NOTES FROM THE SPORTS TRAINING COURSE

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COURSE NOTES

Long-Term Planning in Team Sports

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INTRODUCTION

I am honoured to present these notes, which consist of a copy of the diagrams that Professor Francisco Seirul-lo Vargas prepared for me for this lecture, and a summary of his notes on the concept of planning for team sports, which he wrote around 1994. I have taken the liberty of including some comments and details *(in brackets and in a different font)* which I hope will not detract from the quality of this masterpiece that the master of masters has bestowed upon us.

David Ribera Nebot
(standing in for Professor Francisco Seirul-lo Vargas in this presentation)

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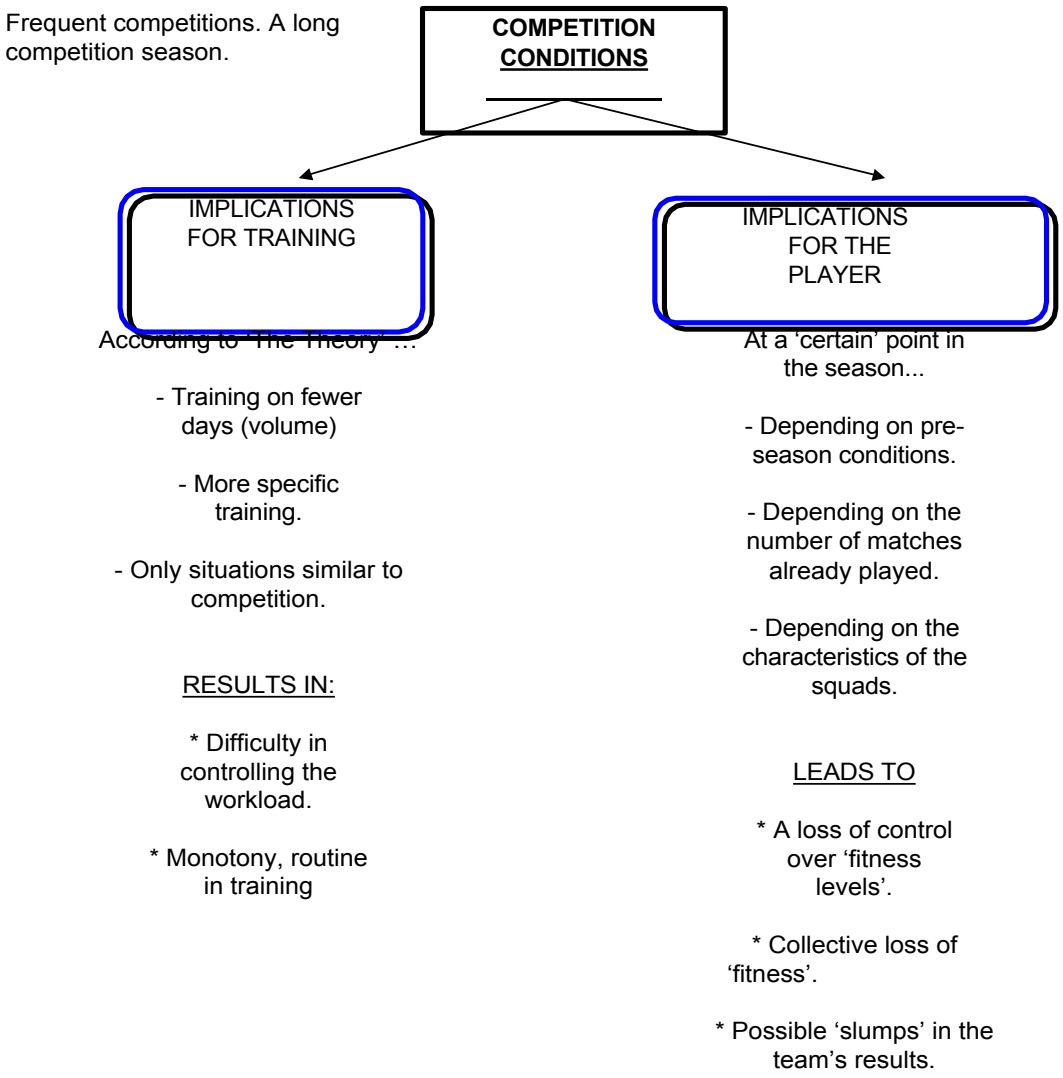
Introduction

In this module, we examine the planning of team sports (D.E.), a term encompassing those sports (games) which, when analysed from various perspectives, share common characteristics that define them. However, there are also some individual sports that meet these criteria and may be included *(tennis, judo, motorcycling, skiing, windsurfing, etc.)*, so that these planning theories can be applied.

We are fully convinced that the theories – primarily athletic in nature – which have been generalised to other individual sports and, by extension, to team sports, are insufficient and ineffective in meeting the needs of these sports.

We recognise that the approach we develop in this module is specific to team sports, and that it may be incomplete in some respects; however, it marks the launch of a project aimed at addressing the major challenges that the scientific study of team sports faces, and there is still much work to be done.

(Although in these notes he refers to the start of a project, Professor Seirul-lo began this project over 19 years ago and has been refining it and applying it to various team and individual sports)



AN INAVITABLE SITUATION WITH A TRAINING SYSTEM BASED ON CLASSICAL PERIODISATION, INHERITED FROM INDIVIDUAL SPORTS

BASIC TRAINING OBJECTIVES FOR TEAM SPORTS

We seek Specific Training for Team Sports that achieves:

1. High control over the training load.
2. Performance with a low number of training sessions.
3. Sufficiently varied and engaging for the player.
4. Quick to assimilate, given the proximity of competitions.
5. Maintain fitness levels throughout the entire competitive season.

This can be achieved through:

STRUCTURED TRAINING
with

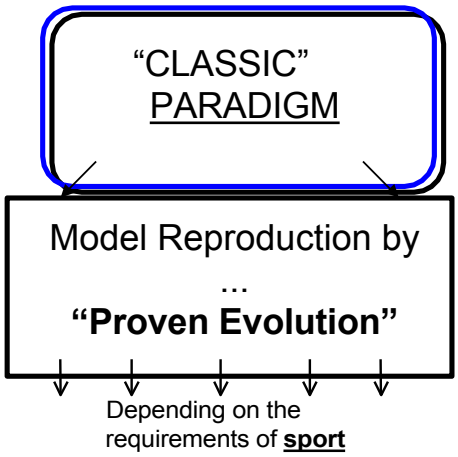
* specific conditions for
pre-season planning.

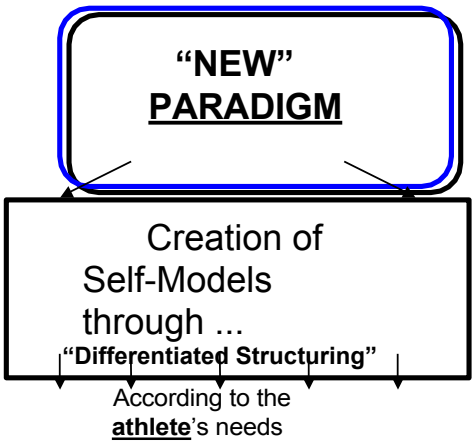
* Specific requirements for
Season Planning.
-Microstructuring-

* Specific conditions for designing
training sessions and programmes.
-Preferred
Preferred
Simulation
Scenarios-

Based on the athlete's needs!!

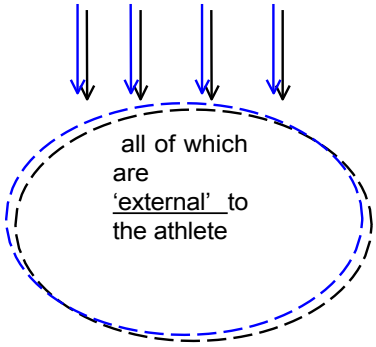
THE 'CLASSIC' PARADIGM AND THE 'NEW' PARADIGM





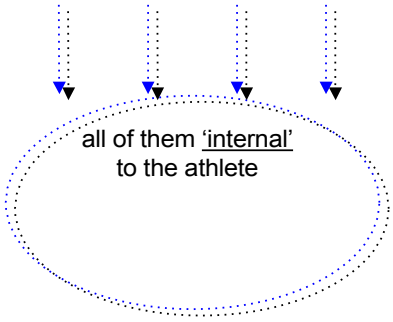
Depe
nding
on ...

* Changes to the rules.
* Competitive demands.
* Society's view of sport.
* Financial incentives.
* Research into sport...



By ...

* Personal interpretation of the rules.
* The impact of competitions on
the player.
* Development of social self-image.
* Personal satisfaction through self-fulfilment.
* Research on the athlete...



(This 'new' paradigm proposed by the professor can be applied to all sports)

SKILLS THAT DEFINE A PLAYER'S TALENT

(The individual is viewed as a behavioural unit. For the study and training of motor skills, the individual can be regarded as a hyper-complex system of interrelated abilities)

* **CONDITIONAL PARAMETERS:** Physical (volume, intensity, etc.)

* **COORDINATIVE:** for the execution of the desired movement.

* **COGNITIVE:** ...for processing information.

We must focus on these three abilities as a minimum

* **SOCIO-EMOTIONAL:** relating to interpersonal and group relationships.

* **EMOTIONAL-VOLITIONAL:** for identification with the personal self.

* **CREATIVE-EXPRESSIVE:** for the projection of the personal self (on the pitch)

CONDITIONAL SKILLS

Basic:	Speed Strength Endurance	Supporting:	Flexibility Relaxation

COORDINATION SKILLS

(For many years now, Professor Seirul-lo has been presenting us with a very comprehensive and structured classification in his classes, designed for application in the fields of Physical Education and Sports Training)

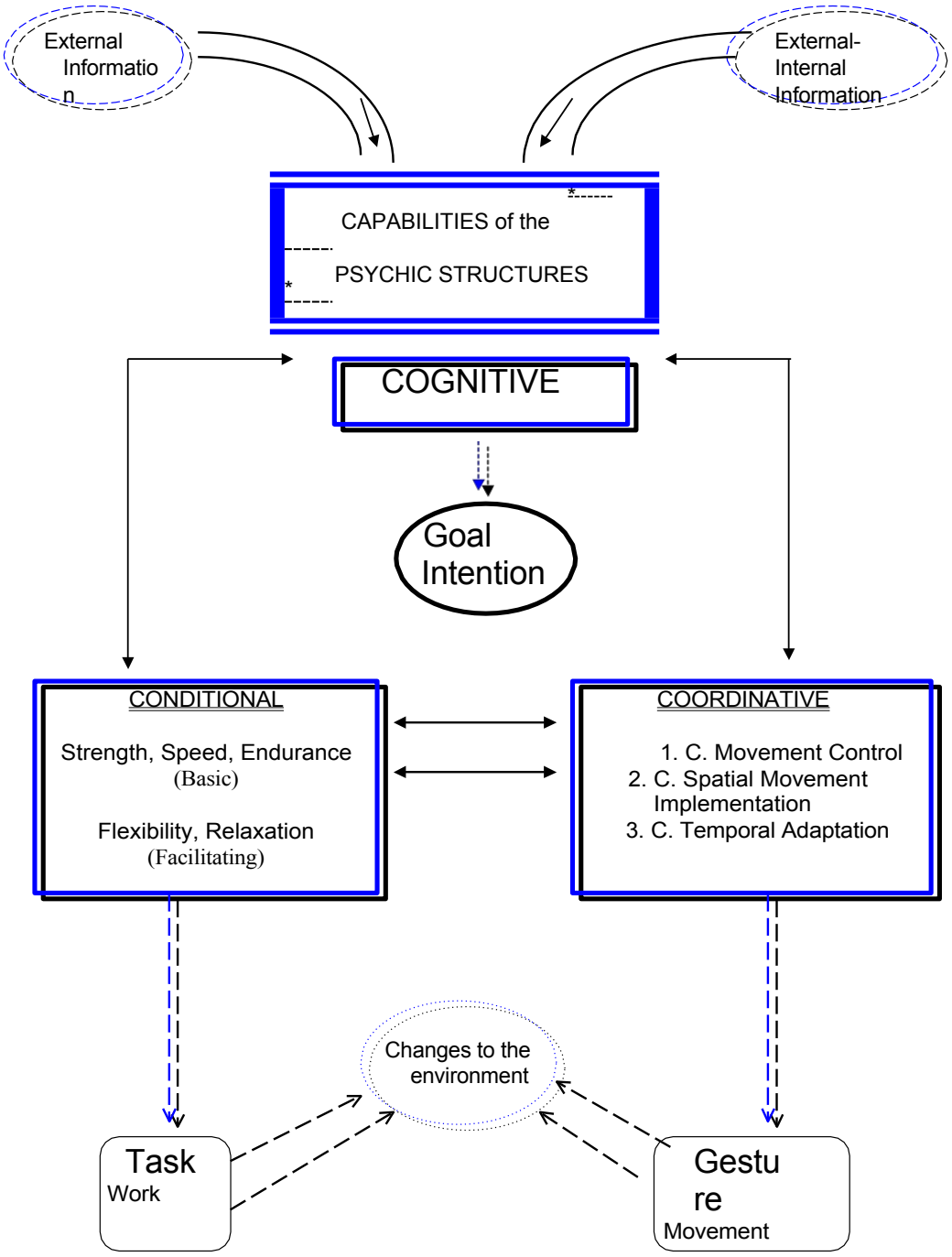
* Movement Control Skills (Level 1): Kinesthetic discrimination
  Segmental differentiation Variability of movement Combination of movements Guided control of movement Fluidity and relaxation of movement Range of motion

* Spatial Movement Implementation Skills (Level 2): Orientation
  Directionality
  Localisation
  Positioning
  Static-dynamic balance

* Temporal Adaptation Skills (Level[3]): Anticipation and motor reaction Rhythmic differentiation
  Rhythmic variability Rhythmic or temporal adaptation
  Rhythmic sense

COGNITIVE ABILITIES

'STRUCTURALIST' (COGNITIVIST) TRAINING SYSTEMS



* INTERACTION BETWEEN STRUCTURES *

* According to the classical framework:

C. Cognitive structures refer to ‘tactics’
Coordination skills relate to ‘technique’
Conditional skills relate to ‘physical fitness’

* **Preferential simulation** training **situations** should be created (aimed at a specific ability) through the interaction of all the structures.

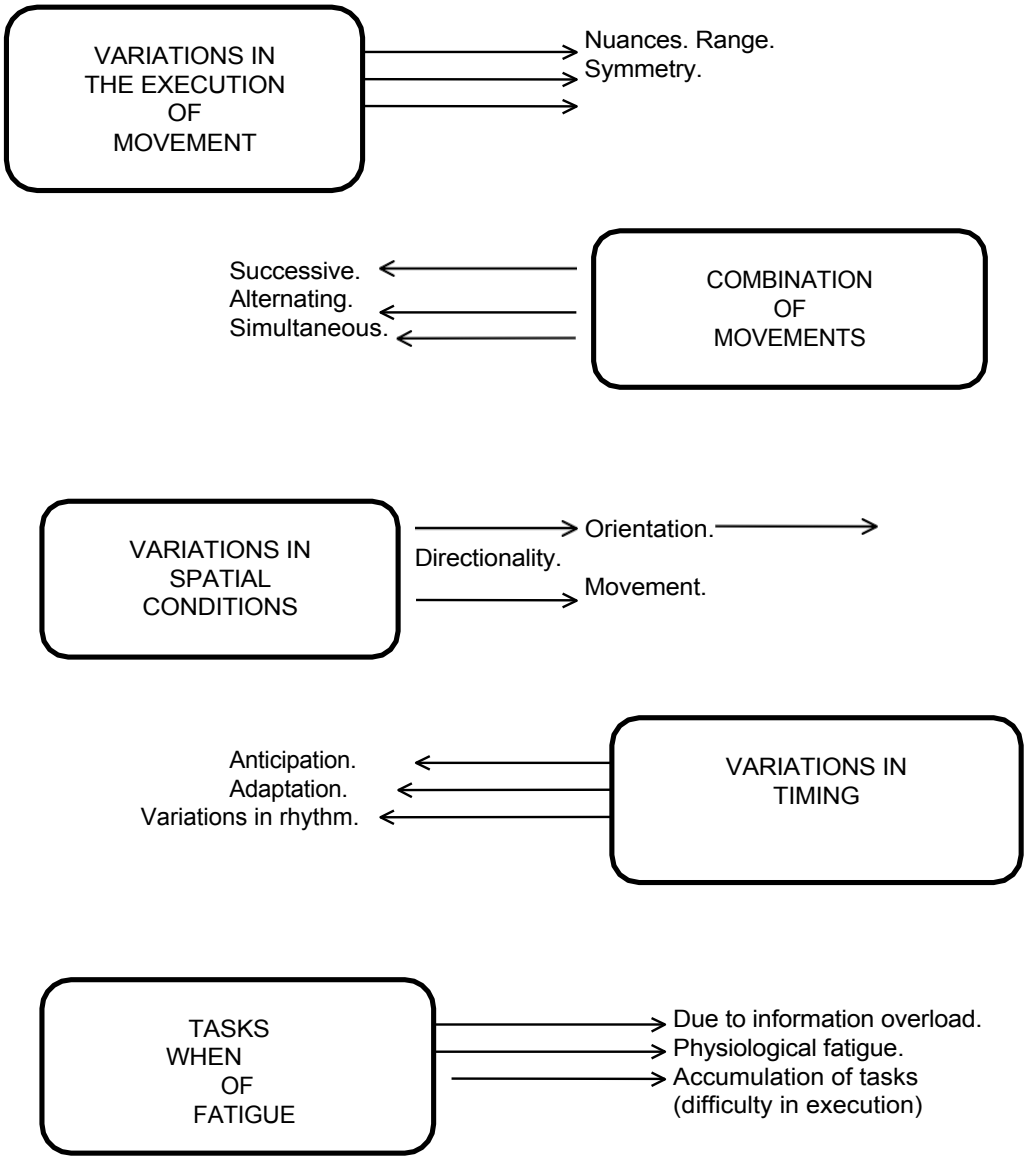
* Specific training conditions must be established to ensure a targeted effect on a particular functional organic system (conditional substrate). Specify the type of motor tasks to be performed, which enhance the coordinative abilities underpinning the athlete’s specific technique (coordinative). Provide relevant information that needs to be processed (involving cognitive structures)

CONFIGURATION OF TRAINING SYSTEMS TO IMPROVE COGNITIVE ABILITIES

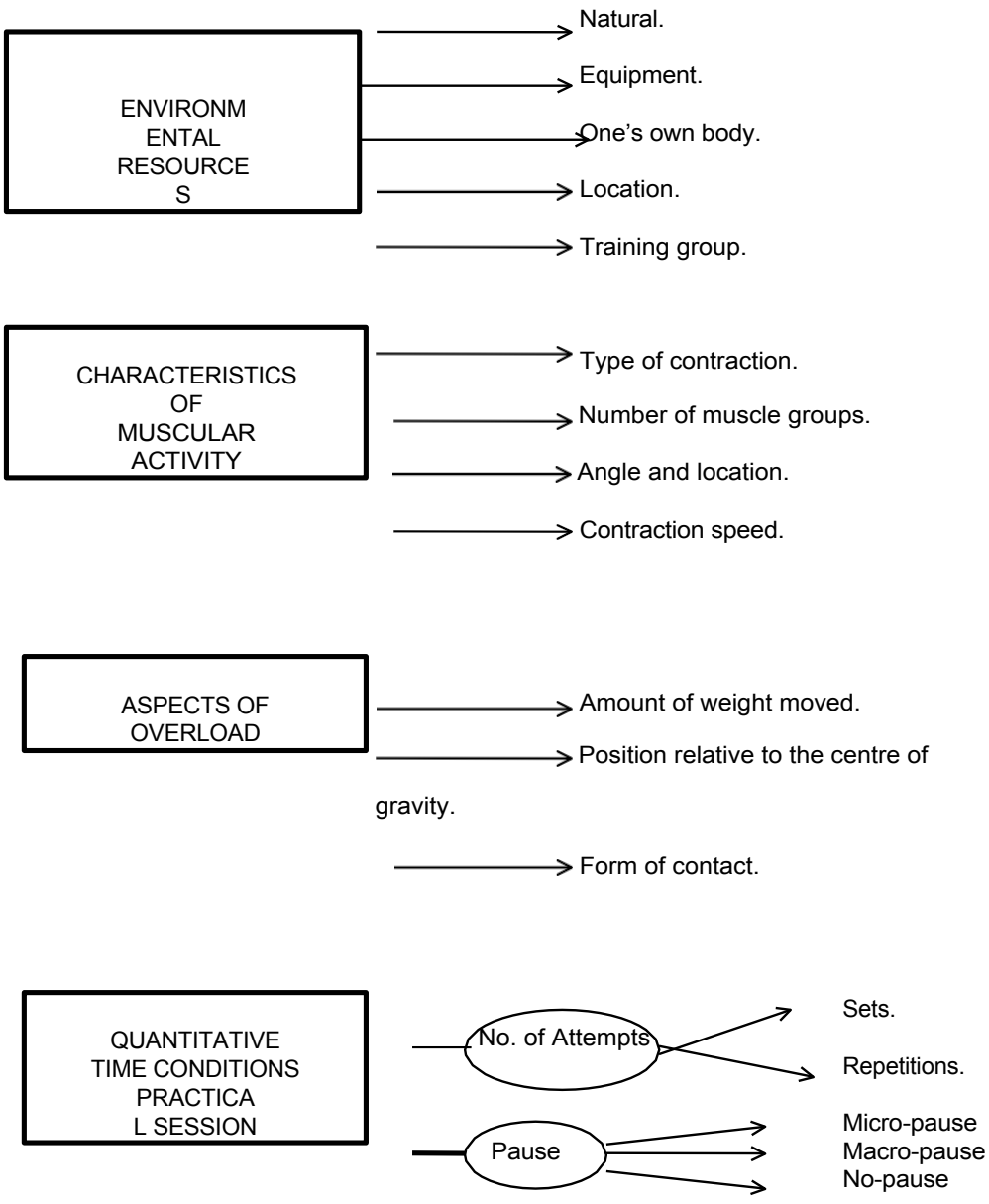
Design learning/training situations that enable:

* Identification of environmental and internal stimuli.
* The development of planning processes.
* The development of decision-making strategies.
* The reinforcement of self-assessment and self-control behaviours.

CONFIGURATION OF TRAINING SYSTEMS TO IMPROVE COORDINATION SKILLS



DESIGN OF TRAINING PROGRAMMES TO IMPROVE NATURAL PHYSICAL CAPACITIES



1. THE CONCEPT OF PLANNING IN TEAM SPORTS

1.1. Definition and concept

Planning is the theoretical framework comprising the description, organisation and design of each and every training session during a specific phase of an athlete's sporting career, as well as the control mechanisms that enable these sessions to be modified in order to achieve an increasingly refined training process, so that the athlete can achieve the desired results in sporting competition.

In team sports, it is not necessary to be in peak physical condition to perform well in competition. For this reason, planning for these sports does not focus exclusively on achieving and maintaining optimal physical condition, but rather on the athlete as an individual and their continuous improvement. The aim is to achieve constant adaptive changes that act as effective optimisers of the various systems which, in every respect, make up the human being. This optimisation will manifest itself as improved performance in competition, provided the training programme has been designed in accordance with the precise requirements.

This shift in perspective is fundamental to devising specific planning for team sports, as it is not, as is the case in individual sports, a matter of basing the plan solely on the subjective view of the sport held by the person drawing up the proposal – the coach – but, on the contrary, of doing so by addressing the athlete's specific optimisation needs in relation to their own conception of the competitive game.
Drawing on their experience, the coach anticipates possible training scenarios which, presumably, will optimise the systems they deem necessary for the athlete to perform; but it is in the subsequent design—as already outlined in the definition—that the coach will provide an effective solution tailored to the actual optimisation needs that have emerged at each stage and phase of the athlete's sporting career, once the individual has experienced specific and frequent competitive situations.

Therefore, planning is not carried out according to a predetermined model, however comprehensive it may be, but rather by organising the events of subsequent training in such a way that the individual continuously optimises their systems in the direction they themselves determine, as a result of the difficulties they encounter whilst practising a particular sport, and the progression of their own optimisation.

1.2. Characteristics

It will be **unique**; that is to say, it must achieve the optimisation of all the systems that make up the athlete as a person, since the athlete is a hyper-complex structure in which each system is necessarily interrelated with all the others, and it is from this interaction that ability develops.

With regard to the sport practised, the planning must be **specific** to the specialism in question.

It must also be **personalised**, tailored to the athlete's specific needs at every stage of their sporting career.

Uniqu
e: This means it must contain all the training elements and activities
that have previously been identified as beneficial to the player at that time. It requires the convergence of interests of all those involved in the coaching team – the head coach, assistant coach, fitness coach, etc. Everyone must contribute their knowledge and experience to develop a plan that operates in a differentiated yet integrated manner to shape the player's performance. Shaping performance is a concept within high-performance planning for team sports, defined by the state of optimisation achieved through the interaction between conditional, technical, tactical, psychological, cognitive and socio-sporting abilities, which determine the level of performance at a specific moment in the player's sporting career.

In this module, we will focus solely on physical abilities, albeit in relation to the other abilities. Perfect alignment of ideas amongst all members of the coaching staff—coaches, fitness coach, psychologist, doctor, and all those who, depending on the team's level, form part of it, is essential to ensure that their respective methodologies and systems are guided by this perspective, in order to unequivocally construct a truly **Unique** Plan**,** which is **consistent** in its approach to the training proposals set out therein, and which facilitates the development of the player's performance.

The concept of uniqueness also entails the sequencing and simultaneity of training content. The true theory of team sports must be developed through research into those sports themselves, not through the application of knowledge from other disciplines. Thus, there must be at least:

.- Psycho-pedagogical principles and laws
.- Bio-physiological principles and laws
.- Ethical and social principles and laws

Many of these supporting theories are still awaiting development, within and for team sports.

Specific:

This means that it must address how, and in accordance with the rules of the sport, the activity is structured and shaped during competitive play.

There are criteria that allow us to group certain team sports into families with similar characteristics, which will make it easier to draw up training plans of a similar nature.

These criteria are:

1. The internal logic by which the sport is structured.
   This arises from how the rules of the sport are interpreted, which determine the dominant motor skills and the interplay of interactions, with the changing roles amongst team members within certain, ever-shifting parameters.

2. The conditions of the competition space.
   The equipment used in the game, the permitted interaction with it, and other characteristics of the playing area create a degree of uncertainty for the player that reflects a level of specificity, at least within a sufficiently
distinct.

3. The number of competitions the athlete must compete in.
   Team sports have more competitions annually than most individual sports and, consequently, over the course of an athlete's entire sporting career; moreover, these are not concentrated but are sometimes spread over 10 months of the year without interruption. This clearly influences the planning approach adopted and also the distribution of the training load throughout the annual cycle.

The planning approach known as ‘classical periodisation’, proposed by Matveiev, accommodates, at best, between 10 and 15 competitions, grouped into one or two competitive cycles; it is therefore used for individual sports that follow this pattern. The so-called ‘Cyclisation’ method, developed by Verjoshanskij, can achieve twice as many high-performance competitive periods; the athlete can reach competition level between 20 and 25 times, but these periods of peak performance do not last longer than four months. Neither the ‘Successive Accentuation’ method (Leib-Neuhof) nor Bondarchuk’s load-concentration training plans further increase the number of times an athlete is in optimal performance condition. When these types of training plans are applied, as is customary, to sports requiring athletes to be in competitive performance condition between 50 and 60 times, periods of underperformance occur during competition. So-called ‘slumps’ are common and almost stoically accepted by coaches, who come to regard this as the natural order of things, attributing it solely to experience and, in some cases, to poor results that lead to a string of successive disasters, from which one can only escape through *‘magical’ methods.*

It therefore seems clear that there is a need to develop a specific planning approach for team sports to resolve these competitive situations.

(In stark contrast, the training programme proposed by Professor Seirul-lo enables athletes to perform at a competitive level 50–60 times throughout the season in team sports and similar disciplines. When his theories have been applied to a significant extent, these results are achieved. One need only look at the results of the F.C. Barcelona handball team, with whom the professor has been working for many years and whose training programme he currently oversees. It is worth noting that it is not just the titles they win, but that they manage to perform at a high competitive level in every match of the year, year after year without exception.)

4. The nature of the relationship between personal development in training and the results achieved in competition.

In team sports, an improvement in a single aspect is not sufficient to guarantee an improvement in competitive results. For this and other reasons, it is necessary to define what ‘fitness’ means in team sports. Improving just one aspect of performance in team athletes can alter the aforementioned concept of performance configuration and leads, at least temporarily, to a decline in those players’ performance; this sometimes causes them to refuse to train under certain conditions, with no justification other than their personal feelings. It is well known that there is almost unanimous opposition to arm strength training in sports where precision in the technical execution involving those body parts is paramount; and this is indeed the case if the concept of performance configuration is not taken into account.

This fourth criterion determines the need for a logical and orderly organisation of all training activities so as not to undermine performance configuration.

5. The way in which competition results are assessed and quantified.

It is, in fact, the relationship between the player’s motor performance and the result—success in competition. There are sports, such as those defined in Group 1 by Bompa—gymnastics, figure skating—in which the level of performance is directly scored as the result, positively or negatively, with the highest score going to the best performer. In other disciplines, performance is measured by quantifying certain execution parameters, such as total time, total distance, etc. Whereas in team sports, the result is assessed indirectly, as a consequence of the performance, and, furthermore, selectively.

The consequence of a good performance, or even a poor one, may be a success, a goal, a basket or a record; however, the extent of this success is also determined selectively by certain factors, such as the match result or the point in time relative to the end of the match at which the goal is scored. Not to mention psychological factors such as who scores the goal, who it is scored against, or against which team it is scored, and social factors such as the significance that goal may have

in terms of the social recognition of the group with which the success is identified. All of this means that success in sports of this category – which is true performance – is also the result of planning in which training programmes were devised to optimise the athlete's ability to adapt specifically to something as significant as being assessed in this way, and to do so immediately and publicly.

Under no circumstances can the planning for a sport in a category defined by these criteria be copied or applied to another, significantly different discipline. And, unfortunately, this is all too common a practice.

Personalised:

We have already seen that planning for these sports must be approached from the athlete's perspective, rather than from the perspective of the sport's performance standards.
Two factors determine the personalisation of the training programme:

1._ Sporting talent.
2._ The concept of a sporting career plan.

1._ There is no doubt that some people may have a genetic predisposition for certain physical activities, but this must be nurtured in order to achieve high performance. We have already seen sufficient evidence to dismiss the notion that talent alone is enough to achieve success, but it must also be made clear that there are certain individuals in team sports who, with very little talent, or with talent limited to certain aspects of the game, have achieved great success as players by specialising in a specific aspect of the game and executing it using the limited, one-sided talent at their disposal. This is yet another clear reason to personalise training planning, offering these individuals the personalised solutions they require. However, the coach will also need to organise the training plans for the other players who make up the squad, both in terms of the content required to compensate for and complement the adjustments that an individual with such characteristics may necessitate in the delivery of the training programme, and in terms of the overall tactical approach of the entire team.

2._ A sporting career encompasses the entire period during which the athlete is actively involved in the sport, or managing its consequences...

The development of a sporting life plan is subject to the individual's own processes of maturation and development, and the ages we suggest are only approximate; however, they are valid for the majority of individuals.

The plan is divided into three stages:

A. Introduction to the sport.
B. Achieving high performance.
C. Declining performance.

Each of the three stages spans a period of 10–12 years and is subdivided into phases.

A_1 .- Phase of regular, non-specific training (age: 5 to 7 years).
A_2 .- Phase of general, multi-disciplinary training (age: 8 to 10 years).
A_3 .- Phase of targeted, multi-faceted preparation (age: 11 to 13 years).
A_4 .- Specific initiation phase (age: 14 to 16 years).
B_1 .- Specialisation phase (age: 17 to 19 years).
B_2 .- Refinement phase (age: 20 to 23 years).
B_3 .- Stability and high-performance phase (aged 24 to 28).
C_1 .- Performance maintenance phase (age: 29 to 34... years).
C_2 .- Phase of compensatory adaptation to reduced performance (age: 35 to 38 years).
C_3 .- Phase of functional readaptation for non-competitive performance (age: 30 to 41... years).

It is essential that every athlete's sporting career is guided by a plan designed to avoid mistakes, which are all too common when sporting events unfold too rapidly and the key developmental criteria involved are not observed at the appropriate stages.

Planning combines and adapts the objectives of the phases to the specific needs of the individual and the sport practised. The sporting career plan serves as the framework against which the key pedagogical criteria—derived from research and practical experience in sporting activity—are assessed. It provides an initial outline of objectives which must subsequently be organised and designed for each individual within their personalised plan.

It is only from phase **A_3**onwards that the first planning exercise should take place; if this covers an entire phase, it will be medium-term, and if it covers a single stage, it will be long-term. As a result of the constant self-optimisation achieved through training, athletes progress from one phase to the next as they personally achieve the objectives and competitive criteria set for each phase.

Although the concept of the project as set out here may seem static and closed, this is not the case; on the contrary, it is highly dynamic, as it can be adapted to the individual needs of a particular athlete and is open-ended, as it is developed by incorporating and accepting all the principles, standards and criteria established through scientific research and sporting practice.

It must be made very clear that the planning for each phase of the project is substantially different and cannot be applied simply by reducing or increasing the training loads or structures used in phases preceding or following the current one, because in each phase the objectives the athlete must achieve are new and, in light of that different state of optimisation, the proposed planning must address the personal needs of that new state. This is the purpose of the project's guidelines and proposals, which will be modified on the basis of the scientific analysis of training events, which the process itself puts to the test in every session undertaken by a player.

Therefore, ***talent*** and the ***sporting career plan*** must be reconciled in order to personalise the planning, thereby developing the athlete in line with their talent, whilst following the path set out in their sporting career plan.

1.3. Functions of planning These

include:

Defining training objectives, derived from each phase of the personalised programme and corresponding to that stage of the player's sporting life, in order to adapt them to the individual.

Describing the training elements that are specific to the sport and derive from its structural characteristics, which are deemed to be the most efficient for achieving those objectives.

Logically organising the selected training elements and content, in accordance with the principles and laws of the underlying theoretical frameworks.

Design the sequence and quantification of the training load based on the competition and its significance for the player; this load must be *delivered* through those elements at different stages of the training process.

Select the individual's physiological systems to which these loads will be directed in order to control the configuration of their performance.

Propose the most appropriate types of training for each and every one of the systems selected above, as well as the duration of application and their consequences.

Establish appropriate monitoring mechanisms to oversee all these processes and their effects on the athlete's various systems.

Have technology in place to support the athlete's assessment during competition in order to analyse the impact it has on them.

All these functions enable the training process to be kept under constant review, so that it can be increasingly tailored to the player's personal needs.

2. DEVELOPMENT OF PLANNING FUNCTIONS

2.1. Fitness level: its implications

Fitness is defined as the optimal individual condition that enables an athlete to perform at their best in competition. Whilst this concept is entirely valid for individual sports, it is less so for team sports, where the responsibility for optimal performance involves more factors than simply the interaction of individual performances. The planning of training sessions for team athletes must take into account other aspects, in addition to these personal ones, in order to achieve peak performance; this depends not only on the optimal individual fitness of the various team members, but also on other perspectives which we shall discuss below. It is clear that all biological theories suggest that peak fitness cannot be sustained for too long, and in team sports, it is necessary to perform consistently throughout a long competitive season. It is therefore necessary to redefine fitness in team sports in order to draw up a specific plan that achieves the states of fitness thus defined and to determine the objectives set for each phase of the athlete's sporting career.

An athlete's fitness in team sports must be considered from the following perspectives:

1. From the athlete's individual perspective.
2. From the perspective of the members of the opposing team, whether direct or indirect opponents.
3. From the perspective of their own teammates, the rest of their team.
4. From the perspective of the stage of the season currently being played and the type of competition taking place.

Combining these four perspectives will give us a more accurate understanding of the concept of athletic form in team sports, and we can use this to set objectives in the High-Performance Phase.

2.1.1. Fitness from the player's individual perspective.

Taking individual needs into account, a player's fitness is achieved through the continuous self-optimisation of all the systems that make up the individual, at every stage of their sporting life, and is manifested through a continuous and uninterrupted improvement in their performance within the team.

To achieve this level of fitness, we must, on the one hand, recognise which systems make up the individual and which are likely to be prioritised in the practice of their specific sport. Progress in the priority systems will be limited by the capacity of the other, non-priority systems involved. This does not mean that training sessions should be planned solely to optimise the priority systems first and then, to a lesser extent, the non-priority ones; rather, it requires finding the right balance to optimise both the priority and non-priority systems together, insofar as the latter support the needs of the priority systems. In this way, we tailor the training plan – or rather*, we personalise* it – as each athlete requires a specific combination for *every stage of their sporting career*. We must understand the concept *of a 'stage of an athlete's sporting* life' not as a short period of hours, or even days, as is often suggested in individual sports, but as variable periods of time, ranging from 1 to 5 or 6 months, which will depend mainly on the total length of time that individual has been practising the sport, and on the athlete's current stage of personal development. When an athlete first starts out, the *phases of their sporting life* are rather inconsistent and irregular in terms of performance; this depends both on the ability – or specific strengths – that underpin their sporting discipline, and on their personal approach to adopting training habits. Over the course of their sporting career, these phases will gradually stabilise over time, leading to a more consistent level of performance, almost always in cycles or with certain temporary variations. The athlete's maturation

of the athlete is identified, amongst other factors, by the fact that periods of peak form can be adapted to the level required by competition and redistributed irregularly – or not – **influenced** exclusively by the training loads set out in the plan. Therefore, from the athlete's perspective, peak form is viewed as the convergence of certain states of optimisation within the individual's physiological systems, as they relate to that particular moment in their sporting life. True fitness is achieved through specific gradients of optimisation between the different systems, which are also subject to rhythmic temporal parameters specific to the athlete; good planning must adapt these to the specific needs of the competition.

2.1.2. Fitness relative to opponents.

In team sports, you compete against 25 or 30 different teams each year, and they are different, amongst other things, because the players who make up those teams are different. Each player's ability is determined by their level of performance in specific actions during the match. We must understand that this level is the result of the optimisation of their various systems; in other words, it reflects where they are in their personal sporting journey. When two players at similar stages of development (Phase-Project) face each other, the one with greater natural talent will have the better chance, or the one whose better planning has provided them with more appropriate training experiences and content. Whereas a contest between players at different stages of their sporting career development—particularly up to the completion of the second stage—is always, or at least in a high percentage of cases, favourable to the player who is at a more advanced stage or phase. Therefore, if we equate fitness levels with the outcome of the contest, a team athlete at a stage or phase of their sporting life that is clearly or significantly more advanced than that of an opponent can be understood to be relatively fit enough to overcome that level of opposition. For this reason, experienced team players – known as *veterans* – who, in our view, are at advanced stages and phases of their sporting careers, where achieving optimal performance levels is highly complex and demanding, can overcome opponents who are not as advanced or well-developed in their sporting careers, even without being at their personal peak. This aspect allows, within a training programme, for the timing of training content to be determined with the necessary confidence required to tackle the greater difficulty involved in optimising systems during the final stages and phases of a sporting career.

For the coach, it is very important to know the level of the opposing team's players in order to work within that margin when designing the timing of their own team's planning, provided that their players are at a higher stage or phase than their opponents, at least for the majority of them. This knowledge can provide even more planning options when gaps are discovered in the opposing team's development of certain preferred systems or in part of their team structure. In this situation, the team sports coach can optimise their players' tactics by incorporating the relevant elements into their planning, thereby exploiting the opponent's weakness *most effectively*, without this necessarily requiring their players to have reached peak fitness. When this happens, it is important to ensure that this situation does not affect the player on a personal level in terms of achieving the desired level of fitness at the next stage of their sporting career.

2.1.3. Fitness levels relative to teammates.

It is essential for the coach of a team sport to achieve consistency in the current fitness levels of all members of their team. This enables the specific interactions required between the various players to take place, allowing them to execute and complete collective playing systems by carrying out individual tasks that demand a *certain* level of fitness. This particular level of fitness may not be optimal for every individual, but it must be sufficient to enable them to contribute individually to the execution of collective tactical systems. Often, this discrepancy between the chosen playing system and the level of fitness required to execute it is unclear, leading to collective failures despite individual successes.

Considering an individual's fitness level from the perspective of the rest of the team is specific to team sports and leads to training loads being organised in a consistent manner, in order to achieve similar levels of fitness. However, given the personalised nature of planning, these loads must be delivered through different training methods, adapted to the individual needs of each player – or group of players – who are at the same stage of their sporting career.

The coach must be aware of the individual *fitness* minimums and maximums required to implement the playing systems he proposes and which, of course, he may modify during the match. This is the concept of *tactical dynamics*; it refers to the alternation or succession of systems that must be implemented throughout a match, with varying levels of physical demand from the perspective of individual physical contribution, and which is based on the concept of the team's collective fitness. It is clear that, in all tactical systems, certain specific positions involve roles that demand greater physical exertion than others, and this leads to differences in fitness levels among the players who are to fulfil those roles. However, the coach still has the option – apart from the rules of the game – to draw on the *availability* of their players, so that when a specific position within a system is particularly demanding, another player can temporarily replace the exhausted player in those roles, thereby maintaining the desired tactical dynamics throughout the entire match. We can thus understand a concept of 'shared' or 'redistributed' fitness, which is specific to team sports and unfeasible in individual sports.

This concept of fitness fundamentally influences training planning in team sports, as an athlete in poor individual form can still fulfil specific roles in a particular position within a tactical setup where only the performance levels they currently possess are required – levels which are, by no means, their personal bests. From this perspective, that athlete is assessed as being in optimal fitness, but only for performing certain specific functions within a particular tactical role. As this individual approaches their individual fitness levels, they must also adapt their team roles in relation to their teammates, and it is the coach's task to maximise the team's performance, building on the individual fitness levels of each player, which the coach must understand and manage through personalised planning.

2.1.4. Fitness levels in relation to the stage of the season.

In team sports, the annual season in top-flight competition lasts between 9 and 10 months. During this period, various competitions take place (league, cups, tournaments, etc.). In relation to this calendar, fitness requirements vary and are determined by the team's objectives in each of the competitions in which it participates.

The other perspectives outlined in the previous points regarding fitness levels can help address the needs arising during these different phases of the competition. Thus, even with the more experienced players in poor individual fitness and the younger players in good fitness, a high-quality team can still succeed in many league matches, cup qualifying rounds and other official tournaments. The specific moments and phases of the competition where the entire squad needs to achieve optimal fitness levels can be defined at a later stage, in order to tackle the decisive stages of the various competitions. This means that training content will differ for different players, so the planning must take these situations into account.

Based on these perspectives, we can define fitness levels for team sports in a very different way to how this has traditionally been done in individual sports, which will help us to develop specialised planning for these sports, as the aim of training planning is to enable the athlete to achieve the best possible fitness level and maintain it in order to perform at their peak throughout the entire season. What is 'fitness'? It is defined in the terms set out above and which we now propose.

Achieving fitness means attaining the optimum level of ability that enables the athlete to perform each and every technical action, to make and execute the desired tactical decisions at any level, throughout the entire match and against any type of opponent, as well as to collaborate from their specific position with the rest of their teammates, thereby participating in the wide variety of tactical structures deemed appropriate at any given moment during the match. All of this must be achieved without compromising the positive progression of their performance in subsequent matches throughout the current season, whilst taking into account their corresponding level of personal development in relation to their sporting career plan.

This definition enables us to select the precise objectives that correspond to the specific phase of the sporting career path the player is currently undergoing. For the high-performance phase, we can define generic objectives which, when presented to each player, will take on a specific meaning relative to how that individual perceives and interprets them; this will enhance the precision of those objectives. The generic objective of increasing jumping power to achieve greater height has different meanings for a goalkeeper than for an outfield player, and for a spiker than for a setter; thus, it is only when this objective is clearly identified that each of these specific positions in different sports can define their actual needs in relation to their personal performance in the game. Can we set non-personalised objectives for the High-Performance Phase? Categorically not, since if we look at planning from the player's perspective, we must, in this phase, achieve the highest level of optimisation of all that specific player's systems, which are clearly different from those of any other player. We can say that in this phase, we must necessarily aim for the highest possible optimisation of all their systems, and this will only be possible if the personalised sporting career plan has been followed.

2.2. Description of the training components

For us *(from the perspective of physical training)*, these will be limited to the elements defined as 'conditional capacity', the *basic* components of which are:

Strength,
Speed,
Endurance

and the *facilitating factors* will be:

Flexibility,
Relaxation

To integrate these as specific qualities or abilities within team sports, we must, on the one hand, describe how they manifest themselves in the particular sport in question and, on the other, assess the subjective value that each individual attributes to that quality within their own performance framework.

How do these qualities manifest themselves?

The first is the coach's responsibility, whilst the second is a task shared by the player and the coach. Let's look at two examples:

A. – How does strength manifest itself in handball?

The coach must observe the competitive situation and describe the specific conditions that require some form of strength for execution at a high-performance level.

Thus, in handball there will be:

* Throwing strength.
  .- required to make all shots on goal.
  .- required to make the various passes.

The characteristics of this strength will be explosive-ballistic or reactive-ballistic.

These throwing actions occur in specific co-ordinated movements, of varying complexity, and, naturally, in cognitive-tactical situations as varied as the playing system or systems used.

* Jumping strength.

.- required to perform the jumps associated with shots (attack).
.- Necessary for jumping to block a shot (defence).
.- required, in a very specific way, for certain jumps specific to the goalkeeper.

The characteristics of this strength will be a specific combination of relative strength, explosive strength, elastic-reactive strength, etc.

More of one or the other will be required depending on the type of jump and the specific position of the player performing the movement.

* Wrestling strength.

.- required for various forms of movement.
.- Necessary for competing for possession of the ball.

The characteristics of this strength will include endurance strength, explosive strength, strength against variable resistance, etc.

The specific requirements for this strength will vary greatly depending on the type of defence and attack practised by the team.

With these three categories of strength, we have outlined the specific strength requirements for handball, which are entirely different from those of any other sport; and, due to the cognitive-tactical and coordinative-technical characteristics that accompany them in every real-game situation, they are unique to the player. Let us now suppose there is a player who only attacks, who always switches to defence because he is a poor defender; his subjective assessment of fighting strength—in terms of strength-endurance and variable resistance—is, personally, very different from that of throwing strength, and this is what we were referring to when we previously proposed the dual interpretation. This player has shaped his performance in a particular way over the years, to the extent that he personally assesses his own needs in certain areas that are very difficult to alter, because the rest of his systems have self-organised to resolve, based on these assumptions, any real-game situation. In most situations, training that particular quality throws the entire system out of balance and impairs performance levels.

B. – How does speed manifest itself in football?

The coach must endeavour to define, as precisely as possible, the game actions that demonstrate this quality. Thus:

* Start-up speed or *acceleration*.

– The player needs this to start running from a standing start, with or without the ball. Covering a distance of 3–5 metres in the shortest possible time.
.- During this run, the player can perform various technical actions, such as making a run to receive a pass or anticipating a pass to intercept it, etc.

* Speed of *intervention*.

.- This is required in all one-on-one situations when contesting a ball that is not in anyone's possession.
.- The player needs to move very quickly over 2–3 metres, brake, turn, plant a foot very quickly whilst off-balance – in short, do whatever is necessary to gain possession of the ball.

* *Change of pace*.

.- This is evident when a player is moving at a certain speed and, at a specific moment, abruptly changes their speed, reaching top speed and maintaining it for as long as deemed necessary.
.- During this overall manoeuvre, the ball may appear at any point during either of the two speed phases, and the total distance covered may be between 20.30 metres.

* Speed of *execution*.

.- This is put to the test when the player carries out a specific action, or links together several technical actions at top speed, over very short and imperceptible distances (control, turn, shot, etc.) within 2 metres.

* *Intermittent* speed.

.- This is the speed required to perform successive actions at maximum speed with intermediate stops or significant reductions in movement speed.

.- It should be regarded as a single action: a sequence of several successive technical actions, separated by very brief pauses, covering distances of between 6 and 15 metres, subdivided into movement phases in one or more directions, of 3–5 metres, and at maximum or sub-maximum speeds.

All these forms of speed in football are necessarily accompanied by technical and tactical components, with the great variability that this sport allows.

In other words, in football there is no such thing as 'movement speed', 'movement technique speed' or 'endurance speed'; rather, there are the specific speeds within these categories, defined as such, which must be described in order to plan training for them.

Clearly, to achieve good change-of-pace speed, it is necessary to integrate aspects of elastic strength, dynamic rebalancing, segmental differentiation, anticipation or prediction of events, differential relaxation and certain other factors; however, improving all or each of these separately will not improve this specific speed.

It is only by carrying out planned training sessions focused on changes of pace – as applied in football – that we will achieve the player's individual performance profile for that attribute. It is the coach's responsibility to identify all the specific elements that arise from actual match play and which, once identified, will enable the specific training objectives to be achieved.

There is also a subjective assessment of each of these manifestations of speed, which will clearly be influenced by the specific position the player occupies within a particular tactical system, and by the extent of their individual talent.

2.3. ORGANISATION OF THE ELEMENTS

2.3.1. First organisational criterion:

The first organisation is based on temporal aspects. A year of sporting practice, at any stage of a sporting career, consists of a **preparatory** period**,** followed by a **competitive** period and a **transition** period. We consider it appropriate, in keeping with tradition and to distinguish team sports, and given the predominance of the competitive aspect, to modify this terminology to **pre-season, season** and **active rest**.

Pre-season: 4 to 8 weeks.
Season: 40 to 44 weeks. Active Rest: 3 to 6 weeks.

2.3.2. Second organisational criterion:

The second classification is intra-thematic, based on each element's relationship to competitive practice. This results in four levels of organisation, leading up to the competitive event:

General,
Directed,
Specialised,
Competitive

These apply to Strength and Endurance, whilst for Speed it can only be Specialised and Competitive, as otherwise its application is impossible.

By **'General'**, we mean the approach that brings basic abilities (Strength, Speed, Endurance) into line with the sport in question.

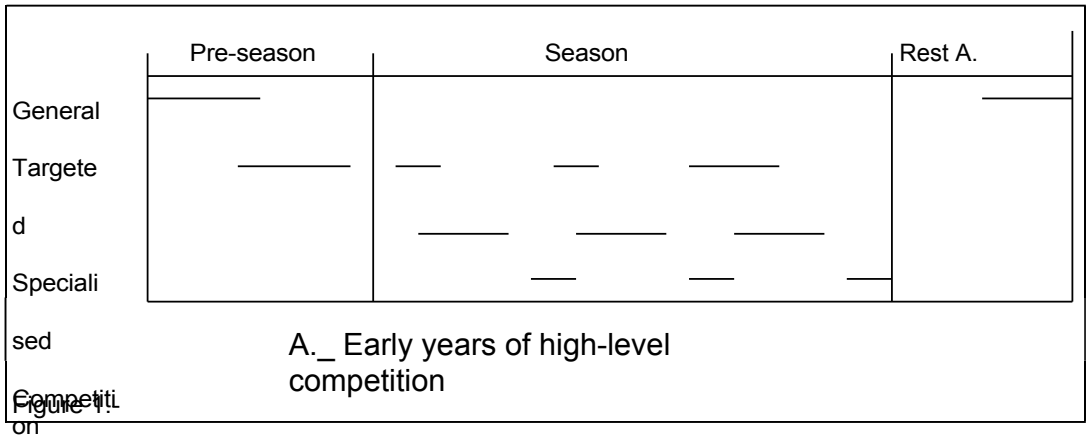
By **'Targeted'**, the approach focuses on the aspects necessary to develop a specific position within the discipline.

By **'Special'**, we mean the approach that allows for the optimisation of the technical and tactical aspects embodied by *that* player.

'Competitive' refers to situations where the conditions in which that quality manifests itself in competition are partially matched or surpassed.

The structure within each quality is clear and follows a sequence from General to Competitive, passing through the two intermediate stages. The proportions and quantification of these elements form part of the training programme.

For the High-Competition Phase, the structure may be defined according to whether it is the early or late years of the high-competition phase.

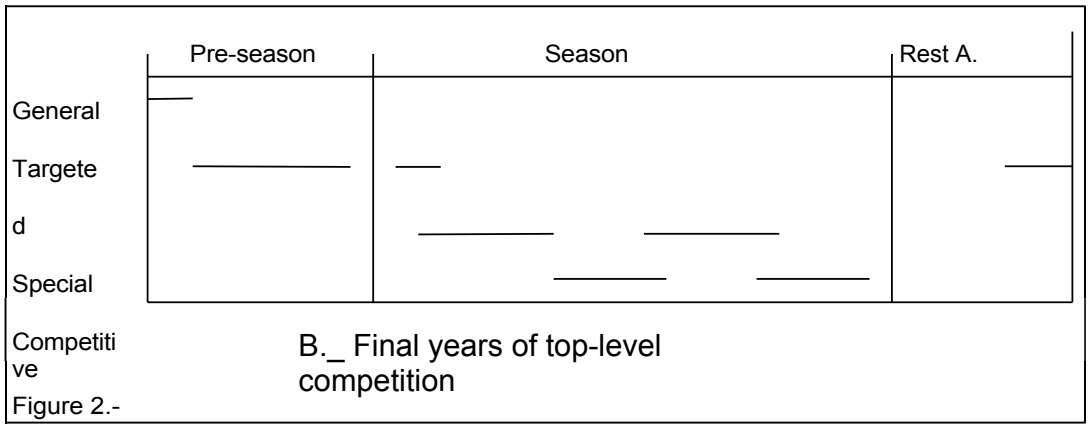


A._ Early years of high-level competition

Figure 1.-

A. – During the pre-season, only General and Directed elements are practised, with a greater emphasis on the latter.

During the season, Directed, Special and Competitive elements follow one another in three or four cycles, in which the Directed content is progressively reduced whilst the Competitive content is increased, with the Special element remaining constant throughout the entire season. The proportions are tailored to the individual and the number of sequences is variable.



B._ Final years of top-level competition

Figure 2.-

B. – In the pre-season of the final years of top-level competition, there are hardly any General elements, with Guided elements dominating the training programme entirely. During the season, and almost coinciding with the first and second rounds of the championship, there are two sequences of Guided, Special and Competitive elements in the first sequence, whilst in the second the Guided elements disappear. The ratio between Special and Competitive elements remains constant throughout the season, although Special elements always outnumber Competitive ones. It is necessary to develop customised indices to compare one year against another and draw conclusions for future planning.

At the end of the season, during the Active Rest period, both phases include General (A.-) and Directed (B.-) elements, in preparation for the start of the following pre-season.

2.3.3. Third organisational criterion:

The third organisational criterion is cross-thematic, in line with the **principles of Synergistic Action**. According to this principle, which is specific to team sports, the combination and sequence of certain elements produce a synergistic effect on the systems they target, amplifying their effects beyond what each element would produce individually within the same system. Laws to develop this principle on a scientific basis have yet to be formulated, but let this serve as a synergistic example of how, when optimised, systems can improve the speed of task execution in this type of sport when performing a speed-based task that simultaneously incorporates elements of complex decision-making—provided that, prior to this practice, we have carried out a certain number of repetitions designed to stimulate reactive strength in the main segments governing this action. This and other laws will define many of the synergistic actions across different systems, which will give rise to certain organisational requirements that are almost constant in high-performance planning. These synergistic actions only emerge in the final phases of an athlete's sporting career, when the application of other principles is insufficient to achieve significant adaptive changes in the athlete's systems.

(If we analyse the various treatises on training, we see that most, if not all, describe the same training principles – albeit in different ways – based on individual sports; and, as we are seeing, from the perspective of this new approach to team sports, most of these principles must be modified, or at least interpreted differently, if we are to apply them effectively to these sports. Here, the professor introduces us to a new principle that he has devised specifically for the high-performance phase of team sports. As early as 1976, he published an article ('Towards a Synergetics of Training') in which certain insights into this type of theory were already evident.)

2.4. DESIGN OF THE TRAINING LOAD

The proposal set out below is specifically designed for team sports and has been tested over more than 19 years with athletes in the High-Performance Phase. It is based on Werchosanskij's theories of load concentration.
This proposal offers different alternatives, depending on whether the sport in question places greater emphasis on strength-endurance or endurance-speed.

(Professor Seirul-lo has been experimenting with this training programme he proposes over the years in various sports, although it is with the F.C. Barcelona handball team that he has been able to apply it most effectively and for the longest period. However, under his guidance, some supporters have also been able to apply this training programme – albeit partially and with all our limitations – across a range of sports, both to athletes in their developmental phase and to those at the elite level.)

*(Dr Hans Selye's first paper on stress syndrome was published in the British journal *Nature* in 1936. It appears that, years later, Matveiev was the first to apply the principles of the phases of the adaptation syndrome described by H. Selye to develop the concept of periodisation in sports training. In a 1987 article, Seirul-lo reviews various training load designs that have been applied in a range of sports, though all were based on models created for individual sports with a competitive structure distinct from that of team sports; he then proposes a load design, based on the concentration of loads, which he will outline below. We should also note that before Werchoshanskij publicised his 'block' system, Seirul-lo had already observed, as far back as 1973 when the professor wrote his final-year dissertation, that sprinters who consistently concentrated their training loads, regardless of the training cycle, achieved improvements in their performance, and he was already interested in observing how the concentration of medium- and high-intensity training loads might influence sprint performance.)*

The volume and intensity of training stimuli are commonly accepted as measures of training load, and the load is defined as the effect these have on the athlete's body. However, we have come to understand the concept of the body as that of a hyper-complex structure composed of functional systems belonging to very different categories; and because these are closely interrelated, the optimisation of any one of them depends on the degree of optimisation achieved by the others. Therefore, the training load, in terms of volume and intensity, must be tailored to act selectively on a specific group of systems, and the sequence of selective loads applied to that particular group of systems brings about their optimisation, thereby resulting in a specific configuration of their performance. The aim of training load planning is to sequence, in a precise manner, its selective action on the different functional systems, according to a specific priority. This necessitates the development of a qualitative training theory specific to team sports. (generic-specific: not valid; quantitative-qualitative: valid).

The second organisational criterion mentioned above conferred a *'general'* character on the elements specific to a particular sporting discipline; and this, from the perspective of the General Theory of Training—on which all planning for individual sports is based—represents a clearly specific orientation. Thus, the volume of a training load of this nature, viewed from the perspective of the General Theory of Training, is of a specific-qualitative nature, whilst for us it marks the starting point for addressing the requirements of any team sport. Consequently, when planning training for these sports, the training load must be approached from different perspectives.

2.4.1. In the pre-season

From our perspective, classifying a training load as having a general focus means beginning to apply that load towards the *functionality* required in our sport. Having clarified these concepts, we can propose the design of the training load for the pre-season in team sports.

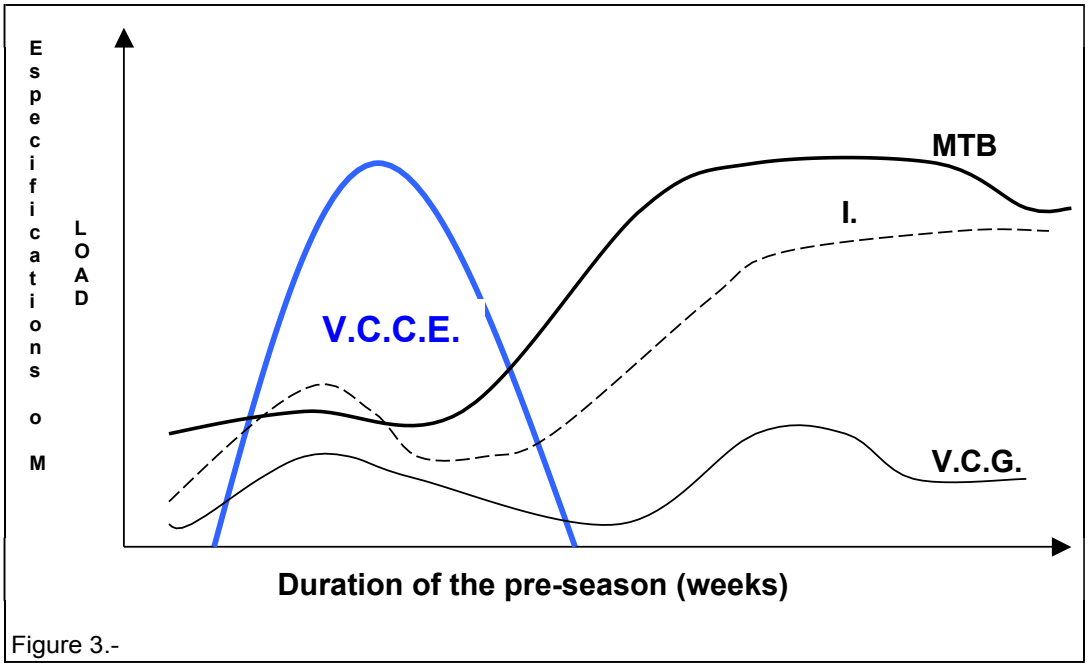


Figure 3.-

V.C.C.E. = Concentrated volume of specific conditioning.
V.T.T. = Technical-Tactical Volume.
V.C.G. = General conditioning volume.
I. = Intensity

If the player has adhered to their sporting development plan, upon reaching the High-Performance Phase they can follow this training load plan during the pre-season.

The duration of the S.C.V. is 45–50 per cent of the total duration of the pre-season. This is followed – although it has already begun – by a certain volume during the *block*, a significant increase in the volume dedicated to technical-tactical development (T.T.V.), and the slope of this curve must always be adjusted to individual needs.

The intensity curve (I) initially rises until the V.C.C.E. reaches its peak value; from that point, it declines until the end of the V.C.C.E. block. In this way, we can tackle the increase in V.T.T. with sufficient assurance of achieving the level of technical execution required at this stage of the season. The remainder of this curve's design follows from the theory of concentrated load, which underpins this proposal.

The design of the V.C.G. curve addresses certain requirements of high-level competition; instances of this generic condition (not specific to the discipline) arise at times when, primarily, the biological and muscular systems undergo sudden changes in load. This general condition acts as a cushion, absorbing the traumatic effects that the load might cause on the functional systems, whilst taking virtually nothing away from its specific nature. For this very reason, and due to the basic requirements of training methodology, a certain level of V.C.G. is maintained throughout the remainder of the pre-season.

This load design may include pre-season competitions and summer tournaments, which are classified as V.T.T., replacing a certain volume of sessions aimed at that objective. Conversely, during the V.C.C.E. phase, it is not advisable to take part in competitions, as this would significantly alter the intensity curve (I), with a clear impact on fitness levels at the end of the pre-season. Only in the final third of the V.C.C.E. phase, when the V.T.T. increases, might a competition be undertaken if the opposing team is of a significantly lower standard than our own; this would be permissible provided that, in accordance with the regulations, modifications could be made to reduce the intensity requirements of participation, thereby enabling us to align with the specified intensity curve (I). This training load design produces different levels of fitness.

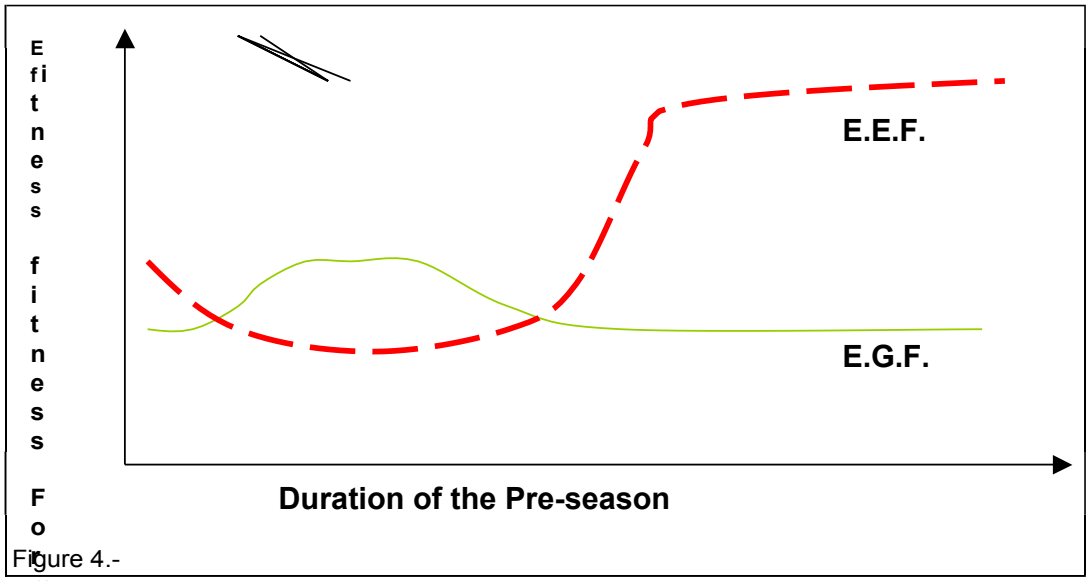


Figure 4.-

E.E.F. = Specific Fitness Level.
E.G.F. = General Fitness Level.

General fitness (E.G.F.) enables us to perform tasks not specific to our discipline under optimal conditions. Consequently, in the general fitness test, improvements are observed in the early stages of the pre-season, whilst over the course of the pre-season – and particularly towards the end – this type of performance is maintained but declines significantly.

Figure 5 shows an example of the standing two-foot vertical jump test carried out during a pre-season, administered to the whole team during the high-performance phase.

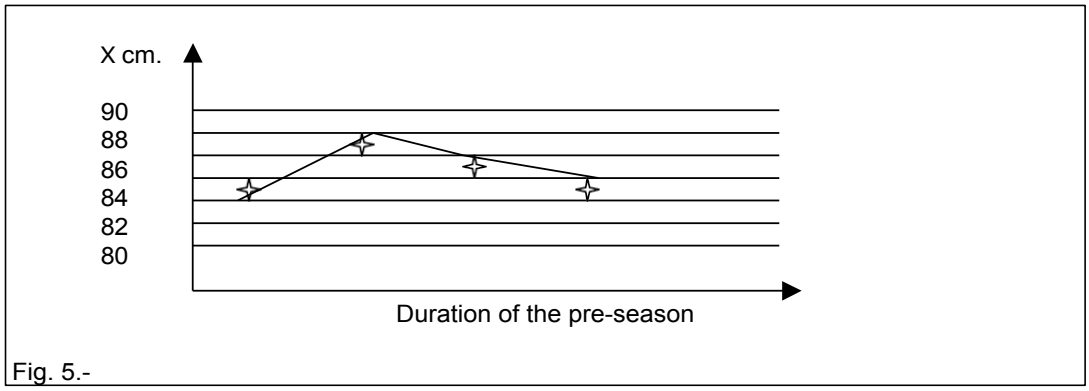


Fig. 5.-

The opposite is true of E.E.F., which, with this load design and training focus, represents the specific fitness level for our discipline. Fitness, in line with the approach outlined for fitness in team sports. Figure 6 shows an example of a capacity similar to that described above. A vertical jump test, involving specific preparatory movement and simple decision-making, which can be regarded as a measure of a quality closer to the specific and corresponding fitness condition for E.E.F.

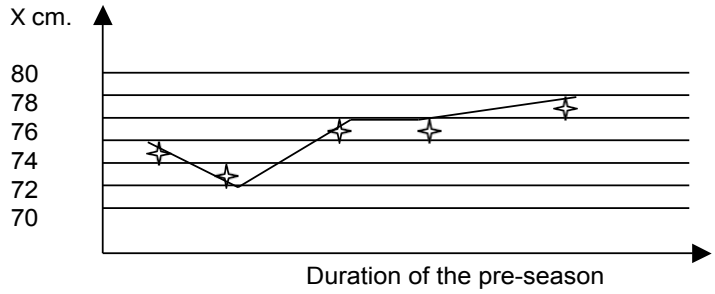


Fig. 6.-

The content of the V.C.C.E. is what makes this training programme suitable for sports in which performance is based, to a certain extent, on either strength or speed.

When a sport prioritises endurance-speed, the components of the
V.C.C.E. are organised sequentially, with different functional orientations for the training loads:

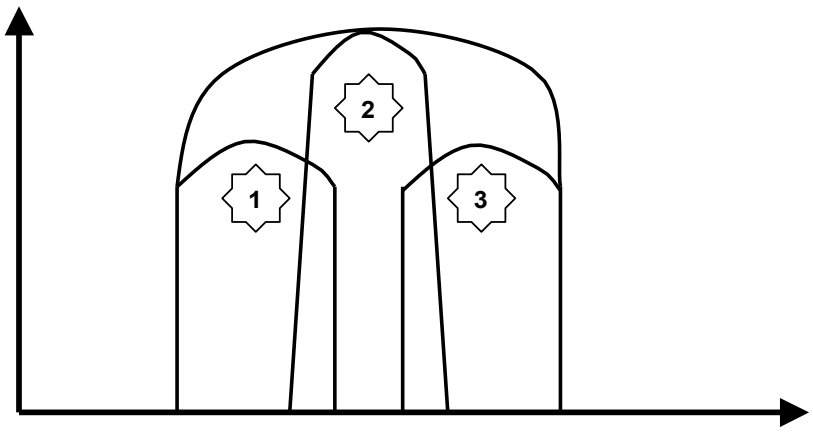


Fig. 7.

1. Its elements shall be of general strength.
2. – Its elements shall be of directed resistance.
3. Its components will be for directed strength.

Whereas if the sport is strength-endurance, the structure is the same, but the elements will be:

1. General endurance elements.
2. General strength elements.
3.- Specific endurance elements.

In this way, we fulfil the second organisational criterion already outlined for pre-season training content. In the Endurance-Speed option, these are sports played on a small pitch, where the strength component forms the basis for developing speed, as the competition involves short, very fast bursts of action that occur intermittently and in contact with an opponent. Hence the greater demand for strength during the pre-season in this type of sport. The same applies to the endurance option, but with this other quality forming the basis of this type of sport.

In all cases, the connecting areas (shaded in Figure 7) are essential for moving from one element to another with a different orientation. A player's performance depends on the efficiency of the training programmes designed for these objectives. The temporal division of the Block comprises five phases:
1; intersection of **1** and **2**; **2**; intersection of **2** and **3**; **3**.
which may well coincide with the five training days in the first week of pre-season.

Clearly, this correspondence will depend on the number of weeks the pre-season lasts; in the worst-case scenario, it should last three weeks to allow for this type of planning, though twice that duration may be more advisable. With this design of training loads during the pre-season, we achieve:

.- An acceleration in the application of training loads that players in the high-performance phase can cope with.

.- *Biological inertia* in the various functional systems of the body, which manifests as an increase in the player's specific conditional capacity.

.- Sufficient interaction between all systems, marking the start of a specific, defined performance configuration.

.- Avoid the monotonous application of exercises that are difficult to transfer to the specific sport practised.

.- A training volume that enables us to maintain the desired level of fitness throughout the entire competitive season.

.- Drawing up a plan that also accommodates the team's socio-economic commitments, thereby enhancing its efficiency and realism.

2.4.2. During the competitive season

The design of the training load during the competition season is entirely dependent on the competition conditions of team sports. Typically, in these sports, competitions take place at weekends and run continuously throughout the season. Therefore, the training load must be adapted to this exceptional circumstance, in a way we shall refer to as ***'microstructuring***'. This is a self-structured microcycle, with its own functional unit, integrated into the season, comprising as many microstructures as are necessary to cover the total duration of the competitions. Furthermore, each of these microstructures is interdependent with the others that make up the season and, in turn, incorporates the training elements required to achieve the desired level of fitness by the end of the microstructure, so that athletes can compete at the highest level at the weekend.

Using the reactive inertia of the functional systems, established and induced during pre-season, we designed the microstructural load to the same specifications as we did then.

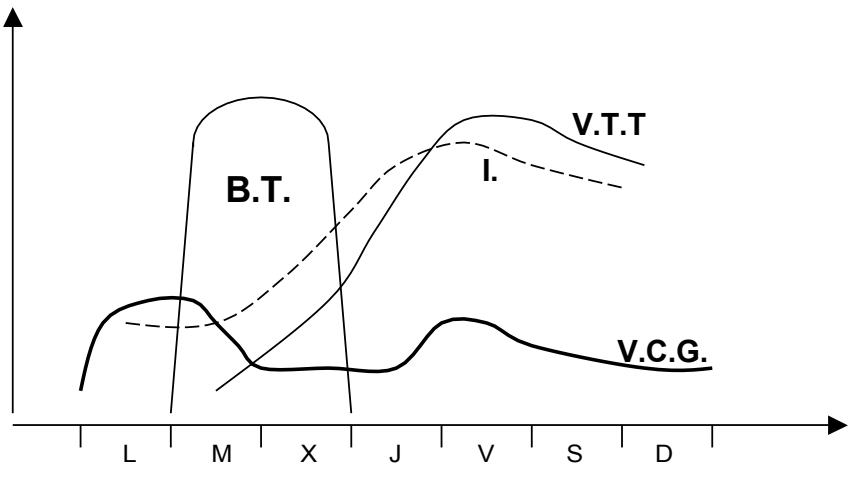


Fig. 8.

B.T. = Seasonal Block.
V.T.T. = Technical-Tactical Volume.
V.C.G. = Generic Quality Volume.
I. = Intensity.

The profile of the curves is similar to that designed for the pre-season, with the aim of adapting *biological rhythms* to cope with very fast-paced and intense training loads.

.- The T.T.V. programme is very similar, in content and design, to that of the pre-season; it is faster, with a steeper initial gradient, so that during the B.T. we can include more technical and tactical elements.

.- There is greater variation in the intensity curve (I), which rises more rapidly and earlier, both in relation to the B.T. values and the V.T.T., resulting in a high concentration of workload during the middle days of the microcycle; the subsequent decline ensures a sufficient level of fitness by the weekend to tackle competitions with confidence. Furthermore, as is often the case in these sports, there may also be a competition on a Wednesday. With this proposed intensity schedule, bringing it forward to Tuesday in the week prior to the competition will be sufficient to bring about a change in dynamics, enabling athletes to compete at a sufficiently high level. In this way, there will be no need to alter the design of the training volumes, but their content will need to be adjusted – with the exception of the V.T.T., but very significantly for the B.T. – during the competition week. It is vitally important to be aware of the competition schedules well in advance, in order to reorganise these curves as indicated.

The V.C.G. curve serves the same purposes as its pre-season counterpart; it should simply be noted that on Monday, the increase in the value of this curve is due to recovery training, if this is carried out – something we recommend.

The major modifications and alternatives lie in B.T., which is why we have changed its name from the pre-season V.C.C.E. There are two possible design options, although both differ initially from the V.C.C.E., as they each consist of just two components. These two components may be sequential, complementary or synergistic in nature.

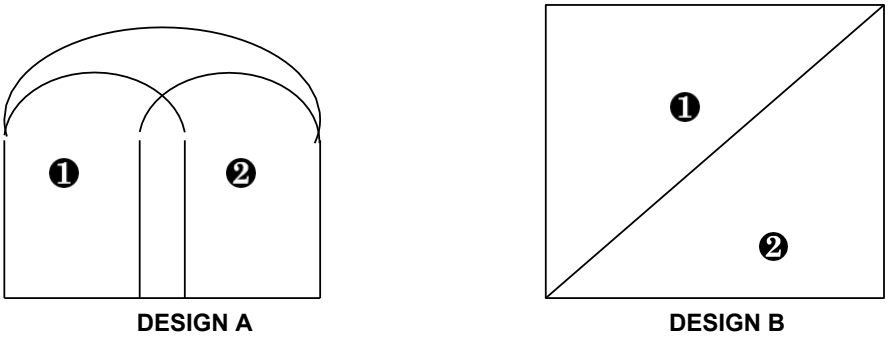


Fig. 9.

.- 'Successive action' means that they stem from the same basic quality and develop it to levels approaching competitive standards. For example: **1.** Directed strength, **2.** Specialised strength.
.- Complementary activity involves linking two different conditional abilities which, due to their characteristics or the way they manifest in sport, must be trained together with a view to competitive performance. For example: **1.** Elastic-reactive strength, and **2.** Discrimination speed or reaction discrimination.
.- Whereas synergistic activity requires an understanding of this phenomenon and generally involves supplementary relationships with the V.T.T. curve, or with abilities from another category with which they have already been linked.

As regards their structure, we must bear in mind that in Option **A,** three phases occur successively (only in the middle phase are the two qualities of this option linked), whilst in Option **B**, throughout the entire block, the two qualities are developed simultaneously. For all these reasons, Option **A** can be used more frequently at the start of the season, and Option **B** towards the end, thereby making the most of its greater capacity to shape performance. Option **B** is also easier to implement in a microcycle that includes two competitions.

2.4.3. Microstructuring

We had termed this form of planning 'microstructuring' because it involved a specific, unchanging structure of the training load, although non-structural modifications do exist; furthermore, because each microstructural unit was related to the others that make up the entire competitive season, and it is precisely this inter-microstructural relationship that is reflected in the overall training load proposed by this planning option. Figure 10 illustrates what this consists of.

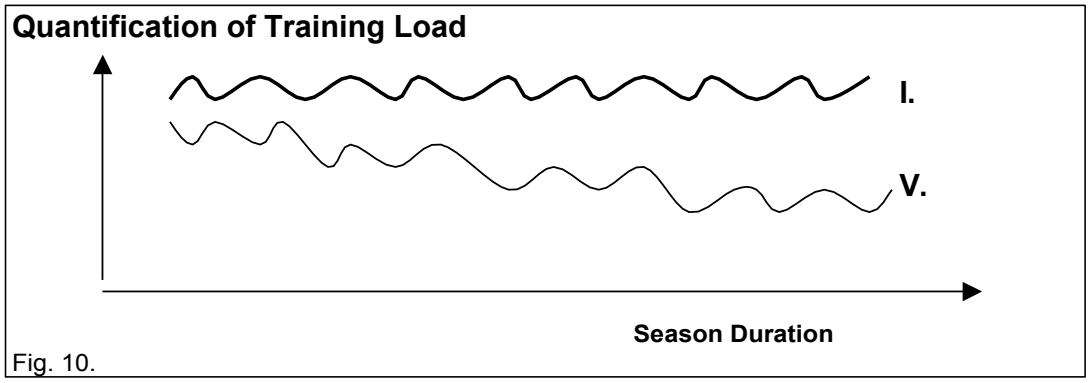


Fig. 10.

We maintain the intensity (I) at a high level throughout the season, with only very slight fluctuations, whilst the volume (V) decreases intermittently and for the duration of competitions. For this reason, we say that option **B** of the B.T. structure is used more towards the end of the season, in addition to the other reasons already mentioned.

We must maintain a high intensity so that variations in volume are more significant and can achieve the desired load dynamics, in accordance with the theories of *P. Tschiene*. Let us assume that it is very risky to reduce the intensity of the load with successive and imminent competitions; therefore, the fluctuations indicated should be timed for periods when the competition calendar poses little threat to the team's aspirations.

The gradual and intermittent reduction in volume throughout the season responds to the need to maintain the desired level of fitness for all competitions during the year. Reducing the volume elicits a positive response from the player's body, which is then able—in conjunction with the corresponding increase in intensity—to achieve a new level of fitness, and to do so continuously throughout the entire season.

For this reason, these curves must be designed with the competition calendar as a reference, so that they are reflected in the microcycle – which is where the exact quantification of the training load is determined – and are thus structured in relation to all other microcycles. To this end, each microcycle and the successive ones must maintain a specific relationship between the conditioning elements used in the block and the elements of the V.T.T. curve, as well as with all other training content belonging to any other system. In general terms, there must be direct correlations between the elements of endurance and those of tactics, and between those of strength-speed and those of technique.

The structure is designed with a specific sequence of priorities which, across successive microcycles, is applied with regard to that particular capacity. To establish these priorities—or not—we utilise different types of blocks. Thus, those involving successive action are the most effective for prioritising a particular quality across the various microcycles. Meanwhile, those involving complementary activity are suitable for establishing inter-system relationships and achieving the desired configuration. The sequence of priorities should not extend beyond four microcycles and is used at the start of the season. Towards the end, however, we must ensure that priorities alternate. As we can see, the term ***'structured*** microcycle' is well justified as the planning unit for the season in team sports.

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