1960

A weight appraisal of Newfoundland college women based on the Pryor Width-Weight Tables

Thelma Gerstman
The University of Montana

A WEIGHT APPRAISAL OF NEWFOUNDLAND COLLEGE WOMEN BASED ON THE PRYOR WIDTH-WEIGHT TABLES

by

THELMA GERSTMAN

B.Sc. (P.E.) McGill University, 1949

Presented in partial fulfillment of the requirements for the degree of

Master of Science

MONTANA STATE UNIVERSITY

1960

Approved by:

Charles F. Kutter

Chairman, Board of Examiners

Dean, Graduate School

AUG 1 1960

Date

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION, THE PROBLEM AND DEFINITIONS OF TERMS USED

I. INTRODUCTION

The island of Newfoundland, off Canada's east coast, was first discovered in 1497 and is, therefore, one of the oldest settlements in North America. Early in its history, the wealth of fish off the banks of the island -- claimed to be the most prolific fishing grounds in the world[1] -- attracted mainly Cornish, Irish and Scottish fishermen to its shores and to this day fishing remains one of the foremost industries.

The great rocky land mass of the 42,734 square mile island, however, has remained virtually uninhabited as little arable land is contained therein. Instead, the population is mainly distributed along the 6,000 miles of a coastline indented with large bays and fjords which in itself has caused the people of the province severe social and administrative problems.

In 1944, a medical survey of nutrition in Newfoundland[2] concluded that the fluctuation of successful fishing seasons, the poor fertility of the land, the lack of adequate transportation and communication plus extensive poverty had led to poor food habits which in turn had affected the length of life, general vitality and resistance to

---

[1]A. B. Perlin, The Story of Newfoundland (St. John's: Guardian Limited, 1959), pp. 5-6.

[2]Nutrition Council of the Newfoundland Medical Association, Medical Survey of Nutrition in Newfoundland (Toronto: Murray Printing Co. Ltd., 1945), p. 2.

disease of the majority of Newfoundlanders. These economic factors caused one of the highest mortality, tuberculosis and deficiency disease rates in North America.

One of the methods used to evaluate the nutritional state of the population studied was a measurement and comparison of the weights of Newfoundlanders with Canadians of the same age and height. The study revealed that although the heights of the subjects were the same per age, the body weights of Newfoundlanders were considerably lower in comparison. Forty-three per cent of females and 31 per cent of males studied, out of a total of 868 persons, were more than 10 per cent below standard weight; fourteen per cent of females and 5 per cent of males were 20 per cent or more below standard.[3]

Another study in 1947, conducted on 277 university students in the city of St. John's, revealed that their growth in weight lagged behind their growth in height in comparison to English students of the same ages.[4]

In a re-survey of nutrition in Newfoundland in 1948, again with 868 persons, 227 of whom were the same as in the 1943 study, there was evidence to indicate that weights had improved somewhat but a marked difference still existed between, for example, the Toronto and the Newfoundland child and adult of similar age and height.[5]

---

[3] Ibid., p. 9.

[4] D. P. Cuthbertson, Report on Nutrition in Newfoundland (London: His Majesty's Stationery Office, 1947), p. 29.

[5] W. R. Aykroyd et al, "Medical Resurvey of Nutrition in Newfoundland," Canadian Medical Association Journal, 60, (April, 1949), p. 29.

Since these studies were conducted, the economy of Newfoundland has reached a high never before achieved. The union of the island with Canada in 1949 brought a previously unheard of wealth to the new province in the form of old age and disability pensions and children's allowance. Too, the government, aware of the problems of nutrition revealed by these studies, has been making a concerted effort to improve conditions by stocking the shelves with increased imports of nourishing foods such as evaporated milk, canned and fresh fruits and vegetables, margarine and flour of improved quality, and by educating the people to realize the necessity for wholesome balanced diets.[6]

II. THE PROBLEM

Statement of the problem. It was the purpose of this study to (1) appraise the weights of female university students of Newfoundland origin in attendance at the Memorial University of Newfoundland by use of the Pryor Width-Weight Tables;[7] and (2) to determine, if possible, whether living in rural or urban locations and the parents' occupations have any appreciable relationship to the results.

Importance of the study. Much emphasis has been placed upon weight in relation to health, not only in Newfoundland but in North America generally. Prominent insurance companies have published tables of weights in relation to sex, age and height. An individual failing to fall into the zone of from 10 per cent below to 20 per cent above

---

[6] Ibid., pp. 4-9.

[7] Helen B. Pryor, Width-Weight Tables (Stanford: Stanford University Press, 1940).

average for his category (with a variation of percentages according to age) is considered to be a poor insurance risk.[8]

It is a known medical fact, reiterated by Etheredge, that (1) persons appreciably underweight are prone to suffer from tuberculosis and other respiratory diseases plus eye, skin and postural disorders. Resistance to all disease and general vitality is low; (2) persons appreciably overweight show a prevalence of high blood pressure, arteriosclerosis, cerebral hemorrhage, angina pectoris and kidney disease. They are also accident prone due to general fatigue and awkwardness.[9]

Cureton too points out that one of the great dangers of obesity is the overload on the heart as every pound of fat requires 4,500 feet of blood vessels. He further claims that when obesity reaches the stage of the individual being 35 per cent or more above average weight his mortality rate becomes 1½ times higher.[10]

Further emphasis has been placed upon the disadvantages of being underweight by health educators who reveal that this state tends to contribute to the following: (1) scrawny appearance; (2) a tendency to chill easily; (3) irritibility; (4) lack of ambition; (5) inability to concentrate; (6) a tendency to tire easily; (7) digestive disorders; and (8) lowered resistance to disease germs.[11]

---

[8]M. L. Etheredge, Health Facts for College Students (Philadelphia: W. B. Saunders Company, 1958), p. 77.

[9]Ibid., p. 78.

[10]Cureton, Thomas K., "Weight and Tissue Symmetry Analysis," The Research Quarterly Supplement of the American Physical Education Association, 12 #2, (May, 1941), pp. 331-345.

[11]Edward B. John et al, Health for Effective Living (New York: McGraw-Hill Book Company, Inc., 1958), p. 236.

Despite the economic and educational improvements which have taken place in Newfoundland in the past fifteen years, statistics indicate that among the provinces of Canada, Newfoundland still had, at the last census, the highest infant mortality rate (43 per 1,000 live births compared to 33 for Canada as a whole), the highest general mortality rate (8.2 per 1,000 population compared to 7.4 for Canada), the highest tuberculosis rate (19.9 compared to 8.9 for Canada), and the highest death rate from ill-defined or unknown causes.[12] Having established the fact that there is a relationship between health and weight, it can be considered important to know whether Newfoundlanders still indicate a tendency toward appreciable weight variations from normal and if so what further steps could be taken to alleviate the problem.

Basic assumptions. In the course of this study it has been assumed that: (1) Newfoundland university students are of an age which qualifies them to have reaped the benefits of the economic changes taking place in Newfoundland during the past fifteen years; (2) they are representative of all areas of the province; (3) because the greater majority of freshman students attend the university on government grants they are representative of all economies of all parts of the province and not merely members of families of higher incomes; and (4) differences could exist between the weights of rural and urban students due to the influence of greater isolation, and between students of different occupational background influenced by socio-economic factors.

---

[12] "Newfoundland," Encyclopedia Canadiana (Ottawa: The Grolier Society of Canada Limited, 1958), p. 315.

Limitations of the study. The study was limited to the results of tests conducted on 227 female freshman students of Newfoundland origin in attendance at the Memorial University of Newfoundland during the 1959-60 academic year.

The testing was limited to the use of the Pryor Width-Weight Tables involving five measures, namely: (1) age to nearest birthday; (2) height; (3) actual weight; (4) chest width; and (5) hip width.

Socio-economic background of the subjects studied was determined by categorization of the occupations of their parents. For the purposes of this study, the occupations involved were limited to two categories: (1) manual occupations and (2) white-collar occupations. It was realized that the use of occupational background in comparing weight deviations brings into consideration the problem of generalization. No two persons or families of the same occupational background will have a completely similar situation for fair comparison. Some variations are bound to prevail in education, salaries, formal and social contacts, experience, size of family, physical environment and economic management. However, a study conducted by Centers revealed that 85 per cent of manual workers showed a poorer economic status or standard of living in comparison to 23 per cent of the white-collar group, and that manual workers showed a greater insecurity in their work -- only one-third had never been out of work.[13] Both Roe[14]

---

[13]Centers, R., "Motivational Aspects of Occupational Stratification," Journal of Social Psychology, 28, (1948), pp. 187-217.

[14]Anne Roe, The Psychology of Occupations (New York: John Wiley and Sons, Inc., 1956), p. 36.

and Shartle[15] point out that most persons employed in the manual occupations have a lower income, lower prestige and lower educational training than those employed in white-collar occupations, and that these factors would contribute to the lower standard of living and consequent problems of nutrition and hygiene generally. It was on this basis that the author chose to limit the occupations to the two categories mentioned.

Weight classification of subjects was limited to three groups: (1) below normal weight; (2) normal; and (3) above normal weight. Such classification was based upon a recognized deviation of 12 or more pounds from the appropriate weights indicated in the Pryor Width-Weight Tables.

It was recognized that there exists no completely accurate means of determining appropriate or normal weight whether by a physician's subjective judgment or by a single objective test such as the one used in this study. The use of individualized anthropometric standards to determine whether deviation from normal weight exists should not be considered a substitute for a medical examination but rather a means of resolving whether deviations are severe or prevalent enough to warrant further attention.

No attempt was made in this study to statistically show the significance of differences occuring between groups.

---

[15]Carroll L. Shartle, Occupational Information - Its Development and Application (New York: Prentice-Hall, Inc., 1946), pp. 111-112.

III. DEFINITIONS OF TERMS USED

Anthropometry. Anthropometry is the study of the physical measurements of body structure. The anthropometrical measurements used in this study were height, weight, chest width and hip width.

Appropriate weight. The appropriate weight referred to throughout this study was the weight indicated in the Pryor Width-Weight Tables for each individual in accordance with her age, height, chest width and hip width.

Manual occupations. Occupations requiring physical exertion and labor with the hands have been classified as manual occupations, as opposed to desk, office or white-collar occupations. Examples of occupations classed as manual in this study would include carpenters, fishermen, truck drivers, laborers and farmers.

Normal weight. Normal weight was interpreted as being within a range of from 12 pounds below to 12 pounds above the individual's appropriate weight as indicated in the Pryor Tables. If the subject's actual weight fell outside of the normal weight range she was classed as either underweight or overweight.

Nutritional status. As defined by Turner, nutritional status is, ---"the condition of the body resulting from the utilization of the essential nutrients available to the body".[16]

---

[16]D. Turner, Handbook of Diet Therapy (Chicago: University of Chicago Press, 1952), p. 130.

Rural and urban students. According to the 1958 census of Canada,[17] populations in Newfoundland were categorized as being urban if the community or town had a population of 1,000 or more persons, otherwise it was rural. For the purposes of this study, however, the author felt that the distinction between an urban area with, for example, a population of 1,200 and a rural area of perhaps 900 was not sufficiently acute for purposes of comparison as very similar conditions are apt to prevail in Newfoundland in either size of community. Therefore the subjects studied were arbitrarily split into rural or urban groups according to whether or not the home was located in one of the four metropolitan or industrial areas of Newfoundland.[18] If the student resided in St. John's, Cornerbrook, Bell Island or Grand Falls, she was classed as being an urban dweller. Residence in other than these four localities placed the subject in the rural class.

Weight deviation. Weight deviation throughout this study referred to the actual number of pounds difference between the individual's actual and appropriate weight.

White-collar occupations. White-collar occupations were interpreted as being those with duties either permitting or requiring the salaried workers to have a well-groomed appearance. Such occupations would include office and mercantile personnel such as clerks, bookkeepers and salesmen as well as persons in the professional and semi-professional occupations.

---

[17]Census of Canada, Analytical Report of Rural-Urban Populations (Ottawa: Dominion Bureau of Statistics, 1958).

[18]Perlin, op. cit., p. 11.

CHAPTER II

HISTORY OF PREVIOUS RESEARCH

I. GENERAL ANTHROPOMETRICAL TESTS AND STUDIES

The use of anthropometry as a means of studying the similarities and differences of the human body can be traced back to the early days of recorded history. Bovard indicated that evidence reveals the existence of such studies in ancient India, Egypt, Rome and Greece during the era of the 35th to the 22nd century B.C. The value of using anthropometry to supplement visual observation and eliminate personal bias has long been recognized as an aid in making medical diagnoses or tracing improvements in patients; for scientific research in anatomy and physiology; in the field of criminology for criminological and medico-legal identification; and for the elimination of inferiors in recruiting armies for war.[19]

Hrdlička points out that as civilization progressed, anthropometry was used also for industrial purposes, eugenic studies, the regulation of art, detection of body defects and correction in gymnastics, and in many other scientific investigations.[20]

More modern day use of anthropometry by physical and health educators started with a study of the physical measurements of

---

[19]J. F. Bovard et al, Tests and Measurements in Physical Education (Philadelphia: W. B. Saunders Company, 1949), pp. 17-18.

[20]Aleš Hrdlička, Anthropometry (Philadelphia: The Wistar Institute of Anatomy and Biology, 1920), p. 8.

adolescent boys in Belgium by Zeissing in 1854. In the United States, Dr. Edward Hitchcock at Amherst in 1861 and Dr. D. A. Sargeant at Harvard in 1880 began recording anthropometrical data on students obtained during physical examinations. The purpose of these data were to aid in the determination of a physical standard for American college students derived from a tabulation of all the measurements that could be secured. These measurements included age, height, weight and the length, girth, breadth, depth and strength of various parts of the body plus lung capacity.[21]

II. NUTRITIONAL TESTS AND STUDIES

Ancel Keep, in a fairly recent book on nutrition, claimed that, "The body is, in the most literal sense, the product of its nutrition".[22] The concept of measuring the health of an individual by his nutritional status is far from new, however. Prior to World War I there was much interest taken in age-height tables as a means of measuring the appropriate weight that an individual should have. One of North America's eminent nutritionists, Emerson, claimed that, "The basis of weight for height has proved to be an accurate measure of the condition of undernourished children and in the many thousands of cases that have come under my observation I have never found an instance in which it

---

[21]Jay W. Seaver, Anthropometry and Physical Examination (Meriden: The Curtiss-Way Co., 1909), pp. 86-87.

[22]Ancel Keep et al, Modern Nutrition in Health and Disease (Philadelphia: Lea and Febiger, 1955), p. 13.

has proved to be impracticable".[23]

The use of height-weight tables was considered by other nutritionists to be but a pioneer step, however. Taylor argued that it was a great misconception that any individual of a certain age and height should weigh a certain number of pounds without consideration of individual body differences. He classified children into five groups: (1) slender; (2) slender medium; (3) medium; (4) medium heavy; and (5) heavy.[24] To further support his argument, Taylor quoted R. Tait Mackenzie, an authority on anthropometry, as saying, "There are wide variations of normal types of body build from slender to stocky. For children in good health there is a physical development or nutritional status proportional to the type of build".[25] With this concept in mind Taylor prepared weight tables based on height, girth of shoulders, chest, left and right upper arms, waist, hips, thighs and calves.

Quimby, too, felt that the age-height measurements alone were inadequate and that people of the same age vary as much in skeletal measurements as in height. He stated that, "Body weight is considered to be an important index of nutrition and it is important to know how much of the body weight differences are due to differences in skeletal

---

[23]W. R. P. Emerson, Nutrition and Growth of Children (New York: D. Appleton Company, 1922), p. 6.

[24]Taylor, Charles K., "The Great Underweight Delusion," The Outlook, 130, (1922), p. 425.

[25]Taylor, Charles K., "More Enlightenment Wanted," The Outlook, 131, (1922), p. 69.

build".[26] He felt that age-height tables were useless, harmful and absurd and that their inaccuracies caused people to attempt to gain or lose weight needlessly.

These theories of inadequacies led to the development of more comprehensive measurements and corresponding tables. These developments took into consideration not only age and height but various other body measurements ranging from one to over forty-six items which could be measured objectively.[27]

A sample of a test and study using just one body measurement in addition to age and height is revealed in a fairly recent project carried out in Canada. The study, conducted on 22,000 Canadians of all backgrounds and ages by the Department of National Health and Welfare in 1953, used an age-height-skinfold test to determine standard weights per age of Canadians. The test consisted of measuring the individual's height and weight plus a fold of skin over the triceps and determining average weights by age. The study was based upon a premise that the weight of persons in good health must lie within certain defined limits. The limits used were from 5 to 20 per cent above or below the figure given as average.[28]

---

[26]Quimby, Rexford C., "What a Man Should Weigh," Research Quarterly of the American Physical Education Association, 5:1, (March, 1934), pp. 91-109.

[27]Lydia J. Roberts, Nutrition Work With Children (Chicago: University of Chicago Press, 1935), p. 64.

[28]Pett, L. B., G. F. Ogilvy, "Report of Canadian Average Weights, Heights and Skinfolds," Canadian Bulletin on Nutrition (Ottawa: Department of Public Printing and Stationery, 1947).

Two of the more highly recommended "nutritional status" tests for children are the American Child Health Index (ACH Index) and the Wetzel Grid. The ACH Index[29] was developed by the American Child Health Association and used the measurements of arm girth, chest depth and hip width of several thousand children. However, the facts that the measurements are so time consuming and that tables are not available for all grades has discouraged the widespread use of this test.

The Wetzel Grid[30] consists of seven paths of growth on a chart for boys and girls of different body builds. Should the child move out of his own path for height and weight and into another path, his growth status is considered unsatisfactory. The grid is expensive and time-consuming but is being used by some schools and pediatricians.

One of the most complex of all studies to determine appropriate weights based on body structure was conducted by Sheldon. He divided man into 88 different somatotypes by studying and measuring 46,000 men aged 18 to 65 and then determined a proper weight for each somatotype of each age.[31]

---

[29]Raymond Franzen and George T. Palmer, The ACH Index of Nutritional Status (New York: The American Child Health Association, 1934).

[30]Norman C. Wetzel, Instruction Manual in the Use of the Guide for Evaluating Physical Fitness (New York: National Eduation Association Service Inc., 1941).

[31]William H. Sheldon, Atlas of Men (New York: Harper and Brothers, 1954).

III. SPECIFIC TESTS USED ON COLLEGE WOMEN

Many attempts have been made in the United States to determine the normal or average nutritional status of college women based on the use of the weight factor. Boillin[32] reveals that a study carried out by Katherine Sibley at Syracuse University divided individual college women into slender, medium and stocky builds on the basis of the breadth of shoulder alone for weight predictions. Marion Johnson developed three methods of weight prediction for women: (1) chest volume (width plus depth); (2) chest volume plus height; and (3) chest volume plus weight. By using a control group who were judged by physicians as being in good nutritional state, she concluded that the chest volume-height method was the most accurate.[33]

Highsmith and Sorenson determined through investigation that pelvic breadth was important for weight prediction of women of college age.[34] This supports the belief of Franzen who claimed, after using various tests, that if one single measure was to be used in predicting the weight of young women, hip measurement was the most accurate but that prediction was improved if a combination of measurements were used.[35]

---

[32]Mary Louise Boillin, Interrelations Between Various Anthropometric Measurements in College Women (New York: Bureau of Publications, Columbia University, 1930), p. 4.

[33]Ibid., p. 6.

[34]Ibid.

[35]R. Franzen, Physical Measures of Growth and Nutrition (New York: American Child Health Association, 1929), p. 138.

Boillin's summary, after studying five skeletal dimensions for women, namely width of hips, height, chest depth, biacromial width and chest width, was, "Height is inadequate as a determinant for weight expectancy in girls of late adolescence. Individual differences in chest and hip measurements are decidedly more significant than height in determining weight expectancy at this age period."[36]

Of the many tests conducted in the United States to establish sets of averages of what college women should weigh, two tests have been recommended by authorities in the field as being most accurate for their purposes. These were the Ludlum-Powell test,[37] and the Pryor[38] test. Neither test is without criticism, however. The Ludlum-Powell test, which uses chest depth (along with chest width and height) as a measurement, has been criticized by Turner who claimed that chest depth is an impossible measurement for women because of the highly variable mammary glands existing in women of otherwise similar build.[39] The Pryor test, involving chest width, hip width and height, provides tables constructed for ready computation after the measurements have been taken. This factor has been criticized on the premise that such tables must necessarily reduce complete mathematical accuracy in order to increase the ease of their use.[40]

---

[36]Boillin, op. cit., p. 49

[37]Ludlum F. E., Elizabeth Powell, "Chest-Height-Weight Tables for College Women," Research Quarterly of the American Physical Education Association, 1:3, (October, 1940), p. 55.

[38]Pryor, Loc. cit.

[39]Turner, Abby H., "Body Weights Optimal for Young Adult Women," The Research Quarterly of the American Association for Health, Physical Education and Recreation, 14:3, (October, 1943), p. 258.

[40]Ibid., p. 261

CHAPTER III

PROCEDURES OF THE STUDY

I. SUBJECTS BEING STUDIED

Source of subjects and numbers involved. As has been mentioned earlier in the study, it was felt that persons in their teens would be of an age to have experienced the benefits of an over-all improved standard of living in Newfoundland. With this in mind, plus the fact that in previous studies Newfoundland females evidenced a high inclination toward extremes in underweight, female university students were chosen as subjects of this study.

Further points considered in the choice of subjects were: (1) the study was concerned only with Newfoundland and those persons who were born and raised in areas of Newfoundland; (2) only freshman students at the Memorial University of Newfoundland are required to participate in physical education classes. It is in these classes that suitable clothing is worn and time and facilities are made available for more accurate testing; and (3) it was pointed out to the author by rural students in particular that they tend to gain weight after moving into the city of St. John's due to changes in diet and the more regulated life of residences. For these reasons the subjects were chosen from first year women of Newfoundland origin participating in physical education classes at the Memorial University of Newfoundland during the 1959-60 academic year.

Based on the above requirements, the total number of women

students tested was 227 which represented 90 per cent of the first year women enrolled in the faculties of Arts, Science and Education. The 10 per cent of the first year women students not included in the study represented women not participating in physical education classes or who were other than Newfoundlanders.

II. SELECTION AND DESCRIPTION OF TEST USED

Selection of a test. In choosing an anthropometrical test to measure nutritional status by weight, evaluation was necessary as to the validity, reliability, objectivity and administrative economy of the test to be used.

The Pryor Width-Weight test was selected for this study on the basis of the following features:

(1) It used the skeletal measurements of chest width and hip width to supplement age, sex and height to calculate the appropriate weight of an individual. The use of these skeletal measurements was recommended by Franzen who stated that whereas height had a correlation value of .52 in predicting the weight of girls, chest width scored .67 and hip width .75. A combination of all these measurements, according to Franzen, further improved the prediction.[41]

(2) Original research for the Pryor test was carried out on 12,000 persons ranging in age from 1 to 41. Measurements obtained were sorted into age-sex groups and the mean width-height index was

---

[41]Franzen, loc. cit.

found for each age and sex separately. Careful measurement of adolescent boys and girls every six months over a four year period showed that the width of the pelvic crest is a reliable measure in predicting body build during the period of most rapid growth. Also, because of the extreme ranges of body build, it was desirable to show seven normal weights for each age and height depending upon the width of the iliac crest. The weight tables developed thereon offer a much more accurate estimate of nutritional status than is determined from height-weight measurements.[42]

(3) As measurement for this test relied only upon such equipment as weight scales, stadiometer, calipers and charts, elements of subjectivity were reduced to a minimum.

(4) Under the criteria of administrative economy, such points as time and personnel needed to administer the test and availability of equipment required were considered. The Pryor test required approximately one minute per subject tested, part of which test -- height and weight -- was a regular feature of the health program. The measurement of such items as height, weight, chest and hip width required little specialised training. Time required to calculate the appropriate weight of each student was merely that required to glance at a computed chart. Also, as weight scales, stadiometer and calipers were readily available and the card used was mimeographed, little expense was involved in the administration of the test.

---

[42]Bovard, op. cit., p. 54.

Description of the test. The Pryor Width-Weight test involved the following steps:

(1) Calculation of age to the nearest birthday of the subject being studied.

(2) Measurement of the weight of the subject to the nearest pound.

(3) Measurement of the height of the subject to the nearest inch.

(4) Measurement of the chest width of the subject by use of calipers, measurement being done from the front of the subject at nipple level and recorded in centimeters.

(5) Measurement of the hip width of the subject by use of calipers, measurement being done from the front of the subject at the level of the crests of the ilia and recorded in centimeters.

(6) Reference to the Pryor tables according to the subject's sex, age, height, chest and hip width for the appropriate weight.

(7) Determination of the deviation between the appropriate and actual weight of the subject.

III. ADMINISTRATION OF THE TEST

To obtain data for the study, the Pryor test was administered in the following way:

(1) The subjects were tested during their first physical education classes in the 1959-60 academic year, a part of each class period being devoted to the tests until each student had been tested.

(2) The subjects were tested wearing uniform romper style cotton gym suits, socks and underclothing, the weight and bulkiness of which was negligible in affecting accurate measurement.

(3) Each subject was given a numbered card (Appendix A) and required in advance to fill in her age to the nearest birthday, her home village, town or city, and her parent's occupation.

(4) Each subject was individually weighed to the nearest pound and measured for height to the nearest inch by the use of an accurate combined weighing scale-stadiometer machine. Following this, the measurements of hip width and chest width were taken by the use of sliding wooden calipers. The hip width was measured from the front of the subject with firm pressure of the calipers at the greatest width of the crests of the ilia. The chest width was measured from the front of the subject at nipple level with no pressure against the rib cage and with the chest at rest. These measurements were recorded by the student on her card and verified by the measurer. All measurements of all subjects were done by the author.

(5) The cards were collected and checked against the Pryor tables to determine chest classification according to the subject's sex, age and chest width. The correct chest classification -- narrow, medium or broad -- was then considered in relation to the subject's height and hip width to discover from the Pryor tables the appropriate weight of that individual. The chest classification, appropriate weight and the number of pounds deviation between actual and appropriate weight were recorded on the card using the plus symbol for overweight

and the minus symbol for underweight.

Code numbers rather than names were used on the cards to ensure anonymity. A student wishing to know her appropriate weight was able to check by the number of her card.

IV. ORGANIZATION OF DATA

Subjects were listed chronologically by code number with the following data for each: (1) home address; (2) parent's occupation; (3) actual weight; (4) the appropriate weight indicated in the Pryor tables; and (5) the deviation in pounds of the actual weight from the appropriate Pryor weight using the plus and minus symbols to represent whether the deviation was above or below the appropriate weight. The list is illustrated in Appendix B.

Using the deviations in pounds of the individual's actual weight from the appropriate Pryor weights as raw scores, frequency distribution charts were drawn up for each of the following groups: (1) total group (unclassified); (2) rural group; (3) urban group; (4) manual occupation group (including those students whose parents were pensioned, unemployed or deceased); and (5) white-collar occupation group.

The frequency distribution charts used three pound intervals of deviation and indicated the number of cases occurring in each interval, the cumulative frequency in numbers and the cumulative frequency in percentages. The latter was used to establish 25th and 75th percentile weights as a basis for comparison of the groups.

These charts also enabled the author to determine the total range of deviations for each group above and below the appropriate weights.

Some procedure was necessary for classifying subjects into underweight, overweight and normal groups on a basis other than general deviation from the appropriate weights indicated in the Pryor tables. However, the problem of ascertaining what constitutes a normal weight range is one that is not specifically answered by authorities. The Metropolitan Life Insurance Company's height-weight tables allow a variance of from 7 to 11 pounds for the small frame, 8 to 10 pounds for the medium frame and 10 to 14 pounds for the large frame.[43] Ludlum and Powell, in their study on college women, used a straight 10 pound deviation above and below the weight indicated for the individual as normal as being the limits of the normal range.[44]

The amount of disagreement among other authorities and sources in the determination of the boundaries of normal weight was disclosed by the fact that "normal" ranged from 5 to 20 per cent above or below the given normal or appropriate weight indicated in height-weight tables. Krause claimed, "The normal accepted weight standard can fall 15 per cent below normal before underweight is considered serious but anyone 10 per cent or more above normal weight should reduce."[45]

---

[43]Marie V. Krause, Nutrition and Diet Therapy (Philadelphia: W. B. Saunders Company, 1957), p. 590.

[44]Ludlum and Powell, op. cit., p. 57

[45]Krause, op. cit., p. 280.

Etheredge wrote, "A 5 to 10 per cent deviation from average weight in a college student is not a handicap but more than this becomes a hazard to life and health."[46] Chenowith and Selkirk quoted Baldwin and Wood as favoring the idea that 10 per cent or more below normal weight is underweight, 20 per cent or more above normal is overweight.[47] Conversely, Kilander's opinion was that 20 per cent or more below normal was underweight and 10 per cent or more above normal was overweight.[48] To find some method, therefore, of delineating the boundaries of normal weight based upon all of these opinions, the author arbitrarily determined the average weight of the total group of Newfoundland girls in this study which was found to be 123 pounds. Using this average weight figure as a base, the percentage weight deviation indicated by each authority was computed in terms of pounds. The average deviation of all of the recommendations for the normal weight class was found to be 12.5 pounds for both underweight and overweight data. Pounds rather than percentages were used for their convenience in mathematical handling.

It was realized that the 12.5 pound boundaries arrived at in this manner cannot be considered an accurate representation of the more acute deviation, but as accuracy has been rendered impossible by the variance and vagueness of other writers on the subject, this can merely

---

[46]M. L. Etheredge, Health Facts for College Students (Philadelphia: W. B. Saunders Company, 1958), p. 78.

[47]Laurence B. Chenowith, Theodore K. Selkirk, School Health Problems (New York: Appleton-Century-Crofts, Inc., 1953), p. 76.

[48]H. Frederick Kilander, Health for Modern Living (Englewood Cliffs: Prentice-Hall, Inc., 1957), pp. 198-207.

be considered a range for comparison of groups for purposes of this study.

Since actual weights of subjects were recorded to the nearest pound, limits of classes for underweight, normal and overweight were as follows: (1) Underweight: 13 or more pounds below the appropriate weight; (2) Normal: from 12 pounds below the appropriate weight up to and including 12 pounds above the appropriate weight; (3) Overweight: 13 or more pounds above the appropriate weight.

Upon the determination of these three weight categories, subjects were classified accordingly.

CHAPTER IV

ANALYSIS OF DATA

I. TOTAL GROUP

The total unclassified group of subjects studied consisted of 227 students representing 90 per cent of the first year women enrolled at the Memorial University of Newfoundland during the 1959-60 academic year. These students were representative of both rural and urban areas of all parts of Newfoundland and were of many and diverse socio-economic backgrounds.

Analysis of the data arrived at in this study relied upon the use of such measures as the total range of weight deviations, the range of the middle 50 per cent of the group and the classification of subjects into the three weight classes, underweight, normal and overweight.

Range of deviations. Among the 227 students making up the total group of subjects used in this study, deviations from the appropriate weights indicated in the Pryor tables for each subject were found to cover a range of from 35 pounds underweight to 50 pounds overweight.

Although the total range of deviations has been utilized in this study, it was recognized by the author that the location of a few subjects with the more extreme weight deviations at either end of the scale would serve to indicate a range not wholly represen-

tative of the total group. Garrett points out that the total range is of most use when the total spread of scores is all that is required or when the data are too scant or scattered to justify the use of any other measure of variability. He also points out that the use of the quartile is valuable in studies where there are extremes or scattered measures and when the degree of concentration around the median is sought.[49] For this reason the total range of deviations was supplemented by the use of the range of the middle 50 per cent of the group to reveal a much more accurate picture of the concentration of the group as a whole. This was accomplished by locating the 25th and 75th percentile weights in the deviation range and using these weights as range boundaries.

The ogive curve in Figure 1 shows the cumulative percentage of weight deviations of the total group which represents the total range of deviations found in this group. The 25th and 75th percentile deviations indicate the range of deviations of the middle 50 per cent of the group.

---

[49]Henry E. Garrett, Statistics in Psychology and Education (Toronto: Longmans, Green and Co., 1947), p. 71.

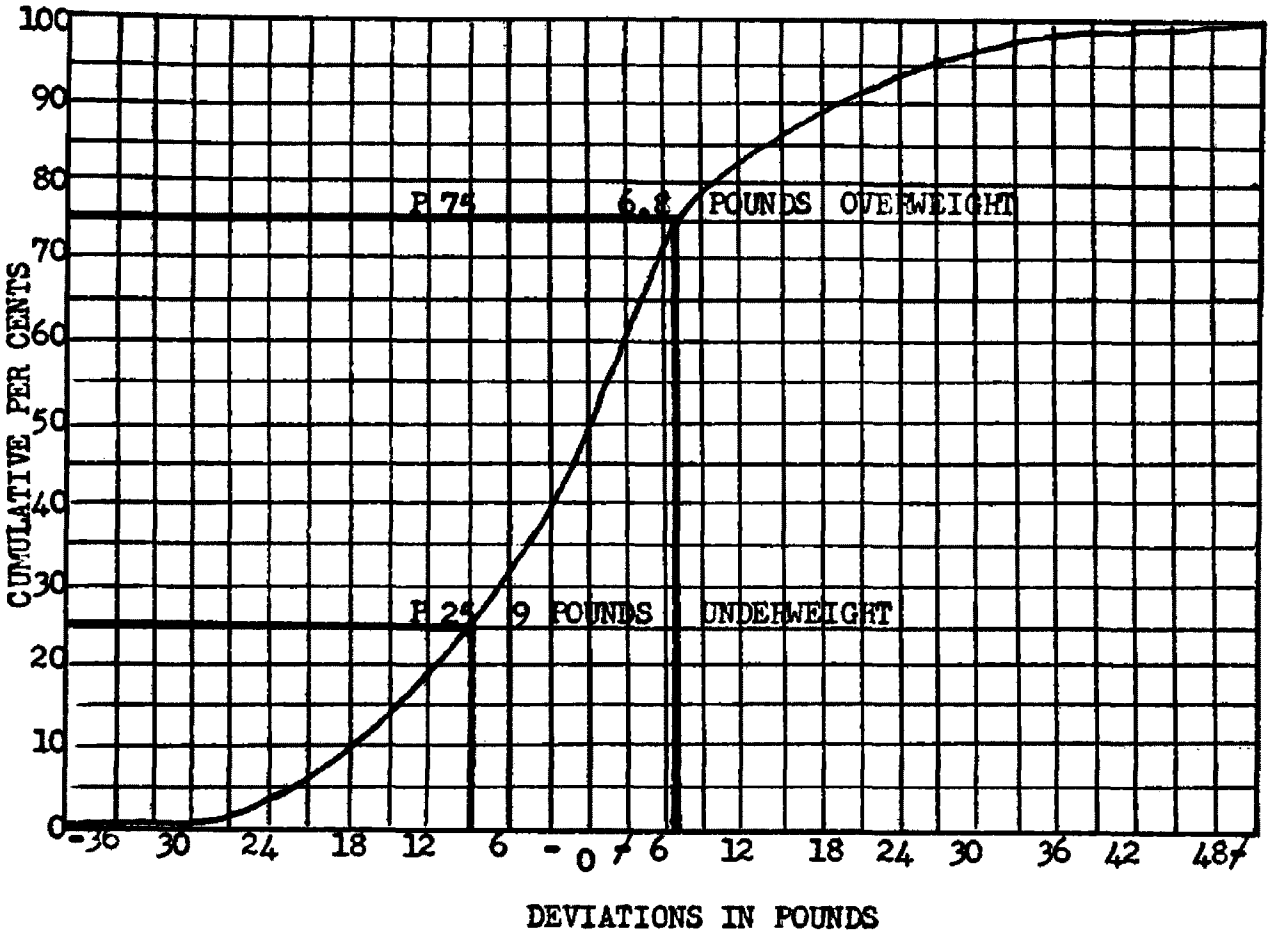

FIGURE 1

SMOOTHED OGIVE CURVE REPRESENTING THE CUMULATIVE PERCENTAGE OF WEIGHT DEVIATIONS OF THE TOTAL GROUP AND SHOWING THE RANGE OF THE MIDDLE 50%

From Figure 1 it can be seen that although the deviations of the total group ranged from 35 pounds below to 50 pounds above the Pryor norms, 50 per cent of the group lay within the range of from 9 pounds under to only 6.8 pounds over the norms. Of the 25 per cent of the group with deviations more than 9 pounds underweight, only 2 persons or .8 per cent of the group deviated beyond 27 pounds underweight. Of the 25 per cent of the group showing overweight deviations higher than 6.8 pounds, again only 2 persons ranged beyond 33 pounds overweight with a gap of four intervals containing no subjects. The actual figures involved in these data are shown in Table I.

Classification of weights. In accordance with the author's decision to consider the normal range of weight as being within the bounds of 12 pounds above and below the given appropriate Pryor weights, the percentage of subjects falling into the three weight classes was as follows:

Underweight: 14.5% (35 subjects)
Normal: 72.5% (165 subjects)
Overweight: 13.0% (29 subjects)

The distribution of subjects within the different weight classes and within the various intervals of deviation in each weight class is illustrated in Table I.

TABLE I

FREQUENCY DISTRIBUTION OF WEIGHT DEVIATIONS FOR TOTAL GROUP

Deviations in pounds	Frequency	Cumulative per cents	Weight classification
-34-36 (35)	1	.4%	
31-33	1	.8	
28-30	0	.8	UNDERWEIGHT
25-27	0	.8	GROUP
22-24	3	2	(14.5%)
19-21	6	5	
16-18	13	10.5	
13-15	9	14.5	
10-12	20	23	
7-9	29	36	
4-6	28	48	
- 1-3	17	55.5	
0 Appropriate	12	61	NORMAL GROUP
+ 1-3	16	68	(72.5%)
4-6	13	73	
7-9	18	82	
10-12	12	87	
13-15	6	90	
16-18	5	92	
19-21	5	94	
22-24	3	95	
25-27	6	98	OVERWEIGHT
28-30	1	98	GROUP
31-33	1	99	(13%)
34-36	0	99	
37-39	0	99	
40-42	0	99	
43-45	0	99	
46-48	1	99	
+49-51 (50)	1	100	

II. RURAL AND URBAN GROUPS

One of the assumptions made by the author concerning this study was that subjects grouped according to their rural or urban locations might serve to show that differences in weight deviation tendencies exist among persons from different residential backgrounds. This assumption was based upon the premise that the nutrition of subjects residing in rural areas could be affected by the problems of food distribution and variety brought about by the isolation, transportation and economic difficulties affecting the majority of rural Newfoundlanders in this rugged island province. To provide the necessary data to follow up on this assumption, subjects tested were requested to signify their home location on the data card and this location was then categorized as being either rural or urban. Subjects were classified as urban if they resided in any of the four metropolitan or industrial areas (St. John's, Cornerbrook, Grand Falls and Bell Island). Students residing in other than these four areas were classed as rural. (See page 8). Seventy-five subjects, or 33.2 per cent of the total group, were classed as urban; 152 subjects, or 66.8 per cent, were rural.

Range of deviations. Of the 152 rural subjects, deviations in weight from the Pryor norms were found to cover a range of from 35 pounds underweight to 50 pounds overweight. The total range of the 75 urban subjects, however, indicated a range extending only from 21 pounds underweight to 27 pounds overweight. The differences in the ranges for these two groups and their percentile distributions are seen in Figure 2.

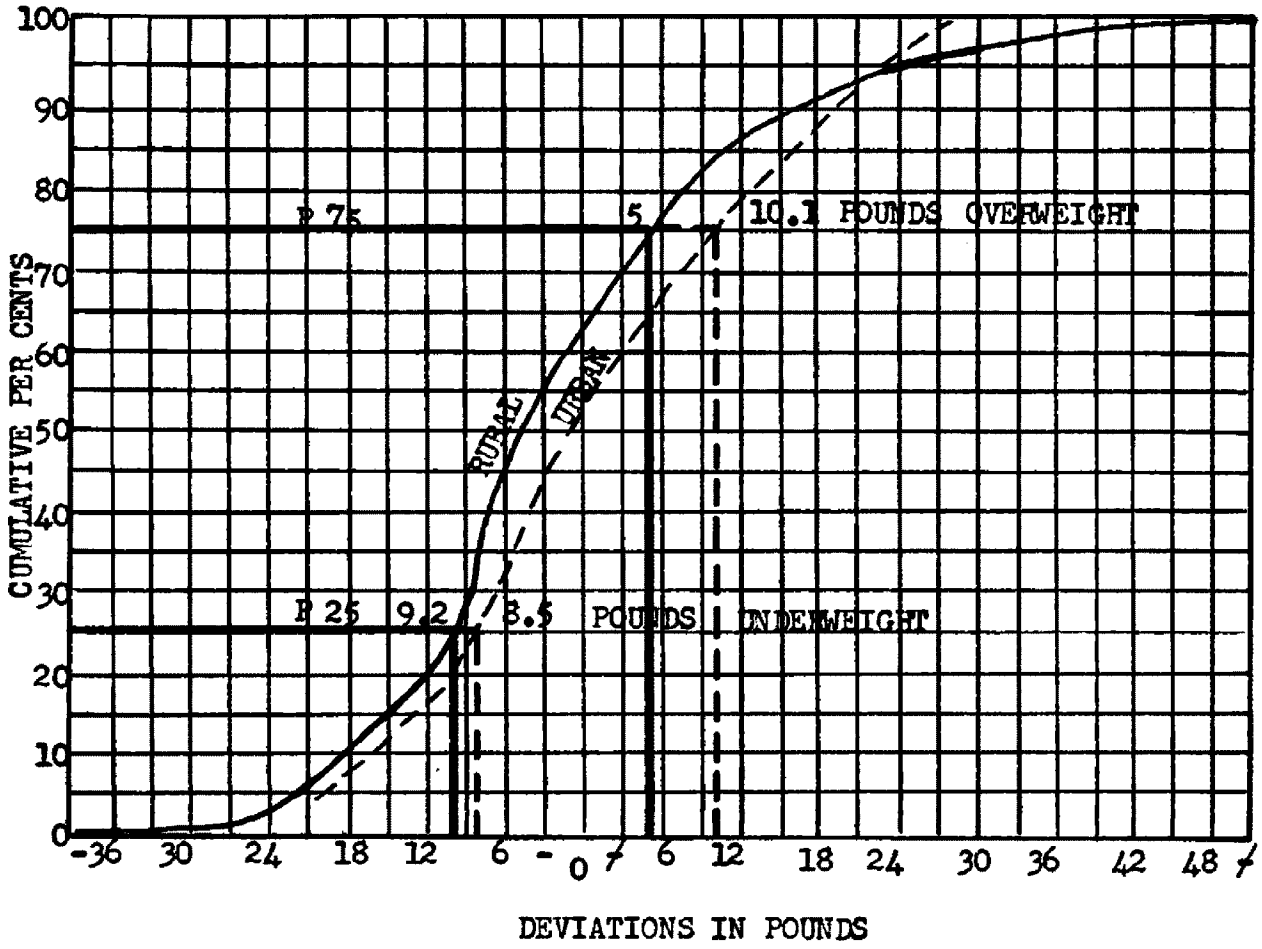

FIGURE 2

SMOOTHED OGIVE CURVE REPRESENTING THE CUMULATIVE PERCENTAGE OF WEIGHT DEVIATIONS OF THE RURAL AND URBAN GROUPS AND SHOWING THE RANGE OF THE MIDDLE 50%

The smoothed ogive curves in Figure 2 show that although the total range of deviations is greater in the rural than in the urban group, the middle 50 per cent range is slightly larger in the urban group. The 25th percentile weight for the rural group falls at 9.2 pounds, a slight difference from the 8.5 pounds for the urban group. However, it can readily be seen that at the 75th percentile the difference between the two groups has become somewhat greater with the rural group showing a deviation of only 5 pounds overweight in comparison to 10.1 pounds for the urban group. The location of these curves would indicate that urban dwellers have a slightly greater tendency to weigh more than rural dwellers.

Classification of weights. The tendency of urban students to be slightly heavier than rural students has been further evidenced by the location of subjects from these two groups into the three selected weight classes. In the rural group, 16 per cent were underweight, 73 per cent were normal and 11 per cent were overweight. In the urban group, 11 per cent were underweight, 70 per cent were normal and 19 per cent were overweight.

The fact that the overweight figures for the urban group are higher than the underweight figures for the rural group has provided the rural group with a slightly higher percentage of persons within the normal range of deviations.

Tables II and III indicate how the subjects from these two groups have been distributed in the various intervals of deviation and into the three weight classes.

TABLE II

FREQUENCY DISTRIBUTION OF WEIGHT DEVIATIONS FOR RURAL GROUP

Deviations in pounds	Frequency	Cumulative per cents	Weight classification
-34-36 (35)	1	.6%	
31-33	1	1	
28-30	0	1	
25-27	0	1	UNDERWEIGHT
22-24	2	3	GROUP
19-21	3	5	(16%)
16-18	8	10	
13-15	9	16	
10-12	12	24	
7-9	20	37	
4-6	18	49	
- 1-3	12	56.5	
0 Appropriate	9	62	NORMAL GROUP
+ 1-3	14	72	(73%)
4-6	10	78	
7-9	12	85	
10-12	6	89	
13-15	4	92	
16-18	2	93.5	
19-21	0	93.5	
22-24	2	95	
25-27	3	97	OVERWEIGHT
28-30	1	97	GROUP
31-33	1	98	(11%)
34-36	0	98	
37-39	0	98	
40-42	0	98	
43-45	0	98	
46-48	1	99	
49-51 (50)	1	100	

TABLE III

FREQUENCY DISTRIBUTION OF WEIGHT DEVIATIONS FOR URBAN GROUP

Deviations in pounds	Frequency	Cumulative per cents	Weight Classification
-19-21	2	3%	UNDERWEIGHT
16-18	5	9	GROUP
13-15	1	11	(11%)
10-12	8	21	
7-9	9	33	
4-6	9	45	
- 1-3	5	52	
0 Appropriate	4	57	NORMAL GROUP
+ 1-3	3	61	(70%)
4-6	3	65	
7-9	6	73	
10-12	6	81	
13-15	2	84	
16-18	3	88	OVERWEIGHT
19-21	5	94	GROUP
22-24	1	96	(19%)
25-27	3	100	

III. MANUAL AND WHITE-COLLAR OCCUPATION GROUPS

The author assumed that not only might residential location be a factor in affecting the weights of the subjects studied, but that socio-economic background could also play an influential role. As was pointed out in Chapter I, studies have shown that persons of lower socio-economic status have, on the whole, a lower standard of living than persons of higher social and economical rank, and that adequate nutrition is one of the health habits which often becomes neglected in a lowered living standard.

To provide the necessary data for the formation of two distinct socio-economic groups as a basis for comparison, subjects were requested to indicate the working parent's occupation on their data card. These occupations were then categorized as being either manual or white-collar in accordance with the author's decision to use these as the two occupational groups for study. The factors influencing the decision to confine the occupations to these two classifications have been described in Chapter I on pages 6 and 7.

The placement of subjects into the occupational categories selected revealed that 145 students, or 63.8 per cent of the total group, were supported by a parent employed in a manual labor occupation. Thirty-one different manual occupations were represented, with over one-third of the manual group consisting of the daughters of fishermen, carpenters and general laborers. Sixteen subjects who indicated the parent to be pensioned, deceased or unemployed were placed in the manual category.

Eighty-two girls, or 36.2 per cent of the total group, were classed in the white-collar group. The number of white-collar jobs represented was thirty-two and almost half of this group consisted of daughters of men engaged in professional and semi-professional occupations. A list of the occupations involved in the study, categorized under manual and white-collar headings, is shown in Appendix C.

Analysis and comparison of these two groups proceeded along the same lines as for the rural and urban groupings.

Range of deviations. Of the 145 subjects making up the manual group, deviations from the Pryor appropriate weights were found to cover a range of from 35 pounds below to 27 pounds above normal. This range was placed considerably lower on the over-all weight deviation scale than that of the white-collar group which had as its boundaries 23 pounds below and 50 pounds above normal. The differences between these two groups and their percentile distributions are illustrated in Figure 3.

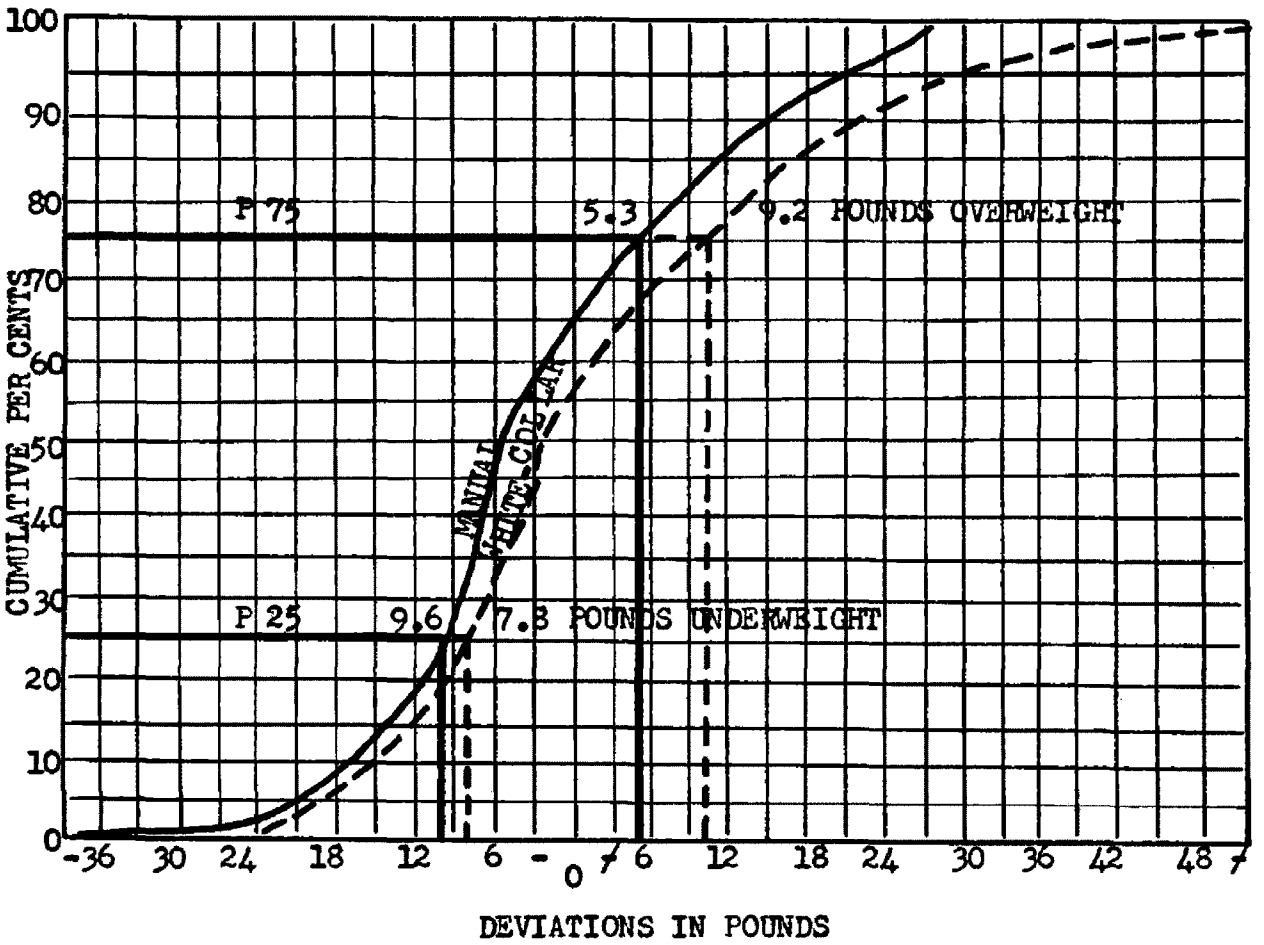

FIGURE 3

SMOOTHED OGIVE CURVE REPRESENTING THE CUMULATIVE PERCENTAGE OF WEIGHT DEVIATIONS OF THE MANUAL AND WHITE-COLLAR GROUPS AND SHOWING THE RANGE OF THE MIDDLE 50%

The ogive curves in Figure 3 show that, similar to the curves for the rural and urban groups, a lesser deviation from assigned weights exists at the 25th percentile than at the 75th percentile. That the white-collar group is inclined to be slightly heavier than the manual group has been evidenced by the figures showing the range of the middle 50 per cent. The manual group lies within the range of from 9.6 pounds below to 5.3 pounds above normal. The white-collar middle range extends from 7.8 pounds below to 9.2 pounds above normal, a difference of but 1.8 pounds at the underweight end of the range and 3.9 pounds at the overweight end.

Classification of weights. It has been found, from the placement of subjects into the three weight classifications, that not only did the manual group contain a slightly higher percentage of overweight students than the manual group, but that it contained 7.5 per cent more overweight persons. In the manual occupations group, 14 per cent were underweight, 76.5 per cent were normal and 9.5 per cent were overweight. In the white-collar occupations group, 15 per cent were underweight, 68 per cent were normal and 17 per cent were overweight.

From these figures it can be seen that the representation of subjects within the normal weight range is 8.5 per cent higher in the manual group than in the white-collar group.

Distribution of subjects from these two groups into the various weight deviation intervals and weight classifications can be seen in Tables IV and V.

TABLE IV

FREQUENCY DISTRIBUTION OF WEIGHT DEVIATIONS FOR MANUAL OCCUPATIONS GROUP

Deviations in pounds	Frequency	Cumulative per cents	Weight classification
-34-36 (35)	1	.7%	
31-33	1	1	
28-30	0	1	
25-27	0	1	UNDERWEIGHT
22-24	1	2	GROUP
19-21	2	3	(14%)
16-18	9	10	
13-15	6	14	
10-12	17	25.5	
7-9	19	39	
4-6	17	50	
- 1-3	12	59	NORMAL GROUP
0 Appropriate	9	65	(76.5%)
+ 1-3	8	71	
4-6	11	78	
7-9	11	86	
10-12	6	90.5	
13-15	5	93	
16-17	3	95	OVERWEIGHT
19-21	4	98	GROUP
22-24	1	99	(9.5%)
+25-27	2	100	

TABLE V

FREQUENCY DISTRIBUTION OF WEIGHT DEVIATIONS
FOR WHITE-COLLAR OCCUPATIONS GROUP

Deviations in pounds	Frequency	Cumulative per cents	Weight classification
- 22-24 (23)	1	1%	UNDERWEIGHT
19-21	3	5	GROUP
16-18	4	10	(15%)
13-15	4	15	
10-12	3	18	
7-9	10	30	
4-6	9	41	
- 1-3	7	51	NORMAL GROUP
0 Appropriate	3	54	(68%)
+ 1-3	9	65	
4-6	2	68	
7-9	7	76	
10-12	6	83	
13-15	1	84	
16-18	2	87	
19-21	1	88	
22-24	2	90.5	
25-27	4	95	
28-30	1	97	OVERWEIGHT
31-33	1	98	GROUP
34-36	0	98	(17%)
37-39	0	98	
40-42	0	98	
43-45	0	98	
46-48	1	99	
49-51 (50)	1	100	

IV. COMPARISON OF CLASSIFIED SUBJECT GROUPS

It has been revealed by the foregoing data that although the differences between the groups studied are not great, the findings do indicate that among rural dwellers and persons of lower socio-economic backgrounds, presumably those whose parents are engaged in manual occupations, there is a greater tendency to be underweight than overweight. Conversely, among urban dwellers and those with white-collar occupational backgrounds which would presumably place them in a higher socio-economic category, there is a greater tendency to be overweight. These facts have been illustrated by: (1) the inclination of the total and middle 50 per cent ranges of deviation to extend further below the Pryor norms than above for the rural and manual groups, and further above the norms than below for the urban and white-collar groups; and (2) the placement of a higher percentage of subjects from the urban and white-collar groups in the overweight classes and, in the case of the urban group, a lower representation of subjects in the underweight class.

Further, it was indicated that although all groups were represented to some degree in each weight classification, the percentages of persons falling into the overweight classes from the urban and white-collar groups showed a more marked increase over the rural and manual groups than was shown in the underweight class. Although rural and manual groups showed a greater inclination to be underweight than overweight, they also showed a greater representation of subjects who can be classified as normal.

The factor that the overweight figures for the urban and white-collar subjects are higher than the underweight figures for the rural and manual subjects could lead to the assumption that the problem of undernutrition among the selected subjects is not as great as that of overnutrition.

These findings are shown in the following table and in the graphic representations of Figures 4 and 5 on the next pages.

TABLE VI

RANGES AND PERCENTAGES OF SUBJECTS IN WEIGHT CLASSES

Group	Range of deviations	Range of middle 50%	Underweight	Normal	Overweight
TOTAL	-35 to +50	-9 to +6.8	14.5%	72.5%	13.0%
RURAL	-35 to +50	-9.2 to +5	16.0%	73.0%	11.0%
URBAN	-21 to +27	-8.5 to +10.1	11.0%	70.0%	19.0%
MANUAL	-35 to +27	-9.6 to +5.3	14.0%	76.5%	9.5%
WHITE-COLLAR	-23 to +50	-7.8 to +9.2	15.0%	69.0%	17.0%

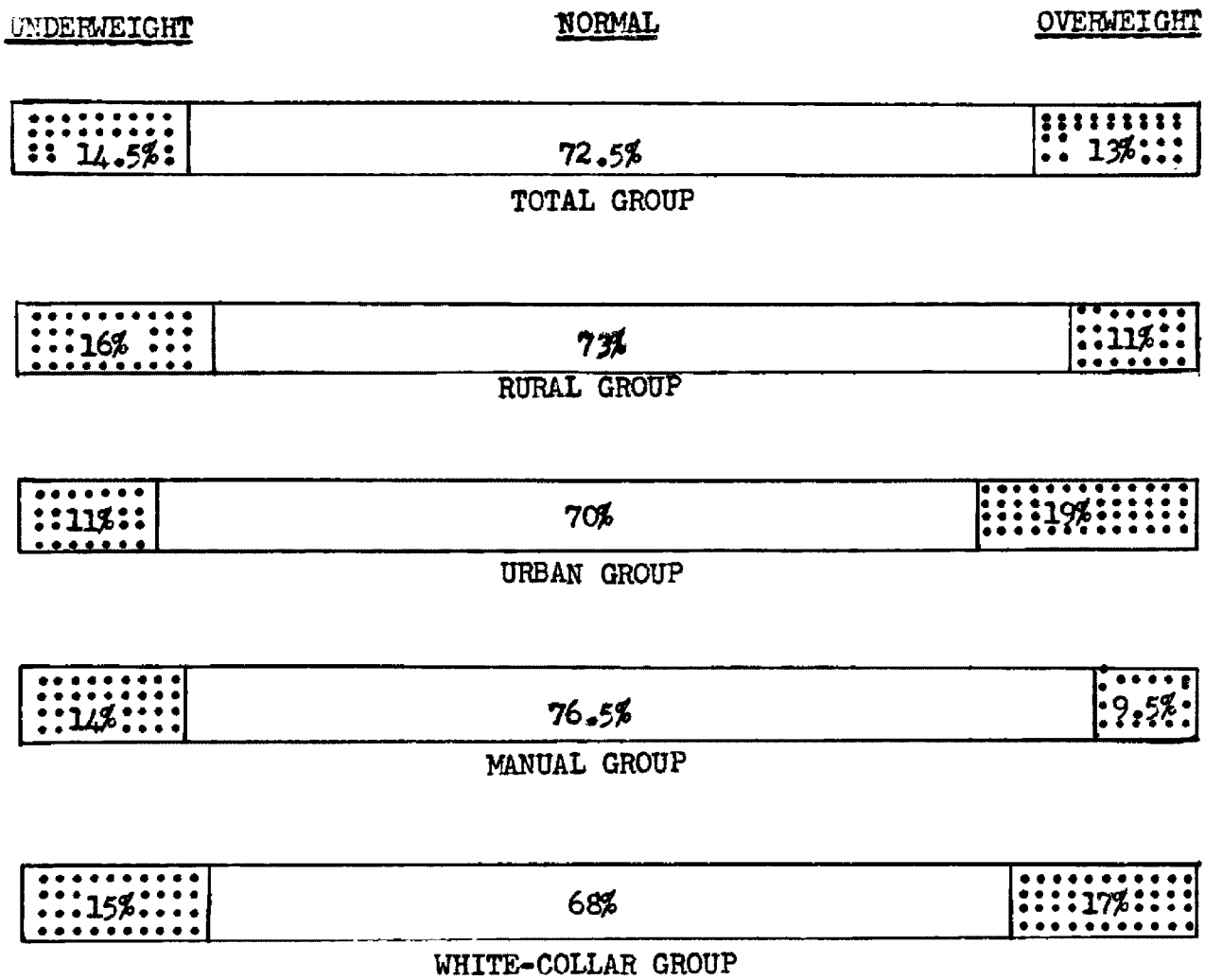

FIGURE 4

PERCENTAGE OF GROUPS UNDERWEIGHT, OVERWEIGHT AND WITHIN 12 POUNDS OF APPROPRIATE WEIGHT

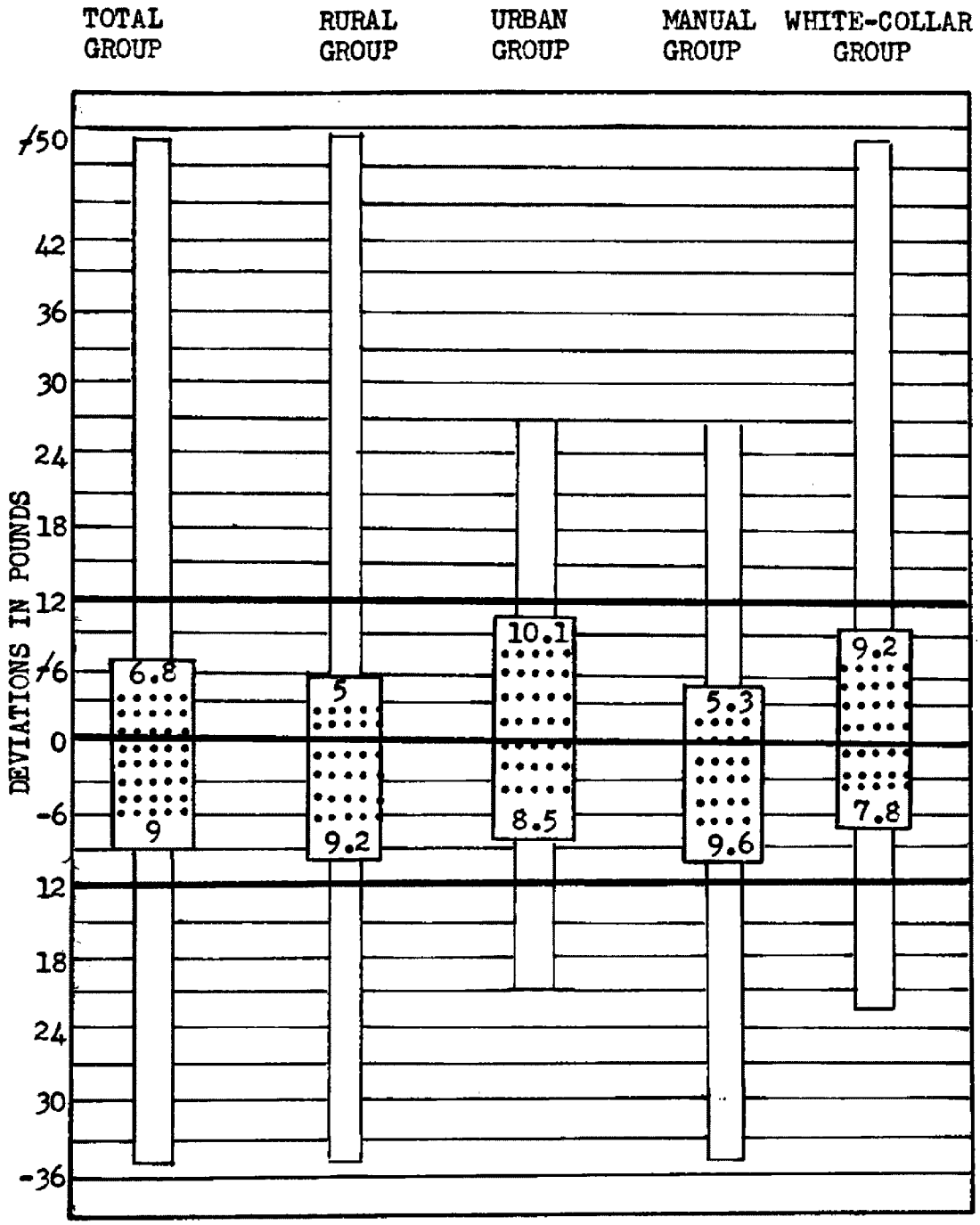

FIGURE 5

RANGE OF DEVIATIONS
AND MIDDLE 50% OF ALL GROUPS

CHAPTER V

SUMMARY AND CONCLUSIONS

I. SUMMARY

Normal weight has long been emphasized as an important criteria in the maintenance of good health. The primary purpose of this study was to appraise the weights of a selected group of female students at the Memorial University of Newfoundland. Although the study did not attempt to make a health appraisal, it was felt that the degree to which Newfoundland girls approximated "normal" weight could be somewhat indicative of their health status.

Previous weight studies in Newfoundland in the 1940's had revealed that over 40 per cent of the women studied indicated deviations below normal weight of from 10 to 20 per cent. Although socio-economic improvements have occurred in Newfoundland since these studies were conducted, the rates of illness and mortality remain high.

This study proceeded upon the assumption that the subjects chosen were representative of all economies of all areas of the province, and that they were of an age which would allow them to have felt the benefits of improved living conditions occurring in the past decade. It was also assumed that subjects from different residential (rural or urban) areas and with different socio-economic backgrounds would indicate differences in the tendency to show weight deviations. It was upon this latter assumption that a secondary purpose of the study was carried out consisting of comparing weight deviations of rural and urban groups,

and white-collar and manual occupational groups.

The study was limited to the use of the Pryor Width-Weight test and corresponding tables. Subjects for the study were 227 female students who were Newfoundlanders in origin, representing 90 per cent of the first year enrollment of women students in the Memorial University of Newfoundland during the 1959-60 academic year.

Previous research revealed that the use of anthropometrical tests to study the differences and similarities of the human body can be traced back as far as the 35th century B.C. It wasn't until the early 20th century, however, that such tests were used to attempt to measure an individual's health or nutritional status by means of his weight. These tests of health or nutritional status were based upon the assumption that all persons of a certain age and height should weigh a certain defined number of pounds. This concept was criticized because no attention was given to the effect of individual body differences. A change in technique brought about the development of weight tables based not only upon age and height but on variations of from one to forty-six body measurements which could be measured objectively.

In the development of weight charts suitable for women of college age, it was found that of all the various body measurements which could be used to supplement age and height, chest and hip measurements showed the greatest significance of reliability for this age and sex group.

The Pryor Width-Weight test was chosen for this study because it met all the criteria of a good test. These criteria of reliability, validity, objectivity and ease of administration were met in that

(1) it used the two factors of chest width and hip width plus age and height to determine an individual's appropriate weight; (2) original research for the Pryor test was carried out on 12,000 persons over a four year period and a set of tables was drawn up by chest classification showing normal weights for each age and height depending upon the width of the iliac crests; (3) the only equipment required were a weight scale, a stadiometer and a set of calipers; and (4) the test was easily administered during regular physical education classes.

Numbered cards were used to record age to the nearest birthday, actual weight to the nearest pound, height to the nearest inch, chest width to the nearest centimeter and hip width to the nearest centimeter. After this information was obtained, the appropriate weight of the subject was readily calculated from the Pryor tables. The difference between the actual and appropriate weights was considered to be the individual's deviation. To provide data for the rural-urban and occupational comparisons, the subject's home area and parent's occupation were also recorded on the card.

A chronological list of subjects was drawn up showing the vital information contained on the cards. From this it was possible to tabulate frequency distribution charts for the following groups: (1) total group unclassified; (2) rural group; (3) urban group; (4) manual occupational group; and (5) white-collar occupational group. The distribution charts used three-pound intervals of frequency and indicated the range of deviation, the number of cases occurring in each interval and the cumulative frequencies in percentages. A deviation of 12 pounds

above and below the appropriate weight was determined and adopted as being the range of normal weight for each individual and subjects were then classified as being underweight, normal or overweight.

The findings of the study can be summarized as follows:

(1) Of the total group of 227 students representing all areas of the province and diverse socio-economic backgrounds, deviations from the Pryor norms were found to cover a range of from 35 pounds underweight to 50 pounds overweight. The more accurate representation of the range of the middle 50 per cent showed that half of the group were located within the bounds of 9 pounds underweight to 6.8 pounds overweight -- well within the 12 pound limit used in the study as a significant deviation. Subjects found to be significantly underweight (13 or more pounds) represented 14.5 per cent of the total group, with 72.5 per cent within the normal range and 13 per cent overweight. Only 4 persons evidenced deviations which could be considered extreme.

(2) The rural group of 152 subjects representing 103 rural areas of Newfoundland showed an identical range of deviations to that of the total group -- 35 pounds under to 50 pounds above the norms. The range of the middle 50 per cent was somewhat lower than that of the total group -- 9.2 pounds under to 5 pounds above normal. The percentage of persons 13 or more pounds underweight was slightly higher at 16 per cent as was the percentage of subjects normal which showed a figure of 73 per cent. The percentage of persons overweight in the rural group was only 11 per cent, a decrease of 2 per cent from the total group. The 4 persons with extreme deviations were located in this group.

(3) The urban group, containing 75 subjects and representing 4 urban areas, showed the smallest range of deviations of any group studied. This range was from 21 pounds underweight to 27 pounds overweight. The range of the middle 50 per cent was from 8.5 pounds underweight to 10.1 pounds overweight with only 11 per cent of the urban subjects showing underweight deviations beyond the 12 pound limit. This group showed the highest percentage of subjects with weight deviations over the normal range -- 19 per cent, with 70 per cent of the group falling into the normal classification.

(4) The manual group contained 145 subjects and represented 31 diverse manual occupational backgrounds. The weight deviations of this group ranged from 35 pounds underweight to 27 pounds overweight with a middle 50 per cent range of from 9.6 pounds underweight to 5.3 pounds overweight. This group had a 14 per cent representation of persons 13 or more pounds underweight -- similar to that of the total group -- and had the highest percentage of persons within the normal range, 76.5 per cent. It also had the lowest percentage of subjects overweight with only 9.5 per cent in this weight class. The 2 subjects with extreme underweight deviations were located in this group.

(5) The white-collar group consisted of 82 subjects and represented 32 different white-collar occupational backgrounds, half of which were in the professional and semi-professional class. Deviations in weight for this group ranged from 23 pounds underweight to 50 pounds overweight. The range of the middle 50 per cent was located within the bounds of 7.8 pounds underweight to 9.2 pounds overweight. This group had the second highest percentage of persons underweight -- 15 per cent

in comparison to 16 per cent of the rural group -- and the second highest percentage of persons overweight -- 17 per cent in comparison to 19 per cent in the urban group. Only 68 per cent of the white-collar group were located within the normal range which is the lowest representation in this range of all groups studied. The 2 subjects with extreme overweight deviations were located in this group.

II. CONCLUSIONS

To facilitate the drawing of conclusions it was necessary to have some criteria against which to judge the findings of the weight deviations of Newfoundland college women. Ideally, comparison should have been made with one or all of the earlier weight studies conducted in Newfoundland in the 1940's which were discussed in the introduction. However, as all three of these studies failed to be concerned with overweight data and also failed to take into account individual body differences, comparison between any of these studies and the present one was rendered impossible.

It was possible, however, to make valid comparison with a more similar study conducted on a cross section of an entering freshman group of students of diverse economic levels at Hunter College in New York. In a general health survey conducted at Hunter in 1951, a study of body weights was included in the data.[50] Normal weights were determined by a

---

[50]Loop, Anne S., Anne B. Lipton, "A Health Survey of Hunter College Freshmen," The Research Quarterly of the American Association for Health, Physical Education and Recreation, 23:1, (March, 1952), pp. 57-58.

weight table based on McCalls study of 1,979 college women over a five year period allowing flexibility with a wide weight range for each age and height and with hip and chest measurements taken into account. In the Hunter study, however, although the students were grouped as underweight, normal and overweight as in the Newfoundland study, 10 pounds was used as a deviation limit rather than 12.

Comparison of the Hunter findings with the data of this study indicated that the Newfoundland students, in every subject category used, showed a higher percentage of subjects in the normal weight range. The Hunter figures revealed that 61 per cent were within this range whereas the author found that the normal weight group in the Newfoundland study included from 68 per cent of the white-collar group to 76.5 per cent of the manual group. A higher percentage of subjects underweight was found to prevail in Newfoundland than in New York -- 11 per cent of the urban group to 16 per cent of the rural group compared with 6.6 per cent at Hunter. Finally, a lower percentage of Newfoundland subjects were found to be overweight. The Newfoundland figures ranged from 9.5 per cent of the manual group to 19 per cent of the urban group in comparison to 32.4 per cent of the Hunter students. From this, then, even allowing for the slight differences between the two studies and the two pound deviation limit difference in particular, it can be concluded that Newfoundland students show a greater tendency to be underweight or of normal weight, but a lesser tendency to be overweight, than their American peers.

A reference by Byrd to the Metropolitan Life Insurance Company's studies on the importance of weight deviations at different ages led the author to further conclude that, except for those few subjects who indicated extremely overweight conditions, it is the underweight group at the particular age studied whose deviations require attention. The Metropolitan studies in question have revealed that from the age of 1 to 30 it is advantageous for individuals to be slightly overweight; from ages 30 to 39 approximation of average weight is best; from ages 40 to 49 the individual should be slightly underweight; and from age 50 onward to be appreciably underweight is a decided advantage in life expectancy.[51] On this basis, the placement of college students into the first mentioned age category would indicate that of the Newfoundland girls studied, only the 14.5 per cent categorized as underweight merit special concern at this particular time.

That further attention should be focused on the underweight group at this age is supported by a statement by Byrd. He points out that persons who are from 10 to 20 per cent underweight (considered to be a moderate degree of undernourishment) are capable only of light or moderate work. Those 20 to 30 per cent below normal (representing severe malnutrition) are capable only of very light work and have a greatly reduced resistance to many illnesses.[52] The author has

---

[51] Oliver E. Byrd, Textbook of College Hygiene (Philadelphia: W. B. Saunders Company, 1957), p. 117.

[52] Ibid., p. 120.

discovered that from 11 per cent of the urban group to 16 per cent of the rural group of subjects studied are within the range of weight deviations extending from 10 to 30 per cent below the norms used, and that subjects from rural locations and from the lower socio-economic backgrounds in particular have shown a tendency to be underweight rather than overweight. In view of the existence of underweight deviations in all subject groups studied but in the rural and manual occupational groups in particular, and in view of the above mentioned disabilities resulting from this defect, it is obvious that the matter demands some attention.

It has been pointed out by Chenowith and Selkirk that the underlying causes of malnutrition, most often recognized by weight defects, are not usually medical in nature but are caused by poverty, ignorance and lack of home control.[53] All of these factors can be controlled to some extent by government sponsored programs of financial and educational aid.

Throughout the school lives of children more attention should be given to the matter of appropriate weight by the classroom teacher, the physical education teacher, and the school nurse, if one exists. The use of the easily administered Pryor test (or of the Wetzel Grid and ACH Index, both difficult to administer but of value at the elementary school level because of the establishment of growth patterns) would facilitate such a program. There exists in most of the Newfoundland

---

[53]Laurence B. Chenowith, Theodore K. Selkirk, School Health Problems (New York: Appleton-Century-Crofts, Inc., 1953), p. 73.

schools, at the present time, a great need for a cumulative health program which, among other benefits, would measure for each child his growth progress. The fact that students can be made weight conscious was evidenced by the fact that approximately 80 per cent of the college students involved in this study took the opportunity to check with the author concerning their deviations from the appropriate weights and requested information on how best to remedy their defects. This in itself was interpreted by the author as a lack of previous knowledge or motivational interest on the part of these particular students to recognize weight as a health factor of any importance. The motivation provided by this study alone was instrumental in urging this group to develop an interest in, and seek knowledge for, better eating habits to control weight.

The Nutrition Division of the Newfoundland Public Health Department, in their clinics and workshops throughout the province, could make parents more aware of proper guidance of a child's eating habits, as well as careful selection of food for nutritional value and balance. This, along with more emphasis on the part of the school health team to motivate the pupils to an awareness of the advantages of being of normal weight, would serve to instill in children a habit of weight consciousness which would carry over and serve as a health protector throughout their lives.

BIBLIOGRAPHY

A. BOOKS

Boillin, Mary Louise. Interrelations Between Various Anthropometric Measurements in College Women. New York: Bureau of Publications, Columbia University, 1930.

Boverd, John F., F. W. Cozens, and E. P. Hagman. Tests and Measurements in Physical Education. Philadelphia: W. B. Saunders Company, 1949.

Byrd, Oliver E. Textbook of College Hygiene. Philadelphia: W. B. Saunders Company, 1957.

Chenowith, Laurence B., and Theodore K. Selkirk. School Health Problems, New York: Appleton-Century-Crofts, Inc., 1953.

Emerson, W. R. P. Nutrition and Growth of Children. New York: D. Appleton Company, 1922.

Etheredge, M. L. Health Facts for College Students. Philadelphia: W. B. Saunders Company, 1958.

Franzen, R. Physical Measures of Growth and Nutrition. New York: American Child Health Association, 1929.

Hrdlička, Aleš. Anthropometry. Philadelphia: The Wistar Institute of Anatomy and Biology, 1920.

Johns, Edward B., Wilfred C. Sutton, and Lloyd E. Webster. Health for Effective Living. Toronto: McGraw-Hill Book Company, Inc., 1958.

Keep, Ancel, et al. Modern Nutrition in Health and Disease. Philadelphia: Lea and Febiger, 1955.

Kilander, H. Frederick. Health for Modern Living. Englewood Cliffs: Prentice-Hall, Inc., 1957.

Krause, Marie V. Nutrition and Diet Therapy. Philadelphia: W. B. Saunders Company, 1957.

Perlin, A. B. The Story of Newfoundland. St. John's: Guardian Limited, 1959.

Roberts, Lydia J. Nutrition Work With Children. Chicago: University of Chicago Press, 1935.

Roe, Anne. The Psychology of Occupations. New York: John Wiley and Sons, Inc., 1956.

Seaver, Jay W. Anthropometry and Physical Examination. Meridens: The Curtiss-Way Co., 1909.

Shartle, Carroll L. Occupational Information - Its Development and Application. New York: Prentice-Hall, Inc., 1946.

Sheldon, William H. Atlas of Men. New York: Harper and Brothers, 1954.

Turner, C. E. School Health and Health Education. St. Louis : The C. V. Mosby Company, 1952.

Turner, D. Handbook of Diet Therapy. Chicago: University of Chicago Press, 1952.

B. PUBLICATIONS OF THE GOVERNMENT, LEARNED SOCIETIES AND OTHER ORGANIZATIONS

Census of Canada. Analytical Report of Rural Urban Populations. Bulletin 3-2. Ottawa: Dominion Bureau of Statistics, 1958.

Cuthbertson, D. P. Report on Nutrition in Newfoundland. London: His Majesty's Stationery Office, 1947.

Nutrition Council of the Newfoundland Medical Association. Medical Survey of Nutrition in Newfoundland. Toronto: Murray Printing Company Limited, 1945.

Pett, L. B. and G. F. Ogilvy. Report of Canadian Average Weights, Heights and Skinfolds. Nutrition Division of the Department of National Health and Welfare, Canadian Bulletin on Nutrition. Ottawa: Department of Public Printing and Stationery, 1957.

C. PAMPHLETS

Franzen, Raymond, George T. Palmer. The ACH Index of Nutritional Status. New York: The American Child Health Association, 1934.

Pryor, Helen B. Width-Weight Tables. Stanford: Stanford University Press, 1940.

Wetzel, Norman C. Instruction Manual in the Use of the Guide for Evaluating Physical Fitness. New York: National Education Association Service Inc., 1941.

D. PERIODICALS

Aykroyd, W. R., et al. "Medical Resurvey of Nutrition in Newfoundland," Canadian Medical Association Journal, 60, April, 1949.

Centers, R. "Motivational Aspects of Occupational Stratification," Journal of Social Psychology, 28, 1948.

Craig, Margaret Bell. "A Comparison of Five Methods Designed to Predict the Normal Weight of College Women," The Research Quarterly of the American Association for Health, Physical Education and Recreation, 15:1, March, 1944.

Cureton, Thomas K. "Weight and Tissue Symmetry Analyses," The Research Quarterly Supplement of the American Physical Education Association, 12:2, May,1941.

Loop, Anne S., and Anne B. Lipton. "A Health Survey of Hunter College Freshmen," Research Quarterly of the American Association for Health, Physical Education and Recreation, 23:1, March, 1952.

Ludlum, F. E., and Elizabeth Powell. "Chest Height-Weight Tables for College Women," Research Quarterly of the American Physical Education Association, 1:3, October, 1940.

Quimby, Rexford C. "What a Man Should Weigh," Research Quarterly of the American Physical Education Association, 5:1, March, 1934.

Taylor, Charles K. "The Great Underweight Delusion," The Outlook, 130, 1922.

Taylor, Charles K. "More Enlightenment Wanted," The Outlook, 131, 1922.

Turner, Abby H. "Body Weights Optimal for Young Adult Women," The Research Quarterly of the American Association for Health, Physical Education and Recreation, 14:3, October, 1943.

E. ENCYCLOPEDIA ARTICLES

"Newfoundland," Encyclopedia Canadiana, Vol. 7. Ottawa: The Grolier Society of Canada Limited, 1958.

APPENDIX

APPENDIX A: SAMPLE OF CARD USED IN THE COLLECTION OF DATA

PRYOR WIDTH-WEIGHT DATA	NUMBER_____
AGE_____ HEIGHT_____ inches WEIGHT_____ pounds HIP WIDTH_____ c.m. CHEST WIDTH_____ c.m.	_____ APPROPRIATE PRYOR WEIGHT _____ DEVIATION _____ CHEST CLASS
_____ HOME CITY, TOWN OR VILLAGE _____ PARENT'S OCCUPATION	_____ RESIDENTIAL CLASS _____ OCCUPATIONAL CLASS

APPENDIX B: CHRONOLOGICAL LIST OF SUBJECTS AND INFORMATION OBTAINED FROM PRIOR DATA CARDS

NO.	HOME ADDRESS	PARENT'S OCCUPATION	ACTUAL WEIGHT	APPROP. WEIGHT	DEVIATION FROM APPROP. WEIGHT
1	St. John's	Pilot	114 LBS	130 LBS	-16 LBS
2	St. John's	Teacher	122	122	0
3	Cornerbrook	Electrician	112	118	- 6
4	Cornerbrook	Electrician	106	116	-10
5	Gambo	Fisherman	98	116	-18
6	Norris Arm	Fisherman	127	139	-12
7	Bridgeport	Fisherman	126	135	- 9
8	Jeffrey's	Postmaster	132	129	✓ 3
9	Brigus	Steelworker	129	131	- 2
10	Channel	Railwayman	126	136	-10
11	Brigus	Carpenter	119	150	-31
12	Buchans	Accountant	125	127	- 2
13	Springdale	Prospector	131	135	- 4
14	Harbour Breton	R.C.M.P. Officer	109	122	-13
15	Cornerbrook	Janitor	145	137	✓ 8
16	Harbour Grace	Postmaster	109	118	- 9
17	Long Harbour	Carpenter	111	146	-35
18	St. John's	Accountant	145	126	✓19
19	Pouch Cove	Deceased	122	135	-13
20	Norris Point	Trucker	119	129	-10
21	Codroy	Accountant	123	120	✓ 3
22	Grand Bank	Barber	120	128	- 8
23	Burin	Engineer	92	116	-24
24	St. Phillips	Farmer	117	125	- 8
25	Carbonear	Mechanic	132	142	-10
26	St. Phillips	Teacher	128	129	- 1
27	St. Phillips	Domestic	108	117	- 9
28	Twillingate	Janitor	181	156	✓25
29	Long Pond	Civil Servant	103	100	✓ 3
30	Long Pond	Laborer	106	114	- 8
31	Buchans	Miner	103	124	-21
32	St. John's	Engineer	130	123	✓ 7
33	Cornerbrook	Welder	114	124	-10
34	Cornerbrook	Lawyer	115	129	-14
35	St. John's	Architect	138	128	✓10
36	Bell Island	Electrician	112	112	0
37	Chapel Arm	Cook	109	113	- 4
38	Glenwood	Salesman	135	124	✓11
39	Newtown	Fisherman	212	117	- 5
40	Hillgrade	Sea Captain	133	138	- 5
41	Seldom	Fisherman	128	133	- 5
42	Amherst Cove	Fisherman	129	152	-23
43	Trinity East	Cook	119	123	- 4
44	Channel	Carpenter	104	116	-12
45	Victoria	Teacher	119	138	-19

NO.	HOME ADDRESS	PARENT'S OCCUPATIONS	ACTUAL WEIGHT	APPROP. WEIGHT	DEVIATION FROM APPROP. WEIGHT
46	Springdale	Clerk	136 LBS	126 LBS	+10 LBS
47	St. John's	Teacher	146	138	+ 8
48	St. John's	Salesman	114	131	-17
49	Deer Lake	Contractor	120	117	+ 3
50	Channel	Railwayman	126	136	-10
51	Channel	Salesman	175	149	+26
52	Deer Lake	Deceased	125	121	+ 4
53	Trinity	Railwayman	120	120	0
54	St. John's	Businessman	96	102	- 8
55	St. John's	Office Manager	100	119	-19
56	St. John's	Businessman	111	116	- 5
57	Glovertown	Carpenter	109	123	-14
58	Deer Lake	Clergyman	122	136	-14
59	Glovertown	Fisherman	114	135	-21
60	St. John's	Custom Official	104	125	-21
61	Gander	Airways Manager	154	146	+ 8
62	Holyrood	Carpenter	112	120	- 8
63	Bell Island	Deceased	123	121	+ 2
64	Bellevue	Carpenter	138	138	0
65	Gaskies	Businessman	115	124	- 9
66	Torbay	Deceased	112	129	-17
67	Conche	Fisherman	137	135	+ 2
68	Trepassey	Carpenter	129	122	+ 7
69	Avondale	Farmer	128	123	+ 5
70	River Bourgeois	X-Ray Technician	127	124	+ 3
71	Cornerbrook	Carpenter	132	115	+17
72	Ferryland	Fisherman	121	124	- 3
73	St. John's	Carpenter	117	135	-18
74	Lethbridge	Farmer	126	135	- 9
75	Littledale	Railwayman	102	119	-17
76	Humbermouth	Fisherman	120	126	- 6
77	Long Pond	Businessman	117	118	- 1
78	Flower's Cove	Businessman	93	108	-15
79	Hermitage	Fisherman	146	133	+13
80	Joe Batt's Arm	Laborer	166	155	+11
81	Joe Batt's Arm	Clerk	149	121	+28
82	Bell Island	Businessman	121	114	+ 7
83	New Melbourne	Florist	137	129	+ 8
84	Stephenville	Salesman	111	109	+ 2
85	Canada Harbour	Fisherman	120	113	+ 7
86	Great Paradise	Fisherman	110	119	- 9
87	Makinson's	Businessman	104	108	- 4
88	Conche	Co-op Manager	128	106	+22
89	St. Mary's	Sawmill Operator	135	125	+10
90	St. John's	Carpenter	136	116	+20
91	Lourdes	Laborer	111	119	- 8
92	Beaumont	Fisherman	106	117	-11
93	Point Lance	Fisherman	142	119	+23

NO.	HOME ADDRESS	PARENT'S OCCUPATION	ACTUAL WEIGHT	APPROP. WEIGHT	DEVIATION FROM APPROP. WEIGHT
94	Point Union	Mechanic	116 LBS	116 LBS	0 LBS
95	South Branch	Farmer	132	126	↑ 6
96	Glovertown	Carpenter	129	121	↑ 8
97	Lewisporte	Pensioner	152	156	- 4
98	St. John's	Salesman	150	123	↑27
99	Burgoyne's Cove	Carpenter	101	110	- 9
100	St. Andrews	Farmer	128	122	↑ 6
101	Wood's Island	Deceased	122	123	- 1
102	Grand Falls	Pensioner	117	119	- 2
103	Spaniard's Bay	Contractor	108	108	0
104	St. Phillips	Carpenter	108	108	0
105	Exploits	Pilot	162	130	↑32
106	Grand Falls	Papermaker	136	117	↑19
107	St. Lawrence	Unemployed	145	120	↑25
108	Cornerbrook	Grinder	141	127	↑14
109	Fox Harbour	Fisherman	127	125	↑ 2
110	Fox Harbour	Firefighter	117	130	-13
111	Cornerbrook	Salesman	130	118	↑12
112	Fox Harbour	Unemployed	116	134	-18
113	Cornerbrook	Trucker	103	114	-11
114	Carbonear	Fisherman	116	107	↑ 9
115	Bell Island	Pensioner	126	121	↑ 5
116	Bell Island	Miner	130	119	↑11
117	Kilbride	Farmer	117	125	- 8
118	Crawley's Isle	Fisherman	98	110	-12
119	Holyrood	Fisherman	122	126	- 4
120	Holyrood	Deceased	122	115	↑ 7
121	St. Mary's	Laborer	134	125	↑ 9
122	Badger	Laborer	126	130	- 4
123	Spanish Room	Fisherman	114	99	↑15
124	Harbour Grace	Salesman	137	124	↑13
125	Fogo	Bookkeeper	108	125	-17
126	Botwood	Millwrite	112	112	0
127	Deer Lake	Mechanic	125	108	↑17
128	Savage Cove	Fisherman	123	130	- 7
129	Bell Island	Miner	108	114	- 7
130	Fox Trap	Businessman	173	123	↑50
131	Windsor	Bus Driver	115	125	-10
132	Burnt Point	Businessman	106	109	- 3
133	Witless Bay	Carpenter	127	126	↑ 1
134	St. John's	Bookkeeper	125	133	- 8
135	Keels	Ship's Officer	110	118	- 8
136	Porterville	Deceased	112	129	-17
137	Searston	Farmer	115	118	- 3
138	Ferryland	Fisherman	112	122	-10
139	Bell Island	Miner	136	116	↑20
140	Campbell's Creek	Carpenter	121	111	↑10
141	Brigus	Foreman	112	105	↑ 7

NO.	HOME ADDRESS	PARENT'S OCCUPATION	ACTUAL WEIGHT	APPROP. WEIGHT	DEVIATION FROM APPROP. WEIGHT
142	Tompkins	Farmer	133 LBS	116 LBS	+17 LBS
143	Harbour Buffet	Unemployed	118	118	0
144	Pouch Cove	Farmer	116	120	- 4
145	Flat Rock	Foreman	120	105	+15
146	Channel	Salesman	119	111	+ 8
147	Branch	Fisherman	111	114	- 3
148	St. Phillips	Farmer	116	120	- 4
149	Twillingate	Fisheries Officer	127	126	+ 1
150	St. John's	Engineer	118	130	-12
151	St. John's	Carpenter	108	115	- 7
152	Victoria	Power Plant Op.	129	123	+ 6
153	Bell Island	Foreman	106	118	-12
154	Trinity	Cook	107	119	-12
155	Salvage	Carpenter	140	136	+ 4
156	Sandyville	Fisherman	118	114	+ 4
157	Ferryland	Fisherman	115	124	- 9
158	Lamaline	Teacher	132	140	- 8
159	St. Anthony	Carpenter	158	150	+ 8
160	Long Pond	Farmer	110	119	- 9
161	Bell Island	Foreman	107	112	- 5
162	Roddickton	Logger	123	128	- 5
163	Spaniard's Bay	Painter	111	115	- 4
164	Twillingate	Laborer	103	112	- 9
165	St. John's	Engineer	141	135	+ 6
166	St. John's	Businessman	110	118	- 8
167	Gander	Mechanic	103	100	+ 3
168	Gander	Maintenance Wkr.	111	115	- 4
169	Salmon Cove	Miner	104	120	-16
170	Buchans	Miner	113	120	- 7
171	Norris Point	Logger	118	127	- 9
172	Seldom	Fisherman	102	130	-28
173	Bay Roberts	Carpenter	112	127	-15
174	Noggin Cove	Sawmill Worker	164	153	+11
175	Terra Nova	Deceased	109	122	-13
176	Harbour Grace	Salesman	107	117	-10
177	St. John's	Substation Op.	115	104	+11
178	St. John's	Traveller	114	122	- 8
179	Burin	Businessman	206	158	+48
180	Norris Arm	Contractor	121	127	- 6
181	Clarke's Beach	Businessman	107	110	- 3
182	St. John's	Businessman	145	147	- 2
183	St. Mary's	Foreman	133	138	- 5
184	Grand Falls	Metal Worker	137	118	+19
185	Grand Falls	Insurance Agent	112	116	- 4
186	Trepassey	Fisherman	130	124	+60
187	Bell Island	Boilermaker	117	117	0
188	Catalina	Businessman	128	135	- 7
189	Conception Hbr.	Metal Worker	120	117	+ 3

NO.	HOME ADDRESS	PARENT'S OCCUPATION	ACTUAL WEIGHT	APPROP. WEIGHT	DEVIATION FROM APPROP. WEIGHT
190	Bell Island	Miner	107 LBS	117 LBS	-10 LBS
191	Cornerbrook	Cementer	112	104	≠ 8
192	St. Anthony	Plumber	120	123	- 3
193	Marystown	Deceased	131	142	-11
194	Flat Rock	Fisherman	139	134	≠ 4
195	Grand Falls	Carpenter	95	112	-17
196	Lower Island Cove	Deceased	120	121	- 1
197	George's Brook	Pilot	117	117	0
198	Clarenville	Businessman	140	138	≠ 2
199	Grand Falls	Businessman	118	123	- 5
200	Grand Falls	Carpenter	112	114	- 2
201	Burin	Fisherman	123	120	≠ 3
202	Shoal Harbour	Mechanic	160	152	≠ 8
203	Deer Lake	Accountant	129	142	-13
204	Conception Hbr.	Carpenter	104	112	- 6
205	St. John's	Businessman	150	138	≠12
206	St. John's	Professor	107	113	- 6
207	St. John's	Salesman	135	146	-11
208	St. John's	Engineer	119	123	- 4
209	St. John's	Businessman	125	120	≠ 5
210	St. John's	Accountant	148	145	≠ 3
211	St. John's	Engineer	153	160	- 7
212	Victoriaville	Businessman	117	123	- 6
213	St. John's	Salesman	178	178	0
214	St. JOhn's	Accountant	128	118	≠10
215	St. John's	Secretary	152	128	≠24
216	St. John's	Accountant	177	160	≠17
217	St. John's	R.C.M.P. Officer	122	121	≠ 1
218	St. John's	Biologist	141	124	≠17
219	St. John's	Radio Operator	120	125	- 5
220	St. John's	Businessman	166	140	≠26
221	St. John's	Metal Worker	99	101	- 2
222	St. John's	Accountant	107	111	- 4
223	St. John's	Medical Doctor	124	125	- 1
224	St. John's	Salesman	135	128	≠ 7
225	St. John's	Lawyer	105	122	-17
226	St. John's	Newspaperman	171	157	≠14
227	St. John's	Teacher	174	149	≠25

APPENDIX C: CLASSIFICATION OF OCCUPATIONS OF SUBJECT'S PARENTS INTO MANUAL AND WHITE-COLLAR GROUPS

MANUAL OCCUPATIONS (145 subjects)	WHITE-COLLAR OCCUPATIONS (82 subjects)
Barber	Accountant
Boilermaker	Architect
Bus Driver	Airways Manager
Carpenter	Biologist
Cementer	Bookkeeper
Cook	Businessman
Domestic	Civil Servant
Electrician	Contractor
Farmer	Clergyman
Firefighter	Clerk
Fisherman	Co-op Manager
Grinder	Customs Official
Janitor	Engineer
Laborer	Fisheries Officer
Logger	Florist
Maintenance worker	Insurance Agent
Mechanic	Lawyer
Metal worker	Medical Doctor
Millwrite	Newspaperman
Miner	Office Manager
Painter	Pilot
Papermaker	Postmaster
Plumber	Professor
Power Plant operator	Radio Operator
Prospector	R.C.M.P. Officer
Railwayman	Salesman
Sawmill operator	Sea Captain
Substation operator	Secretary
Trucker	Ship's Officer
Welder	Teacher
	Traveller
	X-Ray Technician