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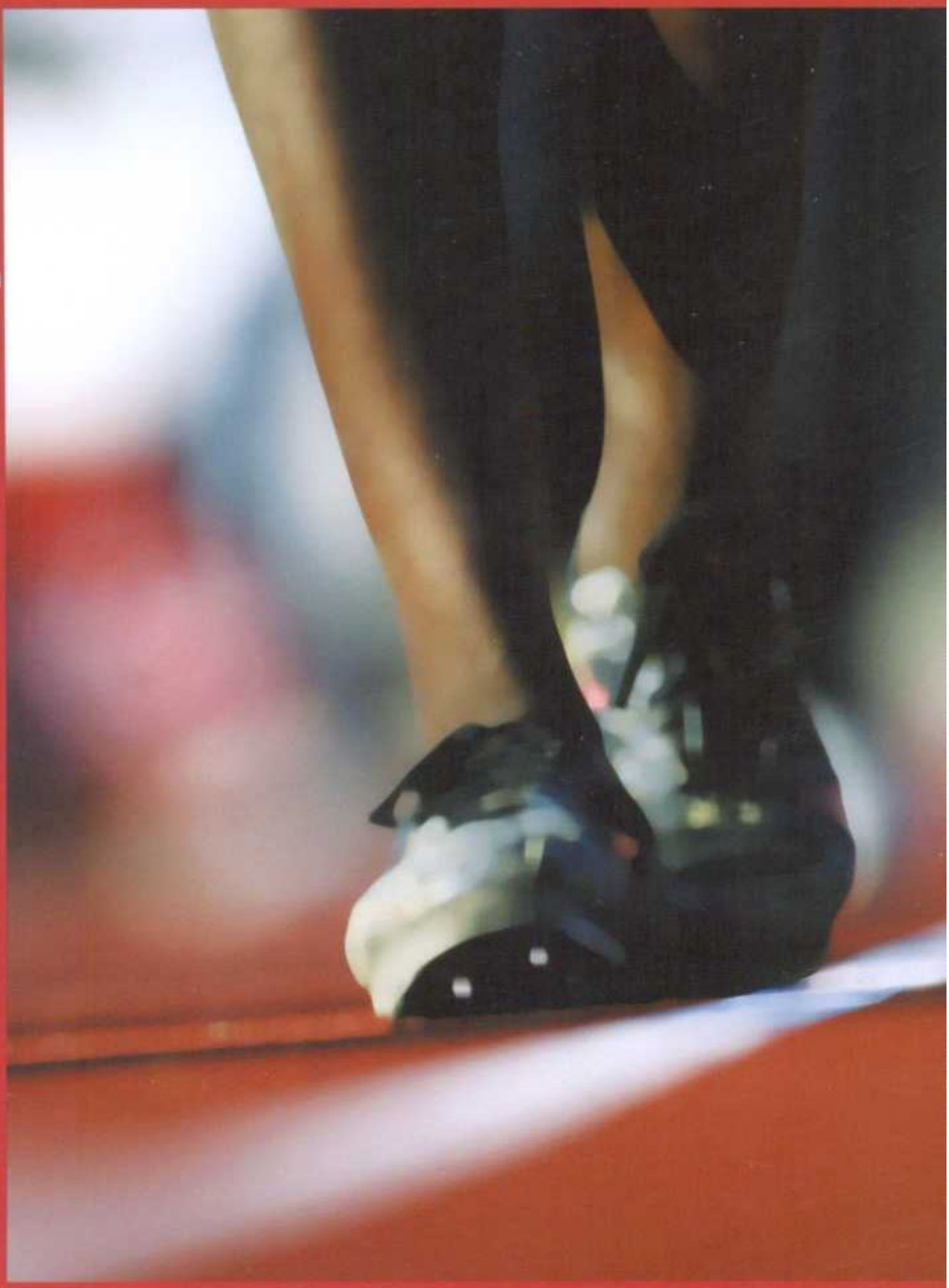

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Management of the training process in qualified female hammer throwers

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ABSTRACT

The problem of construction of the training process in any sport or discipline is connected in many respects with finding rational periods for the training activities most appropriate for the aims of preparation. To date there is no certain solution to the question of the distribution of training means and their volumes for female hammer throwers. Following the training programmes of other athletes is problematic because the plans do not take into account the dynamics of the individual's reaction to specific loadings. It is therefore necessary for the trainer of highly qualified throwers to develop an individualised programme based on qualitative and quantitative measurement of the influence of training load (its contents, volume and organisation) on the athlete's organism. In the case of female athletes, this must be strictly co-ordinated with the cyclic changes in the organism, reflected in the psychological condition, the level of serviceability and the display of motor abilities in each phase of the ovarian-menstrual cycle. The author concludes by providing six guidelines for developing such a programme.

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One of the newest disciplines on the athletics programme is the women's hammer throw, which, like the women's pole vault, first appeared in the 2000 Olympic Games in Sydney. Our personal association and achievements in the international sport arena are connected only with the name of Olga Kuzenkova (RUS), who was the world record holder and became Olympic Champion in Athens in 2004. Unfortunately, with the exception of the current record holder Tatyana Lysenko, the results of younger Russian female hammer throwers leave much to be desired, as their performances at international youth and juniors competitions testify. This may be dangerous for us because in recent years, a number of advanced young female throwers have appeared in other countries and many seem able to occupy the leading positions in this event.

The development of competition in this event in the international arena makes it important to search for new ways and meth-

ods and untapped reserves in the organisation of the training process. It is obvious to us that advances in training will be due not to increases in the volume of loading but to improvements in the effectiveness of the training content. The problem of construction of the training process in any sport or discipline is connected in many respects with finding rational periods for the training activities most appropriate for the aims of preparation. Practical experience and special research that has been carried out on the speed and strength events of track and field show us that the training of highly skilled athletes at all stages of the yearly cycle has a complex character and must provide for the increase of both the special physical preparedness of the athletes and an increase in their technical skill. But, as at each stage of the annual cycle attention should be focused on a certain problem of training, a non-uniform distribution of certain volumes of the main training means takes place, giving us the possibility to speak of a domination of loading in a certain direction in each of the mesocycles of preparation.

At the same time, the analysis shows that there is still no certain co-ordination in the given problem as to the distribution of training means and their volumes, either in female throwers of different standards or in athletes of the same standard. Real examples of training process construction provide evidence of great variability of loading in each group of training means in an annual cycle, even in female athletes of high qualification (Master of Sport and International Master of Sport. See Figure 1). There is no doubt that at such a level the training load has to be individualised but, at the same time, specific features can be expressed only within the framework of general regularities, which determine the most rational forms of training construction.

The analysis of the annual distribution of the basic means of training shows that, in comparison with the 1st Degree athletes and Candidates for Master of Sports, the strongest female hammer throwers concentrate on certain kinds of loading at certain stages of training. Thus in November the greatest volume of work on auxiliary apparatuses prevails. In December and January the use of hammer throwing of different weights, imitation exercises and weight training are emphasised. In February, the winter competitive period, a decrease of the training load in all parameters can be observed. In March – April the volume of special strength training (exercises with weights and jumping exercises) and the quantity of different weight throws (mostly competitive and over-weighted hammers) reaches its peak. In April, while training in "spring" weather, the athletes run mostly short distance and do some imitation exercises. In summer, the main competitive period, the volume of general means of training is reduced reaching, in the majority of cases, the minimal amounts in the annual cycle.

Figure 2 shows changes in the distribution of the basic training mean – hammer throwing. Highly qualified female hammer throwers use special over-weighted hammers (41%) and the normal weight hammer (34%). It is interesting to note that the main volume of over-weighted hammer throwing (5kg) takes place in March when the lighter hammer (3kg) is practically not used. In the months that follow, the quantity of lighter hammer throwing is increased while that of the heavier hammer is decreased.

It should be noted that fixed volumes of throwing exercises with competition, heavier and lighter hammers, the quantity of throws with auxiliary hammers and the volume of weight training are at the level of those parameters that were reached by the strongest male throwers in the beginning of the 1970s. Approximately the same distribution was observed in those years in the training of our strongest hammer thrower, Anatoly Bondarchuk, who concentrated most of his weight training into December and April – May, but during the competitive period maintained his weight training at 7-8% of the whole year level.

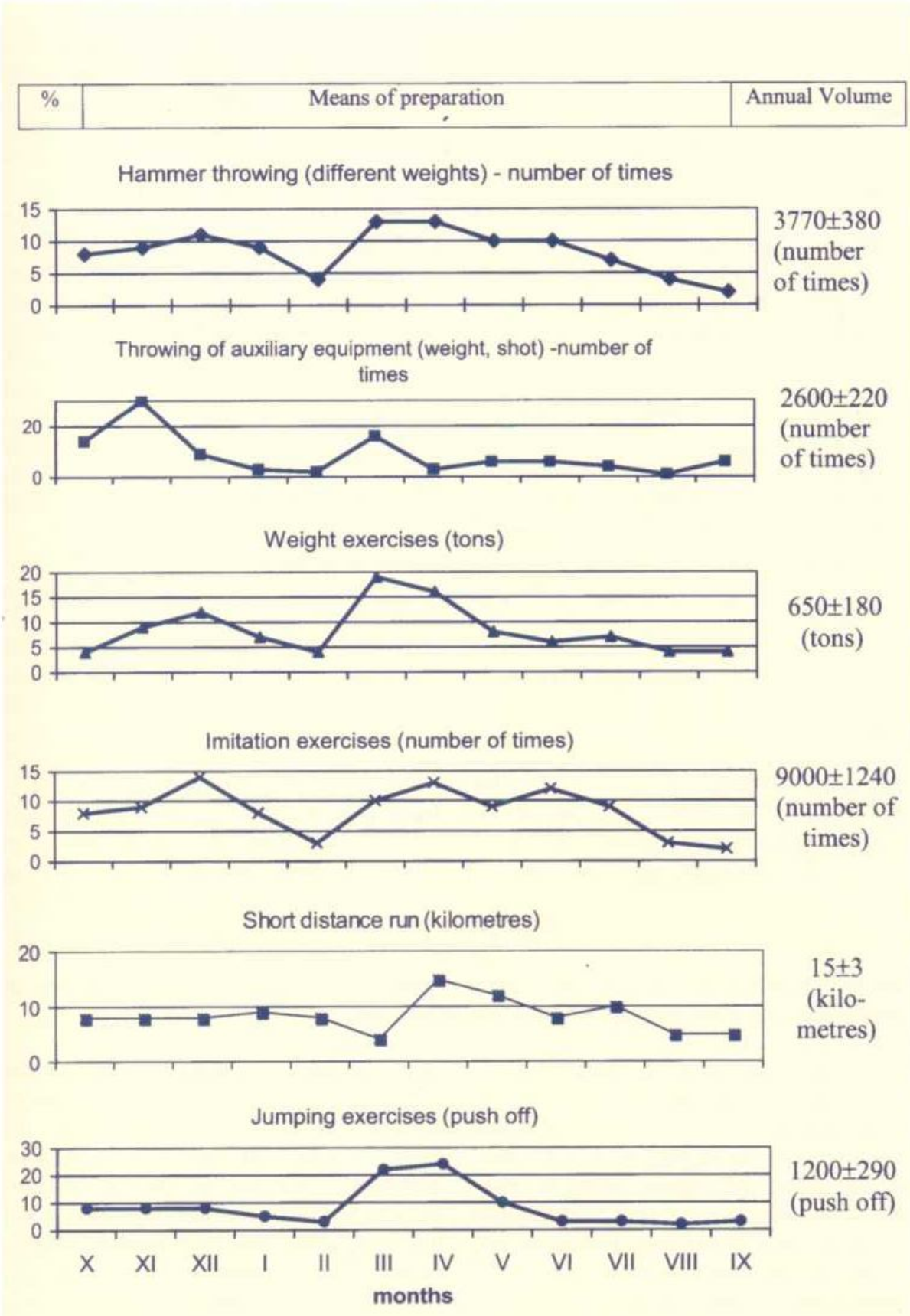

Figure 1: Distribution of general preparation means in female hammer throwers (Masters of Sport and International Masters of Sport) in the annual cycle (% of total annual volume).

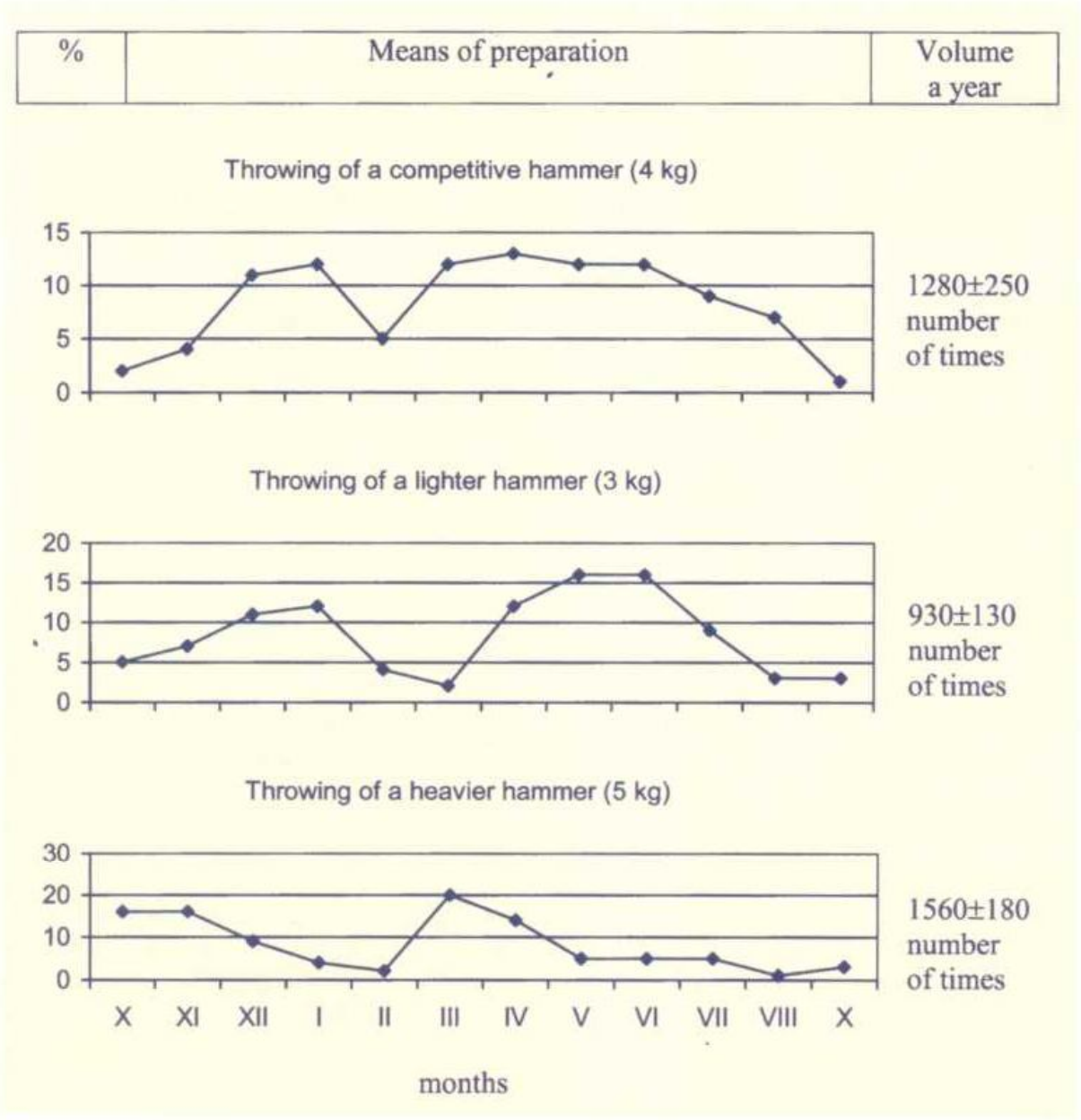

Figure 2: Distribution of the number of throws of various hammer weights in female athletes (Masters of Sport and International Masters of Sport) in a annual cycle (in % of the total volume for the year).

It should be mentioned, that the optimal volume and intensity of exercises with weights is still an open question. Experience shows that an increase in results registered in exercises with the barbell (press, squat, snatch, etc.) does not always positively influence competitive results. This could be explained by the fact that for each thrower, both male and female, the special strength training programme should be strictly individual.

The above is confirmed by the fact that the men's world record holder Yuriy Sedykh showed inferior results in the barbell exercises to his main opponents, but considerably outstripped them in such strength-velocity exercises as the standing long jump. The same could be said about Olga Kuzenkova. According to BAKARINOV, the level of physical fitness in male throwers is obligatory but not a sufficient condition for the achievement high competitive results. In this author's opinion, among highly qualified athletes the decisive factor is strength-velocity readiness and the subtle ability to utilise it in a specific movement skill. This can also be applied to women specialising in hammer throwing.

With regard to use of hammers of different weights, experimental data show that the application of lighter and heavier hammers calls on different working muscles and that the sequence of their inclusion into a movement as well as the force and speed of their reaction are different than in the throwing of a competitive weight hammer. Therefore, we frequently see cases when even substantial improvements in throwing lighter and heavier hammers is not accompanied by improved results in competition. But, even here, everything happens on a strictly individual basis. Thus the above-mentioned Sedykh, who achieved his best marks while winning the world's most important competitions with the standard weight hammer, was able to throw a 6kg hammer farther than his rivals.

Our mention of specific features of throwers is not accidental. It is connected with the fact that the character of the influence of the set loading is determined by the individual reaction of an athlete to it. In other words, the influence of a given load on the same subject (athlete), depending on his\her condition at different times, may appear weak, normal or excessive. Therefore management of the training process of qualified athletes should be carried out on the basis of constant monitoring and diagnosis of the condition of the athlete and his\her abilities with the application of training loads appropriate to this diagnosis. To this end, any system of preparation should be adjusted to the individual athlete, taking into account his\her current condition (level of work capacity) and his/her specific features. Even the finest plan should not become dogma.

However, we see that most throwers (and not only throwers!) do their training like this: the training plan is written, based on the personal experience of a trainer or on analysis of preparation of the strongest athletes, wherein by months and weeks rough volumes of loading are distributed. But the work in a certain training session does not follow a logical sequence and continuity, to speak nothing of scientific substantiation. Thus, planned training loads, as a rule, do not coincide with the dynamics of the athlete's condition within a year's cycle. If such a programme correlates with this or that athlete, it is a piece of luck. If not?

In fact, trainers frequently follow the same, "checked up" yearly routine and are afraid to step outside what they feel they know. It is true that, for younger athletes, standardised training programmes can play a positive role (we can recall the experience of the GDR, where similar programmes were developed not for a certain athlete but for a contingent of athletes of a certain level of qualification and then widely applied). But for highly qualified throwers the proven workloads should be the starting point for adaptation to the corresponding internal reserves of the organism of an athlete. In the absence of knowledge of the interrelation between the effects of training and the athlete's current condition, the training plan becomes a fetish, to which strict adherence can play a negative role.

It is clear that the most integrated indicator of a course of preparation of an athlete and measurement of his/her current condition is the result in the key exercise – throwing of the competitive hammer. But a) this is not always possible and expedient and b) a result frequently does not reflect only the effectiveness of the training programme: the quality of equipment, objective judgement, acclimatisation, psychological readiness the reliability of the athlete's technical skill and other factors also have an effect. As the basis for competitive results is mainly determined by the level of special workability of an athlete, it is preferable to estimate the quality of the course of preparation in terms of the achieved level. Thus if the parameters of special workability rise and the results do not not improve it is possible to speak about drawbacks in the performance technique.

It should be noted that for the reliable estimation of the characteristic condition of an athlete it is preferable to use standardised testing methods or control exercises. Values for key tests for women hammer throwers of different levels are given in Table 1.

Table 1: Indexes of special physical preparation of the female hammer throwers

Index	Qualification Level			
	1st Degree	Candidates for Master of Sport	Master of Sport	International Master of Sport
Running 30m standing start (sec)	4.7	4.5	4.3	4.2
Standing jump (cm)	230	250	270	280
Standing tripple jump (cm)	650	700	740	780
Shot throwing (4kg) from below – backward (m)	14	16	18	19
Shot throwing (4kg) from below – forward (m)	12	14	15	17
Barbell press lying (kg)	50	60	70	80
Squat with barbell on the shoulders (kg)	100	110	130	160

As a result of analysis and generalisation of the literary data, practical experience and our own research, the methodological algorithm of development of the programme of management for the training process of qualified female hammer throwers can be presented as follows:

1. It is necessary to analyse the volumes of training loads mastered by the athletes of corresponding qualification at the previous stages of training. For this purpose, the trainer has to set down a year plan (beginning in October) of training loads for all groups of means summarising it by weeks and months.

2. It is necessary to identify the most essential parameters of special preparation, the level of which, first of all, should be increased for a given female athlete and then to establish the amount of its increase. If appropriate an increase of the special physical preparation level is not provided, it is impossible to solve the questions of mastering technical skills and increasing speed (power) of the competitive exercise.

3. A complex of adequate means of physical and technical preparation should be collected in order to provide the necessary increase in the level of special workability. It is necessary to define the order of introduction of these training means, their sequence and logical continuity within the system of a year cycle. The last said is necessary to get the positive effect of interaction of training loading and to reduce loading of inherently antagonistic relations. Experimental studies show that in strength-velocity events (for instance hammer throwing) large volume loading can negatively influence the current level of ability to express explosive efforts, speed of movements, their coordination and correlation. (VERHOSHANSKII, 1988). Thus, the effect of work on skill perfection becomes considerably lower and reconstruction of its elements is lost. Particulary significant complications arise in the performance of a complete movement (for example hammer throwing at full strength). In this case, some drawbacks in technique are more likely fixed than corrected and the possibility of injury increases. At the same time, technical activity in the form of imitations of co-ordination structure and rhythm of movement (not at full strength) and the application of special development exercises may be quite fruitful. In this case, the technical work for highly qualified female hammer throwers will consist not in its reformation but in bringing it to accordance with the increased level of movement abilities.

4. For rational management of the dynamic condition of female athletes and their adaptive processes in connection with appli-

cation of adequate training loads, it is necessary to organise pedagogical controls. Test indexes are used (better twice a month) which estimate the speed-power and power abilities of the female athletes. It is also important that the special physical preparation of female athletes take place in the same phase of the ovarian-menstrual cycle. If testing of female throwers is carried out without taking into consideration this factor, "false" data showing increases in this or that indicator will be obtained, reflecting not the influence of training loads but purely physiological factors.

5. It is necessary to constantly analyse the interrelation between the test indexes, the amount of loading in the main means of training and competitive results. Taking into consideration the principle: "dose – effect" or "action – response" it is possible, to a great extent, to foresee the answers to questions as to what a female athlete should achieve in order to reach the necessary level of competitive results as well as the point in the competition calendar at which an activity should be applied. It is also necessary to study individual changes in recovery to see how the alteration of loads and volumes of loading accelerate or slow down the course of the rehabilitative processes.

6. The trainer of female athletes should know the somatotype – feminine or masculine – of his/her athlete. For the first group there is a typical constancy of the ovarian-menstrual cycle and its phasal character should be taken into consideration. For the second, and more frequently appearing group of athletes (the masculine type), infringement of the specific biological cycle is frequently observed. They are "closer" to men and (to a certain extent) the organisation of the training process for them can be similar to that of male athletes. But in any case, in the organisation of various kinds of loading during a mesocycle of training equal to the ovarian-menstrual cycle duration it is necessary to take into account that a) the maximal volume of exercises with weights should be planned for the post-menstrual phase and b) lower volumes of jumps should be planned for the post-menstrual phase. It is necessary to refrain completely from this second training mean in the pre-menstrual and ovular phases in order to prevent the negative influence of the exercises on the reproductive function and because there is a decrease in the level of the absolute and explosive power of lower limbs of the female athletes.

The substantiation and construction of a programme of preparation for female hammer throwers (and other athletes) should not be as focused on maximum loading, which is typical nowadays, but on achieving certain training effects and movement skills. Thus, an individual female athlete's characteristics mainly determine the qualitative and quantitative measure of influence of training loading on the organism: the content, volume and organisation should be strictly co-ordinated with the cyclic changes in the organism of the woman, which are reflected in psychological conditions, level of workability and expression of movement abilities in each phase of the ovarian-menstrual cycle.

The pedagogical skill of a trainer will be expressed not only in that his/her athletes have done more throws, have lifted more tonnage of weights or have run more kilometres, but in the necessary changes in the organism of the athlete for which optimal training loads (preferably minimised!) have been applied.

"To train a lot and to train correctly are not necessarily the same" is a well-known expression. Thus, the role of the trainer is very important. The Bulgarian weightlifter and coach Ivan Abadzhiev once said, "the trainer must live with the idea that if he lags behind he will simply be lost, if he does not think up something new he will not open up something. I have noticed that this anxiety can be transferred invisibly to athletes and when it is it forces them to aspire to that which seemed incomprehensible earlier".

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