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Special Report Series No. 5

# PHYSICAL FITNESS OF THE BURMESE

REPORT  
OF THE  
TECHNICAL COMMITTEE  
OF THE  
BURMA MEDICAL RESEARCH COUNCIL

1968

Burma Medical Research Institute, Rangoon

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## I. INTRODUCTION

The importance of physical fitness of a nation does not need stressing. In Burma, as in other countries, the need to increase the physical fitness of its people has been early recognised and soon after attaining independence, the National Fitness Council Law was promulgated by the then Parliament in 1950. The National Fitness Council came into existence in 1951. Since then, the National Fitness Council, later the Sports and Physical Education Committee and still later the Sports and Physical Education Department has formulated and undertaken various programmes to encourage sports activities among the people. The trend towards mass sports activity has been most pronounced with the advent of the Revolutionary Government in 1962. The Hiking and Mountaineering Association has become very active and mass hikes have been organised all over the country regularly. December has been designated the "Sports Month" and various sports and physical activities are organised throughout the country down to the village level during this month.

With the institution of all these programmes, there are encouraging signs that the population in general are becoming more health and physical fitness conscious.

While a great deal is being done to promote sports and physical fitness, there is also a great need to assess scientifically the impact of these measures on the physical fitness of the people. What is the present level of physical fitness of the Burmese? How does the physical fitness of the Burmese compare with that of other nations? What is the impact of the present measures to promote physical fitness? What further measures should be undertaken? These are some of the questions which will need urgent answers, especially that of the present level of physical fitness. For it is on the basis of the present level that future physical fitness levels of the population will be compared and future programmes drawn.

The Burma Medical Research Council recognising the importance of the subject and realising its urgent need for study, decided at its 18th meeting held on 8 January, 1968 to form a Technical Committee to study the problem.

The Technical Committee for the Study of Physical Fitness of the Burmese, as this Committee was called, was given the following terms of reference :

1. To act in accordance with the general terms of reference for all Technical Committees (of the Burma Medical Research Council).

2. To study the various methods for the evaluation of physical fitness.
3. To study the present level of physical fitness of the Burmese people and to assess the impact of the various measures being undertaken to raise the level of physical fitness and to make suitable recommendations.
4. To report to the Burma Medical Research Council in 2 months.

The Committee was formally formed on the 26 January, 1968 and it held its first meeting on 16 February, 1968. At this first meeting the Committee formed a Working Group comprising the following members :

Dr. U Mya Tu  
Dr. U Kywe Thein  
Dr. Daw May May Yi  
U Ba Aye  
Dr. U Tha Moe

The Committee met six times. The Working Group met eight times.

## 2. DEFINITION OF PHYSICAL FITNESS

In order to assess the present level of physical fitness of the people, the Committee first considered what was meant by "physical fitness".

Though the term "physical fitness" is much used these days, it means different things to different people. Thus some authors define it in terms of work capacity for prolonged heavy work (Astrand, 1956), whilst others in terms of the capacity of the organism to maintain various internal equilibrium in response to stress (Darling, 1947). Physical fitness is also related to a task (Moorehouse & Miller, 1963). These same authors classify physical fitness into anatomical fitness, physiological fitness and psychological fitness.

Moorehouse (1955) defines physical fitness as that aspect of total fitness which concerns the integrity of the total organism in action. Under total fitness, he includes besides physical fitness, mental fitness, emotional fitness and social fitness and he suggests that any study of physical fitness include observations on mental, emotional and social fitness as well.

Similarly Karvonen (1964) expresses the view that physical fitness is not a unidimensional concept but has to be seen as a sum total of different capacities.

It is obvious that there are many facets of physical fitness and there is lack of general agreement as to what constitutes physical fitness.

The Committee considers that ideally a study of physical fitness should include the emotional or psychological, mental and social aspects as well. However, to study the physical fitness of the population, which would include all other aspects of total fitness would not be practical at present. The Committee feels that its definition of physical fitness should be an operational one. Hence, it defines *physical fitness as the capacity of individuals to perform efficiently certain tasks involving physical activity.*

In spite of limiting the definition of physical fitness to make it operational, the Committee considers that the physical fitness of the population should be studied in all its physical aspects. Thus, apart from the study of *physical performances* (such as for strength, speed, power, endurance and agility), a study should also be made of the *work capacity for prolonged physical work*. Since anatomical factors will also influence physical performance and work output, a study of the *physical growth* including physique, body composition and various hereditary body deformations should also be made. The Committee also considers that a study of physical fitness will not be complete if the health aspects

are neglected. Although fitness does not describe a state of health, health and fitness go hand in hand. It is said that "a healthy people is one of the greatest assets of a nation". The Committee considers that that statement should be modified to read "a healthy *and physically fit* people is one of the greatest assets of a nation".

Hence, basing on the Committee's concept of physical fitness as stated above, the Committee came to the conclusion that evaluation of the level of physical fitness of the population should include the following :

- (a) Anthropometric measurements
- (b) Performance tests of physical fitness
- (c) Work capacity tests
- (d) Clinical and nutritional studies



### 3. THE PRESENT LEVEL OF PHYSICAL FITNESS OF THE BURMESE

#### 3.1 Assessment from Anthropometric Data

Anthropometric measurements was one of the earliest types to be used in the appraisal of physical fitness of individuals. However, the greater part of the earlier anthropometric work placed emphasis on the symmetry and size of the body. Age, height, weight and various indices to predict normal weight and measurements of various parts of the body were recorded. "Norms" were then set up and the individual values were then interpreted from these norms. Recent research in this field however, tends to interpret such measures in terms of development patterns of each individual rather than in terms of rigid norms. Developments in somatotyping and in the techniques of determining the body composition have resulted in their inclusion in physical fitness appraisal.

Anthropometric data on the Burmese are scarce. From the few data available on

- (a) Height-age relations
- (b) Weight-age relations
- (c) Skinfold measurements and
- (d) Pulmonary volumes,

an assessment of the physical fitness had been attempted.

#### 3.1.1 Physical growth and development

In many parts of the world, a change in human development is now taking place, distinguished by an "acceleration of growth", a deceleration of aging and a lengthening of the life span. These trends are apparent in technologically developed countries.

The first comprehensive nutritional survey (which included anthropometric measurements) conducted in Burma was by Maung Gale during 1939-1940 (Maung Gale, 1948). He examined school children of both sexes from Insein, Bassein, Yamethin, Minbu, Mergui and Thaton districts. During 1954-1957 Postmus (1957) conducted another similar survey in Maymyo, Lashio, Myitkyina, Payagyi, Insein, Bassein, Mingaladon, Kyaukpyu, Kalewa, Mandalay and Meiktila rural districts on school children, in Rangoon on office workers and in Kyagu and Thingangyun in the Rangoon area on labourers. Later, anthropometric studies were made in 1957 on rural school children in

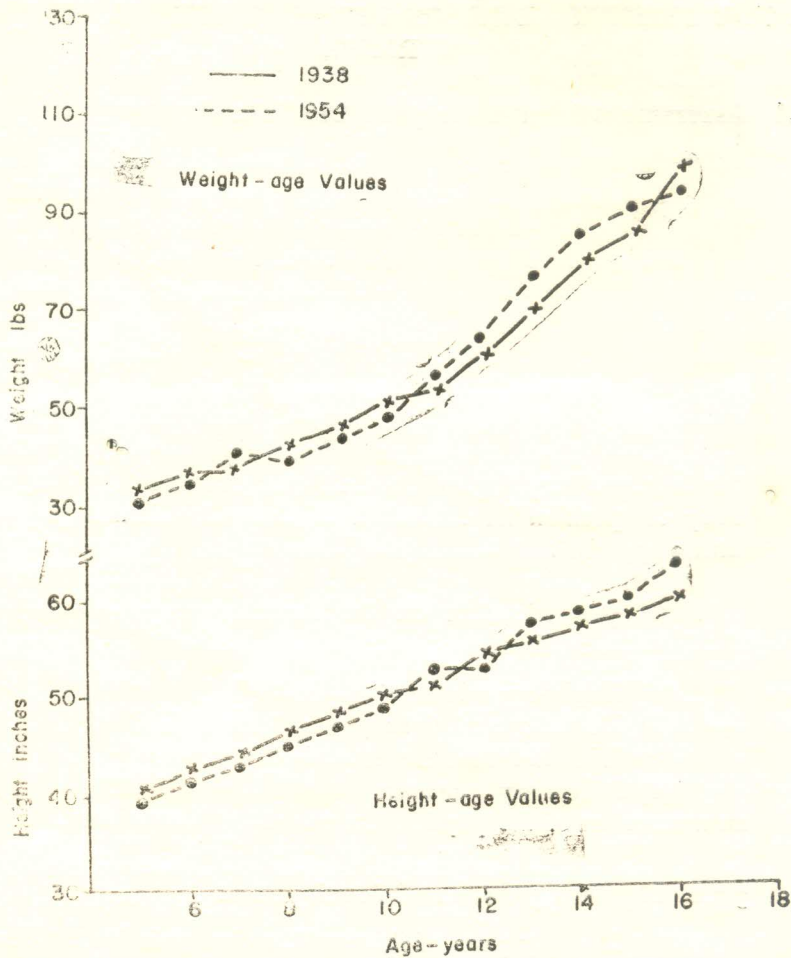
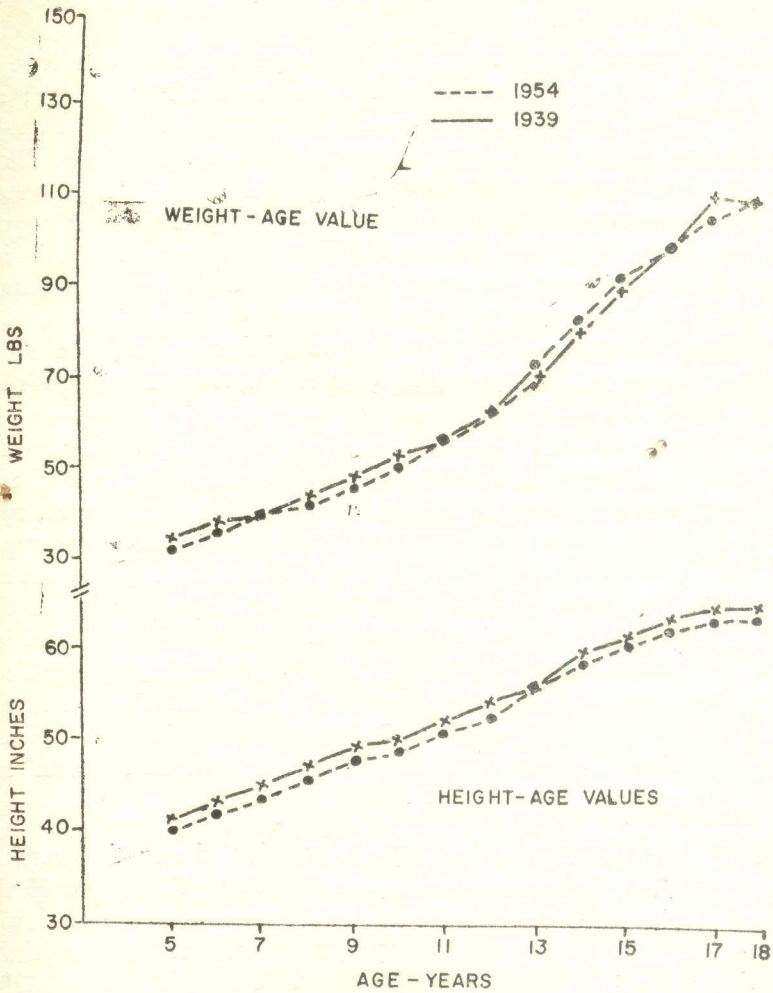


FIGURE 1.—Physical growth of Burmese boys, 5—18 years.



FIGURES 2.—Physical growth of Burmese girls, 5—18 years.

Aung San Village in Insein district by Ko Ko (1959-1960) ; on military personnel, military dependents and some civilians in 1961 by the Interdepartmental Committee on Nutrition and National Defense (ICNND, 1963) ; and on Rangoon University male entrants in 1961 by Mya-Tu and Ko Ko (1962). The Nutrition Project of the Directorate of Health Services (Khin Nwe Aung, personal communication) has been conducting nutrition surveys of factory and office workers in Rangoon and in Chauk since 1967 in which are included some anthropometric data.

*Comparison of growth curves of Burmese children during the periods before and after World War II (1939-1945)*

In Figures 1 and 2 are compared the growth curves of Maung Gale's children (national figure) obtained in 1939 and of Postmus' sample obtained 15 years later in 1954. Both the heights and weights of both boys and girls appear to be lower in the 1954 sample than in the 1939 sample and Postmus concludes that "the general impression is that after the war the nutritional condition of children was lower than before the war". However, Kywe-Thein (personal communication) who was associated with Postmus in his work states that statistical analysis was done and there was no significant difference between Postmus' and Maung Gale's figures.

In 1957, Ko Ko (1959-60) conducted an anthropometric survey of school children in the Aung San Rural Health Centre in Insein District. Comparing his results with those of Maung Gale (1948) he states that "The results of the present survey differ very little from U Maung Gale's Insein children. The differences are significant only in 8 year old girls and 10 year old boys" (Table 1).

The ICNND Nutrition survey in 1961 compared the growth curves of Burmese children up to the age of 18 years of both military dependents and civilians to that of American children. Their conclusion is that "the growth curves are quite outside those accepted as adequate for American children. However, the curves themselves follow the general pattern quite well and would seem only to indicate a small stature rather than growth retardation".

Figures 3 and 4 show the growth curves of Burmese, Thai and Malayan boys and girls, 0-5 years of age (ICNND, 1964).

TABLE I.—*Changes in heights and weights of children in Insein district in 1938 and 1957*

**Boys**

Age (1)	Height (inches)		Weight (lbs)	
	Maung Gale 1938 (2)	Ko Ko 1957 (3)	Maung Gale 1938 (4)	Ko Ko 1957 (5)
4 ...	...	...	...	...
5 ...	40.8	41.9	34.3	35.7
6 ...	42.6	42.1	37.1	36.1
7 ...	44.1	43.9	39.0	39.3
8 ...	46.1	45.1	42.6	41.8
9 ...	47.3	46.9	45.0	45.2
10 ...	49.8	48.9	52.2	50.0
11 ...	51.1	51.3	54.9	54.3
12 ...	52.7	52.7	57.3	58.9
13 ...	...	54.8	...	65.7
14 ...	...	58.9	...	74.0
15 ...	...	59.0	...	85.0

**Girls**

Age (1)	Height (inches)		Weight (lbs)	
	Maung Gale 1938 (2)	Ko Ko 1957 (3)	Maung Gale 1938 (4)	Ko Ko 1957 (5)
4 ...	37.25	...	28.75	...
5 ...	41.6	41.1	34.7	34.8
6 ...	42.0	42.1	36.0	35.2
7 ...	43.6	44.2	38.1	39.1
8 ...	46.2	45.5	43.8	41.6
9 ...	47.8	47.0	45.7	44.1
10 ...	49.3	48.8	50.7	48.4
11 ...	51.3	50.9	55.2	54.1
12 ...	52.2	52.9	57.8	62.1
13 ...	...	55.5	...	77.9
14 ...	...	57.1	...	78.6
15 ...	...	58.9	...	93.9

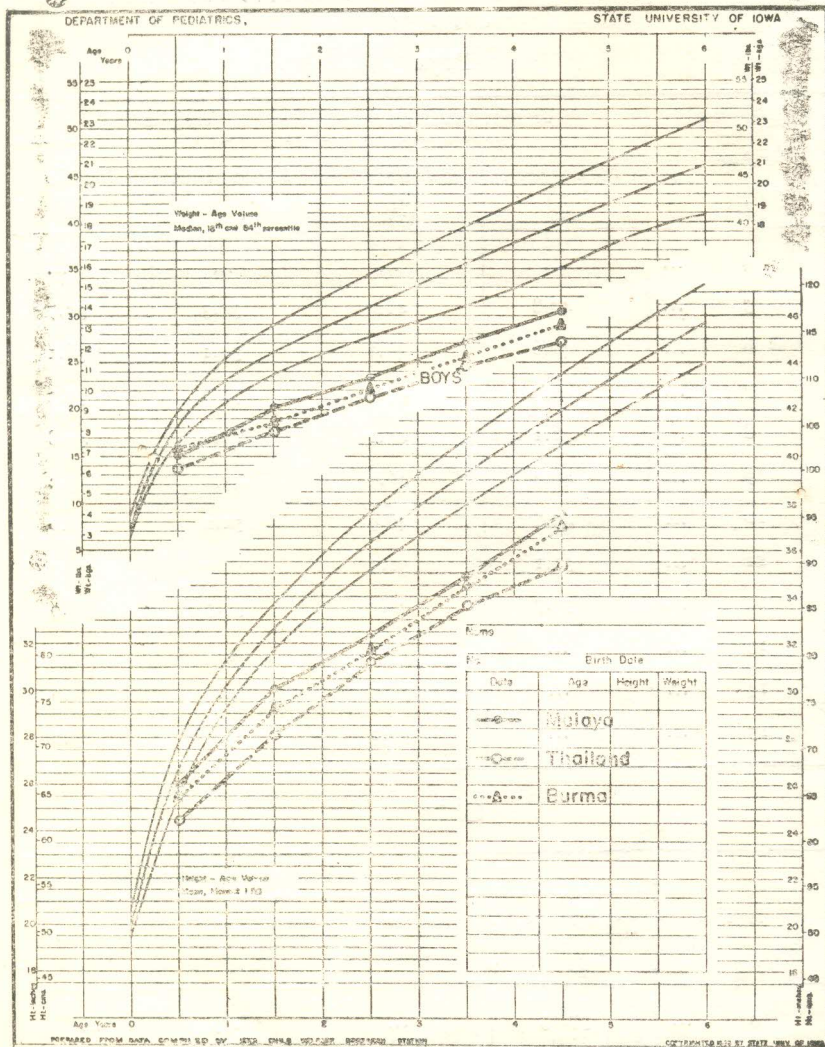


FIGURE 3. HEIGHTS AND WEIGHTS OF MALAYAN BOYS 0 TO 5 YEARS OF AGE, COMPARED WITH THAI AND BURMESE BOYS OF SAME AGE

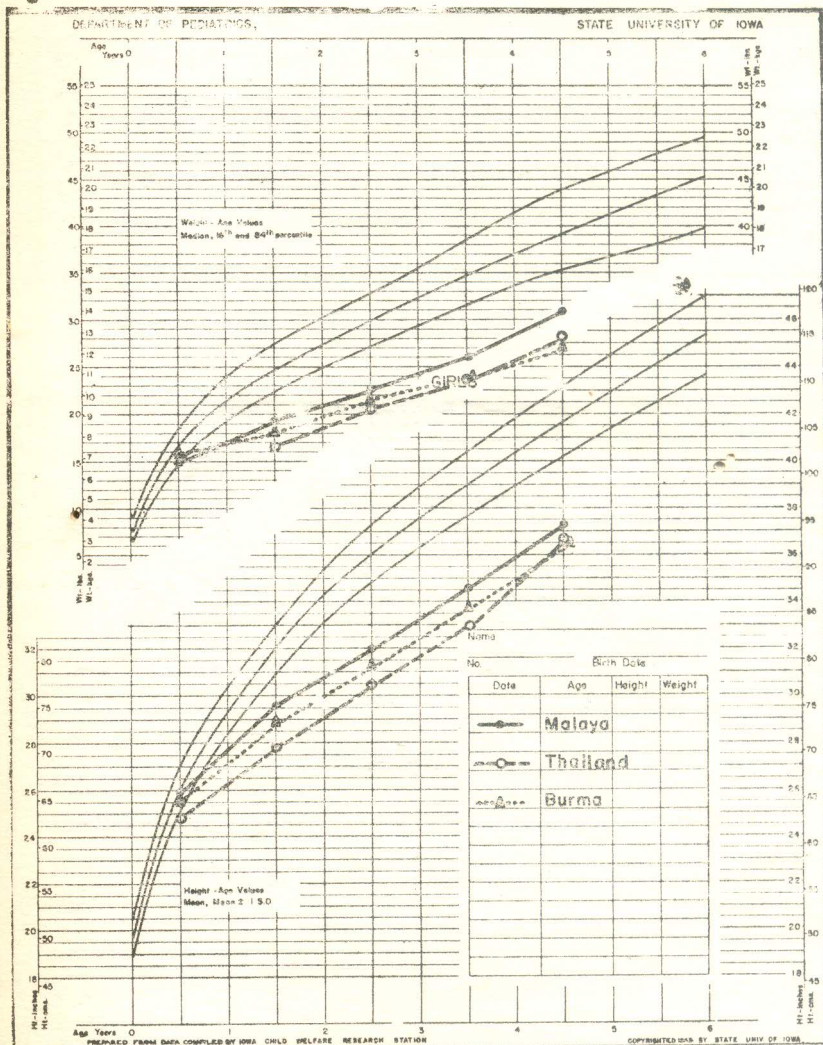


FIGURE 4. HEIGHTS AND WEIGHTS OF MALAYAN GIRLS 0 TO 5 YEARS OF AGE, COMPARED WITH THAI AND BURMESE GIRLS OF SAME AGE

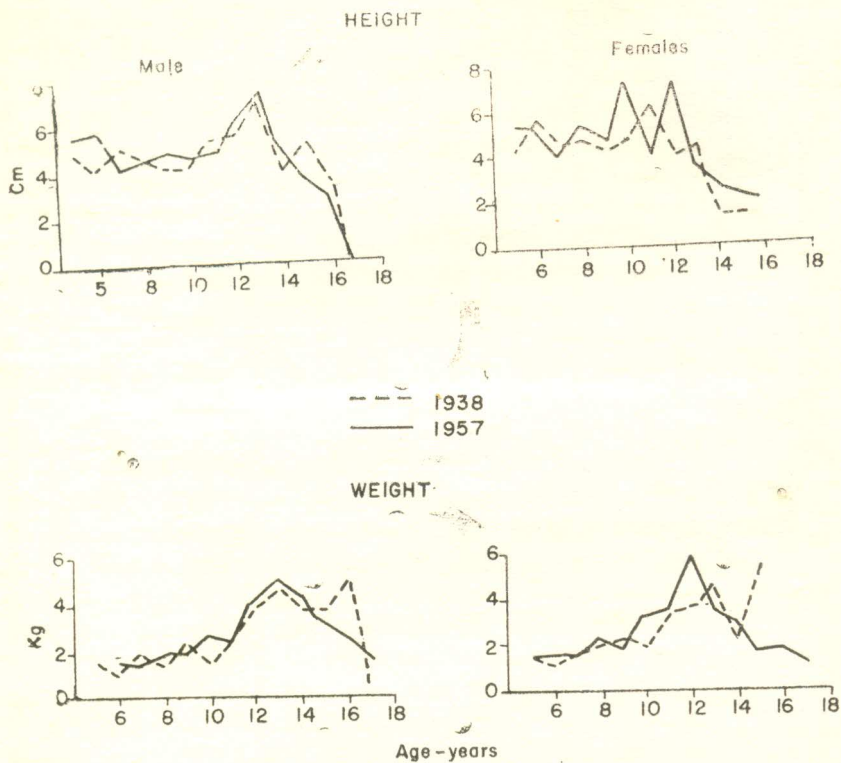


FIGURE 5.—Comparison of periods of greatest growth in 1938 and 1957.



Figure 5 shows a comparison of the rate of growth of boys and girls in 1938 and in 1957. The graphs show that during this 15 year period, the periods of greatest growth have not changed. Whilst other countries, notably Japan, Sweden, Poland, USA, and England show an increase in physical development between 1939 and 1954, surveys conducted so far in Burma have revealed that there is no such increase in the physical development of Burmese youth during this period. Lauw Tjin Giok, Rose & Gyorgy (1967) compared the height and weight of Indonesian children obtained during a survey in 1937-41 and again in 1964. They found that the majority of the children in the 1964 survey were 90-100% of the 1937-41 height and 80-100% of the 1937-41 weight. These children were from the low economic class. The average height and weight (with SE) of a group of children of the middle to high economic class in the same city were respectively,  $102 \pm 1.0$  and  $109 \pm 2.1\%$  of the 1937-41 standard. If the 1937-41 Indonesian standard includes children of all socio-economic classes, it then appears that the physical development of Indonesian children during the years 1941-1964 has shown no increase either.

On the other hand, Chang, Lee, Low and Kvan (1963) compared the heights and weights of Southern Chinese children (in Hong Kong) in 1961-1962 with those growth data of Southern and Eastern Chinese about 40 years ago and have shown that at 18, today's boys are about 4.2 cm taller and 3.3 kg heavier than their counterparts 40 years ago, and today's girls are taller by 2.7 cm but there has been little change in weight.

Data on the changes in the rate of growth of other neighbouring countries such as Thailand and Malaysia are not available.

*Comparison of the heights and weights of Burmese adults during the periods 1954 and 1967*

In Table 2 the heights and weights of male and female Burmese adults obtained by various workers are compared. By "adult" is meant those 19 years of age and above. Unfortunately there is no data for the height and weight of adults for the pre-World War II period.

The figures of Postmus (1957), ICNND (1961) and the Nutrition Project (1967) are for the general population. It can be seen that there is no difference in the heights of both males and females in all these three surveys.

TABLE 2.—*Height and weight of Burmese adults (19 years and above)*

Males		Authors	Females		Remarks
Height (inches)	Weight (lbs)		Height (inches)	Weight (lbs)	
63.10	116.0	Postmus (1957) Office workers ...	59.1	101.0	
64.86	112.18	Mya-Tu and Ko Ko (1961) University entrants, age 19—38.	...	...	
63.58	108.46	ICNND (1963) civilians, age 15 + ...	59.33	98.34 94.16	Adults taken as above 15.
66.11	123.02	Tun Tawk <i>et al.</i> (1966) University students, age 19—24.	60.31	105.15	
66.13	133.97	Mya-Tu <i>et al.</i> (To be published) athletes, age 19—38	...	...	Volley Ball athletes not included.
...	...	Hnin Hnin Aye <i>et al.</i> (1968) University students ...	...	100.03	
63.50	115.01	Khin Nwe Aung (personal communication, 1967) workers.	59.48	95.07	Age not specified.

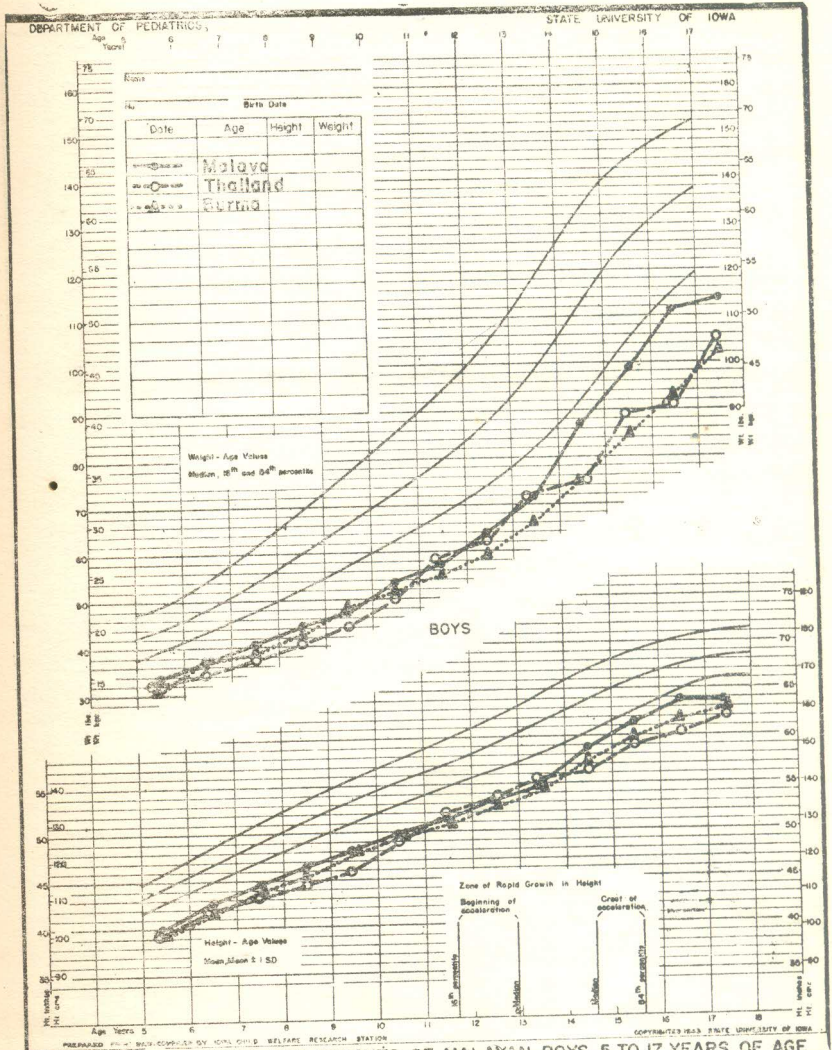


FIGURE 6. HEIGHTS AND WEIGHTS OF MALAYAN BOYS 5 TO 17 YEARS OF AGE COMPARED WITH THAI AND BURMESE BOYS OF SAME AGE

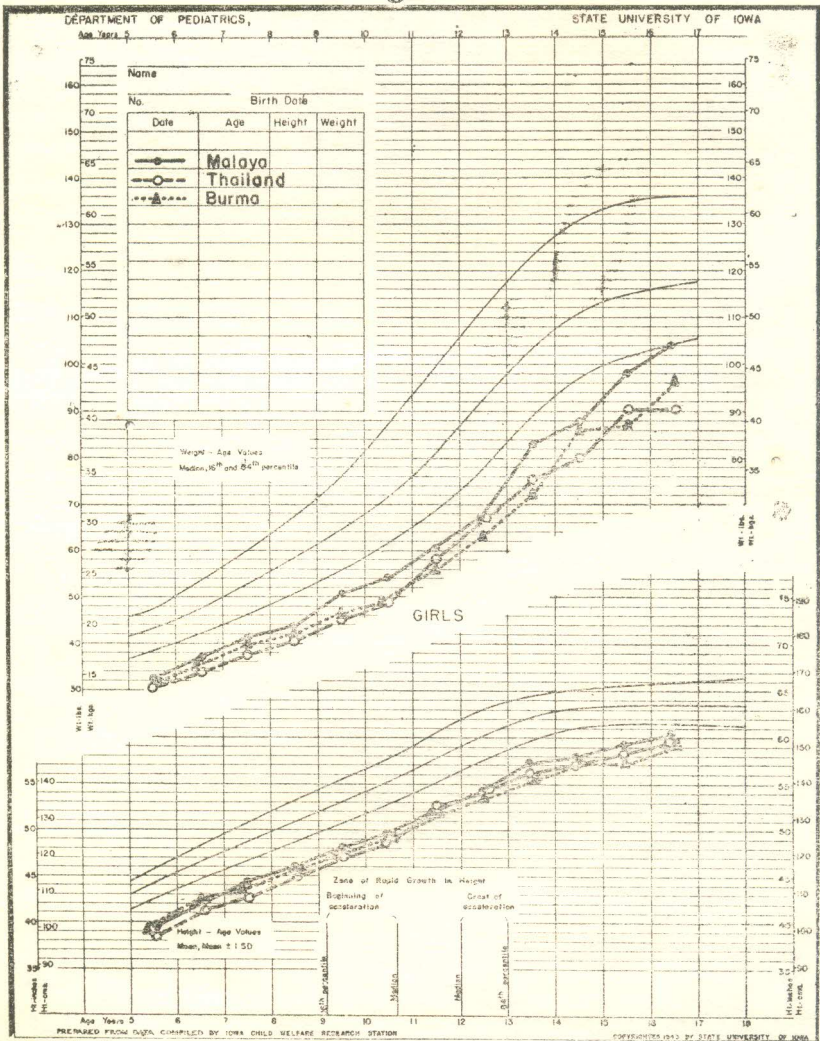


FIGURE 7. HEIGHTS AND WEIGHTS OF MALAYAN GIRLS 5 TO 16 YEARS OF AGE COMPARED WITH THAI AND BURMESE BOYS OF THE SAME AGE

