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AN ANTHROPOMETRIC SURVEY OF 200 R.A.F. AND R.N. AIRCREW AND THE APPLICATION OF THE DATA TO GARMENT SIZE ROLLS

by

R. E. Simpson

C. B. Bolton

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SUMMARY

An anthropometric survey of limited scope was undertaken in October and November 1966, involving 200 Royal Air Force and Royal Navy aircrew. The 44 measurements taken on each subject were mainly those used in the drafting of patterns for the R.A.E. experimental range of aircrew functional garments. The acquired data have been tabulated and presented primarily for functional clothing sizing purposes. Tables and graphs are also included which give the data in a form suitable for use in aircrew work-space studies etc. Comparisons are made between specimen garment size-rolls for the 200 subjects based on chest girth/torso hoop, chest girth/stature and weight/stature as control parameters.

An analysis of the data supports the recommendation that size-rolls for one-piece garments in which a good torso fit is essential should be based on two direct body measurements, such as chest girth and torso hoop, rather than include one or more indirect measurements like weight or stature in the control parameters.

The data indicate that if one-piece garment torso fit is not important it is better logistically to use chest/stature or weight/stature as controls for garment sizing.

From the experience gained during this survey, suggestions are made regarding measuring techniques and procedures which should prove useful in a larger scale survey which is recommended.

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CONTENTS

		Page
1	INTRODUCTION	7
2	MEASURING APPARATUS	8
3	MEASUREMENTS AND MEASURING PROCEDURE	9
4	PRESENTATION OF DATA	12
5	DISCUSSION	13
6	CONCLUSIONS AND RECOMMENDATIONS	15
Acknowledgements		16
Appendix A	Glossary of statistical terms and symbols	18

LIST OF TABLES Tables 1 to 50 shew percentile tables and, where applicable measuring technique, for the following measured and deduced dimensions:

Table 1	Chest girth	21
Table 2	Torso hoop (average of left and right)	22
Table 3	Ankle-height of minimum girth	23
Table 4	Knee pivot height	24
Table 5	Crotch height	25
Table 6	Wrist height	26
Table 7	Thigh pivot height	27
Table 8	Waist height	28
Table 9	Axillary height	29
Table 10	Suprasternal height	30
Table 11	Neck root height	31
Table 12	Seventh cervical height	32
Table 13	Shoulder height - $3\frac{1}{4}$ inches from body centreline	33
Table 14	Height (stature)	34
Table 15	Knee height - sitting	35
Table 16	Buttock to knee length	36
Table 17	Heel/instep girth	37
Table 18	Sitting height	38
Table 19	Knee girth - fully flexed	39
Table 20	Ankle girth - minimum	40
Table 21	Ankle girth at $2\frac{1}{2}$ inches above minimum ankle girth	41
Table 22	Calf girth	42
Table 23	Small girth (garter)	43
Table 24	Knee girth - standing	44
Table 25	Thigh girth	45

CONTENTS (Contd.)

		Page
Table 26	Buttock girth	46
Table 27	Waist girth	47
Table 28	Neck girth	48
Table 29	Wrist girth - minimum above styloid process	49
Table 30	Wrist girth - 2½ inches above minimum wrist girth	50
Table 31	Elbow girth - fully flexed	51
Table 32	Biceps girth - extended	52
Table 33	Biceps girth - contracted	53
Table 34	Inter-wrist span	54
Table 35	Inter-elbow span	55
Table 36	Elbow to wrist length	56
Table 37	Arm reach - from wall	57
Table 38	Shoulder breadth	58
Table 39	Waist to waist - under crotch	59
Table 40	Waist to waist - over shoulder	60
Table 41	Head girth	61
Table 42	Weight	62
Table 43(a)	Age	63
Table 43(b)	Shoe size (U.K.)	63
Table 44(a)	Top of knee to knee pivot	64
Table 44(b)	Shoulder height minus crotch height	64
Table 45(a)	Axillary height minus wrist height	65
Table 45(b)	Thigh pivot height minus crotch height	65
Table 46(a)	Height (stature) minus shoulder height	66
Table 46(b)	Ankle girth 2½ inches above minimum, minus minimum ankle girth	66
Table 47(a)	Wrist girth 2½ inches above minimum (proximal edge of styloid process) minus wrist girth at proximal edge of styloid process	67
Table 47(b)	Axillary height minus waist height	67
Table 48(a)	Waist height minus thigh pivot height	68
Table 48(b)	Thigh pivot height minus knee pivot height	68
Table 49(a)	Thigh pivot height minus minimum ankle girth height	69
Table 49(b)	Waist height minus crotch height	69
Table 50	Axillary height minus crotch height	70
Table 51	Trivariate tables - specimen 9 size roll based on chest girth/torso hoop controls	72

CONTENTS (Contd.)

		Page
Table 52	Trivariate tables - specimen 9 size roll based on chest girth/stature controls	76
Table 53	Trivariate tables - specimen 9 size roll based on weight/stature controls	80
Table 54	Typical remeasuring results	83
Table 55	Dimensions of the nine theoretical "men" in preliminary size roll based on chest/torso hoop controls	84
Table 56	The effect of different pairs of garment sizing control parameters on the range of some of the dependent subject measurements	85
Table 57	Summary of statistical data on full sample	86
Table 58	Comparison of anthropometric data on British military aircrew - surveys 1944 and 1966	87
References		88
Illustrations		Figures 1-23
Detachable abstract cards		-

ILLUSTRATIONS

	Fig.
R.A.E. anthropometric rig	1
Data recording proforma	2
Location and marking of datum points on subject	3
Graphs of chest/torso hoop, chest/stature and weight/stature showing specimen size rolls	4
Graph of stature/arm length	5
Graph of stature/leg length	6
Graph of average torso hoop/nude weight	7
Graph of average torso hoop/half wrist span	8
Graph of average torso hoop/stature	9
Graph of chest girth/half wrist span	10
Graph of chest girth/thigh girth	11
Graph of sitting height/thigh length	12
Graph of sitting height/arm reach	13
Graph of leg length/arm length	14
Graph of stature/sitting height	15
Graph of torso length/leg length	16
Graph of chest girth/waist girth	17

ILLUSTRATIONS (Contd.)

	Fig.
Graph of chest girth/buttock girth	18
Frequency distribution of stature	19
Frequency distribution of weight	20
Frequency distribution of torso hoop	21
Frequency distribution of chest girth	22
Frequency distribution of shoe size	23

1 INTRODUCTION

The opportunity was taken to obtain 44 measurements on each of 200 R.A.F. and R.N. aircrew during the Phantom Aircrew Equipment fitting trials, held at the R.A.F. Institute of Aviation Medicine, in October and November 1966.

This information was required to provide realistic data for the derivation of preliminary size-rolls for aircrew protective garments[1] under development in the Human Engineering Division of Engineering Physics Department, R.A.E. It was also needed to substantiate previous recommendations[2] for the basing of one-piece garment size-rolls on two direct control dimensions, such as chest girth and torso hoop (vertical trunk circumference), rather than including an indirect measurement such as height or weight as a control.

This Report deals mainly with the collection, presentation and application of anthropometric data required for the production of close fitting functional garments. It does, however, include additional data on measurements such as sitting height, arm reach etc. which have direct application in aircrew working environment studies.

A review of previous anthropometric surveys of U.K. aircrew[3] has indicated that the information is sufficiently dated as to have dubious relevance to present aircrew. Even if national differences between U.S.A. and U.K. aircrew could be ignored, the more recent data on U.S.A. aircrew anthropometry[4], has not been presented in a form suitable for use by clothing designers. An additional major shortcoming of all available data, in relation to current R.A.E. clothing development, is the omission of many of the specific body dimensions required. These dimensions, although not conventional tailoring measurements, are used in the formularised pattern drafting system[2], in which body-related key dimensions are directly applied to the working patterns.

This pilot survey provided an opportunity to acquire information on these missing dimensions and to give the measuring team first hand experience of the problems involved in measuring a large number of subjects, and processing the resulting data.

The measuring techniques and apparatus described have been evolved over the past few years to provide, with very little operator training, a high standard of accuracy and repeatability in the measurement of the human body.

The survey sample of 200 men was dictated by the Phantom trials and is smaller than would have been chosen. However, the largest standard deviation in the linear measurements taken was 2.707 inches with a standard error of 0.135 inch. The standard error of the mean over all subjects in the worst case is, by calculation, 0.191 inch.

For the purpose of this Report the 200 subjects have been assumed to be a random sample. The data have already been used elsewhere to adjust the sizes and tariff of flying clothing for the U.K. Phantom aircraft.

The data relating to the sub-groups determined by various pairs of control dimensions are, because of their smaller size and hence decreased statistical significance, used mainly to illustrate a recommended approach to one-piece garment sizing.

A glossary of the statistical terms used in this Report is included at Appendix A.

2 MEASURING APPARATUS

A measuring rig (Fig.1a) for taking vertical and horizontal linear dimensions of the subjects was designed and constructed prior to this survey. It is similar to the Morant board in that it is based on a floor and two walls mutually at right angles but does not use the half inch square grid pattern as scales. It was thought that greater accuracy would be obtained from the use of a traversing vertical scale upon which was mounted a measuring head having datum edges which could be aligned with that part of the body being measured.

The measuring head (Fig.1b) is itself free to move up and down the vertical scale and the position of the datum edges can be read directly as a distance from floor and vertical end wall. The scales are graduated in inches and the travelling portions carry vernier scales graduated in tenths of inches. Body dimensions can thus be read easily to the nearest 0.1 inch.

For hygienic reasons the working surfaces of the two rig walls have been re-constructed with a plastic laminate facing and to prevent complaints of cold feet from the subjects the floor has been cork faced.

The complete rig can be readily dismantled and folded and is transportable so that it may be used by travelling anthropometric survey teams.

Circumferential measurements were made by hand using $\frac{3}{8}$ inch wide glass-cloth measuring tapes.

A daily check was made on the accuracy of the measuring rig and tapes. The former was maintained within ±1/16 inch over the measuring range both horizontally and vertically and the latter started and remained approximately 0.1 inch short on 60 inches. Checking was done using a steel rule as a standard.

3 MEASUREMENTS AND MEASURING PROCEDURE

A small work study was undertaken prior to the preparation of the recording proforma (Fig.2) to determine the most convenient sequence of measuring. Despite this precaution, it was found, as the survey proceeded, that some small changes in the sequence would have further increased convenience and, possibly, speed. Once the measuring routine had become familiar to the operators the time per subject for the taking of 44 dimensions was about 16 minutes.

The dimensions taken were as listed on the proforma and in addition to age, weight and shoe size, covered 41 other measurements. These consisted of 20 linear dimensions for which the rig was used and 21 girths involving the use of the measuring tapes. During measuring with the tapes, tension was maintained sufficiently to keep the tape from slipping without causing marked flesh indentation. On the tapering body sections care was taken to align the appropriate measuring edge of the tape with the girth plane required.

Because of the smallness of the errors in the measuring apparatus, all dimensions were recorded as taken, rounded off to the nearest 0.1 inch, without correcting for apparatus errors.

Photographs showing the method of taking each of the measurements are inset at Tables 1 to 41 inclusive.

A few dimensions relating to wrist and ankle taper and the associated datum planes were required specifically for pressure/immersion seal sizing and location for a special development garment. These particular dimensions would not be perpetuated in future surveys, and the more usual ankle and wrist datum planes would be substituted. The thigh pivot referred to in this Report was taken as the crest of the prominence at the head of the femur. Allowance has been made for the displacement of this datum from the thigh joint axis when applying the data to pattern drafting. The location of the knee joint axis could possibly be omitted in future surveys as the acquired data shew it can be fairly well defined as a function of knee height - sitting.

Of the 44 recorded dimensions, Table 51 indicates, by means of a symbol, those which have been used by R.A.E. for direct application to functional garment patterns. The dimensions which have not previously been taken on anthropometric surveys or, if taken, have not been done in a manner having direct application to the R.A.E. pattern drafting system are also indicated in this Table by means of an alternative symbol.

Prior to taking the measurements of each subject certain datum points were located and marked (Fig.3) with an eyebrow pencil. This procedure greatly aided the taking of heights such as waist, knee pivot, suprasternum etc. and enabled over shoulder measures to be made at a standard distance of $3\frac{1}{4}$ inches from the body centreline. The shoulder datum points and upper wrist and ankle seal girth positions were located by means of plastic templates and the main wrist and ankle datum circumferences were located, before marking, by means of $\frac{1}{2}$ inch wide fabric bands. The waist line was similarly located by settling a $\frac{1}{2}$ inch wide fabric belt firmly at the subject's waist and marking at convenient intervals on each side of the belt. Subsequent measurements were made at this circumference with the belt removed; waist height and half torso hoop measurements were taken at the belt width centre.

Before commencement of measuring, the subjects were asked to adopt an upright but relaxed stance i.e. not standing stiffly to attention. For the measuring of sitting height etc., where the subject was seated, a similarly relaxed but upright posture was adopted.

The procedure followed for the survey was for two measurers only to take turns at measuring and recording. The recorder observed closely all measurements and on occasion was able to correct what would otherwise have been a mis-measurement. The situation of the table used by the recorder and the form of the measuring apparatus were such that the recorder was himself able to read the measurement as a check on the measurer. This routine helped to ensure the maintenance of accuracy in what rapidly became a rather tedious task even for operators with a direct personal interest in the survey data.

Subjects were measured wearing only their own underpants. The variety of style and material, from thin cellular "continental briefs" to thick flannelette trunks, was sufficient to make a difference of about 0.7 inch in measuring over the buttocks and an attempt was made to allow for this in the recording.

Most men have a pronounced taper from chest to waist and this causes some difficulty in measuring chest circumference accurately as small changes in the height at which the measurement is made have considerable effect on the girth. The datum height chosen was horizontal through the nipples and measurement was done from the front of the subject. Care had to be taken to ensure that the tape had not slipped down at the back. It is recommended that the chest girth be taken using a mirror behind the subject so that it is easy to see that the tape does not slip down (see illustration with Table 1).

Potential sources of error were found in the variation of stance between subjects and movement during the taking of measurements. It is therefore important that the operators have sufficient interest and ability to recognise and correct artificialities of stance before taking measurements.

The chest girth measurement, which is likely to be most in error for these reasons and which may be one of the defining variables for garment sizing was taken twice, at the commencement and towards the end of the measuring sequence. If there was a difference of more than $\frac{1}{4}$ inch between the first measure (which was jotted down on scrap paper) and the second, the recorder requested a remeasure and the chest girth measurement was repeated until both operators were satisfied that they had an accurate measure. A rough check on the torso hoop was afforded by summing the two half hoops taken near the end of the measuring sequence.

Some subjects were measured more than once as a check on repeatability of measurement by the same operator and as a comparison of performance between the two operators who shared the task of measuring. The operators were not aware of which subjects would be remeasured, the choice being made randomly by O.C. Trial without reference to any other person. Unfortunately time pressed too heavily to permit as many remeasures as would have been liked, particularly in the early weeks of the Trial. However, it is thought that the checking done is enough to give reasonable confidence in the accuracy and repeatability of the anthropometric data presented in this Report. Typical remeasure results are shown in Table 54.

Repetition of lengthy verbal instructions to each subject regarding attitude and positioning in the rig would largely have been avoided had coloured, or numbered, footprints been painted on the baseboard and silhouettes on the walls where subjects were required to stand.

4 PRESENTATION OF DATA

The measurements of each subject were recorded on a proforma and subsequently transferred to punched cards for use on sorting and computing machinery.

The fashion of printing a percentile table for each of the separate dimensions has been followed. These are given at Tables 1 to 50 inclusive and include mean, standard deviation, coefficient of variation and range. The standard errors are bracketed after these values. Such presentation is, however, of little use by itself in the sizing of clothing where a complete individual has to be fitted. Trivariate tables have therefore been compiled in which the individuals were sorted into arbitrary groups based on each of the following three pairs of control dimensions:

(i) chest girth - torso hoop (vertical trunk circumference)

(ii) chest girth - stature

(iii) weight - stature

These trivariate tables, given at Tables 51, 52 and 53 respectively, record the minimum, maximum, mean and standard deviation of all dependent variables for sub-groups based on specified increments of the particular control parameters.

Chest girth - torso hoop control sizing has been used for a range of experimental aircrew functional clothing at R.A.E. Fig.4a shows a preliminary 9 sized roll, based on these controls, superimposed on a chest/torso hoop plot of the 200 survey subjects. The increments of chest girth and torso hoop defining the sizing rectangles are based on acceptable garment clearances derived from earlier work. The main dimensions of the 9 theoretical "men" in this chest/torso hoop based size-roll are listed at Table 55. These were determined by taking the maximum circumferences and mean lengths in each size block from Table 51.

The more conventional sizing parameters of chest/stature and weight/stature on which Tables 52 and 53 have been based are shown plotted for each subject at Figs.4b and 4c respectively. The increments of chest girth, stature and weight defining the sizing rectangles shown superimposed on these plots have been selected to provide a nine-size coverage equivalent to that adopted for the preliminary size-roll based on chest girth and torso hoop control dimensions (Fig.4a).

The effect on the range of the dependent subject measurements of using the three different pairs of control parameters can be seen by comparing equivalent sizes in Tables 51, 52 and 53. For convenience, the range variation for some of the more important dimensions is listed separately at Table 56. The data in this latter table are taken from only eight of the nine sizes under each control grouping as the size 9 in each group includes too few subjects.

The range, mean, standard deviation and coefficient of variation of all the body measurements taken in this survey have been extracted and, for convenience, gathered into a single list at Table 57.

The relationship between certain pairs of body dimensions having significance in clothing sizing and human engineering studies is shown graphically together with the regression equations, correlation coefficients and covariances at Figs.5 to 18 inclusive.

Figs.19, 20, 21, 22 and 23 show respectively, the frequency distribution of stature, weight, torso hoop, chest girth and shoe size.

A comparison of some of the anthropometric data obtained from this survey with the data provided by the 1944 survey of British military aircrew[3] is given at Table 58.

5 DISCUSSION

5.1 General

Table 58 indicates that in the 22 year period between the Morant[3] and R.A.E. surveys of comparable British aircrew, significant changes have taken place.

The average age of aircrew has increased by $5\frac{1}{2}$ years, weight by 19 pounds, stature by 1.17 inches, chest girth by 3.66 inches and waist girth by 4.14 inches. These changes are of considerable importance from the point of view of clothing size-rolls. They highlight the need for a larger survey to provide more statistically significant data, particularly for use in the preparation of trivariate tables such as are presented at Tables 51, 52 and 53.

5.2 Chest girth/torso hoop control for garment sizing

The implications of the use of chest girth and torso hoop as control measurements for one-piece garment sizing can be deduced from a study of Table 56, and comparison of Tables 51, 52 and 53. The range of torso hoop and chest girth dimensions for subjects within any of the arbitrary sizes

considered does not exceed 3 inches. Thus a good torso fit would be ensured, with close alignment of the garment and subject crotch line. The range of subject arm lengths within the sizing groups is little different from those to be accommodated within the equivalent sizes obtained by chest/stature or weight/stature control.

As would be expected from a control system in which a body length measurement (stature, shoulder height etc.) is not included, the range of leg lengths (crotch height) for any of the size groups is greater when using chest and torso hoop as the control dimensions.

Work in the Human Engineering Division of R.A.E. led to the adoption of the chest/torso hoop system of sizing for experimental pressure suits, where a good torso fit was of paramount importance. With these garments, limb length adjustment was practicable and to a large extent overcame limb sizing problems. This system of sizing has more recently been applied to an experimental aircrew overall to ensure good torso fit. In particular, it meets the need for an accurately aligned garment/subject crotch area to minimise the "hobbling" effect of a low garment crotch and its adverse effects on the positioning of thigh window pockets, leg-garter tunnels etc. when "drawn in" by seat/parachute crotch straps.

A theoretical fitting trial based on comparison of the dimensions of the 9 sizes of overall with those of the 200 survey subjects indicates that a satisfactory torso fit would be obtained on 95% but an acceptable fit as regards leg length would be obtained on only 65% to 75% of the subjects. As foreseen, there is a need for either two leg and, possibly, arm lengths for each torso size, making 18 sizes in all, or a method of limb length adjustment if 9 sizes are to be provided. Methods of limb length adjustment for this experimental overall are under investigation.

5.3 Chest girth/stature and weight/stature control

The more conventional chest/stature and weight/stature control methods of garment sizing have been considered together, as the implications of their use in determining garment size-rolls are similar. By including a body length dimension as one of the control measurements, the range of dependent body length dimensions for any one of the arbitrarily selected sizing groups listed at Table 56 is less than for chest/torso hoop control sizing. This is particularly true of the shoulder height dimension upon which garment lengths can be conveniently based. The maximum range of this dimension from the

subjects in the arbitrary size groups based on chest/stature and weight/stature controls is 4.8 inches and 4.0 inches respectively, against 9.9 inches for chest/torso hoop control.

A shortcoming of the chest/stature and weight/stature systems is the relatively poor torso hoop fit provided. The maximum range of subject torso hoop dimensions to be accommodated by any size in the specimen size-roll varies from 11.2 inches under chest/stature control to 7.5 inches under weight/stature control. Assuming a minimum garment torso clearance of 3.5 inches on the largest man in these size-blocks, the smallest man will have, respectively 14.7 inches and 11.0 inches excess garment girth around the nude torso hoop, with a resulting crotch drop of up to 7.35 inches and 5.5 inches. These are extreme cases for the greatest torso hoop range within a particular size but in the case of chest/stature control, the 11.2 inch torso girth range applies to the most populous size 5 grouping (28% of survey subjects).

If body fit is unimportant and ranges of subject shoulder height, of up to 4.8 inches and 4.0 inches can be accommodated satisfactorily within a particular garment size, the chest/stature and weight/stature methods of garment sizing are advantageous from the logistic viewpoint.

Of these two sizing methods, weight/stature control affords the better garment fit because of the generally smaller range of dependent subject measurements within comparable size-blocks.

6 CONCLUSIONS AND RECOMMENDATIONS

(i) The measuring apparatus and techniques used for this survey have given a high standard of accuracy and repeatability as indicated by the repeat measure data given at Table 54. It has been shown that these standards can be achieved with very little operator training.

(ii) To obtain the degree of torso fit considered desirable in one-piece aircrew functional clothing, sizing should be based on direct body measures (measurements actually fitted by clothing) rather than indirect measures such as height and weight. The data from this study support the use of chest girth and torso hoop as control parameters for this purpose.

(iii) If torso fit is unimportant it is better logistically to use chest girth/stature or weight/stature as the control measurements. Of these two, weight/stature control should afford the better general garment fit, based on the evidence of this survey.

(iv) There should be a larger scale anthropometric survey of British military aircrew in the near future to remedy the lack of up-to-date information. This information should be updated more frequently than hitherto.

(v) Any future surveys should include those dimensions specifically required for functional tailoring purposes, particularly those indicated in this Report as being not previously taken.

(vi) To make the international exchange of anthropometric data on military personnel meaningful for functional clothing purposes, standardisation of measurements taken, measuring techniques and methods of data presentation should be sought between the Commonwealth and N.A.T.O. nations.

(vii) For functional clothing purposes, survey results should be recorded and processed in a manner lending itself to the production of tables such as those given at Tables 51, 52 and 53 of this Report.

(viii) The experience gained from this preliminary survey has highlighted the following points:

(a) A thorough work study to determine the sequence of measuring most convenient to both measurer and subject is an essential preliminary of any future survey.

(b) Every endeavour should be made to avoid using uninterested personnel as either measurers or recorders.

(c) The more important or difficult measurements should be repeated during the measuring sequence, with sufficient time interval for the measurer to have forgotten the original figure.

(d) Periodic random remeasures and operator comparisons should be made as a check on accuracy and repeatability.

(e) Any clothing worn by the measured subjects for modesty purposes should be standardised. Drip dry briefs affording minimum and standard cover are suggested.

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The valuable assistance given by Mathematics Department, R.A.E., in particular Miss E.V. Hartley and her assistants, in the collating and processing of the survey data is also gratefully acknowledged.

Appendix A

GLOSSARY OF STATISTICAL TERMS AND SYMBOLS

Frequency distribution

If we consider the weights of a given collection of individuals, these can be arranged in categories. Thus there might be 17 individuals whose weight falls within the category 140 to 145 lb, 14 individuals in the 145 to 150 lb group and so on. This device for summarising information may be presented in graphical form when it is called a bar-chart or histogram.

With a large enough sample, collection, or population of individuals and a small enough weight interval, the broken outline of the bar-chart can be idealised as a continuous curve of frequency plotted against weight (the variable quantity). Then, instead of being limited to information on the number whose weights lie between certain fixed limits, we may consider the proportion of the whole population above or below a given weight or between any two weights under the curve.

In many cases this frequency curve or distribution is symmetrical. The symmetrical normal curve is a particularly important shape as it is often assumed to be a satisfactory way in which to approximate to the true frequency distribution of a population.

Percentile

The Q% point, or the Q-percentile, of a frequency distribution is that value of the variable quantity (x) below which Q% of all values in the population lie.

Mean

The mean $(\bar{x})$ of a distribution is the arithmetic average of all values of x. For the normal curve this is also the commonest value in the population.

Standard deviation

The standard deviation of a distribution is a measure of the variability of the quantity being studied:

$$\text{s.d.} = \sqrt{\frac{\Sigma (x - \bar{x})^2}{N}} \quad .$$

It is useful to remember that, in the case of a normal distribution, approximately 68.2% of the values lie within ±1 s.d. of the mean, 95.4% within ±2 s.d. and 99.7% within ±3 s.d. of the mean.

Coefficient of variation

This is a method of expressing the variability in a dimensionless form as the percentage given by:

$$\frac{\text{s.d.}}{\text{mean}} \times 100$$

Standard error

When the mean, standard deviation, or any other quality is measured for a sample of a population the result will vary with the sample used. The possible results of repeated sampling will themselves form a frequency distribution whose variability depends inversely on the sample size.

The standard deviation of this derived distribution is called the standard error of the mean, s.d., or other quality under consideration. In the case of a normal population the true value of the mean, s.d. etc., lies within ±1 s.e. of the sample value on 68% of occasions, within ±2 s.e. on 95% of occasions and etc.

Correlation coefficient

If two variables such as height (x) and weight (y) be measured for the individuals of a population there may be some correlation or dependence between them. The correlation coefficient is a dimensionless measure of this dependence and lies between -1 and +1. An exact linear relationship in which x and y increase together leads to the value +1, if x decreases as y increases the value would be -1. In general, relationships are not exact and the numerical value is less than 1. A value that is close to zero indicates little or no relationship between x and y.

Regression lines

When the relationship is not exact, then for a given x, the y values have a frequency distribution about a mean value Y. In the important special case where x and y are both normally distributed the regression line $Y = a + bx$ gives this mean value of y for given x. By interchanging the roles of x and y in the definitions of a and b in the following formulae the (different) regression line $X = a' + b'y$ gives the mean of the x values for a specified y value.

x = a basic size, number, unit, etc.

N = number of x, size of sample or population

Σx = the sum of $x_1 + x_2 + \ldots . x_n$

$\bar{x}$ = mean (arithmetic) or average = $\frac{\Sigma x}{N}$

$\Sigma |x - \bar{x}|$ = the sum of the differences, neglecting sign, of x and $\bar{x}$

$\Sigma (x - \bar{x})^2$ = the sum of the squares of the differences of x and $\bar{x}$

σ = standard deviation = $\sqrt{\frac{\Sigma (x - \bar{x})^2}{N}}$

v = coefficient of variation = $\frac{\sigma}{\bar{x}} \times 100\%$

$SE_{\bar{x}}$ = standard error of the mean = $\frac{\sigma}{\sqrt{N}}$

SE_{σ} = standard error of the standard deviation = $\frac{\sigma}{\sqrt{2N}}$

SE_{v} = standard error of coefficient of variation = $\frac{v}{\sqrt{2N}}$

r = correlation coefficient = $\frac{\Sigma (x - \bar{x})y}{\sqrt{\Sigma (x - \bar{x}) \times \Sigma (y - \bar{y})y}}$

c = covariance = $v\ \sigma_x\ \sigma_y$

b = regression slope = $\frac{\Sigma (x - \bar{x})y}{\Sigma (x - \bar{x})^2}$

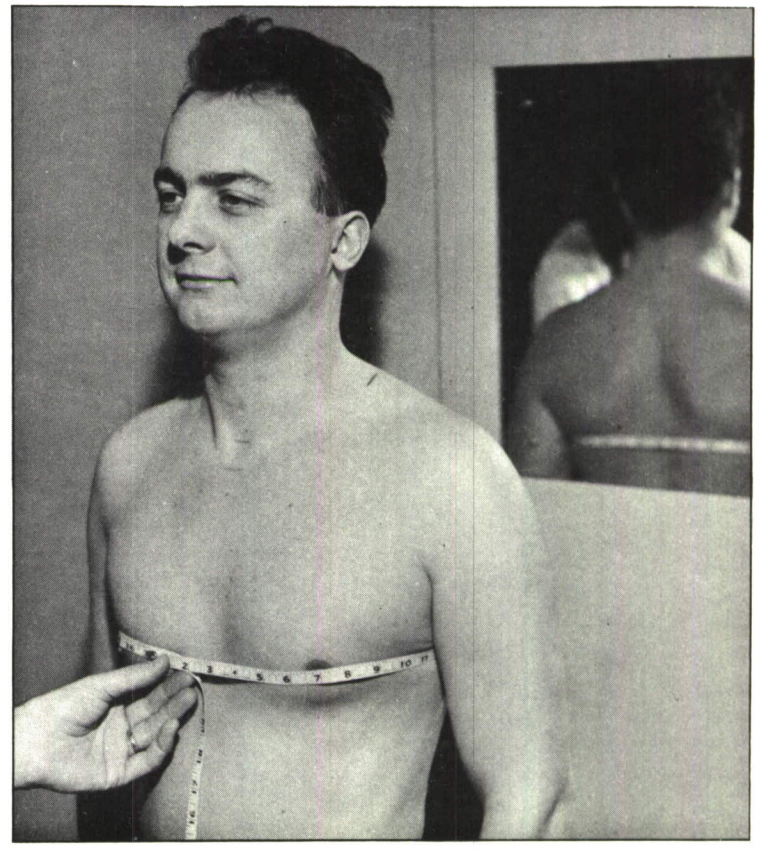
a = regression intercept = $\bar{y} - b\ \bar{x}$

σ^2 = variance = s.d.^{2} = $\frac{\Sigma (x - \bar{x})^2}{N}$

Tape horizontal over nipples with subject breathing normally and standing in a relaxed manner.

PERCENTILE VALUES

%	cm	in
min	86.36	34.00
1	86.36	34.00
2	87.63	34.50
3	88.65	34.90
5	89.41	35.20
10	91.06	35.85
15	92.29	36.33
20	92.91	36.58
25	93.75	36.91
30	93.98	37.00
35	94.74	37.30
40	95.50	37.60
45	96.56	38.01
50	96.98	38.18
55	97.54	38.40
60	98.47	38.77
65	99.01	38.98
70	100.08	39.40
75	101.60	40.00
80	103.12	40.60
85	104.27	41.05
90	105.92	41.70
95	107.95	42.50
97	109.98	43.30
98	111.76	44.00
99	112.78	44.40
max	116.59	45.90



Mean: 97.907 (0.408) cm; 38.546 (0.161) in.
Standard deviation: 5.773 (0.289) cm; 2.273 (0.114) in
Coefficient of variation: 5.897 (0.295) %
Range: 86.36–116.59 cm; 34.00–45.90 in
No. of subjects: 200

Table 1
CHEST GIRTH

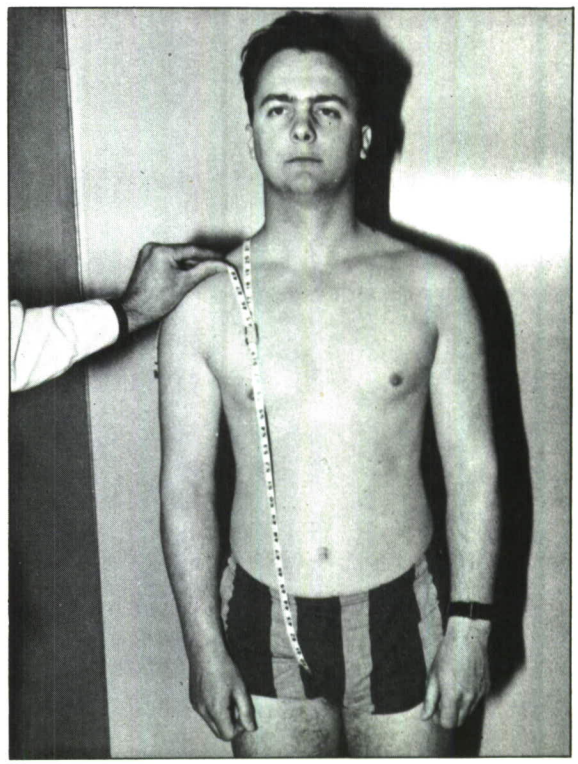
T.R. 67125

Record the average of the right and left hand torso hoops. For left hand hoop, tape to pass over left shoulder datum mark and to the left of the genitals when passed through the crotch; opposite for right hand hoop measure. Tape to span hollows and lie in the buttock crease, i.e. should not include buttock prominence.

PERCENTILE VALUES

%	cm	in
min	144.53	56.90
1	146.05	57.50
2	150.37	59.20
3	151.13	59.50
5	153.16	60.30
10	155.45	61.20
15	156.15	61.48
20	157.42	61.98
25	158.41	62.37
30	159.38	62.75
35	161.16	63.45
40	162.31	63.90
45	163.12	64.22
50	163.77	64.47
55	164.63	64.82
60	165.61	65.20
65	166.24	65.45
70	166.88	65.70
75	167.98	66.13
80	168.66	66.40
85	169.93	66.90
90	172.21	67.80
95	175.01	68.90
97	175.77	69.20
98	176.28	69.40
99	177.04	69.70
max	185.93	73.20

Mean: 163.68 (0.468) cm; 64.44 (0.184) in
Standard deviation: 6.619 (0.331) cm; 2.606 (0.130) in
Coefficient of variation: 4.044 (0.202) %
Range: 144.53–185.93 cm; 56.90–73.20 in
No. of subjects: 200



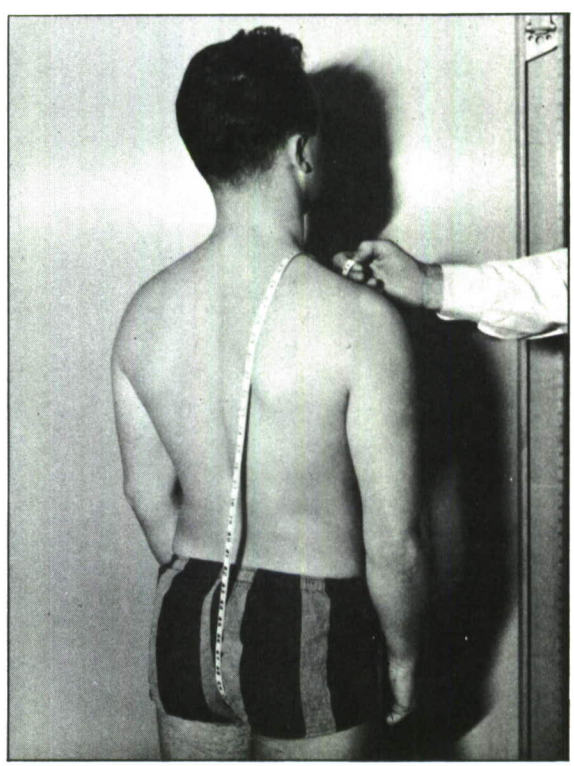


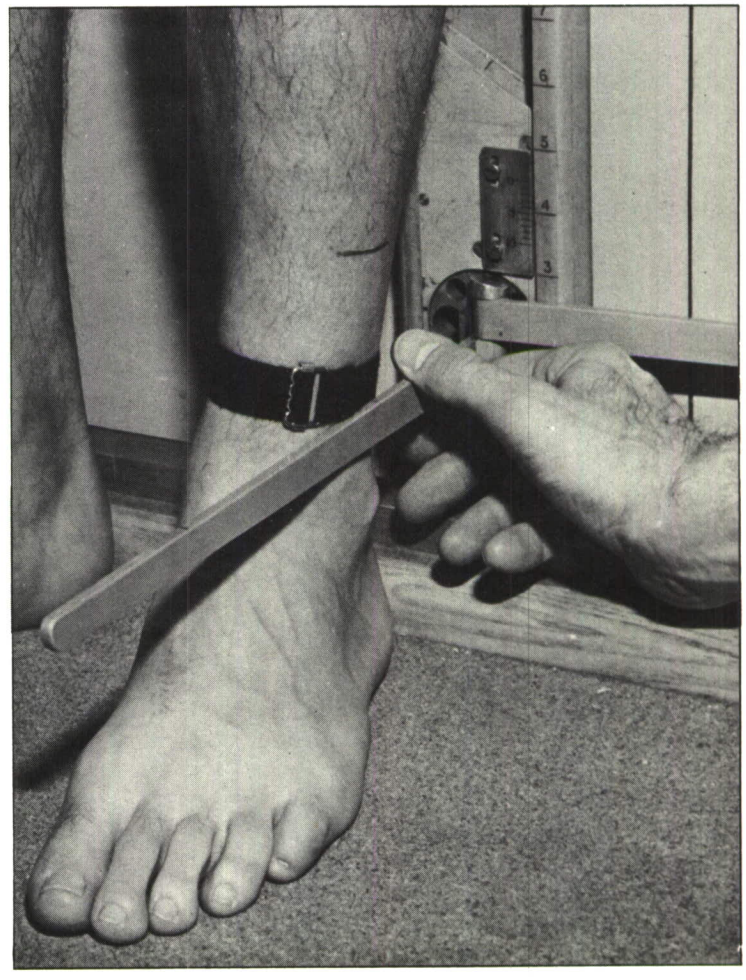
Table 2
TORSO HOOP

T.R. 67125

Using the lower edge of an adjustable tape band to mark the minimum ankle girth, measure the height from floor datum.

PERCENTILE VALUES

%	cm	in
min	10.16	4.00
1	10.16	4.00
2	10.41	4.10
3	10.77	4.24
5	11.18	4.40
10	11.48	4.52
15	11.64	4.58
20	11.88	4.68
25	12.04	4.74
30	12.17	4.79
35	12.29	4.84
40	12.41	4.89
45	12.50	4.92
50	12.59	4.95
55	12.67	4.99
60	12.76	5.03
65	12.87	5.07
70	12.98	5.11
75	13.10	5.16
80	13.23	5.21
85	13.41	5.28
90	13.61	5.36
95	13.90	5.47
97	14.22	5.60
98	14.39	5.67
99	14.73	5.80
max	14.99	5.90



Mean: 12.682 (0.061) cm; 4.993 (0.024) in
Standard deviation: 0.861 (0.043) cm; 0.339 (0.017) in
Coefficient of variation: 6.789 (0.339) %
Range: 10.16–14.99 cm; 4.00–5.90 in
No. of subjects: 200

Table 3

ANKLE – HEIGHT OF MINIMUM GIRTH

Locate the knee hinge point by feel and eye whilst subject gently swings lower leg to and fro to flex the joint. Mark the hinge point and measure its height from the floor datum.

PERCENTILE VALUES

%	cm	in
min	42.16	16.60
1	43.94	17.30
2	44.96	17.70
3	45.72	18.00
5	46.31	18.23
10	47.06	18.53
15	47.43	18.67
20	47.88	18.85
25	48.41	19.06
30	48.89	19.25
35	49.19	19.37
40	49.45	19.47
45	49.73	19.58
50	49.93	19.66
55	50.18	19.76
60	50.47	19.87
65	50.66	19.94
70	50.86	20.02
75	51.36	20.22
80	51.71	20.36
85	52.01	20.47
90	52.58	20.70
95	54.36	21.40
97	55.12	21.70
98	55.37	21.80
99	56.39	22.20
max	57.66	22.70



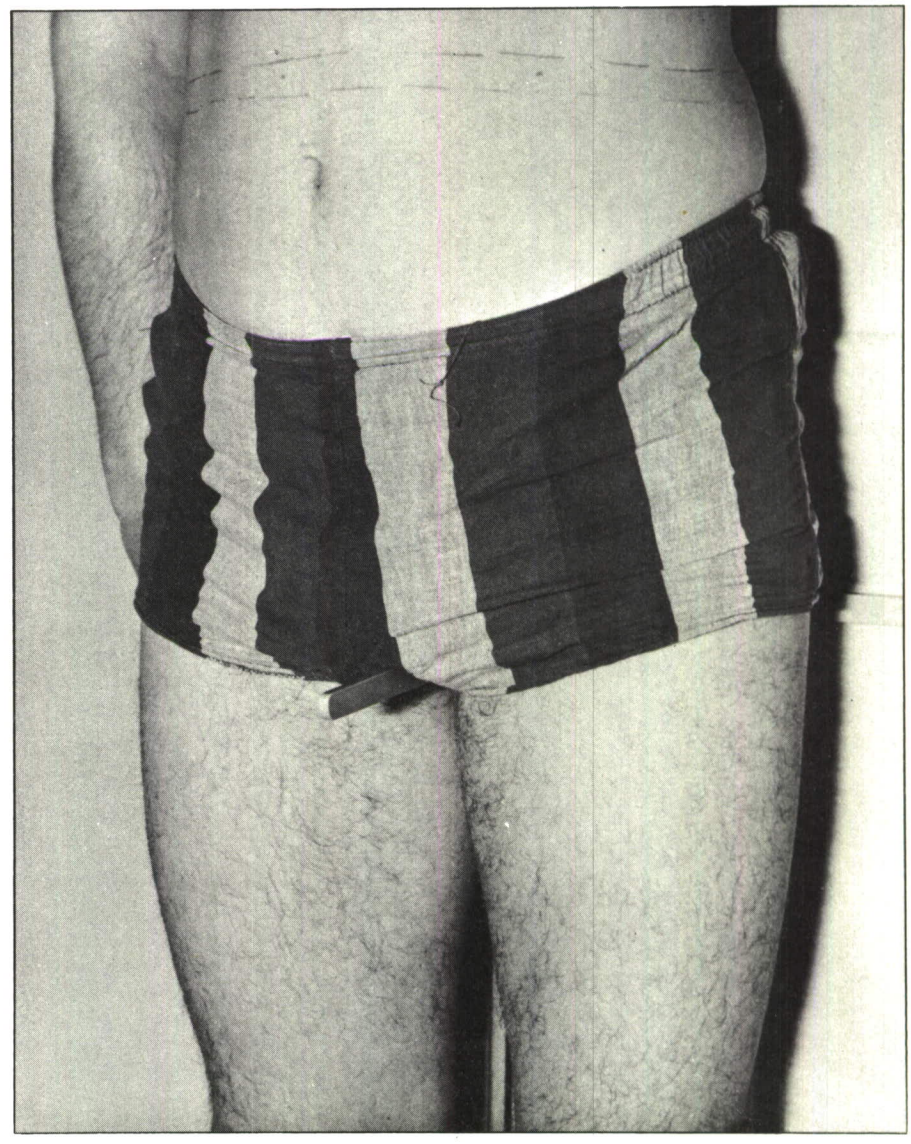
Mean: 50.071 (0.170) cm; 19.713 (0.067) in
Standard deviation: 2.398 (0.120) cm; 0.944 (0.047) in
Coefficient of variation: 4.789 (0.239) %
Range: 42.16–57.66 cm; 16.60–22.70 in
No. of subjects: 200

Table 4
KNEE PIVOT HEIGHT

Place datum edge of lower arm of measuring head in light contact with the lowest point of crotch, avoiding genitals. Record datum edge height from floor datum.

PERCENTILE VALUES

%	cm	in
min	72.39	28.50
1	73.15	28.80
2	73.66	29.00
3	74.42	29.30
5	76.12	29.97
10	77.72	30.60
15	78.61	30.95
20	79.63	31.35
25	80.07	31.53
30	80.67	31.76
35	81.03	31.90
40	81.53	32.10
45	82.04	32.30
50	82.76	32.58
55	83.06	32.70
60	83.48	32.87
65	84.33	33.20
70	84.80	33.39
75	85.15	33.52
80	86.11	33.90
85	87.43	34.42
90	88.39	34.80
95	89.15	35.10
97	90.93	35.80
98	92.96	36.60
99	93.47	36.80
max	97.03	38.20



Mean: 82.926 (0.299) cm; 32.648 (0.118) in
Standard deviation: 4.227 (0.211) cm; 1.664 (0.083) in
Coefficient of variation: 5.097 (0.255) %
Range: 72.39–97.03 cm; 28.50–38.20 in
No. of subjects: 200

Table 5
CROTCH HEIGHT

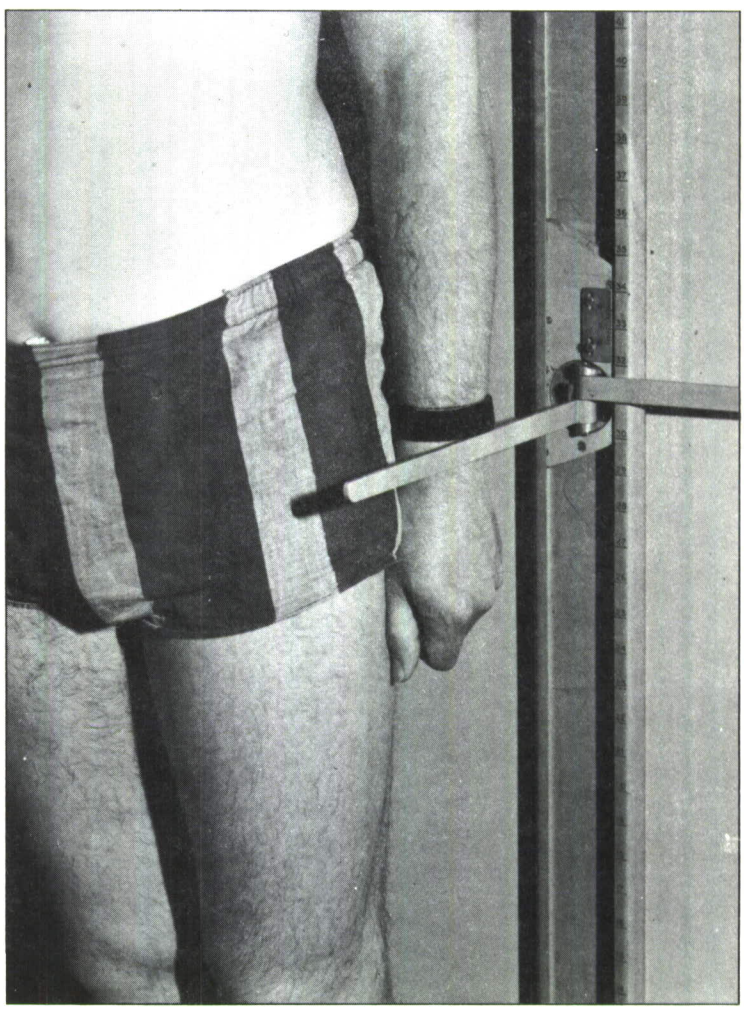
T.R. 67125

Neg.No.C5023

Using the lower edge of an adjustable tape band to mark the minimum wrist circumference above the styloid process, record the wrist datum height above the floor datum.

PERCENTILE VALUES

%	cm	in
min	79.25	31.20
1	79.50	31.30
2	80.77	31.80
3	81.15	31.95
5	82.04	32.30
10	83.57	32.90
15	84.50	33.27
20	85.17	33.53
25	85.94	33.83
30	86.30	33.98
35	87.12	34.30
40	87.69	34.52
45	88.28	34.76
50	88.65	34.90
55	88.97	35.03
60	89.31	35.16
65	89.75	35.33
70	90.30	35.55
75	91.36	35.97
80	91.95	36.20
85	92.64	36.47
90	93.34	36.75
95	95.12	37.45
97	95.63	37.65
98	96.01	37.80
99	96.77	38.10
max	99.82	39.30



Mean: 88.646 (0.274) cm; 34.900 (0.108) in
Standard deviation: 3.876 (0.194) cm; 1.526 (0.076) in
Coefficient of variation: 4.373 (0.219) %
Range: 79.25–99.82 cm; 31.20–39.30 in
No. of subjects: 200

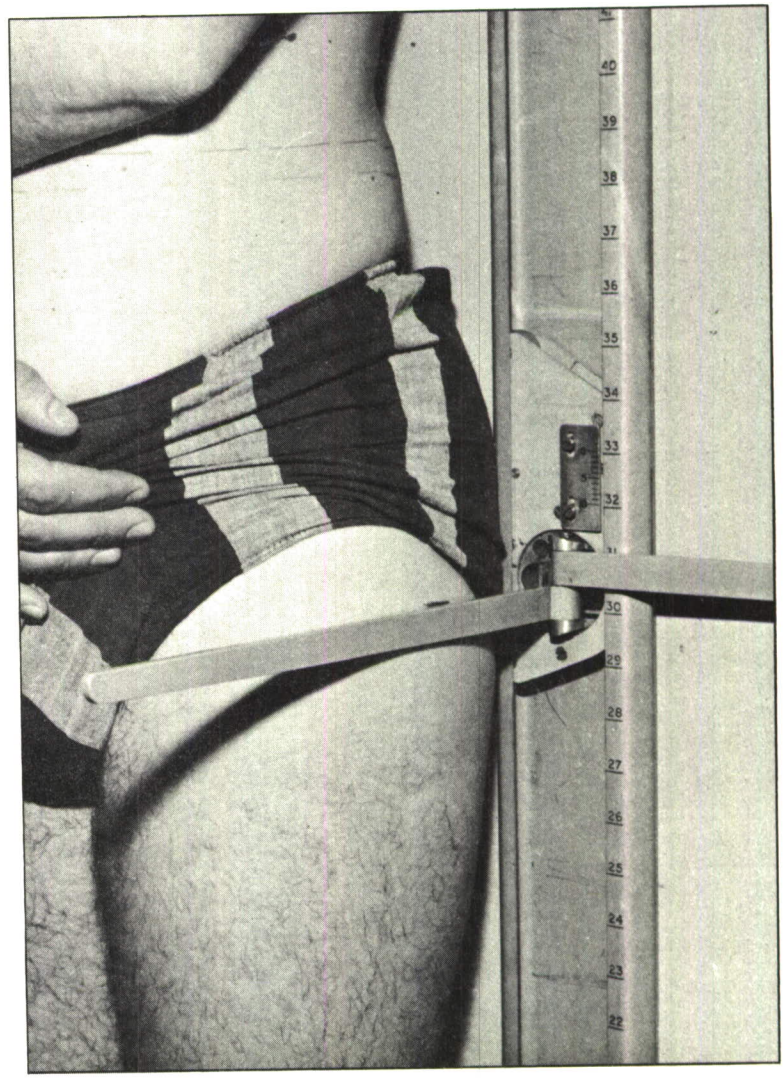
Table 6
WRIST HEIGHT

T.R. 67125

Locate by feel and/or eye the prominence at the head of the femur, mark this position and align datum edge of measuring head with mark. Record height from floor datum on vertical scale. Location is sometimes simplified if subject flexes the joint.

PERCENTILE VALUES

%	cm	in
min	78.99	31.10
1	80.52	31.70
2	81.28	32.00
3	82.04	32.30
5	82.55	32.50
10	84.29	33.19
15	85.39	33.62
20	86.19	33.93
25	87.17	34.32
30	87.95	34.62
35	88.34	34.78
40	89.15	35.10
45	89.62	35.28
50	90.06	35.46
55	90.46	35.61
60	90.88	35.78
65	91.44	36.00
70	92.33	36.35
75	92.81	36.54
80	93.19	36.69
85	93.85	36.95
90	94.84	37.34
95	96.77	38.10
97	97.79	38.50
98	98.81	38.90
99	100.33	39.50
max	106.17	41.80



Mean: 90.056 (0.299) cm; 35.455 (0.118) in
Standard deviation: 4.227 (0.211) cm; 1.664 (0.083) in
Coefficient of variation: 4.693 (0.235) %
Range: 78.99–106.17 cm; 31.10–41.80 in
No. of subjects: 200

Table 7

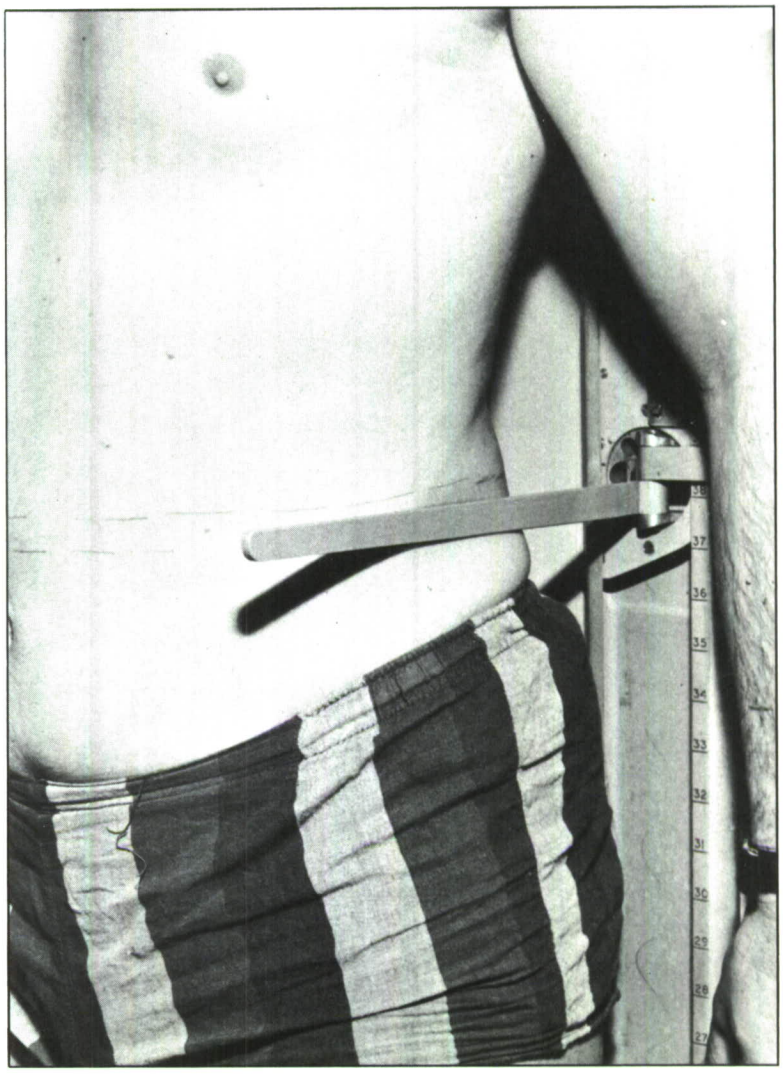
THIGH PIVOT HEIGHT

Neg.No.C5025

With the subject wearing a narrow adjustable belt in the natural waist, mark belt edge lines. Record height of centre line of belt width above floor datum.

PERCENTILE VALUES

%	cm	in
min	97.03	38.20
1	97.54	38.40
2	97.92	38.55
3	99.06	39.00
5	99.72	39.26
10	102.11	40.20
15	103.63	40.80
20	105.11	41.38
25	105.92	41.70
30	106.63	41.98
35	107.14	42.18
40	108.24	42.61
45	108.71	42.80
50	109.12	42.96
55	109.60	43.15
60	110.17	43.38
65	110.74	43.60
70	111.19	43.77
75	112.14	44.15
80	113.16	44.55
85	113.88	44.83
90	115.32	45.40
95	117.60	46.30
97	118.49	46.65
98	119.63	47.10
99	121.16	47.70
max	124.97	49.20



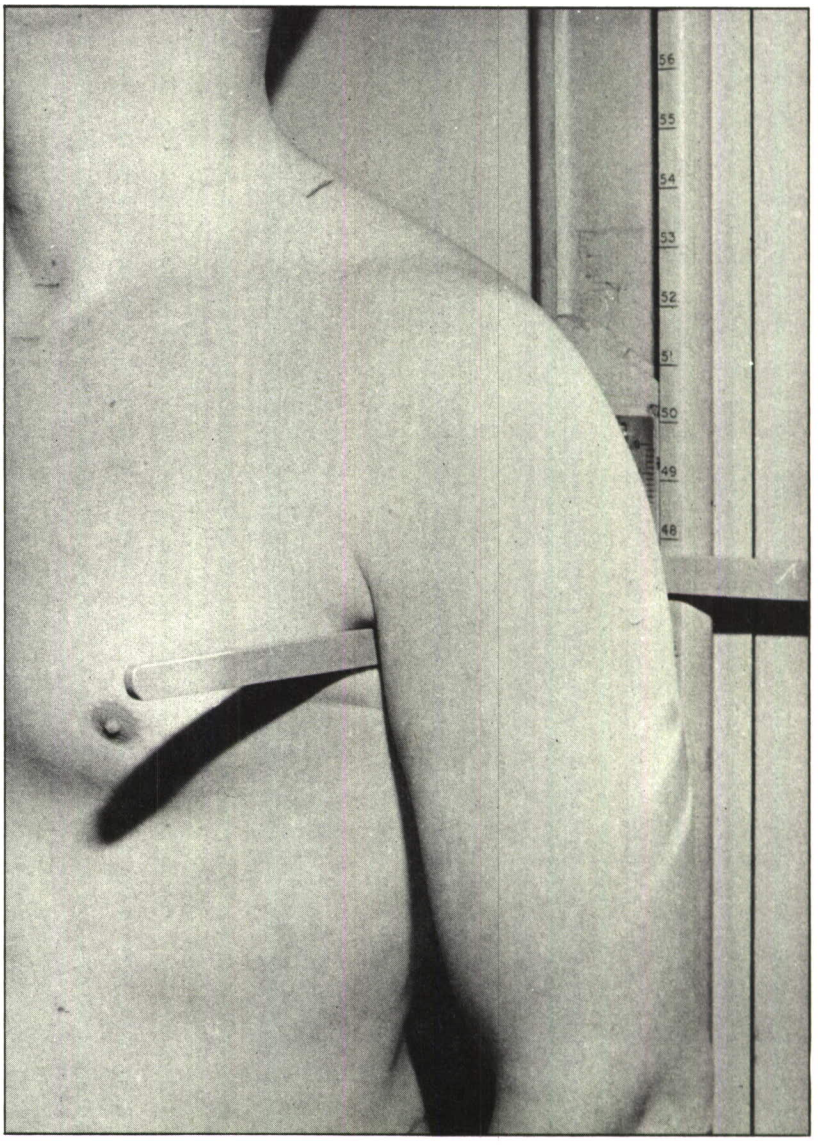
Mean: 109.141 (0.359) cm; 42.969 (0.141) in
Standard deviation: 5.072 (0.253) cm; 1.997 (0.100) in
Coefficient of variation: 4.648 (0.232) %
Range: 97.03–124.97 cm; 38.20–49.20 in
No. of subjects: 200

Table 8
WAIST HEIGHT

With the subject's arm slightly away from side, raise the measuring head lower arm until its datum edge makes light contact with the low point of the armpit. Record height of datum edge above floor datum.

PERCENTILE VALUES

%	cm	in
min	120.14	47.30
1	121.16	47.70
2	121.67	47.90
3	122.05	48.05
5	122.94	48.40
10	125.81	49.53
15	126.92	49.97
20	128.57	50.62
25	129.41	50.95
30	130.01	51.18
35	130.98	51.57
40	131.95	51.95
45	132.67	52.23
50	133.10	52.40
55	133.76	52.66
60	134.43	52.92
65	134.70	53.03
70	135.38	53.30
75	136.14	53.60
80	137.06	53.96
85	138.18	54.40
90	139.19	54.80
95	141.48	55.70
97	144.02	56.70
98	144.53	56.90
99	146.05	57.50
max	148.59	58.50



Mean: 132.994 (0.382) cm; 52.360 (0.150) in
Standard deviation: 5.403 (0.270) cm; 2.127 (0.106) in
Coefficient of variation: 4.062 (0.203) %
Range: 120.14–148.59 cm; 47.30–58.50 in
No. of subjects: 200

Table 9

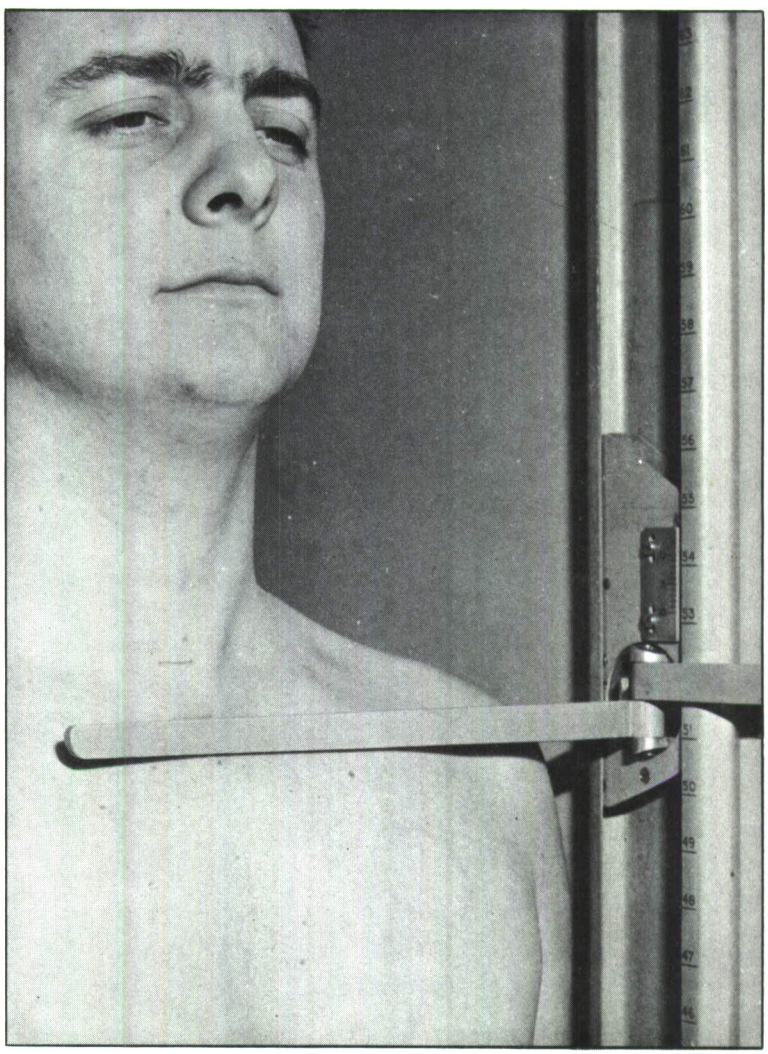
AXILLARY HEIGHT

Neg.No.C5027

Mark base of the hollow at top of the sternum and record height of mark from floor datum.

PERCENTILE VALUES

%	cm	in
min	131.06	51.60
1	131.19	51.65
2	131.95	51.95
3	132.84	52.30
5	134.37	52.90
10	136.40	53.70
15	137.92	54.30
20	139.19	54.80
25	140.21	55.20
30	141.39	55.67
35	142.11	55.95
40	142.81	56.23
45	143.32	56.43
50	143.89	56.65
55	144.27	56.80
60	145.16	57.15
65	145.54	57.30
70	146.30	57.60
75	147.00	57.87
80	147.51	58.07
85	148.08	58.30
90	150.11	59.10
95	152.15	59.90
97	153.80	60.55
98	155.45	61.20
99	157.73	62.10
max	160.78	63.30



Mean: 143.79 (0.379) cm; 56.610 (0.149) in
Standard deviation: 5.359 (0.268) cm; 2.110 (0.106) in
Coefficient of variation: 3.727 (0.186) %
Range: 131.06–160.78 cm; 51.60–63.30 in
No. of subjects: 200

Table 10

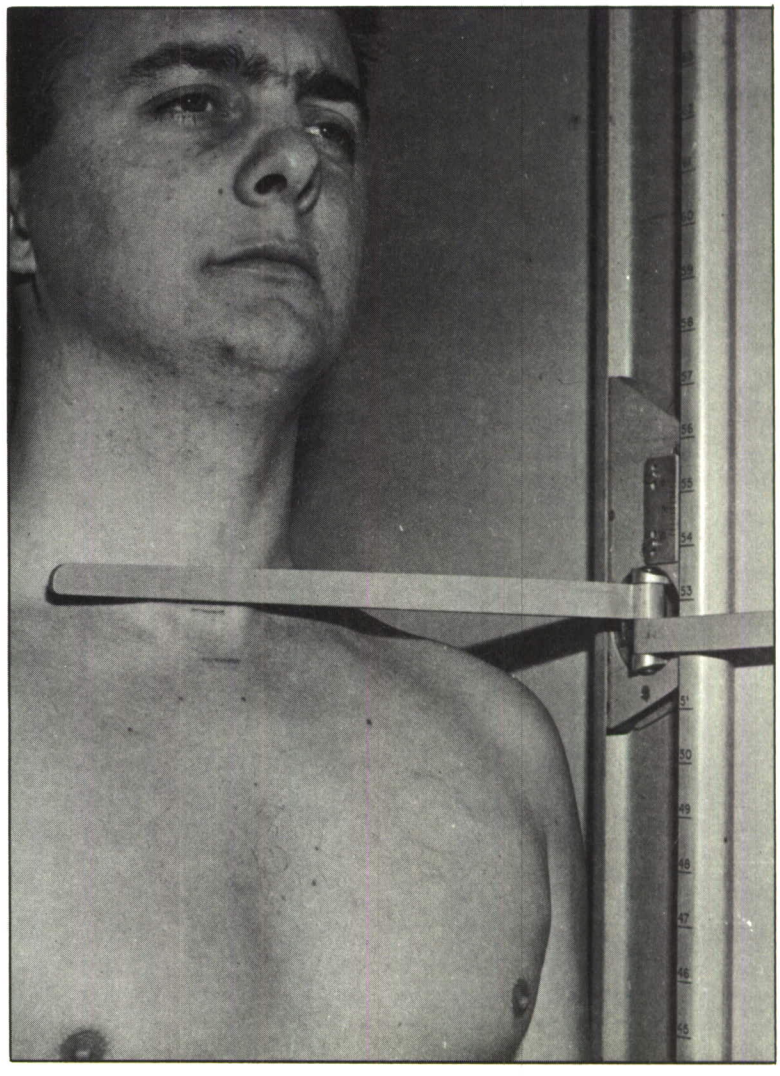
SUPRASTERNAL HEIGHT

T.R. 67125

Mark intersection of neck and chest (lower edge of normal collar band position) and record height of mark above floor datum.

PERCENTILE VALUES

%	cm	in
min	132.84	52.30
1	133.10	52.40
2	134.87	53.10
3	135.25	53.25
5	136.65	53.80
10	138.68	54.60
15	140.29	55.23
20	141.67	55.77
25	142.24	56.00
30	143.64	56.55
35	144.36	56.83
40	144.97	57.07
45	145.59	57.32
50	146.20	57.56
55	146.68	57.75
60	147.37	58.02
65	147.98	58.26
70	148.67	58.53
75	149.35	58.80
80	149.75	58.96
85	150.62	59.30
90	152.53	60.05
95	154.43	60.80
97	156.04	61.43
98	157.73	62.10
99	160.15	63.05
max	163.07	64.20



Mean: 146.068 (0.384) cm; 57.507 (0.151) in
Standard deviation: 5.425 (0.271) cm; 2.136 (0.107) in
Coefficient of variation: 3.714 (0.186) %
Range: 132.84–163.07 cm; 52.30–64.20 in
No. of subjects: 200

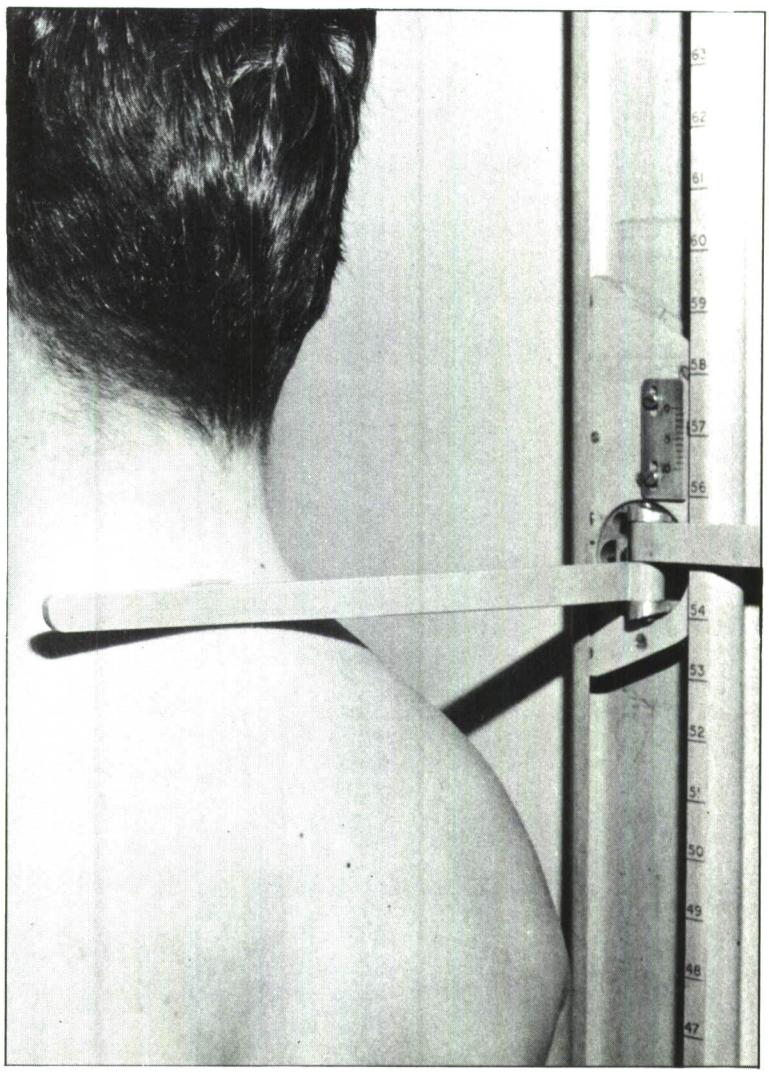
Table 11

NECK ROOT HEIGHT

Mark the crest of the protuberance of the seventh cervical vertebra and record height from floor datum.

PERCENTILE VALUES

%	cm	in
min	137.16	54.00
1	137.92	54.30
2	139.19	54.80
3	140.21	55.20
5	141.48	55.70
10	143.45	56.48
15	145.80	57.40
20	147.07	57.90
25	148.00	58.27
30	149.10	58.70
35	150.11	59.10
40	150.83	59.38
45	151.49	59.64
50	151.84	59.78
55	152.32	59.97
60	152.87	60.18
65	153.54	60.45
70	154.48	60.82
75	155.28	61.13
80	156.27	61.52
85	157.53	62.02
90	159.00	62.60
95	160.53	63.20
97	163.07	64.20
98	163.32	64.30
99	164.34	64.70
max	169.67	66.80



Mean: 151.760 (0.408) cm; 59.749 (0.161) in
Standard deviation: 5.773 (0.289) cm; 2.273 (0.114) in
Coefficient of variation: 3.804 (0.190) %
Range: 137.16–169.67 cm; 54.00–66.80 in
No. of subjects: 200

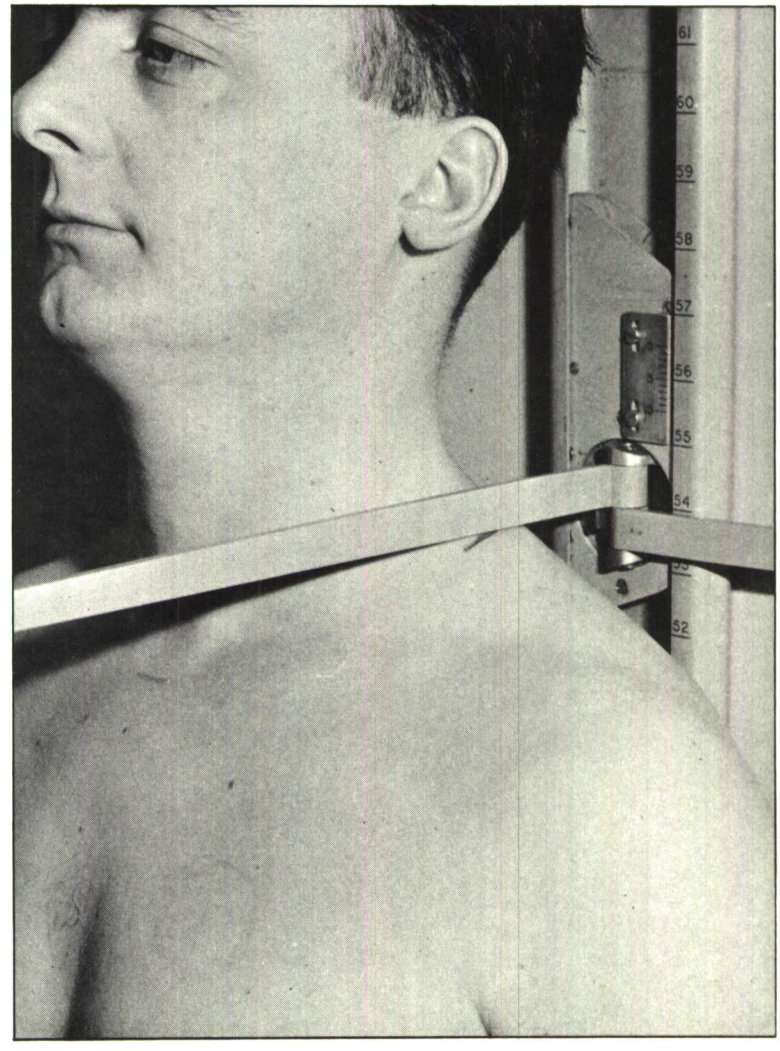
Table 12
SEVENTH CERVICAL HEIGHT

T.R. 67125

Mark shoulder datum point 3¼ inches out from body centreline and record height of datum mark above floor datum.

PERCENTILE VALUES

%	cm	in
min	135.64	53.40
1	136.40	53.70
2	138.18	54.40
3	138.75	54.63
5	139.45	54.90
10	141.48	55.70
15	143.76	56.60
20	144.86	57.03
25	145.80	57.40
30	147.17	57.94
35	147.94	58.24
40	148.76	58.57
45	149.48	58.85
50	149.90	59.01
55	150.32	59.18
60	150.88	59.40
65	151.74	59.74
70	152.55	60.06
75	153.16	60.30
80	154.09	60.67
85	155.45	61.20
90	156.97	61.80
95	159.00	62.60
97	161.04	63.40
98	162.05	63.80
99	163.70	64.45
max	168.91	66.50



Mean: 149.862 (0.409) cm; 59.001 (0.161) in
Standard deviation: 5.786 (0.289) cm; 2.278 (0.114) in
Coefficient of variation: 3.861 (0.193) %
Range: 135.64–168.91 cm; 53.40–66.50 in
No. of subjects: 200

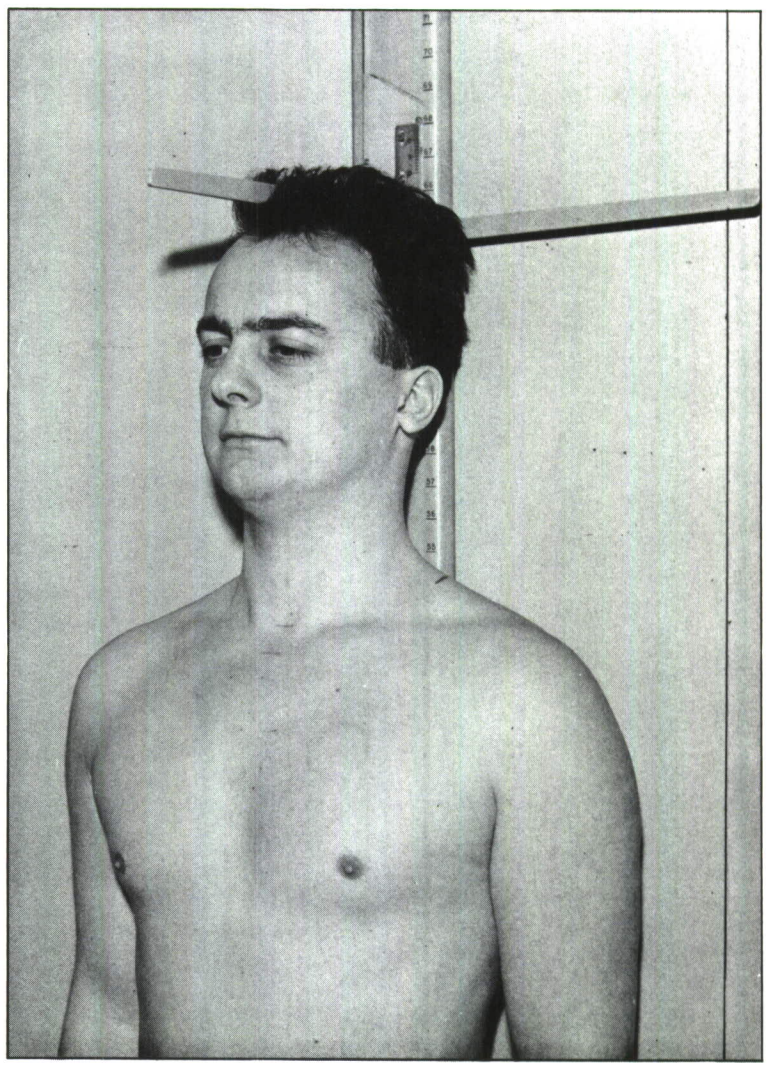
Table 13
SHOULDER HEIGHT

Neg.No.C5031

With the subject standing comfortably erect, lower the upper arm of the measuring head until the datum edge is in light contact with the subject's head. Record height of datum edge from floor datum.

PERCENTILE VALUES

%	cm	in
min	161.80	63.70
1	163.07	64.20
2	164.59	64.80
3	165.10	65.00
5	166.12	65.40
10	168.34	66.27
15	170.56	67.15
20	171.75	67.62
25	172.80	68.03
30	173.80	68.42
35	174.84	68.83
40	175.77	69.20
45	176.40	69.45
50	176.97	69.67
55	177.55	69.90
60	178.26	70.18
65	179.32	70.60
70	180.17	70.93
75	181.02	71.27
80	181.55	71.48
85	182.63	71.90
90	184.40	72.60
95	186.05	73.25
97	188.47	74.20
98	189.99	74.80
99	192.79	75.90
max	195.07	76.80



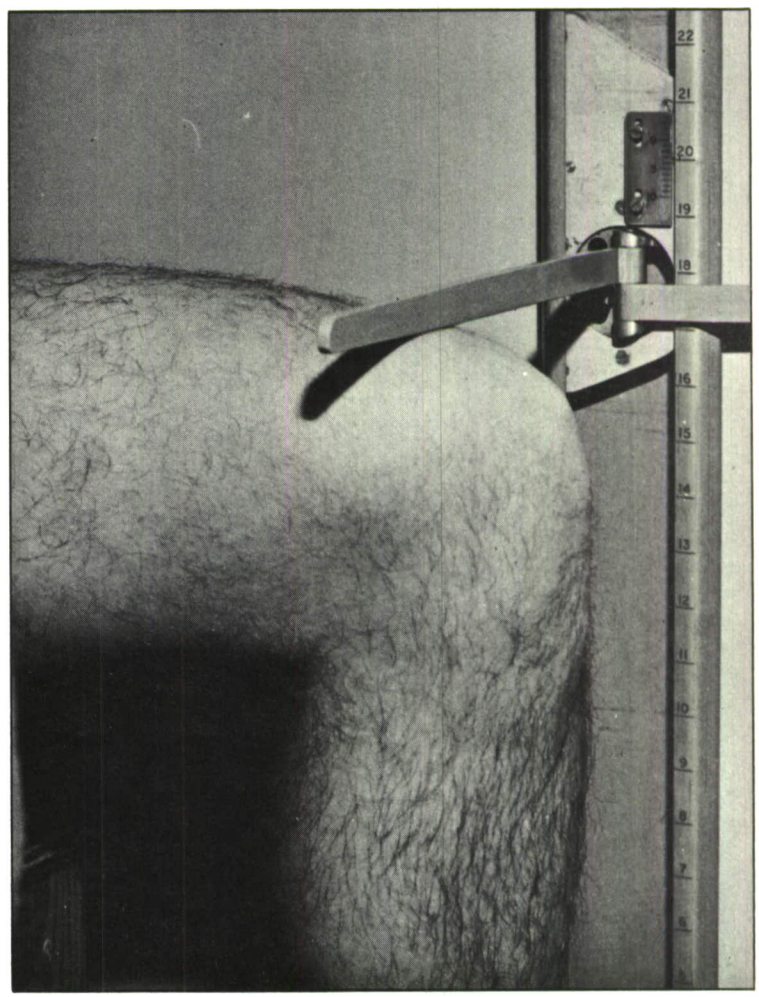
Mean: 176.959 (0.434) cm; 69.669 (0.171) in
Standard deviation: 6.134 (0.307) cm; 2.415 (0.121) in
Coefficient of variation: 3.466 (0.173) %
Range: 161.80–195.07 cm; 63.70–76.80 in.
No. of subjects: 200

Table 14
HEIGHT (STATURE)

With the subject seated, upper surface of thigh horizontal and shin vertical, lower the upper arm of the measuring head until datum edge is in light contact with top of knee, record height of datum edge above floor datum.

PERCENTILE VALUES

%	cm	in
min	48.51	19.10
1	49.02	19.30
2	50.21	19.77
3	50.88	20.03
5	51.22	20.17
10	52.43	20.64
15	52.74	20.76
20	53.23	20.96
25	53.76	21.17
30	54.31	21.38
35	54.64	21.51
40	54.90	21.61
45	55.23	21.74
50	55.50	21.85
55	55.88	22.00
60	56.11	22.09
65	56.34	22.18
70	56.57	22.27
75	56.99	22.44
80	57.45	22.62
85	57.91	22.80
90	58.42	23.00
95	59.77	23.53
97	60.20	23.70
98	60.96	24.00
99	61.72	24.30
max	63.75	25.10



Mean: 55.608 (0.178) cm; 21.893 (0.070) in
Standard deviation: 2.515 (0.127) cm; 0.990 (0.050) in
Coefficient of variation: 4.522 (0.226) %
Range: 48.51–63.75 cm; 19.10–25.10 in
No. of subjects: 200

Table 15

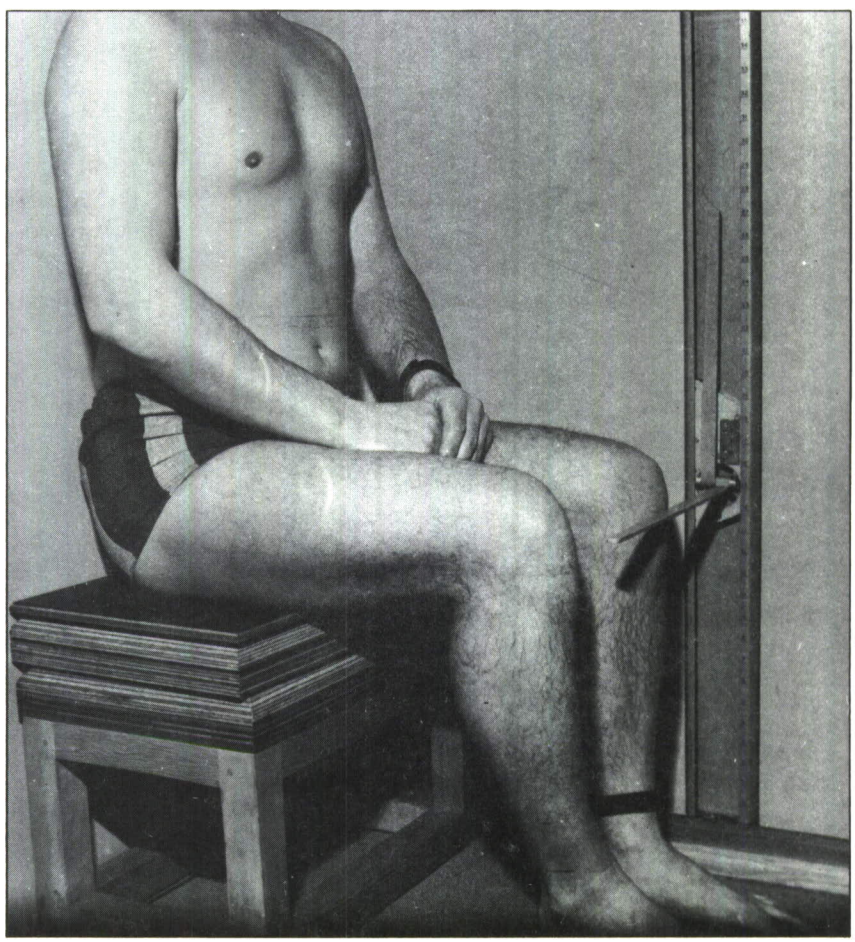
KNEE HEIGHT – SITTING

Neg.No.C5033

With subject seated, upper surface of thigh horizontal and buttocks firmly against datum wall, record distance of knee prominence from datum wall.

PERCENTILE VALUES

%	cm	in
min	53.85	21.20
1	54.23	21.35
2	55.37	21.80
3	55.71	21.93
5	56.13	22.10
10	57.36	22.58
15	57.88	22.79
20	58.58	23.06
25	59.01	23.23
30	59.28	23.34
35	59.51	23.43
40	59.73	23.51
45	60.09	23.66
50	60.76	23.92
55	61.02	24.02
60	61.21	24.10
65	61.50	24.21
70	61.79	24.33
75	62.10	24.45
80	62.55	24.62
85	63.25	24.90
90	64.39	25.35
95	65.40	25.75
97	65.91	25.95
98	66.29	26.10
99	66.67	26.25
max	68.07	26.80



Mean: 60.762 (0.186) cm; 23.922 (0.073) in
Standard deviation: 2.631 (0.132) cm; 1.036 (0.052) in
Coefficient of variation: 4.330 (0.217) %
Range: 53.85–68.07 cm; 21.20–26.80 in
No. of subjects: 200

Table 16

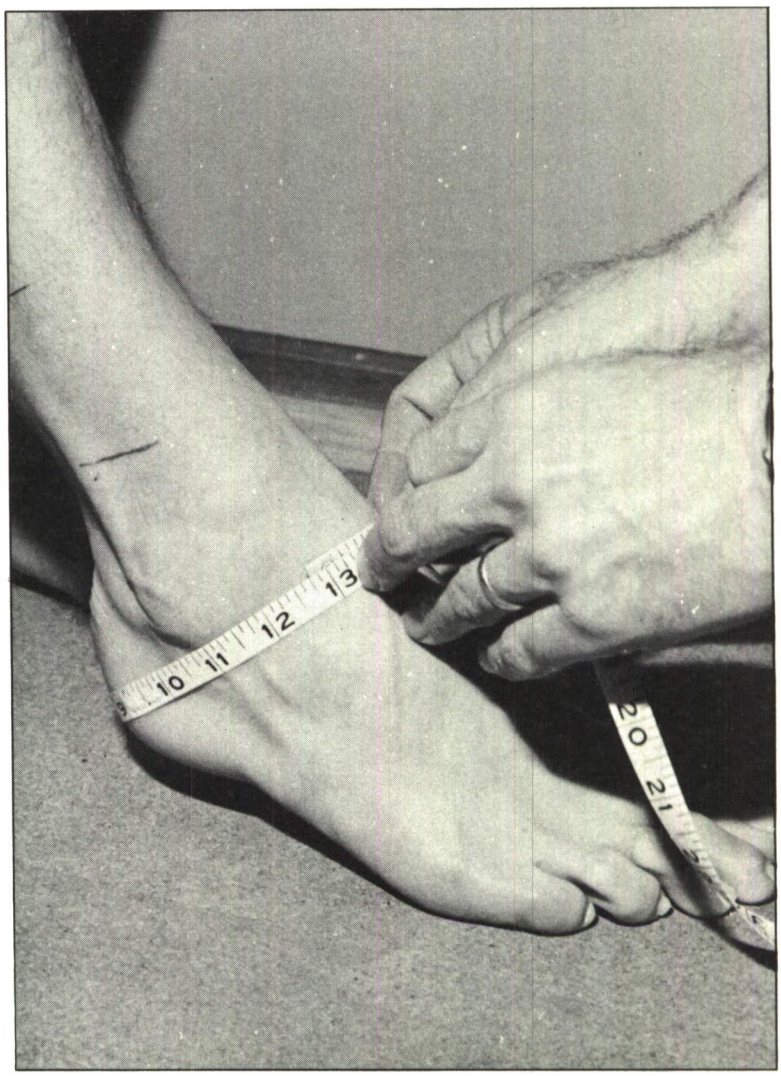
BUTTOCK TO KNEE LENGTH

T.R. 67125

With toe 'pointed', record girth over bulge of the heel.

PERCENTILE VALUES

%	cm	in
min	29.21	11.50
1	29.97	11.80
2	30.23	11.90
3	30.35	11.95
5	30.61	12.05
10	30.99	12.20
15	31.31	12.33
20	31.64	12.46
25	31.85	12.54
30	32.00	12.60
35	32.20	12.68
40	32.38	12.75
45	32.60	12.83
50	32.84	12.93
55	32.97	12.98
60	33.15	13.05
65	33.33	13.12
70	33.47	13.18
75	33.70	13.27
80	33.98	13.38
85	34.29	13.50
90	34.63	13.63
95	35.18	13.85
97	35.56	14.00
98	35.81	14.10
99	36.32	14.30
max	37.08	14.60



Mean: 32.939 (0.099) cm; 12.968 (0.039) in
Standard deviation: 1.399 (0.070) cm; 0.551 (0.027) in
Coefficient of variation: 4.249 (0.212) %
Range: 29.21–37.08 cm; 11.50–14.60 in
No. of subjects: 200

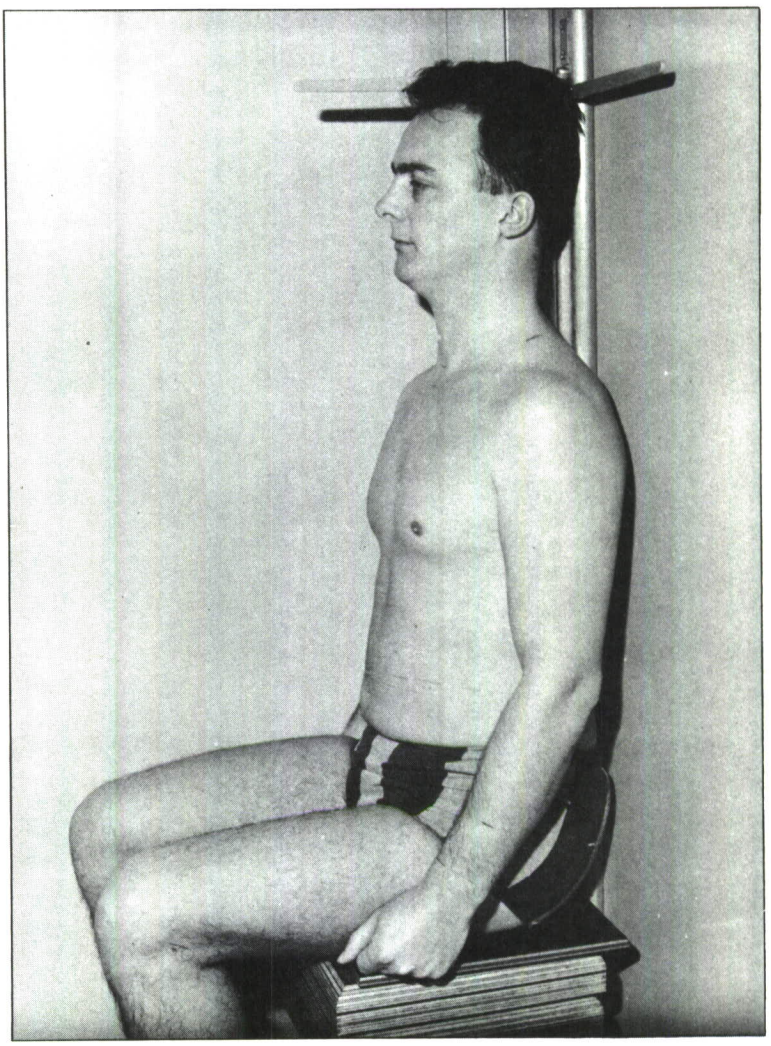
Table 17
HEEL/INSTEP GIRTH

Neg.No.C5035

Subject seated, upper surface of thighs horizontal, lower the upper arm of the measuring head until the datum edge makes light contact with the subjects head. Record height of datum edge above floor datum. Deduct from this measurement the height of the stool, similarly measured, to give subject sitting height.

PERCENTILE VALUES

%	cm	in
min	85.85	33.80
1	86.11	33.90
2	86.87	34.20
3	87.25	34.35
5	87.63	34.50
10	88.26	34.75
15	89.07	35.07
20	89.92	35.40
25	90.42	35.60
30	91.00	35.82
35	91.47	36.01
40	91.76	36.13
45	92.01	36.23
50	92.33	36.35
55	92.74	36.51
60	93.09	36.65
65	93.60	36.85
70	94.04	37.02
75	94.91	37.37
80	95.31	37.52
85	96.01	37.80
90	96.77	38.10
95	97.66	38.45
97	98.17	38.65
98	98.55	38.80
99	98.81	38.90
max	100.33	39.50



Mean: 92.662 (0.215) cm; 36.481 (0.085) in
Standard deviation: 3.043 (0.152) cm; 1.198 (0.060) in
Coefficient of variation: 3.284 (0.164) %
Range: 85.85–100.33 cm; 33.80–39.50 in
No. of subjects: 200

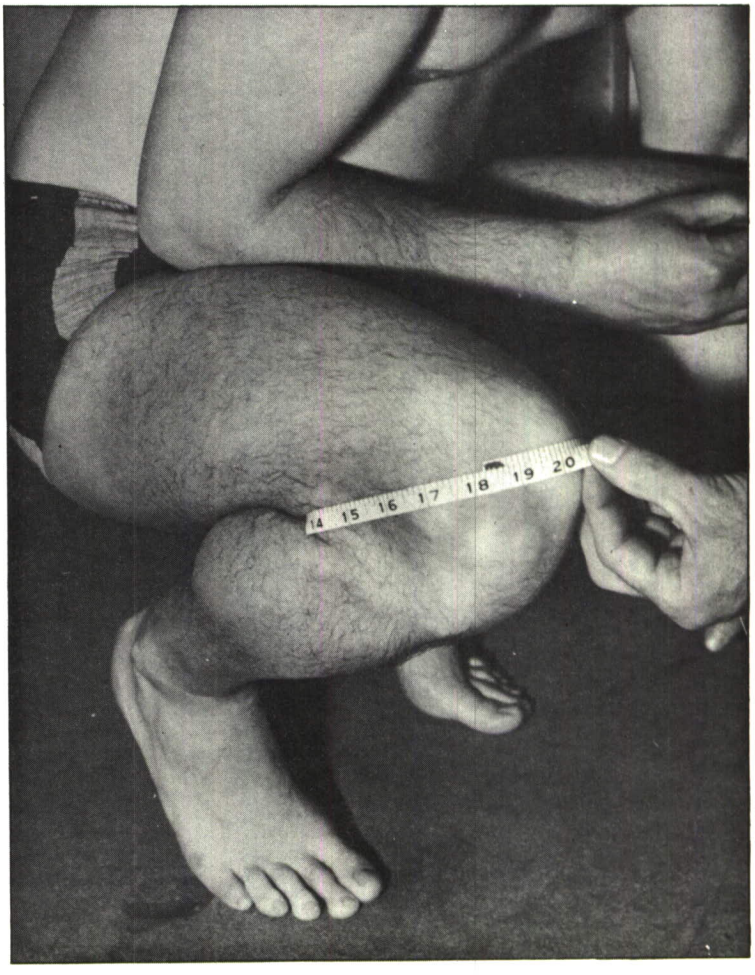
Table 18
SITTING HEIGHT

T.R. 67125

With subject standing, place the tape in the crease behind the knee. Subject then fully flexes the knee and the measure is taken round the maximum knee prominence.

PERCENTILE VALUES

%	cm	in
min	38.10	15.00
1	38.61	15.20
2	39.12	15.40
3	39.50	15.55
5	39.88	15.70
10	40.41	15.91
15	40.64	16.00
20	40.99	16.14
25	41.33	16.27
30	41.73	16.43
35	42.04	16.55
40	42.39	16.69
45	42.73	16.82
50	42.93	16.90
55	43.14	16.98
60	43.36	17.07
65	43.61	17.17
70	44.04	17.34
75	44.58	17.55
80	45.08	17.75
85	45.43	17.89
90	45.80	18.03
95	46.79	18.42
97	46.99	18.50
98	47.37	18.65
99	48.26	19.00
max	49.53	19.50



Mean: 43.142 (0.152) cm; 16.985 (0.060) in
Standard deviation: 2.151 (0.108) cm; 0.847 (0.042) in
Coefficient of variation: 4.987 (0.249) %
Range: 38.10–49.53 cm; 15.00–19.50 in
No. of subjects: 200

Table 19

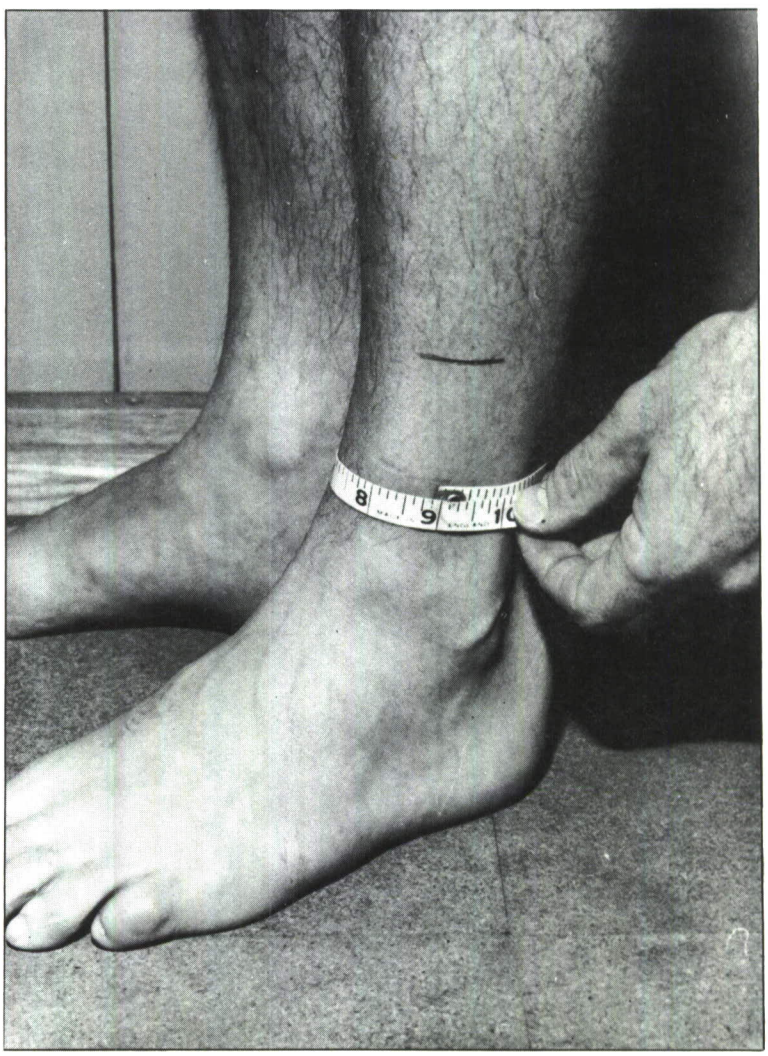
KNEE GIRTH – FULLY FLEXED

Neg.No.C5037

Tape at the smallest circumference immediately above the ankle bones.

PERCENTILE VALUES

%	cm	in
min	19.56	7.70
1	19.81	7.80
2	20.07	7.90
3	20.32	8.00
5	20.42	8.04
10	20.70	8.15
15	21.19	8.34
20	21.40	8.42
25	21.50	8.46
30	21.61	8.51
35	21.84	8.60
40	22.00	8.66
45	22.18	8.73
50	22.40	8.82
55	22.63	8.91
60	22.86	9.00
65	22.99	9.05
70	23.11	9.10
75	23.39	9.21
80	23.57	9.28
85	23.78	9.36
90	24.03	9.46
95	24.32	9.58
97	24.64	9.70
98	24.89	9.80
99	25.15	9.90
max	26.67	10.50



Mean: 22.563 (0.089) cm; 8.883 (0.035) in
Standard deviation: 1.257 (0.063) cm; 0.495 (0.025) in
Coefficient of variation: 5.572 (0.279) %
Range: 19.56–26.67 cm; 7.70–10.50 in
No. of subjects: 200

Table 20

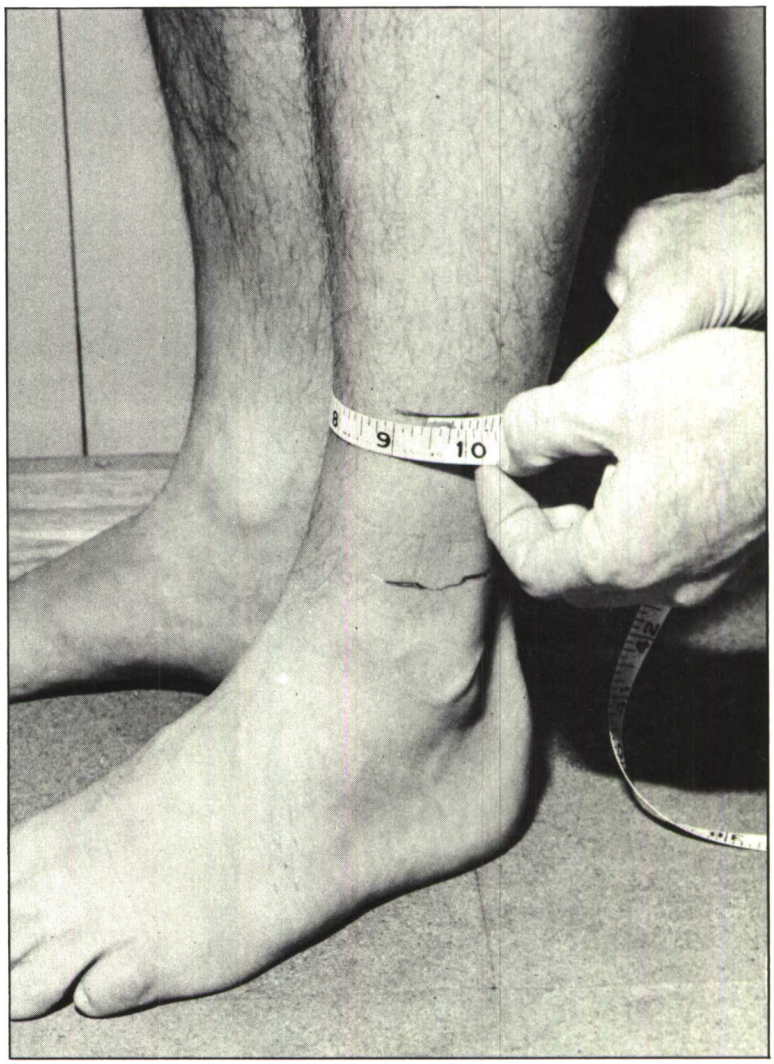
ANKLE GIRTH – MINIMUM

T.R. 67125

Mark datum plane 2½ inches above minimum ankle girth (Table 20 refers). Measure and record girth at this plane.

PERCENTILE VALUES

%	cm	in
min	20.32	8.00
1	21.08	8.30
2	21.42	8.43
3	21.59	8.50
5	21.79	8.58
10	22.39	8.81
15	22.75	8.96
20	22.98	9.05
25	23.24	9.15
30	23.59	9.29
35	23.83	9.38
40	24.01	9.45
45	24.18	9.52
50	24.34	9.58
55	24.66	9.71
60	24.91	9.81
65	25.09	9.88
70	25.27	9.95
75	25.59	10.07
80	25.83	10.17
85	26.10	10.27
90	26.35	10.37
95	26.88	10.58
97	27.18	10.70
98	27.60	10.87
99	27.94	11.00
max	28.45	11.20



Mean: 24.546 (0.110) cm; 9.664 (0.043) in
Standard deviation: 1.557 (0.078) cm; 0.613 (0.031) in
Coefficient of variation: 6.343 (0.317) %
Range: 20.32–28.45 cm; 8.00–11.20 in
No. of subjects: 200

Table 21

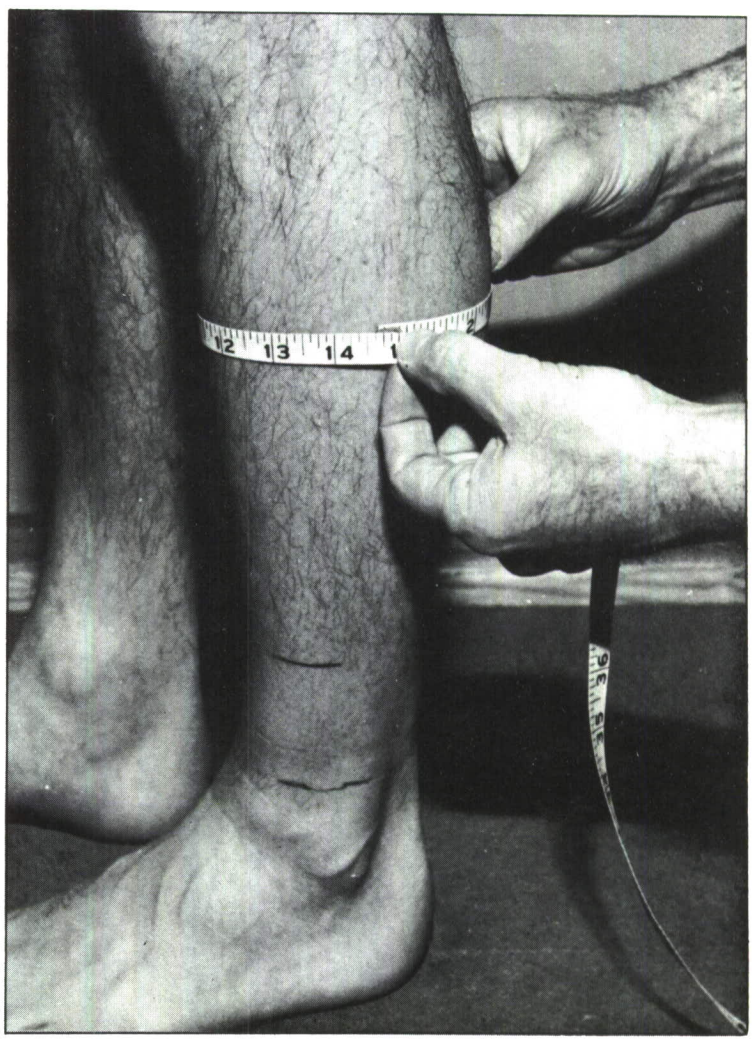
ANKLE GIRTH – 2½ INCHES ABOVE MINIMUM ANKLE GIRTH

Neg.No.C5039

Tape in a horizontal plane around maximum girth of calf.

PERCENTILE VALUES

%	cm	in
min	31.50	12.40
1	31.75	12.50
2	32.00	12.60
3	32.26	12.70
5	32.83	12.92
10	33.63	13.24
15	34.15	13.44
20	34.43	13.56
25	34.85	13.72
30	35.22	13.87
35	35.59	14.01
40	35.88	14.12
45	36.19	14.25
50	36.49	14.37
55	36.71	14.45
60	36.98	14.56
65	37.28	14.68
70	37.63	14.82
75	37.99	14.96
80	38.35	15.10
85	39.05	15.37
90	39.54	15.57
95	40.51	15.95
97	40.98	16.13
98	41.15	16.20
99	41.74	16.43
max	41.91	16.50



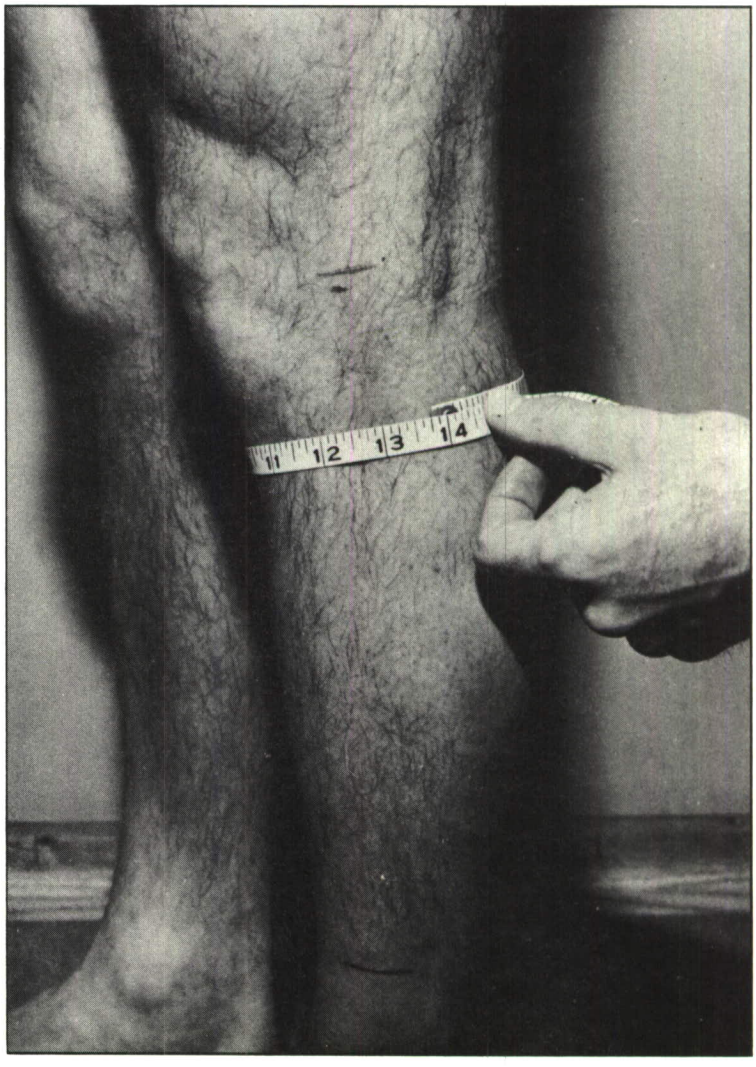
Mean: 36.632 (0.161) cm; 14.422 (0.063) in
Standard deviation: 2.273 (0.114) cm; 0.895 (0.045) in
Coefficient of variation: 6.206 (0.310) %
Range: 31.50–41.91 cm; 12.40–16.50 in
No. of subjects: 200

Table 22
CALF GIRTH

Tape in a horizontal plane located around the minimum girth between calf and knee.

PERCENTILE VALUES

%	cm	in
min	29.97	11.80
1	30.10	11.85
2	30.35	11.95
3	30.52	12.01
5	30.66	12.07
10	31.17	12.27
15	31.50	12.40
20	31.83	12.53
25	32.03	12.61
30	32.30	12.72
35	32.64	12.85
40	32.95	12.97
45	33.37	13.14
50	33.58	13.22
55	33.88	13.34
60	34.13	13.44
65	34.31	13.51
70	34.52	13.59
75	34.86	13.72
80	35.31	13.90
85	35.86	14.12
90	36.39	14.32
95	37.03	14.58
97	37.24	14.66
98	37.34	14.70
99	38.10	15.00
max	38.86	15.30



Mean: 33.754 (0.137) cm; 13.289 (0.054) in
Standard deviation: 1.930 (0.097) cm; 0.760 (0.038) in
Coefficient of variation: 5.719 (0.286) %
Range: 29.97–38.86 cm; 11.80–15.30 in
No. of subjects: 200

Table 23

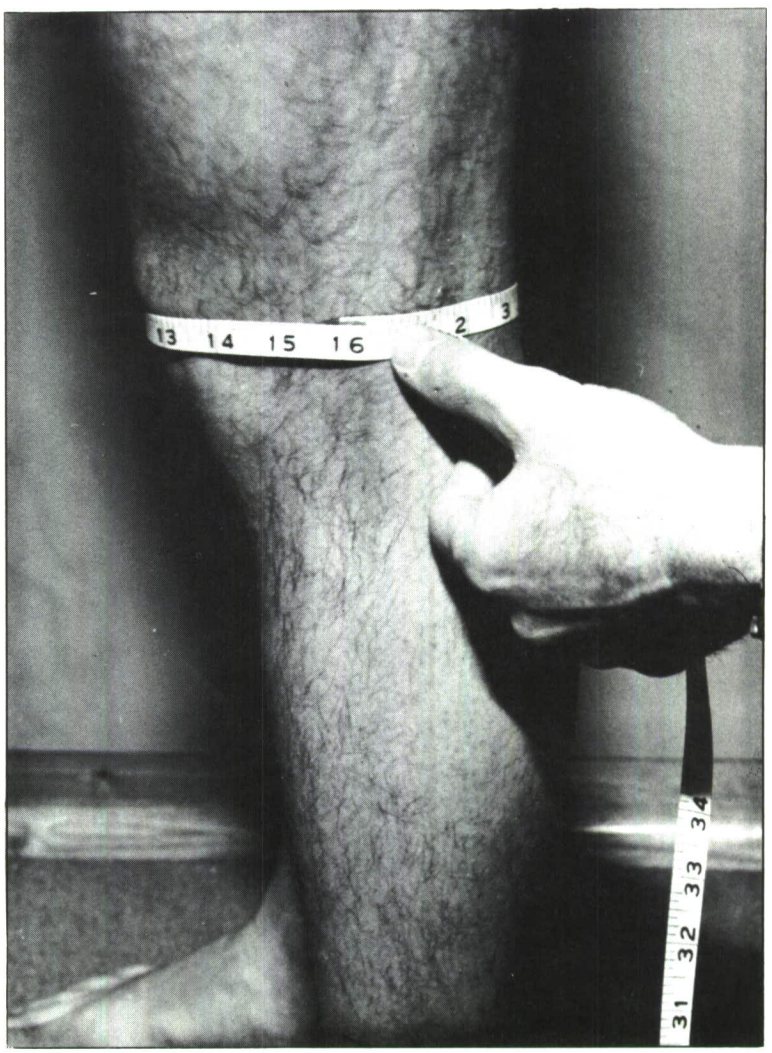
SMALL GIRTH (GARTER)

Neg.No.C5041

Tape in a horizontal plane around maximum knee circumference.

PERCENTILE VALUES

%	cm	in
min	33.78	13.30
1	34.16	13.45
2	34.80	13.70
3	35.31	13.90
5	35.42	13.94
10	35.81	14.10
15	36.45	14.35
20	36.80	14.49
25	37.16	14.63
30	37.41	14.73
35	37.70	14.84
40	37.95	14.94
45	38.12	15.01
50	38.33	15.09
55	38.71	15.24
60	39.16	15.42
65	39.29	15.47
70	39.50	15.55
75	39.88	15.70
80	40.28	15.86
85	40.58	15.97
90	41.15	16.20
95	42.02	16.54
97	42.16	16.60
98	42.93	16.90
99	43.56	17.15
max	45.97	18.10



Mean: 38.669 (0.144) cm; 15.224 (0.057) in
Standard deviation: 2.037 (0.102) cm; 0.802 (0.040) in
Coefficient of variation: 5.269 (0.263) %
Range: 33.78–45.97 cm; 13.30–18.10 in
No. of subjects: 200

Table 24

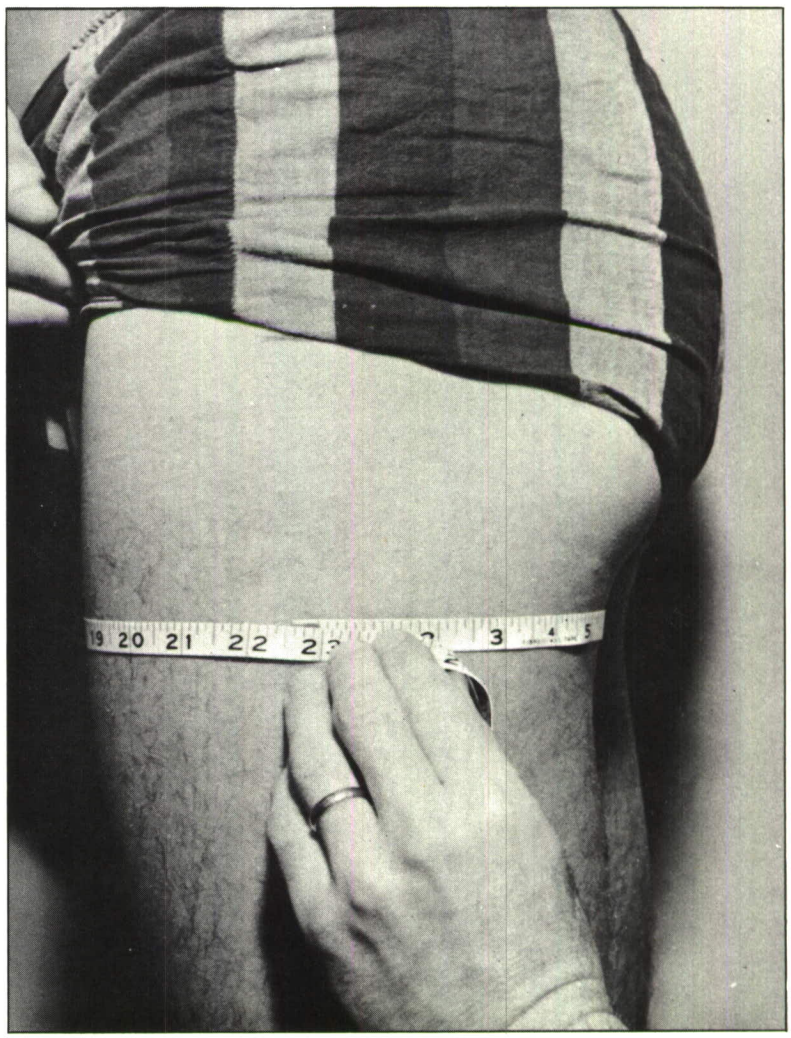
KNEE GIRTH – STANDING

T.R. 67125

Tape horizontal around the maximum thigh girth, close up to crotch and immediately below the gluteal furrow.

PERCENTILE VALUES

%	cm	in
min	46.23	18.20
1	48.01	18.90
2	48.51	19.10
3	49.40	19.45
5	50.16	19.75
10	51.10	20.12
15	51.87	20.42
20	52.68	20.74
25	53.21	20.95
30	53.72	21.15
35	54.28	21.37
40	54.86	21.60
45	55.31	21.78
50	55.85	21.99
55	56.56	22.27
60	57.35	22.58
65	57.91	22.80
70	58.27	22.94
75	58.80	23.15
80	59.86	23.57
85	60.50	23.82
90	61.34	24.15
95	62.74	24.70
97	63.88	25.15
98	64.26	25.30
99	66.04	26.00
max	69.09	27.20



Mean: 56.314 (0.285) cm; 22.171 (0.112) in
Standard deviation: 4.031 (0.202) cm; 1.587 (0.079) in
Coefficient of variation: 7.159 (0.358) %
Range: 46.23–69.09 cm; 18.20–27.20 in
No. of subjects: 200

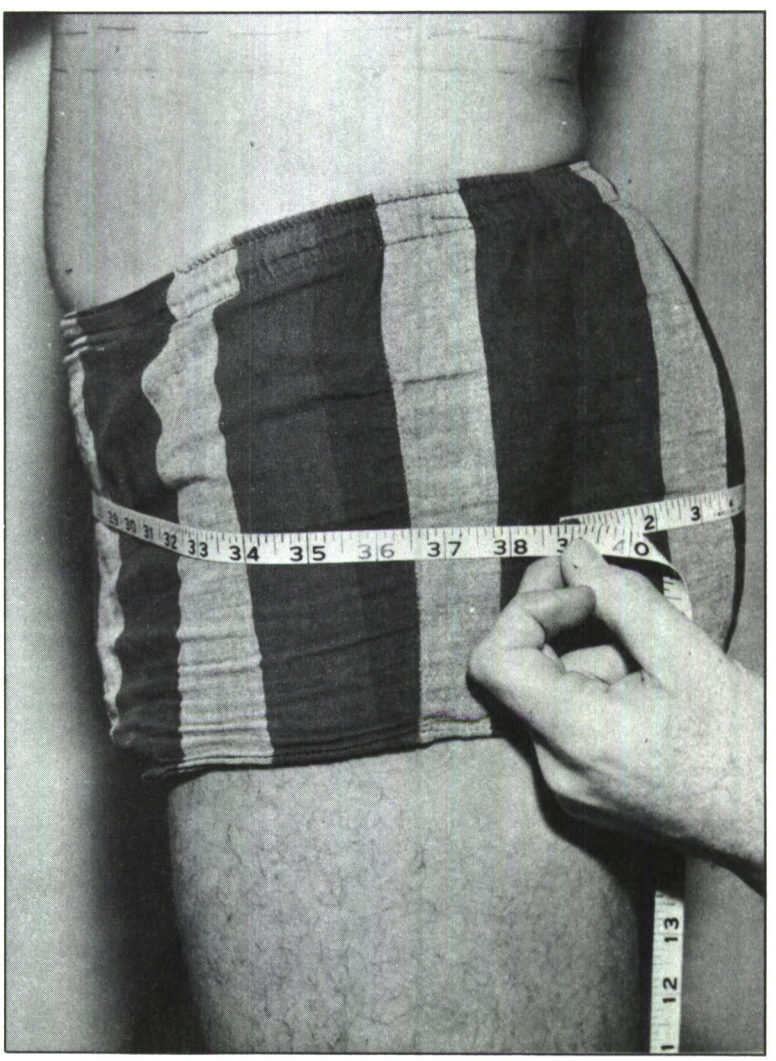
Table 25
THIGH GIRTH

Neg.No.C5043

Tape horizontal around the maximum buttock circumference.

PERCENTILE VALUES

%	cm	in
min	87.12	34.30
1	87.12	34.30
2	89.58	35.27
3	89.92	35.40
5	90.93	35.80
10	91.95	36.20
15	92.71	36.50
20	93.88	36.96
25	94.74	37.30
30	95.18	37.47
35	96.01	37.80
40	96.90	38.15
45	97.62	38.43
50	98.40	38.74
55	98.95	38.96
60	99.63	39.22
65	100.33	39.50
70	101.40	39.92
75	102.11	40.20
80	103.25	40.65
85	104.22	41.03
90	105.41	41.50
95	106.85	42.07
97	107.95	42.50
98	108.46	42.70
99	109.73	43.20
max	117.35	46.20



Mean: 98.674 (0.364) cm; 38.848 (0.143) in
Standard deviation: 5.154 (0.257) cm; 2.029 (0.101) in
Coefficient of variation: 5.223 (0.261) %
Range: 87.12–117.35 cm; 34.30–46.20 in
No. of subjects: 200

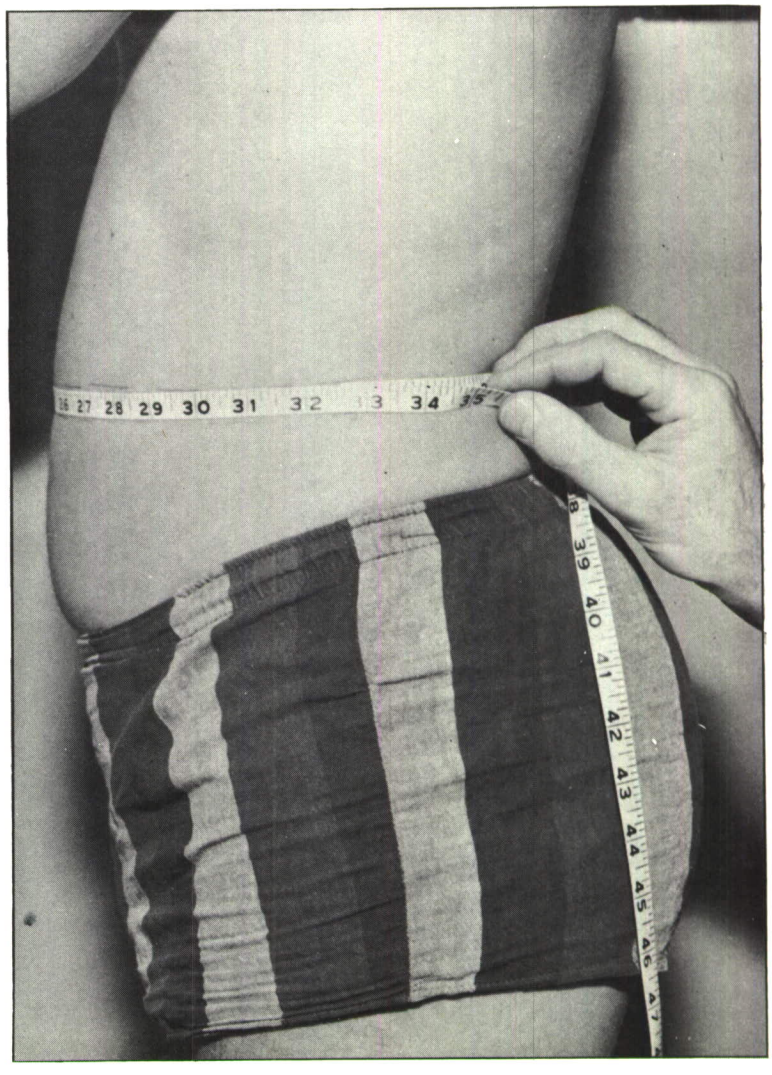
Table 26
BUTTOCK GIRTH

T.R. 67125

Tape horizontal around natural waist, previously located and marked with aid of adjustable belt.

PERCENTILE VALUES

%	cm	in
min	68.58	27.00
1	71.12	28.00
2	72.64	28.60
3	72.81	28.67
5	74.17	29.20
10	75.27	29.63
15	76.45	30.10
20	77.47	30.50
25	78.49	30.90
30	79.18	31.18
35	80.19	31.57
40	81.10	31.93
45	81.60	32.13
50	82.63	32.53
55	83.57	32.90
60	84.92	33.43
65	85.85	33.80
70	87.04	34.27
75	88.39	34.80
80	89.15	35.10
85	90.30	35.55
90	92.20	36.30
95	96.27	37.90
97	98.55	38.80
98	100.33	39.50
99	101.09	39.80
max	105.41	41.50



Mean: 83.705 (0.486) cm; 32.955 (0.191) in
Standard deviation: 6.876 (0.343) cm; 2.707 (0.135) in
Coefficient of variation: 8.214 (0.411) %
Range: 68.58–105.41 cm; 27.00–41.50 in
No. of subjects: 200

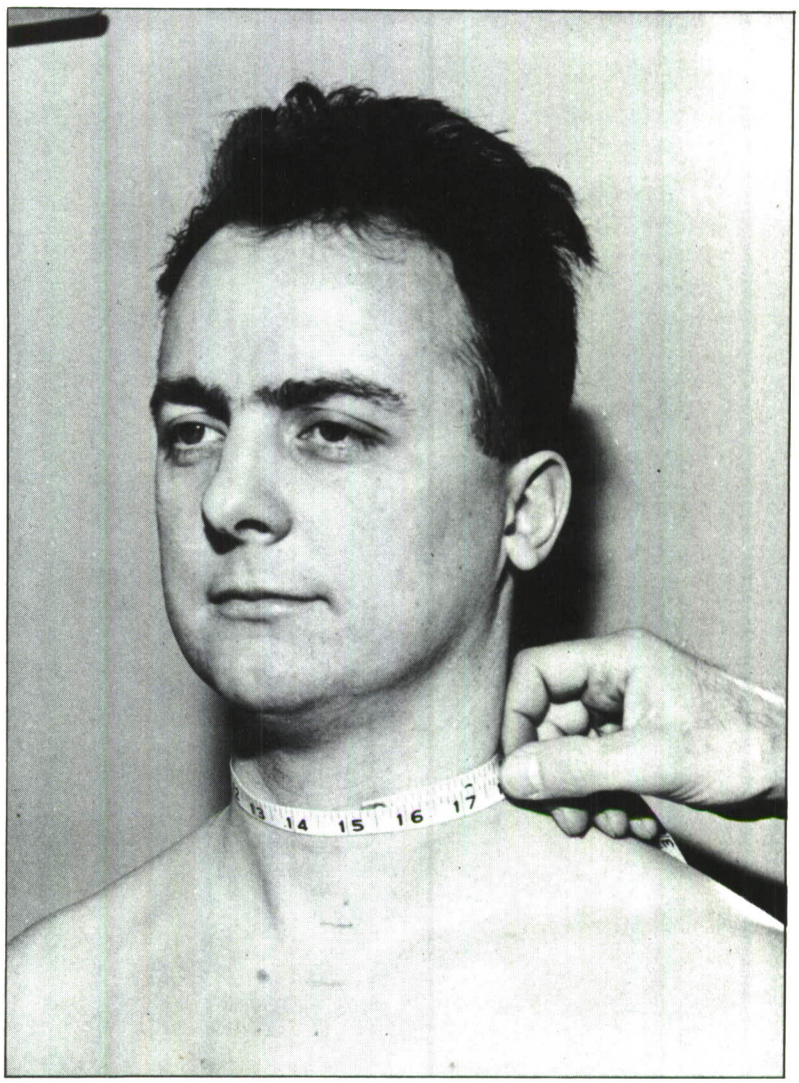
Table 27
WAIST GIRTH

Neg.No.C5045

Measuring tape around neck at position of normal collar band.

PERCENTILE VALUES

%	cm	in
min	33.27	13.10
1	34.29	13.50
2	34.54	13.60
3	35.22	13.87
5	35.63	14.03
10	35.97	14.16
15	36.34	14.31
20	36.55	14.39
25	36.80	14.49
30	37.02	14.57
35	37.20	14.64
40	37.39	14.72
45	37.76	14.87
50	37.99	14.96
55	38.19	15.04
60	38.37	15.11
65	38.53	15.17
70	38.91	15.32
75	39.29	15.47
80	39.53	15.56
85	39.91	15.71
90	40.26	15.85
95	40.98	16.13
97	41.66	16.40
98	42.04	16.55
99	42.67	16.80
max	43.94	17.30



Mean: 38.186 (0.124) cm; 15.034 (0.049) in
Standard deviation: 1.750 (0.088) cm; 0.689 (0.034) in
Coefficient of variation: 4.583 (0.229) %
Range: 33.27–43.94 cm; 13.10–17.30 in
No. of subjects: 200

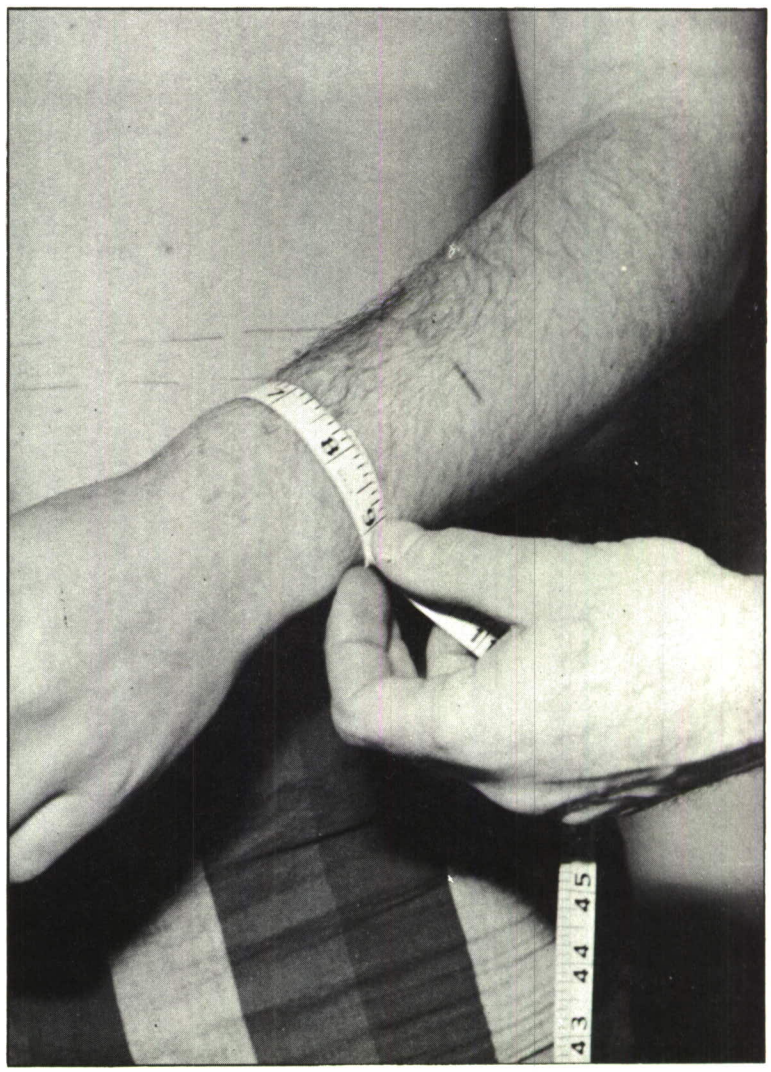
Table 28
NECK GIRTH

T.R. 67125

Measure minimum wrist girth immediately above styloid process.

PERCENTILE VALUES

%	cm	in
min	15.49	6.10
1	15.49	6.10
2	16.00	6.30
3	16.05	6.32
5	16.15	6.36
10	16.35	6.44
15	16.50	6.49
20	16.64	6.55
25	16.78	6.61
30	16.94	6.67
35	17.07	6.72
40	17.18	6.77
45	17.30	6.81
50	17.43	6.86
55	17.56	6.91
60	17.66	6.95
65	17.76	6.99
70	17.89	7.04
75	18.02	7.09
80	18.21	7.17
85	18.48	7.27
90	18.73	7.37
95	19.13	7.53
97	19.61	7.72
98	19.71	7.76
99	19.81	7.80
max	20.57	8.10



Mean: 17.610 (0.066) cm; 6.933 (0.026) in
Standard deviation: 0.927 (0.046) cm; 0.365 (0.018) in
Coefficient of variation: 5.265 (0.263) %
Range: 15.49–20.57 cm; 6.10–8.10 in
No. of subjects: 200

Table 29

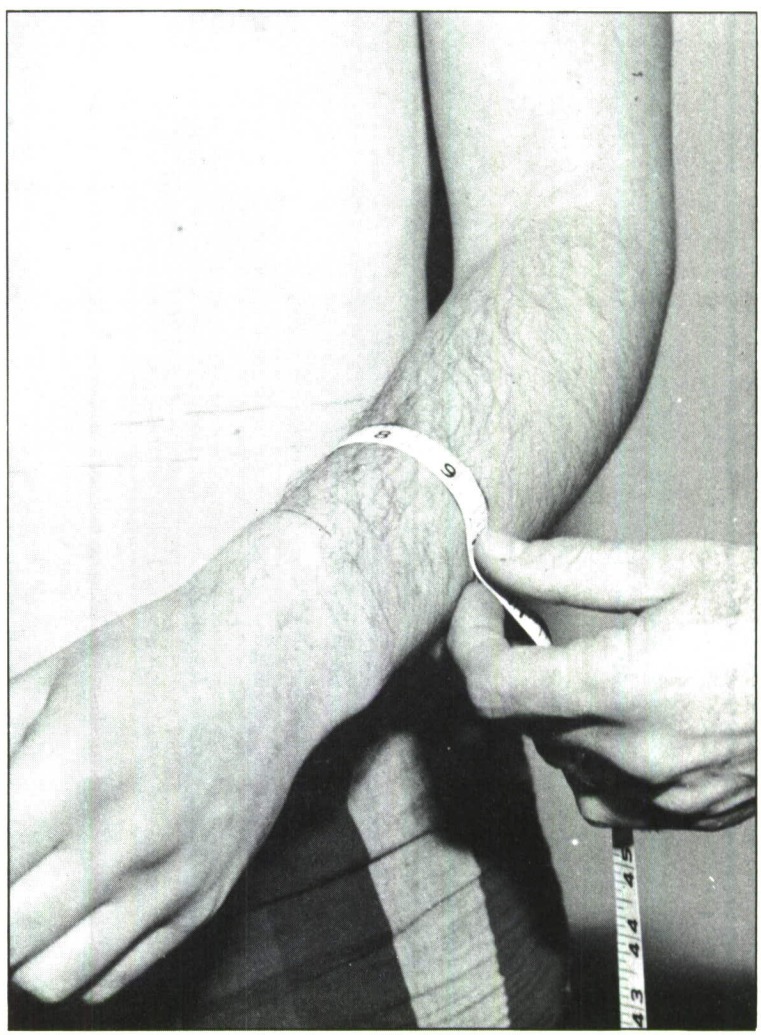
WRIST GIRTH – MINIMUM ABOVE STYLOID PROCESS

Neg.No.C5047

With the minimum wrist girth located (Table 29) by the distal edge of a narrow wrist band, locate and mark a plane 2½ inches up the forearm from this edge. Measure the girth at this plane.

PERCENTILE VALUES

%	cm	in
min	17.02	6.70
1	17.27	6.80
2	17.65	6.95
3	17.91	7.05
5	18.22	7.17
10	18.50	7.28
15	18.85	7.42
20	19.11	7.53
25	19.39	7.63
30	19.59	7.71
35	19.75	7.78
40	19.92	7.84
45	20.09	7.91
50	20.23	7.96
55	20.38	8.03
60	20.59	8.11
65	20.74	8.16
70	20.93	8.24
75	21.16	8.33
80	21.35	8.41
85	21.54	8.48
90	21.84	8.60
95	22.22	8.75
97	22.61	8.90
98	22.99	9.05
99	23.24	9.15
max	23.88	9.40



Mean: 20.366 (0.089) cm; 8.018 (0.035) in
Standard deviation: 1.262 (0.063) cm; 0.497 (0.025) in
Coefficient of variation: 6.199 (0.310) %
Range: 17.02–23.88 cm; 6.70–9.40 in
No. of subjects: 200

Table 30

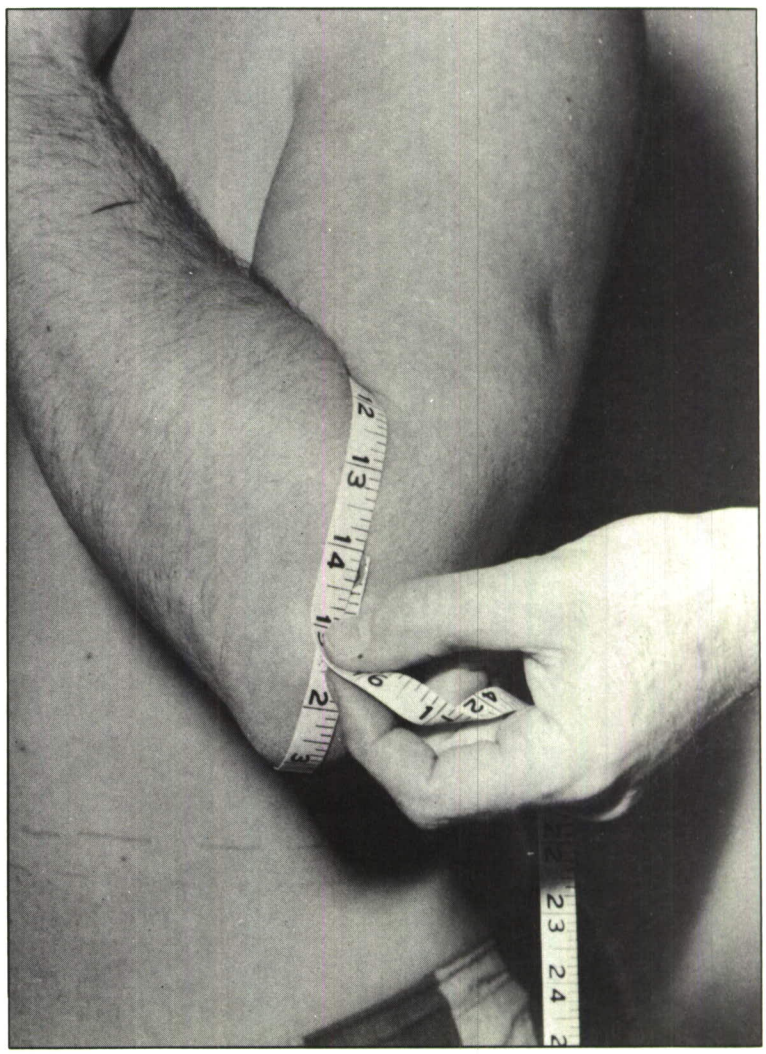
WRIST GIRTH – 2½ INCHES ABOVE MINIMUM WRIST GIRTH

T.R. 67125

Position the measuring tape through the inside face of the elbow joint with the joint flexed at 90°, then fully flex the joint and measure the girth with the tape passing over the maximum elbow prominence.

PERCENTILE VALUES

%	cm	in
min	30.48	12.00
1	30.73	12.10
2	31.31	12.32
3	31.43	12.38
5	32.00	12.60
10	32.84	12.93
15	33.32	13.12
20	33.65	13.25
25	33.90	13.35
30	34.12	13.43
35	34.33	13.51
40	34.51	13.59
45	34.73	13.67
50	34.92	13.75
55	35.15	13.84
60	35.49	13.97
65	35.81	14.10
70	36.04	14.19
75	36.32	14.30
80	36.66	14.43
85	36.95	14.55
90	37.27	14.67
95	37.91	14.92
97	38.23	15.05
98	38.61	15.20
99	38.86	15.30
max	40.13	15.80



Mean: 35.171 (0.125) cm; 13.847 (0.049) in
Standard deviation: 1.768 (0.088) cm; 0.696 (0.035) in
Coefficient of variation: 5.026 (0.251) %
Range: 30.48–40.13 cm; 12.00–15.80 in
No. of subjects: 200

T.R. 67125

Table 31

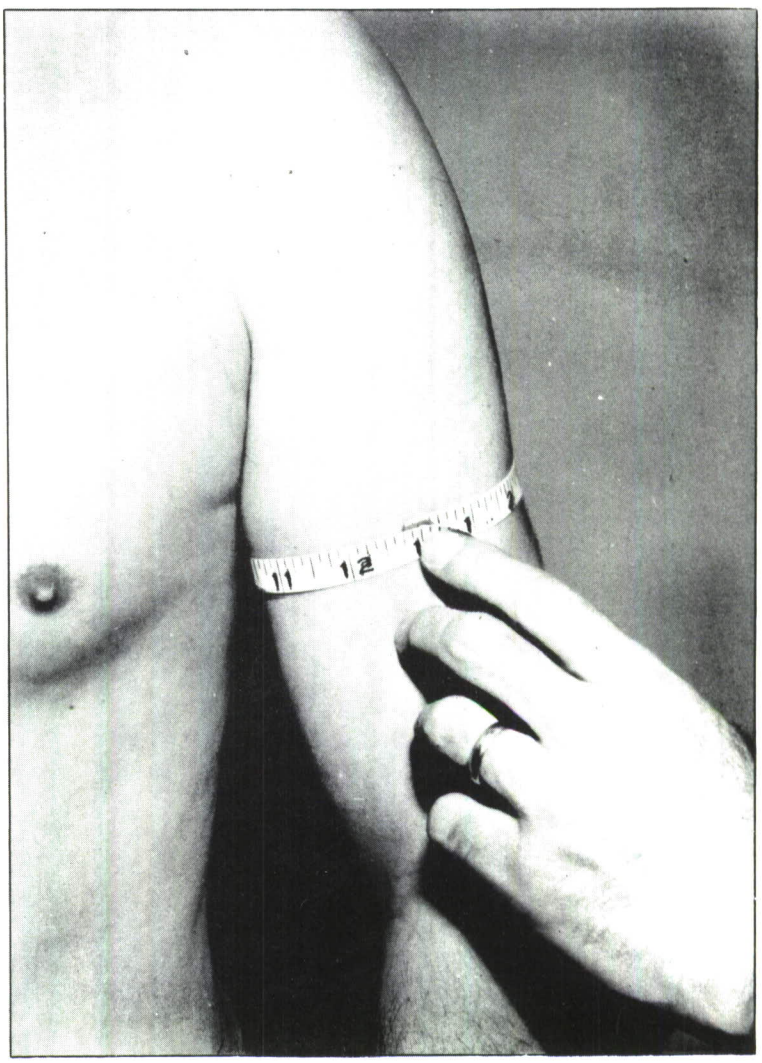
ELBOW GIRTH – FULLY FLEXED

Neg.No.C5049

Locate the measuring tape around the maximum biceps girth.

PERCENTILE VALUES

%	cm	in
min	23.62	9.30
1	23.88	9.40
2	25.15	9.90
3	25.32	9.97
5	25.53	10.05
10	26.08	10.27
15	26.50	10.43
20	26.84	10.57
25	27.30	10.75
30	27.59	10.86
35	27.90	10.99
40	28.15	11.08
45	28.45	11.20
50	28.83	11.35
55	29.17	11.49
60	29.68	11.68
65	29.91	11.78
70	30.19	11.89
75	30.54	12.02
80	31.01	12.21
85	31.33	12.33
90	32.13	12.65
95	33.34	13.12
97	33.78	13.30
98	34.04	13.40
99	34.54	13.60
max	35.56	14.00



Mean: 29.129 (0.166) cm; 11.468 (0.065) in
Standard deviation: 2.342 (0.117) cm; 0.922 (0.046) in
Coefficient of variation: 8.040 (0.402) %
Range: 23.62–35.56 cm; 9.30–14.00 in
No. of subjects: 200

Table 32

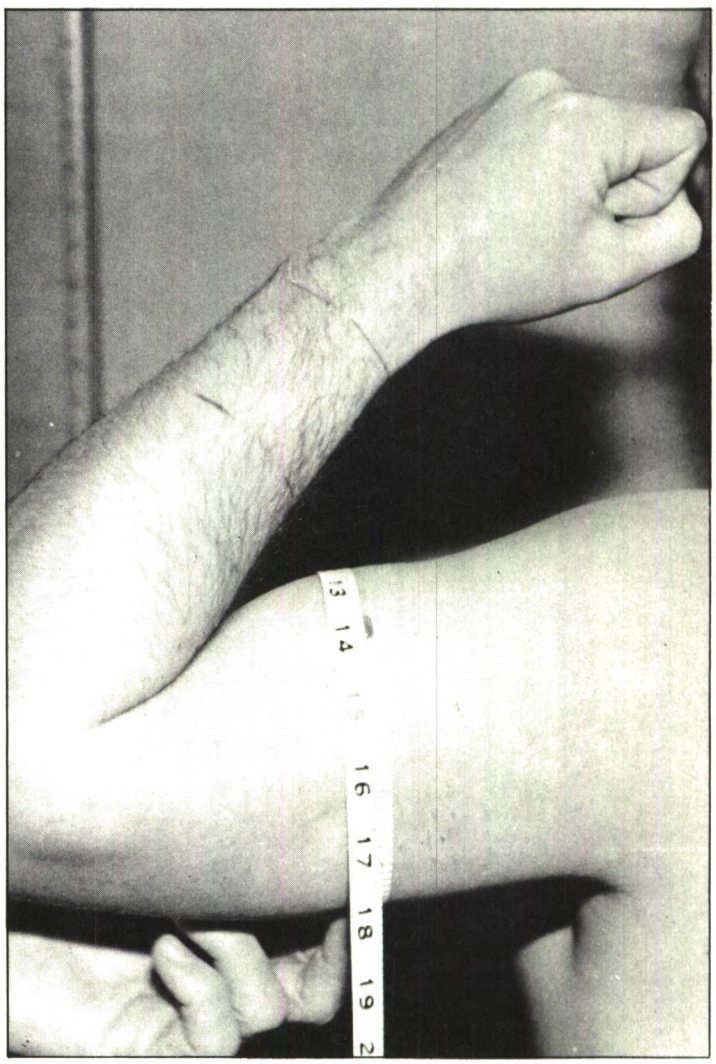
BICEPS GIRTH – EXTENDED

T.R. 67125

Subject bends arm and clenches fist to produce maximum biceps girth. Measuring tape records maximum girth.

PERCENTILE VALUES

%	cm	in
min	25.15	9.90
1	26.92	10.60
2	27.43	10.80
3	28.26	11.12
5	28.57	11.25
10	29.03	11.43
15	29.39	11.57
20	29.72	11.70
25	30.26	11.91
30	30.63	12.06
35	30.90	12.17
40	31.28	12.32
45	31.68	12.47
50	32.00	12.60
55	32.41	12.76
60	32.62	12.84
65	32.83	12.92
70	33.07	13.02
75	33.53	13.20
80	33.99	13.38
85	34.54	13.60
90	36.07	14.20
95	36.58	14.40
97	37.85	14.90
98	38.10	15.00
99	38.27	15.07
max	39.62	15.60



Mean: 32.228 (0.180) cm; 12.688 (0.072) in
Standard deviation: 2.545 (0.127) cm; 1.002 (0.050) in
Coefficient of variation: 7.897 (0.395) %
Range: 25.15–39.62 cm; 9.90–15.60 in
No. of subjects: 200

Table 33

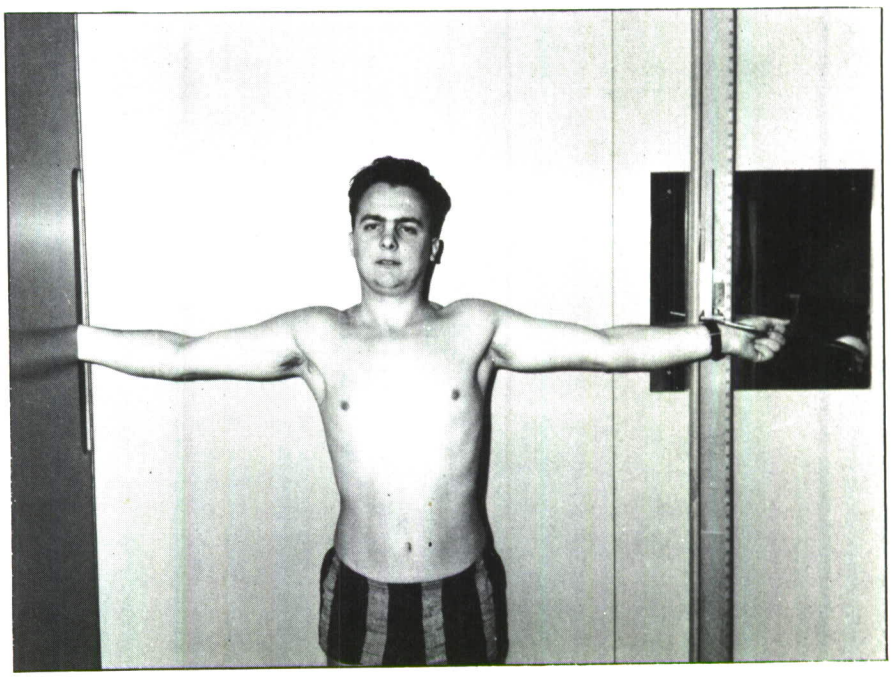
BICEPS GIRTH – CONTRACTED

Neg.No.C5051

With the arms outstretched horizontally and right hand passed through slot in rig wall, align right wrist datum mark with wall datum face. The datum edge of the upper arm of the measuring head is then aligned with the left wrist datum mark and the wrist span recorded on the horizontal scale.

PERCENTILE VALUES

%	cm	in
min	121.92	48.00
1	123.19	48.50
2	124.21	48.90
3	125.48	49.40
5	127.25	50.10
10	128.78	50.70
15	130.30	51.30
20	131.44	51.75
25	132.84	52.30
30	133.52	52.57
35	134.29	52.87
40	134.87	53.10
45	135.38	53.30
50	135.85	53.49
55	136.74	53.83
60	137.75	54.23
65	138.94	54.70
70	139.65	54.98
75	140.89	55.47
80	141.54	55.73
85	142.24	56.00
90	143.76	56.60
95	145.03	57.10
97	147.32	58.00
98	147.57	58.10
99	150.75	59.35
max	153.42	60.40



Mean: 136.553 (0.408) cm; 53.761 (0.161) in
Standard deviation: 5.776 (0.289) cm; 2.274 (0.114) in
Coefficient of variation: 4.230 (0.211) %
Range: 121.92–153.42 cm; 48.00–60.40 in
No. of subjects: 200

Table 34

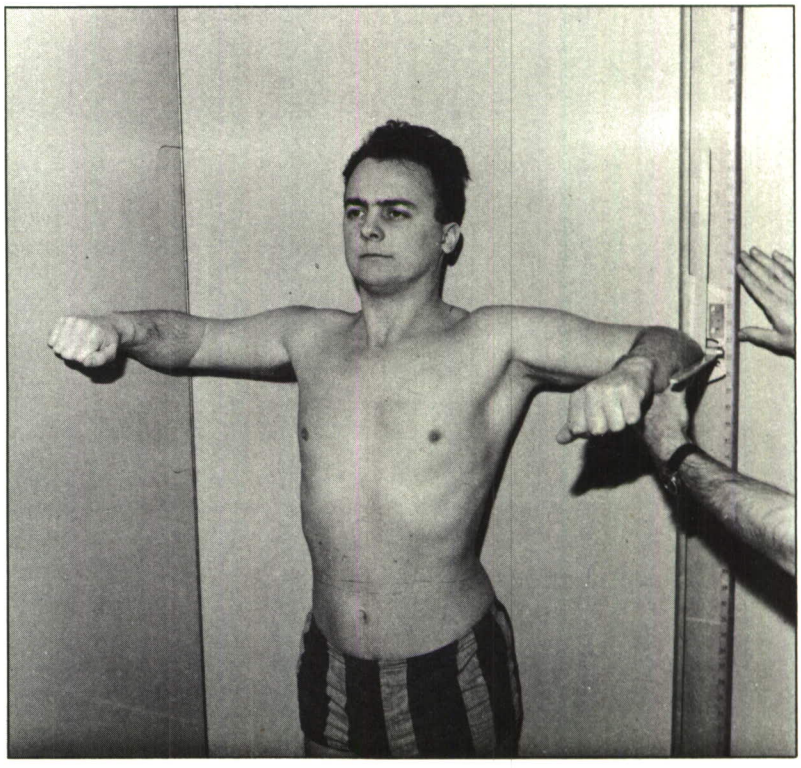
INTER-WRIST SPAN

T.R. 67125

Subject stands with the upper arms outstretched horizontally to the side and the forearms in a horizontal plane at 90° to the upper arms. Contact datum wall with right elbow and position datum edge of measuring head arm against left elbow. Record distance across elbow prominences on horizontal scale

PERCENTILE VALUES

%	cm	in
min	87.88	34.60
1	88.90	35.00
2	89.53	35.25
3	89.92	35.40
5	91.02	35.83
10	92.33	36.35
15	93.17	36.68
20	93.85	36.95
25	94.49	37.20
30	95.38	37.55
35	95.76	37.70
40	96.27	37.90
45	96.90	38.15
50	97.38	38.34
55	97.79	38.50
60	98.55	38.80
65	99.06	39.00
70	99.85	39.31
75	100.23	39.46
80	100.95	39.74
85	101.47	39.95
90	102.36	40.30
95	104.14	41.00
97	105.24	41.43
98	105.66	41.60
99	106.93	42.10
max	108.71	42.80



Mean: 97.577 (0.285) cm; 38.416 (0.113) in
Standard deviation: 4.046 (0.202) cm; 1.593 (0.080) in
Coefficient of variation: 4.147 (0.207) %
Range: 87.88–108.71 cm; 34.60–42.80 in
No. of subjects: 200

Table 35

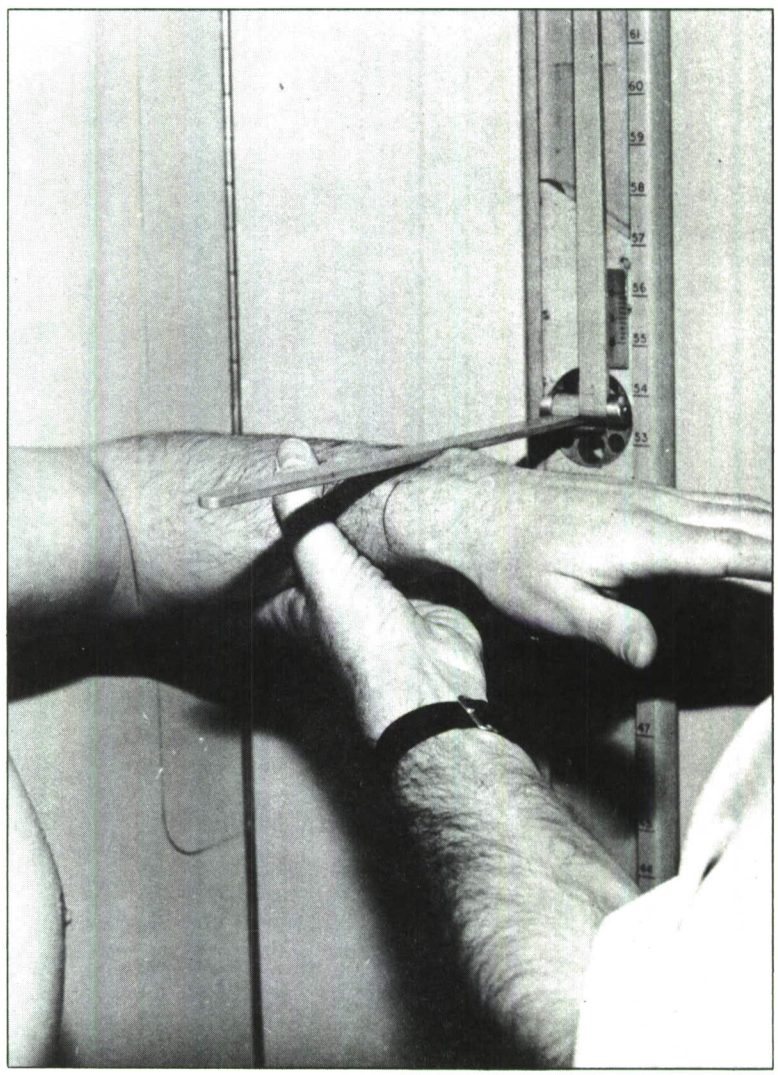
INTER-ELBOW SPAN

Neg.No.C5053

With back of elbow against datum wall of rig, set datum edge of upper arm of measuring head in line with wrist datum mark. Record distance from wall to datum edge on horizontal scale.

PERCENTILE VALUES

%	cm	in
min	22.61	8.90
1	23.11	9.10
2	23.37	9.20
3	23.49	9.25
5	23.72	9.34
10	24.28	9.56
15	24.53	9.66
20	24.78	9.76
25	25.02	9.85
30	25.22	9.93
35	25.41	10.01
40	25.56	10.06
45	25.69	10.12
50	25.82	10.16
55	25.95	10.22
60	26.08	10.27
65	26.25	10.34
70	26.48	10.43
75	26.70	10.51
80	26.94	10.60
85	27.06	10.65
90	27.22	10.72
95	27.94	11.00
97	28.45	11.20
98	28.70	11.30
99	29.21	11.50
max	30.48	12.00



Mean: 25.966 (0.089) cm; 10.223 (0.035) in
Standard deviation: 1.260 (0.063) cm; 0.496 (0.025) in
Coefficient of variation: 4.852 (0.243) %
Range: 22.61–30.48 cm; 8.90–12.00 in
No. of subjects: 200

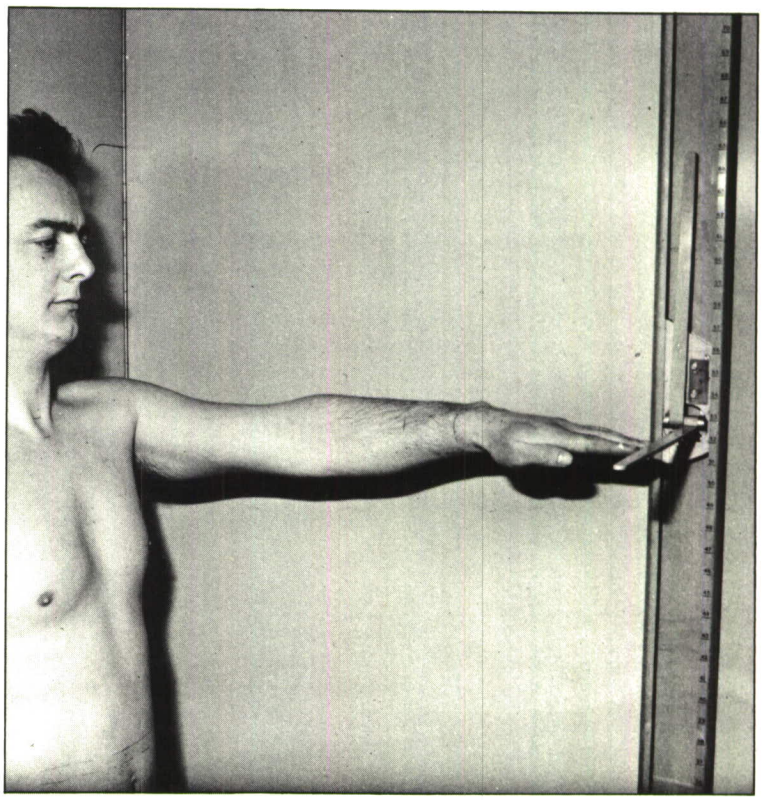
Table 36
ELBOW TO WRIST LENGTH

T.R. 67125

Subject stands with shoulders against datum wall and left arm and hand extended horizontally. Locate datum edge of measuring head against tip of longest finger and record dimension from horizontal scale.

PERCENTILE VALUES

%	cm	in
min	75.18	29.60
1	75.61	29.77
2	76.45	30.10
3	77.22	30.40
5	77.85	30.65
10	79.67	31.37
15	80.39	31.65
20	81.28	32.00
25	81.99	32.28
30	82.80	32.60
35	83.31	32.80
40	83.95	33.05
45	84.44	33.24
50	84.87	33.41
55	85.29	33.58
60	85.55	33.68
65	85.90	33.82
70	86.55	34.07
75	87.25	34.35
80	87.82	34.57
85	88.98	35.03
90	89.92	35.40
95	90.93	35.80
97	91.69	36.10
98	92.71	36.50
99	93.98	37.00
max	100.84	39.70



Mean: 84.889 (0.291) cm; 33.421 (0.114) in
Standard deviation: 4.100 (0.205) cm; 1.614 (0.081) in
Coefficient of variation: 4.829 (0.241) %
Range: 75.18–100.84 cm; 29.60–39.70 in
No. of subjects: 200

Table 37

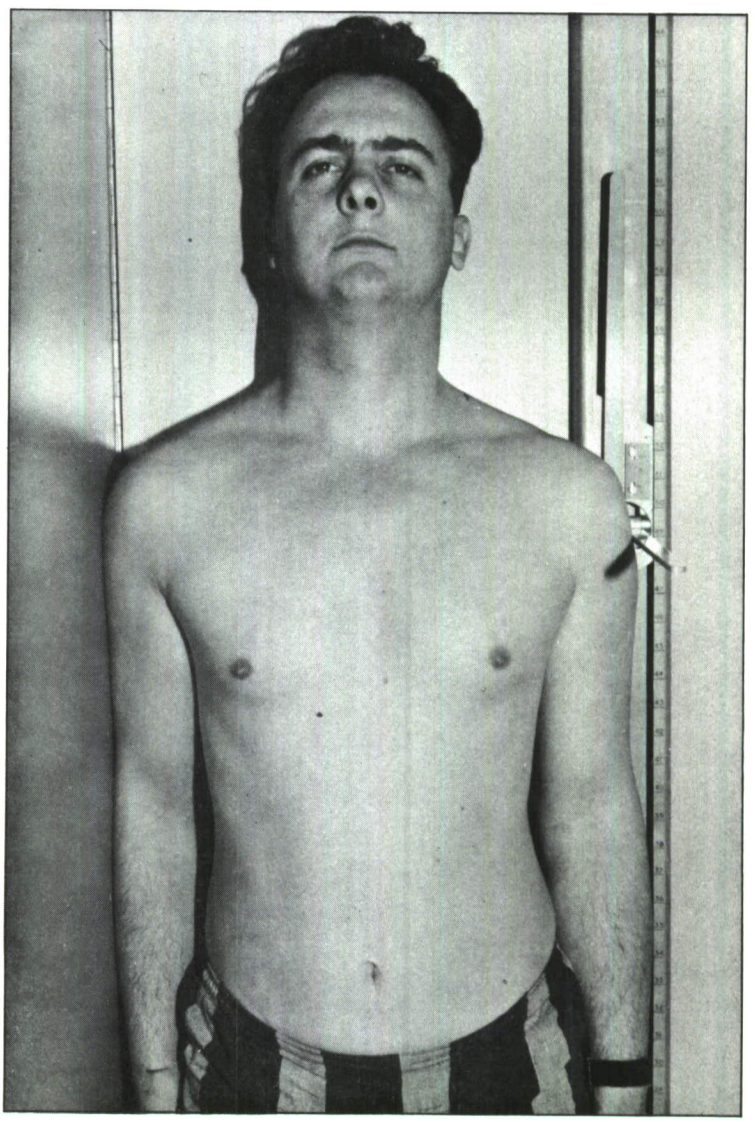
ARM REACH – FROM WALL

Neg.No.C5055

Subject stands with right shoulder against datum wall. Position the datum edge of measuring head at the maximum protrusion of the deltoid muscle and record shoulder breadth from the horizontal rig scale.

PERCENTILE VALUES

%	cm	in
min	39.62	15.60
1	39.88	15.70
2	40.51	15.95
3	40.89	16.10
5	41.40	16.30
10	42.25	16.63
15	42.76	16.83
20	43.14	16.99
25	43.52	17.13
30	43.77	17.23
35	44.01	17.32
40	44.29	17.44
45	44.53	17.53
50	44.82	17.64
55	45.14	17.77
60	45.57	17.94
65	45.92	18.08
70	46.20	18.19
75	46.42	18.28
80	46.82	18.43
85	47.28	18.61
90	47.69	18.78
95	48.39	19.05
97	48.77	19.20
98	49.40	19.45
99	49.66	19.55
max	50.29	19.80



Mean: 45.075 (0.151) cm; 17.746 (0.059) in
Standard deviation: 2.116 (0.106) cm; 0.833 (0.042) in
Coefficient of variation: 4.694 (0.235) %
Range: 39.62–50.29 cm; 15.60–19.80 in
No. of subjects: 200

Table 38

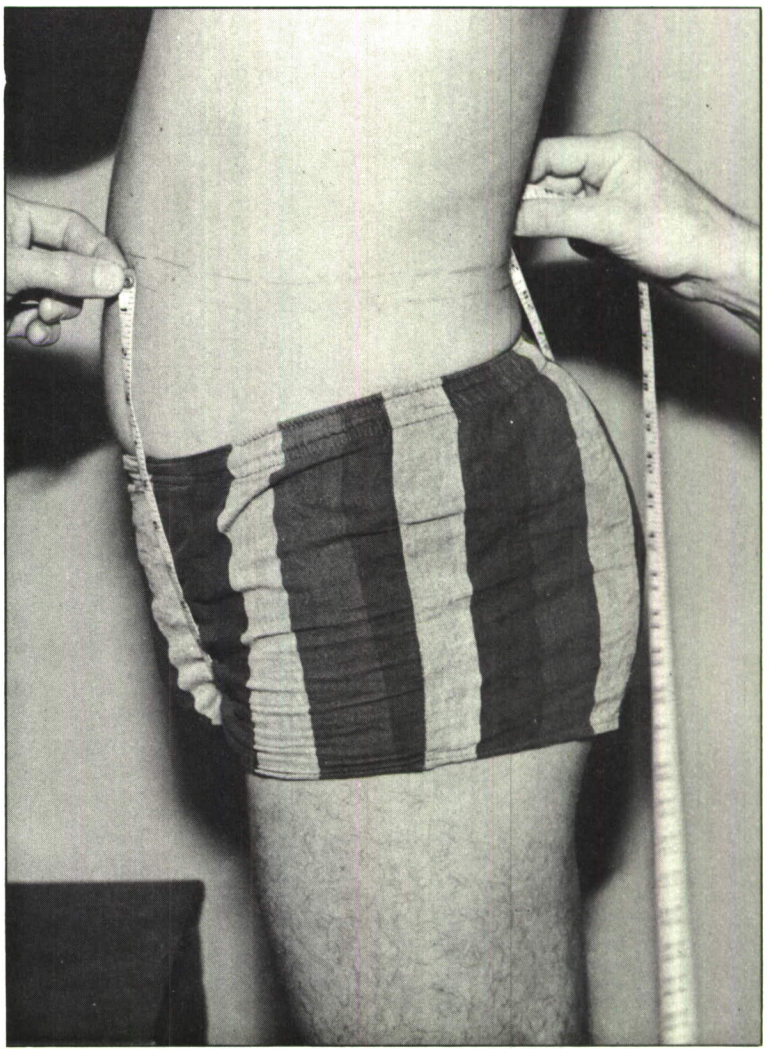
SHOULDER BREADTH

T.R. 67125

Measure the distance from the front waistline datum vertically down through the crotch and up to the waist line at centre back, tape to pass to the side of the genitals.

PERCENTILE VALUES

%	cm	in
min	59.18	23.30
1	61.21	24.10
2	62.99	24.80
3	63.63	25.05
5	64.01	25.20
10	64.90	25.55
15	65.98	25.98
20	66.85	26.32
25	67.82	26.70
30	68.35	26.91
35	68.58	27.00
40	69.17	27.23
45	69.70	27.44
50	70.23	27.65
55	71.12	28.00
60	72.14	28.40
65	72.60	28.58
70	73.22	28.83
75	73.85	29.08
80	74.42	29.30
85	75.06	29.55
90	76.20	30.00
95	77.98	30.70
97	78.99	31.10
98	79.50	31.30
99	81.79	32.20
max	87.12	34.30



Mean: 70.841 (0.312) cm; 27.890 (0.123) in
Standard deviation: 4.417 (0.221) cm; 1.739 (0.087) in
Coefficient of variation: 6.235 (0.312) %
Range: 59.18–87.12 cm; 23.30–34.30 in
No. of subjects: 200

Table 39

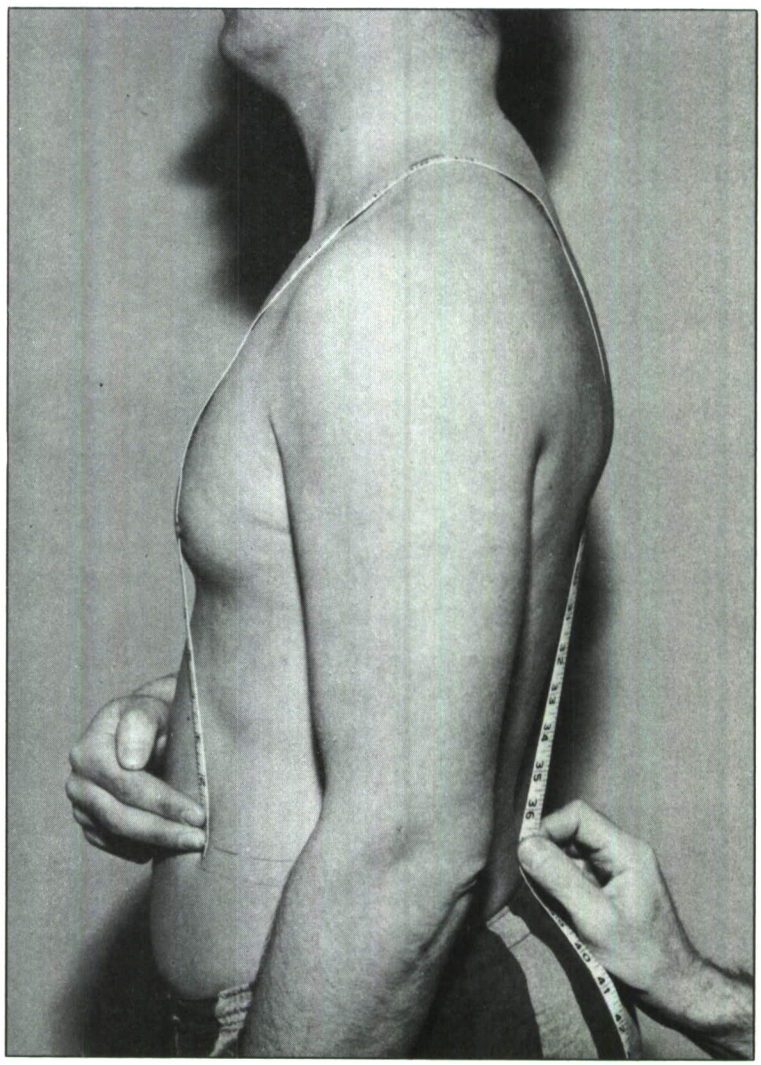
WAIST TO WAIST – UNDER CROTCH

Neg.No.C5057

Measure the distance from the front waistline datum vertically up over the shoulder datum mark and vertically down to the waistline datum at back.

PERCENTILE VALUES

%	cm	in
min	84.07	33.10
1	85.09	33.50
2	86.11	33.90
3	86.61	34.10
5	87.69	34.52
10	89.03	35.05
15	89.83	35.37
20	90.32	35.56
25	91.02	35.83
30	91.60	36.06
35	92.10	36.26
40	92.79	36.53
45	93.54	36.82
50	93.95	36.99
55	94.49	37.20
60	95.19	37.48
65	95.54	37.61
70	96.01	37.80
75	96.82	38.12
80	97.66	38.45
85	98.89	38.93
90	99.89	39.32
95	100.84	39.70
97	101.47	39.95
98	102.62	40.40
99	104.14	41.00
max	108.46	42.70



Mean: 94.244 (0.296) cm; 37.104 (0.117) in
Standard deviation: 4.186 (0.209) cm; 1.648 (0.082) in
Coefficient of variation: 4.442 (0.222) %
Range: 84.07–108.46 cm; 33.10–42.70 in
No. of subjects: 200

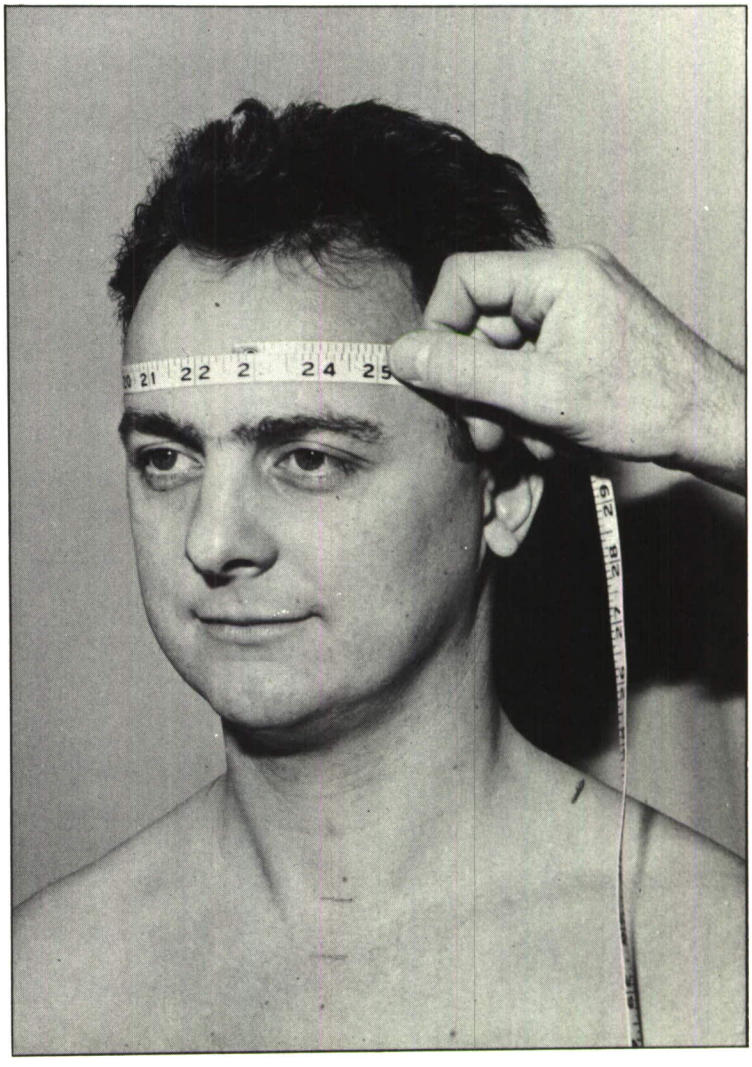
Table 40

WAIST TO WAIST – OVER SHOULDER

Measure the maximum head girth with tape passing above the brow ridges.

PERCENTILE VALUES

%	cm	in
min	53.59	21.10
1	54.10	21.30
2	54.74	21.55
3	54.99	21.65
5	55.40	21.81
10	56.06	22.07
15	56.34	22.18
20	56.59	22.28
25	56.92	22.41
30	57.11	22.48
35	57.28	22.55
40	57.45	22.62
45	57.66	22.70
50	57.83	22.77
55	58.00	22.83
60	58.17	22.90
65	58.32	22.96
70	58.50	23.03
75	58.69	23.11
80	58.86	23.17
85	59.23	23.32
90	59.69	23.50
95	60.28	23.73
97	60.45	23.80
98	60.79	23.93
99	60.96	24.00
max	61.47	24.20



Mean: 57.937 (0.099) cm; 22.810 (0.039) in
Standard deviation: 1.397 (0.070) cm; 0.550 (0.028) in
Coefficient of variation: 2.411 (0.121) %
Range: 53.59–61.47 cm; 21.10–24.20 in
No. of subjects: 200

Table 41

HEAD GIRTH

Neg.No.C5059

PERCENTILE VALUES

%	kg	lb
min	57.15	126.00
1	58.06	128.00
2	59.42	131.00
3	59.72	131.67
5	60.55	133.50
10	62.14	137.00
15	64.56	142.33
20	65.32	144.00
25	66.90	147.50
30	68.27	150.50
35	69.66	153.57
40	70.53	155.50
45	71.44	157.50
50	73.03	161.00
55	74.09	163.33
60	75.52	166.50
65	77.56	171.00
70	79.02	174.20
75	80.74	178.00
80	82.55	182.00
85	84.37	186.00
90	86.64	191.00
95	88.90	196.00
97	93.89	207.00
98	94.57	208.50
99	97.52	215.00
max	108.41	239.00

Mean: 74.314 (0.662) kg; 163.835 (1.459) lb
Standard deviation: 9.357 (0.468) kg; 20.629 (1.031) lb
Coefficient of variation: 12.591 (0.630) %
Range: 57.15–108.41 kg; 126.00–239.00 lb
No. of subjects: 200

Table 42

WEIGHT

Table 43(a)
AGE

PERCENTILE VALUES	
%	Years
min	19.70
1	19.80
2	20.30
3	20.75
5	20.95
10	22.20
15	22.63
20	23.45
25	24.07
30	24.80
35	25.10
40	25.80
45	26.70
50	27.45
55	28.40
60	29.00
65	30.30
70	31.20
75	32.20
80	33.65
85	34.65
90	36.70
95	41.80
97	42.35
98	42.50
99	45.00
max	45.90

Mean: 28.730 (0.422) years
Standard deviation: 5.960 (0.298) years
Coefficient of variation: 20.745 (0.104) %
Range: 19.70–45.90 years
No. of subjects: 200

Table 43(b)
SHOE SIZE (U.K.)

PERCENTILE VALUES	
%	Size
min	6.00
1	6.00
2	6.00
3	6.00
5	6.50
10	6.70
15	6.90
20	7.42
25	7.58
30	7.68
35	7.77
40	7.87
45	7.96
50	8.16
55	8.42
60	8.59
65	8.71
70	8.83
75	8.95
80	9.43
85	9.70
90	9.93
95	10.55
97	10.75
98	10.85
99	10.95
max	12.00

Mean: 8.537 (0.086)
Standard deviation: 1.221 (0.061)
Coefficient of variation: 14.303 (0.716) %
Range: 6.0–12.0
No. of subjects: 200

Table 43

(Measurement shewn at Table 15 minus measurement shewn at Table 4.)

PERCENTILE VALUES

%	cm	in
min	3.56	1.40
1	3.62	1.42
2	3.75	1.48
3	3.84	1.51
5	3.97	1.56
10	4.35	1.71
15	4.63	1.82
20	4.77	1.88
25	4.90	1.93
30	5.01	1.97
35	5.12	2.02
40	5.23	2.06
45	5.34	2.10
50	5.45	2.15
55	5.56	2.19
60	5.64	2.22
65	5.71	2.25
70	5.78	2.27
75	5.86	2.31
80	6.03	2.37
85	6.20	2.44
90	6.39	2.51
95	6.72	2.64
97	6.83	2.69
98	6.98	2.75
99	7.37	2.90
max	8.38	3.30

Mean: 5.535 (0.056) cm
2.179 (0.022) in
Standard deviation: 0.795 (0.040) cm
0.313 (0.016) in
Coefficient of variation: 14.36 (0.718) %
Range: 3.56–8.38 cm; 1.40–3.30 in
No. of subjects: 200

Table 44(a)

TOP OF KNEE TO KNEE PIVOT

(Measurement shewn at Table 13 minus measurement shewn at Table 5.)

PERCENTILE VALUES

%	cm	in
min	58.93	23.20
1	59.18	23.30
2	60.71	23.90
3	60.88	23.97
5	61.59	24.25
10	62.74	24.70
15	63.37	24.95
20	64.30	25.31
25	64.83	25.53
30	65.60	25.82
35	65.96	25.97
40	66.40	26.14
45	66.74	26.28
50	67.21	26.46
55	67.51	26.58
60	67.75	26.67
65	68.04	26.79
70	68.33	26.90
75	68.71	27.05
80	69.09	27.20
85	69.95	27.54
90	70.47	27.74
95	71.12	28.00
97	71.88	28.30
98	72.05	28.37
99	72.64	28.60
max	75.69	29.80

Mean: 66.937 (0.207) cm
26.353 (0.081) in
Standard deviation: 2.921 (0.146) cm
1.150 (0.058) in
Coefficient of variation: 4.36 (0.218) %
Range: 58.93–75.69 cm; 23.20–29.80 in
No. of subjects: 200

Table 44(b)

SHOULDER HEIGHT MINUS CROTCH HEIGHT

Table 44

T.R. 67125

(Measurement shewn at Table 9 minus measurement shewn at Table 6.)

PERCENTILE VALUES

%	cm	in
min	37.08	14.60
1	37.34	14.70
2	37.97	14.95
3	38.86	15.30
5	40.39	15.90
10	41.01	16.14
15	41.49	16.33
20	42.08	16.57
25	42.53	16.74
30	42.89	16.89
35	43.31	17.05
40	43.65	17.19
45	43.90	17.28
50	44.15	17.38
55	44.55	17.54
60	44.90	17.68
65	45.26	17.82
70	45.57	17.94
75	45.90	18.07
80	46.35	18.25
85	46.84	18.44
90	47.50	18.70
95	48.51	19.10
97	48.94	19.27
98	49.28	19.40
99	49.53	19.50
max	52.07	20.50

Mean: 44.346 (0.182) cm
17.459 (0.072) in
Standard deviation: 2.570 (0.129) cm
1.012 (0.051) in
Coefficient of variation: 5.80 (0.260) %
Range: 37.08–52.07 cm; 14.60–20.50 in
No. of subjects: 200

Table 45(a)

AXILLARY HEIGHT MINUS WRIST HEIGHT

(Measurement shewn at Table 7 minus measurement shewn at Table 5.)

PERCENTILE VALUES

%	cm	in
min	1.27	0.50
1	2.29	0.90
2	3.81	1.50
3	3.94	1.55
5	4.19	1.65
10	4.95	1.95
15	5.30	2.09
20	5.56	2.19
25	5.84	2.30
30	6.17	2.43
35	6.42	2.53
40	6.64	2.61
45	6.79	2.67
50	7.03	2.77
55	7.22	2.84
60	7.37	2.90
65	7.68	3.02
70	7.87	3.10
75	8.13	3.20
80	8.36	3.29
85	8.79	3.46
90	9.11	3.59
95	9.57	3.77
97	9.91	3.90
98	10.41	4.10
99	10.92	4.30
max	12.95	5.10

Mean: 7.130 (0.119) cm
2.807 (0.047) in
Standard deviation: 1.689 (0.084) cm
0.665 (0.033) in
Coefficient of variation: 23.69 (1.185) %
Range: 1.27–12.95 cm; 0.50–5.10 in
No. of subjects: 200

Table 45(b)

THIGH PIVOT HEIGHT MINUS CROTCH HEIGHT

Table 45

Neg.No.C5063

(Measurement shewn at Table 14 minus measurement shewn at Table 13.)

PERCENTILE VALUES

%	cm	in
min	24.38	9.60
1	24.38	9.60
2	24.38	9.60
3	24.64	9.70
5	24.89	9.80
10	25.50	10.04
15	25.77	10.15
20	25.95	10.22
25	26.06	10.26
30	26.16	10.30
35	26.31	10.36
40	26.47	10.42
45	26.65	10.49
50	26.90	10.59
55	27.06	10.65
60	27.21	10.71
65	27.38	10.78
70	27.58	10.86
75	27.81	10.95
80	28.04	11.04
85	28.25	11.12
90	28.70	11.30
95	29.21	11.50
97	29.72	11.70
98	29.97	11.80
99	30.23	11.90
max	31.50	12.40

Mean: 27.097 (0.092) cm
10.668 (0.036) in
Standard deviation: 1.295 (0.065) cm
0.510 (0.026) in
Coefficient of variation: 4.78 (0.239) %
Range: 24.38–31.50 cm; 9.60–12.40 in
No. of subjects: 200

Table 46(a)

HEIGHT (STATURE) MINUS SHOULDER HEIGHT

(Measurement shewn at Table 21 minus measurement shewn at Table 20.)

PERCENTILE VALUES

%	cm	in
min	0.25	0.10
1	0.25	0.10
2	0.38	0.15
3	0.51	0.20
5	0.63	0.25
10	0.95	0.37
15	1.12	0.44
20	1.24	0.49
25	1.35	0.53
30	1.45	0.57
35	1.56	0.61
40	1.66	0.65
45	1.77	0.70
50	1.86	0.73
55	1.94	0.77
60	2.03	0.80
65	2.12	0.83
70	2.21	0.87
75	2.30	0.91
80	2.43	0.96
85	2.58	1.01
90	2.76	1.09
95	3.00	1.18
97	3.43	1.35
98	3.64	1.43
99	3.81	1.50
max	4.57	1.80

Mean: 1.984 (0.052) cm
0.781 (0.021) in
Standard deviation: 0.739 (0.037) cm
0.291 (0.015) in
Coefficient of variation: 37.26 (1.863) %
Range: 0.25–4.57 cm; 0.10–1.80 in
No. of subjects: 200

Table 46(b)

ANKLE GIRTH 2½ INCHES ABOVE MINIMUM, MINUS MINIMUM ANKLE GIRTH

Table 46

T.R. 67125

(Measurement shewn at Table 30 minus measurement shewn at Table 29.)

PERCENTILE VALUES

%	cm	in
min	1.02	0.40
1	1.02	0.40
2	1.27	0.50
3	1.34	0.53
5	1.49	0.59
10	1.73	0.68
15	1.90	0.75
20	2.06	0.81
25	2.18	0.86
30	2.30	0.91
35	2.38	0.94
40	2.47	0.97
45	2.55	1.00
50	2.62	1.03
55	2.68	1.06
60	2.75	1.08
65	2.83	1.12
70	2.94	1.16
75	3.04	1.20
80	3.21	1.26
85	3.39	1.33
90	3.56	1.40
95	3.77	1.48
97	3.94	1.55
98	4.06	1.60
99	4.57	1.80
max	4.83	1.90

Mean: 2.756 (0.049) cm
1.085 (0.019) in
Standard deviation: 0.699 (0.035) cm
0.275 (0.014) in
Coefficient of variation: 25.34 (1.267) %
Range: 1.02–4.83 cm; 0.40–1.90 in
No. of subjects: 200

Table 47(a)

WRIST GIRTH 2½ INCHES ABOVE MINIMUM (PROXIMAL EDGE OF STYLOID PROCESS) MINUS WRIST GIRTH AT PROXIMAL EDGE OF STYLOID PROCESS

(Measurement shewn at Table 9 minus measurement shewn at Table 8.)

PERCENTILE VALUES

%	cm	in
min	18.54	7.30
1	18.71	7.37
2	19.05	7.50
3	19.43	7.65
5	19.94	7.85
10	20.91	8.23
15	21.59	8.50
20	22.01	8.67
25	22.42	8.82
30	22.64	8.91
35	23.01	9.06
40	23.39	9.21
45	23.64	9.31
50	23.85	9.39
55	24.16	9.51
60	24.44	9.62
65	24.70	9.72
70	24.91	9.81
75	25.12	9.89
80	25.37	9.99
85	25.63	10.09
90	26.12	10.28
95	26.92	10.60
97	27.30	10.75
98	27.94	11.00
99	28.79	11.33
max	28.96	11.40

Mean: 23.853 (0.146) cm
9.391 (0.058) in
Standard deviation: 2.070 (0.104) cm
0.815 (0.041) in
Coefficient of variation: 8.68 (0.434) %
Range: 18.54–28.96 cm; 7.30–11.40 in
No. of subjects: 200

Table 47(b)

AXILLARY HEIGHT MINUS WAIST HEIGHT

Neg.No.C5065

(Measurement shewn at Table 8 minus measurement shewn at Table 7.)

PERCENTILE VALUES

%	cm	in
min	13.72	5.40
1	13.72	5.40
2	14.99	5.90
3	15.24	6.00
5	15.49	6.10
10	16.32	6.42
15	16.76	6.60
20	17.22	6.78
25	17.70	6.97
30	18.14	7.14
35	18.39	7.24
40	18.56	7.31
45	18.77	7.39
50	18.97	7.47
55	19.24	7.58
60	19.60	7.72
65	19.85	7.81
70	20.14	7.93
75	20.32	8.00
80	20.67	8.14
85	20.91	8.23
90	21.23	8.36
95	21.84	8.60
97	22.29	8.77
98	22.61	8.90
99	22.86	9.00
max	24.38	9.60

Mean: 19.083 (0.137) cm
7.513 (0.054) in
Standard deviation: 1.936 (0.097) cm
0.762 (0.038) in
Coefficient of variation: 10.14 (0.507) %
Range: 13.72–24.38 cm; 5.40–9.60 in
No. of subjects: 200

Table 48(a)

WAIST HEIGHT MINUS THIGH PIVOT HEIGHT

(Measurement shewn at Table 7 minus measurement shewn at Table 4.)

PERCENTILE VALUES

%	cm	in
min	33.78	13.30
1	34.04	13.40
2	34.71	13.67
3	35.81	14.10
5	36.26	14.28
10	36.87	14.52
15	37.46	14.75
20	37.82	14.89
25	38.20	15.04
30	38.61	15.20
35	38.98	15.35
40	39.22	15.44
45	39.54	15.57
50	39.80	15.67
55	40.10	15.79
60	40.43	15.92
65	40.77	16.05
70	41.08	16.17
75	41.59	16.37
80	41.99	16.53
85	42.31	16.66
90	42.71	16.81
95	43.18	17.00
97	43.94	17.30
98	44.45	17.50
99	45.08	17.75
max	49.78	19.60

Mean: 39.985 (0.165) cm
15.742 (0.065) in
Standard deviation: 2.334 (0.117) cm
0.919 (0.046) in
Coefficient of variation: 5.83 (0.292) %
Range: 33.78–49.78 cm; 13.30–19.60 in
No. of subjects: 200

Table 48(b)

THIGH PIVOT HEIGHT MINUS KNEE PIVOT HEIGHT

T.R. 67125

Table 48

(Measurement shewn at Table 7 minus measurement shewn at Table 3.)

PERCENTILE VALUES

%	cm	in
min	67.06	26.40
1	67.82	26.70
2	69.34	27.30
3	69.60	27.40
5	70.61	27.80
10	72.52	28.55
15	73.22	28.82
20	73.85	29.07
25	74.86	29.47
30	75.23	29.62
35	75.82	29.85
40	76.39	30.07
45	76.79	30.23
50	77.39	30.47
55	77.72	30.60
60	78.08	30.74
65	78.45	30.89
70	79.50	31.30
75	79.81	31.42
80	80.33	31.63
85	81.03	31.90
90	81.72	32.18
95	83.31	32.80
97	84.58	33.30
98	86.36	34.00
99	87.38	34.40
max	91.69	36.10

Mean: 77.373 (0.277) cm
30.462 (0.109) in
Standard deviation: 3.919 (0.196) cm
1.543 (0.077) in
Coefficient of variation: 5.07 (0.254) %
Range: 67.06–91.69 cm; 26.40–36.10 in
No. of subjects: 200

Table 49(a)

THIGH PIVOT HEIGHT MINUS MINIMUM ANKLE GIRTH HEIGHT

(Measurement shewn at Table 8 minus measurement shewn at Table 5.)

PERCENTILE VALUES

%	cm	in
min	20.57	8.10
1	21.08	8.30
2	21.34	8.40
3	21.59	8.50
5	22.10	8.70
10	23.21	9.14
15	23.51	9.26
20	23.81	9.38
25	24.47	9.63
30	24.81	9.77
35	25.23	9.93
40	25.53	10.05
45	25.84	10.17
50	26.11	10.28
55	26.50	10.43
60	26.92	10.60
65	27.21	10.71
70	27.51	10.83
75	27.84	10.96
80	28.22	11.11
85	28.55	11.24
90	28.99	11.41
95	29.40	11.57
97	30.23	11.90
98	30.35	11.95
99	30.48	12.00
max	31.75	12.50

Mean: 26.213 (0.162) cm
10.32 (0.063) in
Standard deviation: 2.286 (0.114) cm
0.900 (0.045) in
Coefficient of variation: 8.72 (0.436) %
Range: 20.57–31.75 cm; 8.10–12.50 in
No. of subjects: 200

Table 49(b)

WAIST HEIGHT MINUS CROTCH HEIGHT

Table 49

(Measurement shewn at Table 9 minus measurement shewn at Table 5.)

PERCENTILE VALUES

%	cm	in
min	41.66	16.40
1	42.67	16.80
2	44.20	17.40
3	44.96	17.70
5	45.47	17.90
10	46.40	18.27
15	47.24	18.60
20	47.85	18.84
25	48.20	18.98
30	48.67	19.16
35	49.02	19.30
40	49.45	19.47
45	49.76	19.59
50	49.99	19.68
55	50.42	19.85
60	50.82	20.01
65	51.03	20.09
70	51.28	20.19
75	51.52	20.28
80	52.01	20.47
85	52.68	20.74
90	53.34	21.00
95	54.29	21.37
97	54.86	21.60
98	55.03	21.67
99	55.50	21.85
max	56.39	22.20

Mean: 50.063 (0.187) cm; 19.710 (0.074) in
Standard deviation: 2.642 (0.132) cm; 1.040 (0.052) in
Coefficient of variation: 5.28 (0.264) %
Range: 41.66–56.39 cm; 16.40–22.20 in
No. of subjects: 200

Table 50

AXILLARY HEIGHT MINUS CROTCH HEIGHT

Table 51 – Part 1

	Mercury Serial No.	1st Control – Chest Girth		Chest/Torso-Hoop Groupings: Up to 36.9			37.0 – 39.9			40.0 – 42.9		43–45.9	Total Range
		2nd Control – Torso Hoop		59.0 – 61.4	61.5 – 63.9	64.0 – 66.4	60.0 – 62.9	63.0 – 65.9	66.0 – 68.9	63.0 – 66.4	66.5 – 69.9	66.5 – 70.4	
		No. in Group		12	26	9	28	48	19	24	19	3	200
	2	Weight lb	Min	130	126	135	138	149	154	157	175	207	126
			Max	145	155	166	174	188	194	200	209	215	239
			Mean	137.1	142	148	151.5	164	174.1	181.1	191.9	210.333	163.8
			S.D.	4.889	7.394	9.566	7.872	9.015	11.59	8.934	9.495	4.163	20.63
*	3	Chest girth	Min	34.5	34	34.9	37	37	37	40.0	40.5	44	34
			Max	36.8	36.9	36.7	39.5	39.9	39.9	42.9	42.4	45.9	45.9
			Mean	35.98	35.86	36.11	38.02	38.24	38.45	41.13	41.337	44.767	38.55
			S.D.	0.704	0.864	0.66	0.759	0.84	0.846	0.849	1.646	1.002	2.273
*	4	Av. Torso hoop	Min	59.2	61.5	64.3	60.3	63.4	66	63.7	66.5	69.3	56.9
			Max	61.3	63.9	65.9	62.9	65.8	68.4	66.4	69.5	69.7	73.2
			Mean	60.48	62.48	64.86	61.8	64.59	67.05	65.69	67.86	69.5	64.44
			S.D.	0.855	0.732	0.658	0.749	0.672	0.724	0.642	0.99	0.2	2.606
*	5	Min Ankle girth, height	Min	4.1	4	4.6	4	4.4	4.6	4.4	4	4.8	4
			Max	5.1	5.5	5.2	5.6	5.9	5.9	5.5	5.7	5.5	5.9
‡			Mean	4.783	4.927	4.856	4.943	5.052	5.058	5.046	5.053	5.1	4.993
			S.D.	0.276	0.324	0.207	0.319	0.339	0.337	0.308	0.373	0.361	0.339
*	6	Knee pivot height	Min	17.7	18.1	17.3	16.6	18.5	18.7	18.6	18.5	20	16.6
			Max	20	20.5	20.2	20.8	21.7	22.5	21.0	22.2	21.4	22.7
ø			Mean	18.92	19.46	19.27	19.16	19.92	20.25	19.78	20.31	20.6	19.71
			S.D.	0.645	0.638	0.896	0.965	0.766	0.928	0.675	0.914	0.721	0.944
*	7	Crotch height	Min	30.1	29.5	29.1	29	30	31.5	28.5	30	33.4	28.5
			Max	33.8	35	34.5	34.9	36.7	37.2	36.7	38.2	34.9	38.2
			Mean	31.69	32.42	32.09	32.01	32.99	33.4	32.45	33.3	34.167	32.65
			S.D.	1.068	1.523	1.717	1.481	1.379	1.575	1.856	1.929	0.751	1.664
	8	Wrist height	Min	31.2	32.4	33	31.8	33.1	35	32.1	33.5	36	31.2
			Max	35.3	36.2	36.6	35.5	38.3	37.8	37.1	39.3	37.4	39.3
			Mean	33.28	34.34	35.28	33.68	35.36	36.31	34.71	35.98	36.633	34.9
			S.D.	1.11	0.912	1.312	1.022	1.112	0.921	1.283	1.427	0.709	1.526
*	9	Thigh pivot height	Min	32.5	32.4	31.1	31.7	33.2	34.3	32.4	33.1	36.6	31.1
			Max	36.2	36.9	37	36.8	38.5	38.9	38	41.8	36.8	41.8
‡			Mean	34.04	34.97	34.64	34.67	35.88	36.26	35.42	36.51	36.7	35.46
			S.D.	1.151	1.347	1.839	1.468	1.326	1.304	1.487	1.944	0.1	1.664
*	10	Waist height	Min	39.2	39.5	38.5	38.4	39.3	41.4	39.3	41.1	44.8	38.2
			Max	43.2	44.7	45.4	44.7	47.1	48.5	46.3	49.2	45.8	49.2
			Mean	41.02	42.43	42.57	41.82	43.47	44.12	43.18	44.14	45.2	42.97
			S.D.	1.409	1.519	1.967	1.776	1.604	1.809	1.67	2.049	0.529	1.997
*	11	**Axillary height**	Min	48.1	48.7	48.1	47.3	49.2	51.8	48	50.3	53	47.3
			Max	53	54.5	54.2	54.5	57	57.5	55.3	58.4	54.7	58.5
‡			Mean	50.31	51.85	52.16	50.87	52.94	54.06	52.04	53.76	53.933	52.36
			S.D.	1.437	1.642	1.992	1.814	1.55	1.516	1.902	2.146	0.862	2.127
	12	Supra-sternal height	Min	52.2	53.2	52.4	51.7	54.7	56.5	53.5	54.6	57.7	51.6
			Max	56.2	58.1	58.1	58	60.6	62.2	59.7	63.3	59.2	63.3
			Mean	53.96	55.96	56.37	55.15	57.17	58.23	56.68	58.18	58.4	56.61
			S.D.	1.319	1.542	1.886	1.667	1.456	1.419	1.676	2.078	0.755	2.11
‡	13	Neck root height	Min	53.2	54.1	53.4	52.3	55.5	57.4	54.2	55.3	58.6	52.3
			Max	57.2	59	59.1	59.1	61.5	63.2	60.8	64.2	60	64.2
			Mean	54.92	56.84	57.29	56.02	58.07	59.18	57.55	59.07	59.333	57.51
			S.D.	1.318	1.55	1.887	1.712	1.437	1.442	1.749	2.095	0.702	2.136
	14	7th Cervical height	Min	55.1	55.9	55.1	54	57.5	59.8	56.5	57.6	61.4	54
			Max	59.8	61.9	62.1	61.9	64.5	64.7	62.8	66.8	62.8	66.8
			Mean	57.2	59.04	59.54	58.17	60.3	61.5	59.8	61.37	62.1	59.75
			S.D.	1.489	1.828	2.144	1.917	1.564	1.412	1.796	2.286	0.7	2.273
‡	15	Shoulder height 3½" from C_L	Min	54.7	55.6	54.9	53.4	56.8	58.8	55.7	56.6	60.6	53.4
			Max	58.6	60.5	61.5	60.8	63.4	64.4	62.2	66.5	61.7	66.5
			Mean	56.29	58.25	58.86	57.27	59.63	60.78	59.04	60.81	61.2	59
			S.D.	1.323	1.587	2.038	1.782	1.518	1.517	1.764	2.325	0.557	2.278
	16	Height (Stature)	Min	65	65.5	65.4	63.7	67.3	69.4	65.5	67	70.2	63.7
			Max	69.6	72.1	71.8	71.8	74.8	75.9	73.2	76.8	73.1	76.8
			Mean	66.84	69.03	69.64	67.91	70.34	71.57	69.53	71.22	71.6	69.67
			S.D.	1.584	1.895	1.997	1.859	1.71	1.557	2.061	2.332	1.453	2.415
	17	Knee height – sitting	Min	20.1	20.1	19.1	19.3	20.7	21.3	20.6	20.8	22.5	19.1
			Max	21.8	22.6	22.3	22.7	24	24.2	23.3	25.1	23.5	25.1
			Mean	20.95	21.49	21.33	21.31	22.13	22.44	22.02	22.67	22.9	21.89
			S.D.	0.585	0.67	1.021	0.867	0.754	0.791	0.82	0.988	0.529	0.99
	18	Buttock – Knee length	Min	22	22	21.2	21.5	22.3	23.4	22.1	23	24.3	21.2
			Max	24.3	24.5	24.3	25.5	26.1	26.3	26	26.8	25.8	26.8
			Mean	22.97	23.35	23.21	23.41	24.21	24.61	23.98	24.69	25.2	23.92
			S.D.	0.763	0.66	0.874	0.915	0.802	0.932	0.881	1.002	0.794	1.036
ø	19	Heel/instep girth	Min	11.5	12	12.3	11.9	12.1	12.8	12.5	12.8	13.5	11.5
			Max	13	13.9	13	13.8	14.2	14.3	13.6	14.6	14	14.6
‡			Mean	12.43	12.58	12.63	12.62	13.07	13.29	13.18	13.47	13.7	12.97
			S.D.	0.444	0.438	0.287	0.434	0.452	0.423	0.288	0.405	0.265	0.551
	20	Sitting height	Min	33.8	34.5	36.4	33.9	34.6	36.2	34.5	36.1	35.9	33.8
			Max	36	38.8	38.5	37.7	38.7	38.9	38.5	38.4	37.7	39.5
			Mean	35.12	36.39	37.14	35.47	36.63	37.54	36.43	37.28	36.9	36.48
			S.D.	0.716	1.040	0.689	0.825	0.973	0.852	1.072	0.766	0.917	1.198
*	21	Knee girth, fully flexed	Min	15	15.4	15.6	15.5	16	16.5	16.2	16.4	18.3	15
			Max	17.6	18.1	17.4	17.9	18.6	18.4	19.5	18.7	18.5	19.5
‡			Mean	16.15	16.51	16.49	16.43	17.06	17.5	17.45	17.7	18.433	16.99
			S.D.	0.672	0.709	0.670	0.636	0.594	0.598	0.813	0.659	0.115	0.847
	22	Ankle – girth min.	Min	8	7.7	8.3	7.8	8	8.5	8.2	8.8	9.1	7.7
			Max	8.7	9.6	9.5	9.6	10.3	9.9	9.8	9.9	9.8	10.5
			Mean	8.342	8.562	8.767	8.611	8.875	9.174	9.175	9.342	9.467	8.883
			S.D.	0.227	0.408	0.412	0.424	0.428	0.336	0.412	0.250	0.351	0.495

Neg.No.C5068

∅	24	Ankle girth	Min	8.6	8	8.8	8.6	8.3	9.1	8.7	9.3	**10**	8
ǂ		2½" above min.	Max	9.6	10.2	10.4	10.4	11.2	10.8	11	11	**10.7**	11.2
			Mean	9.075	9.231	9.6	9.486	9.627	9.884	10	10.16	**10.3**	9.664
			S.D.	0.270	0.584	0.563	0.530	0.566	0.510	0.568	0.436	**0.361**	0.613
	25	Calf girth	Min	12.7	12.4	13	12.6	12.8	12.9	13.8	14	**15.1**	12.4
			Max	14.2	15	14.9	15.4	16	15.9	16.5	16.5	**15.8**	16.5
			Mean	13.48	13.65	13.96	14.05	14.48	14.6	15.1	15.45	**15.433**	14.42
			S.D.	0.420	0.723	0.678	0.710	0.656	0.788	0.770	0.721	**0.351**	0.895
ǂ	26	Small girth	Min	12.1	12	12.3	12	12.1	12.6	13	12.5	**14.2**	11.8
			Max	13.3	14	13.6	14	14.4	15	15.3	14.9	**14.6**	15.3
			Mean	12.58	12.58	12.84	12.88	13.36	13.7	13.94	14	**14.433**	13.29
			S.D.	0.424	0.491	0.510	0.509	0.508	0.674	0.607	0.584	**0.208**	0.760
	27	Knee girth, standing	Min	13.7	13.3	14	13.6	14.2	14.5	14.8	15	16	13.3
			Max	15.2	15.5	15.2	15.9	16.1	16.6	17.2	17.2	**16.6**	18.1
			Mean	14.48	14.45	14.57	14.86	15.28	15.68	15.83	16.06	**16.4**	15.22
			S.D.	0.439	0.546	0.458	0.513	0.477	0.582	0.652	0.556	**0.346**	0.802
	28	Thigh girth, max	Min	19.6	18.2	20	19.9	20.1	20.9	20.2	22.4	**23.7**	18.2
			Max	21.4	22.2	23.1	23.8	25.4	24.9	25.4	25.2	**26.5**	27.2
			Mean	20.65	20.43	21.23	21.55	22.22	22.66	23.55	23.96	**24.8**	22.17
			S.D.	0.557	0.997	0.985	1.055	1.007	1.091	1.124	0.853	**1.493**	1.587
*	29	Buttock girth	Min	35.4	34.3	35.5	36	36.8	37.8	37.7	39.3	**41.7**	34.3
			Max	37.3	39.1	39.4	40.7	41.5	42.0	42.5	43	**43.2**	46.2
			Mean	36.39	36.77	37.56	37.78	38.95	39.86	40.47	41.39	**42.533**	38.85
			S.D.	0.568	1.068	1.232	1.064	1.065	1.2	1.212	0.959	**0.764**	2.029
*	30	Waist girth	Min	28.3	27	29	28.7	29.2	29.5	29.8	32.3	**39.3**	27
			Max	32.8	33.3	32.6	34.4	37.5	36.1	39.8	38.3	**41.5**	41.5
			Mean	30.29	30.19	30.53	31.98	32.71	33.51	35.35	35.95	**40.167**	32.96
			S.D.	1.229	1.38	1.158	1.405	1.527	1.737	1.915	1.572	**1.172**	2.707
*	32	Neck girth	Min	13.5	13.1	14.1	14	14.2	14.3	14.9	15.4	**15.5**	13.1
			Max	14.7	15.2	15	15.8	17.3	16	16.2	17.2	**16**	17.3
			Mean	14.14	14.41	14.63	14.79	15.06	15.08	15.55	15.96	**15.8**	15.03
			S.D.	0.375	0.443	0.255	0.388	0.543	0.521	0.412	0.508	**0.265**	0.689
	33	Wrist girth	Min	6.1	6.4	6.4	6.3	6.1	6.7	6.6	6.9	**7.3**	6.1
			Max	6.9	7.1	7.1	7.4	7.6	7.8	7.8	7.9	**7.4**	8.1
			Mean	6.583	6.662	6.778	6.689	6.946	7.084	7.15	7.374	**7.367**	6.933
			S.D.	0.233	0.186	0.259	0.256	0.284	0.283	0.277	0.318	**0.058**	0.365
∅ ǂ	34	Wrist girth	Min	7.1	6.9	7.2	7.3	6.7	7.3	7.5	8	**8.4**	6.7
		2½" above min	Max	8.2	8.2	8.4	8.6	8.9	8.7	9.2	9.4	**9.2**	9.4
			Mean	7.575	7.592	7.833	7.839	7.969	8.126	8.375	8.547	**8.833**	8.018
			S.D.	0.384	0.344	0.444	0.352	0.446	0.396	0.372	0.366	**0.404**	0.497
* ǂ	35	Elbow girth –	Min	12	12.1	12.8	12.4	12.3	13	13.3	13.5	**13.8**	12
		fully flexed	Max	14	14.6	14.5	14.7	14.8	15	15.3	15.8	**14.8**	15.8
			Mean	13.15	13.33	13.53	13.70	13.73	14.14	14.28	14.58	**14.4**	13.85
			S.D.	0.622	0.510	0.529	0.569	0.644	0.494	0.524	0.651	**0.529**	0.696
	36	Biceps extended	Min	9.8	9.3	9.9	10.2	10.1	10.3	11.2	11.5	**12.5**	9.3
			Max	11.3	11.5	11.8	12.5	13	13.3	13.4	14	**14**	14
			Mean	10.57	10.57	10.68	11.23	11.41	11.63	12.38	12.55	**13.2**	11.47
			S.D.	0.394	0.553	0.683	0.628	0.602	0.710	0.595	0.683	**0.755**	0.922
	37	Biceps contracted	Min	10.7	9.9	11.2	11.4	11.4	11.6	12.4	13	**13.7**	9.9
			Max	12.2	12.8	13.1	13.6	13.8	14.6	15.1	15.1	**15.1**	15.6
			Mean	11.7	11.61	11.84	12.4	12.61	12.87	13.68	13.92	**14.6**	12.69
			S.D.	0.393	0.608	0.695	0.575	0.538	0.668	0.674	0.703	**0.781**	1.002
* ǂ	38	Inter wrist span	Min	48.9	49.2	48	48.5	49.9	51.5	49.4	50.7	**54.8**	48
			Max	54	56.5	56.1	57.2	58.1	58.1	56.9	60.4	**55.6**	60.4
			Mean	51.55	53.42	52.42	52.66	54.21	54.46	53.85	55.14	**55.3**	53.76
			S.D.	1.588	**1.979**	2.202	2.217	1.943	1.74	2.046	2.518	**0.436**	2.274
* ǂ	39	Inter elbow span	Min	35.3	35.3	35	34.6	36.1	36.7	36.1	36.8	**38.5**	34.6
			Max	39.4	40.4	41.5	40.9	42.8	41.5	41.3	42.8	**40**	42.8
			Mean	36.7	38.06	37.84	37.77	38.71	39.03	38.68	39.22	**39.367**	38.42
			S.D.	1.07	1.45	1.723	1.549	1.452	1.208	1.494	1.491	**0.777**	1.593
* ǂ	40	Elbow – wrist length	Min	9.1	9.3	9.2	8.9	9.3	10	9.5	9.4	**10.3**	8.9
			Max	10.7	10.9	10.2	10.9	11.2	11.6	10.8	11.5	**10.7**	12
			Mean	9.867	10.15	9.856	9.968	10.32	10.43	10.2	10.55	**10.5**	10.22
			S.D.	0.429	0.395	0.332	0.488	0.41	0.449	0.416	0.536	**0.2**	0.496
	41	Shoulder – fingertip	Min	30.1	30.4	30.1	29.6	30.8	31.7	31.1	30.2	**33.8**	29.6
		length	Max	33.3	39.7	35.6	35.3	36.1	36.1	39.5	37	**35.8**	39.7
			Mean	**31.82**	33.31	32.74	32.67	33.69	33.93	33.73	34.01	**34.833**	33.42
			S.D.	1.09	2.004	1.766	1.341	1.159	1.291	1.66	1.697	**1.002**	1.614
	42	Shoulder breadth	Min	15.6	15.7	16.3	16	16.1	16.6	17.3	17.5	**18.3**	15.6
			Max	17.8	18.1	18.3	18.7	19.2	18.7	19.8	19.6	**19.1**	19.8
			Mean	16.76	17.15	17.24	17.58	17.76	17.72	18.46	18.47	**18.633**	17.75
			S.D.	0.614	0.561	0.704	0.68	0.69	0.706	0.731	0.581	**0.416**	0.833
	43	Waist to waist	Min	24.8	25.2	26.3	25.1	24.4	26.4	26.9	26.8	**30.5**	23.3
		thro' crotch	Max	27.1	28.6	30	29	30.5	31.5	30.7	32.3	**32.2**	34.3
			Mean	25.84	26.76	28.23	26.63	28.07	29.27	28.78	29.41	**31.333**	27.89
			S.D.	0.823	0.891	1.176	0.913	1.274	1.516	0.95	1.325	**0.850**	1.739
*	44	Waist to waist	Min	33.1	21.4	35.7	33.9	34.5	36.5	35.6	36.7	**36.9**	33.1
		over shoulder	Max	37	38.1	39.4	37.7	39.6	40	40	40.8	**39.2**	42.7
			Mean	35.07	35.73	37.38	35.76	37.15	38.44	37.39	38.89	**38**	37.1
			S.D.	0.979	3.072	1.297	0.954	1.249	1.079	1.076	1.099	**1.153**	1.648
	45	Shoe size	Min	6	6	7	6	7	8	6.5	7.5	**10**	6
			Max	10	37.5	9	10	11	11	11	12	**10.5**	12
			Mean	7.667	9.231	8.111	7.625	8.792	9.368	8.667	9.289	**10.333**	8.537
			S.D.	1.231	5.862	0.546	0.867	1.061	0.863	1.12	1.182	**0.289**	1.221
	46	Head girth	Min	21.7	21.1	21.5	22	21.6	21.5	22.3	22.3	**22.5**	21.1
			Max	23	31.6	23.2	23.7	24.1	23.8	23.9	24.2	**23.2**	24.2
			Mean	22.38	22.89	22.46	22.79	22.84	22.85	23.18	23.12	**22.867**	22.81
			S.D.	0.449	1.878	0.508	0.459	0.53	0.473	0.459	0.528	**0.351**	0.55

* Measures used in RAE pattern drafting system.

ǂ Measures not normally recorded in anthropometric surveys.

∅ Measures taken to determine if a constant dimension could be used in the RAE pattern drafting system.

Table 51 – Part 3

Mercury Serial No.	1st Control - Chest Girth		Chest/Torso-Hoop Groupings									Total Range
			Up to 36.9			37.0 - 39.9			40.0 - 42.9		43-45.9	
	2nd Control - Torso Hoop		59.0 - 61.4	61.5 - 63.9	64.0 - 66.4	60.0 - 62.9	63.0 - 65.9	66.0 - 68.9	63.0 - 66.4	66.5 - 69.9	66.5 - 70.4	
	No. in Group		12	26	9	28	48	19	24	19	3	200
50	Knee top to Knee pivot (17-6)	Min	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.9	2.1	1.4
		Max	2.4	2.5	2.4	2.7	2.7	2.7	3.3	3	2.5	3.3
		Mean	2.033	2.027	2.067	2.168	2.21	2.189	2.242	2.358	2.3	2.179
		S.D.	0.215	0.247	0.274	0.282	0.288	0.374	0.392	0.299	0.2	0.313
51	Torso length (15-7)	Min	23.2	24.7	25.8	24	25.4	26.3	24	26.2	26.8	23.2
		Max	26	27.8	27.6	26.7	27.9	28.4	27.9	28.6	27.2	29.8
		Mean	24.6	25.83	26.78	25.26	26.64	27.38	26.59	27.511	27.033	26.35
		S.D.	0.77	0.722	0.482	0.742	0.607	0.545	0.833	0.672	0.208	1.150
52	Axilla - wrist (11-8)	Min	15.9	15.8	15.1	14.8	15.3	16.8	14.6	14.7	16.7	14.6
		Max	19	19.2	18	19.5	19.3	19.8	19.4	19.5	18.2	20.5
		Mean	17.03	17.52	16.89	17.19	17.59	17.75	17.33	17.78	17.3	17.46
		S.D.	1.008	0.975	0.892	1.198	0.927	0.797	1.035	1.074	0.794	1.012
54	Head + Neck Length (16-15)	Min	10	9.8	10.3	10	9.6	10.1	9.6	9.6	9.6	9.6
		Max	11.1	11.9	11.3	11.2	11.8	12.4	11.7	11.3	11.4	12.4
		Mean	10.55	10.78	10.79	10.65	10.71	10.79	10.5	10.41	10.4	10.67
		S.D.	0.342	0.510	0.392	0.348	0.495	0.628	0.577	0.401	0.917	0.510
55	Ankle circumference taper over 2½" (24-22)	Min	0.5	0.3	0.4	0.1	0.2	0.1	0.3	0.3	0.5	0.1
		Max	1	1.2	1.2	1.4	1.5	1.2	1.7	1.8	1.1	1.8
		Mean	0.733	0.669	0.833	0.875	0.752	0.711	0.825	0.821	0.833	0.781
		S.D.	0.172	0.241	0.278	0.326	0.279	0.288	0.326	0.321	0.306	0.291
56	Wrist circumference taper over 2½" (34-33)	Min	0.7	0.4	0.7	0.7	0.4	0.5	0.8	0.7	1	0.4
		Max	1.4	1.3	1.4	1.9	1.6	1.5	1.8	1.6	1.9	1.9
		Mean	0.992	0.931	1.056	1.15	1.023	1.042	1.225	1.174	1.467	1.085
		S.D.	0.227	0.235	0.219	0.249	0.272	0.265	0.259	0.266	0.451	0.275
57	Axilla - waist (11-10)	Min	8.1	7.8	8.7	7.5	7.5	8.8	7.5	8.6	8	7.3
		Max	10	10.7	10.3	10.6	11.4	11.4	10.7	10.3	9.9	11.4
		Mean	9.292	9.427	9.589	9.054	9.471	9.942	8.858	9.621	8.733	9.391
		S.D.	0.535	0.692	0.575	0.863	0.802	0.791	0.741	0.56	1.021	0.815
58	Waist - thigh pivot (10-9)	Min	6.1	6.1	7.4	5.4	5.9	5.9	5.4	6.2	8.2	5.4
		Max	8.2	8.3	8.4	8.8	8.8	9.6	9.4	8.4	9	9.6
		Mean	6.975	7.454	7.922	7.146	7.592	7.863	7.763	7.632	8.5	7.513
		S.D.	0.582	0.625	0.349	0.719	0.711	0.897	0.814	0.560	0.436	0.762
59	Thigh pivot - knee pivot (9-6)	Min	14.4	14.3	13.8	13.8	14.5	14.8	13.3	14.6	15.4	13.3
		Max	16.2	17	17	16.9	17.7	17.2	17.8	19.6	16.7	19.6
		Mean	15.13	15.51	15.39	15.51	15.96	16.01	15.64	16.2	16.1	15.74
		S.D.	0.631	0.835	1.077	0.769	0.811	0.679	1.071	1.118	0.656	0.919
60	Thigh pivot - ankle (9-5)	Min	27.4	27.7	26.4	26.7	28.6	29.1	27.4	27.8	31.1	26.4
		Max	31.4	31.8	31.8	32.1	33.4	34	33.1	36.1	31.9	36.1
		Mean	29.26	30.05	29.79	29.73	30.83	31.2	30.38	31.45	31.6	30.46
		S.D.	1.124	1.238	1.688	1.387	1.198	1.325	1.4	1.823	0.436	1.543
61	Waist - Crotch (10-7)	Min	8.1	8.6	9.4	8.3	8.6	9.3	8.4	9.600	9.9	8.1
		Max	11.8	11.4	11	11.5	12	12	12	12.200	11.6	12.5
		Mean	9.325	10.01	10.49	9.811	10.47	10.73	10.74	10.842	11.033	10.32
		S.D.	0.999	0.706	0.537	0.76	0.796	0.889	0.734	0.657	0.981	0.90
62	Axilla - Crotch (11-7)	Min	17.5	17.8	19	16.8	17.8	19.6	17.3	19.3	19.6	16.4
		Max	20.1	21.1	21	21.3	22	22.2	21.5	21.7	19.9	22.2
		Mean	18.62	19.44	20.08	18.86	19.95	20.67	19.60	20.463	19.767	19.71
		S.D.	0.833	0.783	0.665	1.006	0.769	0.699	0.815	0.681	0.153	1.04

Neg.No.C5070

Table 52 – Part 1

Mercury Serial No.	Chest/Stature Groupings										Total Range
	1st Control - Chest girth	Up to 36.9			37.0 - 39.9			40.0 - 42.9		43-45.9	
	2nd Control - Stature	64.0-66.9	67.0-69.9	70.0-72.9	64.0-67.4	67.5-70.9	71.0-74.4	66.0-69.9	70.0-73.9	70.0-73.9	
	No. in group	13	21	14	12	56	27	18	22	5	200
2	Weight lb										
	Min	130	132	126	128	137	150	157	170	194	126
	Max	144	155	166	160	194	194	194	208	217	239
	Mean	136	143.667	144.286	149.333	161.393	167.444	179.111	188	208.4	163.8
	S.D.	4.082	6.613	10.388	8.845	11.969	11.274	10.476	9.217	9.044	20.63
3	Chest girth										
	Min	34.9	34	34	37	37	37	40	40	44	34
	Max	36.8	36.9	36.6	39.5	39.9	39.9	42.9	42.5	45.9	45.9
	Mean	35.831	36.019	35.886	38.083	38.212	38.181	41.094	41.118	44.580	38.55
	S.D.	0.572	0.877	0.816	0.788	0.856	0.854	0.871	0.668	0.766	2.273
4	Av. Torso hoop										
	Min	57.5	61.2	61.5	58.9	56.9	62.9	62.6	64.9	65.9	56.9
	Max	64.3	64.8	65.9	65.2	68.1	69	67.3	69.1	71.1	73.2
	Mean	60.715	62.467	63.593	61.867	63.904	65.7	65.867	66.850	69.1	64.44
	S.D.	1.776	1.139	1.444	1.474	2.053	1.516	1.181	1.432	1.924	2.606
5	Min Ankle girth, height										
	Min	4.1	4	4.7	4	4.4	4.6	4.2	4	4.8	4
	Max	5.1	5.2	5.5	5	5.7	5.9	5.5	5.5	5.7	5.9
	Mean	4.646	4.886	5.043	4.658	4.995	5.2	4.922	5.082	5.260	4.993
	S.D.	0.279	0.280	0.221	0.294	0.292	0.326	0.378	0.317	0.365	0.339
6	Knee pivot height										
	Min	17.3	18.1	19.2	17.7	18.7	19.1	18.2	19.5	20	16.6
	Max	19	20	20.5	19	20.7	22.2	20.6	21.3	21.4	22.7
	Mean	18.446	19.362	19.886	18.450	19.654	20.467	19.344	20.264	20.660	19.71
	S.D.	0.486	0.517	0.382	0.371	0.528	0.763	0.628	0.437	0.546	0.944
7	Crotch height										
	Min	28.9	29.5	31.2	29.5	30	31.5	28.8	31.8	33.3	28.5
	Max	32.1	33.8	35	32	34.9	36.7	32.8	36.7	34.9	38.2
	Mean	30.585	32.052	33.579	30.817	32.486	34.096	31.367	33.559	34.140	32.65
	S.D.	0.896	1.103	1.058	0.752	0.937	1.114	1.016	1.005	0.777	1.664
8	Wrist height										
	Min	31.2	32.4	34.4	31.8	32	35	32.1	33.5	36	31.2
	Max	33.9	35.3	36.6	33.8	36.7	38.3	35.9	37.1	37.5	39.3
	Mean	32.862	34.119	35.5	32.925	34.754	36.389	34.156	35.8	36.840	34.9
	S.D.	0.901	0.804	0.772	0.761	0.975	0.961	0.975	0.892	0.627	1.526
9	Thigh pivot height										
	Min	31.1	32.4	34.5	31.8	33.2	34.7	32.5	35.3	36.6	31.1
	Max	33.9	36.6	37	34.7	37.2	38.5	36.3	38	38.1	41.8
	Mean	32.992	34.681	36.043	33.308	35.350	36.941	34.578	36.482	36.980	35.46
	S.D.	0.738	1.065	0.785	0.887	0.843	0.944	1.010	0.758	0.630	1.664
10	Waist height										
	Min	38.2	40.6	42.6	38.4	39.3	42.9	39.3	42.1	43.6	38.2
	Max	41.9	43.6	45.4	42.2	44.6	47.1	43.5	46.3	45.8	49.2
	Mean	39.869	42.086	43.893	40.175	42.775	44.807	42.006	44.386	44.76	42.97
	S.D.	0.989	0.891	0.742	1.173	0.957	1.197	1.030	0.987	0.792	1.997
11	Axillary height										
	Min	47.8	50	51.8	47.7	49.5	52.5	48	51.1	53	47.3
	Max	50.1	53.3	54.5	52.7	54.4	57	53.5	55.3	55	58.5
	Mean	49.123	51.548	53.429	49.517	52.132	54.496	51.078	53.668	54.3	52.36
	S.D.	0.772	0.980	0.774	1.384	0.999	1.156	1.257	1.048	0.797	2.127
12	Supra-sternal height										
	Min	51.6	54	56.3	51.7	54.4	57.1	53.5	56.3	57.7	51.6
	Max	53.9	56.8	58.1	55.1	57.9	60.6	57.3	59.9	59.5	63.3
	Mean	53.054	55.543	57.521	53.783	56.407	58.589	55.639	58.150	58.740	56.61
	S.D.	0.729	0.942	0.551	1.174	0.842	0.981	1.080	0.995	0.730	2.11
13	Neck root height										
	Min	52.4	55	57.4	52.5	55.3	58	54.4	57.1	58.6	52.3
	Max	54.8	57.8	59.1	56	58.7	61.5	58.1	60.8	60.7	64.2
	Mean	53.954	56.433	58.457	54.625	57.3	59.519	56.489	59.050	59.760	57.51
	S.D.	0.696	0.892	0.515	1.204	0.832	0.971	1.108	0.993	0.796	2.136
14	7th Cervical height										
	Min	54.3	57.1	59.3	54.5	57.5	60.2	55.7	59.6	61.4	54
	Max	56.9	60.1	62.1	57.8	60.7	64.5	60.9	63.7	62.8	66.8
	Mean	55.946	58.633	60.936	56.525	59.496	61.996	58.617	61.359	62.360	59.75
	S.D.	0.716	0.956	0.756	1.147	0.785	1.019	1.374	1.012	0.611	2.273
15	Shoulder height 3¼" from C_L										
	Min	53.7	56.4	59	54.1	56.7	58.8	55.1	58.8	60.6	53.4
	Max	56.1	59.3	61.5	57.2	60.6	63.4	59.9	62.5	62.1	66.5
	Mean	55.3	57.833	60	55.792	58.748	61.207	57.889	60.714	61.48	59
	S.D.	0.643	0.873	0.654	1.112	0.918	1.083	1.234	1.023	0.567	2.278
16	Height (Stature)										
	Min	64.2	67.2	70	64.6	67.6	71	66	70.1	70.2	63.7
	Max	66.5	69.9	72.1	67.4	70.9	74.2	69.9	73.2	73.3	76.8
	Mean	65.662	68.590	70.993	66.325	69.398	72.115	68.161	71.386	72.18	69.67
	S.D.	0.679	0.877	0.737	1.101	0.919	0.878	1.186	0.893	1.310	2.415
17	Knee height - sitting										
	Min	19.1	20.1	21.4	20	20.8	21.5	20.3	21.7	22.5	19.1
	Max	20.8	22.1	22.6	21.5	23	24	22.7	23.3	23.6	25.1
	Mean	20.408	21.357	22.021	20.617	21.832	22.696	21.544	22.636	23.12	21.89
	S.D.	0.497	0.506	0.356	0.428	0.512	0.616	0.682	0.442	0.492	0.99
18	Buttock - Knee length										
	Min	21.2	22.5	23.2	21.5	22.3	23.4	22.1	23.4	24.3	21.2
	Max	23.4	24.3	24.5	24.2	25.5	26	24.8	26	25.8	26.8
	Mean	22.4	23.295	23.814	22.725	23.857	24.844	23.511	24.691	25.16	23.92
	S.D.	0.592	0.518	0.442	0.849	0.6	0.723	0.601	0.629	0.564	1.036
19	Heel/instep girth										
	Min	11.5	12	12.1	11.9	12	12.5	12.5	12.8	13.5	11.5
	Max	12.9	13	13.9	13	14.1	14.2	13.5	13.8	14	14.6
	Mean	12.308	12.552	12.757	12.375	12.898	13.307	13.139	13.350	13.8	12.97
	S.D.	0.388	0.299	0.477	0.336	0.424	0.380	0.322	0.284	0.235	0.551
20	Sitting height										
	Min	33.8	34.9	35.3	33.9	34.4	35	34.5	35.5	35.9	33.8
	Max	36.6	37.3	38.8	36.4	38.4	38.7	37.4	38.5	39	39.5
	Mean	34.877	36.205	37.307	35.2	36.223	37.407	36.056	37.209	37.260	36.48
	S.D.	0.749	0.612	0.870	0.739	0.924	0.880	0.831	0.855	1.176	1.198
21	Knee girth, fully flexed										
	Min	15	15.8	15.4	15.6	15.5	16.5	16.2	16.2	17.9	15
	Max	17	18.1	17.6	17.1	18.4	18.6	18	19.5	18.5	19.5
	Mean	16.077	16.586	16.464	16.325	16.916	17.244	17.2	17.695	18.240	16.99
	S.D.	0.597	0.661	0.740	0.475	0.708	0.639	0.519	0.840	0.279	0.847
22	Ankle - girth min.										
	Min	8	8	7.7	8	7.8	8	8.2	8.5	9.1	7.7
	Max	8.9	9.6	9.5	9.4	10.3	9.8	9.6	9.9	9.8	10.5
	Mean	8.508	8.571	8.564	8.567	8.846	8.956	9.133	9.277	9.5	8.883
	S.D.	0.281	0.404	0.473	0.452	0.465	0.409	0.416	0.358	0.308	0.495

Neg.No.C5071

24	Ankle girth 2½" above min.	Min	8.8	8.5	8	8.6	8.4	8.3	8.7	9	9.9	8
		Max	10	10.4	10.4	10.4	11.2	10.8	11	10.6	10.7	11.2
		Mean	9.346	9.319	9.150	9.475	9.673	9.6	10.072	10	10.26	9.564
		S.D.	0.333	0.572	0.660	0.6	0.537	0.579	0.655	0.454	0.336	0.613
25	Calf girth	Min	12.7	12.5	12.4	12.6	13	12.8	13.8	14	15.1	12.4
		Max	14.4	15	14.9	15.3	16	15.9	16.5	16.5	15.8	16.5
		Mean	13.631	13.724	13.657	14.1	14.477	14.230	15.178	15.195	15.320	14.42
		S.D.	0.429	0.683	0.822	0.816	0.688	0.745	0.862	0.754	0.295	0.895
26	Small girth	Min	12.1	12	12	11.8	12	12.1	12.7	12.5	13.7	11.8
		Max	13	14	13.5	14	14.7	15	14.9	15.3	14.6	15.3
		Mean	12.423	12.743	12.629	12.958	13.262	13.370	13.811	13.968	14.3	13.29
		S.D.	0.271	0.524	0.520	0.566	0.609	0.659	0.616	0.645	0.367	0.760
27	Knee girth, standing	Min	13.7	14	13.3	13.8	13.6	14.2	14.2	14.8	16	13.3
		Max	15	15.5	15.3	15.5	16.4	16.6	17.2	17.2	16.6	18.1
		Mean	14.308	14.6	14.436	14.875	15.2	15.367	15.756	15.950	16.36	15.22
		S.D.	0.377	0.455	0.620	0.458	0.611	0.562	0.724	0.640	0.329	0.802
28	Thigh girth, max	Min	19.9	19	18.2	19.4	19.9	20.1	21.4	20.2	21.4	18.2
		Max	21.4	22.2	23.1	23.5	25.4	24	25.2	25.4	26.5	27.2
		Mean	20.7	20.848	20.236	21.783	22.145	21.944	23.533	23.777	24.36	22.17
		S.D.	0.481	0.885	1.205	1.153	1.229	0.940	1.026	1.122	2.031	1.587
29	Buttock girth	Min	34.3	35.5	35.4	34.3	35.4	36.8	37.7	38	41.4	34.3
		Max	39	39.1	39.4	39.2	42	41.1	42.5	43	43.3	46.2
		Mean	36.438	36.919	36.921	37.683	38.730	39.052	40.439	40.977	42.46	38.85
		S.D.	1.152	0.954	1.164	1.406	1.463	1.105	1.264	1.131	0.868	2.029
30	Waist girth	Min	27	28.3	28	30	28.6	29.2	33.5	29.8	39.3	27
		Max	33.3	32.5	32.6	34.3	36.3	37.5	38.3	38.3	41.5	41.5
		Mean	30.485	30.390	29.957	32.275	32.623	32.685	35.544	35.559	40.04	32.96
		S.D.	1.551	1.105	1.248	1.556	1.673	1.851	1.230	1.966	0.882	2.707
32	Neck girth	Min	13.5	13.6	13.1	14.2	14	14.3	14.9	15	15.2	13.1
		Max	14.9	15	15.2	15.5	17.3	15.9	16.2	17.2	16.8	17.3
		Mean	14.192	14.462	14.450	14.817	14.980	15.030	15.533	15.814	15.88	15.03
		S.D.	0.395	0.323	0.529	0.383	0.565	0.485	0.336	0.557	0.606	0.689
33	Wrist girth	Min	6.4	6.1	6.4	6.4	6.3	6.1	6.6	6.6	7.2	6.1
		Max	6.9	7.1	7.1	7.2	7.5	7.8	7.8	7.9	7.7	8.1
		Mean	6.623	6.695	6.650	6.708	6.895	6.970	7.189	7.223	7.4	6.933
		S.D.	0.169	0.244	0.218	0.278	0.278	0.366	0.316	0.313	0.187	0.365
34	Wrist girth 2½" above min	Min	7.1	6.9	7.1	7.7	7.2	6.7	7.8	7.5	8.4	6.7
		Max	8.2	8.4	8.4	8.5	8.9	8.7	9.1	9.4	9.2	9.4
		Mean	7.731	7.705	7.479	8	7.996	7.856	8.494	8.382	8.72	8.018
		S.D.	0.357	0.372	0.398	0.298	0.404	0.486	0.369	0.355	0.342	0.497
35	Elbow girth - fully flexed	Min	12	12.4	13.1	13.3	12.4	12.3	13.3	13.5	13.8	12
		Max	14	13.9	14.6	14.7	14.8	14.9	15.1	15.8	14.8	15.8
		Mean	13.069	13.3	13.621	13.742	13.762	13.893	14.144	14.545	14.320	13.85
		S.D.	0.613	0.476	0.468	0.448	0.567	0.699	0.555	0.559	0.444	0.696
36	Biceps extended	Min	10.3	9.8	9.3	10.6	10.2	10.1	10.9	11.2	11.1	9.3
		Max	11.3	11.8	11.5	12.2	12.5	13.3	13.4	14	14	14
		Mean	10.685	10.729	10.307	11.392	11.4	11.341	12.311	12.495	12.66	11.47
		S.D.	0.316	0.545	0.588	0.599	0.591	0.811	0.637	0.736	1.055	0.922
37	Biceps contracted	Min	11.3	10.7	9.9	12.1	11.4	11.4	12.7	12.4	12.8	9.9
		Max	12.2	13.1	12.9	13.4	13.6	14.6	14.9	15.1	15.1	15.6
		Mean	11.685	11.838	11.429	12.575	12.580	12.593	13.694	13.773	14.2	12.69
		S.D.	0.254	0.566	0.712	0.416	0.537	0.780	0.596	0.795	0.962	1.002
38	Inter wrist span	Min	48	49.2	52.1	48.9	49.9	52.2	49.4	52.5	54.8	48
		Max	54	55.3	56.5	53	57.2	58.1	56.9	56.7	57.3	60.4
		Mean	50.723	52.581	54.757	51.092	53.570	55.467	52.683	55.236	55.8	53.76
		S.D.	1.445	1.318	1.442	1.238	1.583	1.450	1.795	1.216	0.919	2.274
39	Inter Elbow span	Min	35	35.3	36.7	35.2	35.9	36.8	35.6	37.7	38.5	34.6
		Max	39.4	40.2	41.5	37.9	40.9	42.8	40.9	41.3	40.7	42.8
		Mean	36.492	37.476	39.007	36.625	38.339	39.6	37.856	39.405	39.56	38.42
		S.D.	1.103	1.141	1.248	0.877	1.119	1.336	1.276	0.993	0.856	1.593
40	Elbow - wrist length	Min	9.1	9.4	9.8	9.2	9.3	9.9	9.4	9.9	10.3	8.9
		Max	10.2	10.7	10.9	10.4	11.2	11.2	10.6	11.3	10.7	12
		Mean	9.6	10.081	10.293	9.750	10.196	10.530	9.967	10.559	10.5	10.22
		S.D.	0.314	0.341	0.281	0.329	0.371	0.362	0.363	0.310	0.141	0.496
41	Shoulder - fingertip length	Min	30.1	30.5	32.2	29.6	30.8	31.9	30.2	33	33.8	29.6
		Max	33.1	34.6	39.7	33.3	35.9	36.1	34.5	39.5	35.8	39.7
		Mean	31.223	32.643	34.550	31.842	33.304	34.389	32.733	34.527	34.9	33.42
		S.D.	0.934	1.120	1.875	0.977	1.037	1	1.148	1.559	0.797	1.614
42	Shoulder breadth	Min	15.6	15.7	16.3	16.3	16	16.1	17.2	17.4	18.3	15.6
		Max	17.8	17.7	18.3	18.7	19.2	18.7	19.8	19.5	19.1	19.8
		Mean	16.9	17.019	17.307	17.458	17.675	17.874	18.372	18.505	18.72	17.75
		S.D.	0.639	0.567	0.623	0.715	0.660	0.765	0.784	0.579	0.335	0.833
43	Waist to waist through crotch	Min	23.3	25.2	26	24.1	24.4	26	26.9	26.8	25.6	23.3
		Max	28	29.4	30	27.2	31.5	30.5	30.7	32.3	32.2	34.3
		Mean	25.854	26.919	27.336	26.158	27.329	28.489	28.728	29.164	29.66	27.89
		S.D.	1.381	1.158	1.102	0.961	1.602	1.211	0.925	1.361	2.61	1.739
44	Waist to waist over shoulder	Min	33.1	34.6	34.7	35.4	33.5	34.5	35.6	36.5	36.9	33.1
		Max	38.1	38.1	39.4	38.2	40	39.8	40	39.9	42.7	42.7
		Mean	35.323	36.1	36.914	36.242	36.752	37.756	37.550	38.114	39.54	37.1
		S.D.	1.279	1.016	1.323	0.828	1.570	1.292	1.334	1.081	2.339	1.648
45	Shoe size	Min	6	7	6	6	7	7.5	7	7	9	6
		Max	10	9	11	8.5	11	11	10	11	10.5	12
		Mean	7.115	8.143	8.5	7.125	8.420	9.389	8.417	9.114	10.1	8.537
		S.D.	1.044	0.615	1.074	0.829	0.933	0.892	0.827	1.068	0.652	1.221
46	Head girth	Min	21.1	22	21.5	22	21.6	21.5	22.3	22.3	22.5	21.1
		Max	23.3	24	23.5	23.2	24.1	23.8	24	24.2	23.2	24.2
		Mean	22.331	22.552	22.493	22.7	22.802	22.833	23.122	23.168	22.98	22.81
		S.D.	0.609	0.473	0.581	0.384	0.530	0.469	0.460	0.537	0.295	0.55

Table 52 – Part 3

Mercury Serial No.	1st Control - Chest girth		Chest/Stature Groupings: Up to 36.9		37.0 - 39.9				40.0 - 42.9		43-45.9	Total Range
	2nd Control - Stature		64.0-66.9	67.0-69.9	70.0-72.9	64.0-67.4	67.5-70.9	71.0-74.4	66.0-69.9	70.0-73.9	70.0-73.9	
	No. in Group		13	21	14	12	56	27	18	22	5	200
50	Knee top to Knee pivot (17-6)	Min	1.6	1.6	1.8	1.5	1.5	1.5	1.4	2	2.1	1.4
		Max	2.4	2.5	2.5	2.5	2.7	2.7	2.8	3.3	2.8	3.3
		Mean	1.962	1.995	2.136	2.167	2.179	2.230	2.2	2.373	2.460	2.179
		S.D.	0.269	0.233	0.221	0.277	0.281	0.337	0.338	0.306	0.27	0.313
51	Torso length (15-7)	Min	23.2	24.5	24.9	23.9	23.3	25.9	24.5	24	26.8	23.2
		Max	26	26.9	27.8	26.7	28.4	28.4	27.9	28.6	28.8	29.8
		Mean	24.715	25.781	26.421	24.975	26.262	27.111	26.522	27.155	27.34	26.35
		S.D.	0.810	0.719	0.850	0.758	0.957	0.687	0.806	1.004	0.835	1.150
52	Axilla - wrist (11-8)	Min	15.1	16.2	16.7	15.1	15.3	16.7	14.6	16.8	16.7	14.6
		Max	18	19.1	19.2	18.9	19.5	19.3	19.4	18.7	18.2	20.5
		Mean	16.262	17.429	17.929	16.592	17.379	18.107	16.922	17.868	17.46	17.46
		S.D.	0.669	0.776	0.798	0.989	0.820	0.692	1.116	0.561	0.619	1.012
54	Head + Neck Length (16-15)	Min	9.8	10.3	10.3	10	9.6	10.1	9.6	9.6	9.6	9.6
		Max	10.9	11.2	11.9	11.2	12.2	12.4	11.1	11.7	11.4	12.4
		Mean	10.362	10.757	10.993	10.533	10.650	10.907	10.272	10.673	10.7	10.67
		S.D.	0.318	0.284	0.554	0.392	0.487	0.514	0.440	0.503	0.768	0.510
55	Ankle Circumference taper over 2½" (24-22)	Min	0.6	0.4	0.3	0.1	0.2	0.2	0.3	0.3	0.5	0.1
		Max	1.1	1.2	0.9	1.4	1.5	1.1	1.8	1	1.1	1.8
		Mean	0.838	0.748	0.586	0.908	0.827	0.644	0.939	0.723	0.76	0.781
		S.D.	0.156	0.260	0.221	0.406	0.254	0.255	0.406	0.202	0.241	0.291
56	Wrist Circumference taper over 2½" (34-33)	Min	0.7	0.4	0.6	0.9	0.6	0.4	0.8	0.8	1	0.4
		Max	1.6	1.4	1.3	1.9	1.6	1.2	1.7	1.5	1.9	1.9
		Mean	1.108	1.010	0.829	1.292	1.102	0.885	1.306	1.159	1.32	1.085
		S.D.	0.266	0.197	0.223	0.243	0.227	0.241	0.269	0.206	0.383	0.275
57	Axilla - waist (11-10)	Min	7.8	8.7	8.3	7.9	7.3	7.5	7.5	7.9	8	7.3
		Max	10.1	10.7	10.3	10.5	11.4	11.4	10.7	10.3	11.4	11.4
		Mean	9.254	9.462	9.536	9.342	9.357	9.689	9.072	9.282	9.54	9.391
		S.D.	0.783	0.524	0.610	0.729	0.969	0.768	0.720	0.727	1.397	0.815
58	Waist - thigh pivot (10-9)	Min	6	6.1	7.3	5.4	5.9	6.3	5.4	6.8	6.5	5.4
		Max	8.2	8.3	8.4	7.5	8.8	8.8	9	9.4	9	9.6
		Mean	6.877	7.405	7.850	6.867	7.425	7.867	7.428	7.905	7.78	7.513
		S.D.	0.627	0.645	0.361	0.587	0.743	0.685	0.817	0.593	1.043	0.762
59	Thigh pivot - Knee pivot (9-6)	Min	13.8	14.3	15	13.8	14.5	15.1	13.4	14.9	15.4	13.3
		Max	15.2	16.9	17	15.7	16.9	17.7	16.1	17.8	17.1	19.6
		Mean	14.546	15.319	16.157	14.858	15.696	16.474	15.233	16.218	16.32	15.74
		S.D.	0.424	0.711	0.620	0.649	0.640	0.640	0.712	0.631	0.638	0.919
60	Thigh pivot - Ankle (9-5)	Min	26.4	27.7	29.8	26.8	28.6	29.5	27.4	30.1	31.1	26.4
		Max	29.5	31.5	31.8	30.4	32.8	33.4	30.9	33.1	32.4	36.1
		Mean	28.346	29.795	31	28.650	30.355	31.741	29.656	31.4	31.72	30.46
		S.D.	0.810	1.044	0.724	1.005	0.852	0.978	1.016	0.752	0.497	1.543
61	Waist-Crotch (10-7)	Min	8.1	9.2	9.3	8.3	8.6	9.2	9.7	8.4	9.7	8.1
		Max	11.8	11.2	11.4	10.4	12	12	11.4	12.2	11.6	12.5
		Mean	9.285	10.033	10.314	9.358	10.289	10.711	10.639	10.827	10.62	10.32
		S.D.	1.031	0.646	0.602	0.689	0.841	0.741	0.495	0.824	0.92	0.90
62	Axilla-Crotch (11-7)	Min	17.5	18.1	18.9	17.7	16.4	18.4	18.7	17.3	19.6	16.4
		Max	19.9	21.1	21	20.9	22	22.2	21.5	21.7	21.7	22.2
		Mean	18.538	19.495	19.850	18.7	19.646	20.4	19.711	20.109	20.16	19.71
		S.D.	0.738	0.803	0.689	0.825	1.123	0.770	0.686	1.001	0.868	1.04

Neg.No.C5073

Table 53 – Part 1

Mercury Serial No.	1st Control - Weight		Weight/Stature Groupings									Total Range
			Up to 154 lb.			155 - 179			180 - 204		205-229	
	2nd Control - Stature		63.0 - 65.9	66.0 - 68.9	69.0 - 71.9	64.5 - 67.9	68.0 - 71.4	71.5 - 74.9	67.0 - 70.9	71.0 - 74.9	71.0 - 74.9	
	No. in Group		13	29	27	13	50	15	19	19	5	200
2	Weight lb	Min	128	134	126	156	155	156	180	180	208	126
		Max	152	154	154	175	179	178	194	204	217	239
		Mean	138.231	142.862	145.963	161.846	165.900	168.200	185.474	190.316	211.600	163.8
		S.D.	7.886	6.226	6.914	6.656	7.503	6.527	4.858	6.473	4.099	20.63
3	Chest girth	Min	34.9	34	34	37.4	36.3	37	37.5	38.7	41.8	34
		Max	38.6	39.5	38.6	43	41.1	40.1	43.3	44.5	45.9	45.9
		Mean	36.454	36.769	36.352	39.608	38.550	38.253	40.995	40.984	43.620	38.55
		S.D.	1.107	1.210	1.080	1.623	1.168	0.837	1.516	1.203	1.630	2.273
4	Av. Torso Hoop	Min	57.5	56.9	60.7	60.7	61.1	62.9	64.2	64.5	68.9	56.9
		Max	64.3	64.4	65.7	66.3	68.1	69	67.8	69.1	71.1	73.2
		Mean	60.769	61.734	63.007	63.631	64.884	65.760	66.126	66.895	69.700	64.44
		S.D.	1.783	1.465	1.399	1.647	1.495	1.667	1.053	1.482	0.837	2.606
5	Min Ankle girth, height	Min	4.1	4	4.6	4.2	4.4	4.6	4	4.8	5	4
		Max	5.1	5.3	5.5	5.4	5.7	5.9	5.5	5.7	5.5	5.9
		Mean	4.654	4.821	5.063	4.792	4.972	5.233	5.047	5.168	5.240	4.993
		S.D.	0.276	0.320	0.232	0.333	0.305	0.366	0.370	0.208	0.195	0.339
6	Knee pivot height	Min	16.6	18.1	18.8	18	18.6	19.5	18.5	19.8	20.4	16.6
		Max	18.9	20.3	20.6	19.4	20.7	22.2	20.5	21.7	21.8	22.7
		Mean	18.069	19.048	19.811	18.738	19.676	20.820	19.842	20.426	21.080	19.71
		S.D.	0.629	0.507	0.392	0.384	0.499	0.712	0.503	0.487	0.606	0.944
7	Crotch height	Min	28.9	29.5	31.2	28.8	30.8	32.3	30	32.5	33.3	28.5
		Max	32.1	33.4	35	32.2	34.5	36.7	34.8	36.7	36.5	38.2
		Mean	30.231	31.545	33.252	30.854	32.472	34.720	32.347	33.916	34.680	32.65
		S.D.	0.943	0.880	1.034	1.019	0.8	0.976	1.108	1.053	1.176	1.664
8	Wrist height	Min	31.2	32	34	31.4	32.9	35.2	33	34.5	36.5	31.2
		Max	33.9	34.9	36.6	34.4	37.1	38.3	36.5	37.8	38.1	39.3
		Mean	32.623	33.431	35.089	33.231	35.016	36.607	35.016	36.232	37.240	34.9
		S.D.	0.854	0.713	0.605	0.974	0.9	0.795	0.909	0.823	0.647	1.526
9	Thigh pivot height	Min	31.1	32.4	34.1	32.5	33.6	34.9	33.1	35.3	36.6	31.1
		Max	33.5	36	37	34.7	37.4	38.5	37.1	39.5	38.7	41.8
		Mean	32.531	34.276	35.763	33.762	35.460	37.293	35.479	36.916	37.240	35.46
		S.D.	0.735	0.988	0.855	0.594	0.851	0.882	1.046	0.993	0.873	1.664
10	Waist height	Min	38.2	39.5	41.5	39.3	41.2	43.5	41.1	43.1	43.6	38.2
		Max	40.6	43	45.5	42.8	44.8	47.1	44.7	46.7	46.7	49.2
		Mean	39.238	41.469	43.356	40.885	42.890	45.387	43.105	44.811	45.260	42.97
		S.D.	0.790	0.997	1.036	1.187	0.775	1.033	1.175	0.953	1.157	1.997
11	Axillary height	Min	47.300	48.8	51.6	48	50.6	53.1	50.3	53	54.1	47.3
		Max	50.1	52.6	54.5	52.7	54.2	57	54.4	56.7	57	58.5
		Mean	48.631	50.479	52.867	50.092	52.462	54.973	52.168	54.258	55.180	52.36
		S.D.	0.850	0.831	0.819	1.449	0.888	1.059	1.069	0.952	1.089	2.127
12	Supra-sternal height	Min	51.6	53.1	55.8	52.5	55	57.8	54.6	57.5	58.3	51.6
		Max	53.8	56.4	58.1	55.2	58.2	60.6	58.1	60.3	61.2	63.3
		Mean	52.569	54.783	56.919	54.354	56.720	59.1	56.526	58.632	59.620	56.61
		S.D.	0.703	0.881	0.693	0.841	0.726	0.910	1.045	0.772	1.062	2.11
13	Neck root height	Min	52.3	54	56.8	53.3	56.1	58.8	55.3	58.4	59.4	52.3
		Max	54.4	57.1	59.1	56	59.1	61.5	58.9	61.5	62.1	64.2
		Mean	53.431	55.652	57.830	55.254	57.606	60.020	57.511	59.574	60.560	57.51
		S.D.	0.733	0.848	0.725	0.891	0.742	0.917	1.070	0.804	1.006	2.136
14	7th cervical height	Min	54	56	59.3	55.5	58.2	61.1	57.5	60.7	62.1	54
		Max	56.4	59.3	62.1	58.5	61.6	64.5	61.3	64.2	64.3	66.8
		Mean	55.346	57.738	60.230	57.269	59.876	62.573	59.632	61.889	63.140	59.75
		S.D.	0.750	0.897	0.818	0.938	0.797	1.002	1.036	0.885	0.862	2.273
15	Shoulder height 3½" from CL	Min	53.4	55.5	58.3	54.7	57.6	60.6	56.6	60	61.3	53.4
		Max	55.7	58.3	61.5	57.4	61.1	63.4	60.6	63.6	63.8	66.5
		Mean	54.723	56.893	59.393	56.569	59.082	61.780	59.063	61.279	62.280	59
		S.D.	0.717	0.812	0.805	0.911	0.765	0.905	1.123	0.892	0.960	2.278
16	Height (Stature)	Min	63.7	66	69.1	65.3	68	71.5	67	71	71.5	63.7
		Max	65.7	68.9	71.9	67.7	71.4	74.8	70.9	74.3	74	76.8
		Mean	65.046	67.690	70.152	66.885	69.824	72.673	69.4	71.879	73.020	69.67
		S.D.	0.605	0.856	0.917	0.8	0.960	0.941	1.147	0.833	0.920	2.415
17	Knee height - sitting	Min	19.1	20.1	21.1	20	20.6	22.1	20.8	22.1	22.7	19.1
		Max	20.8	22.3	22.6	21.5	22.7	24	23	23.7	24.3	25.1
		Mean	20.154	21.076	21.922	20.885	21.856	23.040	22.205	22.826	23.420	21.89
		S.D.	0.503	0.515	.38	0.404	0.441	0.544	0.572	0.453	0.576	0.99
18	Buttock - Knee length	Min	21.2	21.5	22.8	22.3	23.1	24	22.1	24.4	25.1	21.2
		Max	23.4	24.2	24.5	24.8	25.5	26.1	25	26.2	26	26.8
		Mean	22.162	23.083	23.767	23.208	24.082	24.960	23.837	25.079	25.580	23.92
		S.D.	0.541	0.551	0.476	0.685	0.612	0.757	0.637	0.587	0.342	1.036
19	Heel/Instep girth	Min	11.5	11.9	12.1	12	12	12.9	13	13	13.6	11.5
		Max	12.8	13.5	13.9	13.2	13.9	14.2	14.1	14	14	14.6
		Mean	12.269	12.507	12.659	12.646	12.99	13.520	13.337	13.421	13.8	12.97
		S.D.	0.373	0.351	0.395	0.338	0.364	0.369	0.265	0.288	0.158	0.551
20	Sitting height	Min	33.8	34.4	34.4	33.9	35.1	36.2	34.6	35	37.1	33.8
		Max	36.6	37	37.9	36.4	38.5	38.7	37.1	38.5	39	39.5
		Mean	34.7	35.683	36.670	35.208	36.706	37.593	36.079	37.263	37.940	36.48
		S.D.	0.704	0.663	0.848	0.733	0.893	0.790	0.661	0.957	0.688	1.198
21	Knee girth fully flexed	Min	15	15.5	15.6	15.9	16	16.5	16.2	16.7	18	15
		Max	17	17.7	17.6	17.7	18.2	18.6	19.	19.5	18.5	19.5
		Mean	15.985	16.348	16.504	16.677	17.188	17.280	17.337	17.842	18.340	16.99
		S.D.	0.558	0.532	0.586	0.520	0.553	0.669	0.748	0.713	0.230	0.847
22	Ankle - girth min	Min	8	8	8	8	7.8	8.6	8.9	8.5	9.1	7.7
		Max	8.9	9.4	9.1	9.4	9.6	9.4	10.3	9.9	9.8	10.5
		Mean	8.485	8.528	8.552	8.762	8.926	9.020	9.384	9.337	9.520	8.883
		S.D.	0.339	0.345	0.317	0.391	0.404	0.251	0.318	0.376	0.295	0.495

24	Ankle girth 2½" above min.	Min	8.8	8.5	8.3	8.7	8.4	8.9	9.4	9	10.2	8
		Max	10.2	10.4	10	10.4	10.6	10.1	11.2	10.8	10.7	11.2
		Mean	9.454	9.262	9.259	9.677	9.714	9.627	10.363	10.074	10.4	9.664
		S.D.	0.446	0.469	0.516	0.517	0.490	0.358	0.474	0.499	0.212	0.613
25	Calf girth	Min	12.7	12.5	12.6	13.8	13.4	13.5	14.4	14.1	15.1	12.4
		Max	15	14.7	15.1	15.3	15.9	15	16.5	16.5	15.8	16.5
		Mean	13.862	13.562	13.863	14.562	14.554	14.22	15.489	15.347	15.5	14.42
		S.D.	0.651	0.565	0.630	0.417	0.578	0.443	0.661	0.675	0.265	0.895
26	Small girth	Min	11.8	12	12	12.5	12.3	12.5	13.5	13.4	14.2	11.8
		Max	13.5	13.6	13.5	14.2	14.7	14.2	14.9	15.3	14.6	15.3
		Mean	12.508	12.641	12.648	13.369	13.450	13.340	13.979	14.179	14.480	13.29
		S.D.	0.459	0.427	0.356	0.525	0.513	0.479	0.471	0.532	0.164	0.760
27	Knee girth, standing	Min	13.7	13.6	13.6	14.1	14.2	14.5	14.8	15.1	16	13.3
		Max	15.2	15.5	15.4	17.2	16.3	16.1	17.1	16.6	17.2	18.1
		Mean	14.438	14.555	14.559	15.277	15.398	15.293	15.874	16.005	16.620	15.22
		S.D.	0.479	0.482	0.427	0.779	0.446	0.488	0.599	0.475	0.427	0.802
28	Thigh girth, max	Min	19.4	19	18.2	21.4	20.8	20.2	22.4	21.4	24.2	18.2
		Max	22.5	22.6	21.9	23.5	24.7	23.1	25.4	25.4	26.5	27.2
		Mean	20.9	20.821	20.585	22.562	22.486	21.9	23.989	23.8	25.160	22.17
		S.D.	0.950	0.802	0.835	0.621	0.849	0.854	0.768	1.008	1.026	1.587
29	Buttock girth	Min	34.3	35.4	35.4	37.4	37.5	37.6	38.8	40.1	41.7	34.3
		Max	39	39.2	38.7	40	41.8	41	42.5	43	43.3	46.2
		Mean	36.554	36.928	36.978	38.862	39.252	39.007	40.974	41.211	42.560	38.85
		S.D.	1.531	0.828	0.933	0.702	1.002	0.943	0.985	0.829	0.680	2.029
30	Waist girth	Min	27	28.6	28	31.6	29	29.8	32	32.3	36.9	27
		Max	34	34.3	32.3	36.8	36	35	38.3	39.5	40.2	41.5
		Mean	30.946	30.721	30.489	34.385	33.138	32.360	35.379	35.832	38.840	32.96
		S.D.	1.849	1.305	1.191	1.339	1.519	1.489	1.562	1.913	1.333	2.707
32	Neck girth	Min	13.5	13.6	13.1	14.3	14.2	14.4	14.9	15	15.5	13.1
		Max	14.9	15.2	15.2	16.2	15.9	15.9	17.3	17.2	16.8	17.3
		Mean	14.331	14.497	14.552	15.231	15.036	15.120	15.642	15.784	16.2	15.03
		S.D.	0.425	0.408	0.450	0.553	0.426	0.539	0.534	0.558	0.485	0.689
33	Wrist girth	Min	6.4	6.1	6.1	6.4	6.3	6.6	6.9	6.6	7.4	6.1
		Max	6.9	7	7.1	7.8	7.5	7.6	7.6	7.9	7.8	8.1
		Mean	6.623	6.679	6.652	6.962	6.942	7.020	7.253	7.242	7.620	6.933
		S.D.	0.183	0.208	0.238	0.384	0.261	0.270	0.190	0.324	0.205	0.365
34	Wrist girth 2½" above min	Min	7.1	6.9	6.7	7.7	7.3	7.5	8	7.5	8.4	6.7
		Max	8.2	8.4	8.2	8.7	8.7	8.5	9.1	9.4	8.9	9.4
		Mean	7.831	7.686	7.585	8.223	8.056	7.953	8.584	8.347	8.660	8.018
		S.D.	0.304	0.350	0.370	0.314	0.388	0.311	0.295	0.379	0.182	0.497
35	Elbow girth - fully flexed	Min	12	12.4	12.4	13.4	12.3	13	13.3	13.5	13.8	12
		Max	13.8	14.3	14.8	14.7	15	15	15.8	15.3	15.5	15.8
		Mean	13.038	13.4	13.581	13.977	13.808	13.980	14.374	14.337	14.740	13.85
		S.D.	0.571	0.491	0.645	0.398	0.586	0.696	0.585	0.528	0.643	0.696
36	Biceps extended	Min	10.300	10.3	9.3	10.6	10.6	10.1	11.2	11.1	12.5	9.3
		Max	12.2	11.8	11.9	13.2	13.	12	14	13.6	14	14
		Mean	10.938	10.762	10.593	11.869	11.624	11.207	12.358	12.4	13.020	11.47
		S.D.	0.594	0.495	0.559	0.718	0.545	0.530	0.687	0.698	0.610	0.922
37	Biceps contracted	Min	11.3	10.7	9.9	12	11.7	11.4	12.6	12.4	13.7	9.9
		Max	12.7	13.1	12.9	13.6	13.8	13	15.1	15	15.1	15.6
		Mean	11.931	11.931	11.793	12.962	12.802	12.333	13.937	13.595	14.360	12.69
		S.D.	0.437	0.575	0.679	0.457	0.505	0.541	0.748	0.712	0.498	1.002
38	Inter wrist span	Min	48	49.2	52.1	49.4	49.9	52.2	50.7	53.7	54.8	48
		Max	51.8	56.9	58.1	53	57.2	58	56	59.6	57.1	60.4
		Mean	50.1	52.248	54.419	51.862	53.676	55.707	53.516	55.837	56	53.76
		S.D.	1.274	1.811	1.514	1.076	1.577	1.490	1.458	1.289	0.914	2.274
39	Inter elbow span	Min	34.6	35.3	36.7	35.6	36.1	36.8	36.8	38.2	38.5	34.6
		Max	37.5	39.8	42.8	38.5	40.9	41.5	41.3	41.6	40.9	42.8
		Mean	35.954	37.324	38.930	37.331	38.452	39.827	38.237	39.621	39.7	38.42
		S.D.	0.846	1.289	1.476	0.726	1.125	1.277	1.131	0.859	0.951	1.593
40	Elbow - wrist length	Min	8.9	9.3	9.8	9.3	9.5	9.9	9.4	10.2	10.5	8.9
		Max	10	10.8	10.9	10.4	11.2	11.1	10.7	11.4	11.3	12
		Mean	9.454	9.966	10.252	9.769	10.224	10.587	10.253	10.632	10.740	10.22
		S.D.	0.313	0.399	0.295	0.322	0.346	0.387	0.339	0.267	0.329	0.496
41	Shoulder - fingertip length	Min	29.6	30.4	31.6	30.8	31.2	33.3	30.2	33	33.8	29.6
		Max	32.5	34.8	39.7	33.3	35.9	36.1	35	39.5	36.5	39.7
		Mean	30.869	32.417	33.867	32.154	33.402	34.893	33.179	34.726	34.960	33.42
		S.D.	0.877	1.136	1.510	0.741	1.014	0.866	1.084	1.607	0.994	1.614
42	Shoulder breadth	Min	15.6	15.9	16	17.2	15.7	16.6	17.4	17.4	17.6	15.6
		Max	17.7	18.3	18.8	18.7	19.6	19.1	19.8	19.1	19	19.8
		Mean	16.862	17.166	17.511	17.662	17.754	17.787	18.468	18.511	18.440	17.75
		S.D.	0.598	0.569	0.701	0.514	0.794	0.797	0.731	0.414	0.541	0.833
43	Waist to waist thro' crotch	Min	23.3	24.8	25.3	25.4	24.4	27.4	26.4	25.6	28.7	23.3
		Max	28	29.4	30	30.7	31	30.1	31.5	32.3	31.3	34.3
		Mean	25.731	26.528	27.070	27.469	28.144	28.780	28.963	29.116	29.940	27.89
		S.D.	1.339	1.071	1.264	1.446	1.360	0.973	1.202	1.536	1.014	1.739
44	Waist to waist over shoulder	Min	34.1	33.1	34.3	33.9	34.1	34.8	34.9	37	37.9	33.1
		Max	38.1	38.1	39.6	40	40	39.1	39.7	41	42.7	42.7
		Mean	35.677	35.614	36.637	36.685	37.354	37.560	37.553	38.384	39.980	37.1
		S.D.	1.064	1.133	1.499	1.796	1.342	1.178	1.273	1.131	1.835	1.648
45	Shoe size	Min	6	6	6	6.5	7	8	8	7	9	6
		Max	8	10	11	10	11	11	10	11	11	12
		Mean	6.962	7.793	8.241	7.615	8.6	9.733	8.895	9.263	10.4	8.537
		S.D.	0.660	0.968	1.004	0.939	0.857	0.923	0.658	1.085	0.822	1.221
46	Head girth	Min	21.1	22	21.5	22	22.1	21.5	22.3	22.3	22.9	21.1
		Max	23.3	23.2	23.7	23.7	24	23.8	24.1	24.2	23.3	24.2
		Mean	22.323	22.614	22.537	22.662	22.9	22.9	23.132	23.137	23.160	22.81
		S.D.	0.614	0.330	0.551	0.493	0.456	0.601	0.576	0.520	0.152	0.55

Mercury Serial No.	Weight/Stature Groupings										Total Range
	1st Control - Weight	Up to 154 lb			155 - 179			180 - 204		205-229	
	2nd Control - Stature	63.0 - 65.9	66.0 - 68.9	69.0- 71.9	64.5- 67.9	68.0 - 71.4	71.5 - 74.9	67.0- 70.9	71.0- 74.9	71.0- 74.9	
	No. in Group	13	29	27	13	50	15	19	19	5	200
50	Knee top to Knee pivot (17-6) Min	1.6	1.5	1.7	1.4	1.6	1.5	1.5	1.9	2	1.4
	Max	2.7	2.7	2.5	2.5	2.8	2.7	2.7	3.3	2.8	3.3
	Mean	2.085	2.028	2.111	2.146	2.18	2.22	2.358	2.405	2.340	2.179
	S.D.	0.339	0.295	0.212	0.288	0.269	0.359	0.293	0.331	0.321	0.313
51	Torso length (15-7) Min	23.2	23.3	24	24.5	24.5	25.9	25.8	24	26.8	23.2
	Max	25.8	26.9	27.9	27.3	28.4	28.4	27.8	28.6	28.8	29.8
	Mean	24.492	25.348	26.141	25.715	26.610	27.060	26.853	27.226	27.6	26.35
	S.D.	0.720	0.811	0.934	0.878	0.734	0.765	0.542	1.058	0.803	1.150
52	Axilla - wrist (11-8) Min	14.8	15.8	16.2	14.6	15.3	16.8	14.7	16.7	16.7	14.6
	Max	16.9	19.1	19.2	18.9	19.5	19.3	18.7	19.5	18.9	20.5
	Mean	16.008	17.048	17.778	16.862	17.446	18.367	17.379	17.8	17.940	17.46
	S.D.	0.645	0.9	0.729	0.982	0.877	0.720	0.881	0.717	0.856	1.012
54	Head + Neck length (16-15) Min	9.8	10.4	10	9.6	9.6	10.2	9.8	9.6	10.2	9.6
	Max	11.1	12.2	11.6	10.9	12.4	11.8	11.1	11.7	11.4	12.4
	Mean	10.323	10.797	10.759	10.315	10.742	10.893	10.5	10.437	10.74	10.67
	S.D.	0.327	0.367	0.419	0.341	0.571	0.482	0.386	0.455	0.555	0.510
55	Ankle circumference taper over 2½" (24-22) Min	0.6	0.1	0.3	0.5	0.2	0.2	0.3	0.3	0.7	0.1
	Max	1.4	1.2	1.2	1.5	1.5	1	1.8	1.7	1.1	1.8
	Mean	0.969	0.734	0.707	0.915	0.788	0.607	0.942	0.774	0.880	0.781
	S.D.	0.269	0.241	0.262	0.346	0.258	0.219	0.315	0.338	0.148	0.291
56	Wrist circumference taper over 2½" (34-33) Min	0.7	0.4	0.6	0.8	0.4	0.6	0.8	0.9	0.8	0.4
	Max	1.6	1.4	1.5	1.9	1.6	1.2	1.6	1.5	1.5	1.9
	Mean	1.208	1.007	0.933	1.262	1.114	0.933	1.258	1.179	1.040	1.085
	S.D.	0.250	0.233	0.220	0.299	0.241	0.180	0.241	0.190	0.270	0.275
57	Axilla - Waist (11-10) Min	8.1	7.3	7.5	7.5	7.6	7.5	7.9	8.3	8.3	7.3
	Max	10.1	10.1	10.7	11.4	11.3	10.5	10.3	10.3	11.4	11.4
	Mean	9.392	9.010	9.511	9.208	9.572	9.587	9.063	9.447	9.920	9.391
	S.D.	0.539	0.782	0.755	1.172	0.751	0.784	0.698	0.654	1.119	0.815
58	Waist - thigh pivot (10-9) Min	5.4	6.3	6.1	5.4	5.9	7.3	6.5	6.2	6.9	5.4
	Max	7.8	8.3	8.8	9	8.6	8.8	8.6	9.4	9	9.6
	Mean	6.708	7.193	7.593	7.123	7.430	8.093	7.716	7.805	8.020	7.513
	S.D.	0.609	0.605	0.656	1.130	0.686	0.454	0.615	0.721	0.750	0.762
59	Thigh pivot - Knee pivot (9-6) Min	13.8	14.3	14.6	13.4	14.8	15.1	14.6	14.3	15.4	13.3
	Max	15.3	16.6	17	15.7	17.7	17.4	17.1	17.8	16.9	19.6
	Mean	14.462	15.228	15.952	15.023	15.784	16.473	15.953	16.174	16.160	15.74
	S.D.	0.527	0.681	0.743	0.619	0.676	0.561	0.709	0.960	0.532	0.919
60	Thigh pivot - ankle (9-5) Min	26.4	27.7	28.9	27.4	28.8	29.5	27.8	28.2	31.1	26.4
	Max	29	31.5	31.8	29.9	32.8	33.4	33.1	34.4	33.4	36.1
	Mean	27.877	29.455	30.7	28.969	30.488	32.060	30.884	31.295	32	30.46
	S.D.	0.897	0.969	0.811	0.656	0.860	0.925	1.181	1.296	0.903	1.543
61	Waist - Crotch (10-7) Min	8.5	8.1	8.4	9.2	8.6	9.8	9.4	8.4	9.9	8.1
	Max	11.2	11.8	12	11.4	12	11.6	12	12.2	11.6	12.5
	Mean	9.531	9.966	9.907	10.338	10.362	10.627	10.758	10.895	10.580	10.32
	S.D.	0.950	0.854	0.845	0.794	0.776	0.619	0.665	0.890	0.676	0.90
62	Axilla - Crotch (11-7) Min	17.5	16.4	16.8	18.5	18.4	17.7	17.8	17.3	19.8	16.4
	Max	20.8	22.2	20.6	22	21.7	21	22	21.7	21.7	22.2
	Mean	19.046	19.197	19.211	19.623	19.998	19.987	19.821	20.342	20.5	19.71
	S.D.	1	1.253	0.909	1.057	0.856	0.785	0.878	1.015	0.758	1.04

Subject	MM		NW		CR		SM	
Date	2/12/1966		2/12/1966		23/11/1966		5/12/1966	
Measured by	CBB	RES	CBB	RES	CBB	CBB	CBB	RES
Chest girth	37.1	37.0	38.0	37.9	36.6	36.3	38.6	37.6
Average torso hoop	60.7	61.6	63.6	64.0	60.9	61.5	63.9	63.7
Min Ankle girth	4.6	4.7	5.6	5.7	5.0	5.1	5.3	5.3
Knee pivot height	18.4	18.4	19.7	19.8	19.7	19.7	20.8	20.7
Crotch height	31.2	31.5	33.5	33.7	33.2	33.5	34.9	34.8
Wrist height	33.2	32.9	35.8	36.3	33.5	34.0	36.5	36.9
Thigh pivot height	33.2	33.2	35.8	35.8	36.4	36.6	37.1	37.2
Waist height	41.0	40.9	44.2	44.3	42.7	42.7	43.8	43.9
Axillary height	50.5	50.3	53.0	53.3	51.5	51.6	54.6	54.8
Suprasternal height	54.3	54.5	56.9	57.0	55.9	56.4	57.8	58.1
Neck root height	55.1	55.2	57.7	57.9	56.8	57.2	58.8	59.0
7th cervical height	57.2	57.1	60.4	60.4	59.3	59.4	61.2	60.9
Shoulder height, $3\frac{1}{4}$ from ℄	56.3	56.2	59.1	59.1	58.4	58.3	60.5	60.5
Height	67.0	67.1	69.9	69.9	69.1	69.5	70.5	70.5
Knee height sitting	20.9	21.0	22.2	22.3	22.1	22.1	22.8	23.0
Buttock-knee length	23.0	23.0	24.4	24.4	23.6	24.0	24.4	23.9
Heel/Instep girth	12.0	12.0	13.9	13.9	12.1	12.2	12.8	12.9
Sitting height	35.6	35.7	36.5	36.5	35.4	36.0	35.9	35.9
Knee girth, fully flexed	16.0	15.4	17.0	17.1	16.0	16.0	16.9	16.5
Ankle girth min	8.1	8.1	9.1	9.1	8.5	8.5	8.6	8.6
Ankle girth $2\frac{1}{2}$" above min	8.7	8.7	10.0	10.1	9.3	9.3	9.5	9.5
Calf girth	12.7	12.6	15.3	15.2	13.7	13.6	15.6	15.6
Small girth	12.2	12.2	14.0	13.9	12.5	12.3	13.7	13.7
Knee girth, standing	14.7	14.5	15.6	15.4	14.5	14.1	15.3	15.5
Thigh girth, max.	20.8	20.7	21.9	22.0	21.2	21.2	23.5	23.4
Buttock girth	38.0	37.8	39.0	39.0	37.1	36.4	38.0	38.1
Waist girth	30.4	30.5	32.2	32.1	31.4	30.7	30.8	30.7
Neck girth	14.5	14.5	14.4	14.2	14.8	14.7	15.0	14.8
Wrist girth, min.	6.7	6.8	7.5	7.5	6.6	6.6	7.0	7.1
Wrist girth, $2\frac{1}{2}$" above min	7.6	7.8	8.5	8.7	7.5	7.6	7.8	8.0
Elbow-girth fully flexed	14.0	14.1	14.5	14.4	14.0	13.5	15.2	14.7
Biceps, extended	11.6	11.0	11.4	10.8	11.5	11.3	12.4	12.2
Biceps, contracted	12.6	12.6	12.2	12.2	12.3	12.2	14.0	14.0
Inter wrist span	52.5	52.2	51.9	51.2	54.1	53.9	53.7	53.5
Inter elbow span	38.2	37.7	36.4	36.4	37.8	37.6	38.0	37.8
Elbow wrist length	10.0	9.9	10.0	9.9	10.8	10.6	10.8	10.7
Shoulder-fingertip length	32.8	32.6	32.7	32.9	33.6	33.7	33.6	33.4
Shoulder breadth	17.7	17.4	17.5	17.2	16.8	16.8	17.3	17.5
Waist-waist thro' crotch	26.4	27.0	29.4	29.0	26.0	25.6	26.0	26.2
Waist-waist over shoulder	34.5	35.5	35.3	35.6	35.2	35.6	38.3	38.5
Head girth	23.1	23.1	23.5	23.2	22.0	22.0	22.6	22.5

Table 54

COMPARISON OF MEASURES AND REPEATABILITY OF MEASUREMENT CHECK RESULTS

T.R. 67125

Computer Ref. No.	Measurement	Illustrated at Table No.	Man sizes (theoretical) in inches								
			1	2	3	4	5	6	7	8	9
3	Chest girth	1	36.9	36.9	36.9	39.9	39.9	39.9	42.9	42.9	45.9
4	Torso hoop	2	61.4	63.9	66.4	62.9	65.9	68.9	66.4	69.9	70.4
21	Knee girth, fully flexed	19	17.6	18.1	17.4	17.9	18.6	18.4	19.5	18.7	18.5
28	Thigh girth, max.	25	21.4	22.2	23.1	23.8	25.4	24.9	24.5	25.2	26.5
29	Buttock girth	26	37.3	39.1	39.4	40.7	41.5	42.0	42.5	43.0	43.2
30	Waist girth	27	32.8	33.3	32.6	34.4	37.5	36.1	39.8	38.3	41.5
32	Neck girth	28	14.7	15.2	15.0	15.8	17.3	16.0	16.2	17.2	16.0
35	Elbow girth, fully flexed	31	14.0	14.6	14.5	14.7	14.8	15.0	15.3	15.8	14.8
5	Min. ankle diameter height	3	4.8	4.9	4.9	4.9	5.1	5.1	5.0	5.1	5.1
6	Knee pivot height	4	18.9	19.5	19.3	19.2	19.9	20.3	19.8	20.3	20.6
7	Crotch height	5	31.7	32.4	32.1	32.0	33.0	33.4	32.5	33.3	34.2
9	Thigh pivot height	7	34.0	35.0	34.6	34.7	35.9	36.3	35.4	36.5	36.7
10	Waist height	8	41.0	42.4	42.6	41.8	43.5	44.1	43.2	44.1	45.2
11	Axillary height	9	50.3	51.9	52.2	50.9	52.9	54.1	52.0	53.8	53.9
15	Shoulder height	13	56.3	58.3	58.9	57.3	59.6	60.8	59.0	60.8	61.2
16	Stature (overall height)	14	66.8	69.0	69.6	67.9	70.3	71.6	69.5	71.2	71.6
38	Inter-wrist span	34	51.6	53.4	52.4	52.7	54.2	54.5	53.9	55.1	55.3
39	Inter-elbow span	35	36.7	38.1	37.8	37.8	38.7	39.0	38.7	39.2	39.4
40	Elbow-wrist length	36	9.9	10.2	9.9	10.0	10.3	10.4	10.2	10.6	10.5
44	Waist-waist over shoulder	40	35.1	35.7	37.4	35.8	37.2	38.4	37.4	38.9	38.0
	Derived dimensions used in the R.A.E. pattern system										
57	Axilla height minus waist height	9-8	9.3	9.4	9.6	9.1	9.5	9.9	8.9	9.6	8.7
58	Waist height minus thigh pivot height	8-7	7.0	7.5	7.9	7.1	7.6	7.9	7.8	7.6	8.5
59	Thigh pivot height minus knee pivot height	7-4	15.1	15.5	15.4	15.5	16.0	16.0	15.6	16.2	16.1
60	Thigh pivot height minus ankle height	7-3	29.3	30.1	29.8	29.7	30.8	31.2	30.4	31.5	31.6
61	Waist height minus crotch height	8-5	9.3	10.0	10.5	9.8	10.5	10.7	10.7	10.8	11.0
	No. of men in size group on which data are based:		12	26	9	28	48	19	24	19	3

Table 55

DIMENSIONS OF THE NINE THEORETICAL "MEN" IN PRELIMINARY SIZE ROLL BASED ON CHEST/TORSO HOOP CONTROLS

	Range of recorded subject measurements - inches									
Size No.	1	2	3	4	5	6	7	8	Min. range	Max. range
Chest/torso hoop control										
Stature	65 -69.6	65.5-72.1	65.4-71.8	63.7-71.8	67.3-74.8	69.4-75.9	65.5-73.2	67 -76.8	4.6	9.8
Shoulder height	54.7-58.6	55.6-60.5	54.9-61.5	53.4-60.8	56.8-63.4	58.8-64.4	55.7-62.2	56.6-66.5	3.9	9.9
Crotch height	30.1-33.8	29.5-35	29.1-34.5	29 -34.9	30 -36.7	31.5-37.2	28.5-36.7	30 -38.2	3.7	8.2
Arm length	15.9-19	15.3-19.2	15.1-18	14.8-19.5	15.3-19.3	16.8-19.8	14.6-19.4	14.7-19.5	3.0	4.8
Chest	34.5-36.8	34 -36.9	34.9-36.7	37 -39.5	37 -39.9	37 -39.9	40 -42.9	40.5-42.4	1.8	2.9
Waist	28.3-32.8	27 -33.3	29 -32.6	28.7-34.4	29.2-37.5	29.5-36.1	29.8-39.8	32.3-38.3	3.6	10.0
Buttocks	35.4-37.3	34.3-39.1	35.5-39.4	36 -40.7	36.8-41.5	37.8-42	37.7-42.5	39.3-43	1.9	4.8
Torso hoop	59.2-61.3	61.5-63.9	64.3-65.9	60.3-62.9	63.4-65.8	66 -68.4	63.7-66.4	66.5-69.5	1.6	3.0
Weight (lb)	130 -145	126 -155	135 -166	138 -174	149 -188	154 -194	157 -200	175 -209	15	43
No. in group	12	26	9	28	48	19	24	19		
Chest/stature control										
Stature	64.2-66.5	67.2-69.9	70 -72.1	64.6-67.4	67.6-70.9	71 -74.2	66 -69.9	70.1-73.2	2.1	3.9
Shoulder height	53.7-56.1	56.4-59.3	59 -61.5	54.1-57.2	56.7-60.6	58.8-63.4	55.1-59.9	58.8-62.5	2.4	4.8
Crotch height	28.9-32.1	29.5-33.8	31.2-35	29.5-32	30 -34.9	31.5-36.7	28.8-32.8	31.8-36.7	2.5	5.2
Arm length	15.1-18	16.2-19.1	16.7-19.2	15.1-18.9	15.3-19.5	16.7-19.3	14.6-19.4	16.8-18.7	1.9	4.8
Chest	34.9-36.8	34 -36.9	34 -36.6	37 -39.5	37 -39.9	37 -39.9	40 -42.9	40 -42.5	1.9	2.9
Waist	27 -33.3	28.3-32.5	28 -32.6	30 -34.3	28.6-36.3	29.2-37.5	33.5-38.3	29.8-38.3	4.2	8.5
Buttocks	34.3-39	35.5-39.1	35.4-39.4	34.3-39.2	35.4-42	36.8-41.1	37.7-42.5	38 -43	3.6	6.6
Torso hoop	57.5-64.3	61.2-64.8	61.5-65.9	58.9-65.2	56.9-68.1	62.9-69	62.6-67.3	64.9-69.1	3.6	11.2
Weight (lb)	130 -144	132 -155	126 -166	128 -160	137 -194	150 -194	157 -194	170 -208	14	57
No. in group	13	21	14	12	56	27	18	22		
Weight/stature control										
Stature	63.7-65.7	66 -68.9	69.1-71.9	65.3-67.7	68 -71.4	71.5-74.8	67 -70.9	71 -74.3	2.0	3.9
Shoulder height	53.4-55.7	55.5-58.3	58.3-61.5	54.7-57.4	57.6-61.1	60.6-63.4	56.6-60.6	60 -63.6	2.3	4.0
Crotch height	28.9-32.1	29.5-33.4	31.2-35	28.8-32.2	30.8-34.5	32.3-36.7	30 -34.8	32.5-36.7	3.2	4.8
Arm length	14.8-16.9	15.8-19.1	16.2-19.2	14.6-18.9	15.3-19.5	16.8-19.3	14.7-18.1	16.8-18.7	1.9	4.3
Chest	34.9-38.6	34 -39.5	34 -38.6	37.4-43	36.3-41.1	37 -40.1	37.5-43.3	38.7-44.5	3.1	5.8
Waist	27 -34	28.6-34.3	28 -32.3	31.6-36.8	29 -36	29.8-35	32 -38.3	32.3-39.5	4.3	7.2
Buttocks	34.3-39	35.4-39.2	35.4-38.7	37.4-40	37.5-41.8	37.6-41	38.8-42.5	40.1-43	2.6	4.7
Torso hoop	57.5-64.3	56.9-64.4	60.7-65.7	60.7-66.3	61.1-68.1	62.9-69	64.2-67.8	64.5-69.1	3.6	7.5
Weight (lb)	128 -152	134 -154	126 -154	156 -175	155 -179	156 -178	180 -194	180 -204	14	28
No. in group	13	29	27	13	50	15	19	19		

Note: The arbitrary sizes to which this table refers are defined on Fig.4. Size 9 has been omitted as containing too few subjects to be usable.

Table 56

THE EFFECT OF DIFFERENT PAIRS OF GARMENT SIZING CONTROL PARAMETERS ON THE RANGE OF SOME OF THE DEPENDENT SUBJECT MEASUREMENTS

Measurement	Table No.	Min.	Max.	Mean	S.D.	Coefficient of Variation
Age years	43a	19.7	45.9	28.730	5.960	2.07
Weight - lb	42	126.0	239.0	163.835	20.629	12.59
Chest girth - in	1	34.0	45.9	38.546	2.273	5.90
Torso hoop	2	56.9	73.2	64.440	2.606	4.04
Ankle - height of min dia	3	4.0	5.9	4.993	0.339	6.79
Knee pivot height	4	16.6	22.7	19.713	0.944	4.79
Crotch height	5	28.5	38.2	32.648	1.664	5.10
Wrist height	6	31.2	39.3	34.900	1.526	4.37
Thigh pivot height	7	31.1	41.8	35.455	1.664	4.69
Waist height	8	38.2	49.2	42.969	1.997	4.65
Axillary height	9	47.3	58.5	52.360	2.127	4.06
Suprasternal height	10	51.6	63.3	56.610	2.110	3.73
Neck root height	11	52.3	64.2	57.507	2.136	3.71
7th Cervical height	12	54.0	66.8	59.749	2.273	3.80
Shoulder height	13	53.4	66.5	59.001	2.278	3.86
Stature (height)	14	63.7	76.8	69.669	2.415	3.47
Knee height, seated	15	19.1	25.1	21.893	0.990	4.52
Thigh length	16	21.2	26.8	23.922	1.036	4.33
Heel/instep girth	17	11.5	14.6	12.968	0.551	4.25
Sitting height	18	33.8	39.5	36.481	1.198	3.28
Knee girth, fully flexed	19	15.0	19.5	16.985	0.847	4.99
Ankle girth, min.	20	7.7	10.5	8.883	0.495	5.57
Ankle girth, 2½" above min.	21	8.0	11.2	9.664	0.613	6.34
Calf girth	22	12.4	16.5	14.422	0.895	6.21
Small (garter) girth	23	11.8	15.3	13.289	0.760	5.72
Knee girth, standing	24	13.3	18.1	15.224	0.802	5.27
Thigh girth	25	18.2	27.2	22.171	1.587	7.16
Buttock girth	26	34.3	46.2	38.848	2.029	5.22
Waist girth	27	27.0	41.5	32.955	2.707	8.21
Neck girth	28	13.1	17.3	15.034	0.689	4.58
Wrist girth, min.	29	6.1	8.1	6.933	0.365	5.26
Wrist girth, 2½" above min.	30	6.7	9.4	8.018	0.497	6.20
Elbow girth, fully flexed	31	12.0	15.8	13.847	0.696	5.03
Biceps girth, relaxed	32	9.3	14.0	11.468	0.922	8.04
Biceps girth, flexed	33	9.9	15.6	12.688	1.002	7.90
Interwrist span	34	48.0	60.4	53.761	2.274	4.23
Interelbow span	35	34.6	42.8	38.416	1.593	4.15
Forearm Length	36	8.9	12.0	10.223	0.496	4.85
Arm length, shoulder - finger tip	37	29.6	39.7	33.421	1.614	4.83
Shoulder breadth	38	15.6	19.8	17.746	0.833	4.69
Waist-waist, under crotch	39	23.3	34.3	27.890	1.739	6.24
Waist-waist, over shoulder	40	33.1	42.7	37.104	1.648	4.44
Shoe size	43b	6.0	12.0	8.537	1.221	14.30
Head girth	41	21.1	24.2	22.810	0.550	2.41
Knee top-knee pivot (15-4)	44a	1.4	3.3	2.179	0.313	14.36
Torso length (13-5)	44b	23.2	29.8	26.353	1.150	4.36
Arm length (9-6)	45a	14.6	20.5	17.459	1.012	5.80
Thigh pivot - crotch (7-5)	45b	0.5	5.1	2.807	0.665	23.69
Top of head - shoulder (14-13)	46a	9.6	12.4	10.668	0.510	4.78
Ankle taper(21-20)	46b	0.1	1.8	0.781	0.291	37.26
Wrist taper (30-29)	47a	0.4	1.9	1.085	0.275	25.34
Axilla-waist (9-8)	47b	7.3	11.4	9.391	0.815	8.68
Waist - thigh pivot (8-7)	48a	5.4	9.6	7.513	0.762	10.14
Thigh pivot - knee pivot (7-4)	48b	13.3	19.6	15.742	0.919	5.83
Thigh pivot - Ankle min. dia. (7-3)	49a	26.4	36.1	30.462	1.543	5.07
Waist - crotch (8-5)	49b	8.1	12.5	10.320	0.900	8.72
Axilla - crotch (9-5)	50	16.4	22.2	19.710	1.040	5.28

Table 57

SUMMARY OF STATISTICAL DATA ON FULL SAMPLE (INCH UNITS)

T.R. 67125

Measure	Survey of 550 British aircrew - December 1944 (see Ref.3)				R.A.E. survey of 200 British aircrew October/November 1966 (this Report refers)				Differences in means of 1944 and 1966 surveys					
	No. of men	Average and S.E.	Standard deviation and S.E.	Range	No. of men	Average and S.E.	Standard deviation and S.E.	Range	Difference		S.E. of difference		Difference / S.E. of difference	
									Means	S.D.	Means	S.D.	Means	S.D.
Age	520	23.2 (0.14)	3.26(0.10)	19 -35	200	28.73(0.422)	5.96 (0.298)	19.7-45.9	5.530	2.700	0.44502	0.31468	12.426	8.580
Height (stature)	529	68.50(0.103)	2.37(0.073)	62 -75	200	69.67(0.171)	2.415(0.121)	63.7-76.8	1.170	0.045	0.19945	0.14103	5.866	0.319
Arm reach	529	33.61(0.065)	1.50(0.046)	28.5-38.0	200	33.42(0.114)	1.614(0.081)	29.6-39.7	0.190	0.114	0.13145	0.09295	1.445	1.227
Sitting height	529	36.16(0.054)	1.24(0.038)	32.0-39.5	200	36.48(0.085)	1.198(0.060)	33.8-39.5	0.320	0.042	0.10041	0.07100	3.187	0.592
Thigh length	529	23.32(0.045)	1.03(0.032)	20.5-26.5	200	23.92(0.073)	1.036(0.052)	21.2-26.8	0.600	0.006	0.08586	0.06071	6.988	0.099
Shoulder breadth	529	16.79(0.030)	0.69(0.021)	14.5-19.0	200	17.75(0.059)	0.833(0.042)	15.6-19.8	0.960	0.143	0.06610	0.04674	14.523	3.059
Weight (lb)	529	144.9 (0.69)	15.9 (0.49)	106 -205	200	163.84(1.459)	20.629(1.031)	126 -239	18.940	4.729	1.61421	1.14142	11.733	4.143
Chest girth	529	34.89(0.079)	1.81(0.056)	30.0-42.5	200	38.55(0.161)	2.273(0.114)	34.0-45.9	3.660	0.463	0.17896	0.12654	20.452	3.659
Waist girth	529	28.82(0.079)	1.81(0.056)	24.5-38.0	200	32.96(0.191)	2.707(0.135)	27.0-41.5	4.140	0.897	0.20696	0.14623	20.004	6.129
Thigh girth	528	20.43(0.056)	1.29(0.040)	16.5-25.0	200	22.17(0.112)	1.587(0.079)	18.2-27.2	1.740	0.297	0.12548	0.08873	13.867	3.347
Neck girth	529	14.44(0.027)	0.61(0.019)	12.75-16.5	200	15.03(0.049)	0.689(0.034)	13.1-17.3	0.590	0.079	0.05547	0.03922	10.636	2.014
Calf girth	529	14.36(0.037)	0.85(0.026)	11.75-17.0	200	14.42(0.063)	0.895(0.045)	12.4-16.5	0.060	0.045	0.07329	0.05182	0.819	0.868
Small girth	529	12.61(0.029)	0.67(0.021)	10.5-15.0	200	13.29(0.054)	0.760(0.038)	11.8-15.3	0.680	0.090	0.06113	0.04322	11.124	2.082
Wrist girth	375	6.68(0.019)	0.36(0.013)	5.5-7.75	200	6.93(0.026)	0.365(0.018)	6.1-8.1	0.250	0.005	0.03181	0.02249	7.860	0.222
Buttock girth	529	36.28(0.070)	1.61(0.049)	32.0-41.5	200	38.85(0.143)	2.029(0.101)	34.3-46.2	2.570	0.419	0.15964	0.11288	16.099	3.712

The measures listed in this table were the only ones taken in the same manner in both surveys.

Table 58

COMPARISON OF ANTHROPOMETRIC DATA ON BRITISH MILITARY AIRCREW – SURVEYS 1944 AND 1966

REFERENCES

No.	Author	Title, etc.
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3	Dr. G. M. Morant Sqn. Ldr. J. C. Gilson	Report on a survey of body and clothing measurements of Royal Air Force personnel. F.P.R.C. 663(a) (1945)
4	H. T. E. Hertzberg G. S. Daniels	Anthropometry of flying personnel 1950. WADC Technical Report 52-321

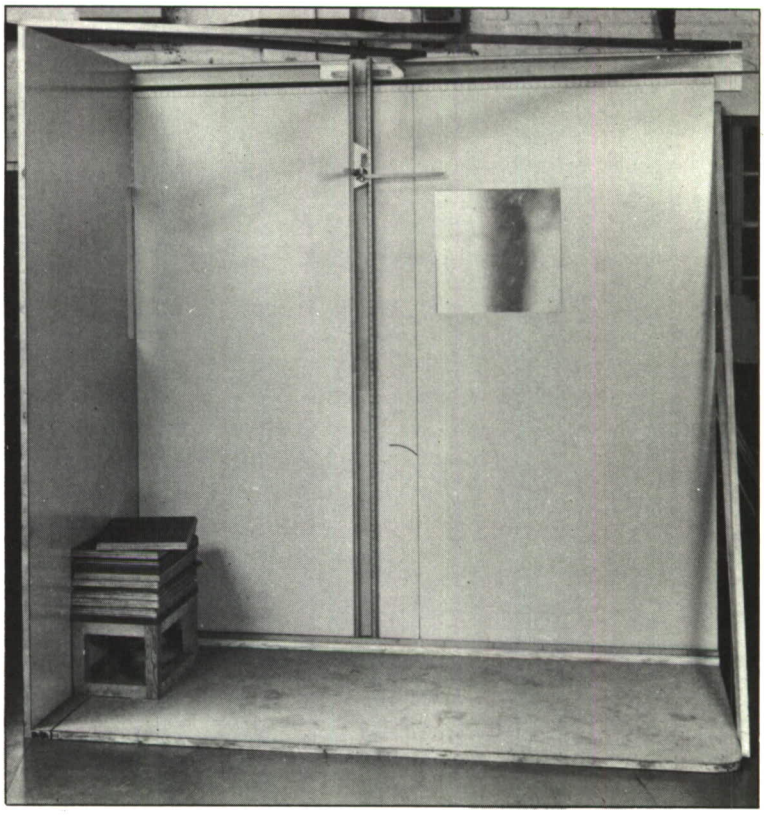


Fig.1a R.A.E. anthropometric rig

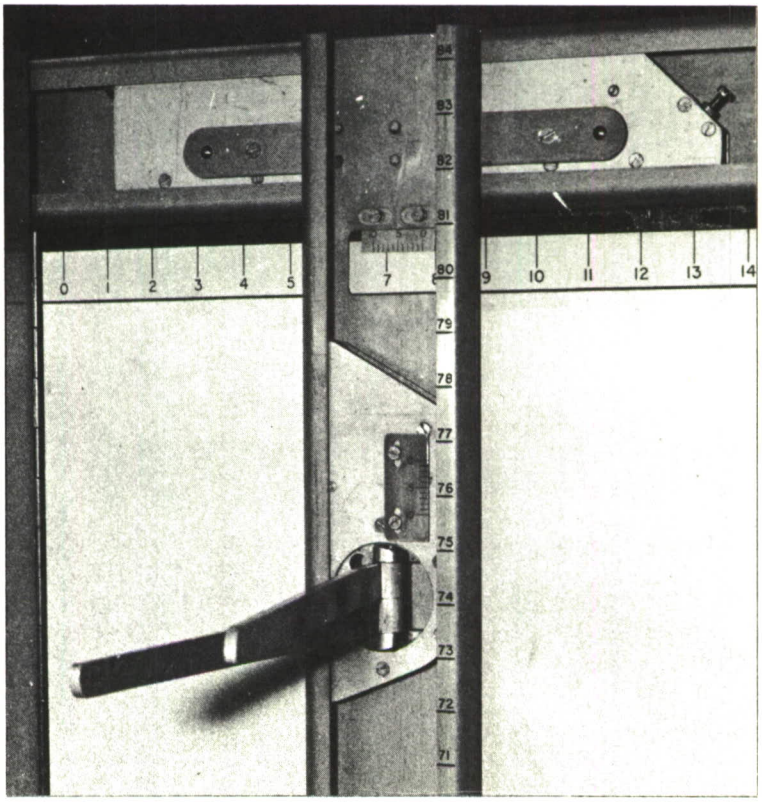


Fig.1b Close-up of measuring head and scales

Fig.2

Neg.No.C5016

Measured by: C.B.B.

Ser. No.: 126

Subject: Flt. Lt. A. B. Seedy

Age: 29

wt. lb: 154

Station: 957 Sqn. R.A.F. S. Tottering

A/C Cat. A.E.O.

Size	Body measure	Size	Body measure
36·1	Chest girth at nipples	10·4	Ankle girth 2½ inches up
64·3	Torso hoop, (L)	14·7	Calf girth
64·2	Torso hoop, (R)	13·6	Small girth (garter)
64·3	Torso hoop, av.	15·1	Knee girth, standing
04·6	Ankle height (least circ.)	21·9	Thigh girth, max.
18·6	Knee pivot height	37·5	Buttock girth
30·8	Crotch height	30·4	Waist girth
34·3	Wrist height	36·1	Chest girth at nipples
33·7	Thigh pivot height	14·7	Neck girth
41·8	Waist height	07·0	Wrist girth
50·5	Axillary height	08·4	Wrist girth, 2½ inches up
55·0	Suprasternal height	13·9	Elbow girth, full flex
55·9	Neck root height	11·8	Biceps, extended
58·3	Seventh cervical height	13·1	Biceps, contracted
57·3	Shoulder height, 3¼ inches out	50·8	Inter-wrist span
68·5	Height	37·3	Inter-elbow span
20·8	Knee height – sitting	09·6	Elbow to wrist length
22·8	Thigh length (Morant)	31·6	Arm length (Morant)
13·0	Heel girth	17·4	Shoulder breadth
52·2	Height – seated	29·4	Waist-waist through crotch
15·7	Chair height	35·7	Waist-waist over shoulder
36·5	Sitting height	08·0	Shoe size
16·3	Knee girth, full flex	22·7	Head girth
09·3	Ankle girth – min.		

Fig.2 Data recording proforma

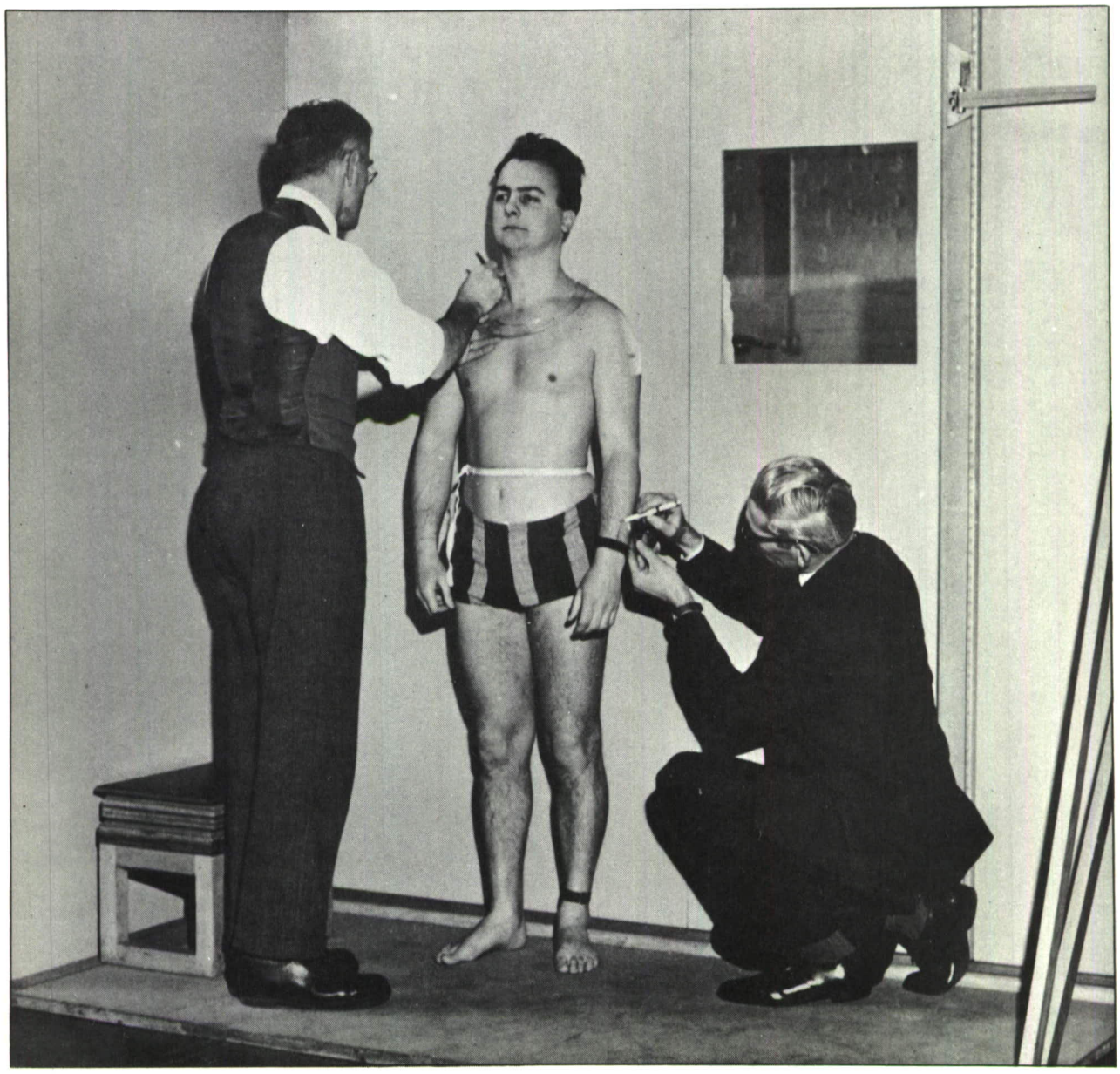


Fig.3 Location and marking of datum points on a subject

T.R. 67125

Fig. 4a

022 903272

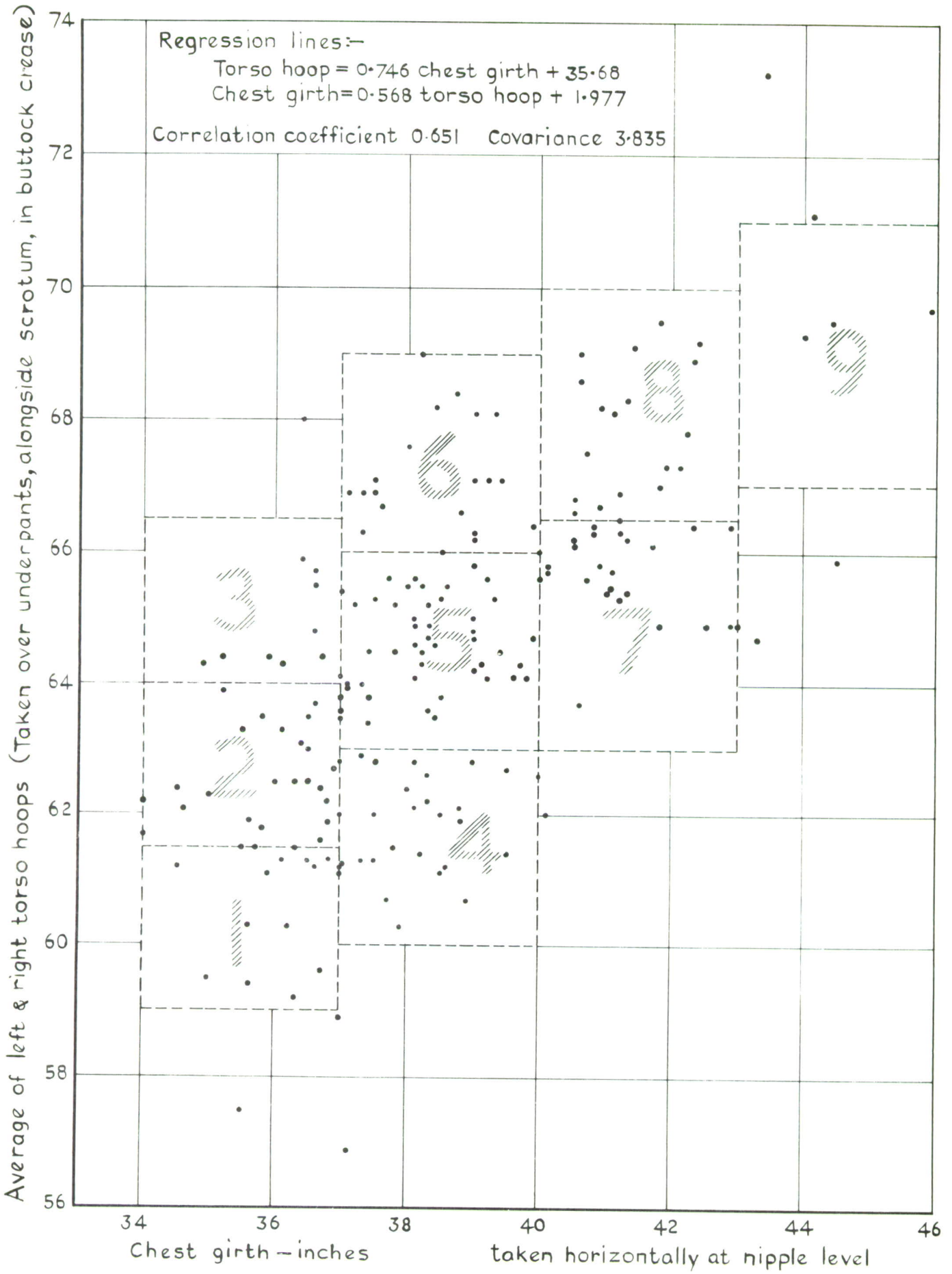


Fig. 4a Chest girth / torso hoop

Specimen 9 size roll grid superimposed

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Fig.4 b&c

Regression lines:—
Stature = 0·290 chest girth + 58·50
Chest girth = 0·257 stature + 20·67
Correlation coefficient 0·273 Covariance 1·489

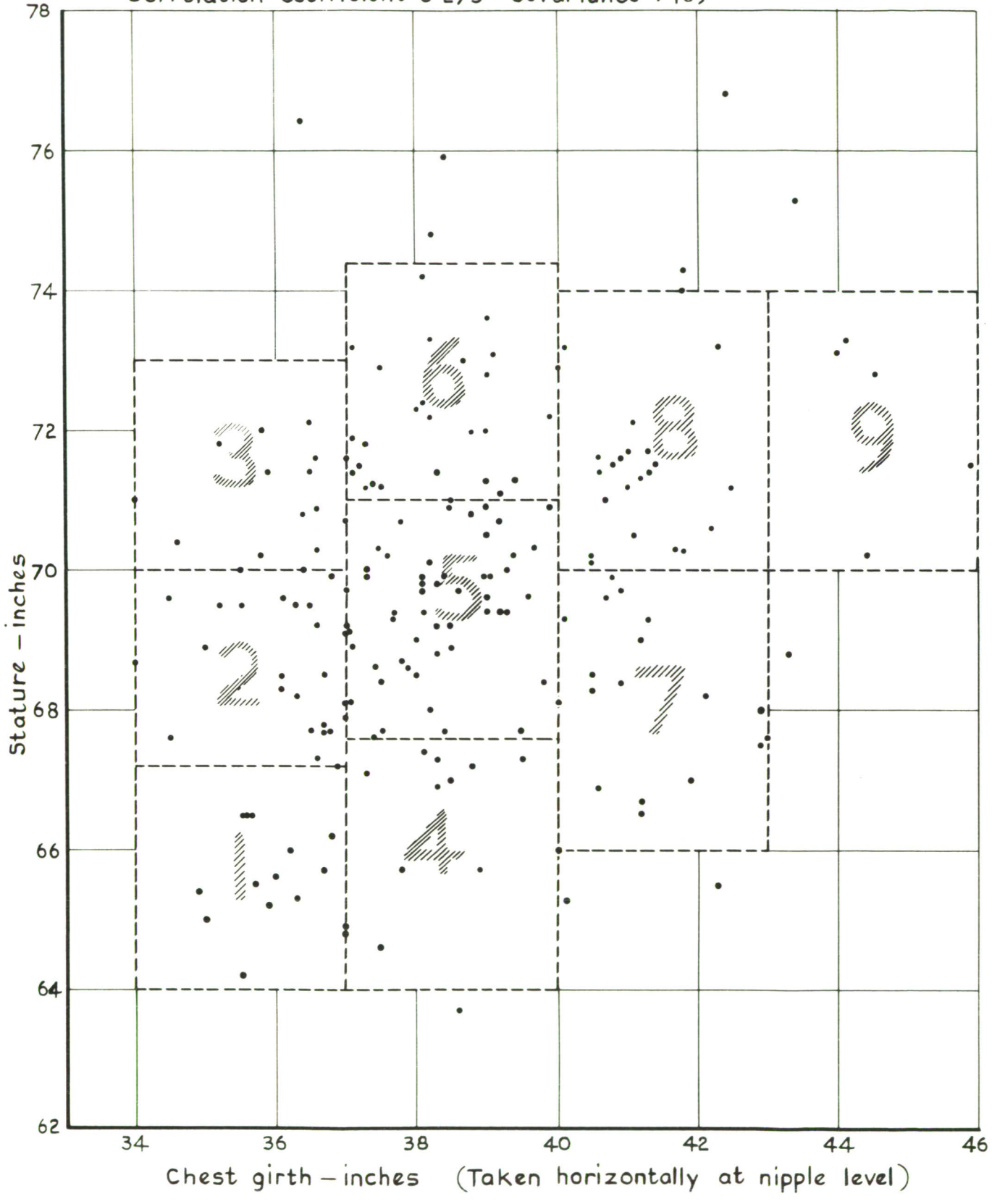


Fig.4b Chest girth / stature
Specimen 9 size roll grid superimposed

Regression lines:—
Stature = 0·061 weight + 59·66
Weight = 4·456 stature — 146·6
Correlation coefficient 0·522 Covariance 25·86

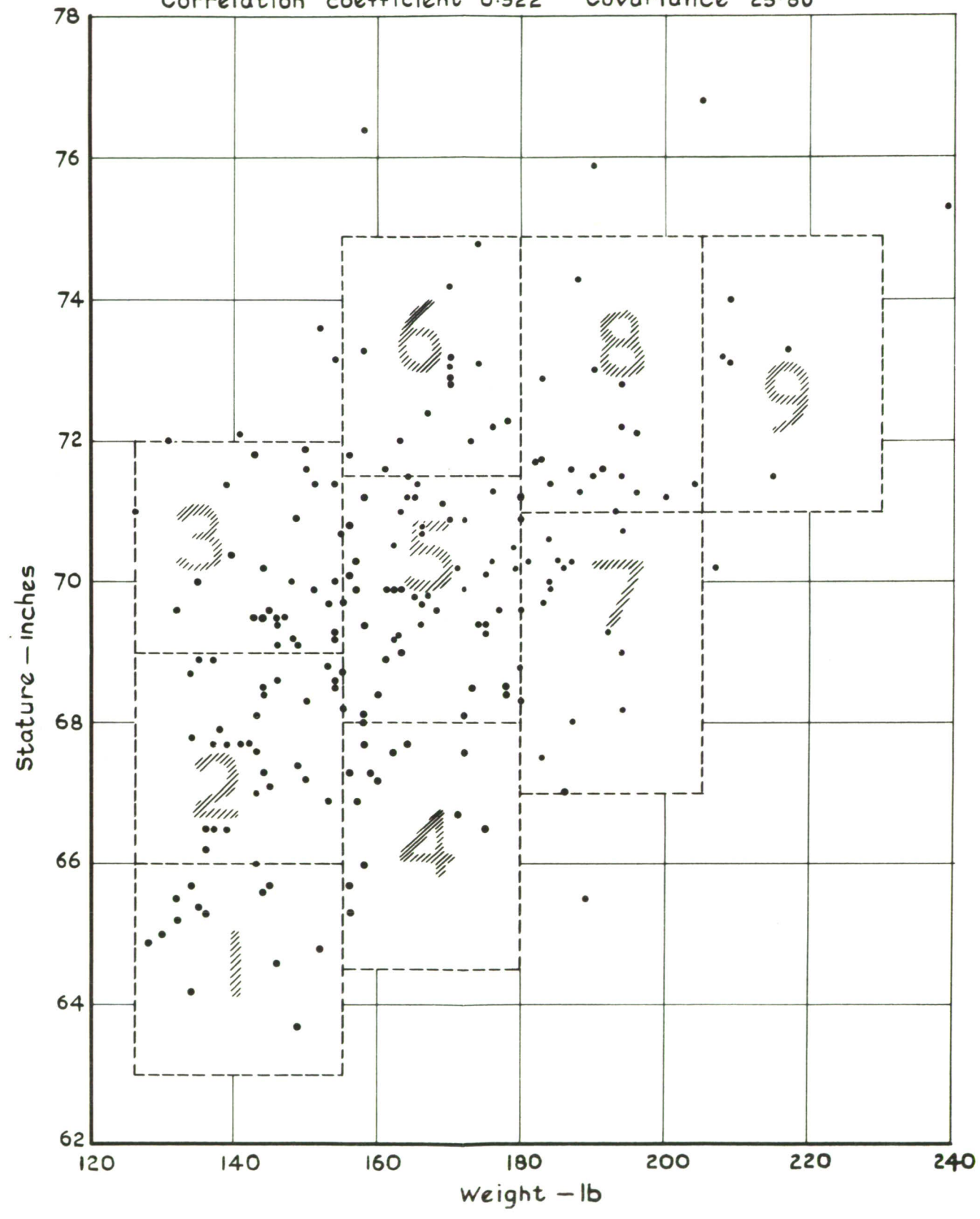
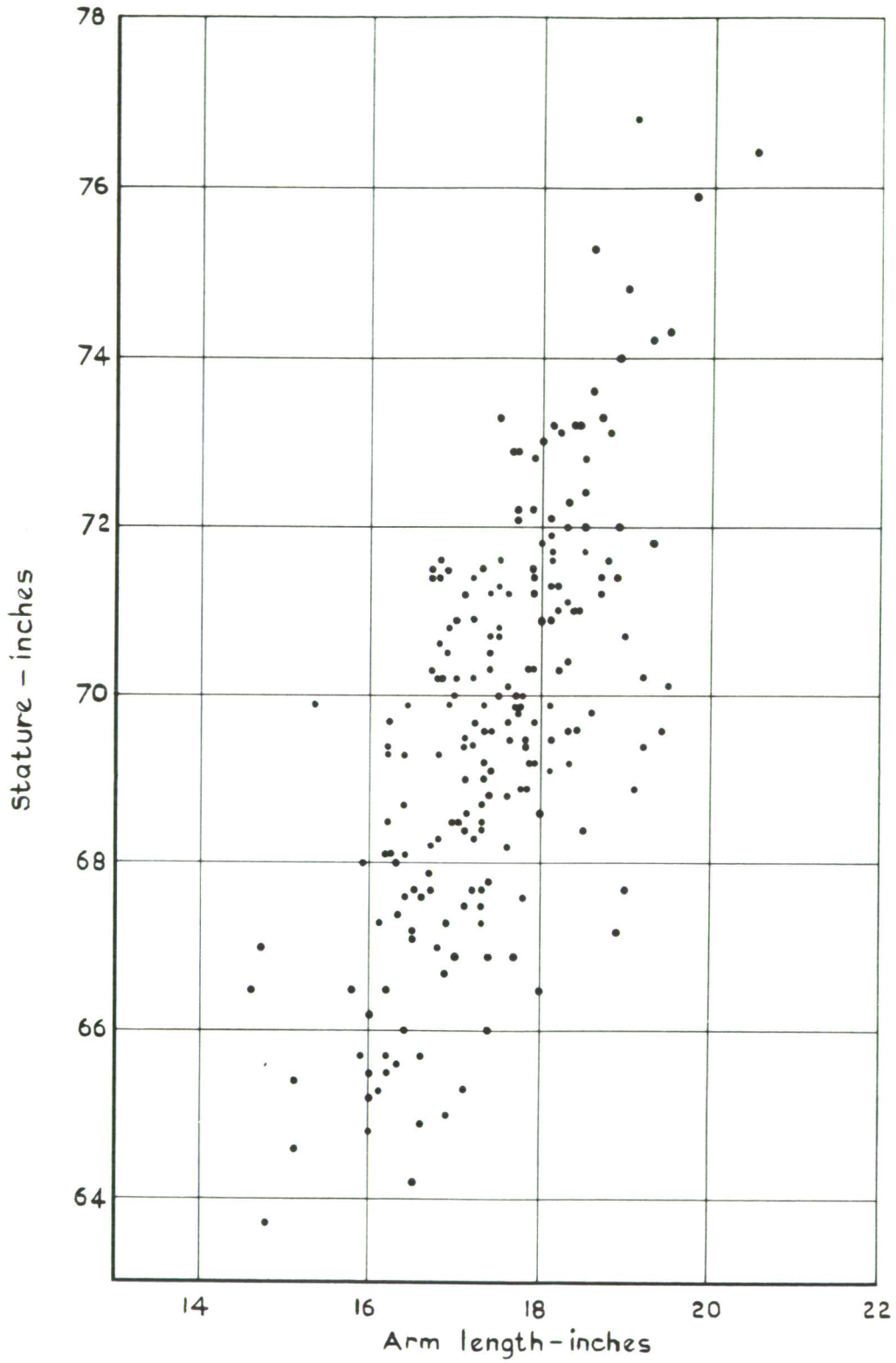


Fig.4c Weight / stature
Specimen 9 size roll grid superimposed

Fig. 5

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Regression lines:—
Stature = 1·626 arm length + 41·28
Arm length = 0·286 stature — 2·450
Correlation coefficient 0·682 Covariance 1·658



(Axilla to proximal edge of styloid process)

Fig. 5 Stature / arm length

Fig.6

Regression lines:—
Stature = 1·259 leg length + 28·55
Leg length = 0·598 stature — 9·024
Correlation coefficient 0·868 Covariance 3·471

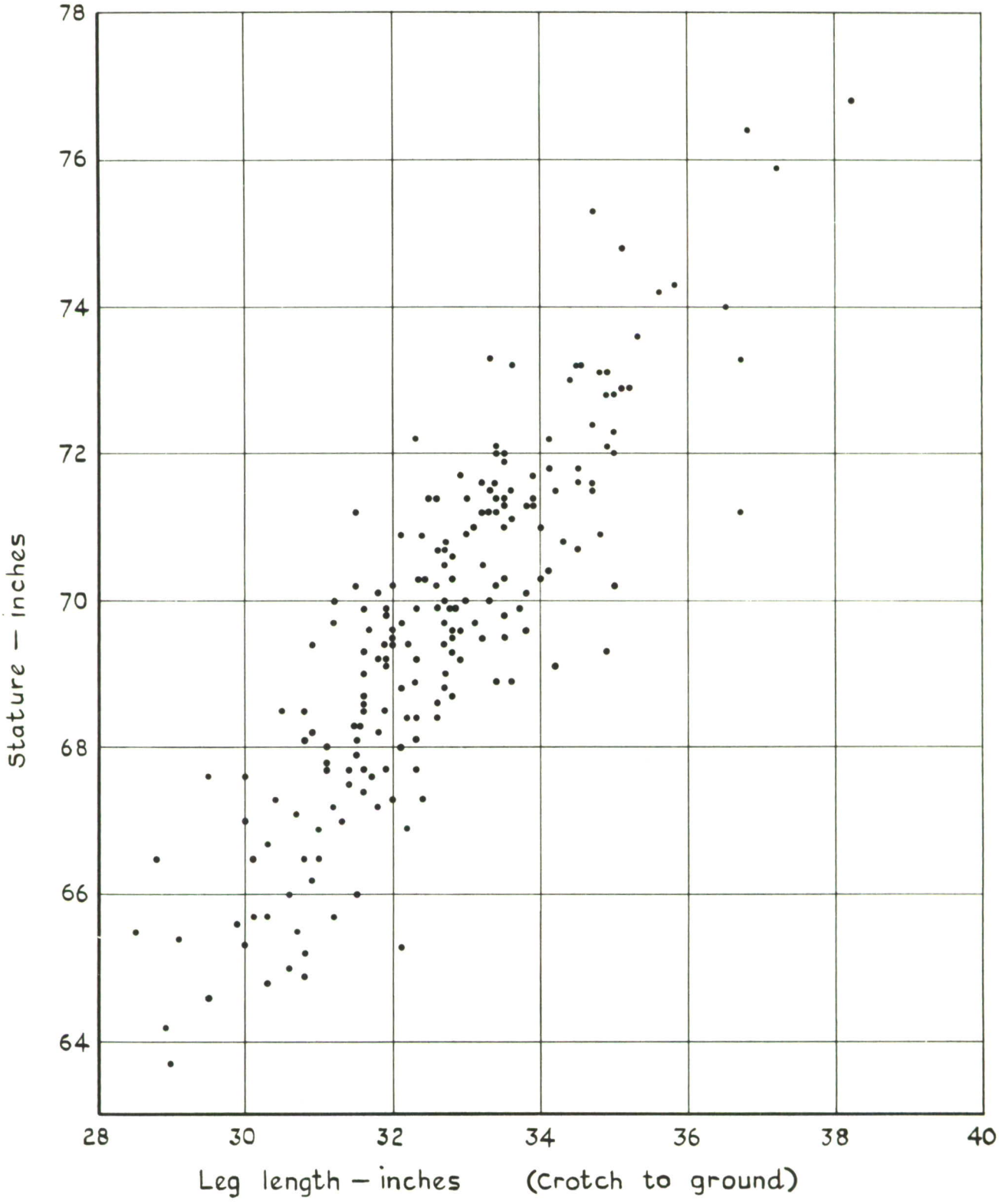


Fig.6 Stature / leg length

Fig.7

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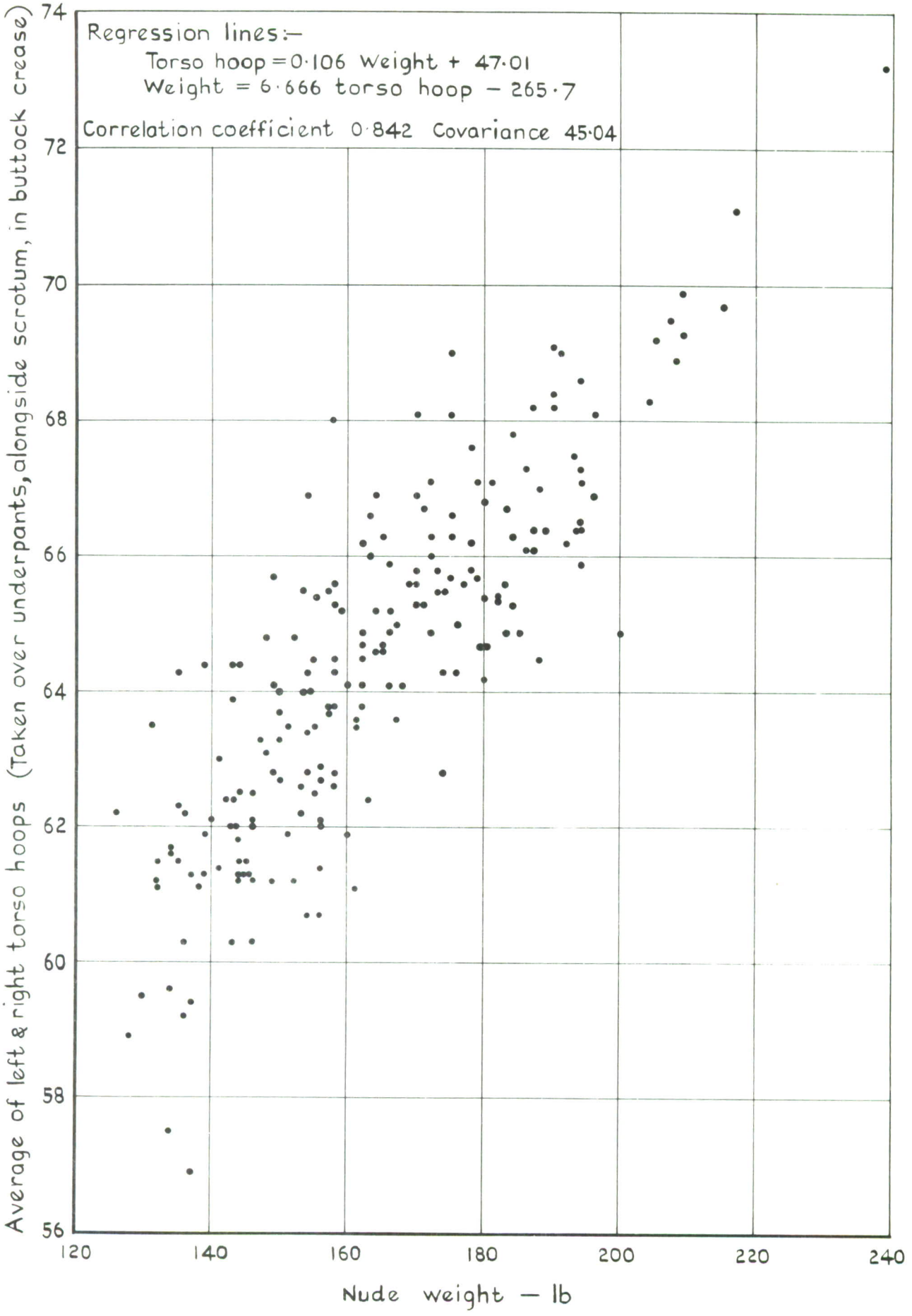


Fig. 7 Average torso hoop / nude weight

Fig.8

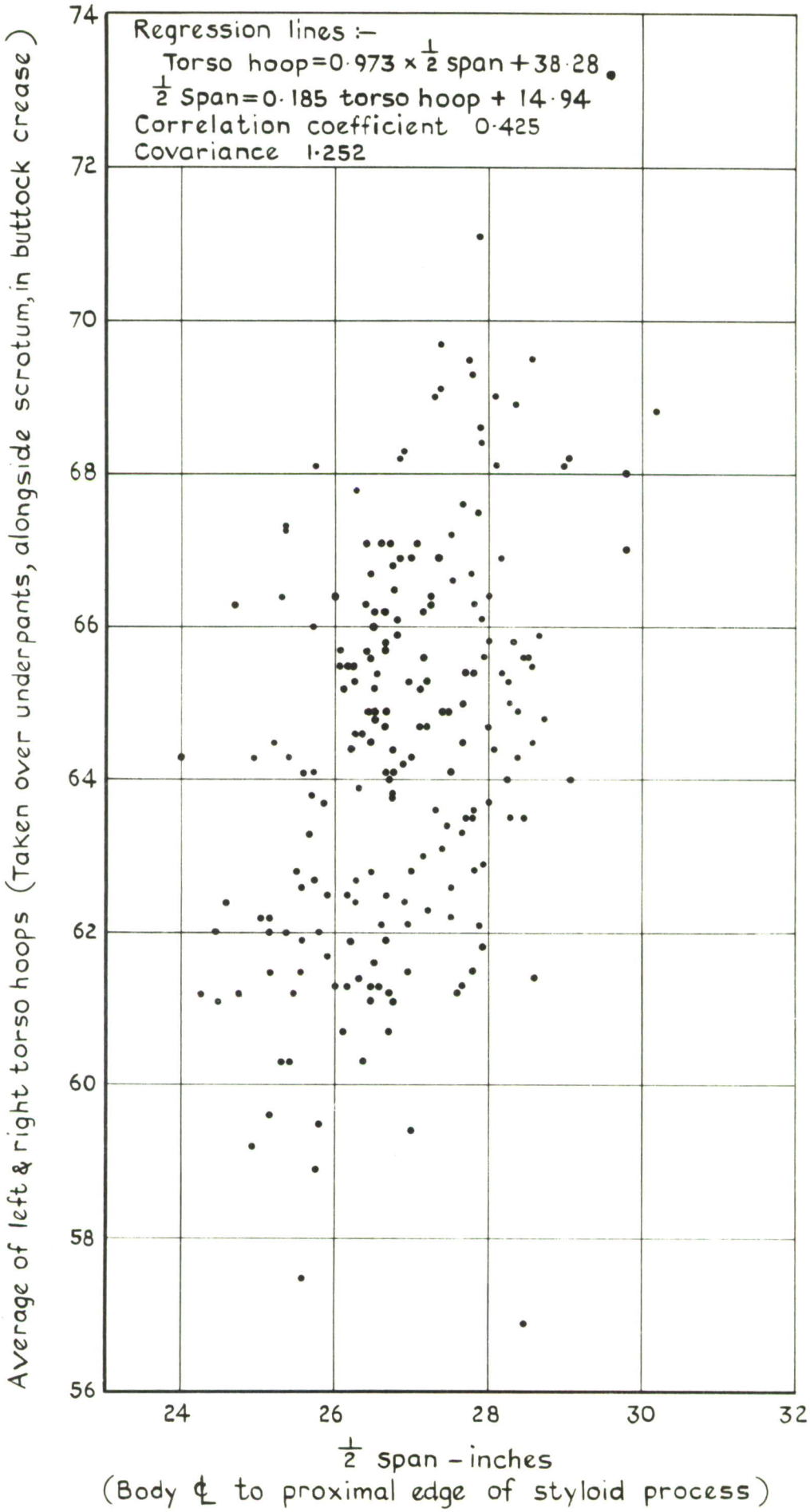


Fig.8 Average torso hoop / half wrist span

Fig.9

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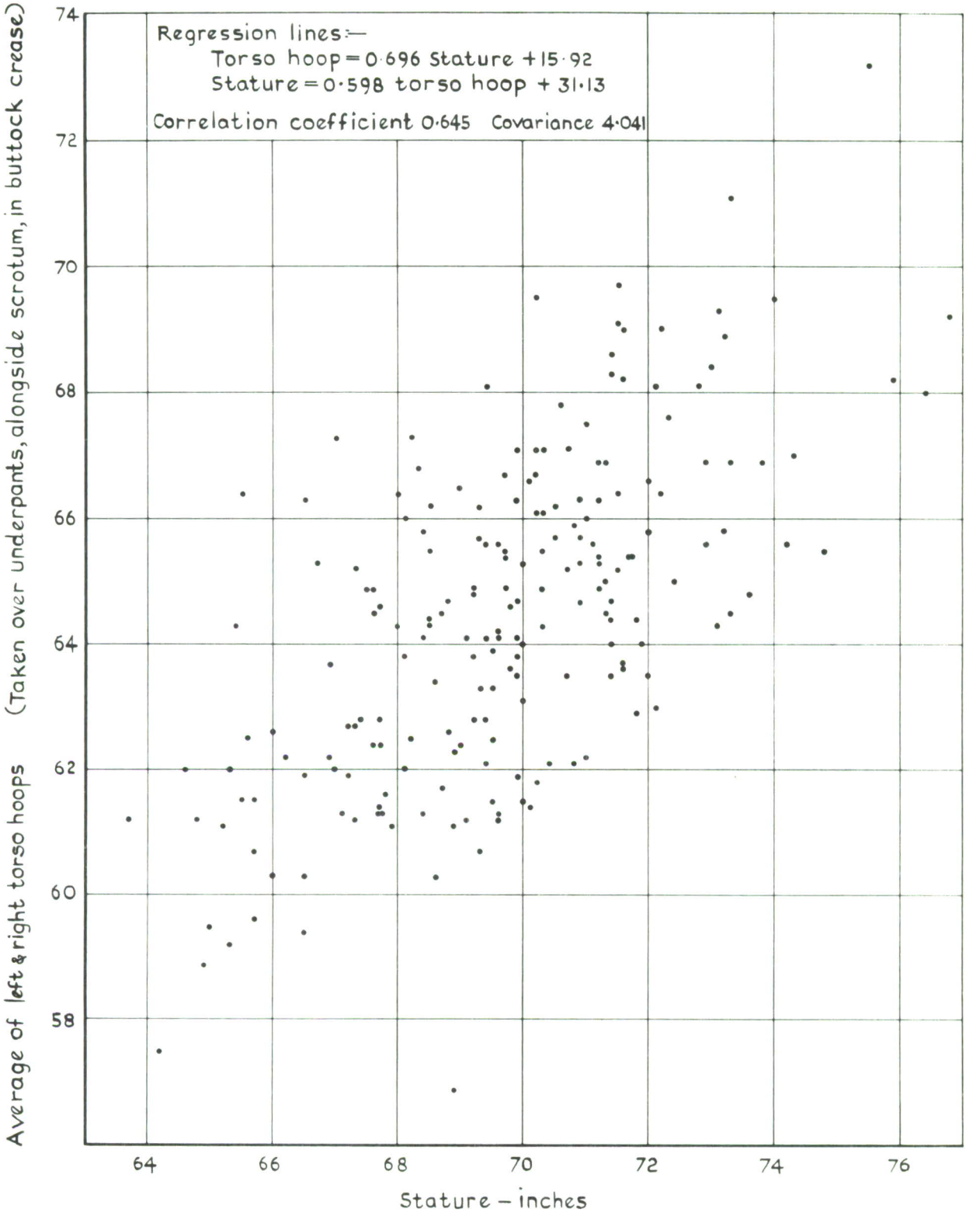


Fig. 9 Average torso hoop / stature

Regression lines:- $\frac{1}{2}$ span = 0·135 chest girth + 21·68
Chest girth = 0·539 x $\frac{1}{2}$ span + 24·06
Correlation coefficient 0·270 Covariance 0·693

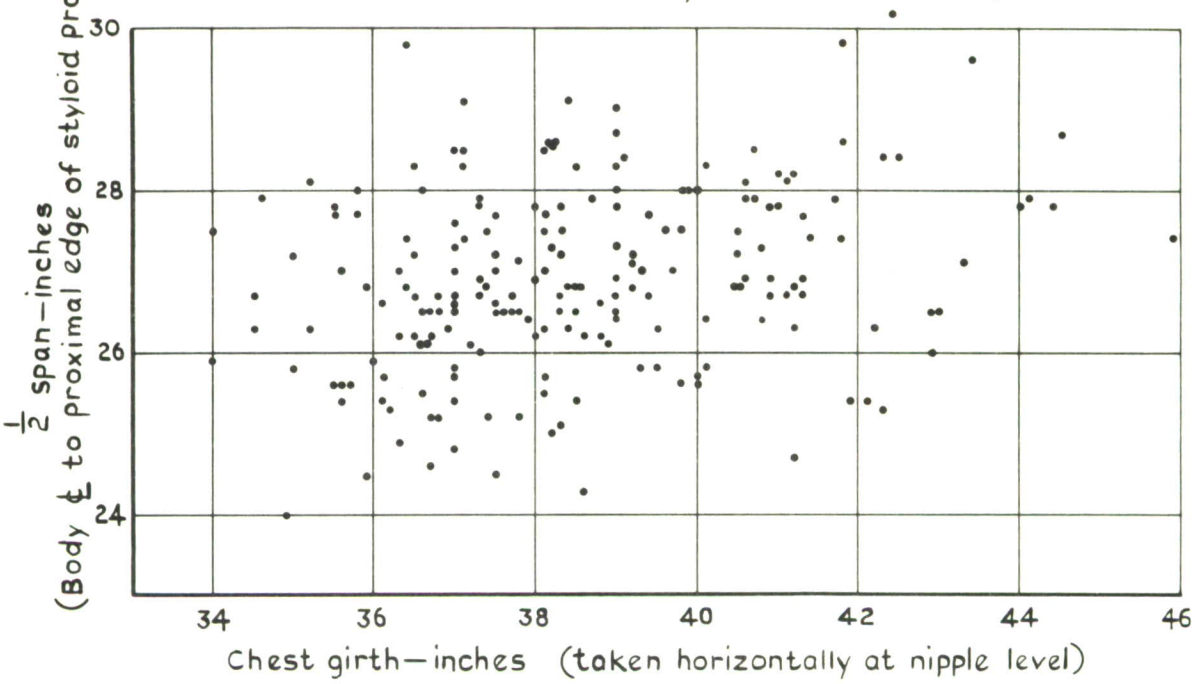


Fig.10 Chest girth / half wrist span

Regression lines:- Thigh girth = 0·535 chest girth + 1·532
Chest girth = 1·098 thigh girth + 14·20
Correlation coefficient 0·767 Covariance 2·752

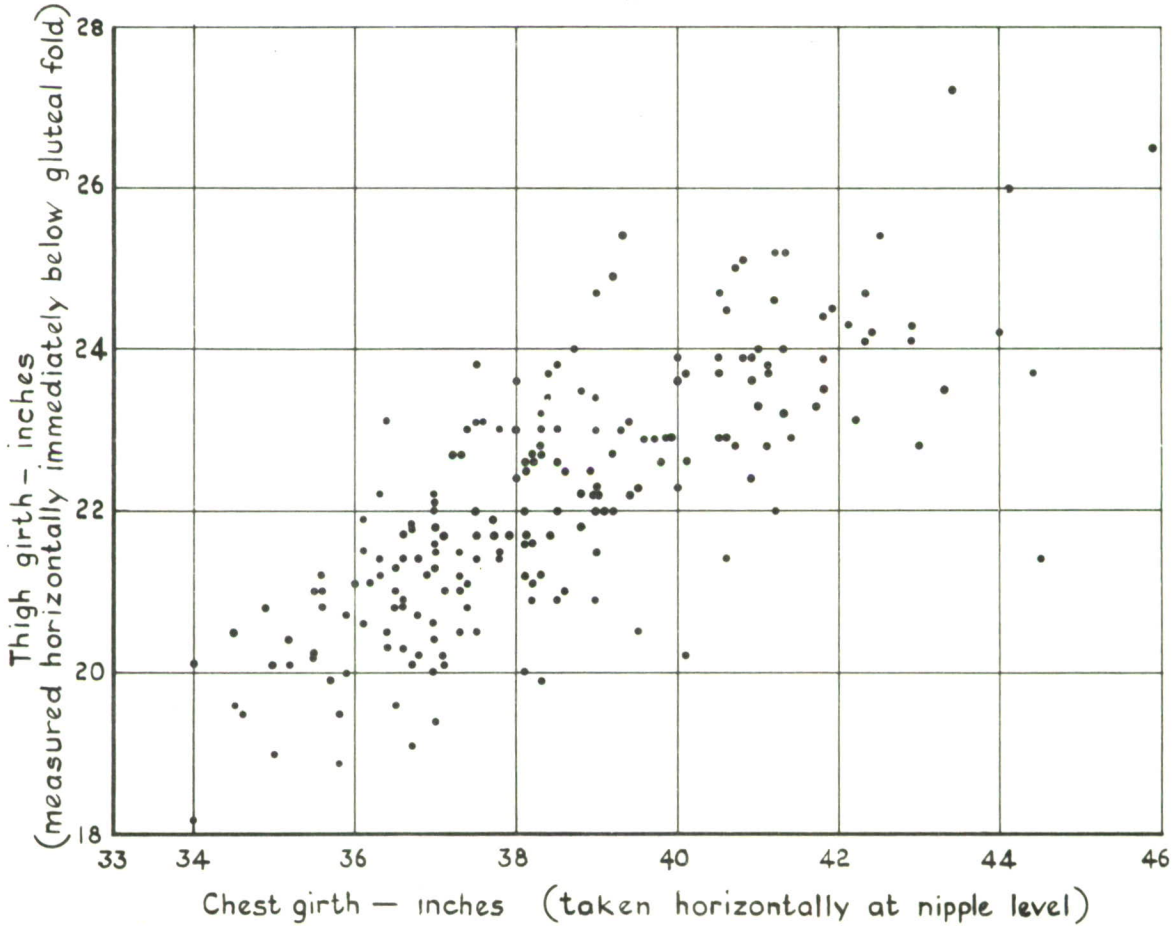


Fig.11 Chest girth / thigh girth

Fig.12 & 13

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Regression lines :- Thigh length = 0·450 sitting height + 7·495
Sitting height = 0·603 thigh length + 22·06
Correlation coefficient 0·521 Covariance 0·643

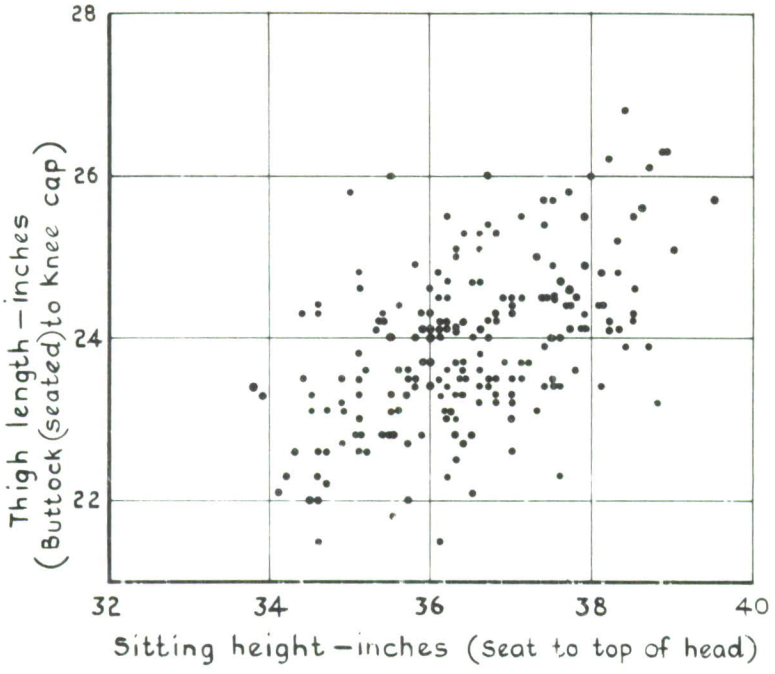


Fig.12 Sitting height / thigh length

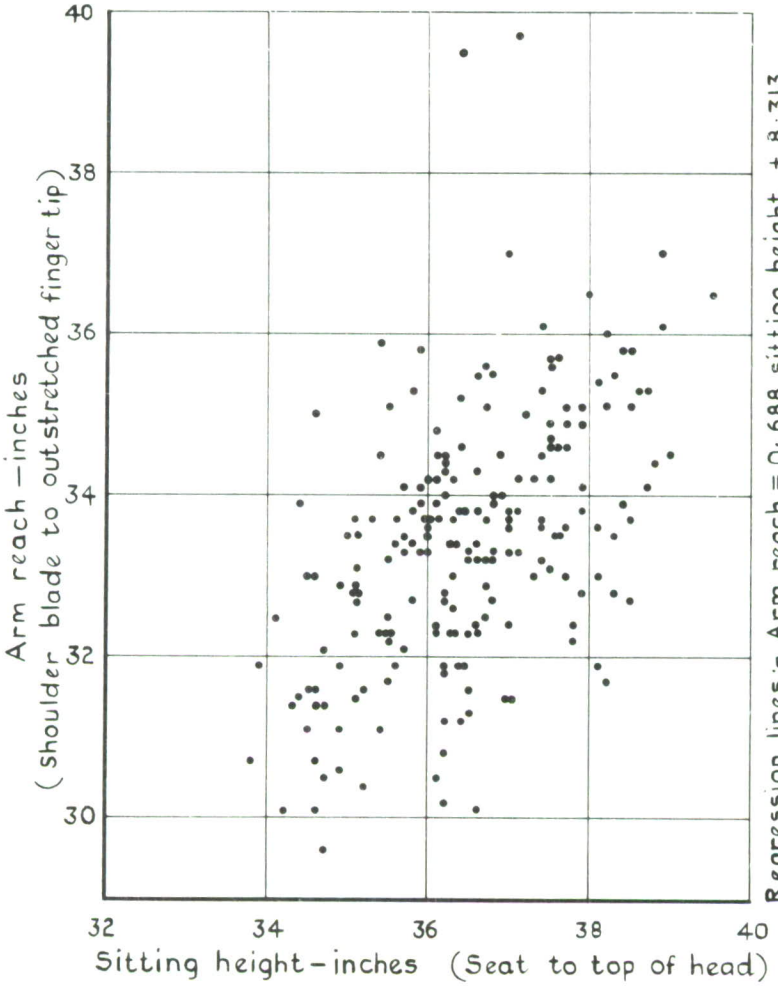


Fig.13 Sitting height / arm reach

Regression lines :—
Leg length = 1·127 Arm length + 12·96
Arm length = 0·417 leg length + 3·837
Correlation coefficient 0·686 Covariance 1·150

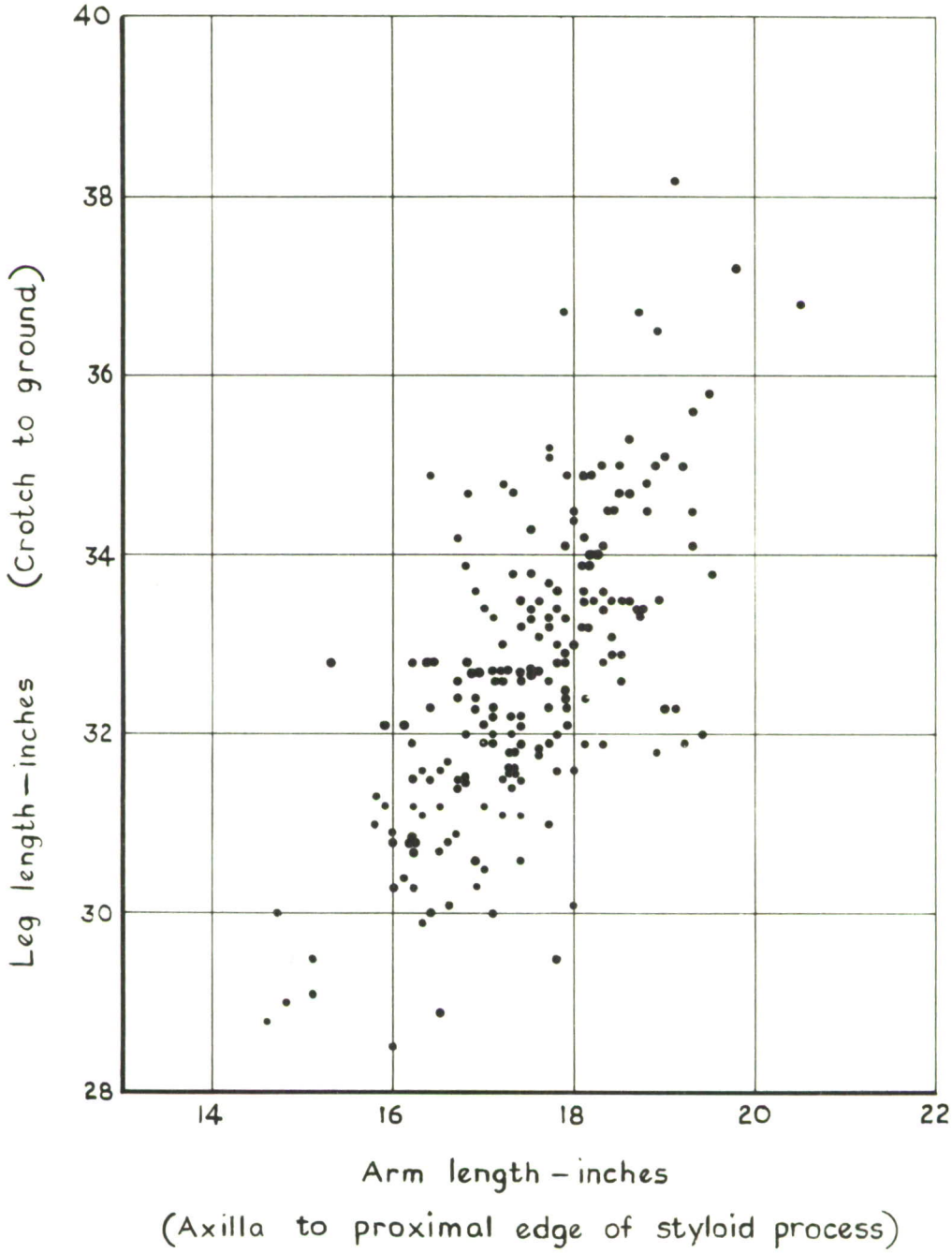


Fig.14 Leg length / arm length

Fig.15

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Regression lines :—
Stature = 1·623 sitting height + 10·46
Sitting height = 0·400 stature + 8·638
Correlation coefficient 0·805 Covariance 2·319

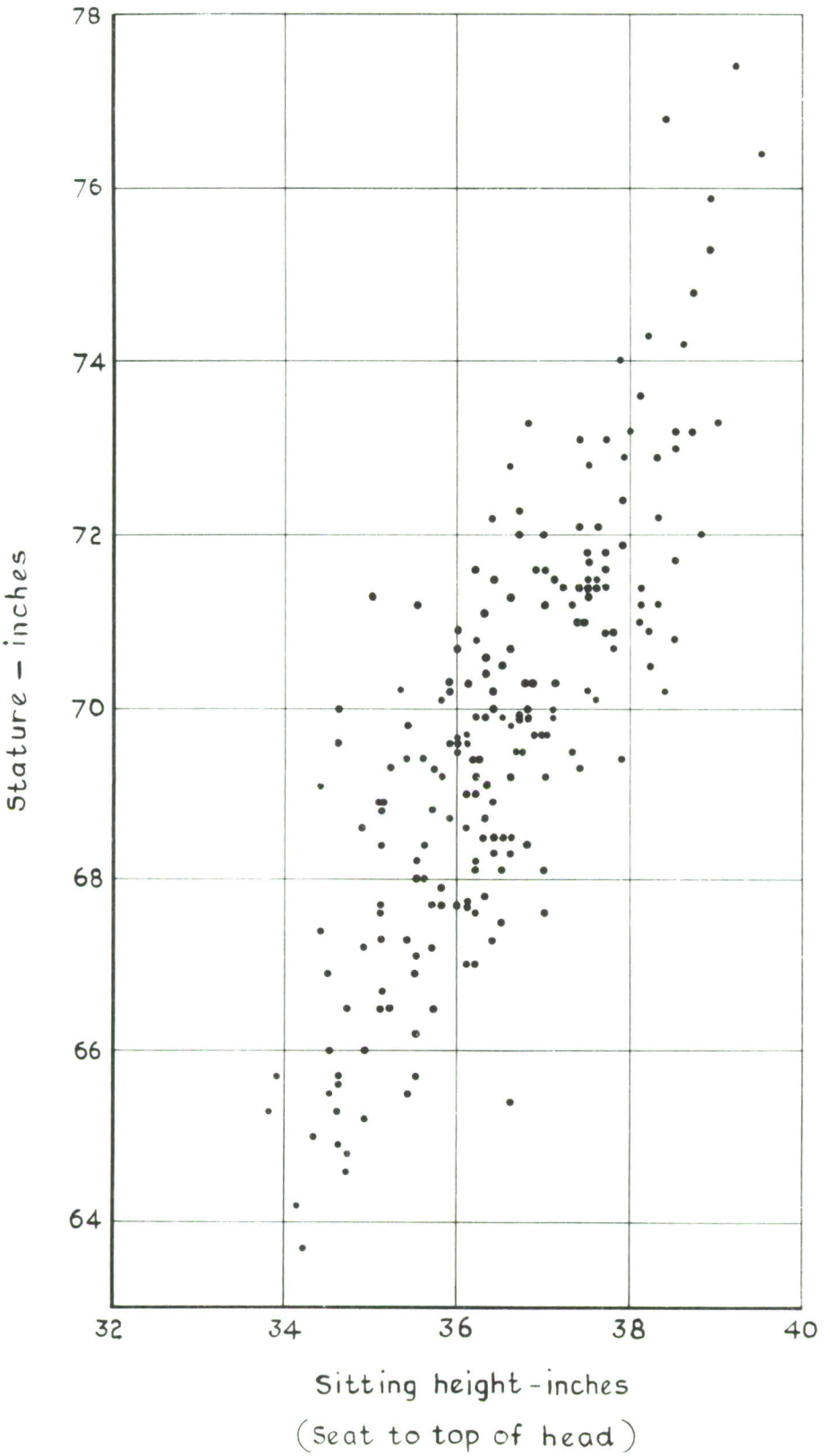


Fig. 15 Stature / sitting height

Fig.16

Regression lines :–

Torso length = 0·198 leg length + 19·89

Leg length = 0·414 torso length + 21·72

Correlation coefficient 0·286 Covariance 0·546

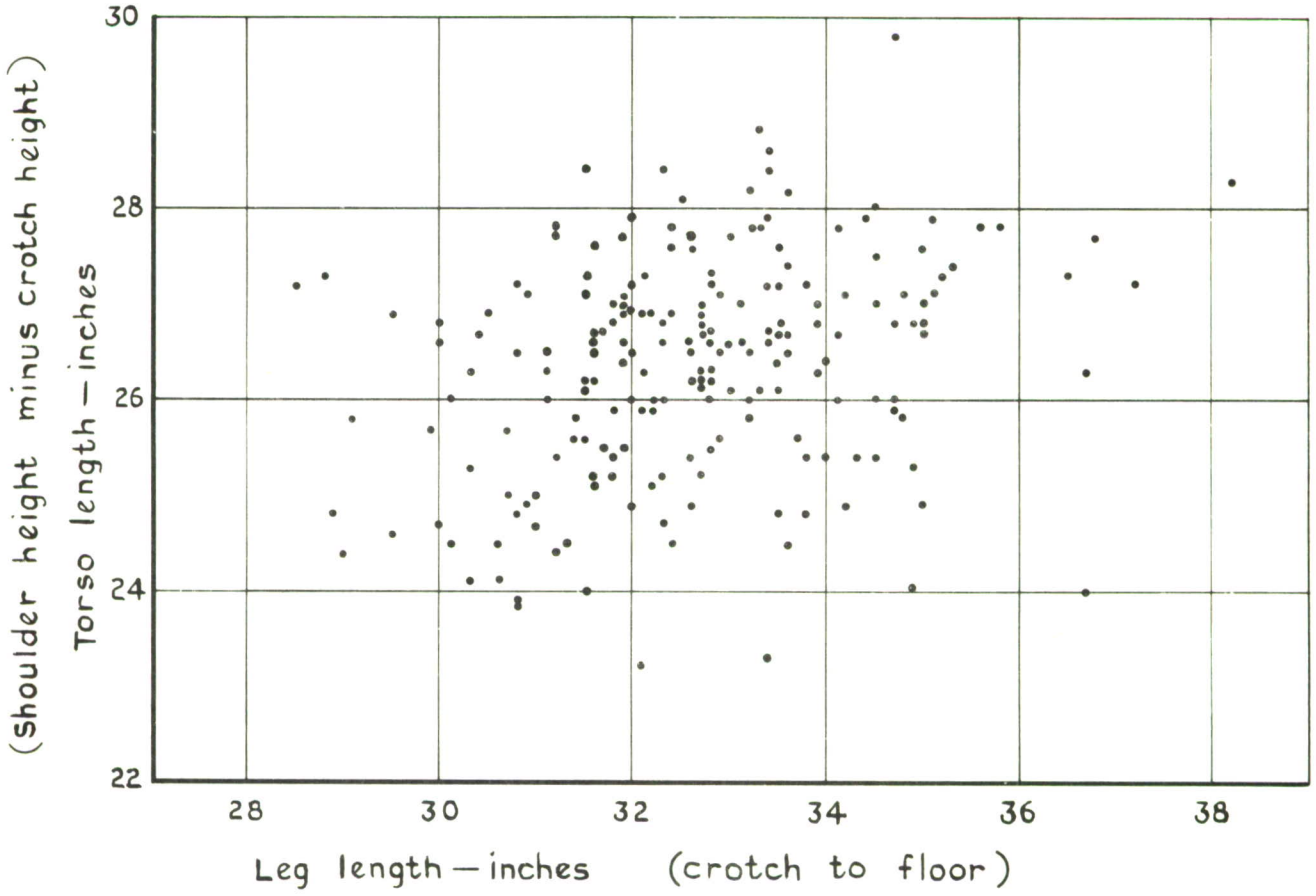


Fig. 16 Leg length / torso length

Fig.17

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Regression lines:—

Waist girth = 1·012 chest girth − 6·068

Chest girth = 0·714 waist girth + 15·03

Correlation coefficient 0·850 Covariance 5·203

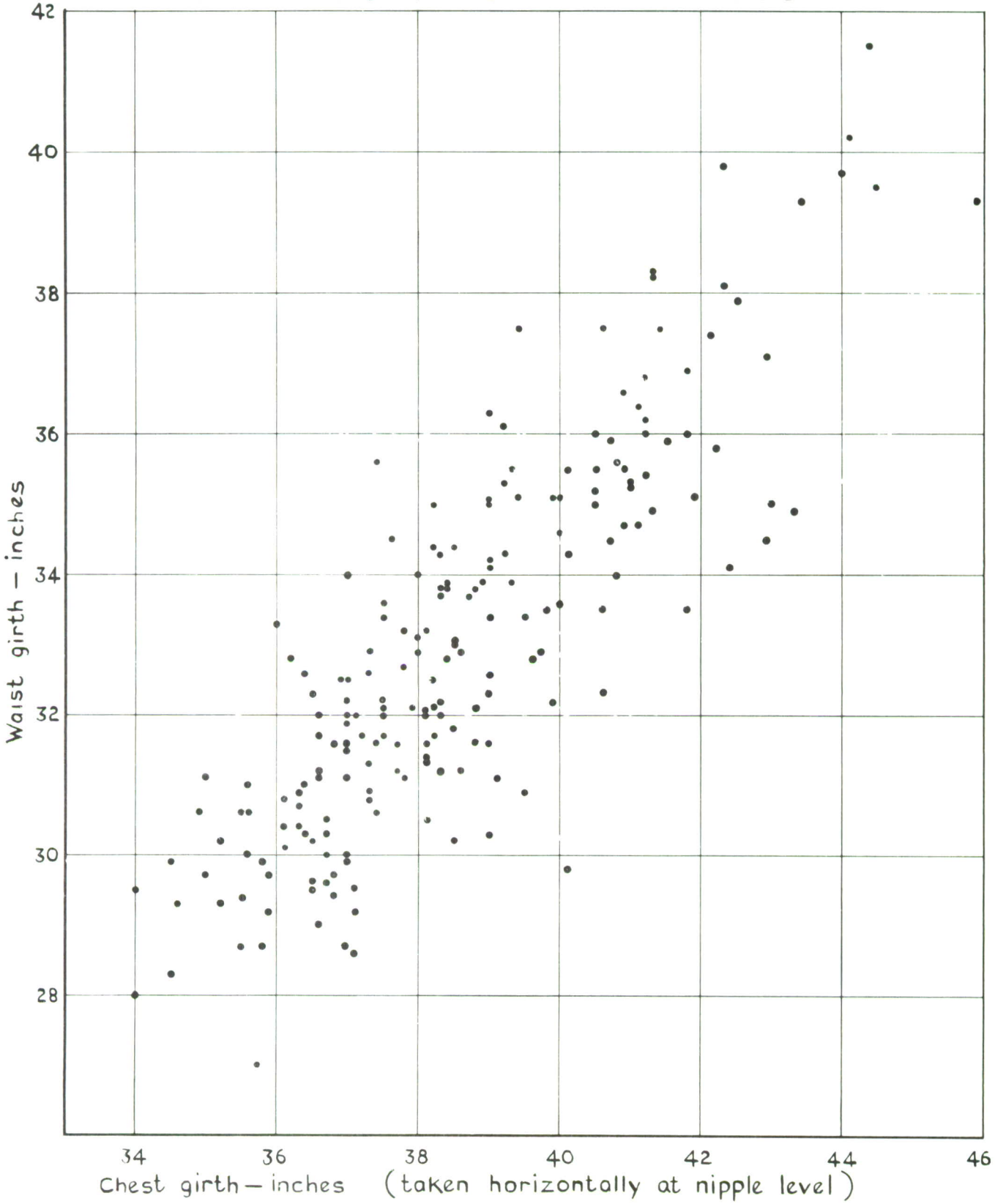


Fig.17 Chest girth / waist girth

Fig.18

Regression lines —

Buttock girth = 0·719 chest girth + 11·13

Chest girth = 0·903 buttock girth + 3·481

Correlation coefficient 0·806 Covariance 3·696

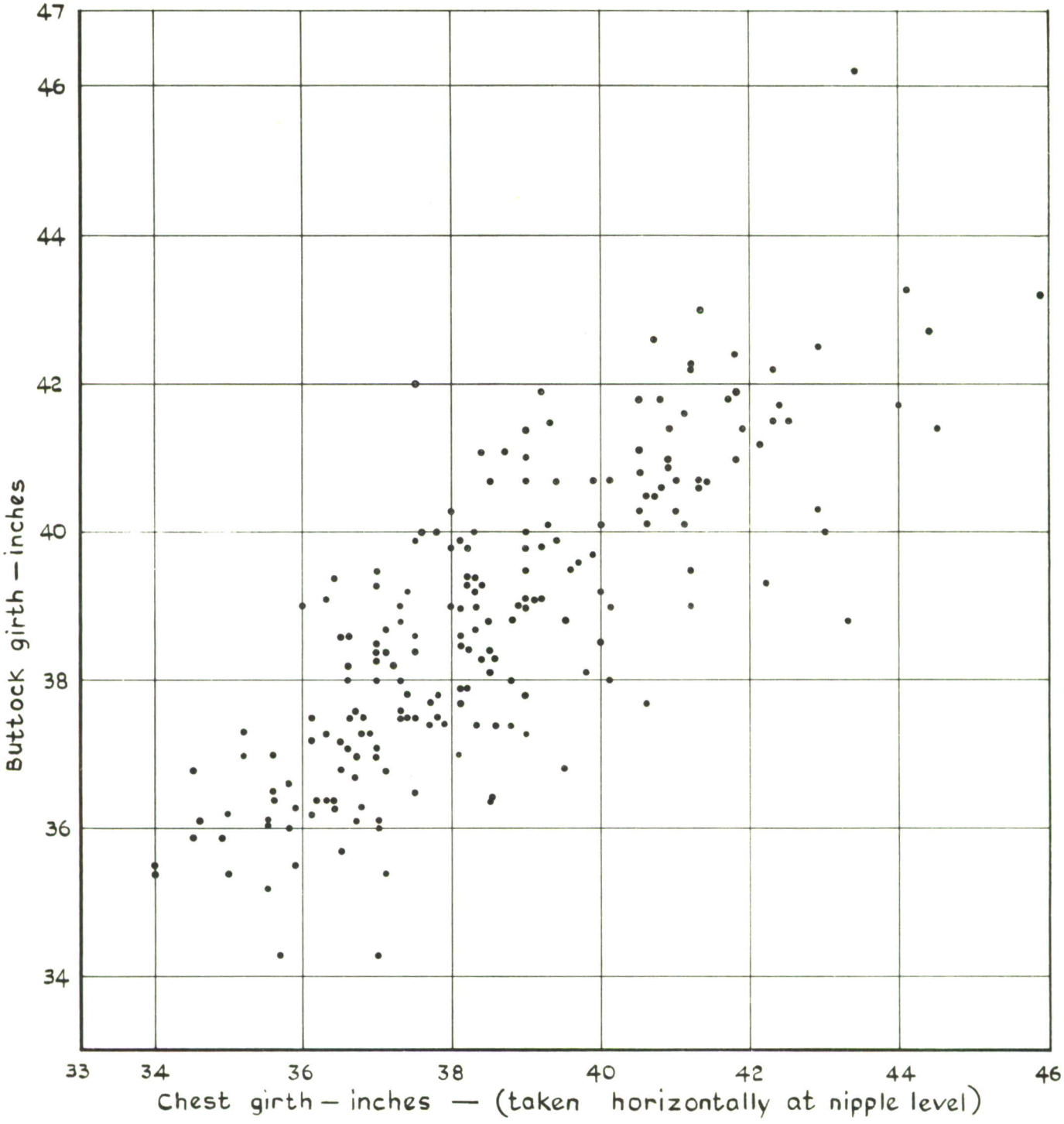


Fig.18 Chest girth / buttock girth

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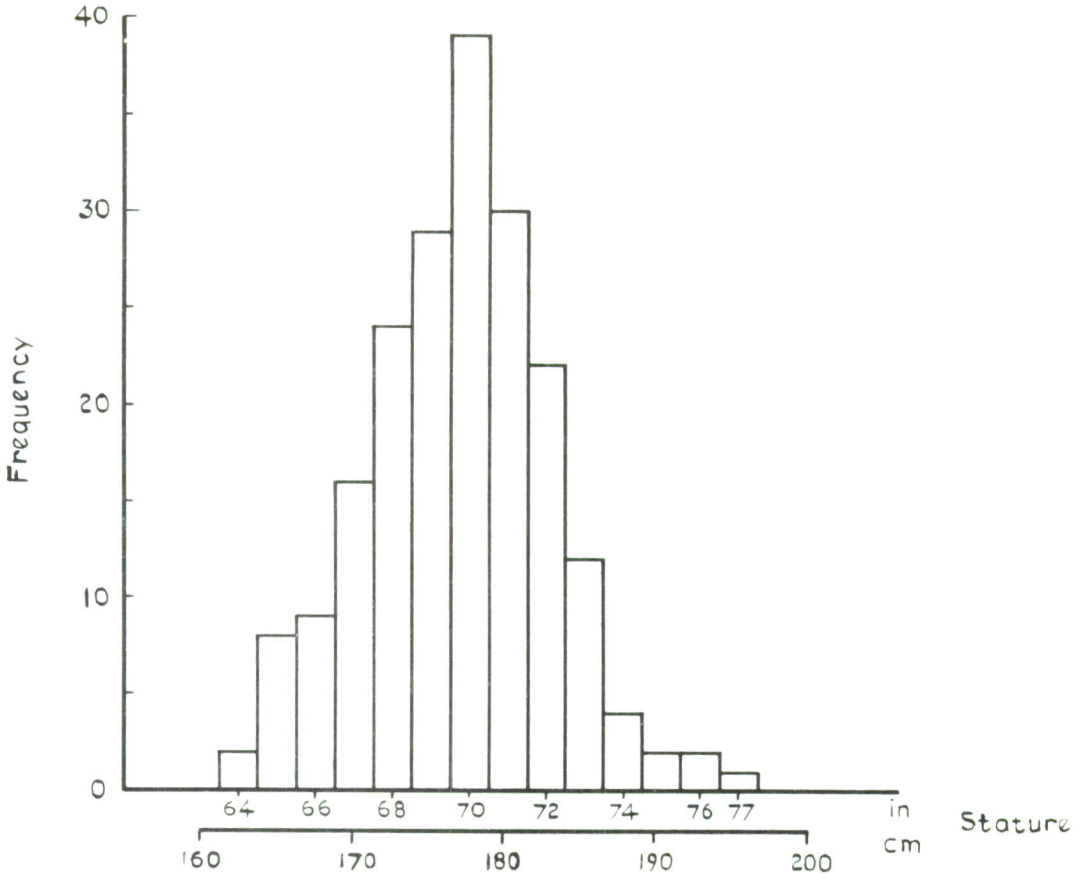


Fig.19 Frequency distribution—stature

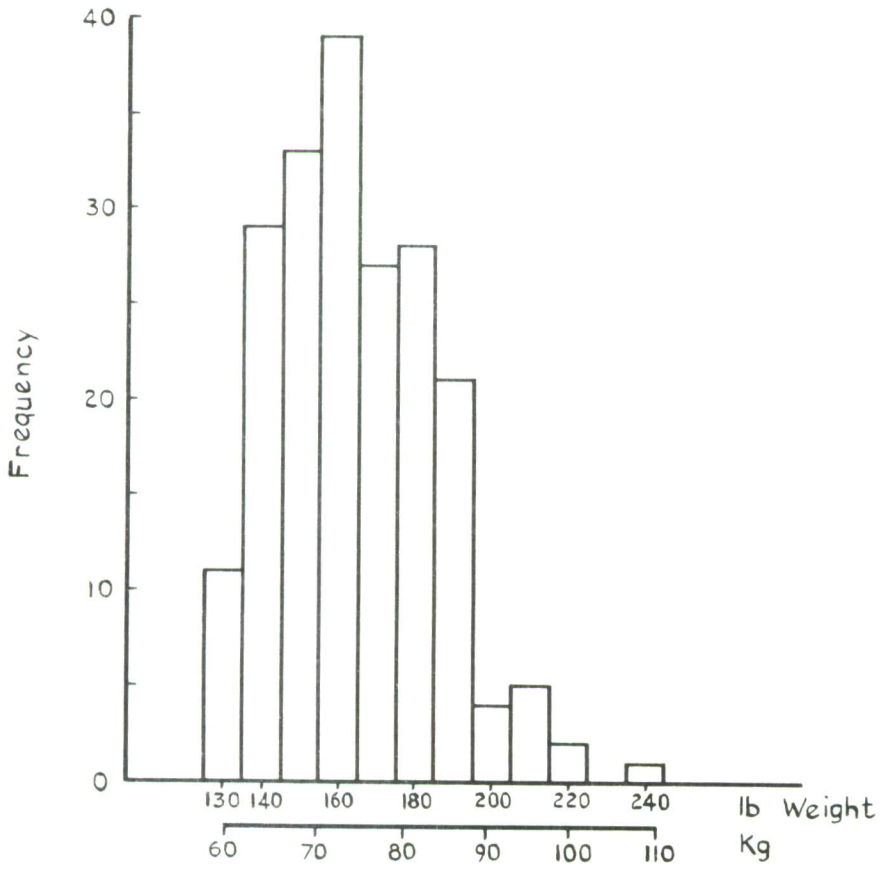


Fig. 20 Frequency distribution — weight

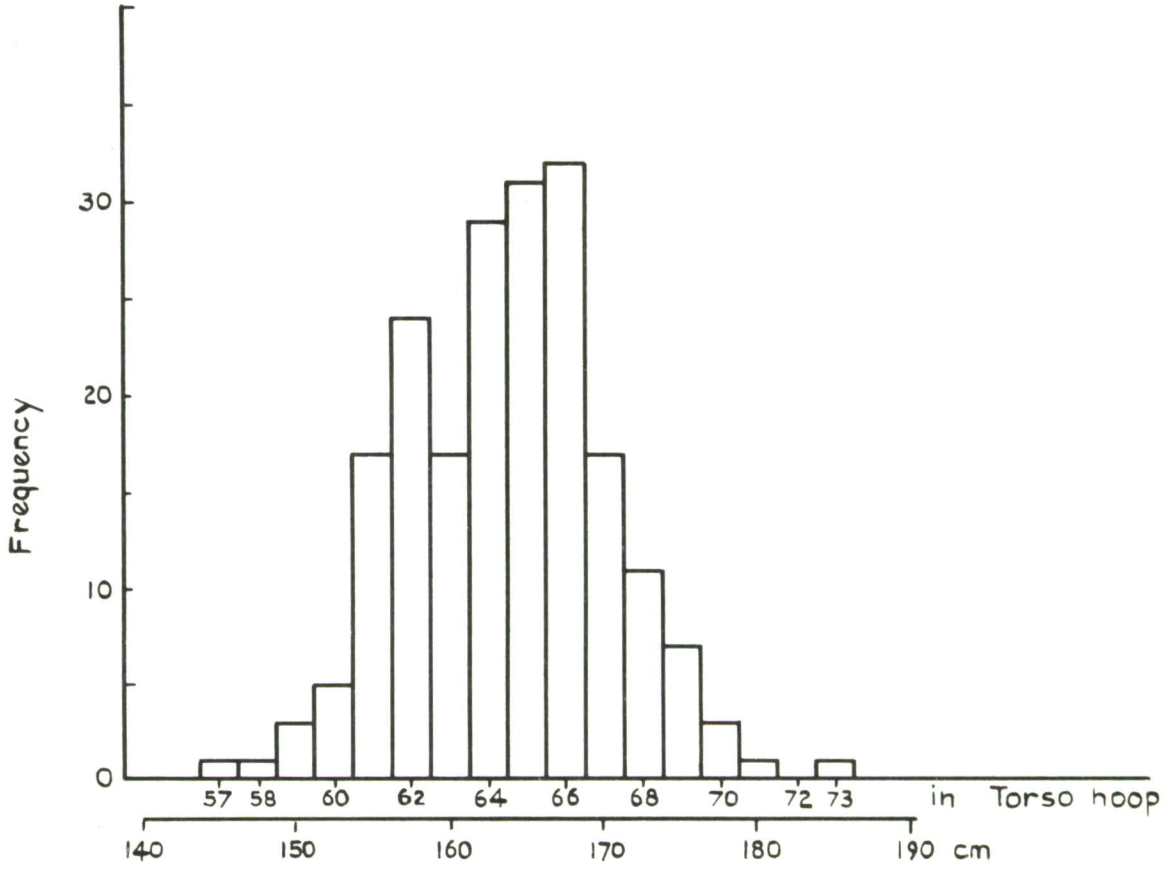


Fig. 21 Frequency distribution — torso hoop

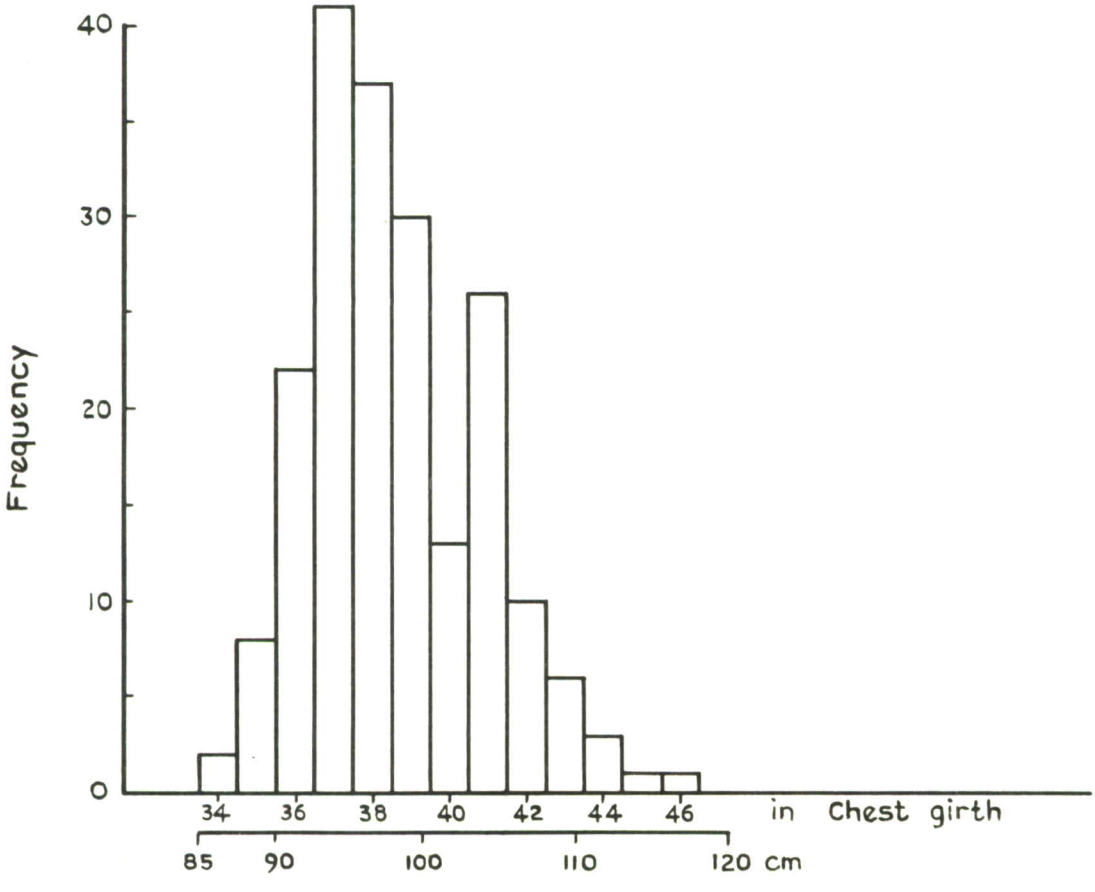


Fig. 22 Frequency distribution — chest girth

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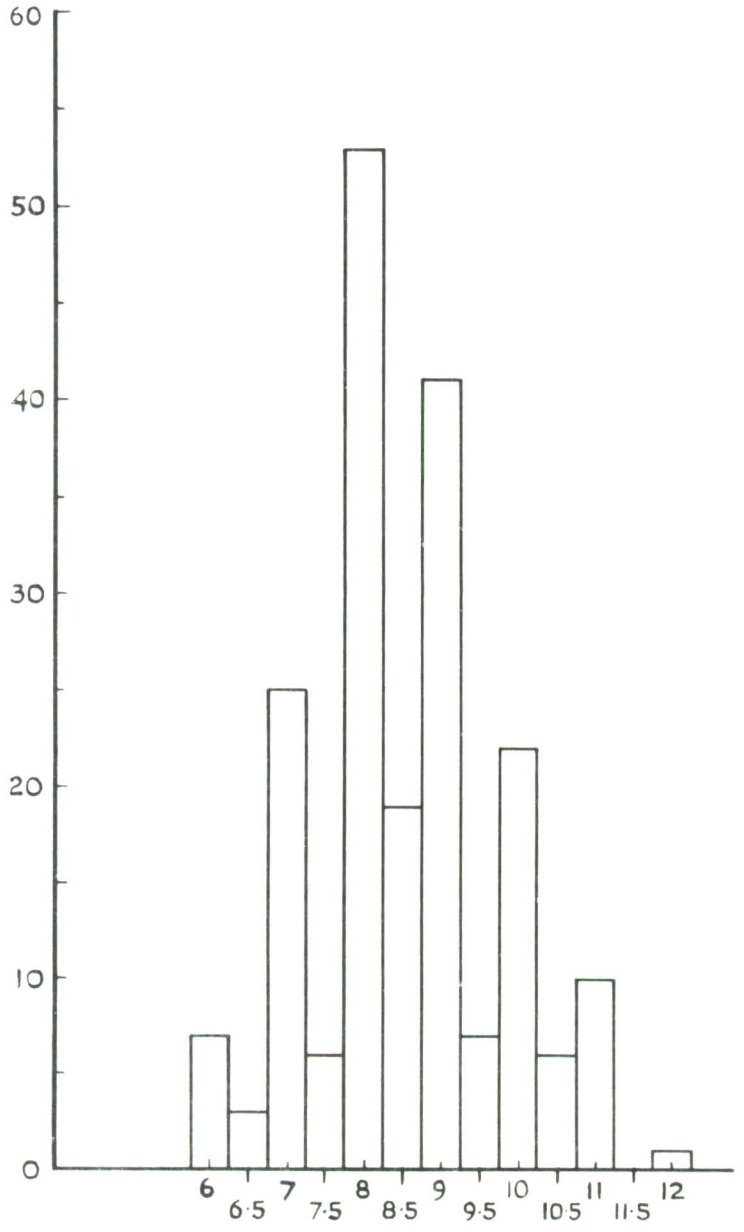


Fig. 23 Frequency distribution – Shoe size

Shoe sizes are given as stated by the subjects
No foot measurements were taken

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