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From Russia with Love? Sixty years of proliferation of L.P. Matveyev's concept of Periodisation?

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ABSTRACT: The scientist L.P. Matveyev studied the question why some soviet participants of the 1952 and 1956 had reached their personal bests at the summer Olympics – and some had not. By analyzing their training he developed the concept for peaking at the right time: Periodization. The concept was tested and was the basis first for soviet, then for Eastern Block success at the Olympics and other major international championships. The training of GDR athletes for the 1968 Olympics was periodized, West Germany followed in 1972. The West German translation of Matveyev served as basis for the French version, while the American version developed directly from the Romanian adaptation by Bompa. The development of the concept will be followed up to the present time when the success of Norwegian cross-country skiing is based on Matveyev. As Matveyev's theories are based on Pavlov, it was questioned after the fall of the USSR by Platonov who favored a more individualized biologically based version. The current discussion on block periodization is used to show that the concept is still alive and developed further by Issurin and others. The cultural differences which permit or refuse the acceptance of the concept into a national system will be discussed.

KEYWORDS: Coaching, Training, Matveyev, Periodisation, Platonov, Bompa.

1. INTRODUCTION

After successes in the European Championships in Athletics (1946), Weight Lifting (1947), Wrestling (1947), and Basketball (1947), the USSR was ready to participate in the Olympic Summer Games of 1952 as it was sure to be at the same level as any other country including the United States. The USSR finished second in 1952 just like four years later in 1956. The results were very good, but the athletes had not reached their best performances at the time of the Olympics. When you have the potential for winning, but reach your best performance at some other time during the

season, the research question is: How to peak at the right time (Krüger, 1974)?

A young researcher was asked to find out why. Lew Pawlowitsch Matwejew¹ (1924 – 2006) wrote his doctoral dissertation on the problem. For this he analyzed Olympic and European Championship results and assembled as much information as possible about the training and competitive results of many athletes in the quantifiable sports of track and field, swimming, and weightlifting. His dissertation changed training, its organization and science, and became the basis for the international success of the USSR and their allies from 1960 onwards. It could, of course, be argued that

1 The transcription of *Матвеев* varies according to language from Matwejew (German), Matveev (English), or Matveiev (French). I use the German form, unless it is written differently in the text.

the success of the USSR and Russia is not the result of superior training theory but of doping (Tétrault-Farber, 2013). As I have argued in the context of doping in the GDR, however: If doping is prevalent everywhere it takes more than doping to win (Krüger, 2008). In the following I will show the development of ‘periodization’ as Matwejew’s system has been called.

Where did Matwejew get his ideas from? He had been a soldier in World War II, so strategy was all important for him and for Soviet theory in all walks of life including sports. The USSR developed socialist planning and both science and sports fell nicely into line. While the capitalist system develops *ex post*, the socialist system develops *ex ante* (Mandel, 1986). As a doctoral student has to quote the researchers who have gone before him, Matwejew had to solve a dilemma as there were two distinct lines of thought in his field since before World War I (Carl, 1983). Letunow (1952) stressed that training had to rely on the ways best for the individual. Training had to be organized in such a way that athletes reach their best results at the proper time. As athletes had different major traits, they had to be grouped to make sure that top results were to be achieved by most, making use of their internal strengths as much as possible. On the other hand, Osolin (1951) pointed out the dominance of the ‘Calendar’. With a strong winter in Russia certain forms of training had to follow seasonal conditions. In addition, athletes had to qualify for international competitions, so training had to take the external calendar into account. Matwejew combined these two lines of thought and that took the internal as well as the external conditions into consideration. In this respect he followed traditional Socialist Planning Science (Ellman, 2014) with the predominance of central planning and centralized responsibility.

2. THEORETICAL BASIS

Although Matwejew explored many different training theories, his own is mainly based on

Lauri Pihkala’s translated chapter in Kummel’s *Athletik* (1930). Pihkala is best known as coach of Paavo Nurmi who ran 24 world records and won 9 Olympic Gold Medals; so Nurmi certainly was in his best shape when it counted. According to Pihkala, Nurmi’s training was divided into four periods (preparation, spring, summer, and recuperation) and each training period was divided into shorter cycles which always included some recuperation. Pihkala explained that his training came in ‘waves’, and included a ‘terrace’ after some waves. On this terrace the form that had been reached was to be stabilized; only continuing to the next level of intensity and/or quantity of training when the attained form was assured.

Matwejew also used Selye (1952, p. 161) and Pawlow (1956) to explain that the same stimulus can be ‘useful or detrimental depending on the circumstances.’ Matwejew used the work of Yakovlev (Virus, 2002) to explain the concept of ‘supercompensation’ as the basis for his rhythmical emphases in training. The dominating scientific ideology of the USSR at the time of Matwejew originated in the works of Iwan Petrowitsch Pawlow (1849 – 1936), Nobel laureate in Physiology (1905). He is best known today for his dogs and their conditioned reflexes. Pawlow showed the many possibilities of the central nervous system to achieve a balance between external milieu (stimuli, conditions) and the organism, which for him explained the dominance of the Cortex. If training and its results can best be explained in terms of conditioned reflexes the season can be set up for allathletes in the same way to have maximal success. Matwejew (1972, p. 59) considered the hetero-chronicity of the various adaptation processes, but he still organized his training system as if all adaptation processes have more or less the same length. If you describe training mainly as a process of conditioning in the sense of Pawlow, such unified action is logical.

Matwejew followed the typical organization of training for amateur athletes at the time: training was divided into training units, into

days, weeks, months, and periods. Cycles of periods (preparation, competition, transition) he called 'macrocycles'. The new terminology he introduced were 'microcycles' (= weeks), 'macrocycles', and 'periods' (= months with the same emphasis). After 1971 he converted the months into 'mezocycles' which often were 4 weeks long, although, under certain circumstances they could be longer or shorter. Later on 'Olympic cycles' (= 4 years) and 'athletic life time cycles' (= career = 16 years or more) were added, basically functioning in a similar manner. A training year could have one or two macrocycles, each with the same order, each leading to a 'peak'. The order of cycles during the year should be done in such a way as to assure that the peak coincides with the major championship which was the aim of the athlete for that year. The advantage of Matwejew's theory was that it could be applied to athletes of any level, beginners as much as Olympic athletes. This eventually assured the widest usage of the theory all over the world.

3. USAGE OF MATWEJEW'S THEORY

Matwejew's theory was applied on Soviet athletes for the first time for the 1960 Olympic Games – and it worked. The USSR was an easy winner on the medal table. So in 1961 a central planning unit was set up to assure that all of the Eastern Bloc countries would also profit from Matwejew's 'Periodization'. A dramatic improvement on the medal table seemed to show the superiority of the State Planning System over the individualistic Capitalist system in making the best of human potential. As this was the time of the *Sputnik*, Matwejew's theory was also used to demonstrate the superiority of Socialism in all walks of life. In the GDR, Harre (1964) included periodization theory into his general training theory for the first time outside of the USSR.

An improved version of Matwejew's dissertation (second edition, the first publicly sold) was finally published in Russian in 1965 and soon

translated into many other languages. German, being one of the language bridges between East and West, had two translations in 1965: in the GDR by Pottratz and Friedrich (1965) and in the West by Tschiene (1965). Matwejew's theory was immediately applied in the GDR, while in the West nobody cared at first. While in the GDR the structure was there to put it into use, in the West there was neither the structure nor did there seem to be the necessity to adopt the approach. It was the time of a joint German team, and whoever had more athletes on the team provided the spokesperson. This attitude changed after the results of the 1968 Olympics when the GDR (with a third of the population of the Federal Republic) had the majority of athletes on the Olympic team.

The (West) German Sport Federation (DSB) was restructured in 1969 and better financed federally to assure success in the Munich Olympics (Krüger, 1975). Matwejew was applied as Tomasz Lempart (1915-2005) became director of planning for the DSB, a position similar to the one he had held in Poland before he was expelled in an anti-Semitic cleansing after 1968. Lempart, who had requested emigration to Israel, and went to Frankfurt instead. A revised and readable version of Matwejew's 'Periodization' was published in 1972. If German sports federations wanted to benefit from the new government money for German sports, they had to set up their annual plans according to Matwejew. No training camp was paid for, if it was not in accordance with the proper planning of the season. Periodization was rapidly included in all of Germany into institutional planning and also into the individual training plans.

It should be noted, however, that Zaciorskij (1968) questioned the statistical basis of Matwejew almost immediately: If you are dealing with the very best athletes of a given sport, the usage of parametric statistics is more than doubtful. These athletes are at the very end of a normal distribution curve, so they are not normally distributed themselves – and if the data

follow a normal distribution curve these athletes cannot be the best. So, Matwejew ought to have used non-parametric statistics.

4. THE DEVELOPMENT OF MATWEJEW'S THEORY

In the following years Matwejew's theory spread all over the world. Of course, from the very beginning it was doubtful whether the theory really worked for 'all' sports. Football, ice hockey or basketball and other sports with a long season in which one game scores as many points as any other were difficult to bring into line with the Soviet idea that you had very few peaks to win Olympic or other championship medals.

Only relatively few countries organized their competition and qualification calendar to be coordinated with the international calendar in a Matwejew manner. To give a full analysis of this phenomenon would take another investigation and will not be done here. With scientists and coaches of the USSR and the GDR spreading out all over the world after the downfall of the USSR and its allies after 1989, the knowledge spread all over the world. Matwejew claimed in an interview in 2001 that his book was translated into more than forty languages (Bourne, 2008, p. 377).

But even before this, the theory had been developed further. Krüger (1973) analyzed the results of the 1972 Munich Olympics in middle and long distance running and came to the conclusion that the training system had to be taken into account; Lydiard's periodization was different but more successful than one based on interval training. The paper did not question Matwejew's theory fundamentally: it showed, however, that it could make sense to have not just one general and one specific preparation cycle before you start the completion cycle, but three. Lydiard added a unique mezo-cycle of hill jumping.

Tschiene (1975), who monitored Soviet training theory for the DSB, was a successful

throwing coach. From his experiences with his athletes he pointed out that the mixture between intensity and quantity of training should be different from Matwejew's recommendations in the general preparation period. The intensity should be higher. This was also demonstrated by the athletic success and scientific work of the Ukrainian Olympic champion Bondartschuk *et al.* (1975). As a hammer thrower he was fully aware that you need to do technical training all year long. Technical training when you do not have maximal strength and power is counterproductive. He thus showed that Matwejew was correct in the set-up of a season, but that you needed much more high intensity training in general preparation. In his dissertation, Bondartschuk had one group using 70% general strength training and 30% specific in the preparation period, while another group used the components in the opposite way 30:70. According to Matwejew 70:30 would have been correct; but Bondartschuk showed that with 30% general and 70% specific high intensity training the throwers had much better results during the season. Today, we know that the throwers used a large quantity of anabolic steroids, so the research only showed that steroids have an influence on periodization, permitting a higher intensity of training early in the preparation period (García Manso, 2002).

After the change in international amateur rules in 1981, athletes started to modify their training according to market rules. Rather than trying to peak when it counted, they had to do well much longer to make a decent living (Krüger, 2004). This resulted in a discussion about whether you need to be in good shape for a long time or a superb shape for the major event (Tschiene, 2011). However, major challenges to periodization theory only occurred after the end of the Eastern Bloc. Verchoshanskij (1998) – who had meanwhile emigrated to Italy – claimed the 'end of periodization', as it ignored the predominance of the biological parameters of physical performance (Tschiene, 1991). For Matwejew training was a

'pedagogical process' and the biological parameters would not change any long term periods or cycles. The Ukrainian Platonov (1997, 1999) defended Matwejew and pointed out that Verchoshankij had been part of the 'old' Soviet system himself, that his critique was unjust as about half of the literature Matwejew quoted was physiological. Matveev (2000) himself answered his critics and pointed out that the main difference between him and his critics was about the role of 'general preparation.' He claimed that every macrocycle must have elements of general 'unspecific' preparation. His opponents ignored the importance of a positive transfer from a 'general' to a 'specific' preparation. With 'specific preparation' good results could be achieved fast, but only with a general preparation in every macrocycle could the best individual performance be reached.

Although Krüger (1974) has pointed out early the importance of Matwejew's periodization in the United States, it only caught on when the Canadian of Rumanian decent Tudor Bompa (1999) published several full length books popularizing 'periodization' as a non-linear approach to training (Pedemonte, 1986a, 1986b). These books have added little to the debate about the feasibility of Matwejew's theory, however.

5. BLOCK PERIODIZATION OR MATWEJEW'S

The current discussion about Matwejew's theory was started by yet another Russian emigrant. Issurin (2008) showed that 'block periodization' is more effective than Matwejew's periodization. If you include enough specific training in blocks you achieve quantifiable aims faster and with fewer training units. Platonov (Lyach, 2014) pointed out the weaknesses of Issurin's theory and claimed that Matwejew's target group was 'not aiming at immediate success in second-league competitions, but at planned and effective preparation for the most important competitions, most of all Olympic Games and World Championships.'

Tønnessen *et al.* (2014, 2015) went one step further and analyzed the training of Norwegian World and Olympic champions in cross country skiing and in orienteering on the basis of their actual measured training data of the year of their greatest successes. The results clearly confirmed Matwejew's theory: In their best years their general preparation was really 'general'. It contained many nonspecific elements to provide a broad basis for success in a truly major event.

If Matwejew's theory is still functioning well, why are there so many attempts to change it or develop it further? Tschieni (2006) summarized the Russian critique that supercompensation theory is weak because of the hetero-chronicity of the adaptation processes. Krüger (2015) pointed out that obviously the supercompensation curve, which is the basis for Matwejew's periodization, does not coincide with the learning curve. Block periodization is very suitable to break up a learning plateau. So the more skill oriented a sport is, the more you need to take the learning curve into consideration; but in terms of the development of a peak at the right time, Matwejew's theory is still working well.

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