FOR SCHOOLS

Our "For Schools" double in this issue concentrates on two entirely different events. The first article, translated from Estonian, gives information related to the planning of distance running training in the 10 to 18 years age range, stressing once again the importance of many-sided development. In the second article Anatoly Bordartchuck sums up the principles applied to the development of young hammer throwers in the Soviet Union.

SOME FACTORS INFLUENCING THE TRAINING OF YOUNG DISTANCE RUNNERS

By A. Pisuke, A. Nurmekivi

The authors look at the major aspects to be considered in the planning of training for young middle and long distance runners in the 10 to 18 years age range. The article is based on translated extracts from "Kesk-ja Pikamaajooks", published by Eesti Raamat, Tallinn, Estonian SSR.

Despite several basic similarities with the training of adults, there are a number of factors to be considered in the preparation of young distance runners. The most important of these specific factors are:

— Consideration of the specific age features.
— Employing the principle of a proportional development of physical capacities.
— The use of training means and methods that lead to the development of a foundation for future top performances.
— The development of different physical capacities during their optimal development age.
— Turning training into an emotional and interesting activity.

The age specific features from the viewpoint of endurance training includes two most important indicators in the aerobic and anaerobic

YOUNG DISTANCE RUNNERS
A number of training factors have to be considered.

work capacities. Looking at oxygen consumption shows that differences between adult and young athletes exist only in their absolute values. There is no difference in the O_2 consumption for kilogram of body weight. Theoretically children have the same endurance capacity as adults, however, this is not exactly true in practice. The reason for this is firstly in the much higher maximal heart frequency of children. The high heart rate reduces the stroke volume and increases the recovery time after work.

Despite this, there is today no indication that the development of the functional capacities of children should be limited. There is danger only in over-loading that can lead to disturbances in the nervous system. It is therefore most important during the growth period to take into consideration the need for more time to recover from training.

The anaerobic work capacity of young athletes, in comparison to their aerobic work capacity, is lower. It appears that this is partly influenced by hormonal factors. However, it should be stressed that training allows to improve considerably the anaerobic work capacity, particularly in the 14 to 18 years age range (Kindermann). According to Travini, the most suitable age to begin with the development of general endurance is 9 to 10 years. The development of specific endurance for boys should start at the age of 14 to 15 years, for girls 13 to 14 years.

At the same time it is important that the development of all physical capacities must take place in proportion and distance runners are no exception. Besides the development of endurance, young distance runners must not forget the development of speed, strength, flexibility, mobility, co-ordination and so on. The development of general all-round physical capacities must also be in proportion to the improvement of specific capacities.

The correct planning of training from the young age into adulthood should take a wave-like step by step increased workload that incorporates gradually the most efficient training means. The wavy pattern is orgnised to develop different physiological systems during their most suitable periods, reducing the load at the less effective ages.

Because middle and long distance running depends largely on the oxygen transport system, it is useful to incorporate in the training, besides endurance runs, other activities of similar influence, such as skiing and swimming. This applies in particular to the first non-specific phase of training where a large number of different means are used to develop the aerobic work capacity.

TRAINING PHASES

The training of young distance runners is usually divided into three main development phases, known as the preliminary, first specialisation and main specialisation phases. According to Filini the three phases are based on the following development model:

Preliminary phase (12 to 14 years)

Basic tasks: 1. All-round physical development. 2. Establishment of the basic techniques in running and other track and field events. 3. Development of general endurance. 4. Development of speed.

Basic training means: 1. Movement and sport games. 2. Different sporting activities that are related to endurance. 3. Steady — state endurance runs. 4. Sprinting.

Training load: General endurance development — 30 to 40km a week, 120 to 140km a month, 900 to 1000km a year.

First specialisation phase (15 to 16 years)

Basic tasks: 1. All-round physical development. 2. Development of general endurance. 3. Improvement of running technique. 4. Development of speed. 5. Development of specific endurance. 6. Development of power.

Basic training means: 1. Steady — state endurance runs. 2. Running at alternating speeds. 3. Sprinting. 4. Different sporting activities that develop endurance.

Training load: General endurance development — 50 to 60km a week, 220km a year. Specific endurance development — 220km a year.

Main specialisation phase (17 to 18 years)

Basic tasks: 1. Development of specific endurance. 2. Development of general endurance. 3. Development of speed.

Basic Training means: 1. Steady — state endurance runs. 2. Running and alternating speeds. 3. Sprinting.

Training load: General endurance development — 90 to 100km a week, 3500km a year. Specific endurance development — 310km a year.

It should be noted that the pace endurance runs in the preliminary training phase must be carefully chosen. It is recommended to select the pace so that both halves of a reasonably long distance is covered in the same speed. Children cover in their first training year in 20 minute about 3km,, in the second year in 25

minutes 4km and in the third year in 27 minutes 5km. Recoveries are checked by pulse rates, expected to drop below 120 beats a minute in five minutes after the run.

FACTORS FOR CONSIDERATION

A few sessions of repetition runs can be included in the training plan of this phase. Distances for the repetition runs are selected from short (80 to 100m), medium (150 to 300m) and long (600 to 1000m) runs, with walking recoveries that allow the pulse rate to drop below 120 before the next repetition is performed. The speed is increased when the young athlete is capable of running the last repetition faster than the previous repetitions. The total length of the repetitions should correspond with the length of the planned competition distance.

Specific training means are gradually introduced in the first specialisastion phase with the aim to develop, among other aspects, the capacity to maintain critical speed. Training continues to be many-sided without forgetting power development. There is a natural improvement of the anaerobic work capacity during this phase but care must be taken not to force it. Recoveries after anaerobic work must be adequate and this should be completely eliminated from the training program when the athlete is frequently involved in racing.

Specific training means are predominant in the main specialisation phase when training includes all the methods used by adult athletes. More and more attention is given to anaerobic glycolite training means but care is needed to avoid that the volume of these means does not exceed that of adult athletes. Care is also needed to secure an adequate recovery after this type of workout.

The planning of training is in general based on finding optimal relations between aerobic, aerobic-anaerobic and anaerobic work. Most dangerous can here be excessive anaerobic-training, as well as over-forced volumes of aerobic running. Recoveries play an important part in the training. Medium loads, that allow to recover by the next day, are preferable. Two days, or even more are needed for recovery after heavy work loads. Maxsimenko, for example, recommends the following planning of microcycles in the first specialisation phase:

Preparation period

Monday	—	general endurancec
Tuesday	—	speed and strength training
Wednesday	—	recovery
Thursday	—	general endurance
Friday	—	speed and specific endurance
Saturday	—	recovery
Sunday	—	recovery

Table 1: The distribution of basic training means in a multi-year development program of young distance runners (Travini).

AGE (YEARS)	RUNNING SPEED AND VOLUME							
	AEROBIC		AEROBIC-ANAEROBIC		ANAEROBIC			TOTAL VOLUME (km)
	1	2	3	4	5	6	7	
10-11	288	180	60	36	24	6	6	600
11-12	378	310	87	65	35	15	10	900
13-14	432	514	142	79	56	24	18	1265
15-16	563	737	229	132	118	32	29	1860
17-18	929	1228	456	208	144	41	37	3042

1 = low intensity; 2 = moderate intensity; 3 = tempo cross-country runs; 4 = long aerobic-anaerobic runs; 5 = racing speed; 6 = faster than racing speed; 7 = close to maximal speed.

Competition period

Monday	—	specific endurance
Tuesday	—	speed and strength training
Wednesday	—	recovery
Thursday	—	speed and general endurance
Friday	—	specific endurance
Saturday	—	recovery
Sunday	—	recovery

How the various basic training means are distributed in a multi-year training plan of young middle and long distance runners is shown in Table 1. According to Travini the volume for girls is expected to be on an average about 20% smaller. The figures in Table 1 correspond closely with the recommendations of other authors, including Logvinov, who recommends that 75% of the total training volume should be devoted to running in the aerobic critical intensity zone, 20% in the aerobic-anaerobic zone and 5% in the above critical anaerobic zone. Logvinov claims that this approach is in the long-term more efficient than using 50% of the total volume for aerobic training, 30% for aerobic-anaerobic and 20% anaerobic running. The last appears to bring fast improvements in the 10 to 14 years age group but was responsible later for significantly poorer development.

As far as running speed is concerned in different types of training sessions, the speeds given by Finland's coach Seppanen for 1000m splits will provide some guidance in Table 2.

IN CONCLUSION

From the above listed factors, scientific research and practical experience the recommended distance running training can be summed up in three major points as follows:

1. Preparation in the early training phases can bring success without employing high intensity training means that can lead to performance stagnation later.
2. The use of many-sided general endurance and speed development in the first two training phases creates a foundation for specific training means in the following phases.
3. Is not recommended to begin specific training for top performance before the age of 18 years (girls a year or two earlier).

Table 2: Suggested running speeds in the training of young distance runners (boys).

AGE (YEARS)	DISTANCE (KM)	SLOW ENDURANCE RUN	MEDIUM ENDURANCE RUN	TEMPO CROSS-COUNTRY
15 - 16	3 - 5	4:35 - 5:00	4:15 - 4:30	3:55 - 4:00
	6 - 9	4:45 - 5:15	4:25 - 4:45	4:05 - 4:15
	10 - 15	4:55 - 5:30	4:35 - 5:00	4:15 - 4:30
17 - 18	4 - 7	4:25 - 4:45	4:05 - 4:15	3:45 - 3:55
	8 - 11	4:35 - 5: 00	4:15 - 4:30	3:55 - 4:00
	12 - 18	4:45 - 5:15	4:25 - 4:45	4:05 - 4:15
	5 - 9	4:15 - 4:30	3:55 - 4:00	3:30 - 3:40

FOOTNOTE:

It appears advisable to stress once more the need to be extremely careful about the introduction of anaerobic training to young athletes. In addition to the recommendations outlined in the above article, the statement of Swiss authority, Kasper Egger, is well worth remembering:

"It is not so much when but how that counts in the development of endurance capacities of the young athletes. The how is particularly important when it comes to the development of anaerobic endurance, that should not begin, even in a restricted way, before the child has sufficient aerobic endurance to be able to run at least 15 minutes at a steady pace without difficulty."

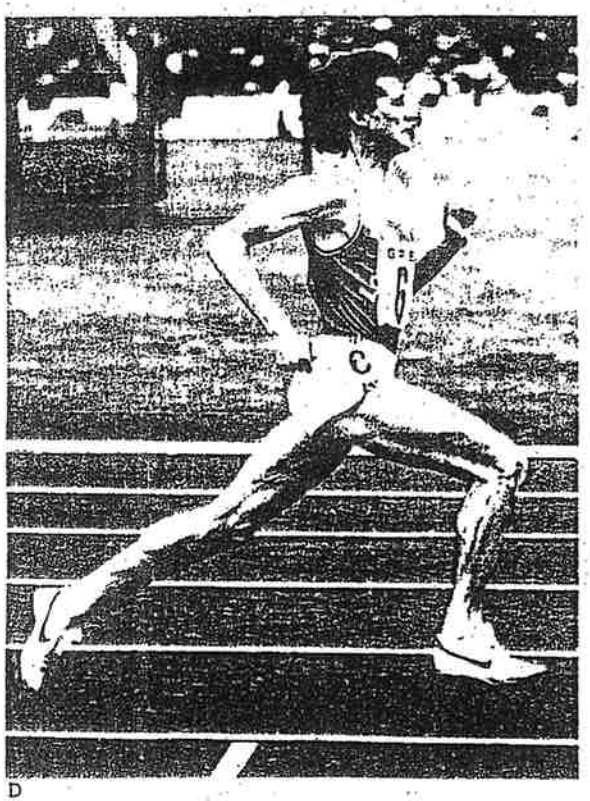
Like most, Egger also stresses that ambitious parents, teachers and coaches represent a great deanger to young athletes when they introduce fast running in the anaerobic zone before a solid aerobic foundation has been established. — Editor.

Basic Model for Middle-Distance Running
(refer below to Seb Coe's classic style)

Sequence D
Full and strong extension of rear leg
High forward knee with toe 'cocked'
Trunk upright with high hips
Long stride length
Well balanced
Arms driving in relaxed fashion

Sequence E
Head steady and focussed
More relaxed and efficient
Economic style with no wasted movements
Trunk in its natural position

Sequence F
Landing on the sole of foot
Landing foot below centre of gravity
< 90 degree knee angle recovery of rear leg
"sweep" the ground as far as possible


D


E


F

MIDDLE DISTANCE / CROSS COUNTRY

When distance running: -

- Use a relaxed running style - eyes straight ahead; trunk and shoulders square to the front; keep your shoulders steady
- Use a low, relaxed arm action, keep your shoulders relaxed
- Use a lower knee lift than in sprinting