1. INTRODUCTION

Sport training of children and youth accounts for the most important stage of the entire training process. It has fundamental and decisive impact on future successes of adult competitors. At that stage foundation of motor abilities and technical skills are developed, together with psychical features, which are indispensable to man in his every day life, in the exertion of his profession and in sports. Therefore, correct realisation of children's and the youth's training becomes crucial for prospective successes, not only in sports. On the contrary, every mistake made at this stage is increased manifold in adult competitors. Various problems of sport training of children and youth became subject of numerous, extensive research works. The material collected at that time was very rich. It was presented in specialist journals and course-books. [Milicerowa 1974; Skład 1985; Raczek 1991; Sozański 1987, 1994; Starosta 1984, Handelsman 1990; Zaporozhanow, Sozański 1997]. Some of the material is out of date already. Moreover, new social-economic conditions require a different approach to many of the issues. Hence, the purpose of the work was to indicate the incorrectness that occur in the area of key problems of the training of children and youth. These problems include: 1. Qualification and selection to sport in general and to particular sport disciplines. 2. Sensitive and critical periods in the development of co-ordination abilities in the period of ontogenesis. 3. Interdependence of co-ordination and physical abilities in the training of children and youth. 4. Theoretical preparation of young
competitors. 5. The form and the content of sport technique in the training of children and youth. 6. Methods and means of various kinds of restitution.

2. QUALIFICATION AND SELECTION TO SPORT IN GENERAL AND TO PARTICULAR SPORT DISCIPLINES

Co-ordination complex sport disciplines, including sport games and martial arts enjoy an increasing popularity among younger and younger people. Some of these disciplines belong to the highest level of movement co-ordination, that is, they require a simultaneous exhibition of precision and speed of movements in the changing conditions. Practising these disciplines, not only requires the expression of various motor abilities but also develops them. The achievement of significant success in some sport disciplines is the source of considerable income. This aspect becomes an incentive to many young people who are avid of fame and money. And although the way to success demands many years of training and many sacrifices, a lot of people choose it. Those interested in success are both competitors and their coaches, sport clubs and associations, and finally countries which allocate considerable resources to competitive sport.

The amount of money spent by the countries depend, to a large extent, on the level of motor abilities, and in particular on the co-ordination abilities of the individual who practising sports. The more the competitor is talented, the smaller is the expenditure of the state on his long-term training cycle and shorter is the period of attaining the top of his fame. The mechanism seems to be simple.

The most crucial part is the selection of the candidate with most adequate predispositions. However, this is only a part of this complex problem. The second, equally important one, is the skilful management of the development of the revealed predispositions and the proper use of them in the mastering of the particular sport discipline. Frequently, it is the second part, which is more complex than the first.
(Fig. 1)

Suggested classification of selected sports disciplines according to their degree of complexity - coordination level by W. Farfel [1960] - interpretation of the concept W. Starosta [1998]

| Suggested degree of sports discipline complexity | 1. Ice and roller hockey | 14. Karate traditional - light with simulate opponent (Kata) |
|                                               | 2. Handball, basketball | 15. Figure and roller skating |
|                                               | 3. Football             | 16. Sport gymnastics |
|                                               | 4. Volleyball           | 17. Sport acrobatics |
|                                               | 5. Judo, wrestling free style | 18. Diving |
|                                               | 6. Karate traditional - light with the real opponent (Kumito) | 19. Rhythmic gymnastics |
|                                               | 7. Wrestling classical style | 20. Track cycling |
|                                               | 8. Fencing              | 21. Speed skating |
|                                               | 9. Table tennis         | 22. Weight lifting |
|                                               | 10. Tennis, badminton   | 23. Compulsory figures - figure and roller skating |
|                                               | 11. Kayak sport, alpine skiing |                   |
| I movement precision                         | 24. Archery             |                   |
|                                               | 25. Pistol shooting     |                   |
|                                               | 26. Basic skating       |                   |
|                                               | 27. Basic roller skating |                   |
|                                               | 28. Karate traditional - technique improvement (Kihon) |                   |

III. Special precision of movement performed in minimum time units under changing conditions.
II. Special precision of movement performed in minimum time units (under almost standard conditions).
I. Special precision of movement performed according to pattern.

The problem of qualification (selection) has always been crucial in every sport discipline. Finding the proper solution to the problem ensures development of the discipline and success of the competitors. The
increasing level of sport results requires the participation of more versatile competitors. In the present times, only those can achieve success on the international arena. In spite of the great number of publications devoted to various issues of selecting children to sport, there is still lack of adequate systemic solutions. In some countries only substitutes of such selection system exist. Some of them were constructed along with the following assumption: “children for sport”, which treats children as objects (i.e. in China, Cuba). Such approach was the cause of dehumanisation of the training process and of the change in the hierarchy of values. Sport result has become the principle measurement of effectiveness of training. Health, comprehensive physical and psychomotor development of the young man have been crowded out.

In few countries the motto of selection was: “sport for children”. Not always was it carried out consistently and in compliance with the latest researches. Between these two tendencies, rules for selecting children to sport have been formulated. Out of necessity I shall concentrate on the model of selection to sport and on the age for commencing systematic training.

2.1. THE MODEL OF QUALIFICATION (SELECTION) TO SPORT

Finding proper solution to the problem of qualification (selection) provides a number of advantages: it eliminates irrelevant financial outlays allocated to many years of training of inadequate athletes. It protects those who train from: waste of time, unfulfilled expectations, deterioration of health due to excess of training loads; does not discourage from taking up sport for health reasons; does not cause the coaches to sustain a loss of time; ensures valuable background for the representation at different levels. The procedure of selection applies to a very young person (a child), who is willing to practising sports, and therefore it can not contain elements which would hurt his dignity and estrange him from sport. The procedure is penetrated by such elements as: biology, medicine, physiology, sociology, pedagogy, psychology, ethics and others.

The proposed model of qualification (selection) is divided into three stages.
The first- introductory, defines the health condition, body structure and its proportions and the level of motor abilities. In the second - main one - on the basis of the results of predisposition assessment (health, somatic, functional, motor, psychical), the candidate is placed into particular groups of sport disciplines (events), adequate to his dominating predispositions. In stage three – the specialist one- the candidate, on the basis of established specific predispositions needed for a particular discipline, is proposed the training of the discipline or any related one of his interest. When comparing the predispositions of the candidate to the theoretical model of the champion, we should remember that it is impossible to find a composition of abilities and features similar to the model one. In various champions of the same sport disciplines, different compositions of model abilities and features may be observed, and that is related to the compensation of the shortages of one feature by the higher level of the other. Although the proposed model [Starosta, Handelsman 1990] is of theoretical character, it was tested in the training practice in some countries (i.e. table tennis in Sweden). In Poland it was used partially (in some sport disciplines or clubs). The selection system used so far in Poland (see Fig.
2) skips stage I and starts from stage II. This means selecting candidates straight to the chosen sport discipline. In view of the systemic solutions, as well as humanistic principles, it is an organisational and methodological error. This means that representatives of each discipline seek adequate candidates for themselves. With such a system of selection, it is likely to happen that among those turned down were people who could have possibly attained success in other sport disciplines. Hence, every sport discipline requires a different composition of motor abilities. From the point of view of a particular sport discipline, such a narrow approach may be justified when the most talented are picked out from hundreds or thousands candidates. However, from the social point of view and from the interest of the entire sport in a particular country, it is an irrational approach. This kind of approach was the cause of elimination of a large number of movement talented children, who did not have the chance to “fall on the right” discipline because of the limited offer, and once rejected did not make an attempt to get engaged in any other discipline. Such a solution applied in the long-term may discourage those most talented and ambitious individuals from taking up sports, and those, when adults, may subsequently discourage their children from taking up movement activity at all. Even if the long-term training starts immediately with a specialisation, nothing should prevent from treating such a “choice” as a temporary one, while considering participation in sport activities as a confirmation or denial of its justness. There should always exist a possibility of changing the specialisation.

2.2. THE AGE OF BEGINNING SYSTEMATIC TRAINING

The age of the individual is a crucial though not decisive criterion in conducting selection. It is also not a criterion of specialisation. The organisation of championships of the highest rank (World and European) for younger and younger competitors, juniors, youngsters and children – forces coaches to commence intensive training at a very early stage. Doubts arise whether early training and participation in a particular discipline comes as the result of the interest of the young competitors? Does it affect positively their health, comprehensive physical and motor development? Who are they needed for? Doubts arise. Once children were treated as objects, it was of no importance, since it served the ideology. However, even in the former German Democratic Republic certain regulations protecting children against excessive exploitation existed. It is possible they resulted rather from rational approach than
from humanistic principles. Nowadays, for the sake of protecting children from adverse effects of the contemporary sport, seeking response to such questions becomes an obligation of all who participate in the training process of children (coaches, doctors, sport activists, judges, parents and others).

The contemporary development of sport forces an early start of systematic training. This is connected in general to the intensive exploitation of the child’s organism, which causes injuries, overload degenerative changes, deterioration or even loss of health. Some countries take part in this “race”. No one says that Poland should follow them, the more so that it is against the Children’s Rights Convention of the UN [Klodecka-Rozalska 1991]. It is quite probable that just as in Germany, also in other countries lawsuits of parents claiming compensation for the loss of health of their children will take place. The defendants are not only clubs but also coaches themselves.

In view of the above mentioned facts it is indispensable to put forward a basic question: will the results of the researches confirm the necessity and the purposefulness of such an “acceleration of a sport career”? The analysis of the age at which martial arts were taken up by about 20000 champions of that discipline [Tumanjan 1984] demonstrated that competitors who started training late, achieved almost the highest class. For example, a considerable majority of free style and classical wrestlers started practising the discipline after they were 13 years old. This observation may confirm that it is not advisable to start early the training process in wrestling. The Roman principle: “slow and steady wins the race” is followed. Most probably the delayed commencement of the systematic training is a kind of a “biological protection” of the competitors, which enables them to function more effectively at the higher stages of training.
Similar results were obtained in our own researches conducted on the best Polish wrestlers. Another issue excited curiosity: how many years of training was needed to "lead" a wrestler, from the former Soviet Union, from the stage of a beginner to the champion? The number of years other at different times and the average number of years lowered steadily, so that in the years 1975-76 it reached similar values for both free style and classical style wrestlers, that was 6 years.
Depending on various factors, a wide span of the competitors' experience in competition participation was observed: from 1 year to over 12 (classical style) and over 19 years (free style). When considering the range of these results, a question arises: what is the value of the arithmetical means that come out as a result of them? The value is dubious. Nonetheless, they constitute the starting point for establishing the age of starting training in this discipline. An even worse solution is to establish the age basing on the constantly changing average age of the medal holders at World Championships and Olympic Games.

On the grounds of the presented facts, the average span of time needed to achieve a champion's rank (level) should be treated in a flexible way that is, it should be defined within the limits involving most of the cases. We are authorised to do this thanks to the materials obtained following researches conducted on wrestlers and following results of our own researches [Puni, Starosta 1979; Starosta 1982; Starosta, Handelsman 1990]. The starting age for taking up training by those investigated, and the average time needed by them to win the world championships...
in ice figure skating – a very coordination complex sport discipline was calculated.

Age of beginning the training on the world champions in figure skating

n=75

[Starosta 1979]
(Fig. 6)

Figure skaters began training their discipline at different age (over 50% of them started the training at the age of 5, 7 and 8), and they needed a different time span to get from the stage of the beginner to the world champion. This span was about 10 years!

An interesting tendency was also observed when following the data of top Polish competitors in rhythmic gymnastics [Drozdowski after Struzyk 1979]. To achieve a first class in this discipline of sport, an average of 3 years of training was required, and the optimal age to start the training
process was 11. Girls taking up rhythmic gymnastics at the age of 8
needed about 5.4 years of training to get to the level of the I sport class
level; at the age of 10 the time span was 4.3 years and at the age of 11
– 3.1, at the age of 12 – 3 years, at the age of 14 – 3.2 years.

Relationship between age of beginning the training in rhythmic gymnastic and the receive the
first sport class on the elite of Polish sportsmen competitors [Starosta 2002*]

(Fig. 7)

These results suggests that: practising a particular discipline should be
started as early as possible (the tendency is still binding), but at the
most optimal age. These data, specific for every particular discipline is
gradually being developed [Starosta, Handelsman 1990].

A very important conclusion concerning especially the theory of sport
selection is drawn out of the data presented: the statistic elaboration of
the material collected from the practice of the selected disciplines does
not confirm the purposefulness of starting the training at an earlier age.
The tendency to lower the age of systematic training is not justified by any bio-social determinants. This is contradictory to the idea: “sport for children” which is an invention of people who crave for success at any cost. Such a tendency deserves condemnation, irresponsible experiments. since no one has the right to risk the health or even the life of children through irresponsible experiments.

2.2.1. SENSITIVE AND CRITICAL PERIODS IN THE DEVELOPMENT OF COORDINATION ABILITIES IN THE ONTOGENESIS

So far these periods were dealt only with respect to physical abilities, i.e. strength, speed, endurance [Baur 1987; Gużałowski 1977; Kiphard 1983; Martin 1982; Winter 1984]. There was no idea how these periods were manifested as far as the development of co-ordination abilities, since they are more susceptible to changes than the physical ones. Therefore, the search of sensitive and critical periods, being in common with all motor abilities, turned out to be an abortive attempt. In addition, a decided majority of authors collected the material on the basis of cross-sectional research [Ljach 1990].

Sensitive and critical periods in the development of co-ordination abilities

The progress in maintaining dynamic equilibrium from the pre-school age to the adult one

n=2647

(Fig. 8)

\(\text{Time (s)}\)

\(0\) \quad \(10\) \quad \(20\) \quad \(30\) \quad \(40\) \quad \(50\) \quad \(60\) \quad \(70\) \quad \(80\) \quad \(90\) \quad \(100\) \quad \(110\) \quad \(120\) \quad \(130\) \quad \(140\) \quad \(150\) \quad \(160\) \quad \(170\) \quad \(180\) \quad \(190\) \quad \(200\) \quad \(210\) \quad \(220\) \quad \(230\) \quad \(240\) \quad \text{Age (years)}

1. Exp. \(n=85\)
2. Exp. \(n=52\)
3. Exp. \(n=40\)
4. Exp. \(n=1250\)
5. Exp. \(n=1250\)
Against such background, the result of many years of observation conducted by P. Hirtz [1985] on a large group of individuals, and more modest results of our own research stand out rather favorably. The ability to maintain balance and the level of global co-ordination abilities, i.e. of the whole body was improving dynamically along with the age of the girls and boys. However, boys featured higher increases/increments. Most significant increases were observed before the age 11. In both test tasks, boys obtained average results higher than girls. Maximum values were achieved by the investigated only at the age of 15-20. Earlier, these values were observed among training girls.

Basing on the material discussed, one may mention the appearance of critical periods (see Fig. 8-9). Hence, between the ages 11 and 13, a temporary stagnation or regress in the level of the ability to maintain, both the balance and global co-ordination abilities, were observed. They were more distinguishable among girls and among those not practising sport at all. This may be explained by the fact that only individuals, in whom such changes take place less dynamically, remain in sports.
2.2.2. INDIVIDUAL CHANGES IN THE LEVEL OF CO-ORDINATION ABILITIES

Average values of the measurements of the abilities to maintain balance have confirmed the revealing of the sensitive period between the ages 7.10 and 10.6 and of the critical period between the ages 10.6 and 13.6. The values also demonstrated a significant differentiation in the time the critical periods in girls appeared.

(Fig. 10)

Relationship of movement coordination level and technical preparation in figure skaters in various of training periods

[Starosta, Starostowa 1988]

(Fig. 11)
Individual variability of a selected element of motor co-ordination in young female figure skaters in course of their career (sums of best right and left turns).

Also, as far as global co-ordination abilities registered within the period of 4 years, and among young ice figure skaters aged 10 -12, a considerable fluctuations of results was observed under the circumstances of general increasing tendency. It is important that those tested obtained higher sport classes in the times of considerable improvement of results of the evaluated element of co-ordination ability. This confirms the relationship between the level of the evaluated element of co-ordination abilities and the technical preparation. The stagnation of results and even its temporary regression was especially visible between the ages 12 and 14. These changes were more distinct among girls than among boys. Changes in the co-ordination level were significant only in the case of results of extreme measurements, i.e. I and IX. Girls featured a bigger differentiation of results and boys a smaller differentiation (Fig.13). The curve of average results showed a relatively mild course.
A fuller picture of the changes taking place was observed when analysing individual results (Fig. 12-13). It demonstrated considerable differentiation in the age when sensitive and critical periods appeared in every particular person. Not all individuals featured big fluctuations of results. The suspension of the development of co-ordination abilities or its regress was revealed at different age. The range of changes differed also in every particular individual. When comparing the curve of individual changes with the mean arithmetical values of the investigated group, it is possible to note that the latter “flatten out” the value of the changes, that is they blur the occurrence of the critical periods. This is especially evident among boys.

Each of them was characterised by a different picture of changes of the level of the co-ordination abilities, affected most probably by the pace of biological development.

The results of the researches conducted show that the occurrence of sensitive periods, and especially of the critical ones in the development of co-ordination abilities, is much more distinct during long-term observations. The results obtained point to the necessity of introducing corrections into the hitherto existing sport training system in Poland, which would take into account the intensive development of co-ordination abilities between the ages 7 –11, and would apply an
accentuated stimulation, regardless of the discipline practised. This would demand a selective effect on the increased development of co-ordination abilities and prevention against its decrease or stopped (suspension) due to excessive increase in the physical ability level (particularly strength and endurance). In such situation it is indispensable to elaborate a new model of sport training of children and youth.

3. INTERDEPENDENCE OF CO-ORDINATION AND PHYSICAL ABILITIES

Both abilities are closely related to each other. By developing one of them, we develop indirectly the other. However, concentrating on the development of physical abilities especially in children, may put the increase of co-ordination abilities at a disadvantage. Moreover, this level may lower or even stop children's further development. Co-ordination abilities are more strongly genetically determined. Thanks to their level, we are able to recognise not only motor abilities but also psychical features of an individual and the efficiency of the functioning of the central nervous system. In spite of that we do not frequently check the level of co-ordination abilities when conducting selection to various sport disciplines. The mutual relationship of physical abilities is not entirely known. Little is known about the relationship between physical and co-ordination abilities. To a little extend they were a subject of special researches. Four years of research conducted on the Polish national team competitors in wrestling, demonstrated a variegated relationship between performance results of various tests of co-ordination and physical abilities.
Correlation coefficient of physical abilities tests, selected somatic and the others indicators of advanced classic-style wrestlers (on the basis of 7 researches) n=30 [Starosta 1986]

(Table 1)

Kind and number of motor abilities or physical traits in presentation of different authors [Starosta 1981]
In principle, the problem of relationship between these abilities was dealt with only when considering other issues. Furthermore, physical abilities were the main problem of research for years, whereas there was little time left for co-ordination abilities. Some of these theoretical concepts formed an obstacle. Among them dominated a concept which claimed that the only measurable abilities were the physical ones. However, even W. Zaciorski [1970] thought it necessary to develop not solely physical abilities.

The concept of H. Gundlach [1970], which proposed a simultaneous development of both physical and co-ordination abilities, did not meet with approbation among Polish bio-mechanics, who limited motor abilities to physical ones. Hence, training programs of only few coaches, including those who dealt with children and youth, offered traces of measures focusing on the development of co-ordination abilities. In their everyday practice they were supposed to settle the problems of the balanced development of both abilities, especially in technically complex sport disciplines. Such a situation came into being in some countries, including Poland, where there was a lack of theoretical concept regarding the relationship in the development of two kinds of motor abilities. Many coaches, thanks to their many years of experience were able to solve the problem quite correctly. On the basis of their experience and on the basis of my own and other available literature, I have set up a classification of debatable areas and of threats relating to the relationship of development of physical and co-ordination activities in the training process.

This specific classification is of indicatory (approximate) character and may be used as material for substantial discussion. Basing on this material it is already possible to formulate methodical recommendations, which could facilitate the guiding of motor abilities development during the sport training, of young competitors in particular. Of exceptionally conflicting character is the development of strength and endurance abilities. Their intensive and uneven development may be hindered or lowered by other physical abilities (i.e. speed, jumping ability, flexibility) but most of all by nearly all co-ordination abilities.
(Table 2)

Indicatory (hypothetical) correlation of physical and coordination abilities in sports training process - free from the possibility of collision area (space), discussion and threaten area

[Starosta 1999]

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<td>Movements symmetrization</td>
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0 - free from the possibility of collision area  ? - discussion area  ! - threaten area

Being familiar with the fact is extremely important for those who conduct activities with children and youth. It does not mean, however, that measures developing strength and endurance should be avoided when training with children and youth. These measures can be used with caution and combined with other exercises developing a variety of other co-ordination abilities. For example, after a series of strength
exercises it is indispensable to apply exercises developing the ability of muscles relaxation, which performed a certain work. Special precautions should be taken when developing, strength in the sensitive period, that is between the ages 7 and 11. It is inadvisable to develop maximum strength because it lowers the ability to portion it, i.e. exhibiting optimum strength (only the one which is really relevant). Such an optimisation of strength exhibition was called “strength precision” [Starosta Rynkiewicz 1998]. It is an example of a rational combination of co-ordination abilities with physical ones. This kind of precision is fundamental in nearly all kinds of sport disciplines and is a symptom of the high level of sport mastery. Without it, it is impossible to attain high results, both in track and field throws, as in weight lifting. Similar caution is necessary when developing endurance. Analogous to strength exhibition, it is connected with considerable loading of the entire organism. A full restitution of the organism takes place after many hours (sometimes after 48). This requires the application of adequate training loads, between which accordingly long breaks should be introduced. Particularly complicated is the development of endurance abilities in co-ordination complex sport disciplines. The development of co-ordination abilities requires a high level of concentration attention which strain, to a large extend, the central nervous system. Therefore, it is not recommended to perform too many exercises developing particular co-ordination abilities during one training lesson (session) unit. The more so that such exercises should be performed mainly during the introductory part of the training lesson.

In the early stage of the training, taken up at the most proper, optimal age for the child, the most important objective should be to set strong foundations for the future specialisation. The right foundations means adequate proportions of co-ordination and physical abilities development. In the period of the child’s particular susceptibility to external stimuli, that is in the sensitive period, the development of all basic co-ordination abilities, and particularly of those considered as the leading ones in case of school children, should predominate [Hirtz 1985]: exhibiting speed reaction, maintaining balance, rhythmisation and differentiation of movements, spatial orientation. Also, in the critical period it is necessary to apply a large number of different and unknown exercises, thus enabling the children to overcome disharmony which is observed in their movements. The more distinct is the critical period, the more exercises should be applied. In the comprehensive motor preparation it is essential to elaborate on the ability of movements symmetryzation, i.e. to attain equally close efficiency (fitness) of both sides of the body.
In the early stage of the training process of the children and youth, a gradual portioning of the special preparation is required. According to many authors [Aleksiejew 1964; Soldatow 1964; Puni, Starosta 1979] the fundamental element of the well understood early (commenced at the right age) specialisation is the suitable proportion of the general and special preparation.

The idea corresponds to the Roman principle: “slow and steady wins the race”. This principle should be the central idea in formulating objectives and tasks in the particular training stages: suitable to the age of the individual (it should take into account his physical and psycho-motor development), and possible to achieve without risking his health. The aims and the tasks of these stages should be subordinate to the main objective of the long-term training. Whereas, the achievement of high sport results should be required only at the higher stages of the training process.

4. THEORETICAL PREPARATION OF YOUNG COMPETITORS

A important component of the comprehensive training is the theoretical preparation, regarding junior and senior competitors, which so far has not been recognised properly. Proper solutions to it have not been worked out yet in any country, although its value is indisputable.
In Germany 30% of the total time of physical education in secondary schools is devoted to theory. Its rank is confirmed by a course-book (hand-book) for athletes which was published in the former Soviet Union 38 years ago [Romanow 1964], and which dealt with an interdisciplinary knowledge on various issues of sport training (foundation of anatomy, physiology, psychology, biomechanics etc.). It was an extensive (455 pp.) vademecum on the theory of sport training, prepared by outstanding specialists (Z.Birjukowa, W.Farfel, W.Filin, W.Djaczkow, D.Donskoj, M.Iwanicki, L.Matwiejew, P.Rudik et al.).

Sport training can not exist without the theory. During each training lesson, the coach should convey to his athletes, through brief, synthetic information, some knowledge on the training process, on its principles,
on the influence of the exercises on the organism etc. It is important however, to expand the range of information, so that the compact knowledge passed to the athlete would help him in getting more familiar with the functioning of his own body in different conditions, and especially in those toughest, that is - during competitions. Equally important is also to teach a young athlete to observe closely his own organism and its functioning. It is of vital help to the competitor himself. Also to the coach it is a source of additional information, which is relevant to the rational management of the training process with loads applied.

It is worth stressing that the coach ought to have a plan of theoretical preparation of his athletes, which would include every vital issue. After a certain period of training these minute fragments of knowledge should form a certain entirety. This form of the athlete’s education should be applied before the right training lesson and after their termination, and their intensification should take place during meetings in sport preparation centre and in transitory training periods. It is advisable to use more active forms of conveying the knowledge; talks, discussions, contests, questions and answers and others.

5. FORM AND CONTENT OF A SPORT TECHNIQUE IN THE TRAINING OF CHILDREN AND YOUTH

Sport technique is sometimes perceived as a form of movements only – i.e. their external image revealed in defined, purposeful and mutually conditioned translocations, in the positions and the movements of hands, legs and trunk of a competitor, which are described by various indicators: the amplitude of movements, their speed, tempo, rhythm etc. Hence, one sometimes forgets about the external conditions, which are called the content of the sport technique. They are described by such imperceptible indicators as the functions of the central nervous system, the aspects of willingness, contractions, tensions and relaxations of muscles or the use of their elasticity. The way of using gravity as well as the force of inertia, acceleration and slowing down is also important [Ozolin 1964]
Components of sports technique  [Starosta 2001]

(Fig. 17)

SPORTS TECHNIQUE  
(variant of exercise executions)

FORM  
"external picture of movements"

* intended and interdependent translocation of the athlete,
* position and translocation of his arms, trunk and head
  (parameters extent and interdependence of movement,
  its speed, rate, rhythm, etc.)

CONTENT  
"internal picture of movements"

* function of the central system;
* demonstration of volition;
* contractures, tension and relaxation of muscles;
* utilization of force of gravity, inertia, acceleration,
decceleration and other factors;
* special for sport disciplines
  kinesthetic sensations
  (i.e. "apparatus feeling", "javelin feeling", "water feeling", and others)

TECHNIQUE INDIVIDUALIZATION AND OPTIMIZATION

MASTER'S TECHNIQUE

In practice, the forms of movements are frequently taught without studying their contents thoroughly. This is done with hope that the competitor will learn by himself the competence of relaxation of muscles – it is indeed impossible to perform movements without the work of muscles. However, in order to learn a perfect technique (a mastery one), it is necessary to perceive teaching as a whole, including both of the components - the "internal" and the "external" ones. It is impossible to reach a high level of expressive sensations, which are specific for the particular sport disciplines, i.e. the "feeling of water" in swimming,
rowing and kayaking, the “feeling of ice” in speed and figure skating, the “feeling of ball” in volley-ball, basketball and handball, etc., without the rational composition of two elements of the technique mentioned above. The active partnership of a coach and a competitor in creating its individual and best variant helps to master the top technique. This is extremely important for the teaching of children who - copying the movements shown to them - learn in the first place their “external” image. The more talented pupil, the more accurate is the copying of movements. However, if the “external” image is not complemented with the “internal” one on time, the further development of the competitor may be hindered. The teaching of the form of movement only is much easier. Its external conditions can be improved by that one only, who has individually experienced every phase of movement and has his/her own essential movement experiences (among others, the kinaesthetic sensations).

When learning more complex exercises it is extremely important to become conscious of their external structure (the form) and their rhythmical scheme. Such notion should be understood as a rhythm that is typical for each exercise. The difficulty in perceiving the rhythm constitutes very often a basic hindrance in the learning of the whole exercise. For example, a mistake in the rhythm of a vertical jump causes that the jump is not very high. The rhythmical components of the technique of an exercise should be maintained here. In this case - among others - the slow and calm preparation for the jump should be maintained, whereas the straightening of legs should be done with the adequate (increasing) acceleration and synchronised with the take-off. Having understood this, I have started to prompt a rhythm. I have called it a “rhythm leader”. Prompting a rhythm while perfecting ex. obligatory figures of figure skating, and particularly the loop in eight and in paragraph, by using the voice to intone the rhythmical line, makes it easier to understand the speed of performing its particular parts. I have used also clapping and whistling for the same purpose. I have also used the visual impulses, sometimes even simultaneously, marking the ups and downs of the rhythmic line. The “rhythm leader” has proved to be particularly helpful in improving technique of exercises, but it has also been very effective in the early phase of teaching of children. Highly advanced competitors have used this method, since the perception of the proper rhythm allows for a smooth performance of the exercise, that is without any well-marked acceleration and stops.
6. METHODS AND MEANS OF THE VARIOUS TYPES OF RESTITUTION

I have included them into this work since a big part of them constitutes an insufficiently used reserve, not only in the competitive sport of adults but also in the sport of children and youth. Additionally, among methods and means, which are used very rarely or not used at all, there are also amazingly simple and effective ones which require neither the additional financial means nor any special outfit. Conventionally, they were divided into three groups [Starosta, Handelsman 1990].
(Fig. 19) Psychological restitution means

- Psychohigiene (means addressed for maintenance and health improvement)
- Psychoprophylaxis (means addressed for illness prophylaxis)
- Psychotherapy (means addressed for illness treatment)

Psychoregulation training

Psychological regulation means
- Self-regulations means
  - Self-suggestion
  - Self-stimulation
  - Self-approval
  - Self-encouragement
  - Self-order (command)
  - Mental training (including ideomotor)
  - Self-observation
  - Self-analysis
  - Self-evaluation
  - Self-criticism
  - Faith – creed in magical influence of different symbolical subjects (i.e. mascots, sport facilities)

Relaxation techniques
- Relaxation exercises
  - Musical therapy
  - Psychodrama
  - Hypnosis
  - Interpersonal training
  - Bio-energotherapy
  - Autogenic training of I. H. Scultz
  - E. Jacobson’s technique of relaxation
  - Zen exercises
  - Meditation
  - Transcendental meditation
  - Bio-feedback
Pedagogical restitution means

- Full and adequate warming up
- Rational structure of training process
- Rational planning of training process
- Means permitting the maintaining of high level of working abilities and accelerated restitution

Individualization
- Rational combination of general and special preparation
- Building optimal micro and macro training cycles
- Organization of training process ensuring optimal restitution

Applying diversified loads
- Diversifying means and methods
- Means "switch-over" ("change-over") (transferring from one kind of activity to another)
- Restitution cycles and days of prophylactic relaxation

Rational day course (lifestyle)
- Various training conditions (i.e. environment, sport facilities, its lighting)
- Optimal inside conditions
- Diversified plan of inter-group and between-group rivalry (including sport competition)
- Attractiveness of training program

Creating positives emotions
- Restitution exercises
The first one refers to the methods and agents of the biological restitution. Out of the bio-chemical means – these authorised only, of course – the aroma-, phyto- and homeotherapy are used very rarely. All of them are easily available to almost everyone who practising exercises. Physiotherapeutic methods are used most often – mainly in the injury treatment, and more rarely in the prophylactics. In some Centres for Olympic Preparation (Spala in Poland) the use of cryotherapy (treatment with low temperatures) in the injury treatment and in the speeding up of the restitution process has become quite common recently. Special agents have become also quite popular.

The second group refers to the psychological restitution means. In our country the psycho-prophylactics is most often practised by application of means that aim at the prevention of possible symptoms of illness. Not too much attention is paid to the ways of the self-regulation of the emotional states, particularly in the training of children and youth. The various ways of auto-suggestion, self-stimulation, self-approval, self-encouragement, self-orders etc. are almost unknown. Thanks to the growing activity of some psychologists the techniques of relaxation, concentrating on the regulation of the emotional states as well as on the psychological restitution after training and during the competitions with multiple starts, have become more and more popular. Psycho-hygiene, i.e. the agents aiming at keeping and improving one’s health, has been used to a small extent so far.

Pedagogical restitution means compose the third group. They seem to be widely known and probably that is why they are so respected. It is difficult to count how many injuries have happened to the competitors of the national team as a result of the improper warming up. The rational structure of the training lessons, where the individualisation of loads, the learning or the improving of a technique (ex. by the left-handed competitors) is very meaningful, is not used very often. How many mistakes are committed as far as the range of proportions of the training methods aiming at the general and specific motor preparation? In training - even of children and youth - the development of physical abilities is very often promoted at the cost of the co-ordination ones, despite the specificity of the sport discipline. In training programmes it is more and more difficult to find the optimal structure of micro- and macro-cycles. What is more, the mistakes in the range of training of adults are transferred onto children. Within the frames of the rational planning of the training process, the diversification of the loads as well as of the means and methods is used very rarely. The rational way of living of the young competitors leaves much to be desired.
7. CONCLUSIONS:

The qualification (selection) method used in many countries so far, includes a mistakable organisation-methodological principle, within the frames of which the representatives of a particular sport discipline look for adequate candidates for themselves. As a result of it, among the individuals turned down in one discipline, there could have been people who could achieve success in other disciplines. Thus, there is a necessity to use the new, more contemporary model, which has been proposed in this work.

The practising of a particular discipline should start at the most optimal age. The tendency to lower the age of the beginning of the systematic training, which is presently practised, is justified neither by research results nor by bio-social conditions.

The early specialisation should be introduced according to the Roman rule: "slow and steady wins the race" and the comprehensive motor development, including the co-ordination abilities, should be emphasised. It is necessary to use proper (adequate) proportions between developing physical and co-ordination abilities. The abilities mentioned above as well as the general preparation (instead of the specific one) should dominate.

The results of the researches have clearly revealed the sensitive periods in the development of the co-ordination abilities among children aged 7-11. Particularly, it points to the necessity to care about the development of these abilities in the aspect of quantity and quality. The lack of properly oriented efforts may lower the level of the co-ordination abilities of the sport exercising (practising) person and may cause losses, which can not be made up for later on

The material gathered has enabled the identification of critical periods in the development of the co-ordination abilities among children aged 11-13,6. The tangible changes have been observed while analysing the individual results. This knowledge should be conductive to making suitable training plans that would take into consideration the difficult period in their motor development. This is particularly important in the technically complex sport disciplines, in which individuals featuring more meaningful critical periods, are frequently rejected and defined as "non-prospective".

The results obtained indicate the necessity to correct the training system used so far, i.e. the intensive development of the co-ordination abilities and the limited development of the physical abilities
(particularly strength and endurance among children aged 7-11, irrespectively from the sport discipline practised. Thus, it is necessary to elaborate a new educational model.

In the training of children the adequate proportions of the development of the physical and co-ordination abilities should be of a special importance. The development of the strength and endurance abilities is extremely conflicting. Their intensive and uneven development may stop or lower the level of the development of other physical abilities (ex. speed) and, in the first place, of almost all basis co-ordination abilities.

In order to master the top technique, it is necessary to treat its teaching as a whole, taking into account its both elements: the form of movement (the “external” pictures – image) and the content (the “internal” one). This is particularly important in the teaching of children who copying the movements shown to them – learn first of all their “external” image.

In order to increase the effectiveness of the training of children and youth, it is necessary to use methods and means of the various type of restitution. Among them, the most available ones, i.e. the pedagogical, should be of a special importance.

8. REFERENCES
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