THE MAIN ELEMENTS IN THE PLANNING OF TRAINING FOR ELITE DISCUS THROWERS

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A study attempting to find the most effective structure and dynamics of a year's training program for elite discus throwers, followed by a summary of the most common short-comings. The article in a slightly abbreviated translation from Teorija I Praktika Fizitscheskoy Kultury (Russia) No. 11, November, 1992. Re-printed with permission from Modern Athlete and Coach.

Elite athletes in speed strength events perform an extremely large training volume. Consequently it is important to understand the structure and dynamics of their year's training program. One possibility in the planning of a macrocycle is the use of the so called delayed long-term training effect. This requires the employment of a large volume of concentrated specific exercises (including speed strength development) in the general preparation phase. Although the parameters of specific performance capacities drop in this phase, the speed strength parameter improves rapidly in the next training phase when the load volume is significantly reduced.

Another possibility, recommended by Bondarchuk, is an individually adjusted approach to the development of specific performance capacities. This is based on regular changes of load complexes in each macrocycle (after 6 to 8 weeks) and is expected to produce a steady rate of improvement in performance capacities, followed by high level performances in competitions.

THE STUDY

Keeping in mind the introductory remarks we conducted a study to discover how elite discus throwers actually complete their yearly training plans. The study involved an analysis of the training diaries of 20 top level discus throwers (57 to 67m). The dynamics of their weekly and monthly load distributions were recorded and the material divided into two parts.

The first group (11 athletes) was made up from throwers who had a successful season (improved on previous year's performances or had excellent results in major competitions). The second group (9 athletes) included throwers whose performances during the season fell short of expectations. A statistical analysis of the dynamics of the test results during the competition periods was conducted in order to discover general trends.

TRAINING ELEMENTS	MONTHS												YEAR'S TOTAL VOLUME
	X	XI	XII	I	I	I	IV	V	VI	VII	VIII	IX	
Number of training days	19	19	22	21	19	20	22	21	19	16	18	17	232+26
Number of training units	22	26	34	33	24	30	31	27	23	23	20	17	316±50
Throws with competition implement	254	389	676	640	485	574	626	438	503	460	301	263	5654±1237
Throws with heavier implements	378	306	520	372	204	348	267	182	170	171	125	168	3211±1080
Throws with lighter implements	178	185	300	211	103	181	218	183	131	125	77	70	1963±353
Throws with other implement *	182	312	612	480	216	352	185	221	133	145	323	184	3445±1006
Strength training (tons)	75	104	158	156	102	129	134	102	90	82	60	66	1258±996
Number of jumping exercises	468	575	511	631	520	685	521	434	277	296	263	280	5461±1865
Sprinting (km)	2.8	4.2	2.8	2.9	1.8	3.2	3.4	4.0	1.7	1.8	1.0	0.5	30.1±7.7

*TABLE 1: Distribution of the main training elements in a year's training of elite discus throwers (*other implements include stones, small weight discus and shorts)*

A statistical analysis of the first group attempted to ascertain the yearly training volumes of the single main training elements and their monthly distribution (table 1) in double periodized year with winter competitions in January-February. The recorded yearly volumes differ from those generally recommended in the literature. The number of throws with the competition weight implement doubled the recommended volume and the number of throws with the heavy implements exceeded recommendation four to five times. On the other hand, the number of throws with light implements was about 19% below the recommendation and the sprinting volume fell snort by 25%.

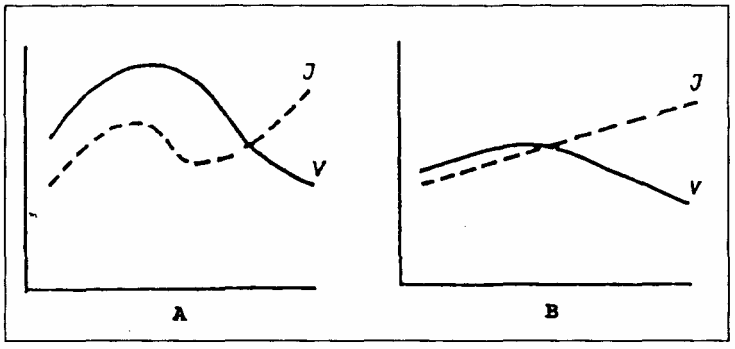
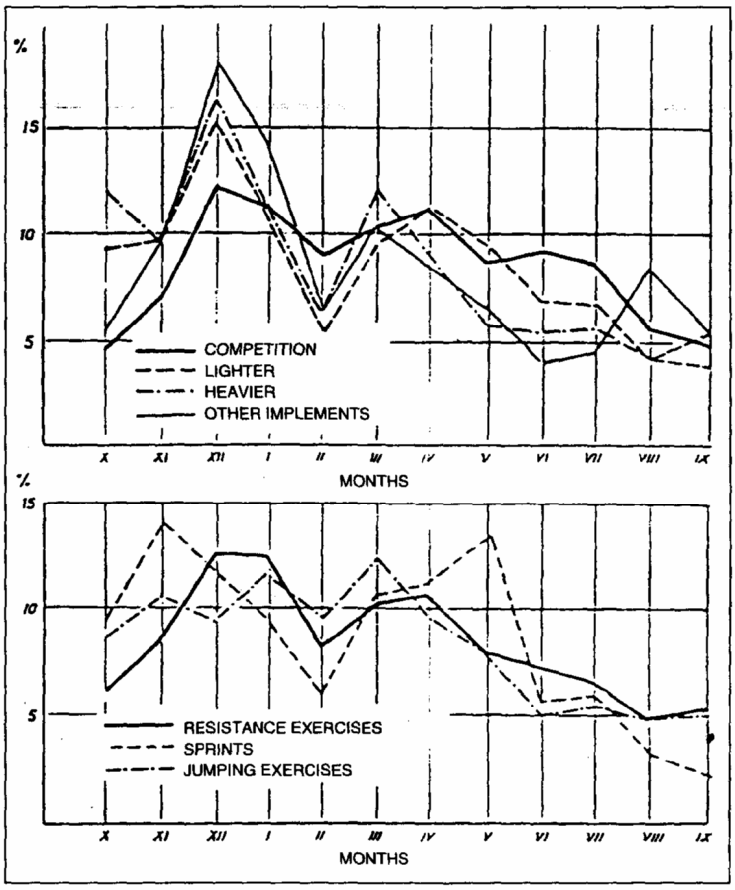


FIG. 1. SPEED STRENGTH CONTROL PARAMETERS
A = Concentrated heavy loads
B = General speed strength development

A wave-like loading dynamics became evident. The main volume of the development of specific performance capacities (strength, jumping and sprinting exercises) was executed in the first preparation period in November, December and January and in the second preparation period in March, April and May. The monthly loads did not exceed 12 to 14% of the year's total volume. This means that the athletes were practically involved in only an average load of speed strength development, as a concentrated monthly volume is regarded to be in the 18 to 20% range of the year's total.

An analysis of the control parameters for speed strength capacities showed no statistically significant drop in the main loading periods. This is contrary to what takes place when concentrated heavy loads are used. (Fig. 1 A). However, the general improvement of the parameters during the competition period corresponds to study results in speed strength development (Fig. 1 B) and appears satisfactory, although it does not follow the scheme of the delayed long-term training effect.



SUMMARY OF THE CYCLIC BLOCKS SYSTEM
A year's guide to cyclic blocks in throwing events, divided into four periods with the direction of each block

The distribution of throwing means (Fig. 2) shows an in parallel use of light and heavy implements. The highest number of throws takes place in December-January and March-April periods (15 to 16% monthly of the year's total). This training area also fails to reach high concentration levels. Nevertheless, an effective combination of speed strength loading and technique (throwing) training brings satisfactory results in the transfer of the improved specific strength level to the throwing action.

The load volume of maximal strength and speed strength development was in the development phases reduced and reached 5 to 10% of the year's total. This maintained the level of the specific performance capacity. The volume of throws, in particular throws with heavy implements, was also drastically reduced in the competition phases and the monthly averages made up only 8% of the year total.

Large fluctuations in the volume and distribution of the main training elements of the second group of throwers made a statistical analysis of this group impossible. However, a logical analysis of their training indicated the following shortcomings:

- A combined, uniformly distributed, general, specific and technical preparation load was noticeable in the monthly training phases. This continued into the competition period when athletes in the first group cut their volume by 50%.

- Compared to the first group, the not so successful throwers had an inferior specific training volume in sprinting and jumping exercises. There was also an excessive volume of exercises employed simultaneously. Exercises with a "stronger" training influence were often used before exercises with a "weaker" training influence. In contrast, athletes of the first group employed relatively one directional exercise up to six weeks before 40 to 80% of these were replaced by intensive specific exercises for a better training effect.

- There are shortcomings in the use of the competition discus, as well as throwing heavier and lighter implements. The lack of proportional distribution of throws with different weight implements failed to correspond with the recommendations made by experienced coaches and the results published in various studies.

CONCLUSIONS

The results of the above outlined analysis of the training of elite discus throwers leads to the conclusion that the structure and dynamics of training employed by successful Soviet discus throwers in the late 1980's followed the individually adjusted development of performance capacities with regularly changed one directional load complexes.

At the same time, we are not completely convinced that this approach is responsible for the best results. According to the studies conducted by Verkhoshansky, equally effective results have been achieved in the javelin throw by using the delayed long-term training effect.