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Nota Breve

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AN OUTLINE OF THE MIDDLE AND MAIN WÜRM CHRONOLOGY OF THE EASTERN ALPS

Abstract: FLIRI F., *An outline of the Middle and Main Würm chronology of the Eastern Alps* (IT ISSN 0084-8948, 1988).

Numerous radiocarbon dates associated by paleobotanical and palynological research proves the climatic cooling in the second part of the Middle Würm. For the Main Würm Glaciation of the Eastern Alps remains only the short span between 24 000 and 16 000 y.b.p. (KEY WORDS: Middle Würm, Main Würm, Quaternary Chronology, Eastern Alps).

Riassunto: FLIRI F., *Lineamenti di cronologia del Würm Medio e del Würm Principale nelle Alpi Orientali* (IT ISSN 0084-8948, 1988).

Numerose datazioni con il radiocarbonio assieme a ricerche paleobotaniche e palinologiche, dimostrano il raffreddamento climatico nella seconda parte del Würm medio. Per la glaciazione del Würm principale nelle Alpi orientali rimane soltanto il breve spazio di tempo fra 24 000 e 16 000 anni dal presente (TERMINI CHIAVE: Würm medio, Würm principale, Cronologia Quaternaria, Alpi Orientali).

As result of the investigation of the lamineted clays and silts of Schabs, north of Brixen/Bressanone, 46°43'N, 11°40'E the author (FLIRI 1978) has presented a date of GrN-7754 = 64 400 ± 1 000 y.b.p., determined at the laboratory in Groningen by radio carbon enrichment. In accordance with palynological facts the horizon of the find could be classified as of the Brörup Interstadial in Early Würm and lended itself to comparison with similar results in the French Alps and Upper Bavaria.

In the Eastern Alps the existence of a later powerful «Mittelwürm Interstadial» was confirmed by the results of FRITZ (1975), with dates between 45 000 and 35 000 y.b.p. approximately in the basin of Klagenfurt (Drasing) and in the Gail valley (both Carinthia) and included the following climatic cooling (dates of Freibach, Karawanken Mountains, between 38 000 and 32 000 approximately, VAN HUSEN, 1975, 1981).

Earlier research in the banded silt and clay of Baumkirchen (Inn valley, 12 km east of Innsbruck, FLIRI & *alii* (1970, 1971, 1973) yielded 12 radiocarbon dates between 26 000 and 32 000 y.b.p. approximately, in good accordance with a first date of 29 350 y.b.p. won in the Val Caltea (Monte Cavallo Range, Venetian Prealps) by FUCHS (1969). The comparison of the Baumkirchen dates with other results in the late Würm suggested with greatest probability that the last great advance of the Main Würm Inn-Glacier including the melting phase must have occurred in a span of less than 10 000 years.

In 1983 the Sub-Commission on European Quaternary Stratigraphy (SEQS) agreed to subdivide the Würm stage into the substages of Lower, Middle and Upper Würm and according to lithological criteria has proposed to accept the change from the Baumkirchen lacustrine clay to the overlaying glacial advance gravel as divide between Middle and Upper Würm (CHALINE & JERZ, 1984).

The new view of alpine valleys free of ice in the Middle Würm was also approved by the results in the Enns valley (Styria) with dates of 30 700 and 20 100 years b.p. (DRAXLER & VAN HUSEN, 1977) in the Salzach valley (Halldorf) with a date of 35 500 years b.p. approximately (SLUPETZKY, 1975) and in the Lesach valley (SW Carinthia) with dates between 36 600 and 30 400 years b.p. (FRITZ, 1977).

A newest but not surprising result is the date of Hv-15443 = 24 000 y.b.p. (subfossile wood, *Pinus cembra*) of the pit of Albeins (Albès) near Brixen/Bressanone, 11°39.5'E, 46°40.6'N, won from glacial advancing gravels overlaid by the Main Würm moraine. The importance of the date is underlined by the great actual and paleoclimatic continentality of this locality, 90 km both from the northern and southern border of the Alps (FLIRI, 1989).

On the other hand the end of the Main Würm melting phase in the deeper alpine valleys is suggested by earliest radiocarbon dates in the Mitterndorf-Basin (NW Styria) with a date of 15 400 years b.p., DRAXLER & VAN HUSEN, 1977) and nearby Treviso with 14 800 y.b.p. approximately (CASADORO & *alii,* 1976). In Grisons (BURGA, 1987) and near Innsbruck (PATZELT, 1986) the first organic resedimentation is dated to 14 800 and 16 000 years b.p. respectively. Only a span between 24 000 and 16 000 years b.p. remains chronologically certain for the Main Würm Glaciation in the Adige/Etsch basin!

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