CHAPTER I

INTRODUCTION

Any objective study of the performance of Indian athletes in the international competition shall reveal the fact that India has not made a mark for themselves in the international sports. Even if the inquiry is restricted to the Asian nations, which themselves do not occupy a very prominent position when compared with other continents, India's position is somewhere around the sixth position (due to the absence of North Korea, India finished fifth in the medal tally behind Iran at the Seoul Asian Games - 1986, thanks to P.T. Usha). Inspite of India's unbroken participation in the Asian Games since their inception in 1951, India's ranking has actually shown a downward trend. In the inaugural Asiads where competitions were restricted to six disciplines, India was second to Japan in the medal tally. Since then the number of disciplines has increased to twenty five and the number of participating nations has reached thirty six. Population wise India is second only to China. India has been participating in Olympics since 1928, whereas a number of other Asian countries have come to international field much later. It is obvious that much smaller nations, with fewer resources and much more recent exposure to the International sport competitions have performed much
Since 1950, India has been paying special attention to development of sports. Raj Kumari Amrit Kaur Coaching Scheme financed by Government of India, regularly organised a number of coaching camps in various disciplines under the foreign coaches to train both Indian sportsmen and Indian coaches. Netaji Subhas National Institute of Sports was established in 1961 at Patiala with the primary purpose of producing sports coaches of high calibre who could help raise the standard of games and sports in the country. It has been training coaches in almost all the sports disciplines besides providing systematic and adequate coaching to all the Indian teams prior to their participation in International competitions. Both the Union and State governments have been developing sports facilities by establishing Regional Centres of National Institute of Sports and the State centres. Almost all the states and Union territories have well established Directorates of Sports which provide facilities, incentives, coaching and training to athletes at all levels. In addition Government of India had instituted a National Physical Fitness Programme to raise the level of physical fitness of our youngmen and women. Sports Authority of India was established in 1984 mainly to lookafter the infrastructure prepared for the Asian Games held at Delhi in the year 1982. Another purpose of the Sports Authority of India was to train sports persons at various level. A number of
private organizations especially public sector undertakings and industrial concerns encourage sportsmen by offering them suitable employment and all facilities for training and participation in competitive sports. Indian sportsmen have plenty of opportunities for exposure to the international competitions.

Inspite of all these massive efforts on the part of Government of India, other governmental and non-governmental agencies and the sportsmen themselves we have comparatively very little achievement to report. This lack of creditable performance at the International level may be due to a number of factors falling in various categories - Physiological, Psychological, Sociological, Biological, Biomechanical and Nutritional etc. One such shortcoming may be the type of training or training methods employed by the coaches for preparing athletes at different levels of competition.

Training in games and sports is no longer a myth and it does not involve a casual approach. It provides opportunities for scientific processes and verifications. Sports training has been accepted as a highly specialised science. Sports scientists are striving to understand various factors affecting skeletal and muscular activity, during a variety of human movements with the help of electromyography, and are engaged in analysing the biomechanics of the performance of top athletes, by focussing their attention upon the analysis
of sports skills. They are constantly studying diverse factors such as strength, limb length, mass, inertia, proportions of angular and linear velocity which influence these movements, to get a better insight into the complexities of human motion and performance. The latest approach is aimed at the construction of a mathematical model of a skill in a form which is suitable for computer analysis so that it could be simulated under several carefully controlled conditions for predicting more effective techniques for higher performance (Miller and Nelson, 1973).

According to Shephard (1978) knowledge of training procedures, including appropriate physiological, psychological and nutritional techniques for optimising performances has increased greatly over the present century and undoubtedly this new learning has made some contribution to the overall changes in performance.

All along the evolutionary changes there have been influences contributing to the current state of training knowledge for developing cardio-respiratory endurance which underlies performance in 1500 m run. The basic methods of training have not changed much, but they have been put into more intelligent science based systems that involve high quality, greater quantity, and regular and prolonged application. One such method, "Fartlek", was perhaps the most alluring discovery since the beginning of the century in the realm
of training. This gave way to more rigidly patterned and controlled variation known as "International Training". This method was developed in its formal state by German Scientist-Coach Woldemar Gerschler during the late 1930s, who trained Rudolph Herbig. Herbig set a number of European records in middle distance running. However, it was only with the success of several world class distance runners, particularly Emil Zatopek, that this method gained universal acceptance. Since then considerable research has been focussed on the effects of interval training on cardio-respiratory endurance. Athletes in both short high intensity events and those in long low intensity events have successfully used interval training. Colfer (1975) has cited the following six variables in interval training; distance or duration of training run, speed or intensity of the run, number of repetitions of the run, the length or duration of the rest interval, nature or type of recovery interval, and frequency of the interval training session. These variables when properly manipulated may, according to him, increase the aerobic and anaerobic capacities of an athlete and bring about desired changes in his physiological functioning.

Competition and test method has a number of similarities with interval and repetition running from the training point of view. Dick (1980) is of the opinion that competition and test method is the best stimulus to develop specific endurance
qualities. This is especially so if the actual competition timing is used as a criterion for the training purpose.

The choice of training methods by the physical education teachers and coaches is dependent upon their basic faith in one or the other methods and not on any analysis of superiority of one method over the other in general or as suited to the individual athletes or to a particular running event. Research studies reported in this direction over the years have been confined mainly to the effects of continuous running or intermittent running or even Fartlek or their comparative effects on selected physiological variables and running performances. But so far no research study has been reported on the effects of competition and test method on performance. Through the present study it was proposed to analyse and compare the effects of Interval Running, and competition and Test methods on the selected variables namely Resting Pulse Rate, Vital Capacity, Resting Blood Pressure, Hemoglobin Content in Blood, Blood Sugar and Performance in Running 1500 m.

Stamp (1968) investigated the effects of an interval running programme on certain physiological variables which included pulse rate as one of them. The experimental group participated in the training programme over a period of 6 weeks. The work load consisted of running bouts on a graded treadmill
with a specific rest interval. Statistical analysis of the data indicated significant lowering of pulse rate.

Mirwald (1965) compared two methods of training for their effects on running a mile. One method involved the use of interval training whereas the other employed a combination of interval and Fartlek training. He concluded that either type of training would result in similar improvement in performances for the mile race.

Swedburg (1975) compared three methods of training viz. continuous training, interval training and continuous pace training to study their effects upon performance and body composition. He observed that the interval training group showed significant improvement on the parameters of body composition, Oxygen consumption, Cooper's 12 minute Run/Walk test and two mile run.

Smith (1971) compared the continuous and intermittent exercise and its effects on certain physiological variables. Using 17 male subjects, he gave intermittent and continuous exercise on a bicycle ergometer at the same relative work load for each subject. The results indicated that intermittent exercise of 15, 30, and 60 seconds durations placed significantly lower demands on the aerobic capacity as indicated by heart rate, pulmonary ventilation and blood lactate levels, than did continuous exercise at the same relative but less total work load.
Christenson et al. (1968) using two well conditioned subjects, compared the effects of intermittent running on treadmill at a speed of 12 miles/hour with continuous running at the same speed. The work and rest intervals for the intermittent condition were 30 seconds each. They reported that length of the work period was the most critical whereas the total work output were of secondary importance. The results showed that the intermittent condition was: (1) a more economical way of work, (2) more demanding on the circulatory and respiratory systems, and (3) more favourable to the development of efficient chemical reactions.

While it is evident from the available literature that considerable research has been undertaken with regard to continuous running, interval running and Fartlek as methods of endurance training, no attempt has been made to study the effects of competition and test method on the physiological parameters and running performances. The sustained efforts of Physical Education and sports scientists to identify those factors that contribute to a higher performance have prompted numerous research studies to be undertaken in a systematic manner.

STATEMENT OF THE PROBLEM

"Comparative Effects of Interval Running and Competition and test Method on Selected Physiological Variables and Running Performance".
OBJECTIVES:

1. To find out the comparative effects of two training methods i.e. interval running and competition and test methods on selected physiological variables.

2. To find out the comparative effects of interval training method and competition and test method on running performance of 1500 meters.

3. To find out the effects of interval running and competition and test method on selected physiological variables and running performance.

HYPOTHESES

It was hypothesized that:

1. There would be no significant differences in the effects of interval running and competition and test methods on selected physiological variables.

2. There would be no significant differences in the effects of interval running and competition and test methods on running performance.

3. The interval running and competition and test methods would have significant effect on the physiological variables and running performance.
DELIMITATIONS

1. The study was delimited to the male students of certificate class of Physical Education at S.K.R. College of Physical Education, Bhagoomajra (Kharar).

2. The study was further delimited to the age group of 18-20 years - both inclusive.

3. The study was confined to selected physiological variables of Resting pulse rate, vital capacity, Blood pressure, haemoglobin and Blood sugar.

4. The study was further delimited to only one running performance of 1500 metres as a criterion variable.

LIMITATIONS

1. No motivational techniques were used in this study. The differences that might have occurred may be due to their interest and attitude during training and performance. Lack of motivation were recognised as a limitation of this study.

2. The effect of uncontrollable factors, that might have influenced the selected physiological variables and running performance in 1500 metres was also accepted as another limitation.
**IMPLICATIONS**

The selected physiological variables which have been chosen for the present study are directly related to the athletic performance, specially with endurance events. The investigation of these variables by employing two different training methods on two different groups would decide the efficiency of either method. The findings of this study will give clear picture to our coaches as well athletes to adopt one particular method at the different stages of training programme. Finally, the findings of this study will indicate which method is more efficient in improving running performance, specially 1500 metres. The results of this study will provide practical guidelines to our coaches and athletes.

**DEFINITIONS OF TERMS**

**Interval Running**

According to Doherty (1967) interval running is a method of training for endurance running which involves repeated efforts on a track at a relatively faster pace, separated by measured intervals of recovery.

**Competition and test Method**

According to Dick (1980) competition and test method is characterized by running under or over or similar distances of particular event at fast pace, slow or at even pace.
respectively. They are the best stimulus to develop special endurance qualities. This is especially so if the actual competition duration is used for this purpose.

**Resting Pulse Rate**

Resting pulse rate has been defined as a number of pulse waves per minute felt at the radial artery early in the morning before leaving bed and an empty stomach.

**Vital Capacity**

Vital capacity is defined as maximal volume of air that can be forcefully exhaled from the lungs following maximal inspiration (Shaver, 1981).

**Blood Pressure**

Blood pressure has been defined as the force or pressure which the blood exerts on the walls of the blood vessels in which it is contained. When the left ventricle contracts and pushes the blood into aorta, the pressure produced is known as the systolic blood pressure. When complete cardiac diastole occurs and the heart is resting with no ejection of blood, the pressure within the vessels is termed as the diastolic blood pressure (Ross and Wilson, 1973).

**Haemoglobin**

Haemoglobin is a complex molecule found in red blood
cells, which contains iron and protein and is capable of combining with oxygen (Mathews and Fox, 1976).

**Blood Sugar**

The amount of sugar present in the circulating blood.