Baltic-Pontic Studies
vol. 3: 1995, 141-147
PL ISSN 1231-0344

Sławomir Kadrow

ABSOLUTE CHRONOLOGY OF THE SOFIEVKA TYPE IN THE LIGHT OF „WIGGLE MATCHING" ANALYSIS

All radiocarbon dating calibrations presented in this paper have been carried out with a computer program *Radiocarbon Calibration <calKN> April 1993, Dendro and Archaeological Wiggle Matching* by Bernhard Weninger of Cologne University (Germany). Calibrations carried out with programs based only on probabilistic interpretation of measurements (e.g. *Probabilistic Calibration of Radiocarbon Time Scale, Silesian Technical University, Gliwice, Poland, ver. 4.0, 1989*, or *Radiocarbon Calibration Program, 1993 ver. 3.03, Quaternary Isotope Lab, University of Washington*) do not yield the actual age of the sample. This is so because each dated sample can be usually matched to a number of more or less probable readings of its calendar age (cf. in this volume: Kovalyukh, Videiko, Skripkin, Chronology..., Table 1). Weninger's program (details in Weninger 1986), thanks to a built-in statistical test, gives for each sample a single, most probable calendar age with a respective standard error. An important novelty of this program is, however, the possibility of „fitting" a series of dates from a specific archaeological context into the appropriate wiggles of the calibration curve (cf. Manning 1995: 126-133). Thus, it is possible with this program to determine the calendar age of specimens with significantly greater precision (Tables 1-5).

The calibration of individual dates from Sofievka type cemeteries (Table 1, Fig.1) sets their duration at 2950-2740 BC. High values of standard errors of measurements, however, make us admit the possibility of extending this period by a hundred years „up" or „down". The archaeological assessment of the length of existence of the cultural phenomenon known as the Sofievka type makes us assume that it was a short-lived phenomenon (cf. Kadrow, Kośko, Videiko, Pottery..., in this volume). A radical version of this assumption, namely that the dated sets were exactly contemporary and short-lived, thanks to wiggle matching, permits us to set their age at ca 2890 BC with a proper allowance for standard error (Fig.2). A more realistic assumption about the transience (as far as archaeological research permits) of the Sofievka type, admitting the possibility that it existed for 100-130 years, allows to set the absolute chronology brackets of the type under discussion at 2920-2790 BC (Fig.3). At the same time the result of the „wiggle matching" analysis sugge-

Table 1

List of dated samples from cemeteries of the Sofievka type (acc to Kovalyukh, Videiko, Skripkin in this volume)

	Lab. Number	Date BP	Std. dev	cal BC
1	Ki–5038	4280	110	2859±170
2	Ki–5039	4160	90	2742±123
3	Ki–5012	4310	70	2953±96
4	Ki–5013	4270	90	2830±144
5	Ki–5014	4230	80	2790±110
6	Ki–5015	4290	90	2877±146
7	Ki–5016	4140	110	2720±144
8	Ki–5029	4300	45	2928±59

Table 2

List of dated samples from cemeteries of the Bodrogkeresztúr culture (acc to Forenbaher 1993)

	Site	Lab. Number	Date BP	Std. dev	cal BC
1	Tiszalúc	GrN–1612(?)	5100	40	3876±63
2	Tiszalúc	GrN–1613	5085	40	3870±60
3	Tiszalúc	GrN–1612(?)	5020	40	3834±74
4	Tiszalúc	GrN–1612(?)	4920	60	3703±55
5	Tiszapolgár-Basatanya	Deb–5	4960	130	3783±138
6	Tiszapolgár-Basatanya	Deb–4	4820	140	3545±166

Table 3

List of dated samples obtained from sites of the Coţofeni culture (acc to Forenbaher 1993)

	Site	Lab. Number	Date BP	Std. dev	cal BC
1	Ostrovul Corbului	LJ–3797	4520	60	3217±105
2	Ostrovul Corbului	LJ–3799	4360	60	2965±70
3	Ostrovul Corbului	LJ–3798	4360	50	2965±60
4	Baile Herculane	LJ–3533	4460	80	3172±142
5	Baile Herculane	LJ–3534	4360	100	3024±161
6	Baile Herculane	LJ–3535	4350	60	2965±68
7	Baile Herculane	LJ–3536	4300	60	2944±84

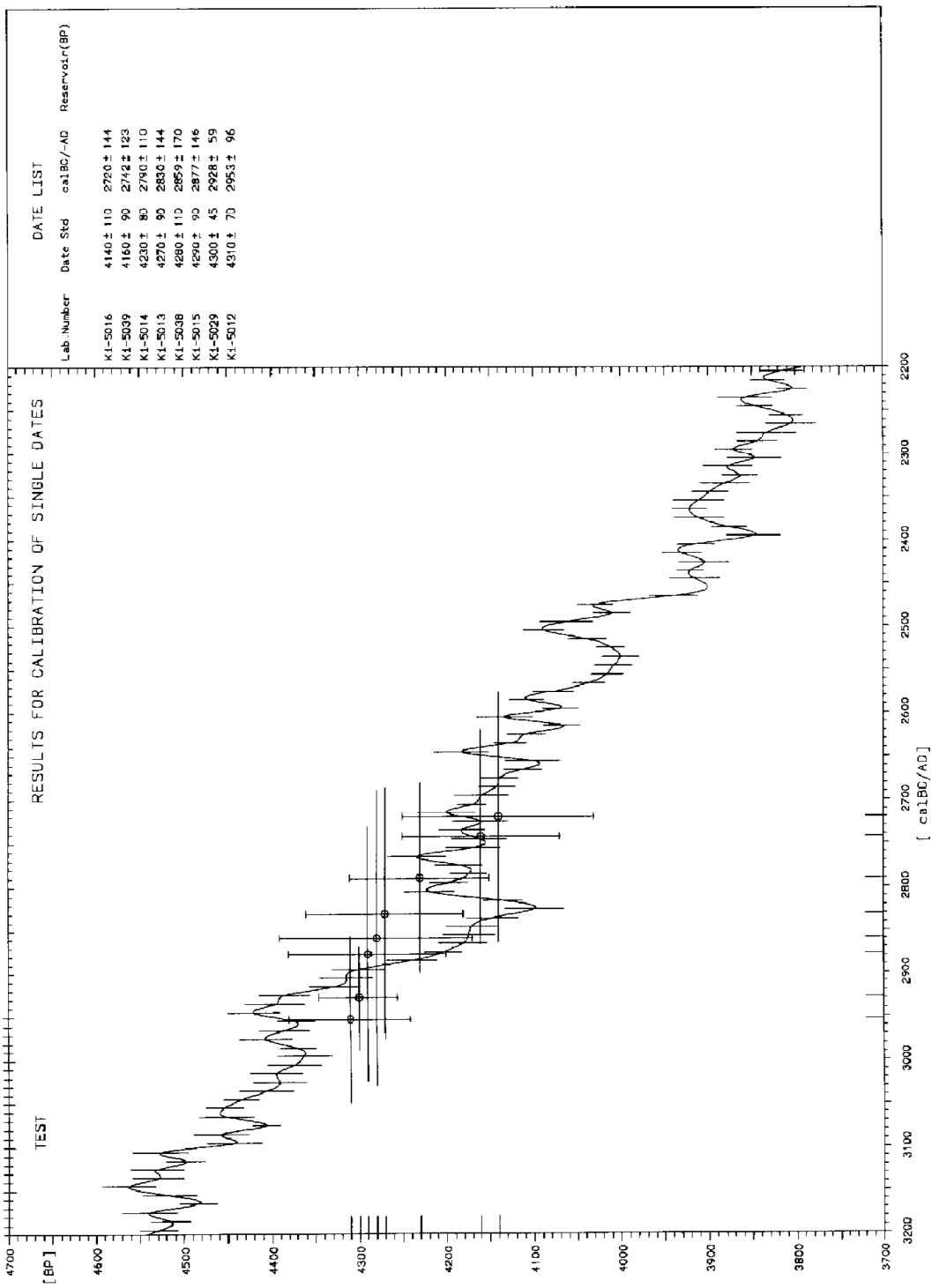

Fig. 1 Test – results for calibration of single dates

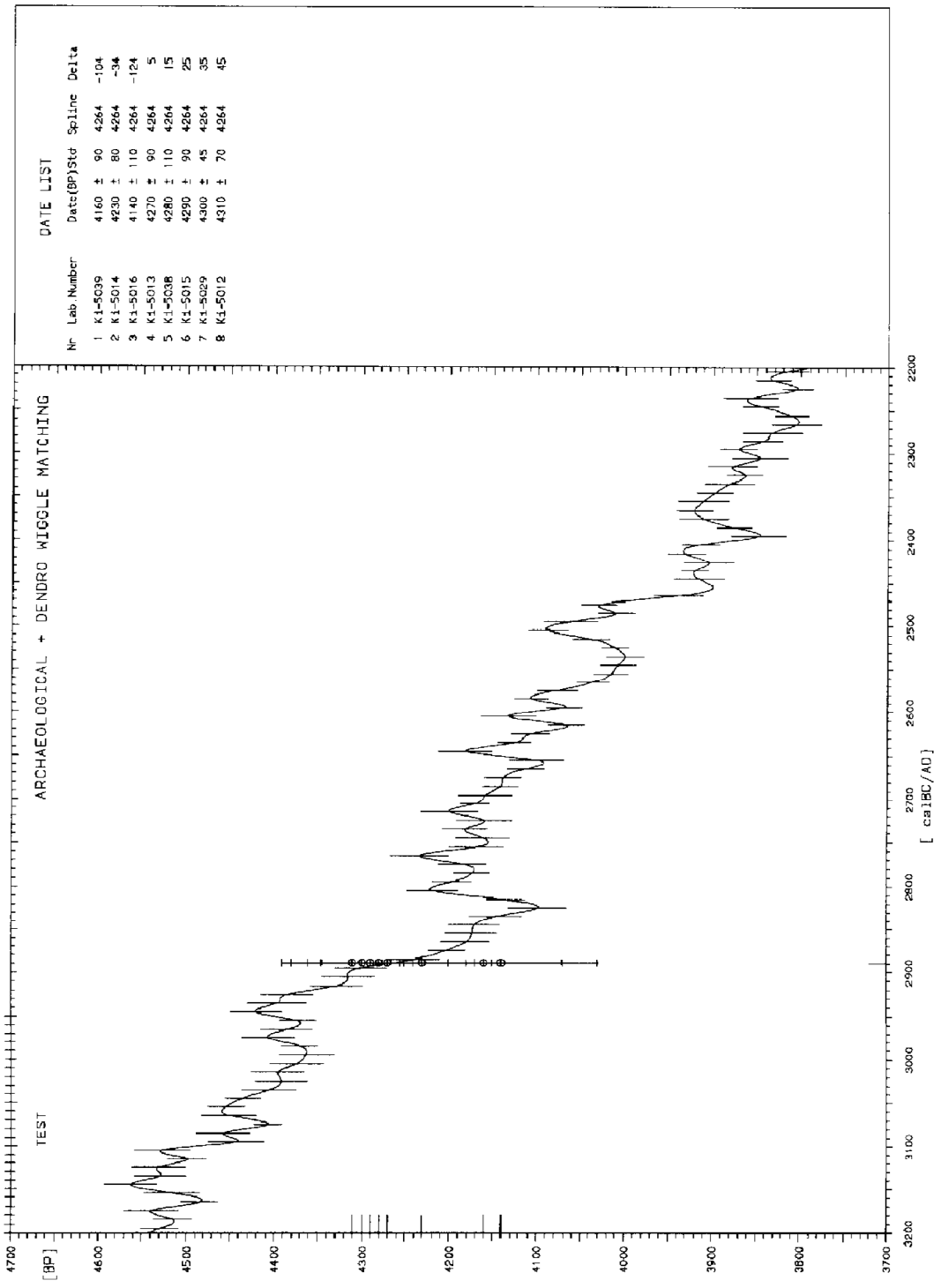

Fig. 2 Test – archaeological + dendro wiggle matching

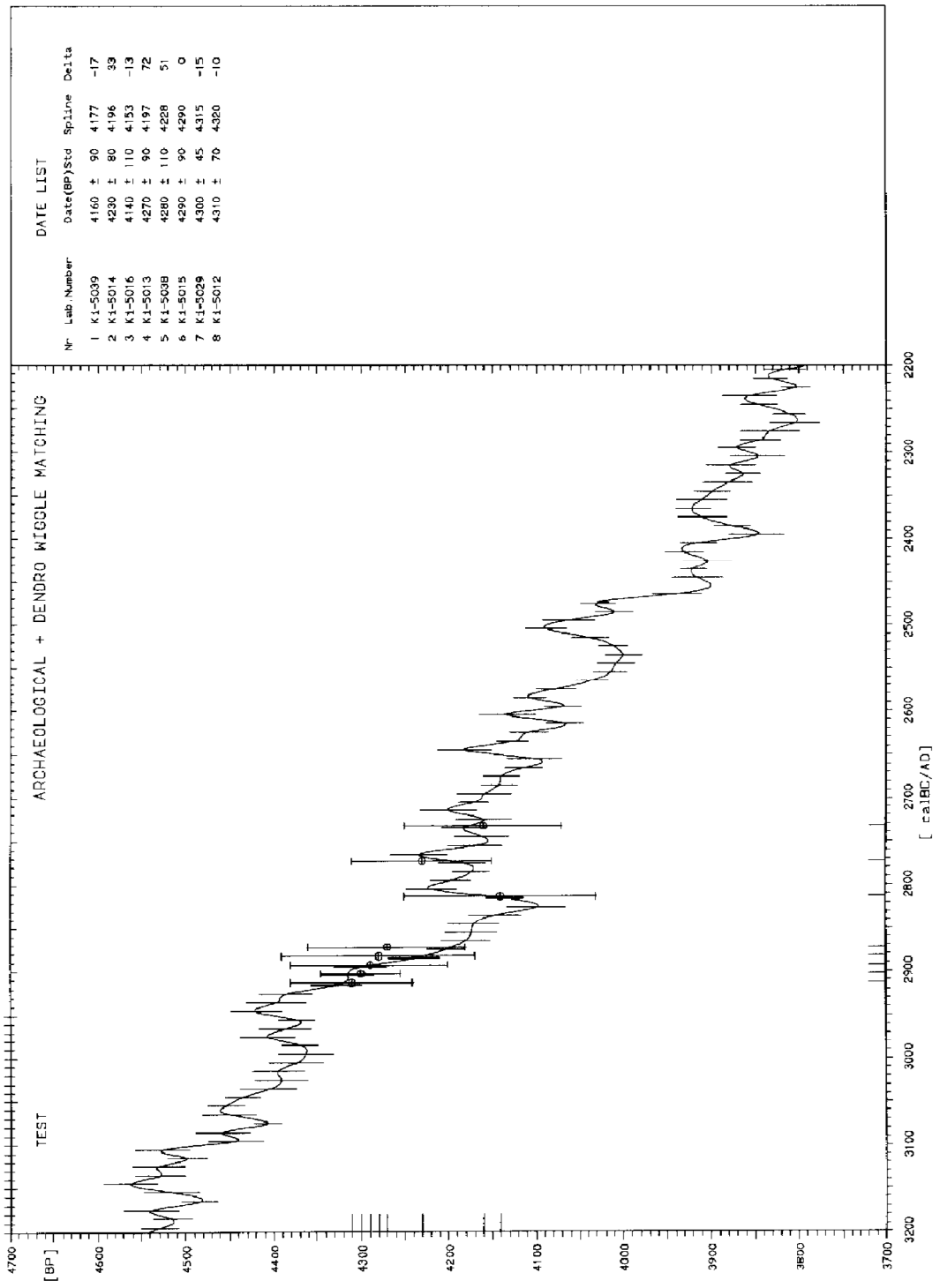

Fig. 3 Test – archaeological + dendro wiggle matching

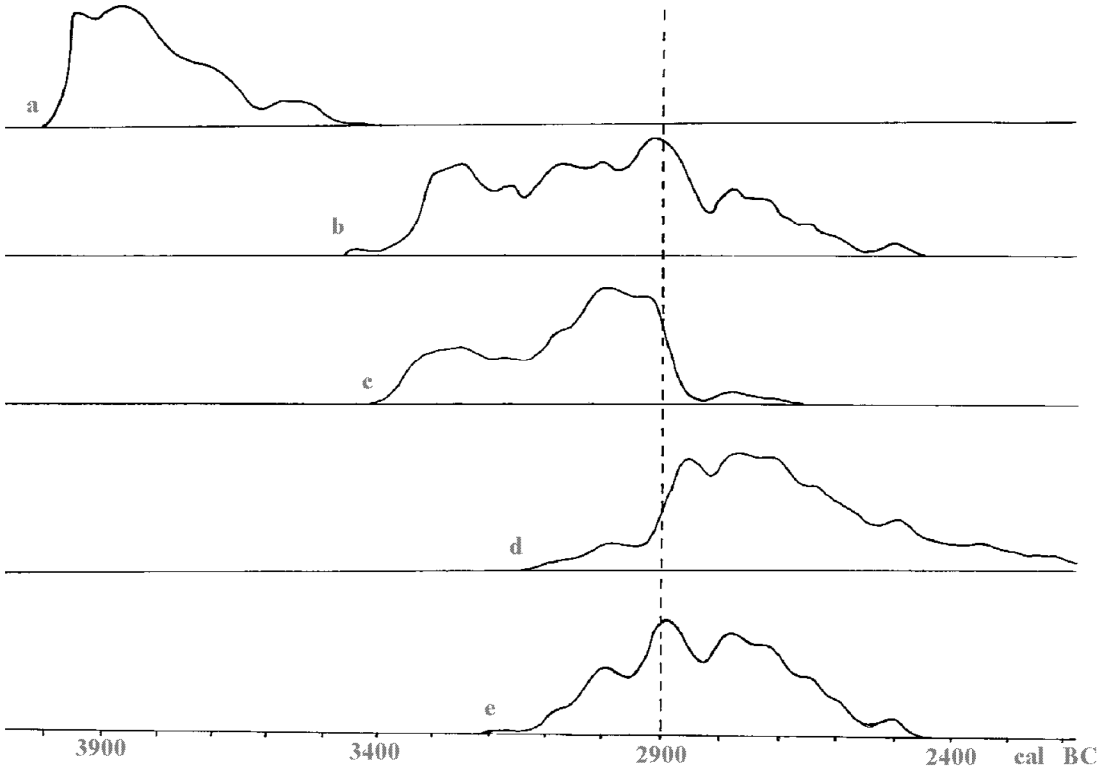

Fig. 4 Comparison of the chronological position of the Sofievka type with the datings of the selected cultures (a-e – see Tables 1-5)

sts a possibility of isolating older sets (dates: Ki-5013, Ki-5038, Ki-5015, Ki- 5029, Ki-5012) and younger (Ki-5039, Ki-5014, Ki-5016), which does not necessarily contradict the transience of the Sofievka type. The relevance of these results is lessened by significant standard errors of absolute age measurements of all specimens (from ±45 to ±110). Unfortunately, none of these datings can be called high precision, however.

A comparison of the chronological position of the Sofievka type with the datings of the culture groups (Tables 2-4; Fig.4) which in the light of the analysis (cf. Kadrow, Kośko, Videiko, Pottery..., in this volume) could have inspired its formation and development, and with the western section of the Yamnaya culture (Tab. 5) allows to draw certain conclusions. Data that we have at our disposal today clearly indicate that the Sofievka type could have been affected by the Coţofeni and Kostolac cultures in their rather late phases and by the Cernavoda II culture, which is not analyzed here due to the lack of radiocarbon datings. This must have happened contemporaneously with the beginnings of the expansion of the Yamnaya

Table 4

List of dated samples obtained from sites of the Kostolac culture (acc to Forenbaher 1993)

	Site	Lab. Number	Date BP	Std. dev	cal BC
1	Vučedol	z–1821	4500	100	3192±148
2	Vučedol	z–1820	4370	90	2999±132
3	Pivnica	KN–232	4500	55	3217±106
4	Pivnica	GrN–8010	4290	60	2929±107
5	Pivnica	KN–145	4180	70	2762±104
6	Gomolava	GrN–7372	4450	70	3156±143
7	Gomolava	GrN–7371	4360	60	2965±70
8	Gomolava	GrN–15681	4310	35	2907±38
9	Gomolava	GrN–13167	4210	60	2785±90

Table 5

List of dated samples obtained from sites of the Yamnaya (west) culture (acc to Forenbaher 1993)

	Site	Lab. Number	Date BP	Std. dev	cal BC
1	Baia Hamangia	Bln–0029	4090	160	2662±210
2	Baia Hamangia	KN–038	4060	160	2640±222
3	Cernavoda	Bln–0062	4260	100	2821±154
4	Varna	Ki–89	4210	60	2785±90

culture to the lower Danube. There is an about 500-year difference in datings of the decline of the Bodrogkeresztúr culture and the chronologically proximate horizon of Hunyadihalom-Lažňany and late phase of the Lublin-Volhynia culture, on the one hand, and the Sofievka type, on the other. Therefore, evident late Polgár traditions in the last mentioned type should be treated as a result of the indirect, multistage and protracted inheritance process.

Translated by Piotr T. Żebrowski