Tuto Tunnel, North Greenland, which runs 350 m horizontally into the polar ice sheet (Langway *et al.*, 1965). Four samples were taken at each of two locations, approximately 300 m (Location 1) and 200 m (Location 2) from the tunnel portal. For the extraction two completely independent methods were used: precipitation in sodium hydroxide, and collection in molecular sieve (Oeschger *et al.*, 1965).

The samples from Location 1 measured so far give ages of 2500 to 3000 B.P., whereas for Location 2 dates of 5000 B.P. to 6000 B.P. are obtained. The final results will be published after the measurement of all samples and the evaluation of the other studies connected with this project.

Murifeld-Bern series, Switzerland

Gyttja and peat from lake and bog deposit, Murifeld, near Bern (46° 56' 22" Lat, 7° 28' 35" E Long). Coll. 1962 and subm. by M. Welten, Univ. of Bern. *Comment* (M.W.): deep excavations in connection with construction of a highway permitted taking of samples on open walls of sediments, already well-known by pollen-analyses. The clearly developed late-glacial sediments proved to contain sufficient organic material for sample C¹⁴ dating. Location was first in Switzerland where Alleröd was dated (B-38, Bern I). It is now the first to record the Bölling-zone: the pollen diagram is clear and the dates fix the warm time as beginning at ca. 11,400 B.C., and ending at ca. 10,500 B.C. in full correspondence with north and central European datings. The oldest date (B-684) fixes a definite stage in establishment of late-glacial vegetation

at this location. Another sample of Bölling age in Switzerland Lobsigen-see (B-398, Bern IV), though not proved to belong to the zone, is fully confirmed by this series. B-501 was measured twice; being more than one thousand years too old, it can only be supposed that stratification was disturbed, possibly when dead-ice melted off.

B-439. Murifeld, 281 cm depth	10,580 ± 120 8630 B.C.
B-440. Murifeld, 291 cm depth	10,580 ± 200 8630 B.C.
B-441. Murifeld, 429 cm depth	13,210 ± 400 11,260 B.C.
Samples from a pollen profile excavated a few years ago.	
B-501. Murifeld, 69 cm above horizon of reference	11,580 ± 200 9630 B.C.
B-500. Murifeld, 35 cm above horizon of reference	11,360 ± 200 9410 B.C.
B-499. Murifeld, 19.5 cm above horizon of reference	11,900 ± 200 9950 B.C.
B-497. Murifeld, 5.5 cm above horizon of reference	12,730 ± 200 10,780 B.C.
B-683. Murifeld, 15 cm below horizon of reference	13,340 ± 200 11,390 B.C.
B-684. Murifeld, 42 cm below horizon of reference	13,860 ± 200 11,910 B.C.

Mont Carré series, Switzerland

Peat and gyttja from Mont Carré, small bog in Val d'Héremence, Valais (46° 9' 11" N Lat, 7° 22' 12" E Long, alt 2290 m). Coll. Aug. 1964 and subm. by M. Welten. *Comment* (M.W.): the 3 samples give an approx. idea of the chief period of development of Hypnaceae-bog situated high above actual timberline. In this case organic matter originates from Atlantic and subboreal time. Within this period accumulation of moss-turf was ca. 0.33 mm/yr. Vegetational history is recorded palynologically.

B-627. Mont Carré, 63 cm depth	4800 ± 120 2850 B.C.
B-628. Mont Carré, 88 cm depth	5260 ± 120 3310 B.C.
B-629. Mont Carré, 140 cm depth	6740 ± 150 4790 B.C.

Gondo-Alpje series, Switzerland

Peat and gyttja from Gondo-Alpje, Valais (46° 12' 30" N Lat, 8° 6' 50" E Long, alt 1635 m). Coll. Sept. 1965 and subm. by M. Welten. *Comment* (M.W.): the 5 samples date vegetational history and different sand-layers, thought to be climatological indices on southern slope of Alps.

		1400 ± 100
B-699.	Gondo-Alpje, 77 cm depth	A.D. 550
		3060 ± 120
B-630.	Gondo-Alpje, 192 cm depth	1110 B.C.
		3740 ± 120
B-631.	Gondo-Alpje, 287 cm depth	1790 B.C.
		4670 ± 130
B-632.	Gondo-Alpje, 387 cm depth	2720 B.C.
		5310 ± 200
B-633.	Gondo-Alpje, 430 cm depth	3360 B.C.

Simplon-Hopschensee series, Switzerland

Samples of gyttja and clay-gyttja were taken by boring with Hiller-sampler at Simplon-Hopschensee, Valais (46° 15' 12" N Lat, 8° 1' 25" E Long, alt 2018 m). Coll. Oct. 1963 by M. Welten and K. Heeb; subm. by M. Welten. *Comment* (M.W.): investigations over two years with repeated sampling and remeasuring have convincingly confirmed existence of a layer of Alleröd-mud at the extremely high altitude of 2017 m above sealevel. Up to now the highest altitudes where Alleröd was clearly proved by pollen-analysis were not much above 1500 m, most higher localities having too little organic matter for C¹⁴-dating and yielding only clay and boulder material during late-glacial period. Result seems to fall in Bölling-period, but the pollen diagram is against this interpretation. Considering the standard deviation of B-608, an Alleröd date is not ruled out. Other results date stages of vegetational history to be discussed elsewhere. B-636 proved an early invasion-peak of spruce in the pollen diagram to be a mistake, resulting from pollen contamination during boring.

		660 ± 80
B-634.	Simplon-Hopschensee, 97 cm depth	A.D. 1290
		3230 ± 100
B-669.	Simplon-Hopschensee, 201 cm depth	1280 B.C.
		4500 ± 300
B-635.	Simplon-Hopschensee, 246 cm depth	2550 B.C.
		5040 ± 150
B-635E.	Simplon-Hopschensee, 277 cm depth	3090 B.C.

B-636. Simplon-Hopschensee, 328 cm depth	3970 ± 120 2020 B.C.
B-610. Simplon-Hopschensee	7730 ± 180 5780 B.C.
Gyttja, 22.5 cm above boulders and clay of Younger-Dryas-period.	
B-609. Simplon-Hopschensee	9000 ± 150 7050 B.C.
Gyttja, 7.5 cm above the boulder-and-clay layer.	
B-530. Simplon-Hopschensee	9530 ± 250 7580 B.C.
Gyttja, 5 m above the boulder-and-clay layer.	
B-608. Simplon-Hopschensee	12,580 ± 200 10,630 B.C.
15 cm of clay-gyttja under the 70-cm thick layer of boulders and clay supposed to originate from Younger-Dryas-period.	

Hellelen-Zeneggen series, Switzerland

Peat and gyttja from peat-basin at Hellelen-Zeneggen, Valais (46° 17' 3" N Lat, 7° 50' 40" E Long, alt 1510 m). Coll. April 1965 and subm. by M. Welten. *Comment* (M.W.): series dates a remarkable sequence of organic sediments covering the whole postglacial period. Rate of sedimentation for gyttja between 6000 and 2000 B.C. reached 0.33 mm/yr, whereas between 1000 B.C. and A.D. 1400 1.6 mm of sedge-peat was formed each year. Consequently period of culture from Bronze Age to late Middle Ages is very well developed in pollen diagram. Details will be published later.

B-637. Hellelen-Zeneggen, 113 cm depth	1200 ± 100 A.D. 750
B-724. Hellelen-Zeneggen, 210 cm depth	1775 ± 100 A.D. 175
B-638. Hellelen-Zeneggen, 270 cm depth	2320 ± 100 370 B.C.
B-639. Hellelen-Zeneggen, 438 cm depth	3120 ± 120 1170 B.C.
B-640. Hellelen-Zeneggen, 480 cm depth	3920 ± 100 1970 B.C.
B-723. Hellelen-Zeneggen, 562 cm	5970 ± 120 4020 B.C.
B-641. Hellelen-Zeneggen, 622 cm depth	8160 ± 130 6210 B.C.

Krauchtal series, Glarus, Switzerland

Wood fragments found in deposits from a landslide during technical borings near Krauchtal (46° 58' 32" N Lat, 9° 13' 34" E Long, alt 1400 m). Coll. and subm. Nov. 1964 by Chr. Schaerer and Crettaz, ETH, Zürich.

B-660. Krauchtal **3560 ± 120**
1610 B.C.
From uppermost part of landslide deposit.

B-661. Krauchtal **6395 ± 150**
4445 B.C.
From an under part of landslide deposit.

Robiei series, Val Bavona, Switzerland

Fragments of trees found during excavation work in a peat deposit above present timberline at Robiei, Val Bavona, Ticino (46° 26' 40" N Lat, 8° 30' 56" E Long, alt 1880 m). Coll. 1964 and subm. by Maggia Kraftwerke, Locarno.

B-675a. Trunk (Larix decidua) **6200 ± 100**
4250 B.C.

B-675b. Bough (Pinus cembra) **4520 ± 100**
2570 B.C.

Basel series, Pfalz, Switzerland

Bones from tombs found on the Pfalz behind the minster of Basle (47° 34' N Lat, 7° 35' E Long). Coll. August 1965 and subm. by R. Moosbrugger, Basle. *Comment* (R.W.): C¹⁴ ages show that tombs are contemporary or a little older than adjacent Carolingian crypt from beginning of 9th century A.D.

B-681. Tomb 2 **1180 ± 120**
A.D. 770

B-682. Tomb 2, "Vorbestattung" **1310 ± 100**
A.D. 640

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