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KÖLN RADIOCARBON DATES III

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The present list contains ^{14}C dates from archaeologic samples attributed to the European Mesolithic period from the typology of associated finds, especially microliths. Of these samples, 14 are from Germany and 6 from France.

Because of the older ages, natural preservation of ^{14}C samples *in situ* is generally poorer for the Mesolithic period than for younger periods. There are also higher risks of contamination and stratigraphic disturbance, eg, by bioturbation (Rolfsen, 1979, fig 2). Poorly conserved samples, especially those stored in museums, often have been treated with carbon-containing preservatives, sometimes without proper notes on quality or quantity of preservative agents used. Therefore, the number of successful ^{14}C dates from older periods is quite low. This problem was realized some time ago, and, on the initiative of JC Vogel, Pretoria, and H de Lumley, Marseille, a group devoted to dating Mesolithic and Paleolithic ^{14}C samples was launched in 1977 at the 10th Congress of INQUA at Birmingham.

For the Mesolithic period, there may be difficulties assigning archaeologic dates to samples. Microliths can occur both in Mesolithic and Neolithic layers. With few finds it might be difficult to distinguish Mesolithic from Neolithic layers, though. Taute (1973/74b, fig 8, 8–14, p 92) demonstrated seven types of microliths occurring both in well-established Mesolithic and Early Neolithic sites in southern Germany and Austria. Extensive investigations were made by researchers on discordant ^{14}C dates (Vaughan, ms; Olson, ms; *cf* also Evin, 1983) which include Mesolithic dates. A compilation of possible sources of discordant ^{14}C dates was published by Münnich (1958, 1961). We have included some obviously discordant ^{14}C dates into the present list, even if the reasons for the errors have not, as yet, been established, following suggestions given, eg, by Milojčić (1958, p 413; 1961, p 451) and Nader (1981).

Sample processing and dating procedures remain unchanged since our previous date list (Freundlich, Schwabedissen & Wendt, 1980).

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Germany

Sarching series

Samples from several Mesolithic settlement "compounds" (Wohnanlage), near Sarching, Kr Regensburg, Bavaria (12° 15′ N, 49° 1′ E). Sites

overlay aeolian sands covering lower terrace of Danube R (Schönweiss & Werner, 1974a, b). Coll and subm by W Schönweiss, Coburg.

KN-2517. Sarching 5.27 **2210 ± 50**

Fragments of wood charcoal from fireplace at ca 70cm below surface N of circular darkened spot in "Anlage 5", Sq 27. Assoc finds (Schönweiss & Werner, 1974 a, b, fig 14–18) correspond to shapes characteristic of Early Mesolithic periods, Beuronien A and B (Taute, 1973/74a; 1975). *Comment:* date does not agree with expected age. Sample material was apparently introduced from upper layers.

KN-2518. Sarching 5.20 **4230 ± 45**

Wood charcoal fragments from fireplace ca 70cm below surface in Sq 20 of "Anlage 5." *Comment:* same as KN-2517.

KN-2519. Sarching 8 **8890 ± 70**

Bone fragments from fireplace ca 70cm below surface in sand dune, belonging to one of several sites yielding many finds, in "Anlage 8, Atzenhof" (Schönweiss & Werner, 1974a). Assoc stone artifacts can possibly be attributed to Late Paleolithic (Schönweiss & Werner, 1974a, fig 3, 1–3) or Mesolithic periods, Beuronien A or B (Schönweiss & Werner, 1974a, fig 11 and 12), or Beuronien C (Schönweiss & Werner, 1974a, fig 4, 1–15). *Comment:* compared to dates from uppermost three levels, Beuronien B (Schicht 10) of Jägerhaushöhle/Kr Tuttlingen, Baden-Württemberg (B-946, 8840 ± 70) (Taute, 1980, p 18–19) and hitherto oldest Beuronien C date of Felsdach rock shelter, Inzigkofen/Kr Sigmaringen, Baden-Württemberg (B-935, 8720 ± 120), *cf* Taute (1980, p 18–19), this sample may well originate from Early Mesolithic period, Beuronien B.

Teverener Heide series

Wood charcoal from Mesolithic context on Teverener Heide/Scherpenseeler Denne near Teveren/Kr Heinsberg, Nordrhein-Westfalen (6° 6′ N, 50° 56′ E), excavated 1975/76 and subm by S K Arora, Rheinisches Landesmus, Bonn, Außenstelle Braunkohle, Lich-Steinstrass, Niederzier (Arora, 1978).

KN-2261. Teverener Heide 120-6-1 **8920 ± 80**

Wood charcoal from pit, 50cm below surface, surrounded by light, fine sand, assoc with artifacts belonging to Teverener Gruppe (latest early Atlantic period of West German Mesolithic Stufe IV, after Arora, 1976).

KN-2662. Teverener Heide 120-10-1 **8910 ± 80**

Wood charcoal from same layer as KN-2261. *Comment:* dates appear too old compared to dates from same period in Holland (Arora, 1976, note 80):

a) de Leien, Friesland prov, GrN-1567, 7700 ± 70 and GrN-685, 7150 ± 140 (Vogel & Waterbolk, 1963, p 176);

b) Duurswoude I, Friesland prov, GrN-1567, 7700 ± 70 (Vogel & Waterbolk, 1963, p 169);
c) Hatert, Gelderland prov, GrN-1607, 7670 ± 110 (Vogel & Waterbolk, 1963, p 174);
d) Oirschot V, Nordbrabant prov, GrN-1659, 8030 ± 50 and 6230 ± 60 (Vogel & Waterbolk, 1963, p 174).

KN-2899. Teverener Heide 213 **7510 ± 170**

Evenly distributed wood charcoal particles from layer 10 to 20cm depth, ca 50cm below surface, in sand dune. Assoc finds belong to Hambacher Gruppe (Stufe II of West German Mesolithic chronology, *cf* Arora, 1976) ranging from late Pre-boreal through early Boreal periods.

KN-2900. Teverener Heide 214 **7520 ± 240**

Wood charcoal from same layer as KN-2899.

KN-2901. Teverener Heide 172 **7490 ± 80**

Wood charcoal from same layer as KN-2899.

General Comment: ^{14}C dates do not correspond to archaeol assessment; dates for Hambacher Gruppe, archaeol assigned to late Pre-boreal through early Boreal periods, tend to suggest transitional Boreal/Atlantic period, instead. Hambacher dates also contradict Teverener Heide samples, which should be younger according to palynol results, although their ^{14}C dates come out older (*cf* KN-2261, -2262). Possibly, superficial sample layer was contaminated by younger materials.

KN-2999. Gustorf 8 **5420 ± 180**

Bone (*Bos primigenius*) from humic loam sediment found in former erosional creek ca 20cm below surface. Same site, Gustorf, Grevenbroich township, Kr Neuss, Nordrhein-Westfalen (6° 6′ N, 50° 56′ E) yielded numerous flint artifacts belonging to Hambacher Gruppe (Stufe II of West German Mesolithic chronology, *cf* Arora, 1976). Sample coll 1974 by S K Arora, Rheinisches Landesmus, Bonn. *Comment:* ^{14}C date is considerably too young; expected age was similar to KN-2899 to -2901. We learned only after analysis was finished that this bone sample had been preserved by impregnation in synthetic glue dispersion (polyvinyl acetate). Tentative correction for glue contaminant (all-synthetic material from petrochemicals) would render even younger date.

KN-I.329. Sedelsberg **4580 ± 60**

Wood charcoal from Mesolithic dune site, Sedelsberg (Flur 9, Flurstück 388/46), Scharrel/Oldenburg, Kr Cloppenburg, Niedersachsen (7° 44′ N, 53° 3′ E). Sample comes from bleached soil horizon, 50 to 80cm thick, with scattered charcoal particles and covered by 20 to 30cm heather-bearing type humic soil. Basal layer consists of bleached dune sand, partly layered by iron-hardened sand (bog-iron ore). Assoc artifacts include microliths, either trapezoid or with one oblique and one transverse truncation ("Trapezspitzen"), as flaked from regular blades classified as Late

Mesolithic (6th and 5th millennia BC), *cf* Steffens (1963b, fig 1). Sample coll and subm by H G Steffens, Staatliches Mus Naturkunde u Vorgeschichte, Oldenburg i O. *Comment:* ^{14}C date is much too young. Sample was either contaminated by younger materials or introduced from upper layers.

KN-I.683. Minstedt **8540 ± 60**

Charred hazelnut shells (*Corylus*) from Hinck's Weide III excavation on dune site, Minstedt, on banks of Oste R near Bremervörde/Kr Rotenburg/Wümme, Niedersachsen (9° 7′ N, 53° 26′ E). Two samples coll 1958 from excavation areas A and B by F W Franke, Bremervörde, and subm for H Schwabedissen. Samples date accompanying simple-shaped microliths, such as pieces with one transverse and one oblique truncation (Viereckspitzen), as well as right- (or blunt-) angular triangles, and micro-burins (Kerbreste), and two core-axes from area A (Franke, 1978, fig 3–6). These finds represent Early Mesolithic estimated to be "spät-Duvenseezeitlich" (see Comment, H Schwabedissen in Franke, 1978, p 239). *Comment:* date seems appropriate. Due to evidently low carbon content, both samples were combined for processing.

KN-2034. Grosse Ofnet-Höhle **7720 ± 80**

Bone fragments (remains of human skull) from one of two skull burial sites in Grosse Ofnet-Höhle cave on rim of Nördlinger Ries plain near Nördlingen/Kr Nördlingen, Bavaria (10° 28′ N, 48° 10′ E). Excavated 1908, by R R Schmidt and subm 1974 by G Glowatzki, Univ Bern, Switzerland. *Comment:* ^{14}C date suggests skull was buried between Early and Late Mesolithic periods, confirming attribution to Mesolithic period, based on archaeol reasons. Amino-acid racemization analysis (Bada, 1972; Bada & Schröder, 1975; Protsch, 1976) yielded considerably older date: 13,100 (!) ± 100 BP (UCLA-1783; Glowatzki & Protsch, 1973). This date has been legitimately criticized by Naber (1974). Two geometric microliths (one nearly equilateral triangle, one bluntly-angled isosceles triangle) assoc respectively with Skull 24 of Burial I and Skull 1 of Burial II (Schmidt, 1912), uniquely belong to Mesolithic period and can be dated archaeol later than 10,000 BP. Obviously limited value of amino-acid racemization dates is also demonstrated by extremely old date for Schellnecker Wänd, Mesolithic grave, near Neuessing, upper Altmühl R valley (Naber, 1973; Gerhardt & Naber, 1983; Gieseler, 1977): UCLA-1869, 18,200 ± 200 BP (Glowatzki & Protsch, 1974).

Taubried series

Chalky mud and silty gyttja loam sediment with relatively high carbon content, from Taubried II site, Bad Buchau/Kr Biberach, Baden-Württemberg (9° 37′ N, 48° 5′ E). Coll 1980 by F Herzig, subm by H Schlichtherle, Landesdenkmalamt Baden-Württemberg. Both samples come from two profile columns at ca 20cm from each other. They could be attributed to Boreal age by palynol and were linked stratigraphically to layer of hazelnuts (*Corylus*) which contained microliths of Early Mesolithic stage, Beuronien A/B (H Schlichtherle, pers commun). Find layer was imbedded in gyttja

loam sediment overlain by peat datable to Neolithic period (Schlichtherle, 1981, p 34).

KN-3071. Taubried II, col c, TaRC 2 **9370 ± 80**

Gyttja sediment sample underlying hazelnut (*Corylus*) layer, ca 70 to 75cm below surface.

KN-3072. Taubried II, col b, TaRC 6 **9300 ± 80**

Gyttja sediment sample from hazelnut layer, ca 70cm below surface.

General Comment: comparable date from Jägerhaushöhle cave on upper Danube R (Taute, 1980, p 18–19), cultural layer 13 (Beuronien A layer), B-948: 9600 ± 100, and cultural layer 10 (uppermost of three layers of Beuronien B type), B-946: 8840 ± 70.

France

Gramari series

Wood charcoal from Gramari site, Méthamis, Vaucluse (44° 01′ N, 5° 14′ E). Coll and subm 1967 by M Paccard, Velleron/Vaucluse. Site is open-air sta with extended Sauveterrian strat (Paccard, 1971).

KN-I.386. Gramari 3A, Layer 1 **8730 ± 60**

Wood charcoal from Level 3A, Layer 1; same as layer dated at Gif lab (Delibrias, Guillier & Labeyrie, 1971, p 219), Gif-262: 3420 ± 200, Gif-752: 7740 ± 190. *Comment:* Gif dates seem too young (Paccard, 1971, p 83). In their chronologic table, Livache and Paccard (1980, p 143) obviously place our Köln date in wrong position.

KN-I.387. Gramari 3B, Layer 2 **8830 ± 70**

Wood charcoal from Level 3B, Layer 2; to be compared to Gif date from same level, Layer 1 and 2, Gif-753: 8000 ± 190 (Delibrias, Guillier & Labeyrie, 1971, p 219; Paccard, 1971, p 83).

KN-I.389. Gramari 5 **9110 ± 150**

Wood charcoal from Level 5; *cf* Gif date from same level, Gif-755: 10,070 ± 230 (Paccard, 1971, p 83; Delibrias, Guillier & Labeyrie, 1971, p 219).

KN-I.390. Gramari 7 **9310 ± 60**

Wood charcoal from Level 7.

General Comment: Köln dates correspond to expected age and fit chronologic sequence.

KN-I.058. La Baume de Montclus **7670 ± 60**

Wood charcoal from La Baume de Montclus rock shelter, Montclus, Gard (44° 16′ N, 4° 26′ E). Coll and subm 1960 by M Escalon de Fonton, CNRS, Marseille. Sample coll ca 3m below surface. Layer 22A/Zone 5/AB

(Escalon de Fonton, 1966a, p 158, fig 66). Contents of layer are characteristic of Sauveterrian, *Sauveterrian-final* or middle Montclusian, according to Rozoy (1978). Some earlier Köln dates were revised (Freundlich, Schwabedissen & Wendt, 1980, p 68; Rozoy, 1978, p 285). Escalon de Fonton (1966b, p 50) quoted unrevised date, KN-58: 8130 ± 240. *Comment:* date agrees with Lyon dates from same layer, Ly-307: 7770 ± 410, wood charcoal, and Ly-308: 7750 ± 340, 1.5g collagen from 190g bone material (Delibrias, Guillier & Labeyrie, 1971, p 62; Delibrias *et al,* 1976, p 514).

KN-I.157. Abri des Boeufs **7060 ± 160**

Wood charcoal, Layer 2, Abri des Boeufs, 60cm depth, Roquefavour-la Plantade, Ventabren, Bouche-du-Rhône (43° 31′ N, 5° 18′ E). Coll 1950 and subm by M Escalon de Fonton, CNRS, Marseille. Assoc finds consisted of Early Mesolithic period (Montadian), *cf* Escalon de Fonton (1956, p 34–40). *Comment:* date is too young, *cf* other dates of final Montadian, Fos-sur-Mer, Le Mourre Poussiou, Bouche-du-Rhône, Ly-706: 8980 ± 200 (Evin, Marien & Pachiaudi, 1975, p 22) and La Baume Longue, Ponteau, Martigues, MC-591: 9780 ± 200; *cf* Escalon de Fonton (1976, p 1371).

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