THE PRAGUE RADIOCARBON DATING

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All 3 samples were chemically treated in a standard way. Carbonates were removed by boiling in 2% HCl and washing until a neutral reaction. Humic acids were dissolved with a 2% NaOH solution at 80°C for 24 hours and precipitated from the solution with 2 % hydrochloric acid. The samples were finally washed in destilled water, dried and burnt in oxygen flow to carbon dioxide, purified and filled into a proportional detector in which their beta activity was measured and compared with the beta activity of a standard sample of oxalic acid NBS.

The quantity of the samples CD 16/17 and from the stratum below the cultural layer was smaller than the amount necessary for filling the proportional detector to the standard pressure 0.28 MPa. Hence the carbon dioxide was diluted by non-active carbon dioxide to reach the necessary working pressure. This dilution was high especially in the case of the sample from the stratum underlying the finding bed. The dilution was included in the calculation of radiocarbon age by means of a correction, so that the three radiocarbon data are directly comparable. Due to the dilution, however, the statistic deviation of the radiocarbon age of the sample from the stratum underlying the finding bed considerably increased so that the accuracy of the radiocarbon age of this sample is lower than that of the previous samples DE 12/13 and CD 16/17.

The results of measurements were calculated to radiocarbon ages according to standard procedure (Libby 1952), using the conventional half life of radiocarbon 5568 + 30 years (Proceedings 1972). At the same time, the radiocarbon age according to the half life of radiocarbon 5730 + 40 years (Godwin 1962) is given which may be considered more correct. The results are computerized, are expressed in years before present with their standard deviation, and are not rounded off in order to facilitate statistical processing and comparison.

The results of measurements as well as of radiocarbon dating are presented in the attached table with the accuracy of one standard deviation (1 σ). Considering this standard deviation, the real radiocarbon age is within the calculated range from - 1σ to + 1σ around the calculated radiocarbon age with a statistic probability 68 %.

The radiocarbon ages could not be dendrochronologically corrected because they are beyond the reach of the calibration curve.

The submitter remarks in the accompanying report that contamination with rootlets cannot be excluded in case of the samples DE 12/13 and CD 16/17. Hence it cannot be excluded that the results of dating are influenced by this contami-

Tab. 9

Labelling of the sample	Locality	Type of sample	Laboratory No. of sample	Code and No. of measurement	Radiocarbon activity of sample p.m.c. $\pm 1\sigma$	Radiocarbon age of sample ± 1 in years B.P. for $T_{1/2} = 5568+30$ years	for $T_{1/2} = 5730+40$ years	Notice
1	2	3	4	5	6	7	8	9
Hearth DE12/13	Dolní Věstonice	charcoal	146	CU 747	5.17+10,83%	23799+870	24513+876	Sufficient amount of sample, not diluted
Hearth CD 16/17	Dolní Věstonice	charcoal	147	CU 748	6.53+9,25%	21920+743	22570+766	Insufficient amount of sample, dilluted to 94.7% of volume of filling gas
Underlayer	Dolní Věstonice	charcoal	148	CU 749	5.04+26.14%	24005+2100	24725+2163	Very insufficient amount of sample dilluted to 40.9% of volume of filling gas

nation and that the radiocarbon age seems lower than it really is.

The equality of radiocarbon ages of all the samples was tested using the 2σ criterion. According to this criterion, the radiocarbon age of the samples A and B can be considered equal if the difference of their radiocarbon ages Δt_{AB} is smaller than double standard deviation resulting from standard deviations of radiocarbon ages of both samples, i.e. if

$$\Delta t_{AB} < 2\sqrt{\sigma_{tA}^2 + \sigma_{tB}^2}$$

According to this criterion, the radiocarbon ages of all the three samples could be considered the same, i.e. referred to the same time interval. The sample from the stratum underlying the finding bed, however, may be attributed by its origin with a 95 % probability to the time interval from about 20 400 to 29 000 years B.P., so that its higher age cannot be excluded, as indicated by its stratigraphic position.

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References

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