

COMPETITIONS AS AN INTEGRAL PART OF THE TRAINING CYCLE

by Ivan Abadjiev

In my previous lectures I gave for experts - weightlifting coaches - I tried to present my concepts of the modern training process based on the adaptation theory. The sport training can be compared to a complex of selected conditions to which the athlete is subjected so that by adapting himself he improves his organs and systems, in short - his athletic performance.

The adaptation theory is based on the findings of physiology, biology, biochemistry, cytology, genetics, psychology and other medical sciences.

Let us try, by using some adaptation laws of cytology, genetics and physiology to define the role and importance of the competition activity for the preparation of the athlete.

Very often we hear and read about creating such training conditions which would resemble a real competition. The number of competition, control and test trainings is steadily increased. The athletes are engaged in more competitions. All these factors are contributing towards the improvement of sport results.

In order to explain the real, deep causes for the positive impact of the competitions and competition-like workouts on the top sport performance and to include the competition activity as a new positive element of modern athletic preparation, we have to study certain structures, mechanisms and functions of the body organs and systems during the competition. We have to know, how they react, how they function and what changes are taking place in them when subjected to competition conditions.

In my previous talks I stressed the necessity for a specialized preparation, viz. that the training session should consist mainly of classical exercises and of a negligible number of other similar lifts.

In my present contribution I shall try to give a scientific argumentation to the point that these exercises should be performed more often in a competition mode.

If we wish to give a satisfactory explanation to the **problem**, we will have to start at the fundamental principle that each adaptation is based on protein synthesis. The training **process** is an adaptation phenomenon, and this means that it causes a protein synthesis in the body. For this reason I shall try to make you acquainted with the intimate mechanisms of protein production by the living creatures.

The basic instrument for the synthesis of protein is the genetic apparatus DNA.

Fig. 1 shows an inactive chromosome as compared with an active one. In the inactive chromosome the DNA chain is squeezed from the **histomic** proteins in which the genes are not activated. With the active chromosome some histons are phosphorylizcd. Their spatial connection with the genes is disturbed and the latter start a so called transcription, i.e. they start imprinting the genetic code on the synthesized RNA.

Fig. 2 shows how the hormone compounded with a receptor protein with high affinity is penetrating the cell membrane to complete itself with a **histon**. In this way a specific gene will be relased which, on its part, will start to function by carrying out a transcription.

The further mechanism is as follows:

The newly produced **IRNA** penetrates into the cytoplasm, associates itself with several ribosomes and produces **polyribosomes**. The transport RNA pulls the 20 amine acids which after being activated by ATP, are aligned according to the code contained in the IRNA to build the structural proteins.

Why do we have to know these mechanisms? Because the training is an adaptive process based on the protein synthesis. In order to learn how to manage the protein synthesis we need to know some more regularities about them.

The nucleous receptor proteins are combined with the **hormones**. Some authors assert that these proteins are **non-histonal** and that they are made up of heterogeneous molecules which react to the influence of specific external conditions. According to Mecrsson, Yashchenko, Ratchev the hormones are vehicles of information on the newly produced IRNA. This seems to be the mechanism of producing proteins with specific qualities.

In other words: under a **specific** condition proteins with a correlated molecular weight are produced.

The above suggests that when an athlete lifts different weights which put his body in different conditions, he might provoke the production of proteins of different qualities.

Fig 3 illustrates the functioning of the genetic apparatus in a single muscle fibre during the execution of the simple exercise of clean.

The figures 1, 2, 3... depict the points in which the fibre passes over to a new mode of contraction. Please note that the running numbers 1, 2, 3, 4, 5 et. not mean that the contraction goes up as well, because with the upward movement of the barbell the tension is fluctuating. the peak is reached with A at pt. 4. The diagram indicates that at each moment of the movement the muscle fibre is contracted at a different degree.

The lines A, B and C illustrate the contractions of the fibre when lifting different poundage. The figure makes it obvious that the contraction of the muscle fibre is different for each of the poundages lifted.

The figure illustrated further that for each of the particular degrees of tension in line A which correspond to different conditions, specific genes from the genetic apparatus are employed and on that base proteins with specific qualities are being produced.

The other two lines, B and C are drawn under different degrees of tension. The arrows indicate that one and the same genetic apparatus of the same muscle fibre, but during the lifting of different poundages, employs different genes from the same genetic apparatus. If we assume that the different genes give rise to proteins of different qualities it becomes obvious that when barbells of different poundage are lifted, then proteins of divergent qualities will be produced.

The conclusion one could make reads that when weights are lifted under competition conditions (with psychologically motivated athletes and consequently with higher poundage) the production of body proteins especially those produced by the actively engaged muscles will be of a specific quality. And if at the basis of each adaptation act lies a protein synthesis, the mechanisms in reference prove that the qualities of the conditions will determine the qualities of the produced proteins.

A further conclusion could be made that lifting of different poundage represents different conditions and initiates the production of proteins with different qualities.

A general conclusion can be suggested that lifting of limit weights would provoke the reproduction of high quality proteins.

Still there exists a difference between the maximum poundage lifted during a regular training session, that at a smallscale competition

and the poundage lifted at major competitions. The highest performances are in the rule achieved at the most important competitions.

If the above assertions are correct then a general rule could be suggested that the muscle tissue of highest quality will be built during muscle efforts at important competitions. In other words the competitions prove to be the best training sessions.

Considering the above regularities the Bulgarian athletes are taking an active part in all World Cup tournaments, participating in regional championships and in the national championships. Each athlete has an average of 18–20 participations in major events. It makes a competition nearly each third week, and before each competition he will lift nearly his limit poundage.

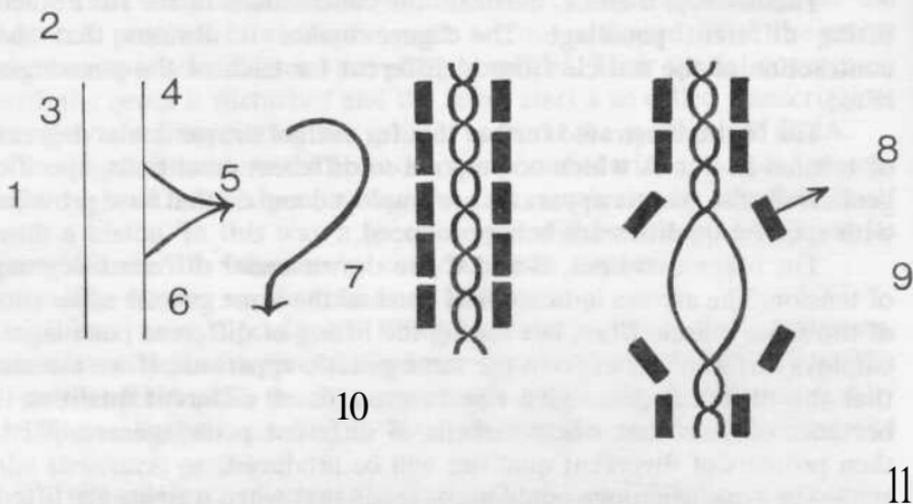


Fig. 1 Participation of 3,5-AMP and the hormones in the regulation of the transcription process

1. hormone
2. membrane
3. adenil cyclaze
4. histon kynaze
5. C AMP
6. histon
7. kynaze-C-M
8. phosphorylized histon
9. IRNA
10. non-active chromosome
11. active chromosome

Fig. 2 Scheme of the hormonal depression of genes by Yachchenko and Ratchev

