

CRITERIA OF TOP FORM IN HIGHLY QUALIFIED ATHLETES

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Abstract:

Top form in sports is a dynamic adaptive state of an individual with a complex hierarchical structure. The issue of its criteria is debatable, but can be solved on the basis of the systematic approach and the theory of multidimensional spaces.

From this point of view top form is regarded as an integral model of the preparedness of an athlete to realise his/her own potential in sport performance. The quantitative and qualitative parameters of that state can be presented as **components of a variable vector, $x(t)$** :

$$x(t) = \{x_1(t), x_2(t), \dots, x_n(t)\}$$

Hypothesis: In the n-dimensional space there is an area which, under definite conditions, is characterised by the least sum of the squares of the distances between the various components of motor activity (factors of sport performance) - x_1, x_2, \dots, x_n . This optimised model of an athlete's specific work capacity is termed sports form.

Object of study: wide range of elite athletes in track and field athletics, rowing, canoeing, wrestling, boxing and basketball over the period 1975-1997 (a total of 7835 cases).

Subject of study: basic parameters of total functional capacity, VO_{2max} , W_{max} , etc. and the specific parameters of motor activity as well as the dynamics of sport results bin the annual cycles.

All data were processed by the methods of multidimensional statistical analysis and are presented as natural values or as statistical quantities (β -coefficients or normalised Z-values).

The quantitative and logical analysis of the results of this study leads to the following major conclusions:

1. Top form is a state or condition which reflects a generalised process of biosocial adaptation, i.e. a transition from the lower determined levels to higher stochastic levels of behaviour in the system-athlete;

- the **first level** is characterised by stable parameters of the athletic condition achieved by training (preparedness) as a natural basis of top form;

- the **second level** is characterised by a definite selectivity of the adaptation process - the development of the major functions building up to the so-called specialised basis of top form;

- the **third level** is characterised by much more mobile

Zusammenfassung:

KRITERIEN FÜR DIE SPITZENFORM BEI DEN HOCHQUALIFIZIERTEN SPORTLERN

Die Leistungsform im Sport ist ein dynamischer verändernder Zustand eines Einzelnen, von einer komplexen hierarchischen Struktur. Über die Kriterien zur Bestimmung der Leistungsform könnte diskutiert werden, aber mit einem systematischen Zugang und mit Hilfe der Theorie mehrdimensionaler Räume kann dieses Problem gelöst werden.

Von diesem Standpunkt aus beobachtet man die Leistungsform als ein vollständiges Modell der Bereitschaft eines Sportlers, seine eigenen Potentiale ins sportliche Resultat umzuwandeln. Die qualitativen und quantitativen Parameter dieses Zustands können als Elemente der Vektorenvariable $x(t)$ dargestellt werden:

$$x(t) = \{x_1(t), x_2(t), \dots, x_n(t)\}$$

Es wurde eine Hypothese gestellt, dass im n-dimensionalen Raum ein Gebiet existiere, das unter definierten Bedingungen durch die niedrigste Summe der Quadrate der Distanzen zwischen den verschiedenen Komponenten motorischer Tätigkeit (Faktoren der sportlichen Leistung) - x_1, x_2, \dots, x_n gekennzeichnet sei. Dieses optimisierte Modell der spezifischen Arbeitskapazität eines Sportlers sei die Sportform.

Zwischen 1975 und 1997 umfasste die Studie ein weites Mustersatz der Leistungssportler: Leichtathletiker, Ruderer, Kanufahrer, Ringer, Boxer und Basketballspieler (im Total 7835 Fälle).

Der Gegenstand der Untersuchung war die gesamte funktionale Kapazität, VO_{2max} , W_{max} , usw. sowie die spezifischen Parameter der motorischen Tätigkeit und die Dynamik der Sportleistungen während des Trainingszyklus.

Alle Daten wurden mittels der multivariaten statistischen Analysen verarbeitet und entweder als gemessene oder als statistische Werte (β -Koeffiziente oder standardisierte Z-Werte) dargestellt.

Aus den quantitativen und logischen Analysen der Ergebnisse wurden die folgenden Hauptschlussfolgerungen gezogen:

1. Die Leistungsform ist ein Zustand, der einen verallgemeinerten Prozess der biosozialen Anpassung widerspiegelt, d.h. den Übergang von den niedrigeren determinierten zu den höheren stochastischen Benennungsstufen im System, das "der Sportler" genannt wird;

- die erste Stufe kennzeichnen die stabilen durch Training erzielten Parameter der sportlichen Form (Bereitschaft), als die Naturbasis für die Leistungsform;

- die zweite Stufe ist durch die Endselektivität des

(operative) components of the specific work capacity.

2. Top form is a qualitatively new state of the athletic condition (preparedness) where all the factors of sport performance are optimally correlated to the so-called concordance which provides a maximum realisation of the athlete's motor potential.

3. Top form is a non-standard state and behaviour of a multi-dimensional and multi-variant biosocial system that exchanges matter, energy and information with its environment, and under defined conditions (most often stress) is spontaneously destabilised, i.e. tends towards its entropy, similar to the so-called dissipate systems according to the theory of Nobel Prize winner Prigozhin (1977). This determines the phasic (cyclic) nature of top form, as confirmed by the sport performance of a number of world and Olympic champions: M. Ottey (100 m and 200 m), P. Ereng (800 m), S. Kostadinova (high jump), N. Bukhalov (canoeing), etc.

4. An integral criterion of top form are the high and stable sport results, above the corresponding "critical threshold", i.e. about 1.5 - 2.5% below the maximal (top) individual performance.

Key words: top form, athletic condition, top athletes, dynamics of sport results

Anpassungsprozesses charakterisiert - die Entwicklung der Hauptfunktionen, die die sogenannte Spezialbasis für die Leistungsform bilden;

- die dritte Stufe ist durch die mehr mobilen (operativen) Komponenten der spezifischen Arbeitskapazität gekennzeichnet.

2. Die Leistungsform ist ein qualitativ neues Zustand der Sportbereitschaft, in dem alle Faktoren der Spitzensportleistung optimal und harmonisch korrelieren, wodurch der maximale Aufwand motorischer Fähigkeiten des Sportlers gesichert wird.

3. Die Leistungsform ist kein Standardzustand des mehrdimensionalen und multivariaten Systems, das Stoff, Energie und Informationen mit seiner Umgebung wechselt. Unter spezifischen Bedingungen (sehr oft unter dem Einfluss des Stresses) wird es spontan destabilisiert, d.h. es neigt zur Entropie, ähnlich wie bei der sogenannten Systemdissipation, deren Theorie von dem Nobelpreisträger Prigozhin (1977) gestellt worden ist. Dadurch wird die zyklische Natur der Leistungsform bestimmt, die in Spitzenleistungen zahlreicher Welt- und Olympiameister: M. Ottey (100m und 200m), P. Ereng (800m), S. Kostadinova (Hochsprung), N. Bukhalov (Kanufahren) usw. bestätigt worden ist.

4. Das vollständige Kriterium für die Leistungsformbestimmung sind die hochwertigen und stabilen Sportleistungen, die oberhalb der entsprechenden "Kriteriumsschwelle", d.h. 1,5 % - 2,5 % unter der individuellen Höchstleistung liegen.

Schlüsselwörter: Spitzenform, Spitzensportler, Kriterien

Introduction

The main tasks that are solved in the training process can be integrated into two principal directions:

- to maximally increase the functional capabilities of an athlete (the athlete's genetic adaptation reserve);
- to most fully express these capabilities during competition.

A high and stable sport performance is based on the complex solution of those two problems. In sports practice, however, there are many examples when either the development of the athlete's functional potential is incomplete, or its manifestation is not accurately timed.

In the former case, obviously, the athletic condition acquired through training was insufficient as a basis to achieve the desired result.

In the latter case it is clear that the athlete, although well trained, was not in top sport form.

As regards the achieved level of **athletic**

condition, considerable practical experience and research evidence prove that it is a **steady state of increased general and specific work capacity of an athlete in individual sport activity**. Its complex multifactorial structure is known to include biological, psychological, social, biomechanical and purely sport-pedagogical components (S. Letunov, 1950; L. Prokop, 1959; L. Matwejew, 1977; G. Stiehler, 1973; A. Viru, 1981; F. Dick, 1980; T. Jelyazkov, 1986; P. Tschiene, 1990; D. Milanović, 1997; and others).

The problem of the nature and criteria of top form in sports is much more complicated. It has become debatable as a number of new data from the leading world sports practice have not been able to find a satisfactory explanation within the theories governing top form since the '60s and '70s. Of course, a large part of the issues, related to top form are not disputed by the specialists, namely:

- the state of top form (TF) is a natural result of the applied training loads and the ensuing adaptation changes in the organism;
- these changes have a phasic character, with their quantitative and qualitative parameters;

- TF can only develop with a steady state of increased general and specific work capacity, defined above as athletic condition (AC);
- AC and TF are two qualitatively different states, despite their common nature;
- TF is a dynamic, and not static, state which has both common and specific features for the different types of sports;
- TF is the top factor for achieving peak sport performance.

The priority contributions of L. P. Matwejew are also accepted without dispute in elucidating those matters, as they have gained global recognition and served as a theoretical and methodological basis for the contemporary periodization of sport training in highly qualified athletes.

The first debatable question comes from the fundamental definition of Matwejew that "top form in sports is that state of optimal preparedness of the athlete to achieve high sport performance which is formed, conserved for a limited time and lost over the large training cycle (macrocycle)".

The opponents' arguments (L. Arkaev and V. Cheburaev, 1983; A. Vorobyev, 1987; A. Yakimov, 1990; S. Zanon, 1997; Y. Verkhoshanski, 1998; and others):

a) The term "optimal preparedness" is rather amorphous and does not reveal its internal content. This leads to different interpretations and conclusions.

b) The triphasic cycle (formation, conservation, and loss) of TF can be reproduced many times in the smaller cycles of the preparation.

The second principled question refers to the ontological nature of the three phases in the development of TF. The way they are defined by Matwejew fully coincides with the three phases in the development of athletic condition achieved through training, which Letunov (1952) defined as: increase in athletic condition - top form - decrease in athletic condition, and L. Prokop (1959) identically defined as: adaptation - maximal sport work capacity - readaptation.

Thus, the question naturally arises: what is common and what is different (specific) in those two states of the organism - athletic condition and top form? It is logical to assume that the phases in the development of TF

(which is built only over a high level of achieved athletic condition) are likely to have other more specific and time-limited parameters (more dynamic and adaptive).

It is our view that the inherent characteristics and criteria of top form can be revealed only at a systemic level.

From such positions, we regard top form as an integral model of the preparedness of an athlete to realize his/her own potential in sport performance. The quantitative and qualitative parameters of that state can be presented as components of a variable vector, $x(t)$:

$$X(t) = X_1(t), X_2(t), \dots, X_n(t)$$

Such an approach for studying human motorics was proposed by V. Zatsiorsky and M. Godik (1966), and for diagnosing athletic condition by V. Karpman and T. Olm (1974).

Hypothesis: In the n -dimensional space there is an area which, under definite conditions, is characterized by the least sum of the squares of the distances between the various components of motor activity (factors of sport performance) - x_1, x_2, \dots, x_n . This optimized model of an athlete's specific work capacity is the sports form.

The object of our study is a wide range of elite athletes in track-and-field athletics, rowing, canoeing, wrestling, boxing and basketball over the period 1975-1997 (more than 7800 units of observation).

The subject of the study are basic parameters of total functional capacity, VO_{2max} , W_{max} , etc., registered at the National Center for Applied Research in Sports, Sofia; some specific parameters of motor activity (mostly sport-pedagogical); time course and dynamics of sport results in the annual cycles of elite athletes.

All data were processed by the methods of multidimensional statistical analysis and are presented as natural values or as statistical quantities (β -coefficients or normalised Z -values).

The quantitative and logical analysis of the results of this study leads to the following major conclusions, supported by some concrete examples.

1. Top form is a state or condition which reflects a generalized process of biosocial adaptation, i.e. a transition from lower

determined levels to higher probability (stochastic) levels of behaviour in the whole system-athlete.

The first level is characterized by stable parameters of the athletic condition achieved through training as a natural basis of top form. These are the stable components of the morpho-functional status of the highly qualified athlete, which are formed over a long period of time.

The second level is characterized by definite selectivity of the adaptation process - development of the major functions building up the so-called specialized basis of top form. These are relatively stable components, which are formed in the large cycles of preparation and are imminent characteristics of athletic condition as a state of high specific work capacity of the athlete.

Our studies over the course of 16 years (4 Olympic cycles) with a large contingent of highly qualified athletes show that the time

course of adaptation changes has a cyclic (phasic) character. It reflects the additive effect of a number of biosocial factors, including the sports calendar, which determine the permissible limits for selective adaptation of the athlete within his/her adaptive potential.

Fig.1 and Fig. 2 illustrate the time course dynamics in the specific functional fitness of the elite Bulgarian competitors in rowing (men) and canoeing (men) for a period of 16 years, by the so-called integral criterion (averaged annual values of 3 measurements of VO_{2max} and W_{max}). The two parameters were determined using a graded Lannoy veloergometer exercise, with starting power output of 60 W and incremental increase of resistance by 30 W every 90 s until exhaustion. Since VO_{2max} and W_{max} are influenced by both the athlete's functional preparedness and body mass, to eliminate the latter factor in our analysis we used the half-sums of the absolute and relative values of the two parameters

Fig. 1: Z-values of the time course dynamics in the specific functional fitness of a top Bulgarian rower

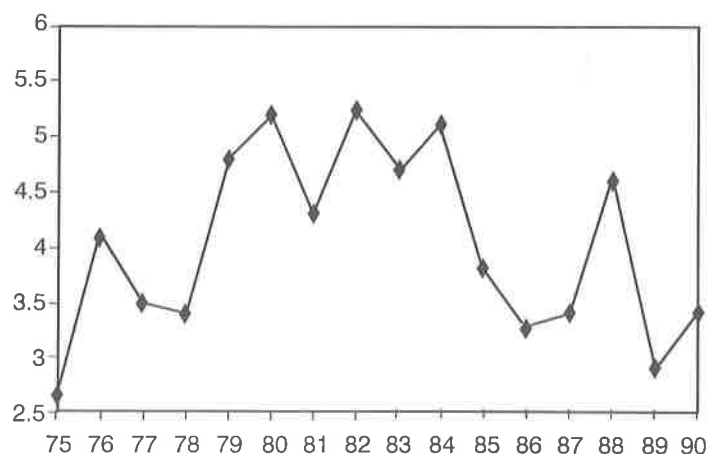
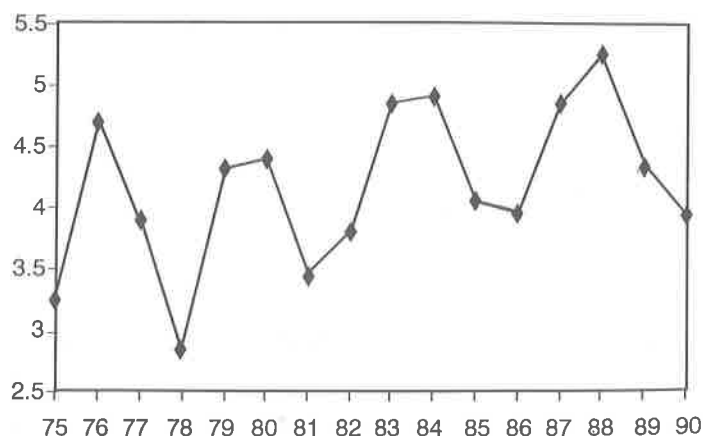


Fig. 2: Z-values of the time course dynamics in the specific functional fitness of a top Bulgarian canoeist



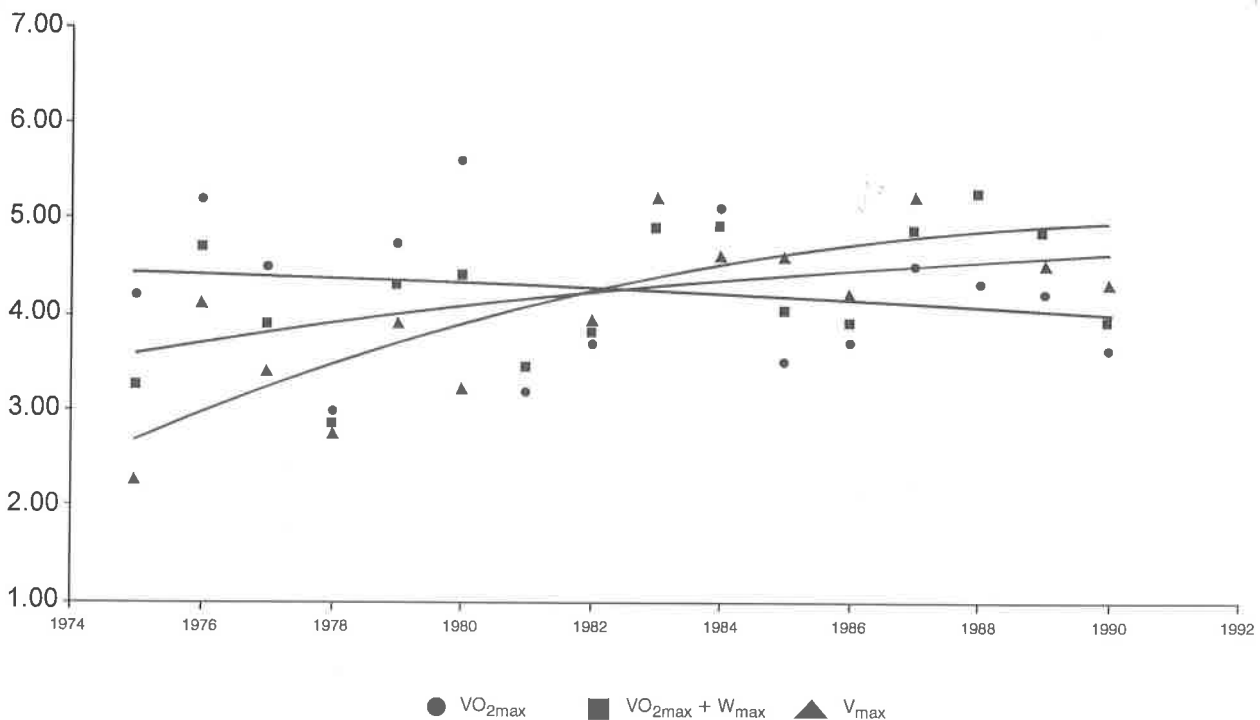
(VO_{2max} and W_{max}), performing the so-called Z-transformation of the primary data. This unification of the evaluation system provides a number of advantages for comparative analysis and interpretation of the research material.

The cyclic character of the athletes' specific work capacity is clearly seen from the two graphs, reaching its peak values in the years of the Olympic Games.

This, however, cannot exhaust the question of top form in its entirety.

The third level is characterized by much more mobile components, reflecting the current state of the athlete's operative work capacity under the added influence of different factors of variable nature, such as prestigious, motivational, mercantile, ethical, emotional, etc. This brings us to the second major conclusion.

Fig. 3: Regression of basic parameters of top form of the best Bulgarian canoeists and kayakers throughout four Olympic cycles



Considerably more differentiated information about the basic parameters of top form is given by the regression graphs in Fig. 3, which characterize the time-course trends and dynamics of the three studied parameters, VO_{2max} , W_{max} and ($VO_{2max} + W_{max}$) for the best Bulgarian competitors in canoeing and kayaking over the same period of 4 Olympic cycles. Regardless of the cyclic nature of their dynamics, the integral criterion ▲ ($VO_{2max} + W_{max}$) is characterized by a stable asymptotic trend of development, resulting from a stable aerobic base ● (VO_{2max}) and considerably improved strength endurance, ■ (W_{max}).

Conclusion: These results support Matwejew's view about the phasic character in the development of top form with respect to its baseline, relatively stable components.

2. Top form is a qualitatively new state of the athletic condition where all factors of sport performance are optimally correlated at a systemic level, also known as concordance which provides the maximum realisation of the athlete's motor potential. This attributes qualitatively new properties to the system, termed "emergence", which are otherwise missing in its individual components, regardless of their high values. This is confirmed by a number of our studies.

Table 1 reflects in concrete quantitative values the sporting biography of one of the world's most outstanding canoeists, N. Bukhalov (Bulgaria), a double Olympic champion in Barcelona '92, and multiple world champion and vice-champion.

Table 1: Sports curriculum vitae of the distinguished canoeist N. Bukhalov (Bulgaria) expressed in real quantity values of his preparedness

№	Major contests	Prize winning place			Test results before World Championships (WC) and before Olympic Games (OG)					
		I	II	III	Kg		Wmax		VO ₂ max	
1.	1986 – WC			C ₁ 500	84.7	380			61.39	
2.	1987 – WC				86.5	410			54.91	
3.	1988 – OG			C ₁ 1000	90.8	430			63.33	
4.	1989 – WC			C ₄ 500	88.7	390			58.06	
5.	1990 – WC			C ₁ 500	86.4	390			63.08	
				C ₄ 500						
				C ₄ 1000						
6.	1991 – WC		c ₁ 500 c ₁ 1000 c ₄ 1000		86.0	400			61.05	
7.	1992 – OG	c ₁ 500 c ₂ 1000			89.3	370			69.43	
8.	1993 – WC	c ₁ 500			90.4	370			58.63	
9.	1994 – WC	c ₁ 200 c ₁ 500 c ₁ 500	c ₁ 1000		93.5	380			60.96	
10.	1995 – WC	c ₁ 500			91.9	390			62.02	
11.	1996 – OG				94.8	400			64.87	
12.	1997 – WC				87.0	370			66.67	
Total of prize winning places for 12 years		6	4	6	\bar{X}	S	\bar{X}	S	\bar{X}	S
Test results before WC and OG					89.2	3.19	390	18.10	62.04	3.9
Results of all tests for 12 years /64/					89.9	2.70	395	33.41	59.95	4.4

As seen from the table, his values for VO₂max and W_{max} have been exceptionally stable over the course of 12 years, both in the tests immediately prior to major contests, and in all the measurements over the entire period - a total of 64. A similar stability was also characteristic of his biodynamic and kinematic parameters of sports technique. Nevertheless, his sports results did not always correlate with the indicated private criteria of specific work capacity. Thus, in 1992 he became a double Olympic champion in C1 - 500 and C1 - 1000 with W_{max} = 370 W and VO₂max = 69.43 ml/kg.min; in 1993 he was world champion in C1 - 500 with W_{max} = 370 W and VO₂max = 58.63 ml/kg.min; in 1994 he was a double world champion in C1 - 200 and C1 - 500 with W_{max} = 380 W and VO₂max = 60.96 ml/kg.min, while at the Olympic Games in Atlanta '96 with W_{max} = 400 W and VO₂max = 64.87 ml/kg.min he performed poorly and got the penultimate places in the 500 m and 100 m finals. Obviously, for a number of reasons, the competitor was not in top form. This comparative analysis, without making its quantitative values absolute, shows that one of

the most important integrated criteria of top form is the concordance of the factors of sport performance, i.e. their optimal correlation during competition.

The state of "top form" is characterized by relative stability in time and depends on a number of factors: specificity of the type of sport, individual morphofunctional status of the athlete, the athlete's qualification and condition, and the regimen of training loads. The selective approach to those factors provides the necessary conditions for purposeful regulation and management of top form in view of the maximal realization of the athlete in forthcoming events. Thus, we reach the third major conclusion.

3. An integral criterion of top form is a high and stable sport performance, but under defined conditions.

The experience of the best specialists and their pupils shows, that the higher the athlete's qualification, the shorter the time necessary for transition to a state of top form. Objective conditions and prerequisites for a greater dynamism of top form have been found to

Table 2: Sports curriculum vitae of the distinguished canoeist n. Bukhalov (Bulgaria) expressed in real quantity values of his preparedness

#	Date	Venue	Result	Rank	#	Date	Venue	Result	Rank
1	27.01	Athens	197	I	15	12.06	Duisburg	192	II
2	02.02	Wupperthl	201	I	16	14.06	Ingolstadt	202	II
3	09.02	Arnstadt	202	I	17	16.06	Sofia	203	I
4	11.02	Karlsruhe	199	II	18	05.07	Oslo	198	I
5	14.02	Moscow	190	V	19	07.07	Padua	200	I
6	16.02	Spala	201	I	20	03.08	Atlanta	205	I
7	03.05	Shizuoka	200	I	21	07.08	Nordenrey	194	II
8	06.05	Mito	195	I	22	10.08	Monaco	202	II
9	11.05	Osaka	196	I	23	14.08	Zurich	202	I
10	25.05	Woerstadt	200	I	24	16.08	Cologne	200	II
11	29.05	Bratislava	198	I	25	23.08	Brussels	203	I
12	02.06	Madrid	194	II	26	30.08	Berlin	203	I
13	05.06	Rome	196	I	27	11.09	Szalgotaryan	201	I
14	07.06	Moscow	201	I	28	16.09	Tokyo	204	I

exist in short-time sports, such as jumps, shot put and throws, sprint, etc., whereas in sports connected with large matter, energy and information expenditures, the periods for achieving and maintaining top form have a longer duration.

The changes in sport results and performance of several athletes from the world sport elite are a convincing illustration to the presented views.

Table 2 shows the sport results of the world

record holder and Atlanta '96 Olympic high jump champion S. Kostadinova (Bulgaria) during 1996.

As seen from the table, during the period from 27 January to 16 September, 1996 covering 34 weeks, she participated in 28 official contests and won 20 of them.

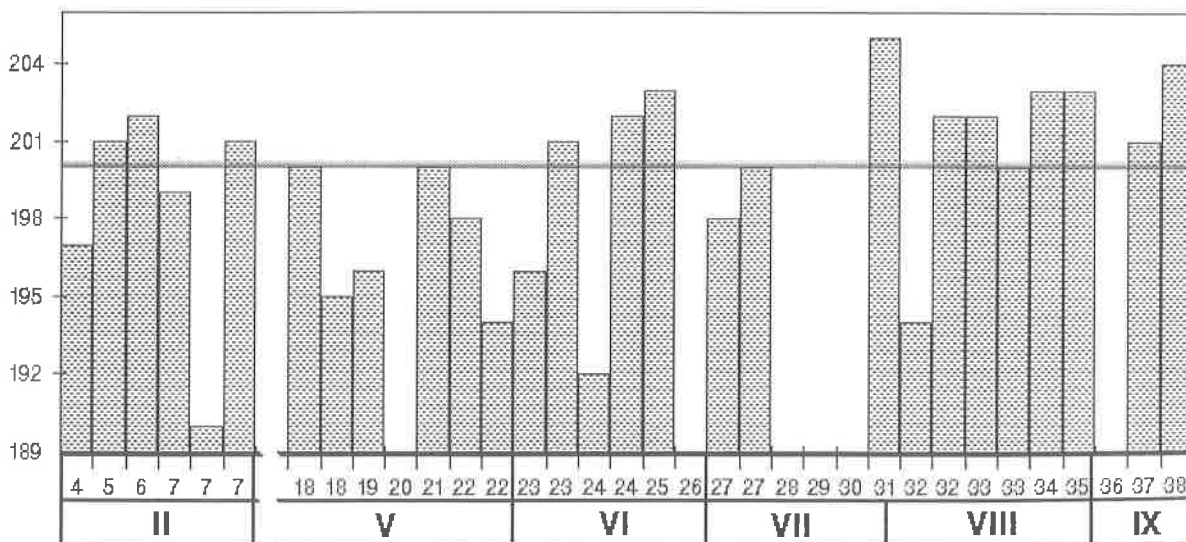
The relevant question, which is in fact debatable, is when and at what contests the competitor was in top form, i.e. when the factors of top sport performance were fully

Fig. 4: Sports curriculum vitae of the distinguished canoeist N. Bukhalov expressed in real quantity values of his preparedness

S. Kostadinova (High Jump) - 1996

Contests = 28 above Ct - 60.7%

Critical Threshold = 200 cm



synchronized and concordant. The answer to this question is related to the determination of the so-called "criterial threshold" as a measure of the permissible lower limit of variation (deviation) from that year's peak performance. This deviation has been defined, with certain conditionality, not to exceed the range of 1.5 - 2.5 % (L. Matwejew, 1991). For S. Kostadinova the threshold is 200 cm (at 2.3% of her maximal achievement that year - the 205 cm Olympic record). Based on this criterion, in 1996 the Olympic champion was clearly in top form during 17 of the total 28 contests (60.7%). At those contests her

performance ranged between 200 and 205 cm. However, these results are not scattered throughout the year, but are concentrated in three cycles (Fig. 4):

The first cycle (February) covers 4 weeks and 6 contests; in 3 of them she was in top form with the results: 202 cm, 202 cm, and 201 cm.

The second cycle (May-June) covers 7 weeks and 11 contests; in 5 of them she was in top form with results ranging from 200 cm to 203 cm.

The third cycle (August-September) covers 7

Fig. 5: The dynamics of sports results of the sprinter M. Ottey (100m) in 1990

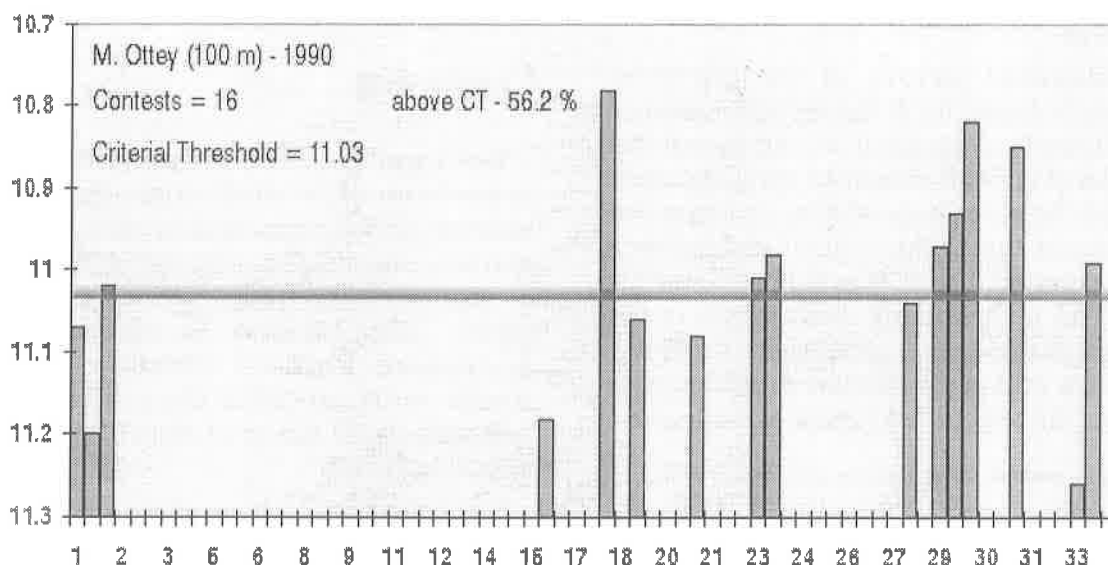
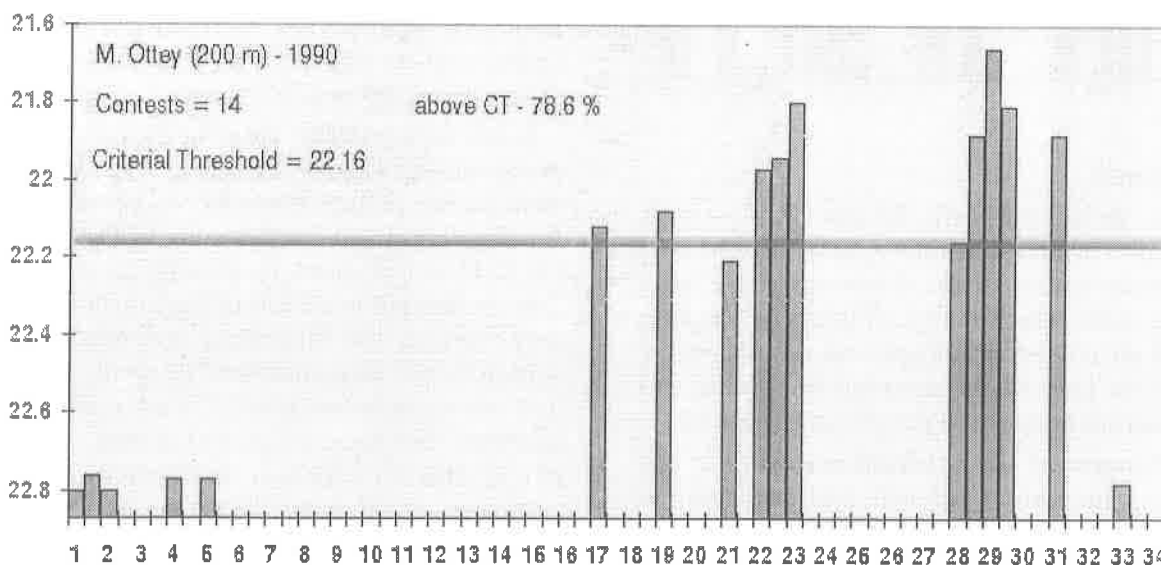


Fig. 6: The dynamics of sports results of the sprinter M. Ottey (200m) in 1990

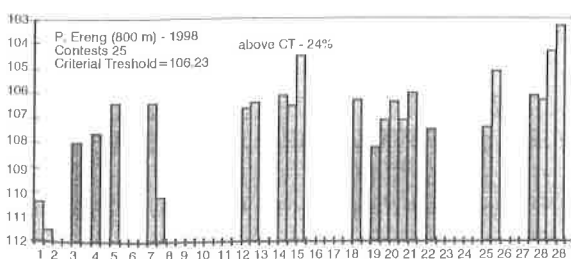


weeks and 9 contests; in 8 of them she was in top form and registered a series of exceptionally high sports results: 205 cm, 202 cm, 202 cm, 203 cm, 203 cm and 204 cm, five of them after the Olympic Games. In this cycle she had only one result below 200 cm (194 cm), immediately after the Olympic Games at a jubilee contest in Nordenrey (Germany) to celebrate the athletic career of another great athlete, H. Henkel (Germany).

The same logical conclusions can be derived from the dynamics of sport results of the great sprinter M. Ottey in 1990, when she was in the apogee of her sport performance (Fig. 5 and Fig. 6). These graphs confirm the cycle character of periodization and the stable top form of the athlete in the two distances, 100 m and 200 m.

An identical picture of the top form dynamics is found for P. Ereng, 800 m runner and Olympic champion at the Seoul '88 Olympics (Fig. 7). It should be specially noted here that the percentage of sport results above the criterial threshold is significantly lower (24%) compared to S. Kostadinova and M. Ottey. This is particularly characteristic of the first half of the annual cycle where there is a need for a prolonged baseline preparation to improve the vegetative functions and speed

Fig. 7: The dynamics of sports form of F. Erengo (800m) in 1988



endurance.

The principal conclusion from those examples which deserves special attention is the cyclic nature of the time-course dynamics of top form which is not arbitrary or random, but is strictly programmed and related to the objective laws of the adaptation process and the current adaptation reserve of the athletes.

The issue of the relevant criteria for top form in individual contests and especially in sporting games is considerably more complicated. Our studies with elite basketball

players show that it can be successfully solved using an algorithm of the discriminant analysis. The aim was to identify those parameters of playing effectiveness that possess the highest "discriminating ability", i.e. that are able to discriminate between stronger and weaker teams. The evaluation was made by calculating the respective discriminant functions and the so-called Machalanobis criterion (D^2). On this basis optimization models of the playing effectiveness were built using step regression analysis (Doolittle's modification). The integral criterion of top form in this case is the set of high values of the multiple correlation coefficient and the low values of the standard error of evaluation.

Conclusion

Top form is a non-standard state and behaviour of a multidimensional and multivariant biosocial system that exchanges matter, energy and information with its environment and under defined conditions (most often stress) is spontaneously destabilized, i.e. tends towards its entropy, similar to the so-called dissipative systems according to the theory of Nobel Prize winner Prigozhin (1977).

It is a state of high specific work capacity due to the concordant action of all factors of sport performance. At the same time, however, its susceptibility to various environmental stressors considerably increases. This determines the phasic (cyclic) nature of top form and its relative stability, as confirmed by the time-course changes and dynamics of sports performance.

Regardless of the specificity of training programs, what is worth noting is the growing importance of the operative components for the regulation and management of top form in the field of top sport. Its prestigious functions and increasing commercialization put to the test not only the bioenergy potential of top athletes, but also their intellectual, ethical, and especially volitional and emotional qualities. Top form drops and downs are most often due to stressor influences of the environment on these operative components, whereas this can almost never happen with its stable components. They can only transiently

be affected by the labile components of top form on a psycho-regulatory basis. This explains the fact why an athlete may demonstrate exceptionally high or quite modest results within an interval of only 3-4 days. This brings forward the role of positive emotions, conscious motivation, and pre-start adjustment of the athletes, as well as of the skill of the coach (very often the coach's intuition) to guide them in the best direction.

That is why the evaluation of top form by the manifested performance and achieved results at sports competitions requires not only a detailed and comprehensive statistical but also substantive-logical analysis. Only under these conditions we can assume that the primary and major criterion of top form is the achieved top and stable performance at responsible sports competitions.

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