

4078

*authentic*  
**ADA 084119**

*12/7*  
**TECHNICAL REPORT  
NATICK/TR-80/016** *01*

# **ANTHROPOMETRY OF WOMEN OF THE U.S. ARMY-1977**

**Report No. 4 - Correlation Coefficients**

by

Ilse Tebbetts

Thomas Churchill

and

John T. McConville

Anthropology Research Project  
Yellow Springs, Ohio

Approved for public release;  
distribution unlimited.

FEBRUARY 1980

**UNITED STATES ARMY  
NATICK RESEARCH and DEVELOPMENT COMMAND  
NATICK, MASSACHUSETTS 01760**



**Clothing, Equipment & Materials Engineering Laboratory**

**CEMEL-209**

*20030109 211*

Approved for public release; distribution unlimited.

Citation of trade names in this report does not constitute an official indorsement or approval of the use of such items.

Destroy this report when no longer needed. Do not return it to the originator.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                       | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| 1. REPORT NUMBER<br>NATICK/TR-80/016                                                                                                                                                                                                                                                                                                                                                                                                                            | 2. GOVT ACCESSION NO.                                 | 3. RECIPIENT'S CATALOG NUMBER                                                                       |
| 4. TITLE (and Subtitle)<br><br>ANTHROPOMETRY OF WOMEN OF THE U.S. ARMY--1977<br>REPORT NO. 4 - CORRELATION COEFFICIENTS                                                                                                                                                                                                                                                                                                                                         |                                                       | 5. TYPE OF REPORT & PERIOD COVERED<br><br>Technical Report                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                       | 6. PERFORMING ORG. REPORT NUMBER<br>CEMEL-209                                                       |
| 7. AUTHOR(s)<br>Ilse Tebbetts<br>Thomas Churchill<br>John T. McConville                                                                                                                                                                                                                                                                                                                                                                                         |                                                       | 8. CONTRACT OR GRANT NUMBER(s)<br><br>DAAK60-79-C-0097                                              |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>Anthropology Research Project, Inc.<br>503 Xenia Avenue<br>Yellow Springs, Ohio 45387                                                                                                                                                                                                                                                                                                                            |                                                       | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS<br><br>62723A<br>1L162723AH98-AC-008 |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>U.S. Army Natick Research & Development Command<br>ATTN: DRDNA-VCA<br>Natick, Massachusetts 01760                                                                                                                                                                                                                                                                                                                    |                                                       | 12. REPORT DATE<br>February 1980                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                       | 13. NUMBER OF PAGES<br>117                                                                          |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)                                                                                                                                                                                                                                                                                                                                                                                     |                                                       | 15. SECURITY CLASS. (of this report)<br><br>UNCLASSIFIED                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                       | 15a. DECLASSIFICATION/DOWNGRADING<br>SCHEDULE                                                       |
| 16. DISTRIBUTION STATEMENT (of this Report)<br><br>Approved for public release; distribution unlimited.                                                                                                                                                                                                                                                                                                                                                         |                                                       |                                                                                                     |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)                                                                                                                                                                                                                                                                                                                                                                      |                                                       |                                                                                                     |
| 18. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                       |                                                                                                     |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)                                                                                                                                                                                                                                                                                                                                                                              |                                                       |                                                                                                     |
| Anthropometry<br>Measurement(s)<br>Body size<br>Sizes (Dimensions)                                                                                                                                                                                                                                                                                                                                                                                              | Survey(s)<br>U.S. Army<br>Military personnel<br>Women | Coefficients of correlation<br>Correlation coefficients<br>Equation(s)<br>Regression equations      |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)                                                                                                                                                                                                                                                                                                                                                                               |                                                       |                                                                                                     |
| <p>Correlation coefficients for the 161 variables measured in the 1976-77 anthropometric survey of U.S. Army women are given in this document, the fourth in a series of five reports describing the results of that study. Five sets of measurements were taken in the original survey; these included a core series plus subsets of traditional, workspace, head-face and static strength measurements. Correlations are given for all core measurements,</p> |                                                       |                                                                                                     |

DD FORM 1473

1 JAN 73

EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

## 20. ABSTRACT (continued)

for each of the subsets, and for combinations of each subset (except the head-face group) with the core dimensions.

Intended as a self-sufficient guide to designers of military clothing, equipment and workspaces, this report contains summary statistics for the five sets of measurements and height-weight regression equations to aid users in estimating given dimensions for groups or individuals for whom directly measured data do not exist. Also included here are instructions for creating regression equations from variables other than height and weight. Visual indexes for all the variables are presented for the benefit of users seeking to identify particular dimensions but who are not familiar with anthropometric terminology.

## PREFACE

The correlations and regression equations reported here are based on anthropometric data obtained in a survey of U.S. Army women conducted in 1976-77 under the supervision of Edmund Churchill, Dr. John T. McConville and Dr. Lloyd Laubach. The data in this report were computed and assembled by the Anthropology Research Project in Yellow Springs, Ohio, under contract No. DAAK60-79-C-0097 with the U.S. Army Natick Research and Development Command, Natick, Massachusetts. Dr. McConville served as senior investigator. Mr. Robert M. White, as contract monitor, offered continuous useful guidance throughout the preparation of this report.

Ms. Kay Downing executed the original drawings for the illustrations used in the Visual Index. Graphic enhancement and layouts of the Index were done by Ron Robinette with his customary meticulous attention to fine detail.

Ms. Jane Reese contributed her considerable typing, layout and proof-reading skills in preparing the manuscript for publication.

40

**BLANK PAGE**

# TABLE OF CONTENTS

|                                               | <u>Page</u> |
|-----------------------------------------------|-------------|
| LIST OF ILLUSTRATIONS. . . . .                | 4           |
| LIST OF TABLES.. . . .                        | 5           |
| INTRODUCTION . . . . .                        | 7           |
| CHAPTER I. CORRELATION COEFFICIENTS . . . . . | 10          |
| Core Measurements . . . . .                   | 12          |
| Traditional Series. . . . .                   | 44          |
| Workspace Series . . . . .                    | 64          |
| Head-Face Series . . . . .                    | 76          |
| Strength Series . . . . .                     | 88          |
| CHAPTER II. REGRESSION EQUATIONS . . . . .    | 101         |
| BIBLIOGRAPHY . . . . .                        | 117         |

# LIST OF ILLUSTRATIONS

Page

## VISUAL INDEX

|           |                                                                       |     |
|-----------|-----------------------------------------------------------------------|-----|
| Figure 1. | Core Measurements. . . . .                                            | 12  |
| Figure 2. | Traditional Series . . . . .                                          | 44  |
| Figure 3. | Workspace Series . . . . .                                            | 64  |
| Figure 4. | Head-Face Series . . . . .                                            | 76  |
| Figure 5. | Strength Series. . . . .                                              | 88  |
| Figure 6. | Bivariate frequency table for stature and<br>sitting height . . . . . | 104 |

# LIST OF TABLES

| <u>Table</u> |                                                     | <u>Page</u> |
|--------------|-----------------------------------------------------|-------------|
|              | Summary Statistics and Selected Percentiles:        |             |
| 1A           | Core Measurements (Metric Units) . . . . .          | 20          |
| 1B           | Core Measurements (English Units) . . . . .         | 23          |
| 2            | Correlations: Core Measurements . . . . .           | 26          |
|              | Summary Statistics and Selected Percentiles:        |             |
| 3A           | Traditional Series (Metric Units) . . . . .         | 48          |
| 3B           | Traditional Series (English Units) . . . . .        | 50          |
| 4            | Correlations: Core and Traditional Series . . . . . | 52          |
|              | Summary Statistics and Selected Percentiles:        |             |
| 5A           | Workspace Series (Metric Units) . . . . .           | 68          |
| 5B           | Workspace Series (English Units) . . . . .          | 69          |
| 6            | Correlations: Core and Workspace Series . . . . .   | 70          |
|              | Summary Statistics and Selected Percentiles:        |             |
| 7A           | Head-Face Series (Metric Units) . . . . .           | 80          |
| 7B           | Head-Face Series (English Units) . . . . .          | 82          |
| 8            | Correlations: Core and Head-Face Series . . . . .   | 84          |
|              | Summary Statistics and Selected Percentiles:        |             |
| 9A           | Strength Series (Metric Units) . . . . .            | 90          |
| 9B           | Strength Series (English Units) . . . . .           | 91          |
| 10           | Correlations: Core and Strength Series . . . . .    | 92          |
|              | Multiple Regression Equations...                    |             |
| 11A          | Core Measurements (Metric Units) . . . . .          | 108         |
| 11B          | Core Measurements (English Units) . . . . .         | 110         |
|              | Multiple Regression Equations...                    |             |
| 12A          | Traditional Series (Metric Units) . . . . .         | 112         |
| 12B          | Traditional Series (English Units) . . . . .        | 113         |
|              | Multiple Regression Equations...                    |             |
| 13A          | Workspace Series (Metric Units) . . . . .           | 114         |
| 13B          | Workspace Series (English Units) . . . . .          | 115         |

**BLANK PAGE**

ANTHROPOMETRY OF WOMEN OF THE U. S. ARMY--1977  
REPORT NO. 4 - CORRELATION COEFFICIENTS

INTRODUCTION

This is the fourth in a series of reports describing and analyzing the data from a large-scale anthropometric survey of Army women conducted in 1976-77. Appearing here, specifically for use by designers of Army clothing and personal-protective equipment, are, (1) the correlation coefficients which describe the relationships between dimensions, and (2) regression equations which can be used to predict dimensions for similar unmeasured populations.

The first volume of the series (Laubach et al., 1977)<sup>1</sup> outlines the survey methodology and describes the measurements. Results of the survey--summary statistics, percentiles, and frequency tables--are presented in the second report (Churchill et al., 1977),<sup>2</sup> while bivariate frequency tables for selected pairs of dimensions appear in the third volume (Churchill et al., 1977).<sup>3</sup> The fifth in the series of reports (McConville et al., 1977)<sup>4</sup> deals with the results of a companion survey of 287 Army men in which comparable anthropometric data were obtained by the same measuring team directly upon completion of the women's survey.

---

<sup>1</sup>Laubach, L.L., J.T. McConville, E. Churchill and R.M. White. Anthropometry of women of the U.S. Army-1977; Report No. 1 - Methodology and survey plan. Technical Report NATICK/TR-77/021, U.S. Army Natick Research and Development Command, Natick, Mass., 1977. (AD A043 715)

<sup>2</sup>Churchill, E., T. Churchill, J.T. McConville and R.M. White. Anthropometry of women of the U.S. Army-1977; Report No. 2 - The basic univariate statistics. Technical Report NATICK/TR-77/024, U.S. Army Natick Research and Development Command, Natick, Mass., 1977. (AD A044 806)

<sup>3</sup>Churchill, T., E. Churchill, J.T. McConville and R.M. White. Anthropometry of women of the U.S. Army-1977; Report No. 3 - Bivariate frequency tables. Technical Report NATICK/TR-77/028, U.S. Army Natick Research and Development Command, Natick, Mass., 1977. (AD A046 692)

<sup>4</sup>McConville, J.T., E. Churchill, T. Churchill and R.M. White. Anthropometry of women of the U.S. Army-1977; Report No. 5 - Comparative data for U.S. Army men. Technical Report NATICK/TR-77/029, U.S. Army Natick Research and Development Command, Natick, Mass., 1977. (AD A048 591)

The women's sample totaled 1,330 subjects all of whom were measured for 69 basic dimensions which, with "age", constitute the "core" measurements. In addition, four subseries of measurements were created as follows:

28 "traditional" body measurements: 255 subjects

14 workspace measurements: 300 subjects

31 head and face measurements: 216 subjects

9 static strength measurements (average and peak values were recorded for each of two trials): 349 subjects

Subjects on whom the core measurements were taken were then randomly assigned to be measured in one of the four subseries.

In brief, about three quarters of the subjects were enlisted women and one quarter officers. Three quarters were Whites, close to one quarter Blacks and about 2% were Orientals. Mean age of the sample was slightly over 23 years. The women averaged 60 kilograms (132 pounds) in weight and had a mean height of 163 centimeters (64 inches).

The correlations presented in Chapter I are divided into five sets of data, one representing core measurements of the entire sample, and the other four representing the subgroups. Except for the head-face series, where they are not relevant, all the core dimensions are correlated with the dimensions in each subgroup; subgroup dimensions are also, of course, correlated among themselves.

Each group of correlations is preceded by a visual index which consists of a series of line drawings illustrating the measured dimensions. The reader need not know the exact anthropometric name used for a particular dimension of interest but can locate it by looking through the visual index. Each dimension illustrated in the index is keyed to the anthropometric name of the dimension, its designated number and a description of how it was measured. Numbers assigned to the variables appear throughout the report; accompanying letters identify the subgroup category from which the measurement was taken (i.e. 3C indicates a core measurement; 5W identifies the variable as a workspace dimension).

Chapter II contains three sets of regression equations based on the height and weight of the total Army women's sample and two of the four subgroups, the traditional and the workspace measurements. With these, designers will be able to estimate reliably numerous dimensions for virtually any group of Army women whose height and weight can be ascertained. Alternatively, a designer may wish to use predictor values other than height and weight for specific design problems. To this end Chapter II contains an explanation of how to construct valid

regression equations using any known variable or variables from the summary statistics and correlation data provided in Chapter I.

Some of the data which are provided in this volume--notably summary statistics, percentiles and measurement descriptions--have appeared in previous volumes. They are repeated here so as to make this a complete and self-sufficient manual which can be used without reference to the other volumes.

## Chapter I

### CORRELATION COEFFICIENTS

The extent to which sizing systems produce well-fitting garments for a large population which, in this case, spans 90 pounds of weight and twelve inches in stature, depends on the ability of the designer to analyze, select and manipulate body size data which will successfully relate to or "control" the important dimensions of a given garment. The coefficients of correlation contribute to this process.

Most commonly employed of the statistics which express the important interrelationships of body parts is the correlation coefficient, a value which reflects the extent to which the increase or decrease of one dimension coincides with a similar change in another dimension or, put another way, the reliability with which one variable can be predicted from another. Height measurements, for example, tend to correlate well with each other, which is to say that as stature increases so does shoulder height, waist height, buttock height or calf height. A perfect agreement (never achieved among body size measurements) is expressed as 1.0; the correlation coefficient of stature and shoulder height, as can be seen on Table 2, is 0.968. Near the other end of the scale are correlation coefficients for such combinations as waist circumference and stature (0.208 for the Army women's sample) which reflects the fact that there is little predictable relationship between a woman's height and her waist size.

Negative correlations result when one variable increases as the other decreases. High negative correlations rarely if ever occur between anthropometric measurements but, as can be seen by examining the correlation tables in this chapter, very low negative correlations occasionally occur. These do not have any special significance; like very low positive correlations, they simply denote the absence of any meaningful relationship between the given variables.

Blank spaces which occur at regular diagonal intervals on the following correlation tables indicate correlations of a variable with itself. This value, which is always 1.0, has been omitted throughout.

As a general rule, there is a high correlation between stature and other height measurements for all populations. Weight correlates well with circumferential and breadth measurements and there is a moderate degree of relationship between stature and weight which, in most population samples, ranges around 0.5.

It is customary in sizing garments to be worn on the torso to select one or two key dimensions on which to base the sizing system. In the case of slacks, these might be stature and hip circumference since a study of the correlation coefficients reveals that, between them, these

two dimensions relate well to virtually all other dimensions of importance. Stature has a controlling influence on such variables as waist and crotch height, while hip circumference correlates well with waist, upper thigh and calf circumferences. Thus a garment sized 34 long could reasonably be expected to fit a tall, slim woman not only at hips and inseam but also at the waist and around the legs.

The correlation coefficient derives from the related concept of the regression line or regression formula by which one can estimate the value of one variable from that of a second variable. Data required to derive regression equations are the correlation coefficients, means and standard deviations. Instructions for constructing regression equations from the Army women's data are given in Chapter II. Presented in this chapter are the summary statistics (Tables 1, 3, 5, 7 and 9) and the correlation coefficients (Tables 2, 4, 6, 8 and 10) required for creation of the regression equations.

Five sets of correlation coefficients appear here. In the first group are the 70 core measurements (69 body size variables plus age). The remaining four sets represent the subgroup measurements. Core measurements are correlated with each subgroup measurement in all but the head/face series.

Dimensions of the head and face have so little relationship to other body measurements that with the exception of age, weight, stature, head circumference, head breadth, and head length, the core measurements are not correlated with those in the head/face series. As can be seen from a study of Table 8, head and face measurements have a notoriously poor relationship even with each other, an anthropometric phenomenon which lies at the root of difficulties encountered in the design and sizing of protective head gear and respirators.

The nine strength measurements were each made twice and the data recorded for each strength test included the subject's peak effort over a three-second interval and the average of her pull. Since each strength measurement was duplicated, four data points (average force 1 and 2 and peak force 1 and 2) were originally reported. Since the duplicated measurements closely resembled each other, it seemed superfluous to include them all in the correlation statistics. For correlation purposes, then, we selected only the higher of the peak measurements and the higher of the average measurements for each subject.

## THE VISUAL INDEX CORE MEASUREMENTS

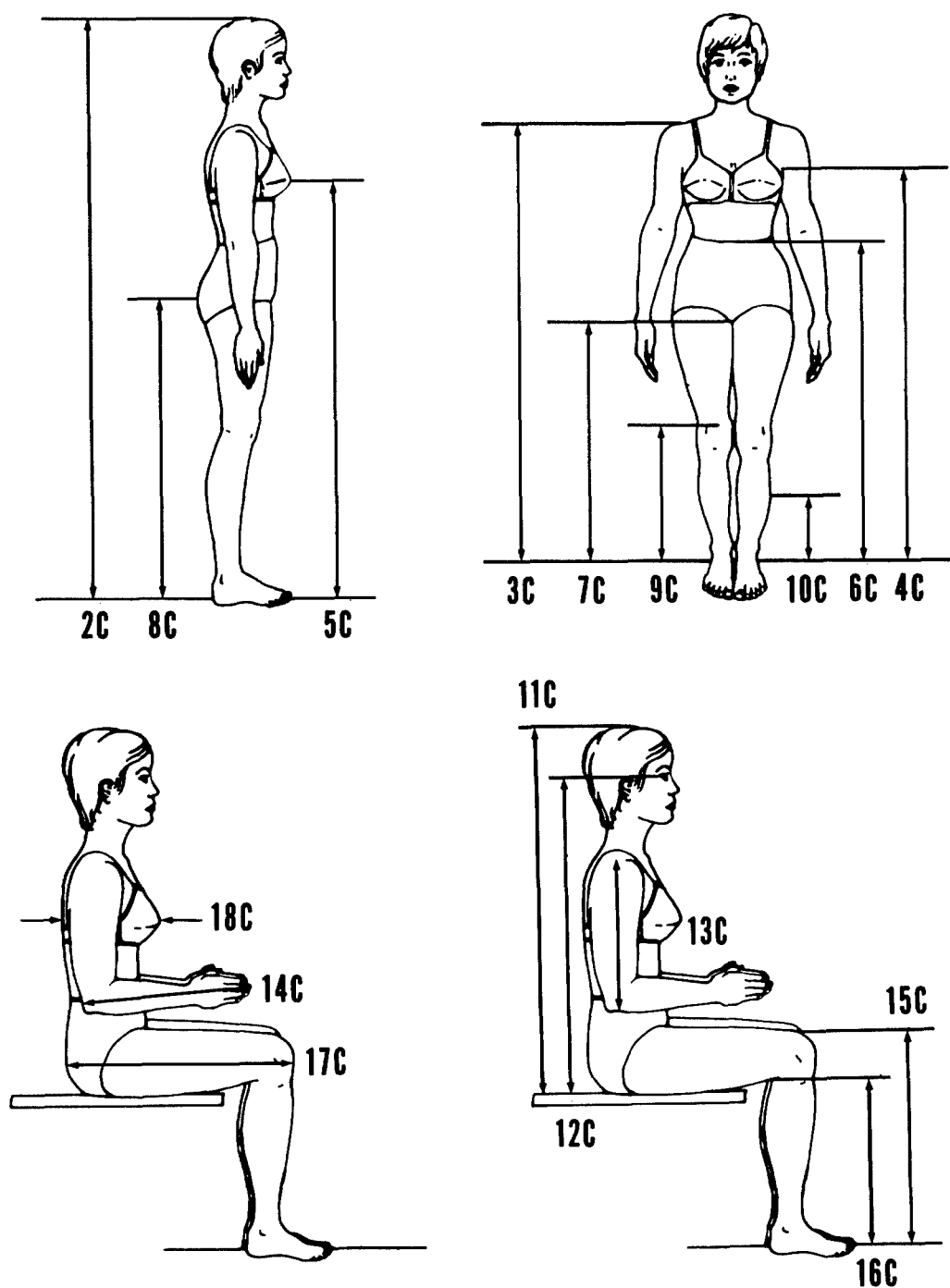


Figure 1. The visual index: core measurements.

- 1C WEIGHT: weight of subject wearing panties and bra (not pictured).
- 2C STATURE: vertical distance from floor to top of the head.
- 3C SHOULDER HEIGHT: vertical distance from floor to acromion, the lateral edge of the acromial process of the shoulder.
- 4C AXILLA HEIGHT: vertical distance from floor to armpit.
- 5C BUSTPOINT HEIGHT: vertical distance from floor to tip of the bra.
- 6C WAIST HEIGHT: vertical distance from floor to natural waist level.
- 7C CROTCH HEIGHT: vertical distance from floor to midpoint of crotch.
- 8C BUTTOCK HEIGHT: vertical distance from floor to the point of maximum protrusion of the buttock.
- 9C KNEECAP HEIGHT: vertical distance from floor to top of the kneecap (patella).
- 10C CALF HEIGHT: vertical distance from floor to the level of the maximum circumference of the calf.
- 11C SITTING HEIGHT: vertical distance from sitting surface to top of the head.
- 12C EYE HEIGHT, SITTING: vertical distance from sitting surface to the outer corner of the eye.
- 13C SHOULDER-ELBOW LENGTH: vertical distance from acromion, the lateral edge of the acromial process of the shoulder, to the underside of the elbow, measured with the upper arms relaxed and the forearms and hands extended forward and horizontally.
- 14C ELBOW-FINGERTIP LENGTH: distance from the tip of the right elbow to the tip of the middle finger, measured with the upper arm hanging relaxed, the forearm and hand extended forward and horizontally.
- 15C KNEE HEIGHT, SITTING: vertical distance from the footrest surface to a point on the thigh 5 cm proximal to the anterior surface of the patella.
- 16C POPLITEAL HEIGHT: vertical distance from the footrest surface to the lateral underside of the thigh where the tendon of the biceps femoris joins the lower leg.
- 17C BUTTOCK-KNEE LENGTH: horizontal distance from the most posterior protrusion of the buttock to the most anterior point of the kneecap.
- 18C BUST DEPTH: horizontal distance from the tip of the bra to the back of the torso.

# THE VISUAL INDEX CORE MEASUREMENTS (CONT.)

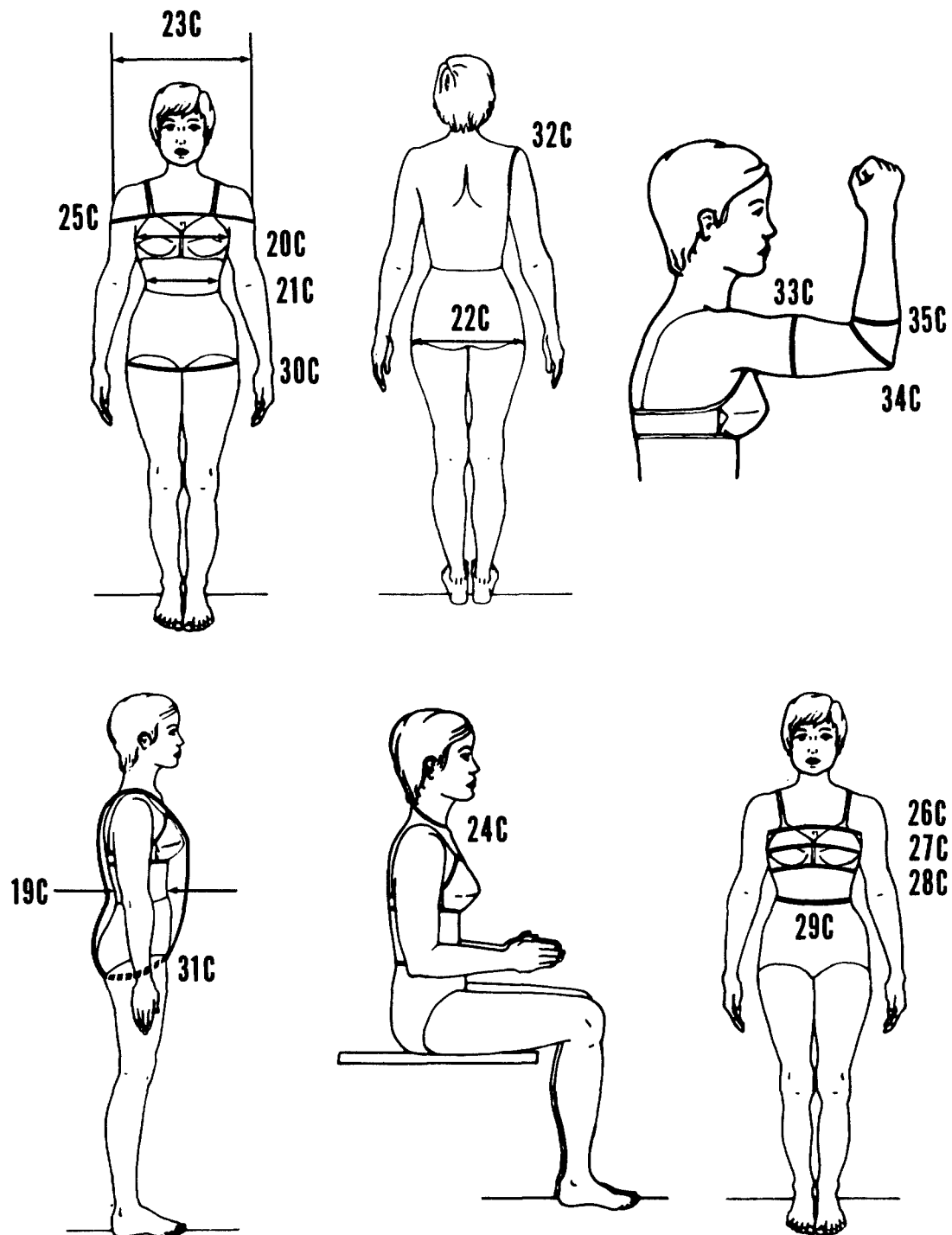


Figure 1. The visual index: core measurements (continued).

- 19C WAIST DEPTH: anterior-posterior depth of the torso at waist level.
- 20C CHEST BREADTH: left-right breadth of the torso at the level of the bust points.
- 21C WAIST BREADTH: left-right breadth of the torso at waist level.
- 22C HIP BREADTH: maximum horizontal breadth of the hips.
- 23C SHOULDER (BIDELTOID) BREADTH: horizontal distance across maximum lateral protrusions of the right and left deltoid muscles.
- 24C NECK CIRCUMFERENCE: circumference of the base of the neck (this circumference is not in a plane perpendicular to the axis of the neck).
- 25C SHOULDER CIRCUMFERENCE: horizontal circumference of the shoulders at the level of the greatest lateral protrusion of the deltoid muscles.
- 26C CHEST CIRCUMFERENCE AT SCYE: horizontal circumference of the trunk measured with the tape high in the armpits.
- 27C BUST CIRCUMFERENCE: horizontal circumference of the trunk measured with the tape passing over the bra points.
- 28C CHEST CIRCUMFERENCE BELOW BUST: horizontal circumference of the trunk measured at a level just below the cups of the bra.
- 29C WAIST CIRCUMFERENCE: horizontal circumference of the waist at 'natural' waist level.
- 30C HIP CIRCUMFERENCE: maximum circumference of the hips at the level of the maximum posterior protrusion of the buttocks.
- 31C VERTICAL TRUNK CIRCUMFERENCE: circumference of the torso measured with the tape passing through the crotch, over the protrusion of the buttock, the midshoulder point, and the tip of the bra. The tape follows the contour of the body's back but not its front.
- 32C ARM SCYE CIRCUMFERENCE: circumference of the scye measured with the tape passing through the armpit and over acromion.
- 33C BICEPS CIRCUMFERENCE, FLEXED: circumference of the arm at the level of the maximal protrusion of the biceps, measured with the elbow flexed 90 degrees, the upper arm horizontal and the fist tightly clenched.
- 34C ELBOW CIRCUMFERENCE, FLEXED: distance around the elbow measured over its tip and through the crotch with arm in same position as 33C above.
- 35C FOREARM CIRCUMFERENCE, FLEXED: maximum circumference of the lower arm measured with the arm in same position as 33C above.

## THE VISUAL INDEX CORE MEASUREMENTS (CONT.)

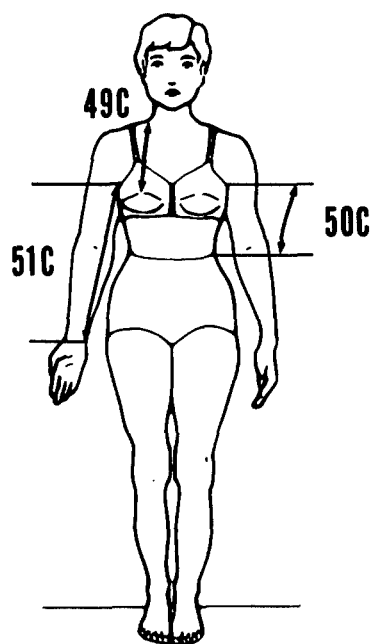
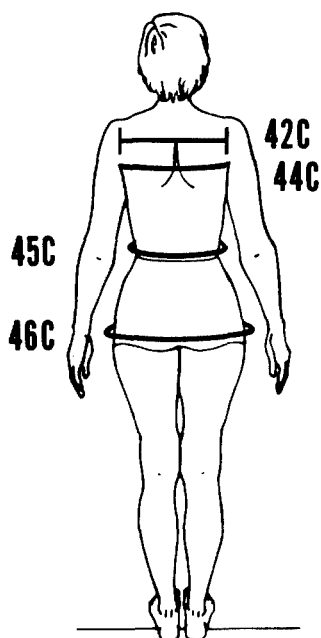
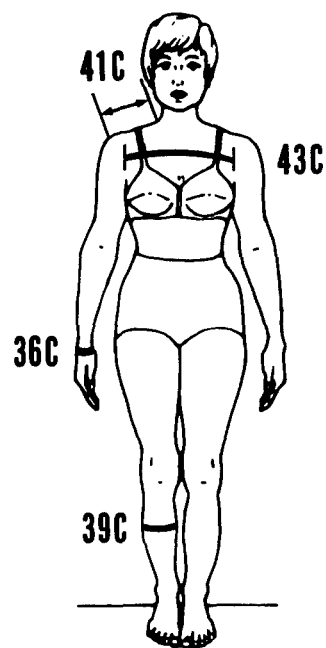
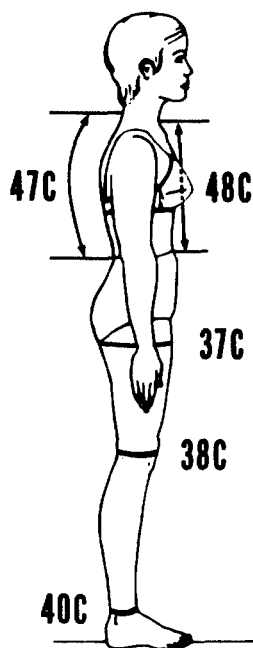


Figure 1. The visual index: core measurements (continued).

- 36C WRIST CIRCUMFERENCE: circumference of the wrist at styliion level.
- 37C UPPER THIGH CIRCUMFERENCE: circumference of the leg measured at the level of the lowest point of the gluteal furrow.
- 38C KNEE CIRCUMFERENCE: circumference of the knee at the level of the midpoint of the kneecap.
- 39C CALF CIRCUMFERENCE: maximum circumference of the calf.
- 40C ANKLE CIRCUMFERENCE: minimum circumference of the ankle.
- 41C SHOULDER LENGTH: surface distance from neck-shoulder junction to acromion.
- 42C INTERSCYE, BACK: surface distance across the back between points midway between the posterior edges of armpits and acromiale points.
- 43C INTERSCYE, FRONT: surface distance across the front between points midway between the anterior edges of armpits and acromiale points.
- 44C BACK CURVATURE-BUST LEVEL: surface distance across the back between midaxillary lines at the level of the bra points.
- 45C BACK CURVATURE-WAIST LEVEL: surface distance across the back between midaxillary lines at waist level.
- 46C BACK CURVATURE-HIP LEVEL: surface distance across the back between midaxillary lines at the level of the maximum protrusion of the buttocks.
- 47C WAIST BACK LENGTH: surface distance from the waist to cervicale.
- 48C WAIST FRONT LENGTH: surface distance from the waist to the anterior neck-torso juncture.
- 49C NECK TO BUSTPOINT: distance from the lateral neck-shoulder juncture to the bra tip with the tape held tense and not following the body contour.
- 50C AXILLA TO WAIST: surface distance from armpit to waist point in the midaxillary line.
- 51C SLEEVE INSEAM LENGTH: distance from the anterior edge of the armpit to the little finger side of the wrist measured with the arm slightly abducted, the palm held forward, and the tape tense.

## THE VISUAL INDEX CORE MEASUREMENTS (CONT.)

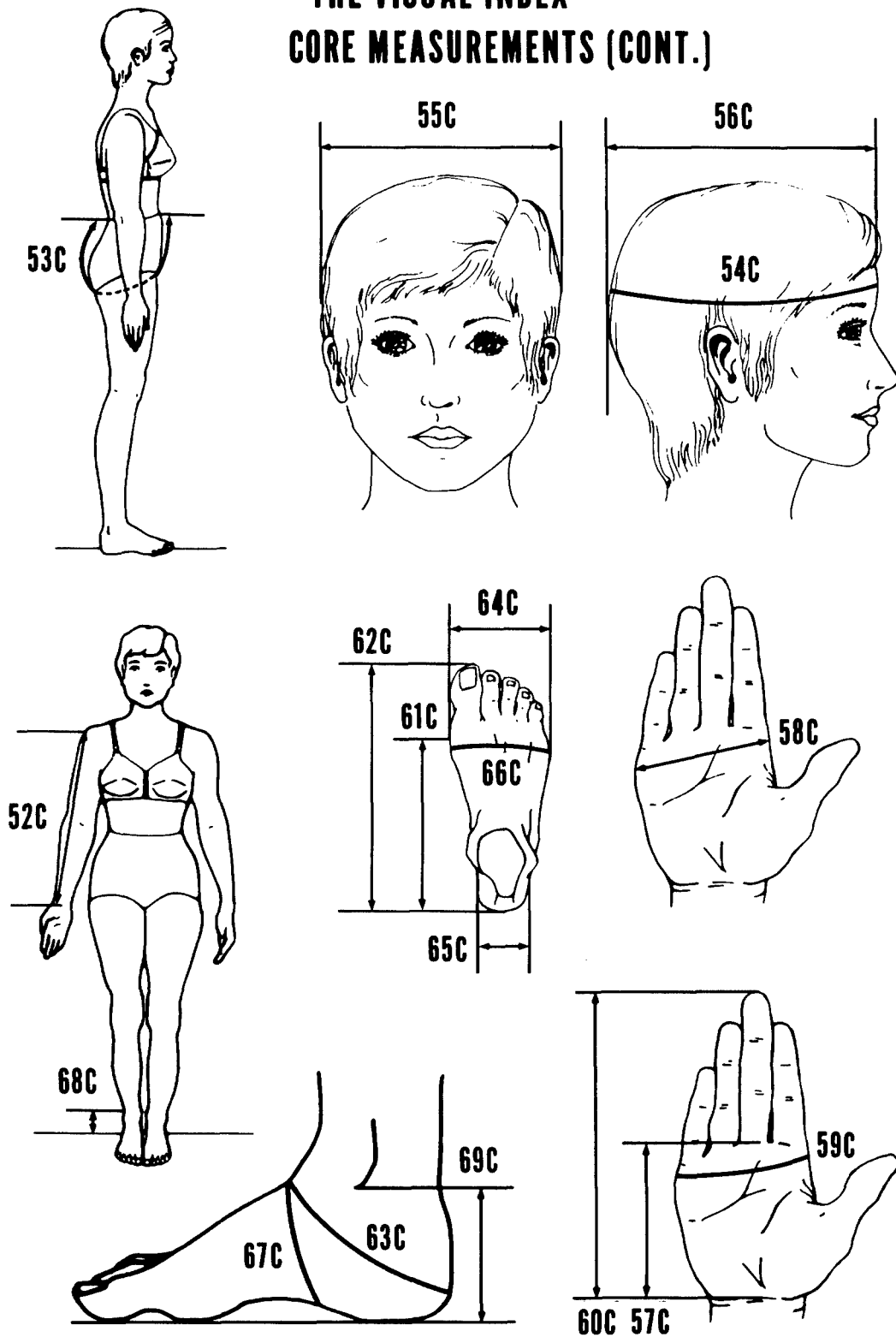


Figure 1. The visual index: core measurements (continued).

- 52C SLEEVE OUTSEAM LENGTH: distance from acromiale to the thumb side of the wrist; arm is slightly abducted, the palm held forward, and tape tense.
- 53C CROTCH LENGTH: surface distance from the waist directly above buttock protrusion, over the protrusion, and through the crotch to waist level in the midsagittal plane.
- 54C HEAD CIRCUMFERENCE: maximum circumference of the head measured with the tape passing above the brow ridges and nuchale.
- 55C HEAD BREADTH: maximum breadth of the head above the level of the ears.
- 56C HEAD LENGTH: maximum length of the head from the most anterior point between the brow ridges to the occiput.
- 57C PALM LENGTH: distance from wrist crease to skin crease at the base of the third finger, measured parallel to the long axis of the hand.
- 58C HAND BREADTH: breadth across the distal ends of the metacarpal bones.
- 59C HAND CIRCUMFERENCE: circumference measured around the metacarpal-phalangeal joints.
- 60C HAND LENGTH: distance from wrist crease to dactylion measured parallel to the long axis of the hand.
- 61C INSTEP LENGTH: distance measured parallel to the long axis of the foot, from heel level to the point of maximum medial protuberance of the foot.
- 62C FOOT LENGTH: length of the foot measured parallel to its long axis.
- 63C HEEL-ANKLE CIRCUMFERENCE: diagonal foot circumference measured with the tape passing under tip of the heel and over instep at foot-leg juncture.
- 64C FOOT BREADTH: maximum breadth of the foot as measured at right angles to its long axis.
- 65C HEEL BREADTH: maximum breadth of the calcaneus.
- 66C FOOT CIRCUMFERENCE: circumference of the foot as measured around the distal ends of the protuberances of the metatarsal bones.
- 67C INSTEP CIRCUMFERENCE: circumference of the foot in a plane perpendicular to the long axis of the foot at the level of the metatarsal-cuneiform joint.
- 68C ANKLE HEIGHT: height at the level of minimum ankle circumference.
- 69C SPHRYION HEIGHT: height of the most distal extension of the tibia on the inside of the foot.

TABLE 1A  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
CORE MEASUREMENTS (N=1330)

| METRIC UNITS*          | MEAN   | SD   | 1ST   | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1C WEIGHT              | 59.92  | 8.51 | 43.1  | 46.7  | 49.3  | 54.1  | 59.6  | 65.1  | 70.6  | 74.5  | 83.9  |
| 2C STATURE             | 162.95 | 6.52 | 148.2 | 152.5 | 154.7 | 158.4 | 162.7 | 167.3 | 171.6 | 174.1 | 178.4 |
| 3C SHOULDER HEIGHT     | 133.48 | 6.00 | 120.4 | 123.9 | 125.8 | 129.3 | 133.3 | 137.6 | 141.5 | 143.7 | 147.5 |
| 4C AXILLA HEIGHT       | 123.25 | 5.58 | 110.7 | 114.3 | 116.2 | 119.3 | 123.1 | 127.1 | 130.7 | 132.8 | 136.2 |
| 5C BUSTPOINT HEIGHT    | 118.29 | 5.63 | 106.0 | 109.3 | 111.1 | 114.4 | 118.2 | 122.1 | 125.7 | 127.8 | 131.5 |
| 6C WAIST HEIGHT        | 101.39 | 5.20 | 89.7  | 93.2  | 95.0  | 97.8  | 101.2 | 104.8 | 108.2 | 110.3 | 114.2 |
| 7C GROUCH HEIGHT       | 76.37  | 4.38 | 66.8  | 69.5  | 70.9  | 73.3  | 76.1  | 79.3  | 82.2  | 83.9  | 86.8  |
| 9C BUTTOCK HEIGHT      | 83.79  | 4.67 | 74.0  | 76.4  | 77.9  | 80.5  | 83.6  | 86.8  | 89.8  | 91.7  | 95.9  |
| 9C KNEECAP HEIGHT      | 47.90  | 2.65 | 42.1  | 43.8  | 44.6  | 46.0  | 47.8  | 49.7  | 51.5  | 52.5  | 54.2  |
| 10C CALF HEIGHT        | 32.55  | 2.30 | 27.8  | 29.0  | 29.7  | 30.9  | 32.4  | 34.1  | 35.6  | 36.6  | 38.3  |
| 11C SITTING HEIGHT     | 85.07  | 3.59 | 76.3  | 79.0  | 80.4  | 82.7  | 85.2  | 87.6  | 89.6  | 90.8  | 92.7  |
| 12C EYE HEIGHT/SIT     | 73.63  | 3.46 | 65.3  | 67.7  | 69.1  | 71.4  | 73.8  | 76.0  | 77.9  | 79.1  | 81.6  |
| 13C SHOULDER-ELBOW L   | 33.56  | 1.75 | 29.8  | 30.8  | 31.4  | 32.3  | 33.5  | 34.7  | 35.9  | 36.6  | 37.7  |
| 14C ELBOW-FINGERTIP    | 43.52  | 2.26 | 38.7  | 40.0  | 40.7  | 41.9  | 43.4  | 45.0  | 46.6  | 47.5  | 49.2  |
| 15C KNEE HEIGHT/SIT    | 50.99  | 2.60 | 45.5  | 46.9  | 47.7  | 49.2  | 50.9  | 52.7  | 54.4  | 55.5  | 57.3  |
| 16C POPLITEAL HEIGHT   | 41.68  | 2.35 | 36.4  | 38.0  | 38.8  | 40.1  | 41.6  | 43.3  | 44.8  | 45.7  | 47.3  |
| 17C BUTTOCK-KNEE LGTH  | 57.84  | 3.06 | 51.1  | 53.1  | 54.1  | 55.7  | 57.7  | 59.9  | 62.0  | 63.2  | 65.2  |
| 18C BUST DEPTH         | 22.91  | 2.21 | 18.7  | 19.6  | 20.2  | 21.4  | 22.7  | 24.3  | 25.8  | 26.8  | 29.0  |
| 19C WAIST DEPTH        | 18.28  | 2.18 | 14.4  | 15.3  | 15.9  | 16.8  | 18.0  | 19.4  | 21.0  | 22.2  | 25.0  |
| 20C CHEST BREADTH      | 28.24  | 1.82 | 24.5  | 25.4  | 25.9  | 27.0  | 28.1  | 29.4  | 30.6  | 31.4  | 33.1  |
| 21C WAIST BREADTH      | 25.57  | 2.42 | 21.2  | 22.1  | 22.7  | 23.9  | 25.3  | 26.9  | 28.7  | 30.0  | 33.0  |
| 22C HIP BREADTH        | 35.36  | 2.45 | 30.1  | 31.5  | 32.3  | 33.7  | 35.2  | 36.9  | 38.5  | 39.5  | 41.8  |
| 23C SHOULDER BREADTH   | 42.83  | 2.20 | 37.3  | 38.4  | 39.2  | 40.5  | 42.0  | 43.5  | 44.8  | 45.6  | 47.4  |
| 24C NECK CIRCUMFERENCE | 32.35  | 1.57 | 29.1  | 29.9  | 30.4  | 31.3  | 32.3  | 33.4  | 34.4  | 35.0  | 36.3  |
| 25C SHOULDER CIRC      | 100.36 | 5.35 | 89.4  | 91.9  | 93.5  | 96.6  | 100.2 | 103.8 | 107.1 | 109.3 | 113.9 |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS

TABLE 1A CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
CORE MEASUREMENTS (N=1330)

| METRIC UNITS*          | MEAN   | SD   | 1ST   | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                        |        |      |       |       |       |       |       |       |       |       |       |
| 26C CHEST CIRC AT SCYE | 85.52  | 5.11 | 75.2  | 77.5  | 79.1  | 82.0  | 85.3  | 88.7  | 92.1  | 94.3  | 99.3  |
| 27C BUST CIRCUMFERENCE | 88.18  | 6.33 | 76.2  | 78.4  | 80.2  | 83.7  | 87.9  | 92.1  | 96.1  | 98.9  | 105.6 |
| 28C CHEST C BELOW BUST | 74.80  | 4.94 | 65.9  | 67.4  | 68.7  | 71.3  | 74.5  | 77.7  | 81.0  | 83.3  | 89.0  |
| 29C WAIST CIRC         | 70.98  | 6.78 | 59.0  | 61.7  | 63.4  | 66.3  | 70.0  | 74.6  | 79.7  | 83.4  | 92.2  |
| 30C HIP CIRCUMFERENCE  | 95.49  | 6.30 | 81.6  | 85.5  | 87.7  | 91.3  | 95.3  | 99.4  | 103.4 | 106.0 | 111.9 |
| 31C VERTICAL TRUNK CIR | 153.82 | 7.21 | 136.5 | 142.2 | 144.9 | 149.1 | 153.7 | 158.5 | 163.1 | 166.0 | 171.6 |
| 32C ARM CIRC AT SCYE   | 37.51  | 2.39 | 32.5  | 33.8  | 34.6  | 35.9  | 37.4  | 39.0  | 40.6  | 41.7  | 44.1  |
| 33C BICEPS CIRC, FLXD  | 26.87  | 2.27 | 21.9  | 23.2  | 24.0  | 25.3  | 26.8  | 28.3  | 29.7  | 30.7  | 32.8  |
| 34C ELBOW CIRC, FLXD   | 25.97  | 1.61 | 22.5  | 23.5  | 24.0  | 24.9  | 25.9  | 27.0  | 28.1  | 28.8  | 30.3  |
| 35C FOREARM CIRC, FLXD | 24.62  | 1.52 | 21.2  | 22.1  | 22.7  | 23.6  | 24.6  | 25.6  | 26.6  | 27.1  | 28.3  |
| 36C WRIST CIRC         | 14.70  | .68  | 13.2  | 13.6  | 13.8  | 14.2  | 14.7  | 15.2  | 15.6  | 15.8  | 16.2  |
| 37C UPPER THIGH CIRC   | 56.90  | 4.55 | 46.4  | 49.4  | 51.1  | 53.9  | 56.9  | 59.8  | 62.6  | 64.5  | 68.9  |
| 38C KNEE CIRCUMFERENCE | 34.82  | 2.24 | 30.2  | 31.3  | 32.0  | 33.3  | 34.7  | 36.2  | 37.7  | 38.6  | 40.8  |
| 39C CALF CIRCUMFERENCE | 35.08  | 2.49 | 29.8  | 31.0  | 31.9  | 33.3  | 35.0  | 36.7  | 38.3  | 39.2  | 41.2  |
| 40C ANKLE CIRC         | 20.73  | 1.25 | 17.9  | 18.7  | 19.2  | 19.9  | 20.7  | 21.6  | 22.4  | 22.8  | 23.7  |
| 41C SHOULDER LENGTH    | 15.00  | 1.06 | 12.5  | 13.3  | 13.7  | 14.3  | 15.0  | 15.7  | 16.4  | 16.8  | 17.7  |
| 42C INTERSCYE BACK     | 37.85  | 2.34 | 32.4  | 33.9  | 34.8  | 36.3  | 37.9  | 39.4  | 40.8  | 41.7  | 43.5  |
| 43C INTERSCYE FRONT    | 33.16  | 1.73 | 29.4  | 30.4  | 31.0  | 32.0  | 33.1  | 34.3  | 35.4  | 36.1  | 37.5  |
| 44C BACK ARC, BUST     | 41.96  | 3.12 | 35.3  | 37.0  | 38.1  | 39.8  | 41.8  | 43.9  | 45.9  | 47.3  | 50.5  |
| 45C BACK ARC, WAIST    | 35.29  | 3.42 | 29.1  | 30.6  | 31.5  | 33.0  | 34.8  | 37.1  | 39.7  | 41.6  | 46.1  |
| 46C BACK ARC, HIP      | 47.49  | 3.69 | 39.6  | 41.8  | 43.0  | 45.0  | 47.3  | 49.8  | 52.3  | 53.9  | 57.2  |
| 47C WAIST BACK         | 40.85  | 2.65 | 35.3  | 36.7  | 37.5  | 39.0  | 40.7  | 42.6  | 44.3  | 45.4  | 47.5  |
| 48C WAIST FRONT        | 36.73  | 2.62 | 31.6  | 32.8  | 33.5  | 34.9  | 36.5  | 38.3  | 40.1  | 41.3  | 44.2  |
| 49C NECK-BUSTPOINT LGT | 25.28  | 2.08 | 21.0  | 21.9  | 22.6  | 23.8  | 25.2  | 26.7  | 28.0  | 28.8  | 30.5  |
| 50C AXILLA-WAIST LEVEL | 23.09  | 2.51 | 18.1  | 19.3  | 20.1  | 21.4  | 22.9  | 24.5  | 26.3  | 27.5  | 30.6  |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS

TABLE 1A CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
CORE MEASUREMENTS (N=1330)

| METRIC UNITS*          | MEAN  | SD   | 1ST  | 5TH  | 10TH | 25TH | 50TH | 75TH | 93TH | 95TH | 99TH |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| 51C SLEEVE INSEAM      | 45.05 | 2.61 | 39.5 | 41.0 | 41.8 | 43.2 | 44.9 | 46.7 | 48.5 | 49.6 | 51.7 |
| 52C SLEEVE OUTSEAM     | 53.79 | 2.96 | 47.1 | 49.2 | 50.1 | 51.7 | 53.6 | 55.8 | 57.8 | 58.9 | 60.7 |
| 53C CROTCH LENGTH      | 72.92 | 5.45 | 58.1 | 63.7 | 66.2 | 69.7 | 73.1 | 76.5 | 79.6 | 81.5 | 85.2 |
| 54C HEAD CIRCUMFERENCE | 54.92 | 1.64 | 51.4 | 52.3 | 52.9 | 53.8 | 54.9 | 56.0 | 57.0 | 57.7 | 59.3 |
| 55C HEAD BREADTH       | 14.61 | .54  | 13.4 | 13.8 | 13.9 | 14.2 | 14.6 | 14.9 | 15.3 | 15.5 | 16.1 |
| 56C HEAD LENGTH        | 18.71 | .67  | 17.1 | 17.6 | 17.9 | 18.3 | 18.7 | 19.2 | 19.6 | 19.8 | 20.3 |
| 57C PALM LENGTH        | 9.88  | .52  | 8.8  | 9.1  | 9.2  | 9.5  | 9.9  | 10.2 | 10.6 | 10.8 | 11.2 |
| 58C HAND BREADTH       | 7.82  | .39  | 7.0  | 7.2  | 7.3  | 7.5  | 7.8  | 8.1  | 8.3  | 8.5  | 8.7  |
| 59C HAND CIRCUMFERENCE | 18.45 | .86  | 16.5 | 17.0 | 17.3 | 17.8 | 18.4 | 19.0 | 19.6 | 19.9 | 20.4 |
| 60C HAND LENGTH        | 17.44 | .90  | 15.5 | 16.1 | 16.3 | 16.8 | 17.4 | 18.0 | 18.7 | 19.0 | 19.7 |
| 61C INSTEP LENGTH      | 17.85 | .98  | 15.7 | 16.3 | 16.6 | 17.2 | 17.8 | 18.5 | 19.1 | 19.5 | 20.4 |
| 62C FOOT LENGTH        | 24.32 | 1.25 | 21.6 | 22.3 | 22.8 | 23.5 | 24.3 | 25.1 | 26.0 | 26.5 | 27.5 |
| 63C HEEL-ANKLE CIRC    | 30.79 | 1.46 | 27.7 | 28.5 | 29.0 | 29.8 | 30.7 | 31.7 | 32.7 | 33.3 | 34.6 |
| 64C FOOT BREADTH       | 8.87  | .51  | 7.7  | 8.0  | 8.2  | 8.5  | 8.9  | 9.2  | 9.5  | 9.7  | 10.2 |
| 65C HEEL BREADTH       | 6.09  | .41  | 5.2  | 5.5  | 5.6  | 5.8  | 6.1  | 6.3  | 6.6  | 6.8  | 7.2  |
| 66C FOOT CIRCUMFERENCE | 22.61 | 1.14 | 20.1 | 20.8 | 21.1 | 21.8 | 22.6 | 23.3 | 24.1 | 24.5 | 25.5 |
| 67C INSTEP CIRC        | 23.48 | 1.26 | 20.8 | 21.5 | 21.9 | 22.6 | 23.4 | 24.3 | 25.1 | 25.7 | 26.8 |
| 68C ANKLE HEIGHT       | 10.86 | 1.02 | 8.7  | 9.2  | 9.6  | 10.2 | 10.8 | 11.5 | 12.1 | 12.6 | 13.7 |
| 69C SPHYRION HEIGHT    | 6.46  | .54  | 5.2  | 5.5  | 5.8  | 6.1  | 6.5  | 6.8  | 7.1  | 7.3  | 7.7  |
| 70C AGE                | 23.61 | 5.40 | 17.7 | 18.2 | 18.5 | 19.6 | 22.5 | 25.6 | 29.9 | 34.1 | 46.2 |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS  
AGE IN YEARS

TABLE 1B  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
CORE MEASUREMENTS (N=1330)

| ENGLISH UNITS*         | MEAN   | SD    | 1ST  | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|------------------------|--------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1C WEIGHT              | 132.11 | 18.76 | 95.0 | 103.0 | 108.7 | 119.3 | 131.4 | 143.6 | 155.7 | 164.2 | 184.9 |
| 2C STATURE             | 64.15  | 2.57  | 58.3 | 60.1  | 60.9  | 62.4  | 64.1  | 65.9  | 67.5  | 68.5  | 70.2  |
| 3C SHOULDER HEIGHT     | 52.55  | 2.36  | 47.4 | 48.8  | 49.5  | 50.9  | 52.5  | 54.2  | 55.7  | 56.6  | 58.1  |
| 4C AXILLA HEIGHT       | 48.52  | 2.20  | 43.6 | 45.0  | 45.7  | 47.0  | 48.5  | 50.0  | 51.4  | 52.3  | 53.6  |
| 5C BUSTPOINT HEIGHT    | 46.57  | 2.21  | 41.8 | 43.0  | 43.7  | 45.0  | 46.5  | 48.1  | 49.5  | 50.3  | 51.8  |
| 6C WAIST HEIGHT        | 39.92  | 2.05  | 35.3 | 36.7  | 37.4  | 38.5  | 39.8  | 41.2  | 42.6  | 43.4  | 45.0  |
| 7C CROTCH HEIGHT       | 30.07  | 1.72  | 26.3 | 27.4  | 27.9  | 28.8  | 30.0  | 31.2  | 32.4  | 33.0  | 34.2  |
| 8C BUTTOCK HEIGHT      | 32.99  | 1.84  | 29.1 | 30.1  | 30.7  | 31.7  | 32.9  | 34.2  | 35.4  | 36.1  | 37.8  |
| 9C KNEECAP HEIGHT      | 18.86  | 1.04  | 16.6 | 17.2  | 17.6  | 18.1  | 18.8  | 19.6  | 20.3  | 20.7  | 21.3  |
| 10C CALF HEIGHT        | 12.81  | .91   | 10.9 | 11.4  | 11.7  | 12.2  | 12.8  | 13.4  | 14.0  | 14.4  | 15.1  |
| 11C SITTING HEIGHT     | 33.49  | 1.41  | 30.0 | 31.1  | 31.7  | 32.6  | 33.5  | 34.5  | 35.3  | 35.8  | 36.5  |
| 12C EYE HEIGHT/SIT     | 28.99  | 1.36  | 25.7 | 26.7  | 27.2  | 28.1  | 29.0  | 29.9  | 30.7  | 31.1  | 32.1  |
| 13C SHOULDER-ELBOW L   | 13.21  | .69   | 11.7 | 12.1  | 12.4  | 12.7  | 13.2  | 13.7  | 14.1  | 14.4  | 14.8  |
| 14C ELBOW-FINGERTIP    | 17.13  | .90   | 15.2 | 15.7  | 16.0  | 16.5  | 17.1  | 17.7  | 18.3  | 18.7  | 19.4  |
| 15C KNEE HEIGHT/SIT    | 20.07  | 1.02  | 17.9 | 18.5  | 18.8  | 19.4  | 20.0  | 20.8  | 21.4  | 21.8  | 22.6  |
| 16C POPLITEAL HEIGHT   | 16.41  | .93   | 14.3 | 15.0  | 15.3  | 15.8  | 16.4  | 17.0  | 17.6  | 18.0  | 18.6  |
| 17C BUTTOCK-KNEE LGTH  | 22.77  | 1.20  | 20.1 | 20.9  | 21.3  | 21.9  | 22.7  | 23.6  | 24.4  | 24.9  | 25.7  |
| 18C BUST DEPTH         | 9.02   | .87   | 7.3  | 7.7   | 8.0   | 8.4   | 9.0   | 9.5   | 10.1  | 10.5  | 11.4  |
| 19C WAIST DEPTH        | 7.20   | .86   | 5.7  | 6.0   | 6.2   | 6.6   | 7.1   | 7.6   | 8.3   | 8.8   | 9.9   |
| 20C CHEST BREADTH      | 11.12  | .72   | 9.6  | 10.0  | 10.2  | 10.6  | 11.1  | 11.6  | 12.0  | 12.4  | 13.1  |
| 21C WAIST BREADTH      | 10.07  | .95   | 8.3  | 8.7   | 8.9   | 9.4   | 10.0  | 10.6  | 11.3  | 11.8  | 13.0  |
| 22C HIP BREADTH        | 13.92  | .96   | 11.9 | 12.4  | 12.7  | 13.3  | 13.9  | 14.5  | 15.1  | 15.6  | 16.5  |
| 23C SHOULDER BREADTH   | 16.55  | .87   | 14.7 | 15.1  | 15.4  | 15.9  | 16.5  | 17.1  | 17.6  | 18.0  | 18.7  |
| 24C NECK CIRCUMFERENCE | 12.74  | .62   | 11.4 | 11.8  | 12.0  | 12.3  | 12.7  | 13.1  | 13.5  | 13.8  | 14.3  |
| 25C SHOULDER CIRC      | 39.51  | 2.11  | 35.2 | 36.2  | 36.8  | 38.0  | 39.4  | 40.9  | 42.2  | 43.0  | 44.8  |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES

TABLE 1B CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
CORE MEASUREMENTS (N=1330)

| ENGLISH UNITS*          | MEAN  | SD   | 1ST  | 5TH  | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| 26C CHEST CIRC AT SCYE  | 33.67 | 2.01 | 29.6 | 30.5 | 31.1 | 32.3 | 33.6 | 34.9 | 36.2 | 37.1 | 39.1 |
| 27C BUST CIRCUMFERENCE  | 34.72 | 2.49 | 30.0 | 30.8 | 31.6 | 33.0 | 34.6 | 36.2 | 37.8 | 38.9 | 41.6 |
| 28C CHEST C BELOW BUST  | 29.45 | 1.94 | 26.0 | 26.5 | 27.0 | 28.1 | 29.3 | 30.6 | 31.9 | 32.8 | 35.0 |
| 29C WAIST CIRC          | 27.94 | 2.67 | 23.2 | 24.3 | 24.9 | 26.1 | 27.6 | 29.4 | 31.4 | 32.9 | 36.3 |
| 30C HIP CIRCUMFERENCE   | 37.59 | 2.48 | 32.1 | 33.7 | 34.5 | 35.9 | 37.5 | 39.1 | 40.7 | 41.7 | 44.1 |
| 31C VERTICAL TRUNK CIRC | 60.56 | 2.84 | 53.7 | 56.0 | 57.0 | 58.7 | 60.5 | 62.4 | 64.2 | 65.4 | 67.6 |
| 32C ARM CIRC AT SCYE    | 14.77 | .94  | 12.8 | 13.3 | 13.6 | 14.1 | 14.7 | 15.3 | 16.0 | 16.4 | 17.4 |
| 33C BICEPS CIRC, FLXD   | 10.58 | .89  | 8.6  | 9.1  | 9.4  | 10.0 | 10.6 | 11.1 | 11.7 | 12.1 | 12.9 |
| 34C ELBOW CIRC, FLXD    | 10.23 | .64  | 8.9  | 9.2  | 9.4  | 9.8  | 10.2 | 10.6 | 11.1 | 11.3 | 11.9 |
| 35C FOREARM CIRC, FLXD  | 9.69  | .60  | 8.3  | 8.7  | 8.9  | 9.3  | 9.7  | 10.1 | 10.5 | 10.7 | 11.1 |
| 36C WRIST CIRC          | 5.79  | .27  | 5.2  | 5.4  | 5.5  | 5.6  | 5.8  | 6.0  | 6.1  | 6.2  | 6.4  |
| 37C UPPER THIGH CIRC    | 22.40 | 1.79 | 18.3 | 19.4 | 20.1 | 21.2 | 22.4 | 23.5 | 24.6 | 25.4 | 27.1 |
| 38C KNEE CIRCUMFERENCE  | 13.71 | .88  | 11.9 | 12.3 | 12.6 | 13.1 | 13.7 | 14.3 | 14.8 | 15.2 | 16.1 |
| 39C CALF CIRCUMFERENCE  | 13.81 | .98  | 11.7 | 12.2 | 12.5 | 13.1 | 13.8 | 14.5 | 15.1 | 15.4 | 16.2 |
| 40C ANKLE CIRC          | 8.16  | .49  | 7.1  | 7.4  | 7.5  | 7.8  | 8.1  | 8.5  | 8.8  | 9.0  | 9.3  |
| 41C SHOULDER LENGTH     | 5.90  | .42  | 4.9  | 5.2  | 5.4  | 5.6  | 5.9  | 6.2  | 6.4  | 6.6  | 7.0  |
| 42C INTERSCYE BACK      | 14.90 | .92  | 12.7 | 13.4 | 13.7 | 14.3 | 14.9 | 15.5 | 16.1 | 16.4 | 17.1 |
| 43C INTERSCYE FRONT     | 13.06 | .68  | 11.6 | 12.0 | 12.2 | 12.6 | 13.0 | 13.5 | 13.9 | 14.2 | 14.8 |
| 44C BACK ARC, BUST      | 16.52 | 1.23 | 13.9 | 14.6 | 15.0 | 15.7 | 16.5 | 17.3 | 18.1 | 18.6 | 19.9 |
| 45C BACK ARC, WAIST     | 13.89 | 1.35 | 11.5 | 12.0 | 12.4 | 13.0 | 13.7 | 14.6 | 15.6 | 16.4 | 18.2 |
| 46C BACK ARC, HIP       | 18.76 | 1.45 | 15.6 | 16.5 | 16.9 | 17.7 | 18.6 | 19.6 | 20.6 | 21.2 | 22.5 |
| 47C WAIST BACK          | 16.08 | 1.04 | 13.9 | 14.5 | 14.8 | 15.3 | 16.0 | 16.8 | 17.4 | 17.9 | 18.7 |
| 48C WAIST FRONT         | 14.46 | 1.03 | 12.4 | 12.9 | 13.2 | 13.7 | 14.4 | 15.1 | 15.8 | 16.3 | 17.4 |
| 49C NECK-BUSTPOINT LGT  | 9.95  | .82  | 8.3  | 8.6  | 8.9  | 9.4  | 9.9  | 10.5 | 11.0 | 11.3 | 12.0 |
| 50C AXILLA-WAIST LEVEL  | 9.09  | .99  | 7.1  | 7.6  | 7.9  | 8.4  | 9.0  | 9.7  | 10.3 | 10.8 | 12.0 |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES

TABLE 1B CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
CORE MEASUREMENTS (N=1330)

| ENGLISH UNITS*         | MEAN  | SD   | 1ST  | 5TH  | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| 51C SLEEVE INSEAM      | 17.74 | 1.03 | 15.5 | 16.1 | 16.4 | 17.0 | 17.7 | 18.4 | 19.1 | 19.5 | 20.3 |
| 52C SLEEVE OUTSEAM     | 21.18 | 1.17 | 18.5 | 19.4 | 19.7 | 20.4 | 21.1 | 22.0 | 22.7 | 23.2 | 23.9 |
| 53C CROTCH LENGTH      | 28.71 | 2.15 | 22.9 | 25.1 | 26.0 | 27.4 | 28.8 | 30.1 | 31.3 | 32.1 | 33.5 |
| 54C HEAD CIRCUMFERENCE | 21.62 | .64  | 20.2 | 20.6 | 20.8 | 21.2 | 21.6 | 22.0 | 22.5 | 22.7 | 23.3 |
| 55C HEAD BREADTH       | 5.75  | .21  | 5.3  | 5.4  | 5.5  | 5.6  | 5.7  | 5.9  | 6.0  | 6.1  | 6.3  |
| 56C HEAD LENGTH        | 7.37  | .26  | 6.7  | 6.9  | 7.0  | 7.2  | 7.4  | 7.5  | 7.7  | 7.8  | 8.0  |
| 57C PALM LENGTH        | 3.89  | .21  | 3.4  | 3.6  | 3.6  | 3.7  | 3.9  | 4.0  | 4.2  | 4.2  | 4.4  |
| 58C HAND BREADTH       | 3.08  | .15  | 2.7  | 2.8  | 2.9  | 3.0  | 3.1  | 3.2  | 3.3  | 3.3  | 3.4  |
| 59C HAND CIRCUMFERENCE | 7.26  | .34  | 6.5  | 6.7  | 6.8  | 7.0  | 7.3  | 7.5  | 7.7  | 7.8  | 8.0  |
| 60C HAND LENGTH        | 6.87  | .36  | 6.1  | 6.3  | 6.4  | 6.6  | 6.8  | 7.1  | 7.4  | 7.5  | 7.7  |
| 61C INSTEP LENGTH      | 7.03  | .39  | 6.2  | 6.4  | 6.5  | 6.8  | 7.0  | 7.3  | 7.5  | 7.7  | 8.0  |
| 62C FOOT LENGTH        | 9.57  | .49  | 8.5  | 8.8  | 9.0  | 9.2  | 9.6  | 9.9  | 10.2 | 10.4 | 10.8 |
| 63C HEEL-ANKLE CIRC    | 12.12 | .57  | 10.9 | 11.2 | 11.4 | 11.7 | 12.1 | 12.5 | 12.9 | 13.1 | 13.6 |
| 64C FOOT BREADTH       | 3.49  | .20  | 3.0  | 3.2  | 3.2  | 3.4  | 3.5  | 3.6  | 3.7  | 3.8  | 4.0  |
| 65C HEEL BREADTH       | 2.40  | .16  | 2.1  | 2.2  | 2.2  | 2.3  | 2.4  | 2.5  | 2.6  | 2.7  | 2.8  |
| 66C FOOT CIRCUMFERENCE | 8.90  | .45  | 7.9  | 8.2  | 8.3  | 8.6  | 8.9  | 9.2  | 9.5  | 9.7  | 10.1 |
| 67C INSTEP CIRC        | 9.24  | .50  | 8.2  | 8.5  | 8.6  | 8.9  | 9.2  | 9.6  | 9.9  | 10.1 | 10.5 |
| 68C ANKLE HEIGHT       | 4.27  | .40  | 3.4  | 3.6  | 3.8  | 4.0  | 4.3  | 4.5  | 4.8  | 5.0  | 5.4  |
| 69C SPHYRION HEIGHT    | 2.54  | .21  | 2.0  | 2.2  | 2.3  | 2.4  | 2.5  | 2.7  | 2.8  | 2.9  | 3.1  |
| 70C AGE                | 23.61 | 5.40 | 17.7 | 18.2 | 18.5 | 19.6 | 22.5 | 25.6 | 29.9 | 34.1 | 46.2 |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES  
AGE IN YEARS

TABLE 2  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | 1C   | 2C   | 3C   | 4C   | 5C   | 6C   | 7C   | 8C   |
|-----|--------------------|------|------|------|------|------|------|------|------|
| 1C  | WEIGHT             |      | .536 | .567 | .522 | .463 | .441 | .402 | .486 |
| 2C  | STATURE            | .536 |      | .968 | .969 | .937 | .897 | .861 | .829 |
| 3C  | SHOULDER HEIGHT    | .567 | .968 |      | .987 | .945 | .891 | .869 | .852 |
| 4C  | AXILLA HEIGHT      | .522 | .969 | .987 |      | .955 | .900 | .885 | .862 |
| 5C  | BUSTPOINT HEIGHT   | .463 | .937 | .945 | .955 |      | .882 | .880 | .855 |
| 6C  | WAIST HEIGHT       | .441 | .897 | .891 | .900 | .882 |      | .882 | .844 |
| 7C  | CROTCH HEIGHT      | .402 | .861 | .869 | .885 | .880 | .882 |      | .937 |
| 8C  | BUTTOCK HEIGHT     | .486 | .829 | .852 | .862 | .855 | .844 | .937 |      |
| 9C  | KNEECAP HEIGHT     | .426 | .848 | .860 | .868 | .858 | .852 | .919 | .891 |
| 10C | CALF HEIGHT        | .416 | .728 | .745 | .749 | .746 | .750 | .843 | .822 |
| 11C | SITTING HEIGHT     | .421 | .767 | .695 | .686 | .640 | .570 | .394 | .378 |
| 12C | EYE HEIGHT/SIT     | .399 | .738 | .677 | .666 | .623 | .551 | .372 | .358 |
| 13C | SHOULDER-ELBOW L   | .472 | .808 | .826 | .810 | .800 | .787 | .826 | .799 |
| 14C | ELBOW-FINGERTIP    | .451 | .731 | .734 | .743 | .746 | .737 | .817 | .804 |
| 15C | KNEE HEIGHT/SIT    | .546 | .857 | .860 | .859 | .848 | .850 | .911 | .880 |
| 16C | POPLITEAL HEIGHT   | .401 | .847 | .848 | .859 | .855 | .853 | .923 | .878 |
| 17C | BUTTOCK-KNEE LGTH  | .720 | .761 | .784 | .775 | .751 | .748 | .799 | .820 |
| 18C | BUST DEPTH         | .739 | .164 | .214 | .166 | .103 | .107 | .094 | .175 |
| 19C | WAIST DEPTH        | .715 | .123 | .175 | .130 | .091 | .017 | .081 | .190 |
| 20C | CHEST BREADTH      | .776 | .269 | .313 | .261 | .191 | .194 | .168 | .249 |
| 21C | WAIST BREADTH      | .737 | .245 | .297 | .252 | .186 | .081 | .190 | .274 |
| 22C | HIP BREADTH        | .801 | .398 | .417 | .376 | .318 | .317 | .228 | .292 |
| 23C | SHOULDER BREADTH   | .813 | .369 | .390 | .352 | .308 | .298 | .272 | .347 |
| 24C | NECK CIRCUMFERENCE | .649 | .359 | .359 | .340 | .307 | .277 | .285 | .346 |
| 25C | SHOULDER CIRC      | .833 | .331 | .354 | .315 | .273 | .266 | .247 | .329 |
| 26C | CHEST CIRC AT SCYE | .825 | .286 | .326 | .276 | .231 | .223 | .200 | .277 |
| 27C | BUST CIRCUMFERENCE | .808 | .239 | .290 | .239 | .172 | .173 | .151 | .228 |
| 28C | CHEST C BELOW BUST | .801 | .276 | .324 | .275 | .234 | .197 | .168 | .243 |
| 29C | WAIST CIRC         | .787 | .208 | .265 | .218 | .162 | .061 | .144 | .246 |
| 30C | HIP CIRCUMFERENCE  | .903 | .414 | .443 | .402 | .343 | .336 | .260 | .348 |
| 31C | VERTICAL TRUNK CIR | .807 | .658 | .681 | .641 | .577 | .495 | .356 | .407 |
| 32C | ARM CIRC AT SCYE   | .818 | .373 | .436 | .360 | .310 | .290 | .265 | .344 |
| 33C | BICEPS CIRC, FLXD  | .817 | .207 | .250 | .200 | .158 | .137 | .120 | .214 |
| 34C | ELBOW CIRC, FLXD   | .662 | .408 | .488 | .460 | .433 | .401 | .409 | .451 |
| 35C | FOREARM CIRC, FLXD | .780 | .334 | .360 | .319 | .287 | .257 | .254 | .320 |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | --10-- | --20-- | --30-- | --40-- | --50-- | --60-- | --70-- | --80-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 36C | WRIST CIRC         | .652   | .464   | .461   | .435   | .412   | .388   | .365   | .391   |
| 37C | UPPER THIGH CIRC   | .883   | .287   | .325   | .285   | .238   | .225   | .184   | .287   |
| 38C | KNEE CIRCUMFERENCE | .820   | .419   | .444   | .410   | .365   | .360   | .313   | .368   |
| 39C | CALF CIRCUMFERENCE | .777   | .304   | .318   | .280   | .241   | .235   | .176   | .238   |
| 40C | ANKLE CIRC         | .639   | .391   | .384   | .358   | .317   | .315   | .231   | .268   |
| 41C | SHOULDER LENGTH    | .247   | .373   | .274   | .302   | .310   | .330   | .319   | .293   |
| 42C | INTERSCYE BACK     | .479   | .276   | .235   | .236   | .203   | .227   | .230   | .249   |
| 43C | INTERSCYE FRONT    | .567   | .387   | .365   | .352   | .344   | .331   | .314   | .342   |
| 44C | BACK ARC, BUST     | .749   | .216   | .259   | .215   | .162   | .158   | .133   | .205   |
| 45C | BACK ARC, WAIST    | .761   | .199   | .252   | .205   | .146   | .065   | .127   | .218   |
| 46C | BACK ARC, HIP      | .791   | .321   | .357   | .320   | .270   | .249   | .189   | .272   |
| 47C | WAIST BACK         | .313   | .520   | .498   | .487   | .435   | .269   | .322   | .313   |
| 48C | WAIST FRONT        | .399   | .368   | .372   | .348   | .320   | .039   | .187   | .234   |
| 49C | NECK-BUSTPOINT LGT | .569   | .276   | .272   | .228   | .043   | .202   | .144   | .175   |
| 50C | AXILLA-WAIST LEVEL | .150   | .284   | .309   | .310   | .274   | .006   | .139   | .160   |
| 51C | SLEEVE INSEAM      | .357   | .746   | .736   | .763   | .767   | .765   | .857   | .825   |
| 52C | SLEEVE OUTSEAM     | .433   | .782   | .799   | .789   | .789   | .781   | .847   | .816   |
| 53C | CROTCH LENGTH      | .636   | .424   | .423   | .390   | .353   | .486   | .205   | .240   |
| 54C | HEAD CIRCUMFERENCE | .409   | .364   | .333   | .334   | .317   | .319   | .324   | .366   |
| 55C | HEAD BREADTH       | .317   | .154   | .149   | .124   | .095   | .115   | .084   | .117   |
| 56C | HEAD LENGTH        | .317   | .370   | .336   | .343   | .327   | .314   | .320   | .345   |
| 57C | PALM LENGTH        | .340   | .585   | .574   | .585   | .590   | .580   | .629   | .610   |
| 58C | HAND BREADTH       | .508   | .433   | .432   | .417   | .409   | .393   | .402   | .419   |
| 59C | HAND CIRCUMFERENCE | .534   | .448   | .445   | .423   | .411   | .395   | .396   | .411   |
| 60C | HAND LENGTH        | .400   | .634   | .629   | .637   | .642   | .625   | .693   | .680   |
| 61C | INSTEP LENGTH      | .508   | .629   | .618   | .617   | .604   | .612   | .646   | .650   |
| 62C | FOOT LENGTH        | .517   | .693   | .681   | .684   | .672   | .667   | .706   | .707   |
| 63C | HEEL-ANKLE CIRC    | .642   | .616   | .618   | .610   | .591   | .593   | .599   | .636   |
| 64C | FOOT BREADTH       | .493   | .413   | .406   | .390   | .373   | .366   | .341   | .332   |
| 65C | HEEL BREADTH       | .499   | .306   | .320   | .307   | .304   | .301   | .340   | .375   |
| 66C | FOOT CIRCUMFERENCE | .587   | .472   | .465   | .451   | .428   | .423   | .395   | .410   |
| 67C | INSTEP CIRC        | .592   | .462   | .468   | .450   | .441   | .443   | .461   | .496   |
| 68C | ANKLE HEIGHT       | .171   | .505   | .506   | .516   | .522   | .499   | .564   | .546   |
| 69C | SPHYRION HEIGHT    | .239   | .402   | .386   | .371   | .341   | .339   | .275   | .252   |
| 70C | AGE                | .181   | .057   | .086   | .056   | .049   | .016   | -.018  | .026   |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | --9C-- | --10C-- | --11C-- | --12C-- | --13C-- | --14C-- | --15C-- | --16C-- |
|-----|--------------------|--------|---------|---------|---------|---------|---------|---------|---------|
| 1C  | WEIGHT             | .426   | .416    | .421    | .399    | .472    | .451    | .546    | .401    |
| 2C  | STATURE            | .848   | .728    | .767    | .738    | .808    | .731    | .857    | .847    |
| 3C  | SHOULDER HEIGHT    | .860   | .745    | .695    | .677    | .826    | .734    | .860    | .848    |
| 4C  | AXILLA HEIGHT      | .868   | .749    | .686    | .666    | .810    | .743    | .859    | .859    |
| 5C  | BUSTPOINT HEIGHT   | .858   | .746    | .640    | .623    | .800    | .746    | .848    | .855    |
| 6C  | WAIST HEIGHT       | .852   | .750    | .570    | .551    | .787    | .737    | .850    | .853    |
| 7C  | CROTCH HEIGHT      | .919   | .843    | .394    | .372    | .826    | .817    | .911    | .923    |
| 8C  | BUTTOCK HEIGHT     | .891   | .822    | .378    | .358    | .799    | .804    | .880    | .878    |
| 9C  | KNEECAP HEIGHT     |        | .843    | .425    | .405    | .794    | .811    | .919    | .925    |
| 10C | CALF HEIGHT        | .843   |         | .294    | .266    | .715    | .777    | .856    | .848    |
| 11C | SITTING HEIGHT     | .425   | .294    |         | .965    | .462    | .327    | .444    | .418    |
| 12C | EYE HEIGHT/SIT     | .405   | .266    | .965    |         | .448    | .300    | .417    | .398    |
| 13C | SHOULDER-ELBOW L   | .794   | .715    | .462    | .448    |         | .785    | .793    | .800    |
| 14C | ELBOW-FINGERTIP    | .811   | .777    | .327    | .300    | .785    |         | .816    | .841    |
| 15C | KNEE HEIGHT/SIT    | .919   | .856    | .444    | .417    | .793    | .816    |         | .935    |
| 16C | POPLITEAL HEIGHT   | .925   | .848    | .418    | .398    | .800    | .841    | .935    |         |
| 17C | BUTTOCK-KNEE LGTH  | .759   | .743    | .352    | .327    | .753    | .741    | .813    | .765    |
| 18C | BUST DEPTH         | .139   | .129    | .126    | .122    | .176    | .144    | .207    | .077    |
| 19C | WAIST DEPTH        | .116   | .148    | .035    | .026    | .151    | .135    | .187    | .054    |
| 20C | CHEST BREADTH      | .211   | .194    | .226    | .214    | .260    | .227    | .298    | .175    |
| 21C | WAIST BREADTH      | .213   | .214    | .161    | .154    | .248    | .204    | .288    | .157    |
| 22C | HIP BREADTH        | .251   | .285    | .402    | .389    | .330    | .257    | .383    | .248    |
| 23C | SHOULDER BREADTH   | .290   | .277    | .296    | .280    | .356    | .345    | .386    | .274    |
| 24C | NECK CIRCUMFERENCE | .301   | .275    | .279    | .256    | .310    | .358    | .340    | .275    |
| 25C | SHOULDER CIRC      | .270   | .262    | .253    | .235    | .334    | .335    | .363    | .252    |
| 26C | CHEST CIRC AT SCYE | .235   | .232    | .227    | .213    | .294    | .283    | .328    | .212    |
| 27C | BUST CIRCUMFERENCE | .191   | .177    | .189    | .185    | .247    | .207    | .270    | .155    |
| 28C | CHEST C BELOW BUST | .219   | .181    | .240    | .231    | .259    | .223    | .295    | .172    |
| 29C | WAIST CIRC         | .181   | .194    | .123    | .118    | .226    | .203    | .252    | .139    |
| 30C | HIP CIRCUMFERENCE  | .292   | .304    | .384    | .370    | .356    | .308    | .410    | .261    |
| 31C | VERTICAL TRUNK CIR | .406   | .343    | .713    | .697    | .465    | .356    | .484    | .374    |
| 32C | ARM CIRC AT SCYE   | .290   | .276    | .296    | .282    | .405    | .320    | .372    | .263    |
| 33C | BICEPS CIRC, FLXD  | .140   | .179    | .167    | .155    | .171    | .210    | .252    | .112    |
| 34C | ELBOW CIRC, FLXD   | .424   | .409    | .312    | .296    | .453    | .482    | .489    | .412    |
| 35C | FOREARM CIRC, FLXD | .281   | .293    | .242    | .230    | .318    | .366    | .385    | .269    |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | -.90 | -.100 | -.110 | -.120 | -.130 | -.140 | -.150 | -.160 |
|-----|--------------------|------|-------|-------|-------|-------|-------|-------|-------|
| 36C | WRIST CIRC         | .386 | .362  | .367  | .349  | .417  | .482  | .469  | .386  |
| 37C | UPPER THIGH CIRC   | .202 | .250  | .243  | .225  | .247  | .230  | .341  | .180  |
| 38C | KNEE CIRCUMFERENCE | .319 | .371  | .336  | .321  | .378  | .367  | .472  | .307  |
| 39C | CALF CIRCUMFERENCE | .198 | .190  | .296  | .284  | .248  | .233  | .341  | .187  |
| 40C | ANKLE CIRC         | .263 | .193  | .392  | .387  | .287  | .282  | .375  | .255  |
| 41C | SHOULDER LENGTH    | .328 | .276  | .298  | .287  | .298  | .362  | .368  | .357  |
| 42C | INTERSCYE BACK     | .240 | .224  | .211  | .200  | .256  | .284  | .311  | .256  |
| 43C | INTERSCYE FRONT    | .335 | .303  | .278  | .266  | .362  | .405  | .404  | .336  |
| 44C | BACK ARC, BUST     | .164 | .144  | .182  | .178  | .220  | .194  | .242  | .132  |
| 45C | BACK ARC, WAIST    | .162 | .170  | .135  | .131  | .204  | .178  | .228  | .120  |
| 46C | BACK ARC, HIP      | .228 | .244  | .288  | .275  | .280  | .259  | .301  | .181  |
| 47C | WAIST BACK         | .339 | .276  | .535  | .519  | .365  | .298  | .344  | .331  |
| 48C | WAIST FRONT        | .214 | .152  | .405  | .403  | .255  | .183  | .226  | .188  |
| 49C | NECK-BUSTPOINT LGT | .175 | .153  | .283  | .281  | .223  | .161  | .240  | .155  |
| 50C | AXILLA-WAIST LEVEL | .154 | .097  | .330  | .328  | .163  | .114  | .100  | .113  |
| 51C | SLEEVE INSEAM      | .806 | .759  | .327  | .305  | .864  | .866  | .808  | .825  |
| 52C | SLEEVE OUTSEAM     | .811 | .761  | .389  | .367  | .922  | .855  | .831  | .832  |
| 53C | CROTCH LENGTH      | .248 | .225  | .479  | .462  | .281  | .208  | .350  | .235  |
| 54C | HEAD CIRCUMFERENCE | .324 | .364  | .236  | .180  | .311  | .427  | .386  | .335  |
| 55C | HEAD BREADTH       | .099 | .137  | .155  | .112  | .136  | .165  | .160  | .113  |
| 56C | HEAD LENGTH        | .319 | .319  | .261  | .220  | .297  | .382  | .362  | .326  |
| 57C | PALM LENGTH        | .632 | .605  | .304  | .279  | .572  | .787  | .647  | .651  |
| 58C | HAND BREADTH       | .419 | .406  | .265  | .239  | .428  | .553  | .466  | .414  |
| 59C | HAND CIRCUMFERENCE | .426 | .401  | .293  | .267  | .430  | .547  | .486  | .424  |
| 60C | HAND LENGTH        | .697 | .671  | .305  | .277  | .639  | .871  | .720  | .717  |
| 61C | INSTEP LENGTH      | .641 | .609  | .336  | .312  | .594  | .732  | .685  | .655  |
| 62C | FOOT LENGTH        | .713 | .667  | .385  | .357  | .645  | .799  | .747  | .721  |
| 63C | HEEL-ANKLE CIRC    | .627 | .588  | .350  | .331  | .568  | .680  | .694  | .622  |
| 64C | FOOT BREADTH       | .372 | .328  | .301  | .280  | .354  | .413  | .449  | .386  |
| 65C | HEEL BREADTH       | .357 | .405  | .066  | .047  | .335  | .487  | .440  | .381  |
| 66C | FOOT CIRCUMFERENCE | .420 | .360  | .333  | .313  | .404  | .456  | .501  | .431  |
| 67C | INSTEP CIRC        | .485 | .486  | .232  | .209  | .436  | .554  | .564  | .488  |
| 68C | ANKLE HEIGHT       | .589 | .528  | .256  | .240  | .456  | .504  | .504  | .552  |
| 69C | SPHYRION HEIGHT    | .337 | .314  | .407  | .394  | .269  | .217  | .378  | .350  |
| 70C | AGE                | .054 | .031  | .075  | .098  | .070  | .047  | .041  | .001  |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>.12C</u> | <u>.18C</u> | <u>.19C</u> | <u>.20C</u> | <u>.21C</u> | <u>.22C</u> | <u>.23C</u> | <u>.24C</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1C  | WEIGHT             | .720        | .739        | .715        | .776        | .737        | .801        | .813        | .649        |
| 2C  | STATURE            | .761        | .164        | .123        | .269        | .245        | .398        | .369        | .359        |
| 3C  | SHOULDER HEIGHT    | .784        | .214        | .175        | .313        | .297        | .417        | .390        | .359        |
| 4C  | AXILLA HEIGHT      | .775        | .166        | .130        | .261        | .252        | .376        | .352        | .340        |
| 5C  | BUSTPOINT HEIGHT   | .751        | .103        | .091        | .191        | .186        | .318        | .308        | .307        |
| 6C  | WAIST HEIGHT       | .748        | .107        | .017        | .194        | .081        | .317        | .298        | .277        |
| 7C  | CROTCH HEIGHT      | .799        | .094        | .081        | .168        | .190        | .228        | .272        | .285        |
| 8C  | BUTTOCK HEIGHT     | .820        | .175        | .193        | .249        | .274        | .292        | .347        | .346        |
| 9C  | KNEECAP HEIGHT     | .759        | .139        | .116        | .211        | .213        | .251        | .290        | .301        |
| 10C | CALF HEIGHT        | .743        | .129        | .148        | .194        | .214        | .285        | .277        | .275        |
| 11C | SITTING HEIGHT     | .352        | .126        | .035        | .226        | .161        | .402        | .296        | .279        |
| 12C | EYE HEIGHT/SIT     | .327        | .122        | .026        | .214        | .154        | .389        | .280        | .256        |
| 13C | SHOULDER-ELBOW L   | .753        | .176        | .151        | .260        | .248        | .330        | .356        | .310        |
| 14C | ELBOW-FINGERTIP    | .741        | .144        | .135        | .227        | .204        | .257        | .345        | .358        |
| 15C | KNEE HEIGHT/SIT    | .813        | .207        | .187        | .298        | .288        | .383        | .386        | .340        |
| 16C | POPLITEAL HEIGHT   | .765        | .077        | .054        | .175        | .157        | .248        | .274        | .275        |
| 17C | BUTTOCK-KNEE LGTH  |             | .385        | .390        | .422        | .423        | .574        | .510        | .436        |
| 18C | BUST DEPTH         | .385        |             | .726        | .728        | .668        | .528        | .656        | .494        |
| 19C | WAIST DEPTH        | .390        | .726        |             | .682        | .787        | .485        | .630        | .523        |
| 20C | CHEST BREADTH      | .422        | .728        | .682        |             | .726        | .583        | .819        | .553        |
| 21C | WAIST BREADTH      | .423        | .668        | .787        | .726        |             | .553        | .674        | .537        |
| 22C | HIP BREADTH        | .574        | .528        | .485        | .583        | .553        |             | .596        | .383        |
| 23C | SHOULDER BREADTH   | .510        | .656        | .630        | .819        | .674        | .596        |             | .619        |
| 24C | NECK CIRCUMFERENCE | .436        | .494        | .523        | .553        | .537        | .383        | .619        |             |
| 25C | SHOULDER CIRC      | .506        | .709        | .669        | .828        | .695        | .590        | .936        | .652        |
| 26C | CHEST CIRC AT SCYE | .480        | .767        | .697        | .854        | .706        | .590        | .855        | .614        |
| 27C | BUST CIRCUMFERENCE | .449        | .904        | .738        | .858        | .724        | .586        | .771        | .563        |
| 28C | CHEST C BELOW BUST | .438        | .768        | .716        | .833        | .723        | .580        | .762        | .569        |
| 29C | WAIST CIRC         | .456        | .732        | .895        | .754        | .926        | .571        | .705        | .588        |
| 30C | HIP CIRCUMFERENCE  | .637        | .650        | .627        | .679        | .664        | .906        | .709        | .522        |
| 31C | VERTICAL TRUNK CIR | .579        | .550        | .486        | .595        | .535        | .689        | .620        | .509        |
| 32C | ARM CIRC AT SCYE   | .520        | .685        | .652        | .729        | .669        | .590        | .737        | .608        |
| 33C | BICEPS CIRC, FLXD  | .452        | .664        | .638        | .670        | .638        | .625        | .717        | .556        |
| 34C | ELBOW CIRC, FLXD   | .538        | .421        | .426        | .487        | .465        | .435        | .555        | .533        |
| 35C | FOREARM CIRC, FLXD | .503        | .559        | .553        | .614        | .581        | .539        | .685        | .623        |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>.17C</u> | <u>.18C</u> | <u>.19C</u> | <u>.20C</u> | <u>.21C</u> | <u>.22C</u> | <u>.23C</u> | <u>.24C</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 36C | WRIST CIRC         | .485        | .399        | .386        | .473        | .422        | .438        | .560        | .550        |
| 37C | UPPER THIGH CIRC   | .570        | .635        | .625        | .658        | .648        | .827        | .691        | .526        |
| 38C | KNEE CIRCUMFERENCE | .596        | .524        | .499        | .554        | .538        | .731        | .602        | .451        |
| 39C | CALF CIRCUMFERENCE | .453        | .494        | .458        | .523        | .497        | .665        | .574        | .454        |
| 40C | ANKLE CIRC         | .400        | .347        | .310        | .408        | .373        | .513        | .453        | .395        |
| 41C | SHOULDER LENGTH    | .299        | .064        | .026        | .184        | .085        | .188        | .362        | .095        |
| 42C | INTERSCYE BACK     | .352        | .376        | .357        | .517        | .420        | .296        | .618        | .408        |
| 43C | INTERSCYE FRONT    | .432        | .403        | .369        | .542        | .401        | .424        | .688        | .457        |
| 44C | BACK ARC, BUST     | .396        | .793        | .671        | .807        | .697        | .545        | .735        | .515        |
| 45C | BACK ARC, WAIST    | .419        | .717        | .839        | .737        | .886        | .553        | .684        | .566        |
| 46C | BACK ARC, HIP      | .560        | .581        | .579        | .597        | .592        | .782        | .628        | .481        |
| 47C | WAIST BACK         | .298        | .127        | .198        | .175        | .371        | .221        | .212        | .244        |
| 48C | WAIST FRONT        | .262        | .323        | .409        | .335        | .529        | .273        | .319        | .231        |
| 49C | NECK-BUSTPOINT LGT | .339        | .616        | .412        | .546        | .453        | .451        | .499        | .354        |
| 50C | AXILLA-WAIST LEVEL | .119        | .063        | .196        | .101        | .368        | .086        | .092        | .134        |
| 51C | SLEEVE INSEAM      | .722        | .075        | .071        | .135        | .155        | .206        | .261        | .262        |
| 52C | SLEEVE OUTSEAM     | .750        | .135        | .121        | .229        | .210        | .283        | .329        | .282        |
| 53C | CROTCH LENGTH      | .448        | .403        | .288        | .449        | .194        | .611        | .478        | .351        |
| 54C | HEAD CIRCUMFERENCE | .396        | .229        | .202        | .287        | .255        | .264        | .337        | .398        |
| 55C | HEAD BREADTH       | .186        | .246        | .201        | .276        | .253        | .224        | .278        | .307        |
| 56C | HEAD LENGTH        | .342        | .135        | .105        | .210        | .160        | .197        | .246        | .268        |
| 57C | PALM LENGTH        | .539        | .097        | .082        | .166        | .140        | .196        | .267        | .308        |
| 58C | HAND BREADTH       | .465        | .288        | .269        | .337        | .315        | .295        | .435        | .474        |
| 59C | HAND CIRCUMFERENCE | .475        | .305        | .287        | .369        | .331        | .314        | .459        | .475        |
| 60C | HAND LENGTH        | .603        | .120        | .119        | .199        | .182        | .215        | .310        | .356        |
| 61C | INSTEP LENGTH      | .668        | .223        | .208        | .274        | .277        | .336        | .374        | .404        |
| 62C | FOOT LENGTH        | .689        | .216        | .190        | .274        | .274        | .339        | .377        | .382        |
| 63C | HEEL-ANKLE CIRC    | .671        | .330        | .307        | .396        | .365        | .428        | .489        | .476        |
| 64C | FOOT BREADTH       | .421        | .260        | .235        | .343        | .275        | .326        | .397        | .405        |
| 65C | HEEL BREADTH       | .502        | .314        | .304        | .344        | .297        | .332        | .396        | .368        |
| 66C | FOOT CIRCUMFERENCE | .493        | .333        | .296        | .390        | .335        | .388        | .475        | .464        |
| 67C | INSTEP CIRC        | .545        | .323        | .325        | .393        | .353        | .356        | .465        | .503        |
| 68C | ANKLE HEIGHT       | .366        | .068        | .061        | .085        | .097        | .012        | .163        | .225        |
| 69C | SPHYRION HEIGHT    | .198        | .063        | .046        | .167        | .106        | .218        | .193        | .166        |
| 70C | AGE                | .118        | .238        | .243        | .168        | .213        | .212        | .133        | .068        |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>250</u> | <u>260</u> | <u>270</u> | <u>280</u> | <u>290</u> | <u>300</u> | <u>310</u> | <u>320</u> |
|-----|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 10  | WEIGHT             | .833       | .825       | .808       | .801       | .787       | .903       | .807       | .818       |
| 20  | STATURE            | .331       | .286       | .239       | .276       | .208       | .414       | .658       | .373       |
| 30  | SHOULDER HEIGHT    | .354       | .326       | .290       | .324       | .265       | .443       | .681       | .436       |
| 40  | AXILLA HEIGHT      | .315       | .276       | .239       | .275       | .218       | .402       | .641       | .360       |
| 50  | BUSTPOINT HEIGHT   | .273       | .231       | .172       | .234       | .162       | .343       | .577       | .310       |
| 60  | WAIST HEIGHT       | .266       | .223       | .173       | .197       | .061       | .336       | .495       | .290       |
| 70  | CROTCH HEIGHT      | .247       | .200       | .151       | .168       | .144       | .260       | .356       | .265       |
| 80  | BUTTOCK HEIGHT     | .329       | .277       | .228       | .243       | .246       | .348       | .407       | .344       |
| 90  | KNEECAP HEIGHT     | .270       | .235       | .191       | .219       | .181       | .292       | .406       | .290       |
| 100 | CALF HEIGHT        | .262       | .232       | .177       | .181       | .194       | .304       | .343       | .276       |
| 110 | SITTING HEIGHT     | .253       | .227       | .189       | .240       | .123       | .384       | .713       | .296       |
| 120 | EYE HEIGHT/SIT     | .235       | .213       | .185       | .231       | .118       | .370       | .697       | .282       |
| 130 | SHOULDER-ELBOW L   | .334       | .294       | .247       | .259       | .226       | .356       | .465       | .405       |
| 140 | ELBOW-FINGERTIP    | .335       | .283       | .207       | .223       | .203       | .308       | .356       | .320       |
| 150 | KNEE HEIGHT/SIT    | .363       | .328       | .274       | .295       | .252       | .410       | .484       | .372       |
| 160 | POPLITEAL HEIGHT   | .252       | .212       | .155       | .172       | .139       | .261       | .374       | .263       |
| 170 | BUTTOCK-KNEE LGTH  | .506       | .480       | .449       | .438       | .456       | .637       | .579       | .520       |
| 180 | BUST DEPTH         | .709       | .767       | .904       | .768       | .732       | .650       | .550       | .685       |
| 190 | WAIST DEPTH        | .669       | .697       | .738       | .716       | .895       | .627       | .486       | .652       |
| 200 | CHEST BREADTH      | .828       | .854       | .858       | .833       | .754       | .679       | .595       | .729       |
| 210 | WAIST BREADTH      | .695       | .706       | .724       | .723       | .926       | .664       | .535       | .669       |
| 220 | HIP BREADTH        | .590       | .590       | .586       | .580       | .571       | .906       | .689       | .590       |
| 230 | SHOULDER BREADTH   | .936       | .855       | .771       | .762       | .705       | .709       | .620       | .737       |
| 240 | NECK CIRCUMFERENCE | .652       | .614       | .563       | .569       | .588       | .522       | .509       | .608       |
| 250 | SHOULDER CIRC      |            | .915       | .823       | .801       | .746       | .718       | .607       | .780       |
| 260 | CHEST CIRC AT SCYE | .915       |            | .881       | .850       | .769       | .713       | .616       | .807       |
| 270 | BUST CIRCUMFERENCE | .823       | .881       |            | .862       | .793       | .707       | .616       | .758       |
| 280 | CHEST C BELOW BUST | .801       | .850       | .862       |            | .778       | .691       | .621       | .740       |
| 290 | WAIST CIRC         | .746       | .769       | .793       | .778       |            | .700       | .558       | .719       |
| 300 | HIP CIRCUMFERENCE  | .718       | .713       | .707       | .691       | .700       |            | .760       | .704       |
| 310 | VERTICAL TRUNK CIR | .607       | .616       | .616       | .621       | .558       | .760       |            | .670       |
| 320 | ARM CIRC AT SCYE   | .780       | .807       | .758       | .740       | .719       | .714       | .670       |            |
| 330 | BICEPS CIRC, FLXD  | .777       | .780       | .718       | .698       | .693       | .725       | .578       | .788       |
| 340 | ELBOW CIRC, FLXD   | .596       | .579       | .487       | .512       | .494       | .522       | .534       | .645       |
| 350 | FOREARM CIRC, FLXD | .736       | .715       | .634       | .643       | .627       | .645       | .579       | .763       |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | -25C- | -26C- | -27C- | -28C- | -29C- | -30C- | -31C- | -32C- |
|-----|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 36C | WRIST CIRC         | .595  | .555  | .479  | .494  | .442  | .511  | .545  | .600  |
| 37C | UPPER THIGH CIRC   | .715  | .705  | .684  | .670  | .692  | .907  | .665  | .697  |
| 38C | KNEE CIRCUMFERENCE | .611  | .602  | .570  | .589  | .561  | .783  | .646  | .631  |
| 39C | CALF CIRCUMFERENCE | .585  | .558  | .533  | .555  | .519  | .718  | .577  | .573  |
| 40C | ANKLE CIRC         | .449  | .416  | .397  | .436  | .369  | .563  | .547  | .461  |
| 41C | SHOULDER LENGTH    | .323  | .222  | .117  | .148  | .071  | .192  | .201  | .072  |
| 42C | INTERSCYE BACK     | .646  | .565  | .467  | .468  | .431  | .385  | .326  | .363  |
| 43C | INTERSCYE FRONT    | .638  | .581  | .500  | .499  | .417  | .477  | .464  | .440  |
| 44C | BACK ARC, BUST     | .769  | .805  | .849  | .825  | .735  | .663  | .564  | .679  |
| 45C | BACK ARC, WAIST    | .723  | .750  | .776  | .767  | .936  | .674  | .537  | .693  |
| 46C | BACK ARC, HIP      | .647  | .633  | .623  | .611  | .636  | .865  | .662  | .625  |
| 47C | WAIST BACK         | .203  | .172  | .153  | .186  | .321  | .242  | .475  | .242  |
| 48C | WAIST FRONT        | .316  | .323  | .343  | .345  | .504  | .321  | .486  | .364  |
| 49C | NECK-BUSTPOINT LGT | .520  | .552  | .627  | .485  | .464  | .511  | .471  | .535  |
| 50C | AXILLA-WAIST LEVEL | .076  | .068  | .083  | .115  | .301  | .123  | .342  | .120  |
| 51C | SLEEVE INSEAM      | .244  | .175  | .120  | .130  | .128  | .236  | .288  | .208  |
| 52C | SLEEVE OUTSEAM     | .307  | .255  | .200  | .210  | .186  | .305  | .394  | .347  |
| 53C | CROTCH LENGTH      | .476  | .485  | .465  | .462  | .262  | .653  | .712  | .497  |
| 54C | HEAD CIRCUMFERENCE | .352  | .327  | .275  | .273  | .245  | .324  | .305  | .289  |
| 55C | HEAD BREADTH       | .302  | .289  | .276  | .281  | .242  | .254  | .248  | .288  |
| 56C | HEAD LENGTH        | .246  | .224  | .176  | .184  | .145  | .237  | .268  | .193  |
| 57C | PALM LENGTH        | .260  | .207  | .141  | .169  | .127  | .224  | .296  | .223  |
| 58C | HAND BREADTH       | .455  | .416  | .337  | .365  | .320  | .369  | .421  | .459  |
| 59C | HAND CIRCUMFERENCE | .476  | .439  | .360  | .389  | .338  | .386  | .450  | .480  |
| 60C | HAND LENGTH        | .302  | .247  | .171  | .196  | .167  | .267  | .328  | .278  |
| 61C | INSTEP LENGTH      | .369  | .327  | .275  | .277  | .271  | .384  | .415  | .347  |
| 62C | FOOT LENGTH        | .371  | .327  | .266  | .282  | .258  | .388  | .439  | .344  |
| 63C | HEEL-ANKLE CIRC    | .491  | .446  | .376  | .412  | .364  | .517  | .513  | .465  |
| 64C | FOOT BREADTH       | .396  | .359  | .314  | .355  | .290  | .387  | .428  | .387  |
| 65C | HEEL BREADTH       | .408  | .397  | .341  | .340  | .333  | .393  | .318  | .377  |
| 66C | FOOT CIRCUMFERENCE | .482  | .424  | .380  | .403  | .350  | .477  | .506  | .463  |
| 67C | INSTEP CIRC        | .481  | .441  | .364  | .403  | .369  | .449  | .429  | .464  |
| 68C | ANKLE HEIGHT       | .156  | .117  | .067  | .090  | .078  | .067  | .198  | .147  |
| 69C | SPHYRION HEIGHT    | .166  | .140  | .119  | .161  | .093  | .185  | .327  | .184  |
| 70C | AGE                | .138  | .199  | .213  | .196  | .223  | .208  | .209  | .190  |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>.330</u> | <u>.340</u> | <u>.350</u> | <u>.360</u> | <u>.370</u> | <u>.380</u> | <u>.390</u> | <u>.400</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1C  | WEIGHT             | .817        | .662        | .780        | .652        | .883        | .820        | .777        | .639        |
| 2C  | STATURE            | .207        | .468        | .334        | .464        | .287        | .419        | .304        | .391        |
| 3C  | SHOULDER HEIGHT    | .250        | .488        | .360        | .461        | .325        | .444        | .318        | .384        |
| 4C  | AXILLA HEIGHT      | .200        | .460        | .319        | .435        | .285        | .410        | .280        | .358        |
| 5C  | BUSTPOINT HEIGHT   | .158        | .433        | .287        | .412        | .238        | .365        | .240        | .317        |
| 6C  | WAIST HEIGHT       | .137        | .401        | .257        | .388        | .225        | .360        | .235        | .315        |
| 7C  | CROTCH HEIGHT      | .120        | .409        | .254        | .365        | .184        | .313        | .176        | .231        |
| 8C  | BUTTOCK HEIGHT     | .214        | .451        | .320        | .391        | .287        | .368        | .238        | .268        |
| 9C  | KNEECAP HEIGHT     | .140        | .424        | .281        | .386        | .202        | .319        | .198        | .263        |
| 10C | CALF HEIGHT        | .179        | .409        | .293        | .362        | .250        | .371        | .190        | .193        |
| 11C | SITTING HEIGHT     | .167        | .312        | .242        | .367        | .243        | .336        | .296        | .392        |
| 12C | EYE HEIGHT/SIT     | .155        | .296        | .230        | .349        | .225        | .321        | .284        | .387        |
| 13C | SHOULDER-ELBOW L   | .171        | .453        | .318        | .417        | .247        | .378        | .248        | .287        |
| 14C | ELBOW-FINGERTIP    | .210        | .482        | .366        | .482        | .230        | .367        | .233        | .282        |
| 15C | KNEE HEIGHT/SIT    | .252        | .489        | .385        | .469        | .341        | .472        | .341        | .375        |
| 16C | POPLITEAL HEIGHT   | .112        | .412        | .269        | .386        | .180        | .307        | .187        | .255        |
| 17C | BUTTOCK-KNEE LGTH  | .452        | .538        | .503        | .485        | .570        | .596        | .453        | .400        |
| 18C | BUST DEPTH         | .664        | .421        | .559        | .399        | .635        | .524        | .494        | .347        |
| 19C | WAIST DEPTH        | .638        | .426        | .553        | .386        | .625        | .499        | .458        | .310        |
| 20C | CHEST BREADTH      | .670        | .487        | .614        | .473        | .658        | .554        | .523        | .408        |
| 21C | WAIST BREADTH      | .638        | .465        | .581        | .422        | .648        | .538        | .497        | .373        |
| 22C | HIP BREADTH        | .625        | .435        | .539        | .438        | .827        | .731        | .665        | .513        |
| 23C | SHOULDER BREADTH   | .717        | .555        | .685        | .560        | .691        | .602        | .574        | .453        |
| 24C | NECK CIRCUMFERENCE | .556        | .533        | .623        | .550        | .526        | .451        | .454        | .395        |
| 25C | SHOULDER CIRC      | .777        | .596        | .736        | .595        | .715        | .611        | .585        | .449        |
| 26C | CHEST CIRC AT SCYE | .780        | .579        | .715        | .555        | .705        | .602        | .558        | .416        |
| 27C | BUST CIRCUMFERENCE | .718        | .487        | .634        | .479        | .684        | .570        | .533        | .397        |
| 28C | CHEST C BELOW BUST | .698        | .512        | .643        | .494        | .670        | .589        | .555        | .436        |
| 29C | WAIST CIRC         | .693        | .494        | .627        | .442        | .692        | .561        | .519        | .369        |
| 30C | HIP CIRCUMFERENCE  | .725        | .522        | .645        | .511        | .907        | .783        | .718        | .563        |
| 31C | VERTICAL TRUNK CIR | .578        | .534        | .579        | .545        | .665        | .646        | .577        | .547        |
| 32C | ARM CIRC AT SCYE   | .788        | .645        | .763        | .600        | .697        | .631        | .573        | .461        |
| 33C | BICEPS CIRC, FLXD  |             | .662        | .832        | .583        | .789        | .684        | .692        | .516        |
| 34C | ELBOW CIRC, FLXD   | .662        |             | .832        | .657        | .521        | .563        | .513        | .484        |
| 35C | FOREARM CIRC, FLXD | .832        | .832        |             | .726        | .687        | .673        | .672        | .571        |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>.330</u> | <u>.340</u> | <u>.350</u> | <u>.360</u> | <u>.370</u> | <u>.380</u> | <u>.390</u> | <u>.400</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 360 | WRIST CIRC         | .583        | .657        | .726        |             | .489        | .604        | .560        | .634        |
| 370 | UPPER THIGH CIRC   | .789        | .521        | .687        | .489        |             | .776        | .767        | .559        |
| 380 | KNEE CIRCUMFERENCE | .684        | .563        | .673        | .604        | .776        |             | .790        | .690        |
| 390 | CALF CIRCUMFERENCE | .692        | .513        | .672        | .560        | .767        | .790        |             | .789        |
| 400 | ANKLE CIRC         | .516        | .484        | .571        | .634        | .559        | .690        | .789        |             |
| 410 | SHOULDER LENGTH    | .122        | .222        | .195        | .275        | .132        | .224        | .169        | .192        |
| 420 | INTERSCYE BACK     | .377        | .331        | .393        | .372        | .352        | .326        | .287        | .240        |
| 430 | INTERSCYE FRONT    | .427        | .401        | .466        | .456        | .424        | .424        | .390        | .332        |
| 440 | BACK ARC, BUST     | .653        | .447        | .585        | .444        | .640        | .546        | .522        | .413        |
| 450 | BACK ARC, WAIST    | .680        | .478        | .609        | .437        | .660        | .548        | .508        | .370        |
| 460 | BACK ARC, HIP      | .669        | .471        | .580        | .447        | .798        | .676        | .633        | .480        |
| 470 | WAIST BACK         | .145        | .284        | .229        | .268        | .163        | .213        | .194        | .230        |
| 480 | WAIST FRONT        | .289        | .284        | .302        | .277        | .271        | .273        | .250        | .227        |
| 490 | NECK-BUSTPOINT LGT | .485        | .335        | .419        | .351        | .462        | .436        | .398        | .338        |
| 500 | AXILLA-WAIST LEVEL | .079        | .131        | .093        | .112        | .060        | .086        | .080        | .123        |
| 510 | SLEEVE INSEAM      | .089        | .383        | .233        | .358        | .154        | .278        | .156        | .194        |
| 520 | SLEEVE OUTSEAM     | .157        | .415        | .282        | .395        | .217        | .346        | .210        | .244        |
| 530 | CROTCH LENGTH      | .475        | .362        | .427        | .402        | .593        | .558        | .489        | .450        |
| 540 | HEAD CIRCUMFERENCE | .277        | .330        | .347        | .346        | .303        | .328        | .287        | .264        |
| 550 | HEAD BREADTH       | .240        | .231        | .294        | .278        | .251        | .247        | .221        | .210        |
| 560 | HEAD LENGTH        | .194        | .283        | .262        | .287        | .215        | .257        | .244        | .252        |
| 570 | PALM LENGTH        | .150        | .381        | .291        | .438        | .151        | .297        | .191        | .257        |
| 580 | HAND BREADTH       | .428        | .562        | .584        | .697        | .357        | .422        | .425        | .488        |
| 590 | HAND CIRCUMFERENCE | .447        | .578        | .618        | .739        | .374        | .449        | .447        | .511        |
| 600 | HAND LENGTH        | .194        | .440        | .357        | .505        | .201        | .338        | .237        | .306        |
| 610 | INSTEP LENGTH      | .283        | .467        | .411        | .507        | .328        | .432        | .368        | .448        |
| 620 | FOOT LENGTH        | .272        | .491        | .416        | .536        | .316        | .459        | .366        | .469        |
| 630 | HEEL-ANKLE CIRC    | .432        | .565        | .560        | .660        | .485        | .624        | .549        | .649        |
| 640 | FOOT BREADTH       | .339        | .429        | .445        | .521        | .366        | .425        | .460        | .529        |
| 650 | HEEL BREADTH       | .402        | .422        | .483        | .477        | .413        | .478        | .410        | .402        |
| 660 | FOOT CIRCUMFERENCE | .432        | .525        | .544        | .631        | .456        | .530        | .557        | .634        |
| 670 | INSTEP CIRC        | .445        | .541        | .570        | .653        | .467        | .528        | .554        | .607        |
| 680 | ANKLE HEIGHT       | .009        | .238        | .123        | .229        | .005        | .060        | -.029       | -.034       |
| 690 | SPHYRION HEIGHT    | .092        | .239        | .197        | .309        | .147        | .179        | .229        | .275        |
| 700 | AGE                | .178        | .083        | .113        | .051        | .119        | .168        | .028        | -.024       |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <del>.410</del> | <del>.420</del> | <del>.430</del> | <del>.440</del> | <del>.450</del> | <del>.460</del> | <del>.470</del> | <del>.480</del> |
|-----|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 10  | WEIGHT             | .247            | .479            | .567            | .749            | .761            | .791            | .313            | .399            |
| 20  | STATURE            | .373            | .276            | .387            | .216            | .199            | .321            | .520            | .368            |
| 30  | SHOULDER HEIGHT    | .274            | .235            | .365            | .259            | .252            | .357            | .498            | .372            |
| 40  | AXILLA HEIGHT      | .302            | .236            | .352            | .215            | .205            | .320            | .487            | .348            |
| 50  | BUSTPOINT HEIGHT   | .310            | .203            | .344            | .162            | .146            | .270            | .435            | .320            |
| 60  | WAIST HEIGHT       | .330            | .227            | .331            | .158            | .065            | .249            | .269            | .039            |
| 70  | CROTCH HEIGHT      | .319            | .230            | .314            | .133            | .127            | .189            | .322            | .187            |
| 80  | BUTTOCK HEIGHT     | .293            | .249            | .342            | .205            | .218            | .272            | .313            | .234            |
| 90  | KNEECAP HEIGHT     | .328            | .240            | .335            | .164            | .162            | .228            | .339            | .214            |
| 100 | CALF HEIGHT        | .276            | .224            | .303            | .144            | .170            | .244            | .276            | .152            |
| 110 | SITTING HEIGHT     | .298            | .211            | .278            | .182            | .135            | .288            | .535            | .405            |
| 120 | EYE HEIGHT/SIT     | .287            | .200            | .266            | .178            | .131            | .275            | .519            | .403            |
| 130 | SHOULDER-ELBOW L   | .298            | .256            | .362            | .220            | .204            | .280            | .365            | .255            |
| 140 | ELBOW-FINGERTIP    | .362            | .284            | .405            | .194            | .178            | .259            | .298            | .183            |
| 150 | KNEE HEIGHT/SIT    | .368            | .311            | .404            | .242            | .228            | .301            | .344            | .226            |
| 160 | POPLITEAL HEIGHT   | .357            | .256            | .336            | .132            | .120            | .181            | .331            | .188            |
| 170 | BUTTOCK-KNEE LGTH  | .299            | .352            | .432            | .396            | .419            | .560            | .298            | .262            |
| 180 | BUST DEPTH         | .664            | .376            | .403            | .793            | .717            | .581            | .127            | .323            |
| 190 | WAIST DEPTH        | .026            | .357            | .369            | .671            | .839            | .579            | .198            | .409            |
| 200 | CHEST BREADTH      | .184            | .517            | .542            | .807            | .737            | .597            | .175            | .335            |
| 210 | WAIST BREADTH      | .085            | .420            | .401            | .697            | .886            | .592            | .371            | .529            |
| 220 | HIP BREADTH        | .188            | .296            | .424            | .545            | .553            | .782            | .221            | .273            |
| 230 | SHOULDER BREADTH   | .362            | .618            | .688            | .735            | .684            | .628            | .212            | .319            |
| 240 | NECK CIRCUMFERENCE | .095            | .408            | .457            | .515            | .566            | .481            | .244            | .231            |
| 250 | SHOULDER CIRC      | .323            | .646            | .638            | .769            | .723            | .647            | .203            | .316            |
| 260 | CHEST CIRC AT SCYE | .222            | .565            | .581            | .805            | .750            | .633            | .172            | .323            |
| 270 | BUST CIRCUMFERENCE | .117            | .467            | .500            | .849            | .776            | .623            | .153            | .343            |
| 280 | CHEST C BELOW BUST | .148            | .468            | .499            | .825            | .767            | .611            | .186            | .345            |
| 290 | WAIST CIRC         | .071            | .431            | .417            | .735            | .936            | .636            | .321            | .504            |
| 300 | HIP CIRCUMFERENCE  | .192            | .385            | .477            | .663            | .674            | .865            | .242            | .321            |
| 310 | VERTICAL TRUNK CIR | .201            | .326            | .464            | .564            | .537            | .662            | .475            | .486            |
| 320 | ARM CIRC AT SCYE   | .072            | .363            | .440            | .679            | .693            | .625            | .242            | .364            |
| 330 | BICEPS CIRC, FLXD  | .122            | .377            | .427            | .653            | .680            | .669            | .145            | .289            |
| 340 | ELBOW CIRC, FLXD   | .222            | .331            | .401            | .447            | .478            | .471            | .284            | .284            |
| 350 | FOREARM CIRC, FLXD | .195            | .393            | .466            | .585            | .609            | .580            | .229            | .302            |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>-41C-</u> | <u>-42C-</u> | <u>-43C-</u> | <u>-44C-</u> | <u>-45C-</u> | <u>-46C-</u> | <u>-47C-</u> | <u>-48C-</u> |
|-----|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 36C | WRIST CIRC         | .275         | .372         | .456         | .444         | .437         | .447         | .268         | .277         |
| 37C | UPPER THIGH CIRC   | .132         | .352         | .424         | .640         | .660         | .798         | .163         | .271         |
| 38C | KNEE CIRCUMFERENCE | .224         | .326         | .424         | .546         | .548         | .676         | .213         | .273         |
| 39C | CALF CIRCUMFERENCE | .169         | .287         | .390         | .522         | .508         | .633         | .194         | .250         |
| 40C | ANKLE CIRC         | .192         | .240         | .332         | .413         | .370         | .480         | .230         | .227         |
| 41C | SHOULDER LENGTH    |              | .475         | .525         | .128         | .066         | .105         | .230         | .169         |
| 42C | INTERSCYE BACK     | .475         |              | .378         | .515         | .439         | .323         | .220         | .184         |
| 43C | INTERSCYE FRONT    | .525         | .378         |              | .440         | .394         | .402         | .170         | .254         |
| 44C | BACK ARC, BUST     | .128         | .515         | .440         |              | .760         | .601         | .172         | .310         |
| 45C | BACK ARC, WAIST    | .066         | .439         | .394         | .760         |              | .639         | .311         | .465         |
| 46C | BACK ARC, HIP      | .105         | .323         | .402         | .601         | .639         |              | .211         | .296         |
| 47C | WAIST BACK         | .230         | .220         | .170         | .172         | .311         | .211         |              | .599         |
| 48C | WAIST FRONT        | .169         | .184         | .254         | .310         | .465         | .296         | .599         |              |
| 49C | NECK-BUSTPOINT LGT | .234         | .338         | .339         | .503         | .462         | .424         | .154         | .304         |
| 50C | AXILLA-WAIST LEVEL | -.002        | .034         | .056         | .105         | .274         | .159         | .657         | .698         |
| 51C | SLEEVE INSEAM      | .366         | .269         | .316         | .110         | .104         | .177         | .297         | .155         |
| 52C | SLEEVE OUTSEAM     | .291         | .231         | .365         | .175         | .160         | .239         | .312         | .212         |
| 53C | CROTCH LENGTH      | .162         | .247         | .339         | .401         | .265         | .549         | -.042        | -.095        |
| 54C | HEAD CIRCUMFERENCE | .137         | .253         | .301         | .248         | .227         | .295         | .156         | .134         |
| 55C | HEAD BREADTH       | .044         | .196         | .215         | .249         | .245         | .227         | .084         | .087         |
| 56C | HEAD LENGTH        | .145         | .201         | .230         | .169         | .129         | .223         | .161         | .145         |
| 57C | PALM LENGTH        | .307         | .235         | .346         | .127         | .104         | .184         | .242         | .133         |
| 58C | HAND BREADTH       | .255         | .305         | .378         | .333         | .312         | .330         | .267         | .223         |
| 59C | HAND CIRCUMFERENCE | .273         | .338         | .398         | .355         | .332         | .334         | .279         | .238         |
| 60C | HAND LENGTH        | .322         | .246         | .377         | .159         | .140         | .214         | .277         | .181         |
| 61C | INSTEP LENGTH      | .295         | .299         | .377         | .260         | .243         | .300         | .259         | .179         |
| 62C | FOOT LENGTH        | .348         | .296         | .403         | .252         | .231         | .308         | .308         | .216         |
| 63C | HEEL-ANKLE CIRC    | .332         | .333         | .449         | .377         | .349         | .434         | .289         | .234         |
| 64C | FOOT BREADTH       | .223         | .266         | .375         | .302         | .274         | .324         | .238         | .189         |
| 65C | HEEL BREADTH       | .221         | .244         | .383         | .314         | .321         | .361         | .126         | .131         |
| 66C | FOOT CIRCUMFERENCE | .256         | .313         | .418         | .368         | .330         | .403         | .250         | .232         |
| 67C | INSTEP CIRC        | .237         | .308         | .395         | .352         | .357         | .386         | .227         | .193         |
| 68C | ANKLE HEIGHT       | .193         | .151         | .180         | .069         | .077         | .071         | .232         | .173         |
| 69C | SPHYRION HEIGHT    | .151         | .163         | .158         | .084         | .094         | .101         | .269         | .152         |
| 70C | AGE                | .008         | .079         | .151         | .169         | .215         | .245         | .053         | .135         |

TABLE 2 CONTINUED  
CORRELATIONS: COPE MEASUREMENTS (N=1330)

|     |                    | <u>.490</u> | <u>.540</u> | <u>.510</u> | <u>.520</u> | <u>.530</u> | <u>.540</u> | <u>.550</u> | <u>.560</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 10  | WEIGHT             | .569        | .150        | .357        | .433        | .636        | .409        | .317        | .317        |
| 20  | STATURE            | .276        | .284        | .746        | .782        | .424        | .364        | .154        | .370        |
| 30  | SHOULDER HEIGHT    | .272        | .309        | .736        | .799        | .423        | .333        | .149        | .336        |
| 40  | AXILLA HEIGHT      | .228        | .310        | .763        | .789        | .390        | .334        | .124        | .343        |
| 50  | BUSTPOINT HEIGHT   | .043        | .274        | .767        | .789        | .353        | .317        | .095        | .327        |
| 60  | WAIST HEIGHT       | .202        | .006        | .765        | .781        | .486        | .319        | .115        | .314        |
| 70  | CROTCH HEIGHT      | .144        | .139        | .857        | .847        | .205        | .324        | .084        | .320        |
| 80  | BUTTOCK HEIGHT     | .175        | .160        | .825        | .816        | .240        | .366        | .117        | .345        |
| 90  | KNEECAP HEIGHT     | .175        | .154        | .806        | .811        | .248        | .324        | .099        | .319        |
| 100 | CALF HEIGHT        | .153        | .097        | .759        | .761        | .225        | .364        | .137        | .319        |
| 110 | SITTING HEIGHT     | .283        | .330        | .327        | .389        | .479        | .236        | .155        | .261        |
| 120 | EYE HEIGHT/SIT     | .281        | .328        | .305        | .367        | .462        | .180        | .112        | .220        |
| 130 | SHOULDER-ELBOW L   | .223        | .163        | .864        | .922        | .281        | .311        | .136        | .297        |
| 140 | ELBOW-FINGERTIP    | .161        | .114        | .866        | .855        | .208        | .427        | .165        | .382        |
| 150 | KNEE HEIGHT/SIT    | .240        | .100        | .808        | .831        | .350        | .386        | .160        | .362        |
| 160 | POPLITEAL HEIGHT   | .155        | .113        | .825        | .832        | .235        | .335        | .113        | .326        |
| 170 | BUTTOCK-KNEE LGTH  | .339        | .119        | .722        | .750        | .448        | .396        | .186        | .342        |
| 180 | BUST DEPTH         | .616        | .063        | .075        | .135        | .403        | .229        | .246        | .135        |
| 190 | WAIST DEPTH        | .412        | .196        | .071        | .121        | .288        | .202        | .201        | .105        |
| 200 | CHEST BREADTH      | .546        | .101        | .135        | .229        | .449        | .287        | .276        | .210        |
| 210 | WAIST BREADTH      | .453        | .368        | .155        | .210        | .194        | .255        | .253        | .160        |
| 220 | HIP BREADTH        | .451        | .086        | .206        | .283        | .611        | .264        | .224        | .197        |
| 230 | SHOULDER BREADTH   | .499        | .092        | .261        | .329        | .478        | .337        | .278        | .246        |
| 240 | NECK CIRCUMFERENCE | .354        | .134        | .262        | .282        | .351        | .398        | .307        | .268        |
| 250 | SHOULDER CIRC      | .520        | .076        | .244        | .307        | .476        | .352        | .302        | .246        |
| 260 | CHEST CIRC AT SCYE | .552        | .068        | .175        | .265        | .485        | .327        | .289        | .224        |
| 270 | BUST CIRCUMFERENCE | .627        | .083        | .120        | .200        | .465        | .275        | .276        | .176        |
| 280 | CHEST C BELOW BUST | .485        | .115        | .130        | .210        | .462        | .273        | .281        | .184        |
| 290 | WAIST CIRC         | .464        | .301        | .128        | .186        | .262        | .245        | .242        | .145        |
| 300 | HIP CIRCUMFERENCE  | .511        | .123        | .236        | .305        | .653        | .324        | .254        | .237        |
| 310 | VERTICAL TRUNK CIR | .471        | .342        | .288        | .394        | .712        | .305        | .248        | .268        |
| 320 | ARM CIRC AT SCYE   | .535        | .120        | .208        | .347        | .497        | .289        | .288        | .193        |
| 330 | BICEPS CIRC, FLXD  | .485        | .079        | .089        | .157        | .475        | .277        | .240        | .194        |
| 340 | ELBOW CIRC, FLXD   | .335        | .131        | .383        | .415        | .362        | .330        | .231        | .283        |
| 350 | FOREARM CIRC, FLXD | .419        | .093        | .233        | .282        | .427        | .347        | .294        | .262        |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>.490</u> | <u>.500</u> | <u>.510</u> | <u>.520</u> | <u>.530</u> | <u>.540</u> | <u>.550</u> | <u>.560</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 360 | WRIST CIRC         | .351        | .112        | .358        | .395        | .402        | .346        | .278        | .287        |
| 370 | UPPER THIGH CIRC   | .462        | .060        | .154        | .217        | .593        | .303        | .251        | .215        |
| 380 | KNEE CIRCUMFERENCE | .436        | .086        | .278        | .346        | .558        | .328        | .247        | .257        |
| 390 | CALF CIRCUMFERENCE | .398        | .080        | .156        | .210        | .489        | .287        | .221        | .244        |
| 400 | ANKLE CIRC         | .338        | .123        | .194        | .244        | .450        | .264        | .210        | .252        |
| 410 | SHOULDER LENGTH    | .234        | -.002       | .366        | .291        | .162        | .137        | .044        | .145        |
| 420 | INTERSCYE BACK     | .338        | .034        | .269        | .231        | .247        | .253        | .196        | .201        |
| 430 | INTERSCYE FRONT    | .339        | .056        | .316        | .365        | .339        | .301        | .215        | .230        |
| 440 | BACK ARC, BUST     | .503        | .105        | .110        | .175        | .401        | .248        | .249        | .169        |
| 450 | BACK ARC, WAIST    | .462        | .274        | .104        | .160        | .265        | .227        | .245        | .129        |
| 460 | BACK ARC, HIP      | .424        | .159        | .177        | .239        | .549        | .295        | .227        | .223        |
| 470 | WAIST BACK         | .154        | .657        | .297        | .312        | -.042       | .156        | .084        | .161        |
| 480 | WAIST FRONT        | .304        | .698        | .155        | .212        | -.095       | .134        | .087        | .145        |
| 490 | NECK-BUSTPOINT LGT |             | .021        | .103        | .181        | .399        | .192        | .232        | .135        |
| 500 | AXILLA-WAIST LEVEL | .021        |             | .108        | .134        | -.251       | .077        | .007        | .097        |
| 510 | SLEEVE INSEAM      | .103        | .108        |             | .898        | .159        | .343        | .102        | .316        |
| 520 | SLEEVE OUTSEAM     | .181        | .134        | .898        |             | .241        | .341        | .135        | .317        |
| 530 | CROTCH LENGTH      | .399        | -.251       | .159        | .241        |             | .225        | .211        | .183        |
| 540 | HEAD CIRCUMFERENCE | .192        | .077        | .343        | .341        | .225        |             | .548        | .796        |
| 550 | HEAD BREADTH       | .232        | .007        | .102        | .135        | .211        | .548        |             | .161        |
| 560 | HEAD LENGTH        | .135        | .097        | .316        | .317        | .183        | .796        | .161        |             |
| 570 | PALM LENGTH        | .111        | .077        | .645        | .636        | .186        | .379        | .149        | .333        |
| 580 | HAND BREADTH       | .238        | .135        | .413        | .424        | .267        | .396        | .286        | .326        |
| 590 | HAND CIRCUMFERENCE | .262        | .122        | .405        | .428        | .292        | .382        | .295        | .314        |
| 600 | HAND LENGTH        | .132        | .110        | .707        | .704        | .193        | .412        | .185        | .355        |
| 610 | INSTEP LENGTH      | .233        | .099        | .623        | .624        | .298        | .430        | .254        | .352        |
| 620 | FOOT LENGTH        | .230        | .129        | .674        | .675        | .299        | .425        | .222        | .370        |
| 630 | HEEL-ANKLE CIRC    | .303        | .122        | .557        | .577        | .387        | .447        | .241        | .388        |
| 640 | FOOT BREADTH       | .233        | .083        | .298        | .349        | .329        | .352        | .246        | .289        |
| 650 | HEEL BREADTH       | .240        | .018        | .350        | .377        | .254        | .398        | .249        | .303        |
| 660 | FOOT CIRCUMFERENCE | .286        | .118        | .350        | .386        | .384        | .370        | .248        | .309        |
| 670 | INSTEP CIRC        | .263        | .075        | .430        | .446        | .332        | .429        | .283        | .334        |
| 680 | ANKLE HEIGHT       | .072        | .155        | .484        | .455        | .059        | .196        | .057        | .200        |
| 690 | SPHYRION HEIGHT    | .138        | .050        | .205        | .236        | .240        | .109        | .063        | .148        |
| 700 | AGE                | .156        | .085        | -.011       | .043        | .133        | .089        | .193        | .016        |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>-57C-</u> | <u>-58C-</u> | <u>-59C-</u> | <u>-60C-</u> | <u>-61C-</u> | <u>-62C-</u> | <u>-63C-</u> | <u>-64C-</u> |
|-----|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1C  | HEIGHT             | .340         | .508         | .534         | .400         | .508         | .517         | .642         | .493         |
| 2C  | STATURE            | .585         | .433         | .448         | .634         | .629         | .693         | .616         | .413         |
| 3C  | SHOULDER HEIGHT    | .574         | .432         | .445         | .629         | .618         | .681         | .618         | .406         |
| 4C  | AXILLA HEIGHT      | .585         | .417         | .423         | .637         | .617         | .684         | .610         | .390         |
| 5C  | BUSTPOINT HEIGHT   | .590         | .409         | .411         | .642         | .604         | .672         | .591         | .373         |
| 6C  | WAIST HEIGHT       | .580         | .393         | .395         | .625         | .612         | .667         | .593         | .366         |
| 7C  | CROTCH HEIGHT      | .629         | .402         | .396         | .693         | .646         | .706         | .599         | .341         |
| 8C  | BUTTOCK HEIGHT     | .610         | .419         | .411         | .680         | .650         | .707         | .636         | .332         |
| 9C  | KNEECAP HEIGHT     | .632         | .419         | .426         | .697         | .641         | .713         | .627         | .372         |
| 10C | CALF HEIGHT        | .605         | .406         | .401         | .671         | .609         | .667         | .588         | .328         |
| 11C | SITTING HEIGHT     | .304         | .265         | .293         | .305         | .336         | .385         | .350         | .301         |
| 12C | EYE HEIGHT/SIT     | .279         | .239         | .267         | .277         | .312         | .357         | .331         | .280         |
| 13C | SHOULDER-ELBOW L   | .572         | .428         | .430         | .639         | .594         | .645         | .568         | .354         |
| 14C | ELBOW-FINGERTIP    | .787         | .553         | .547         | .871         | .732         | .799         | .680         | .413         |
| 15C | KNEE HEIGHT/SIT    | .647         | .466         | .486         | .720         | .685         | .747         | .694         | .449         |
| 16C | POPLITEAL HEIGHT   | .651         | .414         | .424         | .717         | .655         | .721         | .622         | .386         |
| 17C | BUTTOCK-KNEE LGTH  | .539         | .465         | .475         | .603         | .668         | .689         | .671         | .421         |
| 18C | BUST DEPTH         | .097         | .288         | .305         | .120         | .223         | .216         | .330         | .260         |
| 19C | WAIST DEPTH        | .082         | .269         | .287         | .119         | .208         | .190         | .307         | .235         |
| 20C | CHEST BREADTH      | .166         | .337         | .369         | .199         | .274         | .274         | .396         | .343         |
| 21C | WAIST BREADTH      | .140         | .315         | .331         | .182         | .277         | .274         | .365         | .275         |
| 22C | HIP BREADTH        | .196         | .295         | .314         | .215         | .336         | .339         | .428         | .326         |
| 23C | SHOULDER BREADTH   | .267         | .435         | .459         | .310         | .374         | .377         | .489         | .397         |
| 24C | NECK CIRCUMFERENCE | .308         | .474         | .475         | .356         | .404         | .382         | .476         | .405         |
| 25C | SHOULDER CIRC      | .260         | .455         | .476         | .302         | .369         | .371         | .491         | .396         |
| 26C | CHEST CIRC AT SCYE | .207         | .416         | .439         | .247         | .327         | .327         | .446         | .359         |
| 27C | BUST CIRCUMFERENCE | .141         | .337         | .360         | .171         | .275         | .266         | .376         | .314         |
| 28C | CHEST C BELOW BUST | .169         | .365         | .389         | .196         | .277         | .282         | .412         | .355         |
| 29C | WAIST CIRC         | .127         | .320         | .338         | .167         | .271         | .258         | .364         | .290         |
| 30C | HIP CIRCUMFERENCE  | .224         | .369         | .386         | .267         | .384         | .388         | .517         | .387         |
| 31C | VERTICAL TRUNK CIR | .296         | .421         | .450         | .328         | .415         | .439         | .513         | .428         |
| 32C | ARM CIRC AT SCYE   | .223         | .459         | .480         | .278         | .347         | .344         | .465         | .387         |
| 33C | BICEPS CIRC, FLXD  | .150         | .428         | .447         | .194         | .283         | .272         | .432         | .339         |
| 34C | ELBOW CIRC, FLXD   | .381         | .562         | .578         | .440         | .467         | .491         | .505         | .429         |
| 35C | FOREARM CIRC, FLXD | .291         | .584         | .618         | .357         | .411         | .416         | .560         | .445         |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>.570</u> | <u>.580</u> | <u>.590</u> | <u>.600</u> | <u>.610</u> | <u>.620</u> | <u>.630</u> | <u>.640</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 360 | WRIST CIRC         | .438        | .697        | .739        | .505        | .507        | .536        | .660        | .521        |
| 370 | UPPER THIGH CIRC   | .151        | .357        | .374        | .201        | .328        | .316        | .485        | .366        |
| 380 | KNEE CIRCUMFERENCE | .297        | .422        | .449        | .338        | .432        | .459        | .624        | .425        |
| 390 | CALF CIRCUMFERENCE | .191        | .425        | .447        | .237        | .368        | .366        | .549        | .460        |
| 400 | ANKLE CIRC         | .257        | .488        | .511        | .306        | .448        | .469        | .649        | .529        |
| 410 | SHOULDER LENGTH    | .307        | .255        | .273        | .322        | .295        | .348        | .332        | .223        |
| 420 | INTERSCYE BACK     | .235        | .305        | .338        | .246        | .299        | .296        | .333        | .266        |
| 430 | INTERSCYE FRONT    | .346        | .378        | .398        | .377        | .377        | .403        | .449        | .375        |
| 440 | BACK ARC, BUST     | .127        | .333        | .355        | .159        | .260        | .252        | .377        | .302        |
| 450 | BACK ARC, WAIST    | .104        | .312        | .332        | .140        | .243        | .231        | .349        | .274        |
| 460 | BACK ARC, HIP      | .184        | .330        | .334        | .214        | .300        | .308        | .434        | .324        |
| 470 | WAIST BACK         | .242        | .267        | .279        | .277        | .259        | .308        | .289        | .238        |
| 480 | WAIST FRONT        | .133        | .223        | .238        | .181        | .179        | .216        | .234        | .189        |
| 490 | NECK-BUSTPOINT LGT | .111        | .238        | .262        | .132        | .233        | .230        | .303        | .233        |
| 500 | AXILLA-WAIST LEVEL | .077        | .135        | .122        | .110        | .099        | .129        | .122        | .083        |
| 510 | SLEEVE INSEAM      | .645        | .413        | .405        | .707        | .623        | .674        | .557        | .298        |
| 520 | SLEEVE OUTSEAM     | .636        | .424        | .428        | .704        | .624        | .675        | .577        | .349        |
| 530 | CROTCH LENGTH      | .186        | .267        | .292        | .193        | .298        | .299        | .387        | .329        |
| 540 | HEAD CIRCUMFERENCE | .379        | .396        | .382        | .412        | .430        | .425        | .447        | .352        |
| 550 | HEAD BREADTH       | .149        | .286        | .295        | .185        | .254        | .222        | .241        | .246        |
| 560 | HEAD LENGTH        | .333        | .326        | .314        | .355        | .352        | .370        | .388        | .289        |
| 570 | PALM LENGTH        |             | .483        | .473        | .908        | .671        | .735        | .607        | .407        |
| 580 | HAND BREADTH       | .483        |             | .933        | .602        | .556        | .582        | .648        | .613        |
| 590 | HAND CIRCUMFERENCE | .473        | .933        |             | .592        | .557        | .575        | .654        | .608        |
| 600 | HAND LENGTH        | .908        | .602        | .592        |             | .735        | .815        | .681        | .478        |
| 610 | INSTEP LENGTH      | .671        | .556        | .557        | .735        |             | .926        | .748        | .480        |
| 620 | FOOT LENGTH        | .735        | .582        | .575        | .815        | .926        |             | .801        | .531        |
| 630 | HEEL-ANKLE CIRC    | .607        | .648        | .654        | .681        | .748        | .801        |             | .608        |
| 640 | FOOT BREADTH       | .407        | .613        | .608        | .478        | .480        | .531        | .608        |             |
| 650 | HEEL BREADTH       | .465        | .515        | .514        | .499        | .523        | .539        | .718        | .503        |
| 660 | FOOT CIRCUMFERENCE | .423        | .672        | .682        | .506        | .552        | .592        | .732        | .847        |
| 670 | INSTEP CIRC        | .492        | .697        | .700        | .580        | .644        | .655        | .804        | .697        |
| 680 | ANKLE HEIGHT       | .429        | .307        | .305        | .474        | .405        | .449        | .419        | .245        |
| 690 | SPHYRION HEIGHT    | .210        | .275        | .285        | .242        | .148        | .213        | .290        | .277        |
| 700 | AGE                | .044        | .045        | .047        | .026        | .063        | .054        | .052        | -.004       |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                     | <del>650</del> | <del>660</del> | <del>670</del> | <del>680</del> | <del>690</del> | <del>700</del> |
|-----|---------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 10  | WEIGHT              | .499           | .587           | .592           | .171           | .239           | .181           |
| 20  | STATURE             | .306           | .472           | .462           | .505           | .402           | .057           |
| 30  | SHOULDER HEIGHT     | .320           | .465           | .468           | .506           | .386           | .086           |
| 40  | AXILLA HEIGHT       | .307           | .451           | .450           | .516           | .371           | .056           |
| 50  | BUSTPOINT HEIGHT    | .304           | .428           | .441           | .522           | .341           | .049           |
| 60  | WAIST HEIGHT        | .301           | .423           | .443           | .499           | .339           | .016           |
| 70  | CROTCH HEIGHT       | .340           | .395           | .461           | .564           | .275           | -.018          |
| 80  | BUTTOCK HEIGHT      | .375           | .410           | .496           | .546           | .252           | .026           |
| 90  | KNEECAP HEIGHT      | .357           | .420           | .485           | .589           | .337           | .054           |
| 100 | CALF HEIGHT         | .405           | .360           | .486           | .528           | .314           | .031           |
| 110 | SITTING HEIGHT      | .066           | .333           | .232           | .256           | .407           | .075           |
| 120 | EYE HEIGHT/SIT      | .047           | .313           | .209           | .240           | .394           | .098           |
| 130 | SHOULDER-ELBOW L    | .335           | .404           | .436           | .456           | .269           | .070           |
| 140 | ELBOW-FINGERTIP     | .487           | .456           | .554           | .504           | .217           | .047           |
| 150 | KNEE HEIGHT/SIT     | .440           | .501           | .564           | .504           | .378           | .041           |
| 160 | POPLITEAL HEIGHT    | .381           | .431           | .488           | .552           | .350           | .001           |
| 170 | BUTTOCK-KNEE LGTH   | .502           | .493           | .545           | .366           | .198           | .118           |
| 180 | BUST DEPTH          | .314           | .333           | .323           | .068           | .063           | .238           |
| 190 | WAIST DEPTH         | .304           | .296           | .325           | .061           | .046           | .243           |
| 200 | CHEST BREADTH       | .344           | .390           | .393           | .085           | .167           | .168           |
| 210 | WAIST BREADTH       | .297           | .335           | .353           | .097           | .106           | .213           |
| 220 | HIP BREADTH         | .332           | .388           | .356           | -.012          | .218           | .212           |
| 230 | SHOULDER BREADTH    | .396           | .475           | .465           | .163           | .193           | .133           |
| 240 | NECK CIRCUMFERENCE  | .368           | .464           | .503           | .225           | .166           | .068           |
| 250 | SHOULDER CIRC       | .408           | .482           | .481           | .156           | .166           | .138           |
| 260 | CHEST CIRC AT SCYE  | .397           | .424           | .441           | .117           | .140           | .199           |
| 270 | BUST CIRCUMFERENCE  | .341           | .380           | .364           | .067           | .119           | .213           |
| 280 | CHEST C BELOW BUST  | .340           | .403           | .403           | .090           | .161           | .196           |
| 290 | WAIST CIRC          | .333           | .350           | .369           | .078           | .093           | .223           |
| 300 | HIP CIRCUMFERENCE   | .393           | .477           | .449           | .067           | .185           | .208           |
| 310 | VERTICAL TRUNK CIRC | .318           | .506           | .429           | .198           | .327           | .209           |
| 320 | ARM CIRC AT SCYE    | .377           | .463           | .464           | .147           | .184           | .190           |
| 330 | BICEPS CIRC, FLXD   | .402           | .432           | .445           | .009           | .092           | .178           |
| 340 | ELBOW CIRC, FLXD    | .422           | .525           | .541           | .238           | .239           | .083           |
| 350 | FOREARM CIRC, FLXD  | .483           | .544           | .570           | .123           | .197           | .113           |

TABLE 2 CONTINUED  
CORRELATIONS: CORE MEASUREMENTS (N=1330)

|     |                    | <u>.650</u> | <u>.660</u> | <u>.670</u> | <u>.680</u> | <u>.690</u> | <u>.700</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 360 | WRIST CIRC         | .477        | .631        | .653        | .229        | .309        | .051        |
| 370 | UPPER THIGH CIRC   | .413        | .456        | .467        | .005        | .147        | .119        |
| 380 | KNEE CIRCUMFERENCE | .478        | .530        | .528        | .060        | .179        | .168        |
| 390 | CALF CIRCUMFERENCE | .410        | .557        | .554        | -.029       | .229        | .028        |
| 400 | ANKLE CIRC         | .402        | .634        | .607        | -.034       | .275        | -.024       |
| 410 | SHOULDER LENGTH    | .221        | .256        | .237        | .193        | .151        | .008        |
| 420 | INTERSCYE BACK     | .244        | .313        | .308        | .151        | .163        | .079        |
| 430 | INTERSCYE FRONT    | .383        | .418        | .395        | .180        | .158        | .151        |
| 440 | BACK ARC, BUST     | .314        | .368        | .352        | .069        | .084        | .169        |
| 450 | BACK ARC, WAIST    | .321        | .330        | .357        | .077        | .094        | .215        |
| 460 | BACK ARC, HIP      | .361        | .403        | .386        | .071        | .101        | .245        |
| 470 | WAIST BACK         | .126        | .250        | .227        | .232        | .269        | .053        |
| 480 | WAIST FRONT        | .131        | .232        | .193        | .173        | .152        | .135        |
| 490 | NECK-BUSTPOINT LGT | .240        | .286        | .263        | .072        | .138        | .156        |
| 500 | AXILLA-WAIST LEVEL | .018        | .118        | .075        | .155        | .050        | .085        |
| 510 | SLEEVE INSEAM      | .350        | .350        | .430        | .484        | .205        | -.011       |
| 520 | SLEEVE OUTSEAM     | .377        | .386        | .446        | .455        | .236        | .043        |
| 530 | CROTCH LENGTH      | .254        | .384        | .332        | .059        | .240        | .133        |
| 540 | HEAD CIRCUMFERENCE | .398        | .370        | .429        | .196        | .109        | .089        |
| 550 | HEAD BREADTH       | .249        | .248        | .283        | .057        | .063        | .193        |
| 560 | HEAD LENGTH        | .303        | .309        | .334        | .200        | .148        | .016        |
| 570 | PALM LENGTH        | .465        | .423        | .492        | .429        | .210        | .044        |
| 580 | HAND BREADTH       | .515        | .672        | .697        | .307        | .275        | .045        |
| 590 | HAND CIRCUMFERENCE | .514        | .682        | .700        | .305        | .285        | .047        |
| 600 | HAND LENGTH        | .499        | .506        | .580        | .474        | .242        | .026        |
| 610 | INSTEP LENGTH      | .523        | .552        | .644        | .405        | .148        | .063        |
| 620 | FOOT LENGTH        | .539        | .592        | .655        | .449        | .213        | .054        |
| 630 | HEEL-ANKLE CIRC    | .718        | .732        | .804        | .419        | .290        | .052        |
| 640 | FOOT BREADTH       | .503        | .847        | .697        | .245        | .277        | -.004       |
| 650 | HEEL BREADTH       |             | .556        | .669        | .221        | .082        | .126        |
| 660 | FOOT CIRCUMFERENCE | .556        |             | .780        | .280        | .290        | -.027       |
| 670 | INSTEP CIRC        | .669        | .780        |             | .362        | .328        | -.003       |
| 680 | ANKLE HEIGHT       | .221        | .280        | .362        |             | .225        | .042        |
| 690 | SPHYRION HEIGHT    | .082        | .290        | .328        | .225        |             | -.073       |
| 700 | AGE                | .126        | -.027       | -.003       | .042        | -.073       |             |

# THE VISUAL INDEX TRADITIONAL SERIES

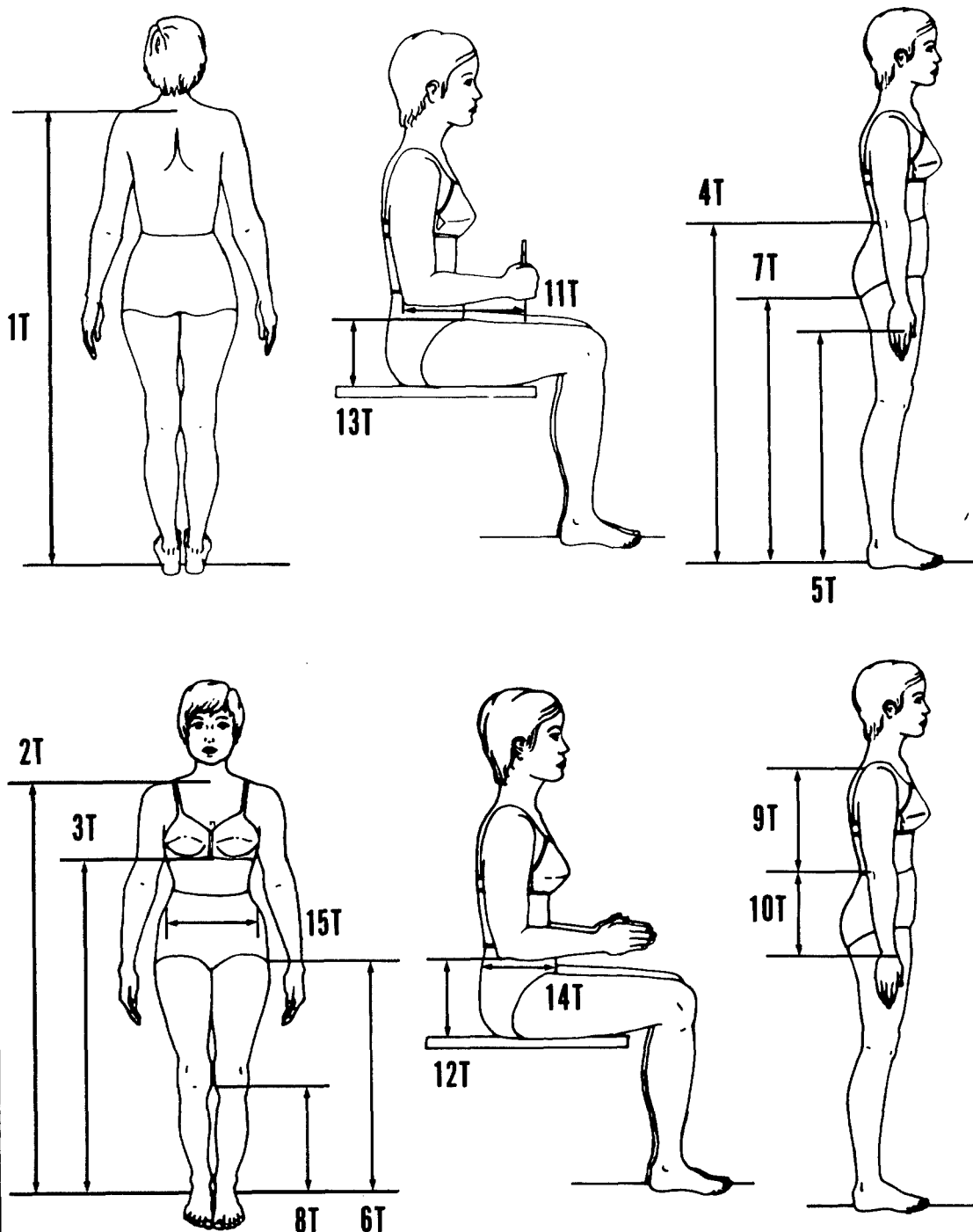


Figure 2. The visual index: traditional series.

- 1T CERVICALE HEIGHT: vertical distance from floor to cervicale; tip of the spinous process of the 7th cervical vertebra.
- 2T SUPRASTERNALE HEIGHT: vertical distance from floor to suprasternale; lowest point of the notch in the upper edge of the breastbone.
- 3T SUBSTERNALE HEIGHT: vertical distance from floor to substernale; midpoint of the lower edge of the breastbone.
- 4T ELBOW (RADIALE) HEIGHT: vertical distance from floor to radiale; the depression between the humerus and the radius.
- 5T KNUCKLE HEIGHT: vertical distance from floor to the largest knuckle where the first phalanx of the middle finger joins the palm.
- 6T HIP (TROCHANTERIC) HEIGHT: vertical distance from floor to trochanterion; tip of the lateral protrusion of the proximal end of the thigh bone.
- 7T GLUTEAL FURROW HEIGHT: vertical distance from floor to the furrow where the gluteal curve intersects the back of the thigh.
- 8T TIBIALE HEIGHT: vertical distance from floor to the proximal medial margin of the shin bone.
- 9T ACROMION-RADIALE LENGTH: the distance, parallel to the axis of the upper arm, from the lateral tip of the acromion to the uppermost point of the radius.
- 10T RADIALE-STYLION LENGTH: the distance, parallel to the axis of the forearm, from the uppermost point of the radius to the most distal point of the styloid process of the radius.
- 11T ELBOW GRIP LENGTH: the distance parallel to the axis of the forearm from the tip of the elbow to the midpoint of the fist measured with the upper arm hanging relaxed, the forearm extended forward, and the hand grasping the fixed blade of a beam caliper.
- 12T ELBOW REST HEIGHT: vertical distance from sitting surface to the bottom of the elbow, measured with the upper arm hanging relaxed, the forearm extended horizontally.
- 13T THIGH CLEARANCE: vertical distance from sitting surface to the top of the thigh at its junction with the abdomen.
- 14T ABDOMINAL EXTENSION DEPTH/SITTING: anterior-posterior depth of the torso at the level of the most protruding point of the abdomen.
- 15T BISPINOUS BREADTH: horizontal distance between the anterior-superior iliac spines.

## THE VISUAL INDEX TRADITIONAL SERIES (CONT.)

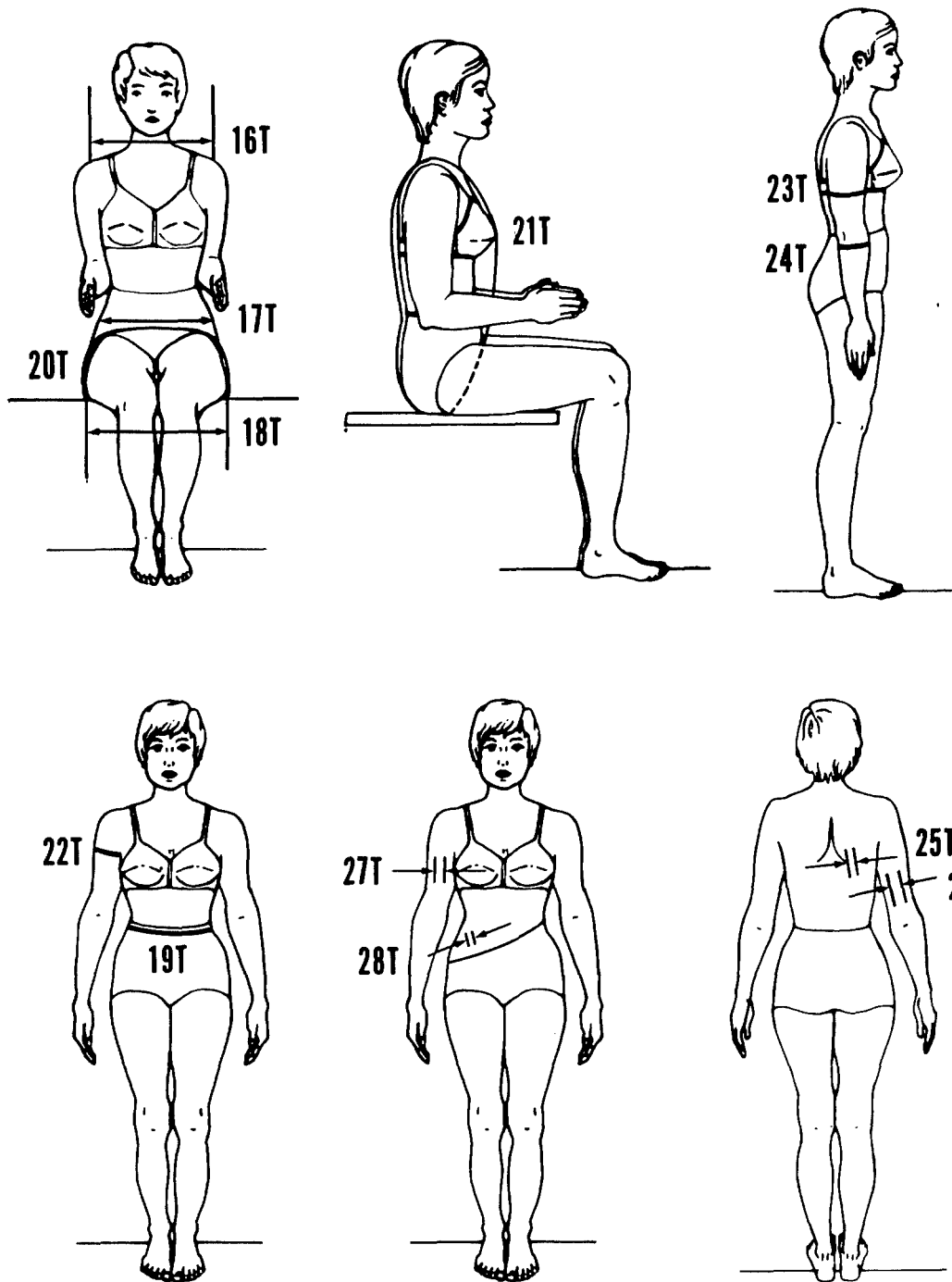


Figure 2. The visual index: traditional series (continued).

- 16T BIACROMIAL BREADTH: horizontal distance between the lateral edges of the acromial processes of the shoulders.
- 17T ABDOMINAL EXTENSION BREADTH, SITTING: horizontal breadth of the trunk at the level of maximum protrusion of the abdomen.
- 18T THIGH-TO-THIGH BREADTH, SITTING: maximum horizontal distance across the thighs measured with subject sitting erect, her thighs parallel and completely supported by the sitting surface.
- 19T WAIST CIRCUMFERENCE (OMPHALION): horizontal circumference of the waist at the level of the midpoint of the navel.
- 20T HIP CIRCUMFERENCE, SITTING: circumference of the buttocks measured with tape drawn as far forward as possible under subject's buttocks and brought diagonally across her lap at the level of the thigh-trunk intersection.
- 21T VERTICAL TRUNK CIRCUMFERENCE, SITTING: torso circumference measured as subject sits with her torso erect and arms relaxed with tape passing between the legs, over the buttock, midshoulder and tip of the bra. Tape follows the posterior, but not the anterior, body contour.
- 22T AXILLARY ARM CIRCUMFERENCE: circumference of the upper arm at armpit level measured in a plane perpendicular to the long axis of the arm.
- 23T BICEPS CIRCUMFERENCE, RELAXED: circumference of the arm at biceps level measured in a plane perpendicular to the long axis of the upper arm.
- 24T FOREARM CIRCUMFERENCE, RELAXED: maximum circumference of the lower arm as measured in a plane perpendicular to its long axis.
- 25T SUBSCAPULAR SKINFOLD: thickness of a skinfold picked up just below the interior angle of scapula and parallel to tension lines of the skin.
- 26T TRICEPS SKINFOLD: thickness of a skinfold picked up on the back of the upper arm and parallel to its long axis at the level which, when elbow is flexed, is midway between acromion and tip of the elbow.
- 27T BICEPS SKINFOLD: thickness of a skinfold picked up parallel to the axis of the upper arm at biceps level.
- 28T SUPRAILLIAC SKINFOLD: thickness of a skinfold picked up in the right midaxillary line at the level of the crest of the ilium and following the border of the crest.

TABLE 3A  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
TRADITIONAL SERIES (N=255)

| METRIC UNITS*          | MEAN   | SD   | 1ST   | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1T CERVICALE HEIGHT    | 140.28 | 6.02 | 126.9 | 130.0 | 132.3 | 136.4 | 140.5 | 144.1 | 147.3 | 149.8 | 156.9 |
| 2T SUPRASTERNALE HT    | 132.62 | 5.65 | 120.7 | 123.4 | 125.3 | 128.8 | 132.6 | 136.3 | 139.7 | 142.9 | 147.2 |
| 3T SUBSTERNALE HEIGHT  | 113.92 | 4.97 | 103.4 | 105.8 | 107.5 | 110.6 | 113.9 | 117.2 | 120.2 | 122.2 | 127.0 |
| 4T ELBOW HEIGHT        | 102.56 | 4.86 | 92.9  | 94.9  | 96.4  | 99.1  | 102.4 | 105.8 | 108.9 | 110.7 | 114.1 |
| 5T KNUCKLE HEIGHT      | 70.99  | 3.97 | 61.9  | 64.6  | 66.0  | 68.3  | 70.9  | 73.7  | 76.1  | 77.5  | 79.5  |
| 6T TROCHANTERIC HT     | 85.91  | 4.43 | 77.1  | 78.7  | 80.1  | 82.7  | 85.8  | 88.9  | 91.5  | 93.2  | 96.6  |
| 7T GLUTEAL FURROW HT   | 74.13  | 4.06 | 65.6  | 67.9  | 69.2  | 71.4  | 73.9  | 76.6  | 79.3  | 81.0  | 84.6  |
| 8T TIBIALE HEIGHT      | 44.05  | 2.47 | 38.6  | 40.0  | 40.9  | 42.4  | 44.0  | 45.6  | 47.2  | 48.2  | 50.6  |
| 9T ACROMION-RADIALE    | 30.85  | 1.67 | 27.3  | 28.1  | 28.7  | 29.7  | 30.9  | 31.9  | 32.8  | 33.4  | 35.1  |
| 10T RADIALE-STYLION    | 24.37  | 1.47 | 21.2  | 22.1  | 22.6  | 23.3  | 24.3  | 25.3  | 26.4  | 27.0  | 27.9  |
| 11T ELBOW-CENTER GRIP  | 32.25  | 1.76 | 28.4  | 29.6  | 30.1  | 31.0  | 32.1  | 33.4  | 34.6  | 35.4  | 36.8  |
| 12T ELBOW REST HEIGHT  | 20.73  | 2.74 | 14.7  | 16.1  | 17.1  | 18.9  | 20.8  | 22.6  | 24.1  | 25.0  | 27.0  |
| 13T THIGH CLEARANCE HT | 15.41  | 1.31 | 12.5  | 13.2  | 13.7  | 14.6  | 15.4  | 16.2  | 17.0  | 17.5  | 18.9  |
| 14T ABDOM-EXTEN DEPTH  | 21.91  | 2.59 | 17.7  | 18.4  | 19.0  | 20.1  | 21.5  | 23.2  | 25.3  | 26.9  | 31.1  |
| 15T BISPINOUS BREADTH  | 23.27  | 2.20 | 18.3  | 20.1  | 20.8  | 21.8  | 23.0  | 24.6  | 26.3  | 27.5  | 29.7  |
| 16T BIACROMIAL BREADTH | 35.71  | 1.61 | 32.2  | 33.0  | 33.6  | 34.6  | 35.7  | 36.8  | 37.7  | 38.3  | 39.6  |
| 17T ABDOM-EXTEN BREDTH | 29.98  | 2.99 | 23.9  | 25.6  | 26.4  | 27.8  | 29.7  | 31.9  | 34.0  | 35.4  | 37.9  |
| 18T THIGH-THIGH BRDTH  | 38.27  | 3.27 | 31.6  | 33.0  | 34.0  | 36.0  | 38.2  | 40.4  | 42.5  | 43.9  | 47.1  |
| 19T WAIST C, OMPHALION | 76.21  | 7.89 | 62.6  | 65.5  | 67.2  | 70.4  | 75.1  | 80.9  | 87.1  | 90.9  | 98.0  |
| 20T HIP CIRC, SITTING  | 98.10  | 6.83 | 85.1  | 87.7  | 89.6  | 93.3  | 97.7  | 102.4 | 106.9 | 109.8 | 115.9 |
| 21T VERT TRUNK CIRC S  | 146.44 | 7.26 | 131.7 | 134.8 | 137.1 | 141.3 | 146.3 | 151.4 | 155.9 | 158.7 | 164.0 |
| 22T AXILLARY ARM CIRC  | 27.63  | 2.59 | 22.7  | 23.6  | 24.4  | 25.8  | 27.5  | 29.3  | 31.0  | 32.2  | 34.9  |
| 23T BICEPS CIRC RELAX  | 25.89  | 2.56 | 21.0  | 21.5  | 22.4  | 24.1  | 25.9  | 27.4  | 28.8  | 30.3  | 33.5  |
| 24T FOREARM CIRC RELAX | 23.28  | 1.50 | 20.5  | 21.0  | 21.4  | 22.2  | 23.2  | 24.3  | 25.3  | 25.9  | 27.0  |
| 25T SUBSCAPULAR SKNFLD | 1.40   | .61  | .6    | .7    | .7    | 1.0   | 1.2   | 1.7   | 2.4   | 2.7   | 3.1   |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS

TABLE 3A CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
TRADITIONAL SERIES (N=255)

| METRIC UNITS*          | MEAN | SD  | 1ST | 5TH | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH |
|------------------------|------|-----|-----|-----|------|------|------|------|------|------|------|
| 26T TRICEPS SKINFOLD   | 1.74 | .50 | .7  | .9  | 1.1  | 1.4  | 1.7  | 2.0  | 2.3  | 2.6  | 3.2  |
| 27T BICEPS SKINFOLD    | .84  | .38 | .2  | .3  | .4   | .6   | .8   | 1.1  | 1.3  | 1.5  | 2.0  |
| 28T SUPRAILLIAC SKNFLO | 1.68 | .71 | .4  | .7  | .8   | 1.2  | 1.6  | 2.1  | 2.7  | 3.0  | 3.6  |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS

TABLE 3B  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
TRADITIONAL SERIES (N=255)

| ENGLISH UNITS*          | MEAN  | SD   | 1ST  | 5TH  | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|
| 1T CERVICALE HEIGHT     | 55.23 | 2.37 | 50.0 | 51.2 | 52.1 | 53.7 | 55.3 | 56.7 | 58.0 | 59.0 | 61.8 |
| 2T SUPRASTERNALE HT     | 52.21 | 2.22 | 47.5 | 48.6 | 49.3 | 50.7 | 52.2 | 53.7 | 55.0 | 55.9 | 58.0 |
| 3T SUBSTERNALE HEIGHT   | 44.85 | 1.96 | 40.7 | 41.7 | 42.3 | 43.5 | 44.9 | 46.1 | 47.3 | 48.1 | 50.0 |
| 4T ELBOW HEIGHT         | 40.38 | 1.89 | 36.6 | 37.4 | 37.9 | 39.0 | 40.3 | 41.7 | 42.9 | 43.6 | 44.9 |
| 5T KNUCKLE HEIGHT       | 27.95 | 1.56 | 24.4 | 25.4 | 26.0 | 26.9 | 27.9 | 29.0 | 30.0 | 30.5 | 31.3 |
| 6T TROCHANTERIC HT      | 33.82 | 1.74 | 30.3 | 31.0 | 31.5 | 32.6 | 33.8 | 35.0 | 36.0 | 36.7 | 38.0 |
| 7T GLUTEAL FURROW HT    | 29.18 | 1.66 | 25.8 | 26.7 | 27.2 | 28.1 | 29.1 | 30.2 | 31.2 | 31.9 | 33.3 |
| 8T TIBIALE HEIGHT       | 17.34 | .97  | 15.2 | 15.7 | 16.1 | 16.7 | 17.3 | 18.0 | 18.6 | 19.1 | 19.9 |
| 9T ACROMION-RADIALE     | 12.14 | .66  | 10.7 | 11.1 | 11.3 | 11.7 | 12.2 | 12.6 | 12.9 | 13.2 | 13.8 |
| 10T RADIALE-STYLION     | 9.60  | .58  | 8.4  | 8.7  | 8.9  | 9.2  | 9.5  | 10.0 | 10.4 | 10.6 | 11.0 |
| 11T ELBOW-CENTER GRIP   | 12.70 | .69  | 11.2 | 11.7 | 11.9 | 12.2 | 12.6 | 13.1 | 13.6 | 13.9 | 14.5 |
| 12T ELBOW REST HEIGHT   | 8.16  | 1.08 | 5.8  | 6.3  | 6.7  | 7.4  | 8.2  | 8.9  | 9.5  | 9.9  | 10.6 |
| 13T THIGH CLEARANCE HT  | 6.07  | .52  | 4.9  | 5.2  | 5.4  | 5.7  | 6.1  | 6.4  | 6.7  | 6.9  | 7.5  |
| 14T ABDOM-EXTEN DEPTH   | 8.63  | 1.02 | 6.9  | 7.3  | 7.5  | 7.9  | 8.5  | 9.1  | 10.0 | 10.6 | 12.3 |
| 15T BISPINOUS BREADTH   | 9.16  | .87  | 7.2  | 7.9  | 8.2  | 8.6  | 9.1  | 9.7  | 10.4 | 10.8 | 11.7 |
| 16T BIACROMIAL BREADTH  | 14.06 | .63  | 12.7 | 13.0 | 13.2 | 13.6 | 14.1 | 14.5 | 14.9 | 15.1 | 15.6 |
| 17T ABDOM-EXTEN BREADTH | 11.80 | 1.18 | 9.4  | 10.1 | 10.4 | 11.0 | 11.7 | 12.5 | 13.4 | 13.9 | 14.9 |
| 18T THIGH-THIGH BROTH   | 15.07 | 1.29 | 12.5 | 13.0 | 13.4 | 14.2 | 15.0 | 15.9 | 16.7 | 17.3 | 18.5 |
| 19T WAIST C, OMPHALION  | 30.01 | 3.10 | 24.6 | 25.8 | 26.4 | 27.7 | 29.6 | 31.9 | 34.3 | 35.8 | 38.6 |
| 20T HIP CIRC, SITTING   | 38.62 | 2.69 | 33.5 | 34.5 | 35.3 | 36.7 | 38.5 | 40.3 | 42.1 | 43.2 | 45.6 |
| 21T VERT TRUNK CIRC S   | 57.65 | 2.86 | 51.8 | 53.1 | 54.0 | 55.6 | 57.6 | 59.6 | 61.4 | 62.5 | 64.6 |
| 22T AXILLARY ARM CIRC   | 10.88 | 1.02 | 8.9  | 9.3  | 9.6  | 10.2 | 10.8 | 11.5 | 12.2 | 12.7 | 13.8 |
| 23T BICEPS CIRC RELAX   | 10.19 | 1.01 | 8.3  | 8.5  | 8.8  | 9.5  | 10.2 | 10.8 | 11.3 | 11.9 | 13.2 |
| 24T FOREARM CIRC RELAX  | 9.16  | .59  | 8.1  | 8.3  | 8.4  | 8.7  | 9.1  | 9.6  | 10.0 | 10.2 | 10.6 |
| 25T SUBSCAPULAR SKNFOLD | .55   | .24  | .2   | .3   | .3   | .4   | .5   | .7   | 1.0  | 1.1  | 1.2  |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES

TABLE 3B CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
TRADITIONAL SERIES (N=255)

| ENGLISH UNITS*        | MEAN | SD  | 1ST | 5TH | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH |
|-----------------------|------|-----|-----|-----|------|------|------|------|------|------|------|
| 26T TRICEPS SKINFOLD  | .69  | .26 | .3  | .4  | .4   | .6   | .7   | .8   | .9   | 1.0  | 1.3  |
| 27T BICEPS SKINFOLD   | .33  | .15 | .1  | .1  | .1   | .2   | .3   | .4   | .5   | .6   | .8   |
| 28T SUPRAILIAC SKNFLD | .66  | .28 | .2  | .3  | .3   | .5   | .6   | .8   | 1.0  | 1.2  | 1.4  |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES

TABLE 4  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | --1I-- | --2I-- | --3I-- | --4I-- | --5I-- | --6I-- | --7I-- | --8I-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1T  | CERVICALE HEIGHT   |        | .979   | .934   | .925   | .807   | .861   | .863   | .862   |
| 2T  | SUPRASTERNAL HT    | .979   |        | .958   | .935   | .815   | .876   | .868   | .868   |
| 3T  | SUBSTERNAL HEIGHT  | .934   | .958   |        | .897   | .761   | .881   | .877   | .860   |
| 4T  | ELBOW HEIGHT       | .925   | .935   | .897   |        | .896   | .805   | .781   | .794   |
| 5T  | KNUCKLE HEIGHT     | .807   | .815   | .761   | .896   |        | .644   | .617   | .647   |
| 6T  | TROCHANTERIC HT    | .861   | .876   | .881   | .805   | .644   |        | .884   | .864   |
| 7T  | GLUTEAL FURROW HT  | .863   | .868   | .877   | .781   | .617   | .884   |        | .899   |
| 8T  | TIBIALE HEIGHT     | .862   | .868   | .860   | .794   | .647   | .864   | .899   |        |
| 9T  | ACROMION-RADIALE   | .608   | .805   | .793   | .688   | .529   | .794   | .785   | .756   |
| 10T | RADIALE-STYLION    | .739   | .726   | .746   | .625   | .384   | .792   | .815   | .777   |
| 11T | ELBOW-CENTER GRIP  | .727   | .724   | .742   | .613   | .363   | .770   | .796   | .750   |
| 12T | ELBOW REST HEIGHT  | .266   | .270   | .190   | .443   | .560   | .002   | -.053  | .037   |
| 13T | THIGH CLEARANCE HT | .218   | .239   | .272   | .275   | .220   | .237   | .173   | .160   |
| 14T | ABDOM-EXTEN DEPTH  | .230   | .228   | .228   | .246   | .202   | .178   | .161   | .160   |
| 15T | BISPINOUS BREADTH  | .379   | .359   | .294   | .386   | .340   | .215   | .232   | .224   |
| 16T | BIACROMIAL BREADTH | .389   | .383   | .379   | .291   | .183   | .335   | .300   | .349   |
| 17T | ABDOM-EXTEN BRDTH  | .457   | .467   | .423   | .517   | .472   | .337   | .307   | .346   |
| 18T | THIGH-THIGH BROTH  | .362   | .383   | .333   | .411   | .369   | .301   | .174   | .238   |
| 19T | WAIST C, OMPHALION | .308   | .317   | .311   | .351   | .284   | .278   | .227   | .222   |
| 20T | HIP CIRC, SITTING  | .473   | .481   | .455   | .511   | .449   | .396   | .302   | .345   |
| 21T | VERT TRUNK CIRC S  | .667   | .660   | .601   | .721   | .676   | .448   | .367   | .419   |
| 22T | AXILLARY ARM CIRC  | .289   | .289   | .305   | .330   | .261   | .253   | .197   | .195   |
| 23T | BICEPS CIRC RELAX  | .254   | .256   | .262   | .322   | .261   | .221   | .156   | .166   |
| 24T | FOREARM CIRC RELAX | .385   | .383   | .391   | .392   | .300   | .354   | .297   | .326   |
| 25T | SUBSCAPULAR SKNFLD | .128   | .121   | .127   | .161   | .102   | .126   | .094   | .064   |
| 26T | TRICEPS SKINFOLD   | .238   | .244   | .224   | .303   | .268   | .189   | .145   | .164   |
| 27T | BICEPS SKINFOLD    | .207   | .211   | .209   | .294   | .266   | .162   | .132   | .129   |
| 28T | SUPRAILIAC SKNFLD  | .204   | .213   | .206   | .267   | .221   | .184   | .147   | .108   |
| 1C  | WEIGHT             | .563   | .567   | .551   | .579   | .484   | .504   | .426   | .440   |
| 2C  | STATURE            | .979   | .985   | .932   | .931   | .823   | .846   | .835   | .843   |
| 3C  | SHOULDER HEIGHT    | .968   | .974   | .940   | .969   | .845   | .868   | .850   | .851   |
| 4C  | AXILLA HEIGHT      | .966   | .976   | .948   | .960   | .833   | .872   | .856   | .852   |
| 5C  | BUSTPOINT HEIGHT   | .941   | .954   | .931   | .908   | .790   | .853   | .860   | .841   |
| 6C  | WAIST HEIGHT       | .894   | .911   | .898   | .829   | .679   | .860   | .875   | .854   |
| 7C  | CROTCH HEIGHT      | .868   | .876   | .892   | .788   | .621   | .923   | .952   | .897   |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | --1I-- | --2I-- | --3I-- | --4I-- | --5I-- | --6I-- | --7I-- | --8I-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 8C  | BUTTOCK HEIGHT     | .868   | .872   | .879   | .804   | .630   | .914   | .925   | .870   |
| 9C  | KNEECAP HEIGHT     | .872   | .879   | .875   | .796   | .641   | .884   | .921   | .933   |
| 10C | CALF HEIGHT        | .761   | .759   | .769   | .675   | .507   | .794   | .843   | .827   |
| 11C | SITTING HEIGHT     | .712   | .714   | .614   | .709   | .717   | .438   | .391   | .459   |
| 12C | EYE HEIGHT/SIT     | .688   | .692   | .597   | .698   | .705   | .412   | .367   | .442   |
| 13C | SHOULDER-ELBOW L   | .830   | .829   | .823   | .714   | .543   | .822   | .808   | .782   |
| 14C | ELBOW-FINGERTIP    | .741   | .738   | .758   | .621   | .369   | .795   | .800   | .768   |
| 15C | KNEE HEIGHT/SIT    | .883   | .885   | .868   | .808   | .638   | .879   | .901   | .903   |
| 16C | POPLITEAL HEIGHT   | .869   | .870   | .863   | .771   | .606   | .879   | .914   | .908   |
| 17C | BUTTOCK-KNEE LGTH  | .772   | .787   | .793   | .710   | .564   | .787   | .771   | .722   |
| 18C | BUST DEPTH         | .278   | .274   | .292   | .299   | .223   | .242   | .207   | .200   |
| 19C | WAIST DEPTH        | .240   | .231   | .253   | .256   | .208   | .209   | .184   | .163   |
| 20C | CHEST BREADTH      | .340   | .339   | .343   | .365   | .330   | .298   | .262   | .269   |
| 21C | WAIST BREADTH      | .300   | .292   | .296   | .337   | .284   | .255   | .234   | .224   |
| 22C | HIP BREADTH        | .454   | .462   | .395   | .482   | .439   | .367   | .250   | .317   |
| 23C | SHOULDER BREADTH   | .405   | .403   | .420   | .391   | .290   | .367   | .307   | .312   |
| 24C | NECK CIRCUMFERENCE | .367   | .362   | .396   | .368   | .284   | .355   | .314   | .341   |
| 25C | SHOULDER CIRC      | .375   | .375   | .411   | .360   | .257   | .369   | .310   | .315   |
| 26C | CHEST CIRC AT SCYE | .380   | .393   | .415   | .406   | .341   | .343   | .314   | .317   |
| 27C | BUST CIRCUMFERENCE | .333   | .337   | .362   | .366   | .309   | .303   | .259   | .262   |
| 28C | CHEST C BELOW BUST | .354   | .350   | .357   | .385   | .358   | .308   | .271   | .272   |
| 29C | WAIST CIRC         | .290   | .283   | .300   | .313   | .258   | .248   | .216   | .206   |
| 30C | HIP CIRCUMFERENCE  | .454   | .465   | .437   | .493   | .428   | .410   | .285   | .339   |
| 31C | VERTICAL TRUNK CIR | .664   | .668   | .611   | .726   | .698   | .451   | .371   | .441   |
| 32C | ARM CIRC AT SCYE   | .435   | .433   | .442   | .475   | .398   | .399   | .348   | .340   |
| 33C | BICEPS CIRC, FLXD  | .276   | .281   | .297   | .339   | .268   | .269   | .192   | .207   |
| 34C | ELBOW CIRC, FLXD   | .483   | .483   | .492   | .486   | .398   | .481   | .461   | .450   |
| 35C | FOREARM CIRC, FLXD | .380   | .379   | .387   | .393   | .305   | .361   | .310   | .327   |
| 36C | WRIST CIRC         | .461   | .455   | .444   | .445   | .324   | .398   | .376   | .391   |
| 37C | UPPER THIGH CIRC   | .310   | .324   | .314   | .365   | .311   | .292   | .188   | .221   |
| 38C | KNEE CIRCUMFERENCE | .443   | .448   | .417   | .470   | .381   | .395   | .300   | .315   |
| 39C | CALF CIRCUMFERENCE | .276   | .276   | .251   | .298   | .236   | .256   | .134   | .191   |
| 40C | ANKLE CIRC         | .386   | .383   | .340   | .393   | .338   | .320   | .239   | .298   |
| 41C | SHOULDER LENGTH    | .289   | .274   | .248   | .135   | .021   | .240   | .238   | .241   |
| 42C | INTERSCYE BACK     | .265   | .255   | .270   | .159   | .088   | .261   | .220   | .240   |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | --1I-- | --2I-- | --3I-- | --4I-- | --5I-- | --6I-- | --7I-- | --8I-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 43C | INTERSCYE FRONT    | .335   | .346   | .337   | .297   | .178   | .280   | .260   | .312   |
| 44C | BACK ARC, BUST     | .286   | .279   | .304   | .301   | .240   | .246   | .208   | .208   |
| 45C | BACK ARC, WAIST    | .292   | .282   | .300   | .316   | .265   | .263   | .227   | .211   |
| 46C | BACK ARC, HIP      | .335   | .354   | .339   | .360   | .304   | .297   | .210   | .243   |
| 47C | WAIST BACK         | .540   | .461   | .403   | .447   | .447   | .290   | .290   | .331   |
| 48C | WAIST FRONT        | .383   | .380   | .349   | .420   | .455   | .222   | .157   | .201   |
| 49C | NECK-BUSTPOINT LGT | .323   | .341   | .328   | .326   | .252   | .305   | .218   | .257   |
| 50C | AXILLA-WAIST LEVEL | .268   | .260   | .256   | .339   | .376   | .139   | .093   | .124   |
| 51C | SLEEVE INSEAM      | .757   | .751   | .755   | .595   | .381   | .826   | .813   | .769   |
| 52C | SLEEVE OUTSEAM     | .817   | .813   | .815   | .707   | .481   | .830   | .835   | .808   |
| 53C | CROTCH LENGTH      | .441   | .466   | .406   | .471   | .431   | .341   | .264   | .309   |
| 54C | HEAD CIRCUMFERENCE | .372   | .389   | .411   | .342   | .245   | .382   | .370   | .381   |
| 55C | HEAD BREADTH       | .268   | .281   | .266   | .283   | .231   | .239   | .264   | .273   |
| 56C | HEAD LENGTH        | .329   | .344   | .358   | .292   | .221   | .341   | .319   | .342   |
| 57C | PALM LENGTH        | .607   | .612   | .627   | .514   | .309   | .651   | .643   | .615   |
| 58C | HAND BREADTH       | .450   | .479   | .495   | .431   | .291   | .448   | .427   | .490   |
| 59C | HAND CIRCUMFERENCE | .481   | .499   | .501   | .455   | .308   | .452   | .436   | .494   |
| 60C | HAND LENGTH        | .650   | .656   | .675   | .564   | .337   | .697   | .699   | .683   |
| 61C | INSTEP LENGTH      | .670   | .685   | .675   | .601   | .413   | .682   | .687   | .693   |
| 62C | FOOT LENGTH        | .724   | .731   | .721   | .643   | .461   | .739   | .732   | .724   |
| 63C | HEEL-ANKLE CIRC    | .620   | .622   | .626   | .565   | .399   | .647   | .582   | .598   |
| 64C | FOOT BREADTH       | .384   | .403   | .400   | .360   | .267   | .372   | .326   | .420   |
| 65C | HEEL BREADTH       | .281   | .276   | .302   | .245   | .109   | .339   | .288   | .278   |
| 66C | FOOT CIRCUMFERENCE | .410   | .424   | .434   | .396   | .289   | .425   | .326   | .400   |
| 67C | INSTEP CIRC        | .467   | .471   | .490   | .440   | .308   | .527   | .484   | .532   |
| 68C | ANKLE HEIGHT       | .481   | .487   | .534   | .441   | .353   | .539   | .575   | .583   |
| 69C | SPHYRION HEIGHT    | .379   | .360   | .295   | .350   | .381   | .257   | .244   | .377   |
| 70C | AGE                | .192   | .212   | .184   | .241   | .216   | .136   | .118   | .121   |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | 9I    | 10I   | 11I   | 12I   | 13I  | 14I  | 15I  | 16I   |
|-----|--------------------|-------|-------|-------|-------|------|------|------|-------|
| 1T  | CERVICALE HEIGHT   | .808  | .739  | .727  | .266  | .218 | .230 | .379 | .389  |
| 2T  | SUPRASTERNAL HT    | .805  | .726  | .724  | .270  | .239 | .228 | .359 | .383  |
| 3T  | SUBSTERNAL HEIGHT  | .793  | .746  | .742  | .190  | .272 | .228 | .294 | .379  |
| 4T  | ELBOW HEIGHT       | .688  | .625  | .613  | .443  | .275 | .246 | .386 | .291  |
| 5T  | KNUCKLE HEIGHT     | .529  | .384  | .363  | .560  | .220 | .202 | .340 | .183  |
| 6T  | TROCHANTERIC HT    | .794  | .792  | .770  | .002  | .237 | .178 | .215 | .335  |
| 7T  | GLUTEAL FURROW HT  | .785  | .815  | .796  | -.053 | .173 | .161 | .232 | .300  |
| 8T  | TIBIALE HEIGHT     | .756  | .777  | .750  | .037  | .160 | .160 | .224 | .349  |
| 9T  | ACROMION-RADIALE   |       | .724  | .752  | -.034 | .213 | .267 | .337 | .314  |
| 10T | RADIALE-STYLION    | .724  |       | .898  | -.185 | .179 | .178 | .203 | .340  |
| 11T | ELBOW-CENTER GRIP  | .752  | .898  |       | -.161 | .166 | .193 | .205 | .365  |
| 12T | ELBOW REST HEIGHT  | -.034 | -.185 | -.161 |       | .011 | .027 | .168 | -.032 |
| 13T | THIGH CLEARANCE HT | .213  | .179  | .166  | .011  |      | .590 | .328 | .344  |
| 14T | ABDOM-EXTEN DEPTH  | .267  | .178  | .193  | .027  | .590 |      | .533 | .325  |
| 15T | BISPINOUS BREADTH  | .337  | .203  | .205  | .168  | .328 | .533 |      | .246  |
| 16T | BIACROMIAL BREADTH | .314  | .340  | .365  | -.032 | .344 | .325 | .246 |       |
| 17T | ABDOM-EXTEN BRDTH  | .414  | .222  | .227  | .297  | .525 | .639 | .597 | .311  |
| 18T | THIGH-THIGH BRDTH  | .340  | .210  | .206  | .216  | .661 | .622 | .524 | .372  |
| 19T | WAIST C, OMPHALION | .357  | .233  | .234  | .073  | .663 | .832 | .601 | .362  |
| 20T | HIP CIRC, SITTING  | .438  | .294  | .311  | .208  | .712 | .762 | .591 | .412  |
| 21T | VERT TRUNK CIRC S  | .511  | .302  | .329  | .595  | .432 | .469 | .524 | .415  |
| 22T | AXILLARY ARM CIRC  | .302  | .205  | .223  | .111  | .751 | .751 | .491 | .433  |
| 23T | BICEPS CIRC RELAX  | .237  | .221  | .199  | .105  | .759 | .728 | .488 | .372  |
| 24T | FOREARM CIRC RELAX | .352  | .366  | .358  | .067  | .682 | .653 | .403 | .455  |
| 25T | SUBSCAPULAR SKNFLD | .153  | .128  | .158  | .012  | .505 | .690 | .400 | .275  |
| 26T | TRICEPS SKINFOLD   | .227  | .165  | .144  | .095  | .659 | .566 | .413 | .212  |
| 27T | BICEPS SKINFOLD    | .216  | .367  | .098  | .138  | .616 | .619 | .474 | .215  |
| 28T | SUPRAILIA C SKNFLD | .196  | .128  | .149  | .123  | .578 | .685 | .410 | .275  |
| 1C  | WEIGHT             | .521  | .444  | .438  | .166  | .764 | .764 | .579 | .522  |
| 2C  | STATURE            | .797  | .689  | .689  | .308  | .204 | .207 | .377 | .387  |
| 3C  | SHOULDER HEIGHT    | .823  | .719  | .711  | .314  | .256 | .259 | .390 | .338  |
| 4C  | AXILLA HEIGHT      | .811  | .716  | .716  | .309  | .230 | .208 | .340 | .348  |
| 5C  | BUSTPOINT HEIGHT   | .801  | .715  | .721  | .243  | .175 | .157 | .289 | .313  |
| 6C  | WAIST HEIGHT       | .775  | .737  | .727  | .112  | .184 | .107 | .249 | .309  |
| 7C  | CROTCH HEIGHT      | .806  | .827  | .797  | -.077 | .176 | .121 | .194 | .297  |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                     | --9I-- | 10I-- | 11I-- | 12I-- | 13I-- | 14I-- | 15I-- | 16I-- |
|-----|---------------------|--------|-------|-------|-------|-------|-------|-------|-------|
| 8C  | BUTTOCK HEIGHT      | .779   | .806  | .778  | -.028 | .295  | .214  | .243  | .336  |
| 9C  | KNEECAP HEIGHT      | .787   | .809  | .782  | -.002 | .154  | .159  | .225  | .323  |
| 10C | CALF HEIGHT         | .710   | .792  | .770  | -.103 | .225  | .205  | .190  | .283  |
| 11C | SITTING HEIGHT      | .472   | .248  | .288  | .687  | .104  | .129  | .385  | .337  |
| 12C | EYE HEIGHT/SIT      | .458   | .231  | .266  | .699  | .080  | .128  | .377  | .324  |
| 13C | SHOULDER-ELBOW L    | .965   | .770  | .775  | -.037 | .205  | .247  | .312  | .329  |
| 14C | ELBOW-FINGERTIP     | .760   | .903  | .948  | -.155 | .171  | .196  | .198  | .397  |
| 15C | KNEE HEIGHT/SIT     | .782   | .840  | .799  | .010  | .294  | .269  | .330  | .380  |
| 16C | POPLITEAL HEIGHT    | .781   | .829  | .828  | -.030 | .124  | .145  | .231  | .337  |
| 17C | BUTTOCK-KNEE LGTH   | .760   | .723  | .696  | -.089 | .476  | .459  | .371  | .368  |
| 18C | BUST DEPTH          | .318   | .212  | .216  | .072  | .602  | .732  | .482  | .340  |
| 19C | WAIST DEPTH         | .267   | .208  | .195  | .032  | .599  | .864  | .492  | .311  |
| 20C | CHEST BREADTH       | .351   | .260  | .265  | .081  | .590  | .671  | .504  | .511  |
| 21C | WAIST BREADTH       | .311   | .225  | .204  | .081  | .636  | .743  | .556  | .391  |
| 22C | HIP BREADTH         | .404   | .269  | .263  | .224  | .614  | .563  | .554  | .370  |
| 23C | SHOULDER BREADTH    | .420   | .333  | .349  | .060  | .662  | .647  | .458  | .711  |
| 24C | NECK CIRCUMFERENCE  | .318   | .273  | .321  | .078  | .532  | .520  | .247  | .442  |
| 25C | SHOULDER CIRC       | .425   | .344  | .358  | .002  | .694  | .707  | .460  | .625  |
| 26C | CHEST CIRC AT SCYE  | .403   | .292  | .331  | .098  | .669  | .743  | .509  | .524  |
| 27C | BUST CIRCUMFERENCE  | .383   | .234  | .253  | .103  | .626  | .755  | .500  | .412  |
| 28C | CHEST C BELOW BUST  | .360   | .278  | .273  | .144  | .593  | .740  | .520  | .451  |
| 29C | WAIST CIRC          | .319   | .233  | .229  | .065  | .642  | .833  | .557  | .378  |
| 30C | HIP CIRCUMFERENCE   | .427   | .294  | .304  | .176  | .755  | .667  | .535  | .430  |
| 31C | VERTICAL TRUNK CIRC | .524   | .314  | .337  | .517  | .533  | .590  | .557  | .418  |
| 32C | ARM CIRC AT SCYE    | .458   | .329  | .339  | .123  | .689  | .724  | .524  | .362  |
| 33C | BICEPS CIRC, FLXD   | .246   | .262  | .242  | .095  | .753  | .701  | .442  | .398  |
| 34C | ELBOW CIRC, FLXD    | .448   | .454  | .449  | .070  | .481  | .475  | .318  | .331  |
| 35C | FOREARM CIRC, FLXD  | .337   | .354  | .348  | .069  | .662  | .620  | .379  | .447  |
| 36C | WRIST CIRC          | .392   | .415  | .457  | .124  | .447  | .409  | .315  | .481  |
| 37C | UPPER THIGH CIRC    | .292   | .231  | .217  | .123  | .840  | .692  | .474  | .399  |
| 38C | KNEE CIRCUMFERENCE  | .394   | .372  | .351  | .147  | .689  | .582  | .446  | .428  |
| 39C | CALF CIRCUMFERENCE  | .252   | .239  | .201  | .140  | .690  | .557  | .371  | .400  |
| 40C | ANKLE CIRC          | .300   | .282  | .267  | .216  | .490  | .413  | .373  | .398  |
| 41C | SHOULDER LENGTH     | .193   | .277  | .303  | -.116 | .076  | .050  | .183  | .680  |
| 42C | INTERSCYE BACK      | .247   | .211  | .254  | -.077 | .346  | .395  | .282  | .650  |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | --9I-- | --10I-- | --11I-- | --12I-- | --13I-- | --14I-- | --15I-- | --16I-- |
|-----|--------------------|--------|---------|---------|---------|---------|---------|---------|---------|
| 43C | INTERSCYE FRONT    | .297   | .337    | .358    | .002    | .329    | .408    | .258    | .743    |
| 44C | BACK ARC, BUST     | .302   | .216    | .240    | .077    | .604    | .676    | .462    | .434    |
| 45C | BACK ARC, WAIST    | .303   | .224    | .227    | .065    | .607    | .791    | .544    | .385    |
| 46C | BACK ARC, HIP      | .368   | .248    | .268    | .076    | .664    | .631    | .474    | .342    |
| 47C | WAIST BACK         | .363   | .276    | .269    | .342    | .120    | .250    | .300    | .335    |
| 48C | WAIST FRONT        | .265   | .110    | .127    | .391    | .185    | .327    | .325    | .235    |
| 49C | NECK-BUSTPOINT LGT | .326   | .222    | .219    | .098    | .432    | .480    | .389    | .360    |
| 50C | AXILLA-WAIST LEVEL | .168   | .050    | .060    | .407    | .076    | .140    | .110    | .093    |
| 51C | SLEEVE INSEAM      | .826   | .844    | .848    | -.201   | .105    | .131    | .177    | .342    |
| 52C | SLEEVE OUTSEAM     | .904   | .879    | .849    | -.089   | .183    | .216    | .262    | .319    |
| 53C | CROTCH LENGTH      | .359   | .220    | .229    | .267    | .520    | .467    | .442    | .313    |
| 54C | HEAD CIRCUMFERENCE | .337   | .370    | .388    | -.035   | .393    | .266    | .146    | .285    |
| 55C | HEAD BREADTH       | .183   | .229    | .245    | .059    | .278    | .279    | .214    | .263    |
| 56C | HEAD LENGTH        | .302   | .317    | .325    | -.025   | .298    | .135    | .097    | .208    |
| 57C | PALM LENGTH        | .602   | .680    | .766    | -.082   | .180    | .163    | .158    | .312    |
| 58C | HAND BREADTH       | .413   | .478    | .509    | -.004   | .337    | .265    | .191    | .404    |
| 59C | HAND CIRCUMFERENCE | .421   | .511    | .533    | .026    | .338    | .308    | .226    | .442    |
| 60C | HAND LENGTH        | .642   | .734    | .815    | -.083   | .199    | .178    | .174    | .372    |
| 61C | INSTEP LENGTH      | .618   | .681    | .709    | -.052   | .310    | .322    | .300    | .418    |
| 62C | FOOT LENGTH        | .659   | .705    | .730    | -.026   | .316    | .304    | .288    | .431    |
| 63C | HEEL-ANKLE CIRC    | .535   | .596    | .586    | -.026   | .486    | .377    | .333    | .500    |
| 64C | FOOT BREADTH       | .308   | .355    | .351    | .004    | .344    | .295    | .250    | .414    |
| 65C | HEEL BREADTH       | .282   | .402    | .370    | -.188   | .378    | .392    | .248    | .403    |
| 66C | FOOT CIRCUMFERENCE | .322   | .376    | .361    | .034    | .417    | .361    | .277    | .405    |
| 67C | INSTEP CIRC        | .386   | .514    | .498    | -.048   | .422    | .370    | .216    | .420    |
| 68C | ANKLE HEIGHT       | .423   | .443    | .457    | -.061   | .046    | .030    | -.035   | .185    |
| 69C | SPHYRION HEIGHT    | .223   | .153    | .180    | .305    | .016    | .089    | .172    | .194    |
| 70C | AGE                | .160   | .055    | .105    | .104    | .092    | .275    | .286    | .088    |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | <u>17I</u> | <u>18I</u> | <u>19I</u> | <u>20I</u> | <u>21I</u> | <u>22I</u> | <u>23I</u> | <u>24I</u> |
|-----|--------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1T  | CERVICALE HEIGHT   | .457       | .362       | .308       | .473       | .667       | .289       | .254       | .385       |
| 2T  | SUPRASTERNAL HT    | .467       | .383       | .317       | .481       | .660       | .289       | .256       | .383       |
| 3T  | SUBSTERNAL HEIGHT  | .423       | .333       | .311       | .455       | .601       | .305       | .262       | .391       |
| 4T  | ELBOW HEIGHT       | .517       | .411       | .351       | .511       | .721       | .330       | .322       | .392       |
| 5T  | KNUCKLE HEIGHT     | .472       | .369       | .284       | .449       | .676       | .261       | .261       | .300       |
| 6T  | TROCHANTERIC HT    | .337       | .301       | .278       | .396       | .448       | .253       | .221       | .354       |
| 7T  | GLUTEAL FURROW HT  | .307       | .174       | .227       | .302       | .367       | .197       | .156       | .297       |
| 8T  | TIBIALE HEIGHT     | .346       | .238       | .222       | .345       | .419       | .195       | .166       | .326       |
| 9T  | ACROMION-RADIALE   | .414       | .340       | .357       | .438       | .511       | .302       | .237       | .352       |
| 10T | RADIALE-STYLION    | .222       | .210       | .233       | .294       | .302       | .205       | .221       | .366       |
| 11T | ELBOW-CENTER GRIP  | .227       | .206       | .234       | .311       | .329       | .223       | .199       | .358       |
| 12T | ELBOW REST HEIGHT  | .297       | .216       | .073       | .208       | .595       | .111       | .105       | .067       |
| 13T | THIGH CLEARANCE HT | .525       | .661       | .663       | .712       | .432       | .751       | .759       | .682       |
| 14T | ABDOM-EXTEN DEPTH  | .639       | .622       | .832       | .762       | .469       | .751       | .728       | .653       |
| 15T | BISPINOUS BREADTH  | .597       | .524       | .601       | .591       | .524       | .491       | .488       | .403       |
| 16T | BIACROMIAL BREADTH | .311       | .372       | .362       | .412       | .415       | .433       | .372       | .455       |
| 17T | ABDOM-EXTEN BROTH  |            | .691       | .722       | .782       | .670       | .671       | .594       | .526       |
| 18T | THIGH-THIGH BROTH  | .691       |            | .716       | .888       | .649       | .703       | .750       | .625       |
| 19T | WAIST C, OMPHALION | .722       | .716       |            | .835       | .560       | .844       | .789       | .682       |
| 20T | HIP CIRC, SITTING  | .782       | .888       | .835       |            | .718       | .809       | .792       | .729       |
| 21T | VERT TRUNK CIRC S  | .670       | .649       | .560       | .718       |            | .577       | .542       | .523       |
| 22T | AXILLARY ARM CIRC  | .671       | .703       | .844       | .809       | .577       |            | .900       | .813       |
| 23T | BICEPS CIRC RELAX  | .594       | .750       | .789       | .792       | .542       | .900       |            | .847       |
| 24T | FOREARM CIRC RELAX | .526       | .625       | .682       | .729       | .523       | .813       | .847       |            |
| 25T | SUBSCAPULAR SKNFLO | .476       | .536       | .718       | .608       | .363       | .719       | .660       | .548       |
| 26T | TRICEPS SKINFOLD   | .517       | .678       | .645       | .696       | .424       | .707       | .785       | .642       |
| 27T | BICEPS SKINFOLD    | .603       | .611       | .718       | .669       | .470       | .757       | .732       | .617       |
| 28T | SUPRAILIAC SKNFLO  | .558       | .622       | .761       | .678       | .469       | .744       | .683       | .587       |
| 1C  | WEIGHT             | .727       | .840       | .834       | .918       | .732       | .850       | .862       | .835       |
| 2C  | STATURE            | .459       | .374       | .292       | .469       | .685       | .271       | .236       | .360       |
| 3C  | SHOULDER HEIGHT    | .499       | .406       | .357       | .509       | .694       | .322       | .299       | .396       |
| 4C  | AXILLA HEIGHT      | .458       | .374       | .309       | .468       | .668       | .278       | .249       | .359       |
| 5C  | BUSTPOINT HEIGHT   | .379       | .288       | .234       | .387       | .595       | .201       | .164       | .294       |
| 6C  | WAIST HEIGHT       | .374       | .257       | .209       | .350       | .505       | .182       | .135       | .286       |
| 7C  | CROTCH HEIGHT      | .291       | .198       | .222       | .302       | .358       | .183       | .144       | .291       |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | <u>-17I-</u> | <u>-18I-</u> | <u>-19I-</u> | <u>-20I-</u> | <u>-21I-</u> | <u>-22I-</u> | <u>-23I-</u> | <u>-24I-</u> |
|-----|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 8C  | BUTTOCK HEIGHT     | .382         | .293         | .309         | .409         | .426         | .286         | .255         | .373         |
| 9C  | KNEECAP HEIGHT     | .309         | .221         | .229         | .340         | .415         | .190         | .166         | .317         |
| 10C | CALF HEIGHT        | .235         | .250         | .238         | .328         | .317         | .220         | .226         | .346         |
| 11C | SITTING HEIGHT     | .454         | .367         | .201         | .413         | .783         | .228         | .181         | .258         |
| 12C | EYE HEIGHT/SIT     | .456         | .352         | .198         | .406         | .781         | .207         | .158         | .227         |
| 13C | SHOULDER-ELBOW L   | .398         | .321         | .335         | .423         | .516         | .280         | .221         | .363         |
| 14C | ELBOW-FINGERTIP    | .210         | .210         | .229         | .315         | .345         | .228         | .220         | .390         |
| 15C | KNEE HEIGHT/SIT    | .400         | .362         | .336         | .457         | .490         | .285         | .298         | .436         |
| 16C | POPLITEAL HEIGHT   | .256         | .205         | .207         | .313         | .393         | .163         | .145         | .310         |
| 17C | BUTTOCK-KNEE LGTH  | .466         | .577         | .529         | .673         | .519         | .487         | .499         | .544         |
| 18C | BUST DEPTH         | .630         | .599         | .766         | .713         | .559         | .766         | .729         | .628         |
| 19C | WAIST DEPTH        | .588         | .532         | .832         | .680         | .447         | .756         | .724         | .652         |
| 20C | CHEST BREADTH      | .641         | .625         | .756         | .699         | .540         | .759         | .710         | .657         |
| 21C | WAIST BREADTH      | .669         | .630         | .834         | .730         | .508         | .760         | .731         | .652         |
| 22C | HIP BREADTH        | .649         | .925         | .678         | .863         | .656         | .637         | .684         | .587         |
| 23C | SHOULDER BREADTH   | .600         | .640         | .745         | .721         | .582         | .831         | .746         | .743         |
| 24C | NECK CIRCUMFERENCE | .417         | .395         | .553         | .567         | .434         | .619         | .544         | .661         |
| 25C | SHOULDER CIRC      | .607         | .645         | .791         | .756         | .557         | .880         | .803         | .789         |
| 26C | CHEST CIRC AT SCYE | .653         | .645         | .804         | .771         | .587         | .862         | .802         | .756         |
| 27C | BUST CIRCUMFERENCE | .690         | .651         | .824         | .774         | .600         | .821         | .752         | .671         |
| 28C | CHEST C BELOW BUST | .652         | .604         | .788         | .720         | .586         | .753         | .734         | .679         |
| 29C | WAIST CIRC         | .645         | .646         | .881         | .775         | .518         | .812         | .782         | .702         |
| 30C | HIP CIRCUMFERENCE  | .713         | .920         | .791         | .945         | .684         | .783         | .789         | .701         |
| 31C | VERTICAL TRUNK CIR | .696         | .710         | .634         | .797         | .888         | .634         | .624         | .595         |
| 32C | ARM CIRC AT SCYE   | .693         | .654         | .804         | .830         | .610         | .884         | .817         | .797         |
| 33C | BICEPS CIRC, FLXD  | .554         | .702         | .757         | .769         | .523         | .884         | .973         | .858         |
| 34C | ELBOW CIRC, FLXD   | .473         | .460         | .532         | .579         | .452         | .607         | .633         | .750         |
| 35C | FOREARM CIRC, FLXD | .503         | .595         | .662         | .703         | .506         | .787         | .833         | .952         |
| 36C | WRIST CIRC         | .421         | .428         | .436         | .542         | .519         | .539         | .556         | .741         |
| 37C | UPPER THIGH CIRC   | .643         | .893         | .770         | .881         | .573         | .806         | .850         | .747         |
| 38C | KNEE CIRCUMFERENCE | .599         | .807         | .629         | .801         | .613         | .666         | .741         | .732         |
| 39C | CALF CIRCUMFERENCE | .491         | .727         | .568         | .721         | .513         | .646         | .731         | .718         |
| 40C | ANKLE CIRC         | .486         | .551         | .426         | .591         | .525         | .478         | .547         | .621         |
| 41C | SHOULDER LENGTH    | .052         | .153         | .095         | .140         | .194         | .131         | .097         | .152         |
| 42C | INTERSCYE BACK     | .309         | .381         | .410         | .426         | .347         | .486         | .408         | .480         |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | <u>-17I-</u> | <u>-18I-</u> | <u>-19I-</u> | <u>-20I-</u> | <u>-21I-</u> | <u>-22I-</u> | <u>-23I-</u> | <u>-24I-</u> |
|-----|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 43C | INTERSCYE FRONT    | .331         | .392         | .413         | .433         | .382         | .441         | .419         | .482         |
| 44C | BACK ARC, BUST     | .594         | .595         | .735         | .675         | .521         | .724         | .692         | .635         |
| 45C | BACK ARC, WAIST    | .624         | .628         | .849         | .754         | .516         | .782         | .751         | .691         |
| 46C | BACK ARC, HIP      | .630         | .823         | .707         | .872         | .564         | .686         | .698         | .616         |
| 47C | WAIST BACK         | .276         | .242         | .204         | .329         | .503         | .236         | .240         | .296         |
| 48C | WAIST FRONT        | .372         | .355         | .335         | .407         | .497         | .342         | .345         | .273         |
| 49C | NECK-BUSTPOINT LGT | .541         | .541         | .566         | .600         | .493         | .594         | .554         | .479         |
| 50C | AXILLA-WAIST LEVEL | .161         | .142         | .119         | .183         | .337         | .165         | .128         | .070         |
| 51C | SLEEVE INSEAM      | .230         | .159         | .182         | .245         | .306         | .139         | .095         | .241         |
| 52C | SLEEVE OUTSEAM     | .330         | .269         | .286         | .351         | .423         | .214         | .195         | .316         |
| 53C | CROTCH LENGTH      | .551         | .626         | .541         | .662         | .628         | .517         | .502         | .455         |
| 54C | HEAD CIRCUMFERENCE | .264         | .282         | .267         | .375         | .285         | .337         | .348         | .463         |
| 55C | HEAD BREADTH       | .267         | .273         | .281         | .338         | .266         | .315         | .349         | .413         |
| 56C | HEAD LENGTH        | .173         | .213         | .156         | .265         | .231         | .238         | .243         | .353         |
| 57C | PALM LENGTH        | .205         | .170         | .156         | .258         | .306         | .169         | .158         | .284         |
| 58C | HAND BREADTH       | .291         | .312         | .288         | .395         | .343         | .348         | .371         | .561         |
| 59C | HAND CIRCUMFERENCE | .317         | .328         | .319         | .420         | .384         | .392         | .417         | .609         |
| 60C | HAND LENGTH        | .194         | .172         | .182         | .266         | .315         | .214         | .201         | .355         |
| 61C | INSTEP LENGTH      | .342         | .333         | .346         | .460         | .395         | .328         | .338         | .459         |
| 62C | FOOT LENGTH        | .333         | .325         | .320         | .441         | .414         | .320         | .326         | .466         |
| 63C | HEEL-ANKLE CIRC    | .407         | .467         | .414         | .559         | .444         | .429         | .457         | .604         |
| 64C | FOOT BREADTH       | .299         | .328         | .291         | .404         | .287         | .319         | .337         | .486         |
| 65C | HEEL BREADTH       | .219         | .395         | .345         | .414         | .194         | .356         | .419         | .513         |
| 66C | FOOT CIRCUMFERENCE | .388         | .405         | .366         | .508         | .386         | .424         | .432         | .578         |
| 67C | INSTEP CIRC        | .315         | .334         | .336         | .452         | .312         | .399         | .440         | .599         |
| 68C | ANKLE HEIGHT       | .089         | -.090        | .048         | .060         | .114         | .046         | -.055        | .118         |
| 69C | SPHYRION HEIGHT    | .180         | .144         | .057         | .174         | .306         | .101         | .102         | .241         |
| 70C | AGE                | .219         | .206         | .268         | .279         | .251         | .185         | .205         | .151         |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | -25I- | -26I- | -27I- | -28I- |
|-----|--------------------|-------|-------|-------|-------|
| 1T  | CERVICALE HEIGHT   | .128  | .238  | .207  | .204  |
| 2T  | SUPRASTERNAL HT    | .121  | .244  | .211  | .213  |
| 3T  | SUBSTERNAL HEIGHT  | .127  | .224  | .209  | .206  |
| 4T  | ELBOW HEIGHT       | .161  | .303  | .294  | .267  |
| 5T  | KNUCKLE HEIGHT     | .102  | .268  | .266  | .221  |
| 6T  | TROCHANTERIC HT    | .126  | .189  | .162  | .184  |
| 7T  | GLUTEAL FURROW HT  | .094  | .145  | .132  | .147  |
| 8T  | TIBIALE HEIGHT     | .064  | .164  | .129  | .108  |
| 9T  | ACROMION-RADIALE   | .153  | .227  | .216  | .196  |
| 10T | RADIALE-STYLION    | .128  | .165  | .067  | .128  |
| 11T | ELBOW-CENTER GRIP  | .158  | .144  | .098  | .149  |
| 12T | ELBOW REST HEIGHT  | .012  | .095  | .138  | .123  |
| 13T | THIGH CLEARANCE HT | .505  | .659  | .616  | .578  |
| 14T | ABDOM-EXTEN DEPTH  | .690  | .566  | .619  | .685  |
| 15T | BISPINOUS BREADTH  | .400  | .413  | .474  | .410  |
| 16T | BIACROMIAL BREADTH | .275  | .212  | .215  | .275  |
| 17T | ABDOM-EXTEN BRDTH  | .476  | .517  | .603  | .558  |
| 18T | THIGH-THIGH BRDTH  | .536  | .678  | .611  | .622  |
| 19T | WAIST C, OMPHALION | .718  | .645  | .718  | .761  |
| 20T | HIP CIRC, SITTING  | .608  | .696  | .669  | .678  |
| 21T | VERT TRUNK CIRC S  | .363  | .424  | .470  | .469  |
| 22T | AXILLARY ARM CIRC  | .719  | .707  | .757  | .744  |
| 23T | BICEPS CIRC RELAX  | .660  | .785  | .732  | .683  |
| 24T | FOREARM CIRC RELAX | .548  | .642  | .617  | .587  |
| 25T | SUBSCAPULAR SKNFLD |       | .610  | .655  | .814  |
| 26T | TRICEPS SKINFOLD   | .610  |       | .723  | .651  |
| 27T | BICEPS SKINFOLD    | .655  | .723  |       | .702  |
| 28T | SUPRAILIAC SKNFLD  | .814  | .651  | .702  |       |
| 1C  | WEIGHT             | .647  | .698  | .673  | .705  |
| 2C  | STATURE            | .089  | .226  | .198  | .178  |
| 3C  | SHOULDER HEIGHT    | .153  | .287  | .268  | .245  |
| 4C  | AXILLA HEIGHT      | .120  | .250  | .224  | .215  |
| 5C  | BUSTPOINT HEIGHT   | .033  | .167  | .139  | .129  |
| 6C  | WAIST HEIGHT       | .055  | .174  | .135  | .131  |
| 7C  | CROTCH HEIGHT      | .074  | .148  | .116  | .117  |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | <u>-25I-</u> | <u>-26I-</u> | <u>-27I-</u> | <u>-28I-</u> |
|-----|--------------------|--------------|--------------|--------------|--------------|
| 8C  | BUTTOCK HEIGHT     | .166         | .238         | .210         | .228         |
| 9C  | KNEECAP HEIGHT     | .081         | .163         | .130         | .134         |
| 10C | CALF HEIGHT        | .143         | .245         | .162         | .162         |
| 11C | SITTING HEIGHT     | .008         | .143         | .172         | .125         |
| 12C | EYE HEIGHT/SIT     | -.003        | .133         | .161         | .119         |
| 13C | SHOULDER-ELBOW L   | .123         | .196         | .191         | .169         |
| 14C | ELBOW-FINGERTIP    | .144         | .139         | .061         | .130         |
| 15C | KNEE HEIGHT/SIT    | .168         | .287         | .212         | .217         |
| 16C | POPLITEAL HEIGHT   | .085         | .143         | .083         | .107         |
| 17C | BUTTOCK-KNEE LGTH  | .340         | .463         | .373         | .386         |
| 18C | BUST DEPTH         | .689         | .580         | .667         | .682         |
| 19C | WAIST DEPTH        | .703         | .550         | .627         | .702         |
| 20C | CHEST BREADTH      | .629         | .564         | .597         | .685         |
| 21C | WAIST BREADTH      | .629         | .552         | .649         | .679         |
| 22C | HIP BREADTH        | .455         | .652         | .568         | .569         |
| 23C | SHOULDER BREADTH   | .656         | .576         | .606         | .666         |
| 24C | NECK CIRCUMFERENCE | .474         | .363         | .416         | .521         |
| 25C | SHOULDER CIRC      | .672         | .599         | .641         | .685         |
| 26C | CHEST CIRC AT SCYE | .674         | .583         | .666         | .683         |
| 27C | BUST CIRCUMFERENCE | .693         | .593         | .674         | .721         |
| 28C | CHEST C BELOW BUST | .634         | .535         | .615         | .662         |
| 29C | WAIST CIRC         | .718         | .595         | .678         | .753         |
| 30C | HIP CIRCUMFERENCE  | .588         | .718         | .663         | .676         |
| 31C | VERTICAL TRUNK CIR | .426         | .539         | .516         | .526         |
| 32C | ARM CIRC AT SCYE   | .662         | .613         | .670         | .682         |
| 33C | BICEPS CIRC, FLXD  | .629         | .736         | .672         | .637         |
| 34C | ELBOW CIRC, FLXD   | .344         | .420         | .471         | .428         |
| 35C | FOREARM CIRC, FLXD | .517         | .585         | .576         | .566         |
| 36C | WRIST CIRC         | .306         | .379         | .331         | .370         |
| 37C | UPPER THIGH CIRC   | .586         | .735         | .663         | .682         |
| 38C | KNEE CIRCUMFERENCE | .473         | .655         | .545         | .550         |
| 39C | CALF CIRCUMFERENCE | .419         | .600         | .500         | .488         |
| 40C | ANKLE CIRC         | .255         | .463         | .359         | .367         |
| 41C | SHOULDER LENGTH    | .023         | -.004        | -.002        | -.002        |
| 42C | INTERSCYE BACK     | .362         | .244         | .305         | .356         |

TABLE 4 CONTINUED  
CORRELATIONS: CORE AND TRADITIONAL SERIES (N=255)

|     |                    | <u>-25I</u> | <u>-26I</u> | <u>-27I</u> | <u>-28I</u> |
|-----|--------------------|-------------|-------------|-------------|-------------|
| 43C | INTERSCYE FRONT    | .371        | .282        | .251        | .342        |
| 44C | BACK ARC, BUST     | .627        | .544        | .615        | .651        |
| 45C | BACK ARC, WAIST    | .673        | .560        | .659        | .710        |
| 46C | BACK ARC, HIP      | .535        | .671        | .554        | .619        |
| 47C | WAIST BACK         | .117        | .129        | .142        | .116        |
| 48C | WAIST FRONT        | .167        | .219        | .247        | .230        |
| 49C | NECK-BUSTPOINT LGT | .491        | .443        | .477        | .491        |
| 50C | AXILLA-WAIST LEVEL | .046        | .059        | .049        | .022        |
| 51C | SLEEVE INSEAM      | .045        | .065        | .018        | .040        |
| 52C | SLEEVE OUTSEAM     | .114        | .186        | .124        | .135        |
| 53C | CROTCH LENGTH      | .389        | .498        | .432        | .477        |
| 54C | HEAD CIRCUMFERENCE | .272        | .308        | .181        | .280        |
| 55C | HEAD BREADTH       | .264        | .280        | .221        | .236        |
| 56C | HEAD LENGTH        | .143        | .226        | .133        | .208        |
| 57C | PALM LENGTH        | .125        | .092        | .080        | .116        |
| 58C | HAND BREADTH       | .134        | .196        | .149        | .210        |
| 59C | HAND CIRCUMFERENCE | .167        | .240        | .165        | .248        |
| 60C | HAND LENGTH        | .139        | .119        | .069        | .120        |
| 61C | INSTEP LENGTH      | .203        | .258        | .174        | .233        |
| 62C | FOOT LENGTH        | .184        | .254        | .186        | .223        |
| 63C | HEEL-ANKLE CIRC    | .237        | .358        | .261        | .337        |
| 64C | FOOT BREADTH       | .221        | .260        | .181        | .227        |
| 65C | HEEL BREADTH       | .292        | .243        | .194        | .309        |
| 66C | FOOT CIRCUMFERENCE | .232        | .342        | .229        | .291        |
| 67C | INSTEP CIRC        | .248        | .295        | .216        | .296        |
| 68C | ANKLE HEIGHT       | -.012       | -.075       | -.029       | .000        |
| 69C | SPHYRION HEIGHT    | .029        | .074        | .102        | .027        |
| 70C | AGE                | .148        | .149        | .164        | .207        |

## THE VISUAL INDEX WORKSPACE SERIES

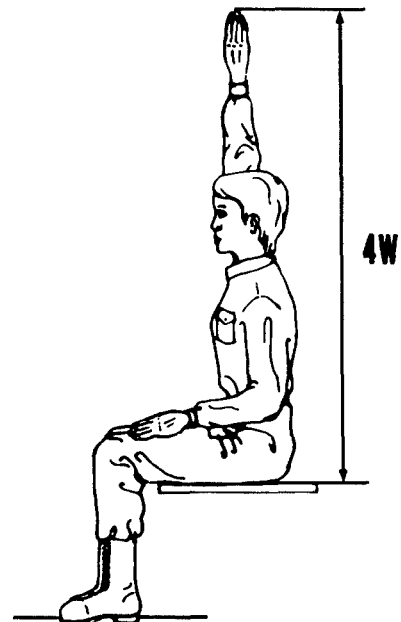
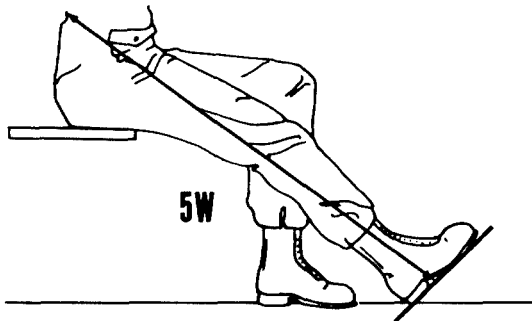
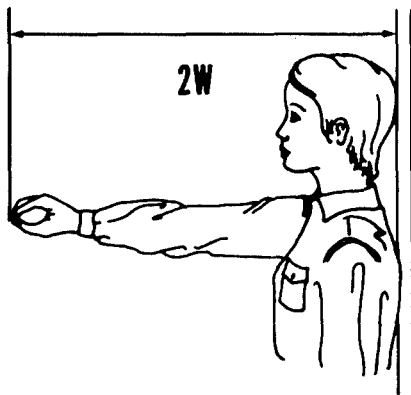
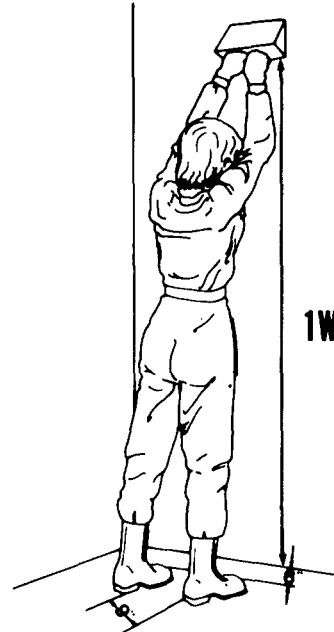
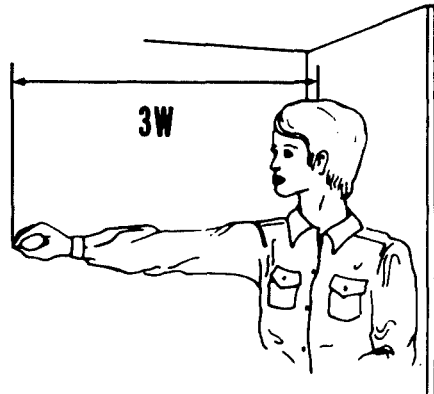


Figure 3. The visual index: workspace series.

- 1W OVERHEAD REACH HEIGHT: vertical distance from floor to the highest point on the first phalanges when subject stands 6 inches from the wall, her arms extended overhead, fists together and against the wall, and the first phalanges horizontal.
- 2W FUNCTIONAL REACH: horizontal distance from wall to the tip of the thumb measured with subject's back against the wall, her arm horizontal, and tip of the index finger touching the pad of the thumb.
- 3W FUNCTIONAL REACH, EXTENDED: distance from wall to the tip of the right thumb measured with left shoulder in firm contact with the wall, right shoulder extended as far as possible, arm held horizontal and tip of the index finger touching the pad of the thumb.
- 4W OVERHEAD REACH, SITTING: height of the tip of the middle finger above the sitting surface measured with subject sitting erect, her right side against a wall, left hand in her lap, right arm and hand extended upward and palm against the wall.
- 5W FUNCTIONAL LEG LENGTH: distance along the main axis of the leg from bottom of the foot to the posterior torso surface, measured with leg extended and knee straightened using an anthropometer whose base is in firm contact with the foot's plantar surface.
- 6W WEIGHT (CLOTHED): weight of subject wearing normal indoor apparel (not pictured).

## THE VISUAL INDEX WORKSPACE SERIES (CONT.)

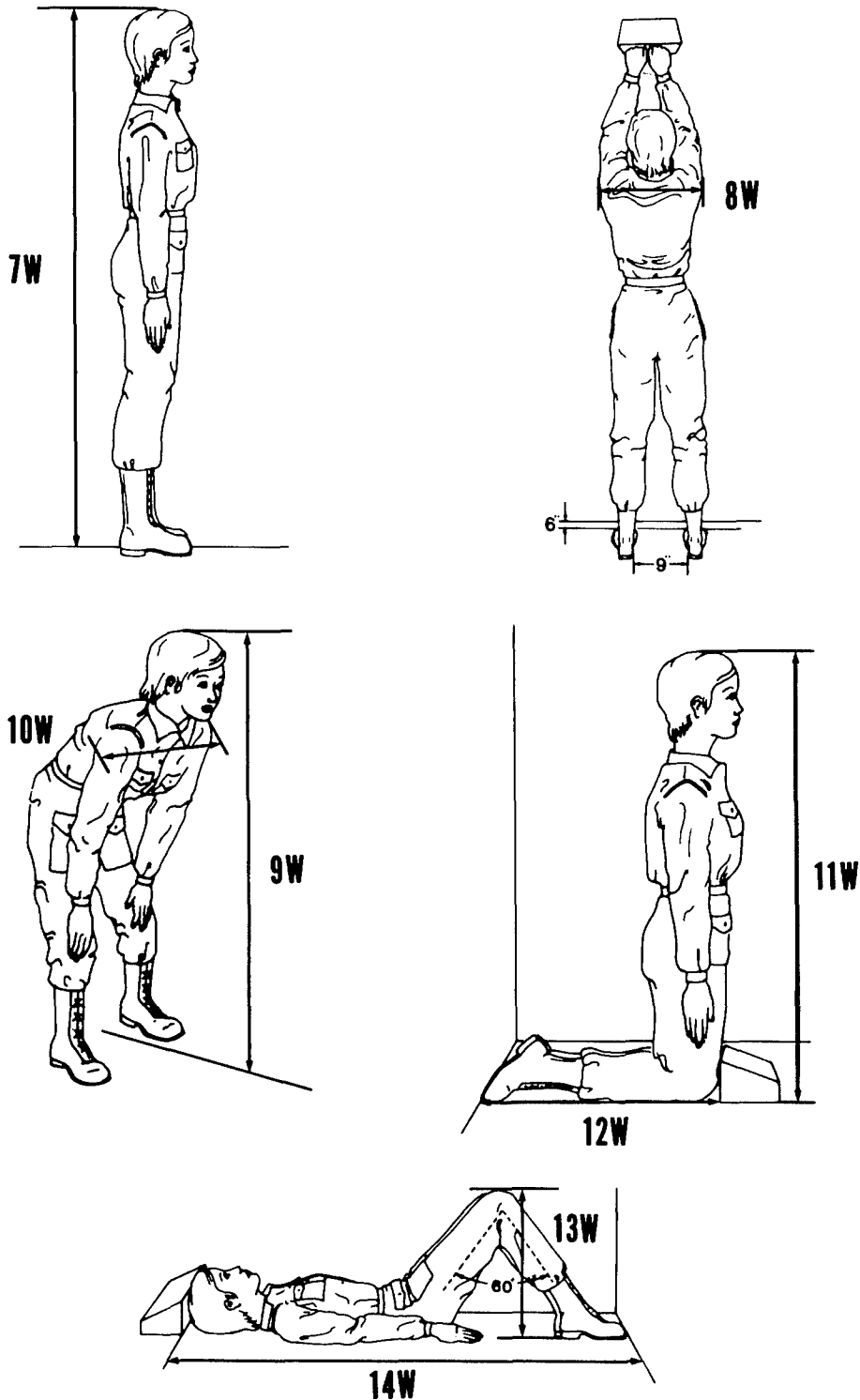


Figure 3. The visual index: workspace series (continued).

- 7W STATURE (CLOTHED): distance from floor to top of the head measured with the subject wearing normal indoor apparel.
- 8W OVERHEAD REACH BREADTH: maximum breadth across arms or shoulders, whichever is wider, measured as subject stands with her toes six inches from a wall, arms extended overhead, fists touching each other and against the wall, and first phalanges horizontal.
- 9W BENT TORSO HEIGHT: distance from floor to top of the head measured as subject stands, her feet 12 inches apart, palms of her hands on her kneecaps, and head as close to the Frankfort plane as possible.
- 10W BENT TORSO BREADTH: maximum breadth of the shoulders measured as subject stands, her feet 12 inches apart, palms of her hands on her kneecaps, and head as close to the Frankfort plane as possible.
- 11W KNEELING HEIGHT: distance from floor to top of the head measured as subject kneels with her toes extended and touching a wall, torso erect, arms hanging loosely, and head in a Frankfort plane.
- 12W KNEELING LEG LENGTH: distance measured from the wall to the anterior portion of the knee as subject kneels, toes extended and touching a wall.
- 13W BENT KNEE HEIGHT: height of the highest point on the knee when subject lies supine, knees raised so that the angle between the upper and lower legs approximates 60 degrees and her toes touch a wall.
- 14W HORIZONTAL LENGTH/KNEES BENT: distance from vertex to tip of the toes when subject lies supine, her knees raised so that the angle between the upper and lower legs approximates 60 degrees and her toes touch a wall.

TABLE 5A  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
WORKSPACE SERIES (N=296)

| METRIC UNITS*           | MEAN   | SD   | 1ST   | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|-------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1W OVERHEAD REACH HT    | 199.21 | 9.07 | 176.0 | 185.2 | 188.6 | 193.2 | 198.6 | 205.1 | 211.5 | 215.1 | 219.5 |
| 2W FUNCTIONAL REACH     | 71.20  | 4.54 | 60.9  | 64.0  | 65.5  | 68.0  | 71.0  | 74.3  | 77.3  | 79.0  | 81.5  |
| 3W FUNCT REACH EXTEND   | 83.15  | 5.86 | 68.6  | 73.4  | 75.7  | 79.2  | 83.2  | 87.2  | 90.8  | 92.7  | 95.5  |
| 4W OVERHEAD REACH SIT   | 129.03 | 6.62 | 111.3 | 117.3 | 120.3 | 124.8 | 129.3 | 133.6 | 137.3 | 139.5 | 143.5 |
| 5W FUNCTIONAL LEG LTH   | 108.93 | 5.79 | 93.6  | 99.6  | 101.9 | 105.2 | 108.8 | 112.8 | 116.6 | 118.7 | 121.3 |
| 6W WEIGHT               | 61.69  | 8.04 | 43.8  | 48.8  | 51.6  | 56.3  | 61.6  | 67.0  | 71.9  | 74.7  | 79.7  |
| 7W STATURE              | 167.19 | 6.67 | 150.4 | 156.8 | 159.3 | 162.9 | 166.8 | 171.3 | 175.9 | 178.7 | 183.7 |
| 8W OVERHEAD REACH BRD   | 34.78  | 1.93 | 30.2  | 31.5  | 32.3  | 33.5  | 34.8  | 36.0  | 37.1  | 37.9  | 39.9  |
| 9W BENT TORSO HEIGHT    | 126.03 | 7.84 | 108.8 | 112.7 | 115.5 | 120.6 | 126.2 | 131.4 | 135.8 | 138.6 | 144.5 |
| 10W BENT TORSO BREADTH  | 40.13  | 2.03 | 35.8  | 36.8  | 37.4  | 38.7  | 40.1  | 41.6  | 42.8  | 43.5  | 44.7  |
| 11W KNEELING HEIGHT     | 122.06 | 4.78 | 110.0 | 114.4 | 116.3 | 118.9 | 121.8 | 125.0 | 128.2 | 130.3 | 134.3 |
| 12W KNEELING LEG LENGTH | 64.84  | 3.47 | 57.6  | 59.2  | 60.3  | 62.4  | 64.8  | 67.1  | 69.2  | 70.5  | 73.1  |
| 13W BENT KNEE HT SUPIN  | 45.51  | 2.55 | 39.3  | 41.3  | 42.3  | 43.8  | 45.5  | 47.2  | 48.7  | 49.6  | 51.1  |
| 14W HORI LG KNEES BENT  | 150.94 | 7.18 | 134.8 | 140.3 | 142.5 | 146.1 | 150.4 | 155.6 | 160.8 | 163.8 | 168.6 |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS

TABLE 5B  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
WORKSPACE SERIES (N=296)

| ENGLISH UNITS*          | MEAN   | SD    | 1ST  | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|-------------------------|--------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1W OVERHEAD REACH HT    | 78.43  | 3.57  | 69.3 | 72.9  | 74.2  | 76.1  | 78.2  | 80.8  | 83.3  | 84.7  | 86.4  |
| 2W FUNCTIONAL REACH     | 28.03  | 1.79  | 24.0 | 25.2  | 25.8  | 26.8  | 28.0  | 29.3  | 30.4  | 31.1  | 32.1  |
| 3W FUNCT REACH EXTEND   | 32.73  | 2.31  | 27.0 | 28.9  | 29.8  | 31.2  | 32.8  | 34.3  | 35.7  | 36.5  | 37.6  |
| 4W OVERHEAD REACH SIT   | 50.80  | 2.61  | 43.8 | 46.2  | 47.3  | 49.1  | 50.9  | 52.6  | 54.1  | 54.9  | 56.5  |
| 5W FUNCTIONAL LEG LTH   | 42.89  | 2.26  | 36.8 | 39.2  | 40.1  | 41.4  | 42.8  | 44.4  | 45.9  | 46.7  | 47.8  |
| 6W WEIGHT               | 136.00 | 17.73 | 96.5 | 107.6 | 113.7 | 124.0 | 135.8 | 147.8 | 158.4 | 164.6 | 175.6 |
| 7W STATURE              | 65.82  | 2.63  | 59.2 | 61.7  | 62.7  | 64.1  | 65.7  | 67.4  | 69.2  | 70.4  | 72.3  |
| 8W OVERHEAD REACH BRD   | 13.69  | .76   | 11.9 | 12.4  | 12.7  | 13.2  | 13.7  | 14.2  | 14.6  | 14.9  | 15.7  |
| 9W BENT TORSO HEIGHT    | 49.62  | 3.09  | 42.8 | 44.4  | 45.5  | 47.5  | 49.7  | 51.7  | 53.5  | 54.6  | 56.9  |
| 10W BENT TORSO BREADTH  | 15.80  | .80   | 14.1 | 14.5  | 14.7  | 15.2  | 15.8  | 16.4  | 16.8  | 17.1  | 17.6  |
| 11W KNEELING HEIGHT     | 48.05  | 1.88  | 43.3 | 45.1  | 45.8  | 46.8  | 48.0  | 49.2  | 50.5  | 51.3  | 52.9  |
| 12W KNEELING LEG LENGTH | 25.53  | 1.37  | 22.7 | 23.3  | 23.7  | 24.6  | 25.5  | 26.4  | 27.3  | 27.8  | 28.8  |
| 13W BENT KNEE HT SUPIN  | 17.92  | 1.01  | 15.5 | 16.3  | 16.6  | 17.2  | 17.9  | 18.6  | 19.2  | 19.5  | 20.1  |
| 14W HORI LG KNEES BENT  | 59.42  | 2.83  | 53.1 | 55.2  | 56.1  | 57.5  | 59.2  | 61.3  | 63.3  | 64.5  | 66.4  |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES

TABLE 6  
CORRELATIONS: CORE AND WORKSPACE SERIES (N=296)

|     |                    | --1W-- | --2W-- | --3W-- | --4W-- | --5W-- | --6W-- | --7W-- | --8W-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1W  | OVERHEAD REACH HT  |        | .600   | .598   | .755   | .784   | .546   | .931   | .322   |
| 2W  | FUNCTIONAL REACH   | .600   |        | .777   | .531   | .518   | .445   | .588   | .291   |
| 3W  | FUNCT REACH EXTEND | .598   | .777   |        | .629   | .541   | .419   | .590   | .273   |
| 4W  | OVERHEAD REACH SIT | .755   | .531   | .629   |        | .708   | .528   | .749   | .275   |
| 5W  | FUNCTIONAL LEG LTH | .784   | .518   | .541   | .708   |        | .481   | .804   | .278   |
| 6W  | WEIGHT             | .546   | .445   | .419   | .528   | .481   |        | .586   | .618   |
| 7W  | STATURE            | .931   | .588   | .590   | .749   | .804   | .586   |        | .412   |
| 8W  | OVERHEAD REACH BRD | .322   | .291   | .273   | .275   | .278   | .618   | .412   |        |
| 9W  | BENT TORSO HEIGHT  | .490   | .434   | .423   | .437   | .480   | .294   | .509   | .201   |
| 10W | BENT TORSO BREADTH | .428   | .366   | .324   | .442   | .357   | .640   | .445   | .618   |
| 11W | KNEELING HEIGHT    | .865   | .472   | .490   | .715   | .735   | .563   | .955   | .408   |
| 12W | KNEELING LEG LGTH  | .803   | .539   | .546   | .614   | .671   | .547   | .815   | .366   |
| 13W | BENT KNEE HT SUPIN | .697   | .606   | .545   | .548   | .660   | .525   | .694   | .296   |
| 14W | HORI LG KNEES BENT | .752   | .408   | .457   | .622   | .645   | .470   | .816   | .382   |
| 1C  | WEIGHT             | .533   | .422   | .392   | .514   | .465   | .997   | .574   | .614   |
| 2C  | STATURE            | .924   | .571   | .578   | .750   | .806   | .591   | .994   | .417   |
| 3C  | SHOULDER HEIGHT    | .915   | .564   | .562   | .753   | .817   | .602   | .967   | .394   |
| 4C  | AXILLA HEIGHT      | .917   | .565   | .563   | .746   | .822   | .565   | .967   | .370   |
| 5C  | BUSTPOINT HEIGHT   | .894   | .548   | .548   | .704   | .782   | .487   | .931   | .317   |
| 6C  | WAIST HEIGHT       | .886   | .540   | .534   | .680   | .786   | .507   | .897   | .346   |
| 7C  | CROTCH HEIGHT      | .886   | .624   | .607   | .643   | .819   | .449   | .878   | .288   |
| 8C  | BUTTOCK HEIGHT     | .845   | .612   | .598   | .664   | .803   | .489   | .843   | .306   |
| 9C  | KNEECAP HEIGHT     | .864   | .614   | .600   | .659   | .802   | .465   | .868   | .321   |
| 10C | CALF HEIGHT        | .770   | .551   | .528   | .521   | .703   | .465   | .759   | .371   |
| 11C | SITTING HEIGHT     | .612   | .284   | .331   | .589   | .467   | .506   | .760   | .416   |
| 12C | EYE HEIGHT/SIT     | .595   | .265   | .303   | .560   | .452   | .461   | .735   | .371   |
| 13C | SHOULDER-ELBOW L   | .855   | .637   | .605   | .682   | .727   | .520   | .813   | .335   |
| 14C | ELBOW-FINGERTIP    | .806   | .651   | .638   | .674   | .685   | .492   | .766   | .380   |
| 15C | KNEE HEIGHT/SIT    | .876   | .637   | .595   | .634   | .771   | .575   | .878   | .408   |
| 16C | POPLITEAL HEIGHT   | .863   | .620   | .593   | .604   | .773   | .428   | .863   | .332   |
| 17C | BUTTOCK-KNEE LGTH  | .795   | .581   | .547   | .555   | .711   | .704   | .773   | .425   |
| 18C | BUST DEPTH         | .179   | .180   | .133   | .190   | .201   | .693   | .184   | .351   |
| 19C | WAIST DEPTH        | .127   | .163   | .100   | .172   | .208   | .672   | .136   | .338   |
| 20C | CHEST BREADTH      | .278   | .242   | .200   | .297   | .265   | .747   | .294   | .522   |
| 21C | WAIST BREADTH      | .268   | .217   | .165   | .290   | .305   | .688   | .306   | .421   |

TABLE 6 CONTINUED  
CORRELATIONS: CORE AND WORKSPACE SERIES (N=296)

|     |                    | <u>1W</u> | <u>2W</u> | <u>3W</u> | <u>4W</u> | <u>5W</u> | <u>6W</u> | <u>7W</u> | <u>8W</u> |
|-----|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 22C | HIP BREADTH        | .330      | .242      | .201      | .282      | .193      | .750      | .360      | .483      |
| 23C | SHOULDER BREADTH   | .387      | .322      | .302      | .431      | .352      | .795      | .402      | .641      |
| 24C | NECK CIRCUMFERENCE | .266      | .272      | .271      | .297      | .270      | .653      | .330      | .526      |
| 25C | SHOULDER CIRC      | .360      | .353      | .320      | .406      | .332      | .803      | .371      | .630      |
| 26C | CHEST CIRC AT SCYE | .294      | .273      | .232      | .288      | .279      | .800      | .308      | .563      |
| 27C | BUST CIRCUMFERENCE | .250      | .228      | .189      | .218      | .233      | .783      | .247      | .453      |
| 28C | CHEST C BELOW BUST | .260      | .237      | .222      | .287      | .243      | .770      | .282      | .441      |
| 29C | WAIST CIRC         | .229      | .243      | .158      | .231      | .250      | .745      | .257      | .434      |
| 30C | HIP CIRCUMFERENCE  | .405      | .306      | .271      | .404      | .321      | .878      | .439      | .535      |
| 31C | VERTICAL TRUNK CIR | .545      | .296      | .290      | .547      | .442      | .808      | .643      | .516      |
| 32C | ARM CIRC AT SCYE   | .375      | .327      | .316      | .402      | .364      | .744      | .404      | .512      |
| 33C | BICEPS CIRC, FLXD  | .221      | .254      | .239      | .293      | .219      | .808      | .259      | .531      |
| 34C | ELBOW CIRC, FLXD   | .444      | .440      | .410      | .417      | .372      | .676      | .460      | .453      |
| 35C | FOREARM CIRC, FLXD | .324      | .321      | .288      | .337      | .260      | .774      | .355      | .533      |
| 36C | WRIST CIRC         | .487      | .384      | .367      | .482      | .417      | .673      | .516      | .481      |
| 37C | UPPER THIGH CIRC   | .276      | .276      | .238      | .305      | .230      | .863      | .316      | .508      |
| 38C | KNEE CIRCUMFERENCE | .393      | .291      | .286      | .356      | .299      | .784      | .425      | .494      |
| 39C | CALF CIRCUMFERENCE | .276      | .249      | .264      | .341      | .198      | .798      | .313      | .468      |
| 40C | ANKLE CIRC         | .390      | .272      | .329      | .465      | .354      | .668      | .441      | .378      |
| 41C | SHOULDER LENGTH    | .415      | .298      | .323      | .427      | .326      | .271      | .427      | .338      |
| 42C | INTERSCYE BACK     | .327      | .251      | .211      | .245      | .262      | .503      | .318      | .409      |
| 43C | INTERSCYE FRONT    | .472      | .392      | .331      | .437      | .344      | .599      | .465      | .522      |
| 44C | BACK ARC, BUST     | .239      | .226      | .189      | .265      | .237      | .714      | .233      | .397      |
| 45C | BACK ARC, WAIST    | .192      | .195      | .120      | .219      | .237      | .726      | .232      | .419      |
| 46C | BACK ARC, HIP      | .288      | .280      | .256      | .387      | .269      | .784      | .324      | .446      |
| 47C | WAIST BACK         | .466      | .303      | .323      | .490      | .414      | .330      | .552      | .241      |
| 48C | WAIST FRONT        | .296      | .174      | .167      | .365      | .302      | .345      | .392      | .260      |
| 49C | NECK-BUSTPOINT LGT | .198      | .153      | .116      | .224      | .208      | .542      | .248      | .365      |
| 50C | AXILLA-WAIST LEVEL | .224      | .087      | .154      | .338      | .261      | .160      | .323      | .110      |
| 51C | SLEEVE INSEAM      | .823      | .649      | .631      | .637      | .725      | .431      | .772      | .294      |
| 52C | SLEEVE OUTSEAM     | .847      | .670      | .637      | .658      | .734      | .475      | .799      | .330      |
| 53C | CROTCH LENGTH      | .321      | .162      | .155      | .286      | .228      | .625      | .378      | .404      |
| 54C | HEAD CIRCUMFERENCE | .299      | .221      | .278      | .253      | .179      | .377      | .347      | .316      |
| 55C | HEAD BREADTH       | .138      | .070      | .078      | .123      | .054      | .266      | .157      | .185      |
| 56C | HEAD LENGTH        | .319      | .207      | .299      | .257      | .213      | .291      | .350      | .253      |

TABLE 6 CONTINUED  
CORRELATIONS: CORE AND WORKSPACE SERIES (N=296)

|     |                    | --1W-- | --2W-- | --3W-- | --4W-- | --5W-- | --6W-- | --7W-- | --8W-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 57C | PALM LENGTH        | .609   | .479   | .481   | .520   | .485   | .363   | .597   | .330   |
| 58C | HAND BREADTH       | .473   | .400   | .406   | .526   | .416   | .569   | .471   | .412   |
| 59C | HAND CIRCUMFERENCE | .485   | .388   | .389   | .508   | .414   | .603   | .489   | .443   |
| 60C | HAND LENGTH        | .678   | .543   | .552   | .599   | .570   | .433   | .664   | .370   |
| 61C | INSTEP LENGTH      | .649   | .495   | .459   | .540   | .599   | .530   | .634   | .345   |
| 62C | FOOT LENGTH        | .711   | .545   | .529   | .628   | .659   | .546   | .707   | .366   |
| 63C | HEEL-ANKLE CIRC    | .618   | .490   | .490   | .593   | .593   | .626   | .638   | .410   |
| 64C | FOOT BREADTH       | .405   | .331   | .371   | .400   | .298   | .558   | .421   | .395   |
| 65C | HEEL BREADTH       | .323   | .339   | .277   | .297   | .336   | .478   | .334   | .340   |
| 66C | FOOT CIRCUMFERENCE | .477   | .439   | .448   | .512   | .412   | .655   | .514   | .441   |
| 67C | INSTEP CIRC        | .500   | .443   | .442   | .538   | .481   | .640   | .524   | .441   |
| 68C | ANKLE HEIGHT       | .525   | .388   | .435   | .473   | .556   | .206   | .549   | .192   |
| 69C | SPHYRION HEIGHT    | .397   | .279   | .260   | .330   | .313   | .367   | .438   | .325   |
| 70C | AGE                | -.117  | -.214  | -.271  | -.157  | -.113  | -.076  | -.066  | -.036  |

TABLE 6 CONTINUED  
CORRELATIONS: CORE AND WORKSPACE SERIES (N=296)

|     |                    | <u>-9W-</u> | <u>-10W-</u> | <u>-11W-</u> | <u>-12W-</u> | <u>-13W-</u> | <u>-14W-</u> |
|-----|--------------------|-------------|--------------|--------------|--------------|--------------|--------------|
| 1W  | OVERHEAD REACH HT  | .490        | .428         | .865         | .803         | .697         | .752         |
| 2W  | FUNCTIONAL REACH   | .434        | .366         | .472         | .539         | .606         | .408         |
| 3W  | FUNCT REACH EXTEND | .423        | .324         | .490         | .546         | .545         | .457         |
| 4W  | OVERHEAD REACH SIT | .437        | .442         | .715         | .614         | .548         | .622         |
| 5W  | FUNCTIONAL LEG LTH | .480        | .357         | .735         | .671         | .660         | .645         |
| 6W  | WEIGHT             | .294        | .640         | .563         | .547         | .525         | .470         |
| 7W  | STATURE            | .509        | .445         | .955         | .815         | .694         | .816         |
| 8W  | OVERHEAD REACH BRD | .201        | .618         | .408         | .366         | .296         | .382         |
| 9W  | BENT TORSO HEIGHT  |             | .392         | .423         | .438         | .405         | .449         |
| 10W | BENT TORSO BREADTH | .392        |              | .425         | .396         | .402         | .374         |
| 11W | KNEELING HEIGHT    | .423        | .425         |              | .734         | .588         | .813         |
| 12W | KNEELING LEG LGTH  | .438        | .396         | .734         |              | .612         | .664         |
| 13W | BENT KNEE HT SUPIN | .405        | .402         | .588         | .612         |              | .266         |
| 14W | HORI LG KNEES BENT | .449        | .374         | .813         | .664         | .266         |              |
| 1C  | WEIGHT             | .288        | .639         | .556         | .535         | .508         | .463         |
| 2C  | STATURE            | .510        | .446         | .959         | .807         | .678         | .828         |
| 3C  | SHOULDER HEIGHT    | .513        | .447         | .922         | .805         | .685         | .799         |
| 4C  | AXILLA HEIGHT      | .520        | .424         | .916         | .801         | .692         | .790         |
| 5C  | BUSTPOINT HEIGHT   | .509        | .392         | .871         | .782         | .678         | .756         |
| 6C  | WAIST HEIGHT       | .542        | .379         | .825         | .785         | .668         | .737         |
| 7C  | CROTCH HEIGHT      | .581        | .370         | .760         | .796         | .720         | .701         |
| 8C  | BUTTOCK HEIGHT     | .560        | .422         | .730         | .759         | .707         | .674         |
| 9C  | KNEECAP HEIGHT     | .594        | .397         | .746         | .784         | .723         | .699         |
| 10C | CALF HEIGHT        | .535        | .417         | .641         | .690         | .646         | .600         |
| 11C | SITTING HEIGHT     | .220        | .348         | .837         | .535         | .349         | .669         |
| 12C | EYE HEIGHT/SIT     | .187        | .324         | .815         | .520         | .333         | .648         |
| 13C | SHOULDER-ELBOW L   | .586        | .453         | .720         | .723         | .658         | .668         |
| 14C | ELBOW-FINGERTIP    | .546        | .490         | .654         | .707         | .663         | .629         |
| 15C | KNEE HEIGHT/SIT    | .561        | .454         | .759         | .819         | .746         | .685         |
| 16C | POPLITEAL HEIGHT   | .556        | .389         | .741         | .776         | .678         | .711         |
| 17C | BUTTOCK-KNEE LGTH  | .522        | .484         | .681         | .693         | .698         | .633         |
| 18C | BUST DEPTH         | .106        | .430         | .190         | .171         | .208         | .193         |
| 19C | WAIST DEPTH        | .089        | .395         | .128         | .125         | .260         | .091         |
| 20C | CHEST BREADTH      | .119        | .567         | .295         | .282         | .281         | .253         |
| 21C | WAIST BREADTH      | .136        | .461         | .310         | .302         | .274         | .274         |

TABLE 6 CONTINUED  
CORRELATIONS: CORE AND WORKSPACE SERIES (N=296)

|     |                    | <u>-.9W</u> | <u>-.10W</u> | <u>-.11W</u> | <u>-.12W</u> | <u>-.13W</u> | <u>-.14W</u> |
|-----|--------------------|-------------|--------------|--------------|--------------|--------------|--------------|
| 22C | HIP BREADTH        | .147        | .402         | .377         | .338         | .271         | .328         |
| 23C | SHOULDER BREADTH   | .208        | .736         | .384         | .394         | .358         | .339         |
| 24C | NECK CIRCUMFERENCE | .205        | .506         | .327         | .259         | .294         | .258         |
| 25C | SHOULDER CIRC      | .240        | .721         | .360         | .363         | .339         | .321         |
| 26C | CHEST CIRC AT SCYE | .152        | .616         | .299         | .319         | .293         | .262         |
| 27C | BUST CIRCUMFERENCE | .137        | .519         | .239         | .244         | .271         | .223         |
| 28C | CHEST C BELOW BUST | .108        | .494         | .285         | .281         | .283         | .227         |
| 29C | WAIST CIRC         | .133        | .483         | .251         | .233         | .291         | .211         |
| 30C | HIP CIRCUMFERENCE  | .229        | .506         | .449         | .406         | .373         | .380         |
| 31C | VERTICAL TRUNK CIR | .211        | .502         | .690         | .483         | .411         | .557         |
| 32C | ARM CIRC AT SCYE   | .186        | .535         | .394         | .370         | .370         | .321         |
| 33C | BICEPS CIRC, FLXD  | .121        | .527         | .256         | .293         | .273         | .207         |
| 34C | ELBOW CIRC, FLXD   | .198        | .543         | .428         | .462         | .453         | .332         |
| 35C | FOREARM CIRC, FLXD | .190        | .606         | .337         | .383         | .392         | .236         |
| 36C | WRIST CIRC         | .312        | .542         | .518         | .487         | .472         | .401         |
| 37C | UPPER THIGH CIRC   | .143        | .478         | .307         | .342         | .340         | .230         |
| 38C | KNEE CIRCUMFERENCE | .215        | .450         | .420         | .426         | .400         | .327         |
| 39C | CALF CIRCUMFERENCE | .127        | .445         | .307         | .355         | .327         | .216         |
| 40C | ANKLE CIRC         | .203        | .388         | .455         | .421         | .395         | .328         |
| 41C | SHOULDER LENGTH    | .245        | .425         | .423         | .356         | .262         | .398         |
| 42C | INTERSCYE BACK     | .184        | .445         | .317         | .332         | .220         | .295         |
| 43C | INTERSCYE FRONT    | .236        | .689         | .438         | .442         | .387         | .395         |
| 44C | BACK ARC, BUST     | .149        | .471         | .223         | .242         | .217         | .235         |
| 45C | BACK ARC, WAIST    | .108        | .456         | .245         | .208         | .226         | .212         |
| 46C | BACK ARC, HIP      | .196        | .451         | .334         | .314         | .317         | .269         |
| 47C | WAIST BACK         | .179        | .285         | .603         | .372         | .306         | .485         |
| 48C | WAIST FRONT        | .108        | .283         | .435         | .256         | .221         | .345         |
| 49C | NECK-BUSTPOINT LGT | .116        | .314         | .282         | .187         | .134         | .266         |
| 50C | AXILLA-WAIST LEVEL | .072        | .187         | .390         | .161         | .159         | .274         |
| 51C | SLEEVE INSEAM      | .601        | .402         | .654         | .700         | .675         | .606         |
| 52C | SLEEVE OUTSEAM     | .600        | .438         | .689         | .716         | .679         | .637         |
| 53C | CROTCH LENGTH      | .139        | .284         | .402         | .312         | .258         | .320         |
| 54C | HEAD CIRCUMFERENCE | .260        | .430         | .315         | .327         | .263         | .264         |
| 55C | HEAD BREADTH       | .015        | .265         | .174         | .113         | .063         | .125         |
| 56C | HEAD LENGTH        | .263        | .333         | .319         | .336         | .252         | .267         |

TABLE 6 CONTINUED  
CORRELATIONS: CORE AND WORKSPACE SERIES (N=296)

|     |                    | <u>9W</u> | <u>10W</u> | <u>11W</u> | <u>12W</u> | <u>13W</u> | <u>14W</u> |
|-----|--------------------|-----------|------------|------------|------------|------------|------------|
| 57C | PALM LENGTH        | .353      | .399       | .530       | .542       | .528       | .487       |
| 58C | HAND BREADTH       | .329      | .498       | .437       | .473       | .434       | .367       |
| 59C | HAND CIRCUMFERENCE | .321      | .516       | .463       | .503       | .429       | .396       |
| 60C | HAND LENGTH        | .449      | .440       | .583       | .628       | .585       | .546       |
| 61C | INSTEP LENGTH      | .438      | .464       | .566       | .593       | .535       | .562       |
| 62C | FOOT LENGTH        | .492      | .485       | .629       | .671       | .606       | .608       |
| 63C | HEEL-ANKLE CIRC    | .397      | .499       | .565       | .574       | .611       | .477       |
| 64C | FOOT BREADTH       | .223      | .423       | .380       | .448       | .437       | .295       |
| 65C | HEEL BREADTH       | .252      | .431       | .257       | .320       | .392       | .229       |
| 66C | FOOT CIRCUMFERENCE | .307      | .498       | .467       | .517       | .483       | .396       |
| 67C | INSTEP CIRC        | .302      | .520       | .465       | .512       | .517       | .392       |
| 68C | ANKLE HEIGHT       | .321      | .240       | .484       | .428       | .402       | .491       |
| 69C | SPHYRION HEIGHT    | .115      | .258       | .425       | .387       | .367       | .292       |
| 70C | AGE                | -.055     | -.042      | -.011      | -.163      | -.183      | .067       |

# THE VISUAL INDEX HEAD - FACE SERIES

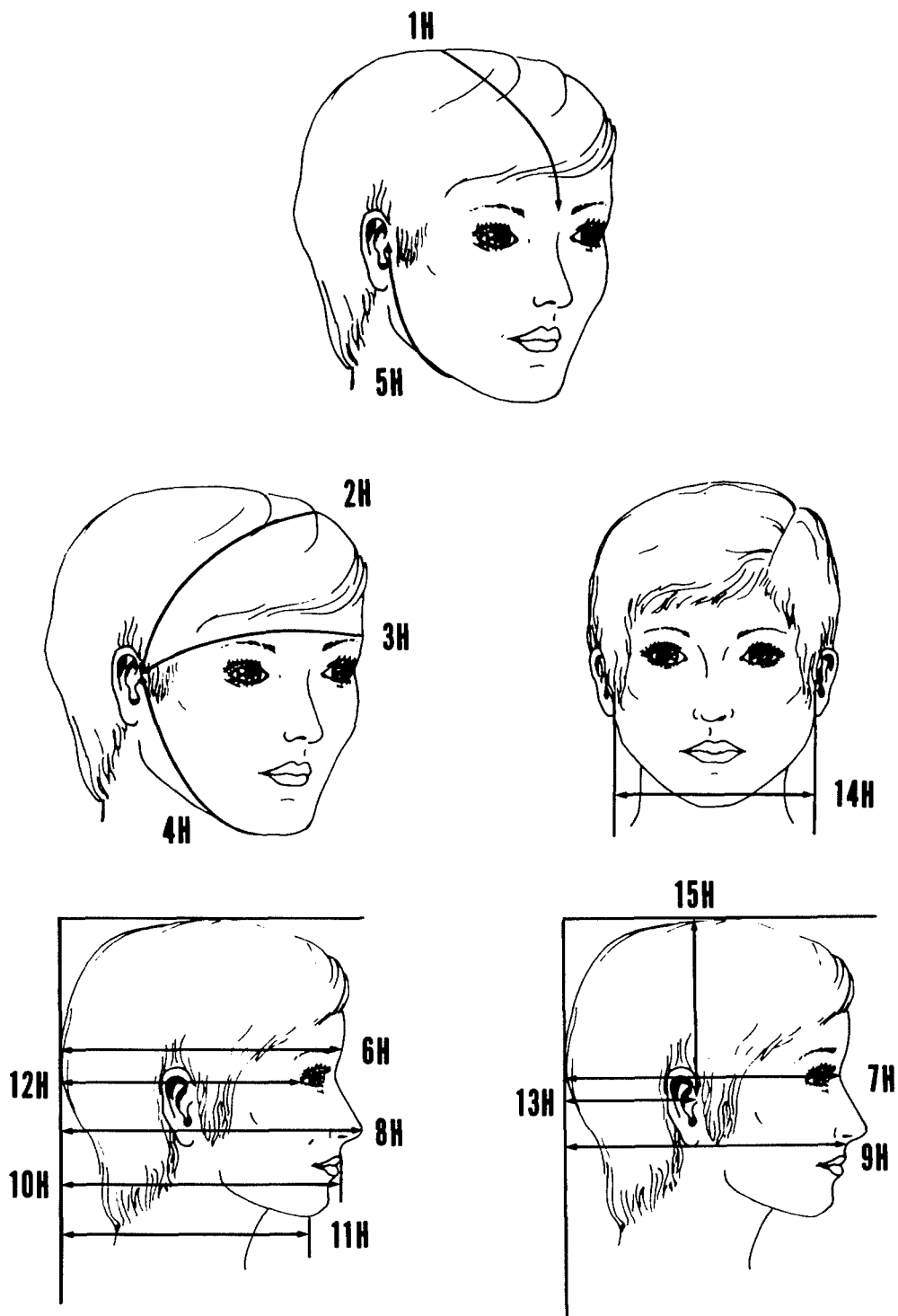


Figure 4. The visual index: head-face series.

- 1H SAGITTAL ARC: distance over the top of the head from glabella (the most anterior point between the brow ridges) to nuchale (the lowest point palpable at the base of the occiput) measured with the tape as close to the scalp as possible.
- 2H BITRAGION-CORONAL ARC: distance from right tragion (the notch just forward of the ear hole) to left tragion, measured across the top of the head.
- 3H BITRAGION-FRONTAL ARC: distance from right tragion (the notch just forward of the ear hole) to left tragion measured across the forehead.
- 4H BITRAGION-MENTON ARC: distance from right tragion (the notch just forward of the ear hole) to left tragion measured with the tape passing under the tip of the chin.
- 5H BITRAGION-SUBMANDIBULAR ARC: distance from right tragion (the notch just forward of the ear hole) to left tragion measured with the tape passing under the gonial angles of the jaw and over the jaw-neck juncture.
- 6H GLABELLA TO WALL: distance from the most anterior point between the brow ridges to the coronal plane tangent to the back of the head.
- 7H SELLION TO WALL: distance from the deepest point in the nasal root depression to the coronal plane tangent to the back of the head.
- 8H PRONASALE TO WALL: distance from the tip of the nose to the coronal plane tangent to the back of the head.
- 9H SUBNASALE TO WALL: distance from the base of the nasal septum to the coronal plane tangent to the back of the head.
- 10H LIP PROTRUSION TO WALL: distance from the most anterior point of the lips to the coronal plane tangent to the back of the head.
- 11H MENTON TO WALL: distance from tip of the chin to back of the head.
- 12H ECTOCANTHUS TO WALL: distance from the outer corner of the scye to the coronal plane tangent to the back of the head.
- 13H TRAGION TO WALL: distance from the cartilaginous notch just forward of the ear hole to the coronal plane tangent to the back of the head.
- 14H BITRAGION BREADTH: breadth of the head between the notches just forward of the ear holes.
- 15H HEAD HEIGHT (TRAGION-VERTEX): distance from the cartilaginous notch just forward of the ear hole to the level of the top of the head.

# THE VISUAL INDEX HEAD - FACE SERIES (CONT.)

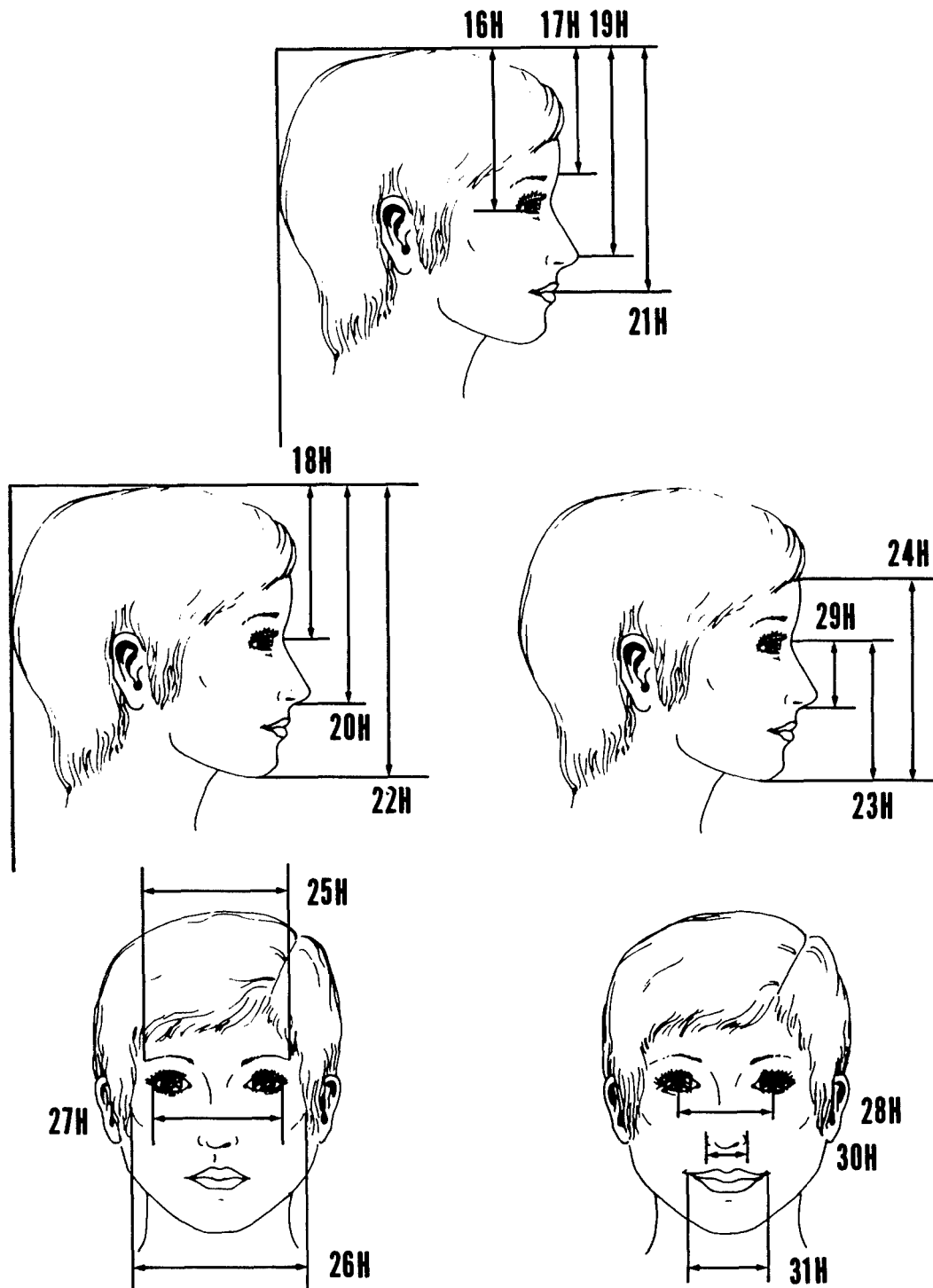


Figure 4. The visual index: head-face series (continued).

- 16H ECTOCANTHUS TO VERTEX: distance from the outer corner of the eye to the level of the top of the head.
- 17H GLABELLA TO VERTEX: distance from the most anterior point between the brow ridges to top of the head.
- 18H SELLION TO VERTEX: distance from the deepest point in the nasal root depression to top of the head.
- 19H PRONASALE TO VERTEX: distance from tip of the nose to top of the head.
- 20H SUBNASALE TO VERTEX: distance from the base of the nasal septum to the level of the top of the head.
- 21H STOMION TO VERTEX: distance from the point of contact of the lips in the midsagittal plane to top of the head.
- 22H MENTON TO VERTEX: distance from tip of the chin to the level of the top of the head.
- 23H FACE LENGTH (SELLION-MENTON): vertical distance from the deepest point in the nasal root depression to tip of the chin.
- 24H CRINION-MENTON: vertical distance from tip of the chin to the midsagittal point of the hairline.
- 25H MINIMUM FRONTAL BREADTH: breadth of the forehead between the greatest indentations of the temporal crests above the brow ridges.
- 26H FACE BREADTH (BIZYGOMATIC): breadth of the face across the zygomatic arches.
- 27H BIOCLAR BREADTH: distance between the outer corners of the eyes.
- 28H INTERPUPILLARY DISTANCE: distance between the centers of the pupils.
- 29H NOSE LENGTH: distance from the lowest point in the nasal root depression to the base of the nasal septum.
- 30H NOSE BREADTH: maximum breadth of the nose.
- 31H MOUTH BREADTH, SMILING: distance between the corners of the mouth measured while the subject smiles broadly.

TABLE 7A  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
HEAD-FACE SERIES (N=215)

| METRIC UNITS*          | MEAN  | SD   | PERCENTILES |      |      |      |      |      |      |      |      |  |
|------------------------|-------|------|-------------|------|------|------|------|------|------|------|------|--|
|                        |       |      | 1ST         | 5TH  | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH |  |
| 1H SAGITTAL ARC        | 33.63 | 1.55 | 30.6        | 31.1 | 31.7 | 32.5 | 33.6 | 34.6 | 35.6 | 36.1 | 38.2 |  |
| 2H BITRAG-CORONAL ARC  | 33.22 | 1.28 | 30.5        | 31.3 | 31.7 | 32.3 | 33.2 | 34.0 | 34.9 | 35.4 | 36.4 |  |
| 3H BITRAG-FRONTAL ARC  | 28.39 | 1.01 | 26.0        | 26.7 | 27.1 | 27.7 | 28.4 | 29.1 | 29.7 | 30.1 | 30.7 |  |
| 4H BITRAG-MENTON ARC   | 29.34 | 1.30 | 26.3        | 27.3 | 27.7 | 28.5 | 29.3 | 30.2 | 31.0 | 31.6 | 32.7 |  |
| 5H BITRAG-SUBMAN ARC   | 26.48 | 1.34 | 23.5        | 24.5 | 24.9 | 25.5 | 26.4 | 27.4 | 28.3 | 28.8 | 29.5 |  |
| 6H GLABELLA-WALL       | 19.25 | .99  | 17.1        | 17.8 | 18.1 | 18.6 | 19.1 | 19.8 | 20.5 | 21.1 | 22.2 |  |
| 7H SELLION-WALL        | 20.16 | .96  | 18.1        | 18.8 | 19.1 | 19.5 | 20.0 | 20.7 | 21.4 | 22.0 | 23.0 |  |
| 8H PRONASALE-WALL      | 21.49 | .97  | 19.4        | 20.1 | 20.4 | 20.8 | 21.4 | 22.1 | 22.8 | 23.2 | 24.2 |  |
| 9H SUBNASALE-WALL      | 20.10 | 1.00 | 18.0        | 18.6 | 18.9 | 19.4 | 20.0 | 20.7 | 21.4 | 21.9 | 23.0 |  |
| 10H STOMION-WALL       | 20.10 | 1.16 | 18.0        | 18.5 | 18.8 | 19.3 | 20.0 | 20.7 | 21.6 | 22.2 | 23.7 |  |
| 11H MENTON-WALL        | 19.47 | 1.10 | 17.2        | 17.8 | 18.2 | 18.7 | 19.4 | 20.1 | 20.9 | 21.4 | 22.4 |  |
| 12H ECTOCANTHUS-WALL   | 17.17 | .93  | 15.3        | 15.8 | 16.1 | 16.5 | 17.1 | 17.7 | 18.4 | 18.8 | 20.0 |  |
| 13H TRAGION-WALL       | 11.06 | .91  | 8.6         | 8.8  | 9.0  | 9.4  | 9.9  | 10.6 | 11.2 | 11.7 | 12.9 |  |
| 14H BITRAGION BREADTH  | 12.97 | .53  | 11.6        | 12.1 | 12.3 | 12.6 | 13.0 | 13.3 | 13.7 | 13.9 | 14.2 |  |
| 15H TRAGION-VERTEX     | 13.19 | .67  | 11.8        | 12.1 | 12.3 | 12.7 | 13.2 | 13.6 | 14.0 | 14.3 | 14.8 |  |
| 16H ECTOCANTHUS-VERTEX | 12.13 | .80  | 10.2        | 10.8 | 11.1 | 11.6 | 12.1 | 12.7 | 13.1 | 13.4 | 13.7 |  |
| 17H GLABELLA-VERTEX    | 8.44  | .87  | 6.7         | 7.1  | 7.4  | 7.8  | 8.4  | 9.0  | 9.5  | 9.9  | 10.6 |  |
| 18H SELLION-VERTEX     | 10.06 | .93  | 8.0         | 8.6  | 8.9  | 9.5  | 10.1 | 10.7 | 11.2 | 11.5 | 12.1 |  |
| 19H PRONASALE-VERTEX   | 13.56 | .99  | 11.4        | 11.9 | 12.3 | 12.9 | 13.6 | 14.2 | 14.8 | 15.1 | 15.7 |  |
| 20H SUBNASALE-VERTEX   | 14.80 | .95  | 12.6        | 13.3 | 13.7 | 14.2 | 14.8 | 15.4 | 16.0 | 16.4 | 16.9 |  |
| 21H STOMION-VERTEX     | 16.84 | 1.01 | 14.7        | 15.2 | 15.6 | 16.2 | 16.8 | 17.5 | 18.0 | 18.4 | 19.1 |  |
| 22H MENTON-VERTEX      | 20.88 | 1.02 | 18.7        | 19.3 | 19.6 | 20.2 | 20.8 | 21.6 | 22.2 | 22.6 | 23.2 |  |
| 23H SELLION-MENTON     | 16.69 | .57  | 9.5         | 9.9  | 10.0 | 10.3 | 10.6 | 11.1 | 11.5 | 11.8 | 12.1 |  |
| 24H CRINION-MENTON     | 17.57 | .82  | 15.7        | 16.2 | 16.5 | 17.0 | 17.6 | 18.1 | 18.6 | 18.9 | 19.5 |  |
| 25H MINIMUM-FRONTAL BR | 11.52 | .51  | 9.5         | 9.7  | 9.9  | 10.2 | 10.5 | 10.9 | 11.2 | 11.4 | 11.8 |  |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS

TABLE 7A CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
HEAD-FACE SERIES (N=215)

| METRIC UNITS*          | MEAN   | SD   | 1ST   | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|------------------------|--------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 26H FACE BREADTH       | 13.20  | .53  | 11.9  | 12.3  | 12.5  | 12.9  | 13.2  | 13.6  | 13.8  | 14.0  | 14.6  |
| 27H BIOCULAR BREADTH   | 9.62   | .50  | 8.5   | 8.8   | 9.0   | 9.3   | 9.6   | 10.0  | 10.3  | 10.5  | 10.8  |
| 28H INTERPUILLARY DIS  | 5.82   | .44  | 4.8   | 5.1   | 5.2   | 5.5   | 5.8   | 6.1   | 6.4   | 6.5   | 6.9   |
| 29H SELLION-SUBNASALE  | 4.58   | .33  | 3.8   | 4.1   | 4.2   | 4.4   | 4.6   | 4.8   | 5.0   | 5.2   | 5.4   |
| 31H NOSE BREADTH       | 3.41   | .45  | 2.6   | 2.9   | 3.0   | 3.1   | 3.3   | 3.6   | 4.1   | 4.3   | 4.6   |
| 31H MOUTH BR, SMILING  | 5.88   | .56  | 4.7   | 5.0   | 5.1   | 5.5   | 5.9   | 6.3   | 6.6   | 6.8   | 7.1   |
| 1C WEIGHT              | 60.05  | 7.99 | 45.0  | 47.6  | 49.9  | 54.3  | 59.7  | 65.1  | 70.5  | 74.2  | 83.0  |
| 2C STATURE             | 162.71 | 6.47 | 148.4 | 151.4 | 153.7 | 158.1 | 163.0 | 167.4 | 170.9 | 172.9 | 176.8 |
| 54C HEAD CIRCUMFERENCE | 55.03  | 1.78 | 51.1  | 52.3  | 52.9  | 53.8  | 54.9  | 56.1  | 57.3  | 58.1  | 59.8  |
| 55C HEAD BREADTH       | 14.62  | .54  | 13.4  | 13.7  | 13.9  | 14.3  | 14.6  | 14.9  | 15.3  | 15.5  | 16.1  |
| 56C HEAD LENGTH        | 18.73  | .74  | 17.0  | 17.5  | 17.8  | 18.2  | 18.7  | 19.2  | 19.6  | 19.9  | 20.7  |
| 70C AGE                | 22.63  | 4.56 | 18.0  | 18.2  | 18.4  | 19.1  | 21.3  | 24.8  | 28.7  | 31.6  | 37.9  |

\*WEIGHT IN KILOGRAMS; ALL OTHER MEASUREMENTS IN CENTIMETERS  
AGE IN YEARS

TABLE 7B  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
HEAD-FACE SERIES (N=215)

| ENGLISH UNITS*         | MEAN  | SD  | 1ST  | 5TH  | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH |
|------------------------|-------|-----|------|------|------|------|------|------|------|------|------|
| 1H SAGITTAL ARC        | 13.24 | .61 | 12.0 | 12.3 | 12.5 | 12.8 | 13.2 | 13.6 | 14.0 | 14.2 | 15.1 |
| 2H BITRAG-CORONAL ARC  | 13.08 | .50 | 12.0 | 12.3 | 12.5 | 12.7 | 13.1 | 13.4 | 13.7 | 13.9 | 14.3 |
| 3H BITRAG-FRONTAL ARC  | 11.18 | .40 | 10.2 | 10.5 | 10.7 | 10.9 | 11.2 | 11.4 | 11.7 | 11.8 | 12.1 |
| 4H BITRAG-MENTON ARC   | 11.55 | .51 | 10.4 | 10.7 | 10.9 | 11.2 | 11.5 | 11.9 | 12.2 | 12.4 | 12.9 |
| 5H BITRAG-SUBMAN ARC   | 10.42 | .53 | 9.2  | 9.6  | 9.8  | 10.0 | 10.4 | 10.8 | 11.2 | 11.4 | 11.6 |
| 6H GLABELLA-WALL       | 7.58  | .39 | 6.7  | 7.0  | 7.1  | 7.3  | 7.5  | 7.8  | 8.1  | 8.3  | 8.7  |
| 7H SELLION-WALL        | 7.94  | .38 | 7.1  | 7.4  | 7.5  | 7.7  | 7.9  | 8.1  | 8.4  | 8.6  | 9.1  |
| 8H PRONASALE-WALL      | 8.46  | .38 | 7.6  | 7.9  | 8.0  | 8.2  | 8.4  | 8.7  | 9.0  | 9.1  | 9.5  |
| 9H SUBNASALE-WALL      | 7.91  | .39 | 7.1  | 7.3  | 7.5  | 7.6  | 7.9  | 8.1  | 8.4  | 8.6  | 9.0  |
| 10H STOMION-WALL       | 7.91  | .46 | 7.1  | 7.3  | 7.4  | 7.6  | 7.9  | 8.2  | 8.5  | 8.8  | 9.3  |
| 11H MENTON-WALL        | 7.66  | .43 | 6.8  | 7.0  | 7.1  | 7.4  | 7.6  | 7.9  | 8.2  | 8.4  | 8.8  |
| 12H ECTOCANTHUS-WALL   | 6.76  | .37 | 6.0  | 6.2  | 6.3  | 6.5  | 6.7  | 7.0  | 7.2  | 7.4  | 7.9  |
| 13H TRAGION-WALL       | 3.96  | .36 | 3.4  | 3.5  | 3.5  | 3.7  | 3.9  | 4.2  | 4.4  | 4.6  | 5.1  |
| 14H BITRAGION BREADTH  | 5.11  | .21 | 4.6  | 4.8  | 4.8  | 5.0  | 5.1  | 5.2  | 5.4  | 5.5  | 5.6  |
| 15H TRAGION-VERTEX     | 5.19  | .26 | 4.6  | 4.8  | 4.9  | 5.0  | 5.2  | 5.4  | 5.5  | 5.6  | 5.8  |
| 16H ECTOCANTHUS-VERTEX | 4.78  | .32 | 4.0  | 4.3  | 4.4  | 4.6  | 4.8  | 5.0  | 5.2  | 5.3  | 5.4  |
| 17H GLABELLA-VERTEX    | 3.32  | .34 | 2.6  | 2.8  | 2.9  | 3.1  | 3.3  | 3.5  | 3.7  | 3.9  | 4.2  |
| 18H SELLION-VERTEX     | 3.96  | .37 | 3.2  | 3.4  | 3.5  | 3.7  | 4.0  | 4.2  | 4.4  | 4.5  | 4.8  |
| 19H PRONASALE-VERTEX   | 5.34  | .39 | 4.5  | 4.7  | 4.8  | 5.1  | 5.3  | 5.6  | 5.8  | 6.0  | 6.2  |
| 20H SUBNASALE-VERTEX   | 5.83  | .37 | 5.0  | 5.3  | 5.4  | 5.6  | 5.8  | 6.1  | 6.3  | 6.4  | 6.7  |
| 21H STOMION-VERTEX     | 6.63  | .40 | 5.8  | 6.0  | 6.1  | 6.4  | 6.6  | 6.9  | 7.1  | 7.2  | 7.5  |
| 22H MENTON-VERTEX      | 8.22  | .40 | 7.3  | 7.6  | 7.7  | 7.9  | 8.2  | 8.5  | 8.7  | 8.9  | 9.2  |
| 23H SELLION-MENTON     | 4.21  | .22 | 3.7  | 3.9  | 3.9  | 4.0  | 4.2  | 4.4  | 4.5  | 4.6  | 4.8  |
| 24H CRINION-MENTON     | 6.92  | .32 | 6.2  | 6.4  | 6.5  | 6.7  | 6.9  | 7.1  | 7.3  | 7.4  | 7.7  |
| 25H MINIMUM-FRONTAL BR | 4.14  | .20 | 3.7  | 3.8  | 3.9  | 4.0  | 4.1  | 4.3  | 4.4  | 4.5  | 4.7  |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES

TABLE 7B CONTINUED  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
HEAD-FACE SERIES (N=215)

| ENGLISH UNITS*         | MEAN   | SD    | 1ST  | 5TH   | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |
|------------------------|--------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| 26H FACE BREADTH       | 5.20   | .21   | 4.7  | 4.8   | 4.9   | 5.1   | 5.2   | 5.3   | 5.4   | 5.5   | 5.7   |
| 27H BIOCULAR BREADTH   | 3.79   | .20   | 3.4  | 3.5   | 3.5   | 3.6   | 3.8   | 3.9   | 4.1   | 4.1   | 4.2   |
| 28H INTERPUPILLARY DIS | 2.29   | .17   | 1.9  | 2.0   | 2.1   | 2.2   | 2.3   | 2.4   | 2.5   | 2.6   | 2.7   |
| 29H SELLION-SUBNASALE  | 1.80   | .13   | 1.5  | 1.6   | 1.7   | 1.7   | 1.8   | 1.9   | 2.0   | 2.0   | 2.1   |
| 30H NOSE BREADTH       | 1.34   | .18   | 1.0  | 1.1   | 1.2   | 1.2   | 1.3   | 1.4   | 1.6   | 1.7   | 1.8   |
| 31H MOUTH BR, SMILING  | 2.31   | .22   | 1.8  | 2.0   | 2.0   | 2.2   | 2.3   | 2.5   | 2.6   | 2.7   | 2.8   |
| 1C WEIGHT              | 132.36 | 17.61 | 99.2 | 104.9 | 109.9 | 119.8 | 131.5 | 143.6 | 155.4 | 163.5 | 183.0 |
| 2C STATURE             | 64.06  | 2.55  | 58.4 | 59.6  | 60.5  | 62.3  | 64.2  | 65.9  | 67.3  | 68.1  | 69.6  |
| 54C HEAD CIRCUMFERENCE | 21.66  | .70   | 20.1 | 20.6  | 20.8  | 21.2  | 21.6  | 22.1  | 22.6  | 22.9  | 23.5  |
| 55C HEAD BREADTH       | 5.75   | .21   | 5.3  | 5.4   | 5.5   | 5.6   | 5.7   | 5.9   | 6.0   | 6.1   | 6.4   |
| 56C HEAD LENGTH        | 7.37   | .29   | 6.7  | 6.9   | 7.0   | 7.2   | 7.4   | 7.5   | 7.7   | 7.9   | 8.1   |
| 70C AGE                | 22.63  | 4.56  | 18.0 | 18.2  | 18.4  | 19.1  | 21.3  | 24.8  | 28.7  | 31.6  | 37.9  |

\*WEIGHT IN POUNDS; ALL OTHER MEASUREMENTS IN INCHES  
AGE IN YEARS

TABLE 6  
CORRELATIONS: HEAD & FACE SERIES (N=215)

|     |                    | --1H-- | --2H-- | --3H-- | --4H-- | --5H-- | --6H-- | --7H-- | --8H-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1H  | SAGITTAL ARC       |        | .516   | .375   | .271   | .220   | .519   | .509   | .444   |
| 2H  | BITRAG-CORONAL ARC | .516   |        | .567   | .292   | .215   | .388   | .382   | .366   |
| 3H  | BITRAG-FRONTAL ARC | .375   | .567   |        | .537   | .471   | .476   | .466   | .458   |
| 4H  | BITRAG-MENTON ARC  | .271   | .292   | .537   |        | .713   | .462   | .444   | .435   |
| 5H  | BITRAG-SUBMAN ARC  | .220   | .215   | .471   | .713   |        | .292   | .271   | .250   |
| 6H  | GLABELLA-WALL      | .519   | .388   | .476   | .462   | .292   |        | .982   | .913   |
| 7H  | SELLION-WALL       | .509   | .382   | .466   | .444   | .271   | .982   |        | .949   |
| 8H  | PRONASALE-WALL     | .444   | .366   | .458   | .435   | .250   | .913   | .949   |        |
| 9H  | SUBNASALE-WALL     | .399   | .358   | .396   | .448   | .215   | .889   | .921   | .967   |
| 10H | STOMION-WALL       | .357   | .366   | .356   | .479   | .205   | .833   | .853   | .896   |
| 11H | MENTON-WALL        | .300   | .332   | .376   | .487   | .211   | .708   | .748   | .812   |
| 12H | ECTOCanthus-WALL   | .397   | .345   | .390   | .468   | .280   | .904   | .888   | .845   |
| 13H | TRAGION-WALL       | .311   | .322   | .180   | .250   | .069   | .787   | .789   | .776   |
| 14H | BITRAGION BREADTH  | .083   | .271   | .461   | .553   | .546   | .144   | .133   | .141   |
| 15H | TRAGION-VERTEX     | .496   | .687   | .405   | .140   | .166   | .378   | .378   | .328   |
| 16H | ECTOCanthus-VERTEX | .516   | .446   | .256   | .294   | .300   | .454   | .388   | .242   |
| 17H | GLABELLA-VERTEX    | .513   | .374   | .215   | .257   | .256   | .432   | .366   | .208   |
| 18H | SELLION-VERTEX     | .485   | .377   | .239   | .331   | .340   | .464   | .387   | .214   |
| 19H | PRONASALE-VERTEX   | .534   | .388   | .330   | .353   | .365   | .503   | .445   | .287   |
| 20H | SUBNASALE-VERTEX   | .529   | .402   | .340   | .369   | .373   | .486   | .435   | .291   |
| 21H | STOMION-VERTEX     | .545   | .443   | .340   | .415   | .419   | .531   | .477   | .339   |
| 22H | MENTON-VERTEX      | .538   | .503   | .399   | .502   | .431   | .527   | .485   | .387   |
| 23H | SELLION-MENTON     | .299   | .347   | .366   | .399   | .353   | .278   | .313   | .348   |
| 24H | CRINION-MENTON     | .236   | .315   | .408   | .460   | .350   | .361   | .367   | .341   |
| 25H | MINIMUM-FRONTAL BR | .219   | .420   | .481   | .434   | .443   | .241   | .235   | .227   |
| 26H | FACE BREADTH       | .094   | .435   | .558   | .653   | .648   | .269   | .249   | .255   |
| 27H | BIOCLAR BREADTH    | .105   | .339   | .429   | .470   | .361   | .333   | .316   | .331   |
| 28H | INTERPUILLARY DIS  | .243   | .247   | .290   | .374   | .293   | .343   | .333   | .321   |
| 29H | SELLION-SUBNASALE  | .102   | .087   | .261   | .132   | .224   | .106   | .167   | .238   |
| 30H | NOSE BREADTH       | .165   | .259   | .144   | .468   | .248   | .422   | .387   | .382   |
| 31H | MOUTH BR SMILING   | .065   | .194   | .204   | .354   | .317   | .248   | .251   | .261   |
| 1C  | WEIGHT             | .285   | .381   | .440   | .480   | .507   | .365   | .361   | .381   |
| 2C  | STATURE            | .313   | .300   | .400   | .312   | .252   | .263   | .280   | .336   |
| 54C | HEAD CIRCUMFERENCE | .606   | .587   | .608   | .541   | .405   | .771   | .761   | .714   |
| 55C | HEAD BREADTH       | .184   | .542   | .396   | .360   | .352   | .267   | .258   | .248   |
| 56C | HEAD LENGTH        | .643   | .339   | .526   | .430   | .291   | .771   | .760   | .697   |
| 70C | AGE                | .043   | .021   | .056   | .053   | .222   | .110   | .113   | .092   |

TABLE 8 CONTINUED  
CORRELATIONS: HEAD & FACE SERIES (N=215)

|     |                    | --9H-- | --10H-- | --11H-- | --12H-- | --13H-- | --14H-- | --15H-- | --16H-- |
|-----|--------------------|--------|---------|---------|---------|---------|---------|---------|---------|
| 1H  | SAGITTAL ARC       | .399   | .357    | .300    | .397    | .311    | .083    | .496    | .516    |
| 2H  | BITRAG-CORONAL ARC | .358   | .366    | .332    | .345    | .322    | .271    | .687    | .446    |
| 3H  | BITRAG-FRONTAL ARC | .396   | .356    | .375    | .390    | .180    | .461    | .405    | .256    |
| 4H  | BITRAG-MENTON ARC  | .448   | .479    | .487    | .468    | .250    | .553    | .140    | .294    |
| 5H  | BITRAG-SUBMAN ARC  | .215   | .205    | .211    | .280    | .069    | .546    | .166    | .300    |
| 6H  | GLABELLA-WALL      | .889   | .833    | .708    | .904    | .787    | .144    | .378    | .454    |
| 7H  | SELLION-WALL       | .921   | .853    | .748    | .888    | .789    | .133    | .378    | .388    |
| 8H  | PRONASALE-WALL     | .967   | .896    | .812    | .845    | .776    | .141    | .328    | .242    |
| 9H  | SUBNASALE-WALL     |        | .962    | .870    | .858    | .820    | .128    | .314    | .223    |
| 10H | STOMION-WALL       | .962   |         | .902    | .829    | .825    | .135    | .282    | .198    |
| 11H | MENTON-WALL        | .870   | .902    |         | .710    | .705    | .171    | .239    | .034    |
| 12H | ECTOCANTHUS-WALL   | .858   | .829    | .710    |         | .841    | .195    | .257    | .349    |
| 13H | TRAGION-WALL       | .820   | .825    | .705    | .841    |         | -.011   | .283    | .232    |
| 14H | BITRAGION BREADTH  | .128   | .135    | .171    | .195    | -.011   |         | .072    | .110    |
| 15H | TRAGION-VERTEX     | .314   | .282    | .239    | .257    | .283    | .072    |         | .662    |
| 16H | ECTOCANTHUS-VERTEX | .223   | .198    | .034    | .349    | .232    | .110    | .662    |         |
| 17H | GLABELLA-VERTEX    | .184   | .160    | -.005   | .280    | .227    | .089    | .528    | .887    |
| 18H | SELLION-VERTEX     | .194   | .163    | .004    | .409    | .218    | .166    | .474    | .908    |
| 19H | PRONASALE-VERTEX   | .231   | .172    | .002    | .392    | .244    | .207    | .488    | .869    |
| 20H | SUBNASALE-VERTEX   | .234   | .175    | .000    | .362    | .232    | .217    | .503    | .862    |
| 21H | STOMION-VERTEX     | .304   | .250    | .036    | .452    | .282    | .226    | .506    | .862    |
| 22H | MENTON-VERTEX      | .353   | .324    | .111    | .443    | .318    | .255    | .553    | .785    |
| 23H | SELLION-MENTON     | .307   | .252    | .140    | .283    | .184    | .183    | .284    | .148    |
| 24H | CRINION-MENTON     | .362   | .363    | .268    | .378    | .269    | .343    | .201    | .169    |
| 25H | MINIMUM-FRONTAL BR | .208   | .239    | .231    | .238    | .154    | .315    | .307    | .309    |
| 26H | FACE BREADTH       | .248   | .276    | .274    | .317    | .147    | .785    | .208    | .205    |
| 27H | BIOCULAR BREADTH   | .388   | .449    | .385    | .358    | .307    | .327    | .134    | .121    |
| 28H | INTERPUPILLARY DIS | .353   | .394    | .315    | .367    | .311    | .152    | .189    | .224    |
| 29H | SELLION-SUBNASALE  | .139   | .017    | -.007   | .066    | -.013   | .244    | .099    | -.017   |
| 30H | NOSE BREADTH       | .476   | .590    | .430    | .520    | .448    | .196    | .092    | .262    |
| 31H | MOUTH BR SMILING   | .288   | .321    | .313    | .269    | .197    | .153    | .153    | .154    |
| 1C  | WEIGHT             | .332   | .305    | .340    | .308    | .215    | .354    | .320    | .208    |
| 2C  | STATURE            | .243   | .167    | .192    | .224    | .130    | .200    | .294    | .177    |
| 54C | HEAD CIRCUMFERENCE | .675   | .653    | .572    | .739    | .575    | .322    | .493    | .473    |
| 55C | HEAD BREADTH       | .233   | .235    | .255    | .308    | .255    | .551    | .357    | .235    |
| 56C | HEAD LENGTH        | .632   | .575    | .499    | .654    | .504    | .131    | .371    | .395    |
| 70C | AGE                | .048   | .070    | .039    | .106    | .057    | .224    | .024    | .047    |

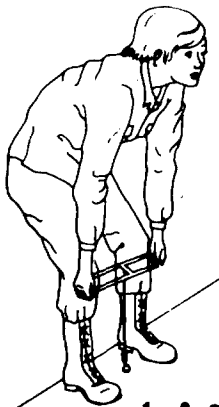
TABLE 8 CONTINUED  
CORRELATIONS: HEAD & FACE SERIES (N=215)

|     |                    | -17H- | -18H- | -19H- | -20H- | -21H- | -22H- | -23H- | -24H- |
|-----|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1H  | SAGITTAL ARC       | .513  | .485  | .534  | .529  | .545  | .538  | .299  | .236  |
| 2H  | BITRAG-CORONAL ARC | .374  | .377  | .388  | .402  | .443  | .503  | .347  | .315  |
| 3H  | BITRAG-FRONTAL ARC | .215  | .239  | .330  | .340  | .340  | .399  | .366  | .408  |
| 4H  | BITRAG-MENTON ARC  | .257  | .331  | .353  | .369  | .415  | .502  | .399  | .460  |
| 5H  | BITRAG-SUBMAN ARC  | .256  | .340  | .365  | .373  | .419  | .431  | .353  | .350  |
| 6H  | GLABELLA-WALL      | .432  | .464  | .503  | .486  | .531  | .527  | .278  | .361  |
| 7H  | SELLION-WALL       | .366  | .387  | .445  | .435  | .477  | .485  | .313  | .367  |
| 8H  | PRONASALE-WALL     | .208  | .214  | .287  | .291  | .339  | .387  | .348  | .341  |
| 9H  | SUBNASALE-WALL     | .184  | .194  | .231  | .234  | .304  | .353  | .307  | .362  |
| 10H | STOMION-WALL       | .160  | .163  | .172  | .175  | .250  | .324  | .252  | .363  |
| 11H | MENTON-WALL        | -.005 | .004  | .002  | .000  | .036  | .111  | .140  | .268  |
| 12H | ECTOCANTHUS-WALL   | .280  | .409  | .392  | .362  | .452  | .443  | .283  | .378  |
| 13H | TRAGION-WALL       | .227  | .218  | .244  | .232  | .282  | .318  | .184  | .269  |
| 14H | BITRAGION BREADTH  | .089  | .166  | .207  | .217  | .226  | .255  | .183  | .343  |
| 15H | TRAGION-VERTEX     | .528  | .474  | .488  | .503  | .506  | .553  | .284  | .201  |
| 16H | ECTOCANTHUS-VERTEX | .887  | .908  | .869  | .862  | .862  | .785  | .148  | .169  |
| 17H | GLABELLA-VERTEX    |       | .879  | .880  | .888  | .829  | .746  | .076  | .074  |
| 18H | SELLION-VERTEX     | .879  |       | .898  | .883  | .894  | .768  | .112  | .162  |
| 19H | PRONASALE-VERTEX   | .880  | .898  |       | .977  | .934  | .841  | .268  | .273  |
| 20H | SUBNASALE-VERTEX   | .888  | .863  | .977  |       | .947  | .862  | .295  | .282  |
| 21H | STOMION-VERTEX     | .829  | .894  | .934  | .947  |       | .916  | .406  | .378  |
| 22H | MENTON-VERTEX      | .746  | .768  | .841  | .862  | .916  |       | .582  | .465  |
| 23H | SELLION-MENTON     | .076  | .112  | .268  | .295  | .406  | .582  |       | .622  |
| 24H | CRINION-MENTON     | .074  | .162  | .273  | .282  | .378  | .465  | .622  |       |
| 25H | MINIMUM-FRONTAL BR | .259  | .265  | .250  | .255  | .270  | .305  | .209  | .223  |
| 26H | FACE BREADTH       | .189  | .234  | .262  | .279  | .310  | .342  | .280  | .377  |
| 27H | BIOCULAR BREADTH   | .072  | .135  | .124  | .133  | .229  | .255  | .220  | .345  |
| 28H | INTERPUILLARY DIS  | .211  | .254  | .213  | .233  | .296  | .309  | .243  | .217  |
| 29H | SELLION-SUBNASALE  | -.019 | -.037 | .248  | .275  | .233  | .274  | .561  | .325  |
| 30H | NOSE BREADTH       | .168  | .297  | .235  | .237  | .365  | .383  | .202  | .345  |
| 31H | MOUTH BR SMILING   | .098  | .153  | .096  | .132  | .183  | .188  | .120  | .236  |
| 1C  | WEIGHT             | .146  | .180  | .179  | .178  | .219  | .279  | .322  | .268  |
| 2C  | STATURE            | .151  | .156  | .234  | .245  | .235  | .301  | .366  | .220  |
| 54C | HEAD CIRCUMFERENCE | .408  | .460  | .488  | .489  | .539  | .570  | .388  | .408  |
| 55C | HEAD BREADTH       | .182  | .218  | .257  | .267  | .282  | .294  | .239  | .321  |
| 56C | HEAD LENGTH        | .364  | .391  | .460  | .453  | .483  | .517  | .360  | .379  |
| 70C | AGE                | .018  | .081  | .106  | .088  | .102  | .073  | .028  | .047  |

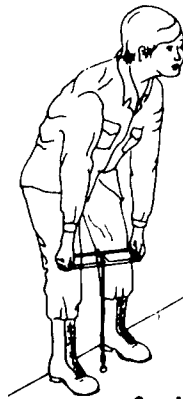
TABLE 8 CONTINUED  
CORRELATIONS: HEAD & FACE SERIES (N=215)

|     |                    | -25H- | -26H- | -27H- | -28H- | -29H- | -30H- | -31H- |
|-----|--------------------|-------|-------|-------|-------|-------|-------|-------|
| 1H  | SAGITTAL ARC       | .219  | .094  | .105  | .243  | .102  | .165  | .065  |
| 2H  | BITRAG-CORONAL ARC | .420  | .435  | .339  | .247  | .087  | .259  | .194  |
| 3H  | BITRAG-FRONTAL ARC | .481  | .558  | .429  | .290  | .261  | .144  | .204  |
| 4H  | BITRAG-MENTON ARC  | .434  | .653  | .470  | .374  | .132  | .468  | .354  |
| 5H  | BITRAG-SUBMAN ARC  | .443  | .648  | .361  | .293  | .224  | .248  | .317  |
| 6H  | GLABELLA-WALL      | .241  | .269  | .333  | .343  | .106  | .422  | .248  |
| 7H  | SELLION-WALL       | .235  | .249  | .316  | .333  | .167  | .387  | .251  |
| 8H  | PRONASALE-WALL     | .227  | .255  | .331  | .321  | .238  | .382  | .261  |
| 9H  | SUBNASALE-WALL     | .208  | .248  | .388  | .353  | .139  | .476  | .288  |
| 10H | STOMION-WALL       | .239  | .276  | .449  | .394  | .017  | .590  | .321  |
| 11H | MENTON-WALL        | .231  | .274  | .385  | .315  | -.007 | .430  | .313  |
| 12H | ECTOANTHUS-WALL    | .238  | .317  | .358  | .367  | .066  | .520  | .269  |
| 13H | TRAGION-WALL       | .154  | .147  | .307  | .311  | -.013 | .448  | .197  |
| 14H | BITRAGION BREADTH  | .315  | .785  | .327  | .152  | .244  | .196  | .153  |
| 15H | TRAGION-VERTEX     | .307  | .208  | .134  | .189  | .099  | .092  | .153  |
| 16H | ECTOANTHUS-VERTEX  | .309  | .205  | .121  | .224  | -.017 | .262  | .154  |
| 17H | GLABELLA-VERTEX    | .259  | .189  | .072  | .211  | -.019 | .168  | .098  |
| 18H | SELLION-VERTEX     | .265  | .234  | .135  | .254  | -.037 | .297  | .153  |
| 19H | PRONASALE-VERTEX   | .250  | .262  | .124  | .213  | .248  | .235  | .096  |
| 20H | SUBNASALE-VERTEX   | .255  | .279  | .133  | .233  | .275  | .237  | .132  |
| 21H | STOMION-VERTEX     | .270  | .310  | .229  | .296  | .233  | .365  | .183  |
| 22H | MENTON-VERTEX      | .305  | .342  | .255  | .309  | .274  | .383  | .188  |
| 23H | SELLION-MENTON     | .209  | .280  | .220  | .243  | .561  | .202  | .120  |
| 24H | CRINION-MENTON     | .223  | .377  | .345  | .217  | .325  | .345  | .236  |
| 25H | MINIMUM-FRONTAL BR |       | .625  | .472  | .561  | -.020 | .242  | .373  |
| 26H | FACE BREADTH       | .625  |       | .533  | .418  | .143  | .319  | .351  |
| 27H | BIOCULAR BREADTH   | .472  | .533  |       | .595  | -.006 | .548  | .439  |
| 28H | INTERPUPILLARY DIS | .561  | .418  | .595  |       | -.065 | .448  | .398  |
| 29H | SELLION-SUBNASALE  | -.020 | .143  | -.006 | -.065 |       | -.095 | -.037 |
| 30H | NOSE BREADTH       | .242  | .319  | .548  | .448  | -.095 |       | .440  |
| 31H | MOUTH BR SMILING   | .373  | .351  | .439  | .398  | -.037 | .440  |       |
| 1C  | WEIGHT             | .351  | .468  | .249  | .195  | .121  | .112  | .183  |
| 2C  | STATURE            | .259  | .226  | .085  | .179  | .370  | -.031 | .029  |
| 54C | HEAD CIRCUMFERENCE | .464  | .455  | .405  | .461  | .102  | .403  | .313  |
| 55C | HEAD BREADTH       | .496  | .654  | .316  | .271  | .122  | .203  | .246  |
| 56C | HEAD LENGTH        | .257  | .193  | .289  | .327  | .177  | .245  | .217  |
| 70C | AGE                | .086  | .194  | -.044 | .054  | .095  | .130  | .103  |

## THE VISUAL INDEX STRENGTH SERIES



1-2 S



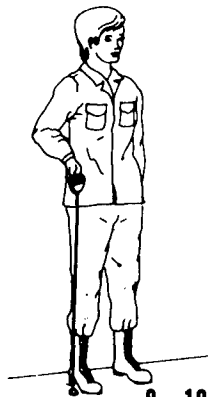
3-4 S



5-6 S



7-8 S



9-10 S



11-12 S



13-14 S



15-16 S



17-18 S

Figure 5. The visual index: strength series.

- 1-2S\* STANDING TWO-HANDED PULL - 38 cm Level: with feet 45 cm apart and knees bent, subject bends at the waist and grasps both sides of the handle directly in front of her. She attempts to lift the handle, primarily using arms and shoulders but also using her legs by extending them upwards.
- 3-4S STANDING TWO-HANDED PULL - 50 cm Level: with feet 45 cm apart and knees straight, subject bends at the waist and grasps both sides of the handle directly in front of her. She attempts to lift the handle, primarily using the arms and shoulders.
- 5-6S STANDING TWO-HANDED PULL - 100 cm Level: with feet 45 cm apart, subject grasps both sides of the handle directly in front of her. She attempts to lift the handle using her arms, keeping knees straight and feet firmly planted.
- 7-8S STANDING TWO-HANDED PUSH - 150 cm Level: with feet 45 cm apart, subject grasps, from below, both sides of the handle directly in front of her. She attempts to push the handle straight upward using arms and shoulders, keeping knees straight and feet firmly planted.
- 9-10S STANDING ONE-HANDED PULL - 100 cm Level (D-RING): with feet 15 cm apart, subject grasps, from the underside, with her dominant hand, the D-ring attached at a point just to the right (or left) of her body. She attempts to lift the D-ring, primarily using her arm, keeping shoulders square, feet firmly planted, and her other arm relaxed at her side.
- 11-12S SEATED ONE-HANDED PULL, CENTERLINE OF SEAT - 45 cm Level (D-RING): subject sits erect, feet 55 cm apart. With her dominant hand, she grasps, from the underside, the D-ring attached just forward of the chair in its vertical midplane. She attempts to lift the D-ring, keeping shoulders square, feet firmly planted, and her other arm in her lap.
- 13-14S SEATED ONE-HANDED PULL, SIDE OF SEAT - 45 cm Level (D-RING): subject sits erect, feet 55 cm apart. With her dominant hand, she grasps, from the underside, the D-ring attached a short distance to the right (or left) of the point midway between the maximal protrusion of the buttock and knee. She attempts to lift the D-ring keeping shoulders square, her feet firmly planted, and her other arm in her lap.
- 15-16S SEATED TWO-HANDED PULL, CENTERLINE OF SEAT - 38 cm Level (SHORT HANDLE): Subject sits erect, feet 55 cm apart. She bends slightly at the waist and grasps both sides of the handle attached just forward of the chair and in its vertical midplane. She attempts to lift the handle, primarily using arms and shoulders, keeping feet flat and arms off her thighs.
- 17-18S SEATED TWO-HANDED PULL, CENTERLINE OF SEAT - 50 cm Level (SHORT HANDLE): Subject sits erect, feet 55 cm apart. She bends slightly at the waist and grasps both sides of the handle attached just forward of the chair and in its vertical midplane. She attempts to lift the handle, primarily using arms and shoulders, keeping feet flat and arms off her thighs.

---

\* The first of each pair of numbers represents the average value and the second represents the peak value for each measurement.

TABLE 9A  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
STATIC STRENGTH SERIES (N=344)

| METRIC UNITS*          | MEAN  | SD    | 1ST  | 5TH  | 10TH | 25TH | 50TH | 75TH | 90TH | 95TH | 99TH  |
|------------------------|-------|-------|------|------|------|------|------|------|------|------|-------|
| 1S STAND TWO-H 38 A1   | 60.15 | 15.17 | 27.7 | 35.4 | 40.5 | 49.6 | 59.8 | 69.8 | 79.2 | 85.5 | 100.1 |
| 2S STAND TWO-H 38 P1   | 66.77 | 15.50 | 33.3 | 41.9 | 47.0 | 56.1 | 66.5 | 77.1 | 86.8 | 92.9 | 105.2 |
| 3S STAND TWO-H 50 A1   | 60.39 | 16.14 | 25.6 | 34.6 | 39.8 | 49.0 | 59.9 | 71.2 | 81.5 | 87.4 | 97.7  |
| 4S STAND TWO-H 50 P1   | 66.70 | 16.57 | 29.9 | 39.3 | 45.0 | 55.1 | 66.6 | 78.0 | 87.9 | 93.7 | 104.7 |
| 5S STAND TWO-H 100 A1  | 32.18 | 8.14  | 17.6 | 20.1 | 21.8 | 26.2 | 31.9 | 37.7 | 42.9 | 46.3 | 53.8  |
| 6S STAND TWO-H 100 P1  | 35.88 | 8.70  | 19.8 | 23.0 | 25.3 | 29.6 | 35.1 | 41.2 | 47.4 | 51.5 | 60.7  |
| 7S STAND TWO-H 150 A1  | 27.08 | 7.33  | 14.0 | 16.6 | 18.6 | 22.2 | 26.3 | 30.7 | 35.8 | 39.8 | 50.6  |
| 8S STAND TWO-H 150 P1  | 30.70 | 8.03  | 17.1 | 19.9 | 21.9 | 25.5 | 29.8 | 34.5 | 40.2 | 44.8 | 57.8  |
| 9S STAND ONE-H 100 A1  | 20.00 | 6.01  | 9.4  | 11.8 | 13.2 | 15.5 | 19.5 | 24.1 | 26.9 | 29.1 | 38.7  |
| 10S STAND ONE-H 100 P1 | 23.34 | 6.81  | 11.4 | 14.3 | 15.4 | 17.9 | 22.8 | 27.4 | 31.5 | 33.4 | 46.1  |
| 11S SEATED CENTER-S A1 | 24.45 | 9.06  | 9.9  | 11.9 | 13.5 | 17.3 | 23.2 | 30.5 | 37.4 | 41.2 | 46.6  |
| 12S SEATED CENTER-S P1 | 28.54 | 10.29 | 11.5 | 13.9 | 15.9 | 20.4 | 27.2 | 35.4 | 43.2 | 47.5 | 53.6  |
| 13S SEATED SIDE-S A1   | 22.98 | 7.20  | 9.5  | 12.0 | 13.9 | 17.7 | 22.5 | 27.6 | 32.5 | 35.5 | 41.5  |
| 14S SEATED SIDE-S P1   | 26.73 | 8.07  | 11.3 | 14.9 | 16.8 | 20.7 | 26.0 | 32.2 | 38.0 | 41.2 | 45.5  |
| 15S SEATED TWO-H 38 A1 | 51.02 | 16.35 | 19.6 | 26.0 | 30.4 | 39.1 | 49.9 | 61.6 | 73.0 | 80.2 | 94.9  |
| 16S SEATED TWO-H 38 P1 | 57.10 | 16.98 | 22.1 | 31.0 | 36.0 | 45.0 | 56.0 | 68.1 | 79.8 | 87.2 | 101.3 |
| 17S SEATED TWO-H 50 A1 | 42.54 | 13.14 | 17.6 | 21.9 | 25.5 | 32.8 | 42.0 | 51.7 | 60.5 | 65.8 | 75.9  |
| 18S SEATED TWO-H 50 P1 | 47.94 | 14.07 | 21.6 | 25.7 | 29.6 | 37.6 | 47.4 | 57.2 | 66.3 | 72.1 | 85.3  |

\*IN KILOGRAMS. In reporting the strength data, the conventional units of kilograms and pounds have been used. However, in accordance with the International System of Units, generally known as "SI", the correct unit for reporting kilograms or pounds of force is the newton. The kilogram-force values reported here may be converted to newtons by multiplying by 9.806, while the pound-force values may be converted to newtons by multiplying by 4.448.

TABLE 9B  
SUMMARY STATISTICS AND SELECTED PERCENTILES  
STATIC STRENGTH SERIES (N=344)

| ENGLISH UNITS*         | MEAN   | SD    | PERCENTILES |      |       |       |       |       |       |       |       |  |
|------------------------|--------|-------|-------------|------|-------|-------|-------|-------|-------|-------|-------|--|
|                        |        |       | 1ST         | 5TH  | 10TH  | 25TH  | 50TH  | 75TH  | 90TH  | 95TH  | 99TH  |  |
| 1S STAND TWO-H 38 A1   | 132.60 | 33.44 | 61.2        | 78.0 | 89.2  | 109.4 | 131.9 | 153.9 | 174.6 | 188.4 | 220.7 |  |
| 2S STAND TWO-H 38 P1   | 147.21 | 34.17 | 73.4        | 92.3 | 103.7 | 123.7 | 146.7 | 169.9 | 191.5 | 204.9 | 232.0 |  |
| 3S STAND TWO-H 50 A1   | 133.15 | 35.59 | 56.4        | 76.4 | 87.8  | 108.0 | 132.0 | 157.0 | 179.6 | 192.7 | 215.5 |  |
| 4S STAND TWO-H 50 P1   | 147.04 | 36.52 | 66.0        | 86.5 | 99.1  | 121.5 | 146.9 | 172.0 | 193.8 | 206.7 | 230.8 |  |
| 5S STAND TWO-H 100 A1  | 70.95  | 17.95 | 38.8        | 44.4 | 48.0  | 57.7  | 70.4  | 83.1  | 94.6  | 102.1 | 118.7 |  |
| 6S STAND TWO-H 100 P1  | 79.09  | 19.18 | 43.7        | 50.7 | 55.7  | 65.4  | 77.5  | 90.9  | 104.5 | 113.6 | 133.7 |  |
| 7S STAND TWO-H 150 A1  | 59.71  | 16.17 | 30.9        | 36.7 | 41.0  | 48.9  | 58.0  | 67.8  | 78.9  | 87.7  | 111.5 |  |
| 8S STAND TWO-H 150 P1  | 67.67  | 17.70 | 37.7        | 43.8 | 48.2  | 56.3  | 65.6  | 76.0  | 88.6  | 98.8  | 127.3 |  |
| 9S STAND ONE-H 100 A1  | 44.10  | 13.25 | 20.6        | 26.0 | 29.1  | 34.1  | 42.9  | 53.0  | 59.4  | 64.1  | 85.3  |  |
| 10S STAND ONE-H 100 P1 | 51.45  | 15.01 | 25.1        | 31.5 | 34.0  | 39.5  | 50.2  | 60.5  | 69.3  | 73.6  | 101.7 |  |
| 11S SEATED CENTER-S A1 | 53.89  | 19.97 | 21.9        | 26.3 | 29.8  | 38.2  | 51.2  | 67.2  | 82.4  | 90.9  | 102.7 |  |
| 12S SEATED CENTER-S P1 | 62.91  | 22.69 | 25.3        | 30.8 | 35.1  | 45.0  | 60.0  | 78.1  | 95.2  | 104.7 | 118.1 |  |
| 13S SEATED SIDE-S A1   | 50.66  | 15.88 | 20.8        | 26.5 | 30.7  | 39.0  | 49.5  | 60.9  | 71.6  | 78.3  | 91.4  |  |
| 14S SEATED SIDE-S P1   | 58.92  | 17.79 | 24.9        | 32.8 | 37.1  | 45.5  | 57.2  | 71.0  | 83.8  | 90.9  | 100.3 |  |
| 15S SEATED TWO-H 38 A1 | 112.48 | 36.04 | 43.2        | 57.2 | 67.1  | 86.1  | 109.9 | 135.9 | 160.9 | 176.8 | 209.2 |  |
| 16S SEATED TWO-H 38 P1 | 125.89 | 37.44 | 48.6        | 68.4 | 79.5  | 99.3  | 123.5 | 150.1 | 176.0 | 192.2 | 223.2 |  |
| 17S SEATED TWO-H 50 A1 | 93.78  | 28.96 | 38.8        | 48.2 | 56.2  | 72.3  | 92.6  | 113.9 | 133.3 | 145.0 | 167.3 |  |
| 18S SEATED TWO-H 50 P1 | 105.68 | 31.01 | 47.6        | 56.6 | 65.3  | 83.0  | 104.4 | 126.1 | 146.1 | 159.1 | 188.0 |  |

\* IN POUNDS

TABLE 10  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    | --1S-- | --2S-- | --3S-- | --4S-- | --5S-- | --6S-- | --7S-- | --8S-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1S  | STAND TWO-H 38 A1  |        | .967   | .809   | .806   | .593   | .586   | .621   | .601   |
| 2S  | STAND TWO-H 38 P1  | .967   |        | .818   | .826   | .626   | .624   | .645   | .633   |
| 3S  | STAND TWO-H 50 A1  | .809   | .818   |        | .981   | .579   | .578   | .585   | .567   |
| 4S  | STAND TWO-H 50 P1  | .806   | .826   | .981   |        | .586   | .594   | .582   | .572   |
| 5S  | STAND TWO-H 100 A1 | .593   | .626   | .579   | .586   |        | .977   | .762   | .766   |
| 6S  | STAND TWO-H 100 P1 | .586   | .624   | .578   | .594   | .977   |        | .762   | .780   |
| 7S  | STAND TWO-H 150 A1 | .621   | .645   | .585   | .582   | .762   | .762   |        | .979   |
| 8S  | STAND TWO-H 150 P1 | .601   | .633   | .567   | .572   | .766   | .780   | .979   |        |
| 9S  | STAND ONE-H 100 A1 | .426   | .446   | .374   | .391   | .604   | .601   | .561   | .570   |
| 10S | STAND ONE-H 100 P1 | .413   | .442   | .372   | .400   | .605   | .617   | .558   | .575   |
| 11S | SEATED CENTER-S A1 | .481   | .495   | .451   | .462   | .393   | .406   | .384   | .380   |
| 12S | SEATED CENTER-S P1 | .480   | .511   | .461   | .479   | .409   | .433   | .388   | .391   |
| 13S | SEATED SIDE-S A1   | .496   | .505   | .482   | .484   | .442   | .454   | .425   | .417   |
| 14S | SEATED SIDE-S P1   | .471   | .488   | .456   | .469   | .436   | .456   | .402   | .399   |
| 15S | SEATED TWO-H 38 A1 | .612   | .636   | .612   | .613   | .523   | .515   | .530   | .522   |
| 16S | SEATED TWO-H 38 P1 | .610   | .642   | .607   | .618   | .532   | .535   | .526   | .526   |
| 17S | SEATED TWO-H 50 A1 | .533   | .562   | .541   | .533   | .523   | .513   | .487   | .483   |
| 18S | SEATED TWO-H 50 P1 | .528   | .564   | .536   | .538   | .542   | .543   | .498   | .501   |
| 1C  | WEIGHT             | .265   | .306   | .282   | .278   | .490   | .489   | .481   | .487   |
| 2C  | STATURE            | .178   | .196   | .113   | .106   | .477   | .477   | .527   | .545   |
| 3C  | SHOULDER HEIGHT    | .190   | .211   | .142   | .133   | .496   | .497   | .542   | .555   |
| 4C  | AXILLA HEIGHT      | .166   | .185   | .108   | .099   | .476   | .479   | .526   | .540   |
| 5C  | BUSTPOINT HEIGHT   | .144   | .162   | .098   | .091   | .430   | .433   | .480   | .494   |
| 6C  | WAIST HEIGHT       | .154   | .171   | .130   | .135   | .449   | .454   | .479   | .506   |
| 7C  | CROTCH HEIGHT      | .160   | .186   | .135   | .143   | .446   | .455   | .480   | .504   |
| 8C  | BUTTOCK HEIGHT     | .129   | .157   | .125   | .134   | .450   | .456   | .470   | .496   |
| 9C  | KNEECAP HEIGHT     | .153   | .161   | .095   | .097   | .434   | .442   | .458   | .474   |
| 10C | CALF HEIGHT        | .142   | .153   | .091   | .098   | .412   | .412   | .443   | .462   |
| 11C | SITTING HEIGHT     | .127   | .133   | .039   | .016   | .308   | .297   | .362   | .369   |
| 12C | EYE HEIGHT/SIT     | .138   | .141   | .048   | .024   | .286   | .271   | .344   | .346   |
| 13C | SHOULDER-ELBOW L   | .198   | .217   | .222   | .222   | .467   | .469   | .472   | .496   |
| 14C | ELBOW-FINGERTIP    | .149   | .169   | .133   | .146   | .475   | .482   | .480   | .512   |
| 15C | KNEE HEIGHT/SIT    | .219   | .234   | .159   | .166   | .483   | .492   | .510   | .526   |
| 16C | POPLITEAL HEIGHT   | .154   | .165   | .117   | .125   | .422   | .436   | .462   | .482   |
| 17C | BUTTOCK-KNEE LGTH  | .179   | .222   | .192   | .199   | .474   | .479   | .482   | .508   |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    | --1S-- | --2S-- | --3S-- | --4S-- | --5S-- | --6S-- | --7S-- | --8S-- |
|-----|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| 18C | BUST DEPTH         | .119   | .146   | .155   | .143   | .232   | .227   | .176   | .170   |
| 19C | WAIST DEPTH        | .063   | .089   | .108   | .107   | .215   | .195   | .154   | .151   |
| 20C | CHEST BREADTH      | .204   | .228   | .240   | .233   | .330   | .326   | .281   | .276   |
| 21C | WAIST BREADTH      | .204   | .229   | .230   | .222   | .273   | .260   | .246   | .224   |
| 22C | HIP BREADTH        | .173   | .195   | .185   | .181   | .267   | .254   | .292   | .278   |
| 23C | SHOULDER BREADTH   | .227   | .265   | .266   | .265   | .390   | .382   | .347   | .343   |
| 24C | NECK CIRCUMFERENCE | .190   | .215   | .161   | .166   | .344   | .342   | .338   | .360   |
| 25C | SHOULDER CIRC      | .224   | .261   | .266   | .265   | .398   | .387   | .349   | .348   |
| 26C | CHEST CIRC AT SCYE | .276   | .302   | .319   | .311   | .406   | .395   | .368   | .363   |
| 27C | BUST CIRCUMFERENCE | .203   | .240   | .247   | .240   | .326   | .315   | .270   | .269   |
| 28C | CHEST C BELOW BUST | .254   | .295   | .284   | .273   | .361   | .354   | .340   | .334   |
| 29C | WAIST CIRC         | .155   | .185   | .184   | .177   | .257   | .242   | .219   | .206   |
| 30C | HIP CIRCUMFERENCE  | .190   | .223   | .208   | .205   | .322   | .314   | .338   | .332   |
| 31C | VERTICAL TRUNK CIR | .222   | .244   | .188   | .169   | .423   | .414   | .455   | .452   |
| 32C | ARM CIRC AT SCYE   | .253   | .289   | .323   | .319   | .422   | .413   | .424   | .425   |
| 33C | BICEPS CIRC, FLXD  | .257   | .306   | .326   | .318   | .427   | .417   | .406   | .403   |
| 34C | ELBOW CIRC, FLXD   | .291   | .323   | .301   | .298   | .498   | .492   | .487   | .500   |
| 35C | FOREARM CIRC, FLXD | .326   | .362   | .354   | .349   | .524   | .512   | .489   | .493   |
| 36C | WRIST CIRC         | .256   | .285   | .306   | .314   | .435   | .433   | .484   | .488   |
| 37C | UPPER THIGH CIRC   | .236   | .269   | .266   | .260   | .343   | .334   | .341   | .330   |
| 38C | KNEE CIRCUMFERENCE | .206   | .236   | .195   | .195   | .375   | .373   | .386   | .388   |
| 39C | CALF CIRCUMFERENCE | .228   | .268   | .233   | .225   | .329   | .334   | .364   | .370   |
| 40C | ANKLE CIRC         | .186   | .216   | .197   | .198   | .294   | .293   | .362   | .370   |
| 41C | SHOULDER LENGTH    | .144   | .133   | .095   | .108   | .251   | .236   | .216   | .225   |
| 42C | INTERSCYE BACK     | .163   | .172   | .157   | .157   | .300   | .290   | .273   | .282   |
| 43C | INTERSCYE FRONT    | .141   | .168   | .132   | .142   | .266   | .265   | .245   | .261   |
| 44C | BACK ARC, BUST     | .243   | .275   | .284   | .275   | .335   | .320   | .320   | .307   |
| 45C | BACK ARC, WAIST    | .197   | .231   | .249   | .243   | .280   | .263   | .249   | .236   |
| 46C | BACK ARC, HIP      | .137   | .170   | .186   | .176   | .311   | .302   | .307   | .302   |
| 47C | WAIST BACK         | .130   | .116   | .054   | .021   | .254   | .242   | .239   | .238   |
| 48C | WAIST FRONT        | .157   | .149   | .095   | .064   | .209   | .199   | .245   | .228   |
| 49C | NECK-BUSTPOINT LGT | .176   | .192   | .185   | .187   | .280   | .277   | .266   | .268   |
| 50C | AXILLA-WAIST LEVEL | .021   | .014   | -.038  | -.077  | .107   | .087   | .141   | .119   |
| 51C | SLEEVE INSEAM      | .122   | .139   | .119   | .127   | .429   | .436   | .426   | .458   |
| 52C | SLEEVE OUTSEAM     | .139   | .157   | .148   | .149   | .443   | .446   | .438   | .460   |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    | <u>1S</u> | <u>2S</u> | <u>3S</u> | <u>4S</u> | <u>5S</u> | <u>6S</u> | <u>7S</u> | <u>8S</u> |
|-----|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 53C | CROTCH LENGTH      | .108      | .130      | .126      | .134      | .241      | .239      | .235      | .244      |
| 54C | HEAD CIRCUMFERENCE | .152      | .175      | .147      | .151      | .314      | .309      | .283      | .289      |
| 55C | HEAD BREADTH       | .109      | .137      | .109      | .106      | .144      | .122      | .101      | .103      |
| 56C | HEAD LENGTH        | .149      | .172      | .133      | .137      | .267      | .273      | .276      | .277      |
| 57C | PALM LENGTH        | .101      | .122      | .113      | .114      | .412      | .422      | .401      | .430      |
| 58C | HAND BREADTH       | .223      | .255      | .250      | .252      | .428      | .425      | .424      | .431      |
| 59C | HAND CIRCUMFERENCE | .261      | .291      | .274      | .277      | .440      | .438      | .449      | .452      |
| 60C | HAND LENGTH        | .165      | .183      | .152      | .161      | .464      | .470      | .445      | .477      |
| 61C | INSTEP LENGTH      | .155      | .191      | .160      | .167      | .420      | .423      | .469      | .494      |
| 62C | FOOT LENGTH        | .169      | .202      | .148      | .159      | .449      | .459      | .493      | .524      |
| 63C | HEEL-ANKLE CIRC    | .235      | .264      | .254      | .255      | .504      | .505      | .521      | .535      |
| 64C | FOOT BREADTH       | .164      | .179      | .138      | .146      | .299      | .310      | .289      | .290      |
| 65C | HEEL BREADTH       | .143      | .162      | .186      | .179      | .379      | .388      | .390      | .397      |
| 66C | FOOT CIRCUMFERENCE | .201      | .218      | .197      | .203      | .381      | .388      | .405      | .411      |
| 67C | INSTEP CIRC        | .241      | .261      | .245      | .255      | .447      | .458      | .446      | .464      |
| 68C | ANKLE HEIGHT       | .122      | .118      | .088      | .084      | .307      | .314      | .304      | .314      |
| 69C | SPHYRION HEIGHT    | .214      | .203      | .151      | .143      | .177      | .179      | .200      | .197      |
| 70C | AGE                | -.055     | -.034     | -.005     | -.027     | .047      | .024      | -.063     | -.080     |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    |  | --9S-- | --10S-- | --11S-- | --12S-- | --13S-- | --14S-- | --15S-- | --16S-- |
|-----|--------------------|--|--------|---------|---------|---------|---------|---------|---------|---------|
| 1S  | STAND TWO-H 38 A1  |  | .426   | .413    | .481    | .480    | .496    | .471    | .612    | .610    |
| 2S  | STAND TWO-H 38 P1  |  | .446   | .442    | .495    | .511    | .505    | .488    | .636    | .642    |
| 3S  | STAND TWO-H 50 A1  |  | .374   | .372    | .451    | .461    | .482    | .456    | .612    | .607    |
| 4S  | STAND TWO-H 50 P1  |  | .391   | .400    | .462    | .479    | .484    | .469    | .613    | .618    |
| 5S  | STAND TWO-H 100 A1 |  | .604   | .605    | .393    | .409    | .442    | .436    | .523    | .532    |
| 6S  | STAND TWO-H 100 P1 |  | .601   | .617    | .406    | .433    | .454    | .456    | .515    | .535    |
| 7S  | STAND TWO-H 150 A1 |  | .561   | .558    | .384    | .388    | .425    | .402    | .530    | .526    |
| 8S  | STAND TWO-H 150 P1 |  | .570   | .575    | .380    | .391    | .417    | .399    | .522    | .526    |
| 9S  | STAND ONE-H 100 A1 |  |        | .972    | .532    | .525    | .503    | .509    | .431    | .440    |
| 10S | STAND ONE-H 100 P1 |  | .972   |         | .544    | .547    | .520    | .540    | .441    | .461    |
| 11S | SEATED CENTER-S A1 |  | .532   | .544    |         | .974    | .763    | .773    | .632    | .629    |
| 12S | SEATED CENTER-S P1 |  | .525   | .547    | .974    |         | .773    | .793    | .620    | .630    |
| 13S | SEATED SIDE-S A1   |  | .503   | .520    | .763    | .773    |         | .974    | .587    | .586    |
| 14S | SEATED SIDE-S P1   |  | .509   | .540    | .773    | .793    | .974    |         | .584    | .592    |
| 15S | SEATED TWO-H 38 A1 |  | .431   | .441    | .632    | .620    | .587    | .584    |         | .983    |
| 16S | SEATED TWO-H 38 P1 |  | .440   | .461    | .629    | .630    | .586    | .592    | .983    |         |
| 17S | SEATED TWO-H 50 A1 |  | .413   | .423    | .580    | .576    | .567    | .571    | .710    | .694    |
| 18S | SEATED TWO-H 50 P1 |  | .424   | .447    | .569    | .577    | .572    | .588    | .699    | .697    |
| 1C  | WEIGHT             |  | .392   | .395    | .168    | .188    | .172    | .171    | .249    | .266    |
| 2C  | STATURE            |  | .409   | .394    | .023    | .028    | .087    | .076    | .122    | .120    |
| 3C  | SHOULDER HEIGHT    |  | .426   | .414    | .051    | .055    | .107    | .093    | .147    | .144    |
| 4C  | AXILLA HEIGHT      |  | .418   | .406    | .027    | .028    | .086    | .073    | .117    | .113    |
| 5C  | BUSTPOINT HEIGHT   |  | .373   | .362    | -.005   | -.001   | .057    | .046    | .098    | .095    |
| 6C  | WAIST HEIGHT       |  | .335   | .330    | -.025   | -.014   | .025    | .016    | .071    | .068    |
| 7C  | CROTCH HEIGHT      |  | .394   | .392    | -.013   | -.006   | .008    | -.009   | .070    | .072    |
| 8C  | BUTTOCK HEIGHT     |  | .383   | .379    | -.035   | -.024   | -.011   | -.033   | .070    | .079    |
| 9C  | KNEECAP HEIGHT     |  | .357   | .346    | -.036   | -.030   | -.006   | -.020   | .064    | .064    |
| 10C | CALF HEIGHT        |  | .351   | .338    | -.060   | -.058   | -.020   | -.046   | .025    | .032    |
| 11C | SITTING HEIGHT     |  | .248   | .228    | .073    | .075    | .165    | .175    | .149    | .144    |
| 12C | EYE HEIGHT/SIT     |  | .228   | .209    | .079    | .079    | .154    | .160    | .165    | .151    |
| 13C | SHOULDER-ELBOW L   |  | .348   | .338    | .021    | .029    | .076    | .053    | .133    | .128    |
| 14C | ELBOW-FINGERTIP    |  | .382   | .375    | -.008   | -.004   | .038    | .016    | .095    | .100    |
| 15C | KNEE HEIGHT/SIT    |  | .423   | .410    | .056    | .063    | .053    | .036    | .139    | .143    |
| 16C | POPLITEAL HEIGHT   |  | .364   | .351    | -.011   | -.015   | -.006   | -.021   | .085    | .082    |
| 17C | BUTTOCK-KNEE LGTH  |  | .382   | .372    | .009    | .017    | .012    | -.012   | .089    | .103    |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    | --9S-- | --10S-- | --11S-- | --12S-- | --13S-- | --14S-- | --15S-- | --16S-- |
|-----|--------------------|--------|---------|---------|---------|---------|---------|---------|---------|
| 18C | BUST DEPTH         | .182   | .184    | .095    | .119    | .079    | .084    | .102    | .119    |
| 19C | WAIST DEPTH        | .178   | .173    | .028    | .040    | -.016   | -.023   | .044    | .060    |
| 20C | CHEST BREADTH      | .227   | .239    | .162    | .182    | .119    | .128    | .205    | .213    |
| 21C | WAIST BREADTH      | .247   | .253    | .155    | .160    | .124    | .116    | .174    | .178    |
| 22C | HIP BREADTH        | .227   | .226    | .093    | .103    | .092    | .102    | .154    | .158    |
| 23C | SHOULDER BREADTH   | .305   | .312    | .154    | .164    | .144    | .148    | .242    | .252    |
| 24C | NECK CIRCUMFERENCE | .302   | .301    | .100    | .112    | .115    | .112    | .185    | .200    |
| 25C | SHOULDER CIRC      | .298   | .303    | .137    | .145    | .133    | .136    | .229    | .240    |
| 26C | CHEST CIRC AT SCYE | .292   | .297    | .201    | .205    | .173    | .173    | .250    | .260    |
| 27C | BUST CIRCUMFERENCE | .271   | .275    | .140    | .160    | .099    | .104    | .181    | .199    |
| 28C | CHEST C BELOW BUST | .289   | .293    | .183    | .205    | .149    | .148    | .214    | .226    |
| 29C | WAIST CIRC         | .231   | .230    | .093    | .099    | .052    | .046    | .131    | .140    |
| 30C | HIP CIRCUMFERENCE  | .287   | .282    | .104    | .118    | .097    | .093    | .166    | .179    |
| 31C | VERTICAL TRUNK CIR | .357   | .342    | .170    | .178    | .204    | .199    | .220    | .228    |
| 32C | ARM CIRC AT SCYE   | .331   | .328    | .186    | .203    | .188    | .187    | .268    | .278    |
| 33C | BICEPS CIRC, FLXD  | .315   | .317    | .226    | .245    | .211    | .212    | .292    | .306    |
| 34C | ELBOW CIRC, FLXD   | .363   | .358    | .199    | .205    | .237    | .236    | .294    | .310    |
| 35C | FOREARM CIRC, FLXD | .366   | .366    | .245    | .252    | .237    | .238    | .343    | .361    |
| 36C | WRIST CIRC         | .384   | .382    | .162    | .166    | .207    | .200    | .264    | .274    |
| 37C | UPPER THIGH CIRC   | .282   | .285    | .169    | .186    | .145    | .147    | .236    | .246    |
| 38C | KNEE CIRCUMFERENCE | .348   | .340    | .108    | .116    | .147    | .134    | .162    | .182    |
| 39C | CALF CIRCUMFERENCE | .260   | .263    | .174    | .197    | .190    | .187    | .264    | .282    |
| 40C | ANKLE CIRC         | .307   | .305    | .203    | .204    | .223    | .217    | .228    | .237    |
| 41C | SHOULDER LENGTH    | .175   | .177    | .030    | .027    | .044    | .042    | .173    | .190    |
| 42C | INTERSCYE BACK     | .202   | .209    | .052    | .037    | .024    | .020    | .135    | .136    |
| 43C | INTERSCYE FRONT    | .264   | .264    | .134    | .148    | .136    | .131    | .204    | .226    |
| 44C | BACK ARC, BUST     | .248   | .248    | .158    | .168    | .150    | .146    | .176    | .178    |
| 45C | BACK ARC, WAIST    | .253   | .261    | .136    | .149    | .109    | .105    | .155    | .165    |
| 46C | BACK ARC, HIP      | .253   | .244    | .080    | .093    | .112    | .113    | .127    | .142    |
| 47C | WAIST BACK         | .205   | .187    | .109    | .098    | .153    | .149    | .132    | .124    |
| 48C | WAIST FRONT        | .233   | .225    | .141    | .139    | .172    | .162    | .191    | .189    |
| 49C | NECK-BUSTPOINT LGT | .264   | .258    | .165    | .176    | .144    | .140    | .186    | .203    |
| 50C | AXILLA-WAIST LEVEL | .152   | .141    | .041    | .023    | .068    | .046    | .050    | .036    |
| 51C | SLEEVE INSEAM      | .306   | .295    | -.050   | -.050   | .005    | -.020   | .048    | .043    |
| 52C | SLEEVE OUTSEAM     | .351   | .342    | -.009   | -.001   | .037    | .011    | .082    | .079    |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    | --9S-- | --10S-- | --11S-- | --12S-- | --13S-- | --14S-- | --15S-- | --16S-- |
|-----|--------------------|--------|---------|---------|---------|---------|---------|---------|---------|
| 53C | CROTCH LENGTH      | .180   | .173    | .079    | .091    | .082    | .089    | .084    | .091    |
| 54C | HEAD CIRCUMFERENCE | .206   | .204    | .071    | .076    | .074    | .067    | .131    | .141    |
| 55C | HEAD BREADTH       | .066   | .075    | .090    | .096    | .063    | .055    | .078    | .085    |
| 56C | HEAD LENGTH        | .179   | .179    | .064    | .077    | .080    | .075    | .131    | .139    |
| 57C | PALM LENGTH        | .380   | .384    | .016    | .034    | .106    | .081    | .092    | .103    |
| 58C | HAND BREADTH       | .324   | .333    | .136    | .142    | .198    | .187    | .223    | .236    |
| 59C | HAND CIRCUMFERENCE | .310   | .322    | .175    | .177    | .203    | .200    | .254    | .268    |
| 60C | HAND LENGTH        | .405   | .407    | .029    | .045    | .098    | .072    | .115    | .127    |
| 61C | INSTEP LENGTH      | .367   | .368    | .058    | .069    | .084    | .062    | .143    | .157    |
| 62C | FOOT LENGTH        | .399   | .394    | .077    | .096    | .124    | .109    | .138    | .157    |
| 63C | HEEL-ANKLE CIRC    | .405   | .397    | .129    | .137    | .210    | .184    | .220    | .229    |
| 64C | FOOT BREADTH       | .199   | .206    | .103    | .121    | .130    | .140    | .147    | .171    |
| 65C | HEEL BREADTH       | .268   | .272    | .082    | .099    | .153    | .141    | .144    | .150    |
| 66C | FOOT CIRCUMFERENCE | .287   | .292    | .129    | .140    | .159    | .153    | .205    | .226    |
| 67C | INSTEP CIRC        | .341   | .347    | .165    | .170    | .185    | .171    | .236    | .248    |
| 68C | ANKLE HEIGHT       | .180   | .176    | -.080   | -.081   | -.044   | -.043   | .049    | .052    |
| 69C | SPHYRION HEIGHT    | .129   | .131    | .151    | .142    | .128    | .133    | .172    | .179    |
| 70C | AGE                | .018   | -.017   | -.097   | -.092   | -.053   | -.057   | -.019   | -.022   |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    |      | -17S- | -18S- |
|-----|--------------------|------|-------|-------|
| 1S  | STAND TWO-H 38 A1  | .533 | .528  |       |
| 2S  | STAND TWO-H 38 P1  | .562 | .564  |       |
| 3S  | STAND TWO-H 50 A1  | .541 | .536  |       |
| 4S  | STAND TWO-H 50 P1  | .533 | .538  |       |
| 5S  | STAND TWO-H 100 A1 | .523 | .542  |       |
| 6S  | STAND TWO-H 100 P1 | .513 | .543  |       |
| 7S  | STAND TWO-H 150 A1 | .487 | .498  |       |
| 8S  | STAND TWO-H 150 P1 | .483 | .501  |       |
| 9S  | STAND ONE-H 100 A1 | .413 | .424  |       |
| 10S | STAND ONE-H 100 P1 | .423 | .447  |       |
| 11S | SEATED CENTER-S A1 | .580 | .569  |       |
| 12S | SEATED CENTER-S P1 | .576 | .577  |       |
| 13S | SEATED SIDE-S A1   | .567 | .572  |       |
| 14S | SEATED SIDE-S P1   | .571 | .588  |       |
| 15S | SEATED TWO-H 38 A1 | .710 | .699  |       |
| 16S | SEATED TWO-H 38 P1 | .694 | .697  |       |
| 17S | SEATED TWO-H 50 A1 |      | .978  |       |
| 18S | SEATED TWO-H 50 P1 | .978 |       |       |
| 1C  | WEIGHT             | .209 | .231  |       |
| 2C  | STATURE            | .110 | .112  |       |
| 3C  | SHOULDER HEIGHT    | .127 | .129  |       |
| 4C  | AXILLA HEIGHT      | .115 | .113  |       |
| 5C  | BUSTPOINT HEIGHT   | .096 | .092  |       |
| 6C  | WAIST HEIGHT       | .064 | .069  |       |
| 7C  | CROTCH HEIGHT      | .095 | .096  |       |
| 8C  | BUTTOCK HEIGHT     | .092 | .101  |       |
| 9C  | KNEECAP HEIGHT     | .047 | .054  |       |
| 10C | CALF HEIGHT        | .025 | .032  |       |
| 11C | SITTING HEIGHT     | .109 | .105  |       |
| 12C | EYE HEIGHT/SIT     | .110 | .099  |       |
| 13C | SHOULDER-ELBOW L   | .138 | .137  |       |
| 14C | ELBOW-FINGERTIP    | .124 | .132  |       |
| 15C | KNEE HEIGHT/SIT    | .103 | .107  |       |
| 16C | POPLITEAL HEIGHT   | .062 | .057  |       |
| 17C | BUTTOCK-KNEE LGTH  | .096 | .102  |       |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    | <del>-17S-</del> | <del>-18S-</del> |
|-----|--------------------|------------------|------------------|
| 18C | BUST DEPTH         | .079             | .105             |
| 19C | WAIST DEPTH        | .033             | .045             |
| 20C | CHEST BREADTH      | .170             | .186             |
| 21C | WAIST BREADTH      | .165             | .177             |
| 22C | HIP BREADTH        | .125             | .125             |
| 23C | SHOULDER BREADTH   | .189             | .195             |
| 24C | NECK CIRCUMFERENCE | .166             | .180             |
| 25C | SHOULDER CIRC      | .189             | .200             |
| 26C | CHEST CIRC AT SCYE | .219             | .233             |
| 27C | BUST CIRCUMFERENCE | .156             | .176             |
| 28C | CHEST C BELOW BUST | .175             | .198             |
| 29C | WAIST CIRC         | .104             | .115             |
| 30C | HIP CIRCUMFERENCE  | .151             | .159             |
| 31C | VERTICAL TRUNK CIR | .187             | .193             |
| 32C | ARM CIRC AT SCYE   | .192             | .219             |
| 33C | BICEPS CIRC, FLXD  | .242             | .268             |
| 34C | ELBOW CIRC, FLXD   | .275             | .296             |
| 35C | FOREARM CIRC, FLXD | .321             | .341             |
| 36C | WRIST CIRC         | .237             | .257             |
| 37C | UPPER THIGH CIRC   | .205             | .214             |
| 38C | KNEE CIRCUMFERENCE | .138             | .158             |
| 39C | CALF CIRCUMFERENCE | .230             | .250             |
| 40C | ANKLE CIRC         | .211             | .224             |
| 41C | SHOULDER LENGTH    | .062             | .069             |
| 42C | INTERSCYE BACK     | .106             | .120             |
| 43C | INTERSCYE FRONT    | .151             | .150             |
| 44C | BACK ARC, BUST     | .158             | .173             |
| 45C | BACK ARC, WAIST    | .104             | .115             |
| 46C | BACK ARC, HIP      | .110             | .118             |
| 47C | WAIST BACK         | .132             | .142             |
| 48C | WAIST FRONT        | .141             | .134             |
| 49C | NECK-BUSTPOINT LGT | .078             | .100             |
| 50C | AXILLA-WAIST LEVEL | .066             | .046             |
| 51C | SLEEVE INSEAM      | .097             | .094             |
| 52C | SLEEVE OUTSEAM     | .083             | .081             |

TABLE 10 CONTINUED  
CORRELATIONS: CORE AND STATIC STRENGTH SERIES (N=344)

|     |                    | -17S- | -18S- |
|-----|--------------------|-------|-------|
| 53C | CROTCH LENGTH      | .047  | .061  |
| 54C | HEAD CIRCUMFERENCE | .104  | .111  |
| 55C | HEAD BREADTH       | .041  | .047  |
| 56C | HEAD LENGTH        | .075  | .081  |
| 57C | PALM LENGTH        | .145  | .158  |
| 58C | HAND BREADTH       | .230  | .253  |
| 59C | HAND CIRCUMFERENCE | .251  | .273  |
| 60C | HAND LENGTH        | .160  | .179  |
| 61C | INSTEP LENGTH      | .162  | .172  |
| 62C | FOOT LENGTH        | .149  | .163  |
| 63C | HEEL-ANKLE CIRC    | .209  | .218  |
| 64C | FOOT BREADTH       | .121  | .132  |
| 65C | HEEL BREADTH       | .121  | .134  |
| 66C | FOOT CIRCUMFERENCE | .194  | .207  |
| 67C | INSTEP CIRC        | .184  | .204  |
| 68C | ANKLE HEIGHT       | .061  | .064  |
| 69C | SPHYRION HEIGHT    | .111  | .113  |
| 70C | AGE                | -.082 | -.097 |

## Chapter II

### REGRESSION EQUATIONS

It is often desirable, and sometimes necessary to determine the dimensions of a target population which has not been measured for the particular dimensions of interest. Such a population might well be a specialized subgroup extracted from a larger sample for which population values are available; it might be a single individual. Thus, for example, one may be concerned with certain workspace dimensions of women volunteering for duty as tank operators whose average stature is 63 inches. Since this height measurement is more than an inch less than the population average for U.S. Army women, it would be of interest to determine certain critical measurements for these women who will have to function efficiently in a workspace originally designed for use by men. Such dimensions might include sitting height, eye height/sitting, arm reach and leg length.

#### Simple Regressions

Given a set of data which include all the dimensions of interest for the comparable population (U.S. Army women) and stature measurements for the target group (or individual), we can construct a formula or straight-line equation which tells us as accurately as possible a woman's sitting height when we put her stature value into the formula. The regression equation can give us the average sitting height for a women of a given stature, an estimate which will be quite accurate if the two variables are reasonably well related. As can be seen by referring to Table 2 in Chapter I, the correlation coefficient of stature and sitting height is .767, a moderately good relationship.

A simple regression equation to predict y (sitting height), knowing x (stature), is as follows:

$$y = r * \frac{SD_y}{SD_x} * x + (\bar{Y} - r * \frac{SD_y}{SD_x} * \bar{X})$$

where

y = the variable to be predicted

x = the value estimated from

r = the correlation coefficient of x with y

SD<sub>y</sub> = the standard deviation for the y variable  
for the reference population

\* = the symbol for multiplication in Fortran

$SD_x$  = the standard deviation for the x variable  
for the reference population

$\bar{Y}$  = the mean value for the variable for the  
reference population

$\bar{X}$  = the mean value for the variable for the  
reference population

If we wished to estimate the average sitting height of Army women who are 63 inches tall, we would substitute in the equation above the following values for stature (variable 2C), sitting height (variable 11C), and the correlation between them taken from the reference population statistics given in Tables 1 and 2. These values are:

$x$  = the stature value of 63"

$y$  = the value to be estimated

$r$  = .767

$\bar{X}$  = 64.15"

$\bar{Y}$  = 33.49"

$SD_y$  = 1.41

$SD_x$  = 2.57

Solving the equation with these values:

$$y = .767 * \frac{1.41}{2.57} x + (33.49 - .767 * \frac{1.41}{2.57} * 64.15)$$

$$y = .421 x + 6.48$$

Using the value 63" for  $x$ :

$$y = (.421 * 63) + 6.48$$

$$y = 33"$$

Thirty-three inches is the best estimate of sitting height for Army women whose stature is 63". In a similar fashion the user can develop other estimates of sitting height for other values of stature and from any other combinations of dimensions for which the necessary statistics of the means, standard deviations and correlation coefficients are available.

The simple regression described above will provide an average  $y$  or sitting height value for various values of  $x$  or stature. But not

all Army women of 63-inch stature will have a sitting height of exactly 33 inches. Figure 1 is a bivariate distribution table of Army women for the variables of stature and sitting height. The numbers under the column 63 (inches of stature) are the numbers of individuals of 63-inch stature who have sitting heights of various values. As the regression estimate is a measure of central tendency (like the mean), the standard error of estimate is a measure of variability about the estimate. The standard error of estimate is computed as:

$$Se_{est} = SD_y \sqrt{1-r^2}$$

Substituting the values used in the example above:

$$\begin{aligned} Se_{est} &= 1.41 \sqrt{1-.767^2} \\ &= 1.41 \sqrt{.411711} \\ &= 0.90" \end{aligned}$$

The standard errors are statistically similar to the standard deviation and used in conjunction with the regression estimate permit the construction of a probability statement of the relationship of stature and sitting height. In practical terms, this means that essentially two-thirds of the subjects who are 63 inches tall will have sitting heights ranging from 32.10 to 33.90 (the regression value plus or minus 1  $Se_{est}$ ) and 95% will have sitting heights falling between 31.20 and 34.80" (regression value plus or minus 2  $Se_{est}$ ).

### Multiple Regressions

With the correlation coefficients and summary statistics presented here, it is also possible to compute multiple correlation coefficients. The multiple correlation coefficient expresses the degree of relationship between one variable (z) and two other variables (x and y). The multiple correlation coefficient can be calculated from the simple correlations as:

$$R = \sqrt{\frac{r^2(x,z) + r^2(y,z) - 2[r(x,z) r(y,z) r(x,y)]}{1 - r^2(x,y)}}$$

If we wished to estimate head breadth for Army women given head length and head circumference, the necessary input values could be found in Tables 1 and 2. The simple correlation coefficients and summary statistics are:

| STATURE(IN) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
|             | 56.0 | 57.0 | 58.0 | 59.0 | 60.0 | 61.0 | 62.0 | 63.0 | 64.0 | 65.0 | 66.0 | 67.0 | 68.0 | 69.0 | 70.0 | 71.0 | 72.0 | TOTAL |
| 38.0        |      |      |      |      |      |      |      |      |      |      |      |      |      | 1    |      | 1    |      | 2     |
| 37.5        |      |      |      |      |      |      |      |      |      |      |      |      |      | 1    |      | 2    |      | 2     |
| 37.0        |      |      |      |      |      |      |      |      |      |      |      | 1    | 1    | 1    | 2    | 2    |      | 7     |
| 36.5        |      |      |      |      |      |      |      |      |      | 1    | 2    | 2    | 4    | 7    | 1    | 1    | 1    | 19    |
| 36.0        |      |      |      |      |      |      |      |      |      | 2    | 4    | 7    | 5    | 10   | 3    | 2    |      | 33    |
| 35.5        |      |      |      |      |      |      |      |      | 3    | 7    | 13   | 16   | 12   | 15   | 4    | 2    |      | 72    |
| 35.0        |      |      |      |      |      |      |      | 5    | 10   | 30   | 22   | 24   | 13   | 6    | 5    |      |      | 115   |
| 34.5        |      |      |      |      |      |      | 4    | 17   | 28   | 45   | 36   | 16   | 17   | 2    |      |      |      | 185   |
| 34.0        |      |      |      |      | 1    | 2    | 6    | 21   | 46   | 46   | 28   | 20   | 2    | 6    |      |      |      | 178   |
| 33.5        |      |      |      |      | 3    | 5    | 31   | 39   | 39   | 35   | 12   | 13   | 3    | 1    |      |      |      | 181   |
| 33.0        |      |      |      |      | 2    | 15   | 40   | 43   | 21   | 19   | 11   | 3    | 2    | 1    | 1    |      |      | 158   |
| 32.5        |      |      |      | 5    | 10   | 23   | 32   | 23   | 19   | 15   | 11   | 1    |      | 1    |      |      |      | 140   |
| 32.0        |      |      | 1    | 3    | 12   | 21   | 27   | 24   | 19   | 5    | 1    |      |      |      |      |      |      | 113   |
| 31.5        |      |      | 1    | 8    | 12   | 13   | 12   | 12   | 9    | 1    |      |      |      |      |      |      |      | 68    |
| 31.0        |      |      |      | 3    | 7    | 7    | 8    | 2    | 2    |      |      |      |      |      |      |      |      | 35    |
| 30.5        |      |      | 2    | 4    | 3    | 8    | 5    |      | 1    |      |      |      |      |      |      |      |      | 25    |
| 30.0        | 1    |      | 1    | 2    | 1    | 4    |      |      |      |      |      |      |      |      |      |      |      | 9     |
| 29.5        |      |      | 2    | 2    |      | 2    |      |      |      |      |      |      |      |      |      |      |      | 6     |
| 29.0        |      | 1    | 1    |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 2     |
| TOTAL       | 1    | 3    | 12   | 26   | 54   | 100  | 165  | 186  | 197  | 206  | 140  | 103  | 59   | 51   | 17   | 8    | 2    | 1330  |

Figure 6. A bivariate frequency table for stature and sitting height (1977 Army women).

|               | CORRELATION<br>COEFFICIENTS |                  |                | SUMMARY<br>STATISTICS<br>(in inches) |      |
|---------------|-----------------------------|------------------|----------------|--------------------------------------|------|
|               | Head<br>Circ (x)            | Head<br>Lgth (y) | Head<br>Br (z) | Mean                                 | SD   |
| Head Circ (x) | --                          | .796             | .548           | 21.62                                | 0.64 |
| Head Lgth (y) | .796                        | --               | .162           | 7.37                                 | 0.26 |
| Head Br (z)   | .548                        | .161             | --             | 5.75                                 | 0.21 |

Substituting these values in the above equation:

$$R = \sqrt{\frac{.548^2 + .162^2 - 2[.548 * .162 * .796]}{1 - .796^2}}$$

$$R = \sqrt{\frac{0.326548 - 0.141331}{.366384}}$$

$$R = \sqrt{.505527}$$

$$R = .711$$

This is an appreciable improvement over either of the simple correlations of head circumference and head breadth ( $r = .548$ ) or head length and head breadth ( $r = .162$ ). Multiple correlations do not necessarily show a marked improvement over the single correlational values but the resulting  $R$  will always be at least as large as the larger (in absolute value) of the single correlation coefficients.

The multiple regression equation can be developed using the following formula:

$$z = ax + by + c$$

$$a = \left( \frac{r(x,z) - r(x,y) * r(y,z)}{1 - r^2(x,y)} \right) * \left( \frac{SD_z}{SD_x} \right)$$

$$b = \left( \frac{r(y,z) - r(x,y) * r(x,z)}{1 - r^2(x,y)} \right) * \left( \frac{SD_z}{SD_y} \right)$$

$$c = \bar{Z} - a * \bar{X} - b * \bar{Y}$$

Substituting the above-tabulated summary data for head circumference, head length, and head breadth:

$$a = \left( \frac{.548 - (.796 * .162)}{1 - .796^2} \right) * \left( \frac{0.21}{0.64} \right)$$

$$a = \frac{.419048}{.366384} * .328125$$

$$a = .375$$

$$b = \left( \frac{.162 - (.796 * .548)}{1 - .796^2} \right) * \left( \frac{0.21}{0.26} \right)$$

$$b = \frac{-.274208}{.366384} * .807692$$

$$b = -.604$$

$$c = 5.75 - (.375 * 21.62) - (-.604 * 7.37)$$

$$c = 2.09$$

and

$$z = .375x - .604y + 2.09$$

Given an individual with a head circumference of 22 inches and a head length of 7.5 inches, the best estimate of head breadth would be:

$$\text{Head Br} = (.375 * 22) - (.604 * 7.5) + 2.09$$

$$\text{Head Br} = 5.81 \text{ inches}$$

The standard error of estimate would be:

$$Se_{est} = SD_z \sqrt{1 - R^2}$$

$$= 0.21 \sqrt{1 - .711}$$

$$= 0.15$$

Similarly, it is possible to construct multiple step regression equations for three or more predictor variables. Although this is a laborious procedure by hand, a computer handles the computations readily and a number of such computer routines are available.

Stature and weight are two easily ascertained dimensions which, between them, correlate well with most measurements of body size (except head, face, foot and hand measurements). Thus, both stature and weight are often incorporated into a multiple regression equation which can then usefully predict a whole range of body measurements with greater accuracy than can be achieved by simple equations. These computations are usually done by computers and are provided here as Tables 11, 12 and 13 for the U.S. Army women's population. These data include height/weight regressions for the core measurements, the traditional series and the workspace series. The strength and head-face measurements are not included because of their poor correlation with height and weight.

TABLE 11A

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

## CORE MEASUREMENTS: METRIC UNITS\*

|                        | R     |                         | SE    | EST  |
|------------------------|-------|-------------------------|-------|------|
| 1C WEIGHT              | 1.000 | $1.000*WT + 0.000*HT +$ | 0.00  | 0.00 |
| 2C STATURE             | 1.000 | $0.000*WT + 1.000*HT +$ | 0.00  | 0.00 |
| 3C SHOULDER HEIGHT     | .970  | $.048*WT + .857*HT -$   | 9.04  | 1.45 |
| 4C AXILLA HEIGHT       | .969  | $.003*WT + .828*HT -$   | 11.86 | 1.38 |
| 5C BUSTPOINT HEIGHT    | .938  | $-.035*WT + .834*HT -$  | 15.51 | 1.95 |
| 6C WAIST HEIGHT        | .898  | $-.032*WT + .739*HT -$  | 17.11 | 2.29 |
| 7C CROTCH HEIGHT       | .864  | $-.042*WT + .609*HT -$  | 20.36 | 2.20 |
| 8C BUTTOCK HEIGHT      | .831  | $.032*WT + .572*HT -$   | 11.33 | 2.60 |
| 9C KNEECAP HEIGHT      | .848  | $-.011*WT + .353*HT -$  | 8.96  | 1.40 |
| 10C CALF HEIGHT        | .729  | $.010*WT + .250*HT -$   | 8.79  | 1.57 |
| 11C SITTING HEIGHT     | .767  | $.006*WT + .418*HT +$   | 16.60 | 2.30 |
| 12C EYE HEIGHT/SIT     | .738  | $.002*WT + .390*HT +$   | 9.96  | 2.34 |
| 13C SHOULDER-ELBOW L   | .809  | $.011*WT + .209*HT -$   | 1.15  | 1.03 |
| 14C ELBOW-FINGERTIP    | .734  | $.022*WT + .241*HT +$   | 2.93  | 1.55 |
| 15C KNEE HEIGHT/SIT    | .863  | $.037*WT + .316*HT -$   | 2.72  | 1.31 |
| 16C POPLITEAL HEIGHT   | .849  | $-.020*WT + .320*HT -$  | 9.26  | 1.24 |
| 17C BUTTOCK-KNEE LGTH  | .846  | $.157*WT + .247*HT +$   | 8.19  | 1.63 |
| 18C BUST DEPTH         | .788  | $.237*WT - .109*HT +$   | 26.47 | 1.36 |
| 19C WAIST DEPTH        | .779  | $.233*WT - .121*HT +$   | 24.03 | 1.37 |
| 20C CHEST BREADTH      | .795  | $.190*WT - .056*HT +$   | 25.98 | 1.11 |
| 21C WAIST BREADTH      | .758  | $.242*WT - .077*HT +$   | 23.62 | 1.58 |
| 22C HIP BREADTH        | .802  | $.237*WT - .016*HT +$   | 23.76 | 1.46 |
| 23C SHOULDER BREADTH   | .817  | $.223*WT - .030*HT +$   | 33.56 | 1.27 |
| 24C NECK CIRCUMFERENCE | .649  | $.118*WT + .004*HT +$   | 24.63 | 1.19 |
| 25C SHOULDER CIRC      | .844  | $.578*WT - .131*HT +$   | 87.07 | 2.87 |
| 26C CHEST CIRC AT SCYE | .845  | $.565*WT - .170*HT +$   | 79.37 | 2.73 |
| 27C BUST CIRCUMFERENCE | .840  | $.710*WT - .264*HT +$   | 88.66 | 3.43 |
| 28C CHEST C BELOW BUST | .822  | $.532*WT - .162*HT +$   | 69.31 | 2.82 |
| 29C WAIST CIRC         | .827  | $.756*WT - .312*HT +$   | 76.52 | 3.81 |
| 30C HIP CIRCUMFERENCE  | .907  | $.707*WT - .093*HT +$   | 68.28 | 2.65 |
| 31C VERTICAL TRUNK CIR | .850  | $.541*WT + .350*HT +$   | 64.37 | 3.80 |
| 32C ARM CIRC AT SCYE   | .822  | $.244*WT - .033*HT +$   | 28.26 | 1.36 |
| 33C BICEPS CIRC, FLXD  | .862  | $.264*WT - .112*HT +$   | 29.30 | 1.15 |
| 34C ELBOW CIRC, FLXD   | .676  | $.109*WT + .039*HT +$   | 13.09 | 1.19 |
| 35C FOREARM CIRC, FLXD | .786  | $.150*WT - .026*HT +$   | 19.87 | .94  |

\*WEIGHT IN KILOGRAMS; STATURE IN CENTIMETERS

TABLE 11A CONTINUED  
MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

CORE MEASUREMENTS: METRIC UNITS\*

|                        | R    |                      | SE    | EST  |
|------------------------|------|----------------------|-------|------|
| 36C WRIST CIRC         | .666 | .045*WT + .017*HT +  | 9.24  | .51  |
| 37C UPPER THIGH CIRC   | .910 | .547*WT - .181*HT +  | 53.62 | 1.89 |
| 38C KNEE CIRCUMFERENCE | .820 | .220*WT - .009*HT +  | 23.10 | 1.28 |
| 39C CALF CIRCUMFERENCE | .789 | .252*WT - .059*HT +  | 29.60 | 1.53 |
| 40C ANKLE CIRC         | .642 | .088*WT + .013*HT +  | 13.34 | .95  |
| 41C SHOULDER LENGTH    | .377 | .008*WT + .055*HT +  | 5.56  | .98  |
| 42C INTERSCYE BACK     | .479 | .128*WT + .010*HT +  | 28.55 | 2.05 |
| 43C INTERSCYE FRONT    | .576 | .103*WT + .031*HT +  | 21.94 | 1.42 |
| 44C BACK ARC, BUST     | .780 | .326*WT - .123*HT +  | 42.46 | 1.95 |
| 45C BACK ARC, WAIST    | .800 | .369*WT - .152*HT +  | 37.94 | 2.05 |
| 46C BACK ARC, HIP      | .801 | .377*WT - .081*HT +  | 38.10 | 2.21 |
| 47C WAIST BACK         | .521 | .015*WT + .200*HT +  | 7.36  | 2.26 |
| 48C WAIST FRONT        | .439 | .087*WT + .087*HT +  | 17.34 | 2.35 |
| 49C NECK-BUSTPOINT LGT | .570 | .145*WT - .012*HT +  | 18.55 | 1.71 |
| 50C AXILLA-WAIST LEVEL | .284 | 0.000*WT + .110*HT + | 5.17  | 2.40 |
| 51C SLEEVE INSEAM      | .747 | -.017*WT + .312*HT - | 4.77  | 1.74 |
| 52C SLEEVE OUTSEAM     | .782 | .007*WT + .351*HT -  | 3.82  | 1.85 |
| 53C CROTCH LENGTH      | .644 | .368*WT + .097*HT +  | 35.06 | 4.17 |
| 54C HEAD CIRCUMFERENCE | .444 | .058*WT + .051*HT +  | 43.14 | 1.47 |
| 55C HEAD BREADTH       | .317 | .021*WT - .001*HT +  | 13.52 | .51  |
| 56C HEAD LENGTH        | .396 | .013*WT + .029*HT +  | 13.20 | .62  |
| 57C PALM LENGTH        | .586 | .002*WT + .045*HT +  | 2.43  | .42  |
| 58C HAND BREADTH       | .543 | .018*WT + .013*HT +  | 4.62  | .33  |
| 59C HAND CIRCUMFERENCE | .568 | .042*WT + .030*HT +  | 11.04 | .71  |
| 60C HAND LENGTH        | .638 | .009*WT + .081*HT +  | 3.70  | .69  |
| 61C INSTEP LENGTH      | .661 | .028*WT + .076*HT +  | 3.79  | .74  |
| 62C FOOT LENGTH        | .715 | .030*WT + .112*HT +  | 4.27  | .88  |
| 63C HEEL-ANKLE CIRC    | .718 | .075*WT + .085*HT +  | 12.44 | 1.01 |
| 64C FOOT BREADTH       | .523 | .023*WT + .017*HT +  | 4.72  | .44  |
| 65C HEEL BREADTH       | .501 | .023*WT + .003*HT +  | 4.22  | .36  |
| 66C FOOT CIRCUMFERENCE | .615 | .063*WT + .039*HT +  | 12.48 | .90  |
| 67C INSTEP CIRC        | .616 | .072*WT + .039*HT +  | 12.81 | .99  |
| 68C ANKLE HEIGHT       | .518 | -.016*WT + .090*HT - | 2.85  | .87  |
| 69C SPHYRION HEIGHT    | .403 | .002*WT + .032*HT +  | 1.13  | .50  |

\*WEIGHT IN KILOGRAMS; STATURE IN CENTIMETERS

TABLE 11B

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

## CORE MEASUREMENTS: ENGLISH UNITS\*

|                        | R     |                         | SE EST     |
|------------------------|-------|-------------------------|------------|
| 1C WEIGHT              | 1.000 | $1.000*WT + 0.000*HT +$ | 0.00 0.00  |
| 2C STATURE             | 1.000 | $0.000*WT + 1.000*HT +$ | 0.00 0.00  |
| 3C SHOULDER HEIGHT     | .970  | $.009*WT + .857*HT -$   | 3.62 .57   |
| 4C AXILLA HEIGHT       | .969  | $.000*WT + .828*HT -$   | 4.60 .54   |
| 5C BUSTPOINT HEIGHT    | .938  | $-.005*WT + .834*HT -$  | 6.27 .77   |
| 6C WAIST HEIGHT        | .898  | $-.005*WT + .739*HT -$  | 6.83 .90   |
| 7C CROTCH HEIGHT       | .864  | $-.007*WT + .609*HT -$  | 8.08 .87   |
| 8C BUTTOCK HEIGHT      | .831  | $.006*WT + .572*HT -$   | 4.50 1.02  |
| 9C KNEECAP HEIGHT      | .848  | $-.001*WT + .353*HT -$  | 3.66 .55   |
| 10C CALF HEIGHT        | .729  | $.002*WT + .250*HT -$   | 3.49 .62   |
| 11C SITTING HEIGHT     | .767  | $.001*WT + .418*HT +$   | 6.54 .91   |
| 12C EYE HEIGHT/SIT     | .738  | $.000*WT + .390*HT +$   | 3.97 .92   |
| 13C SHOULDER-ELBOW L   | .809  | $.002*WT + .209*HT -$   | .46 .40    |
| 14C ELBOW-FINGERTIP    | .734  | $.004*WT + .241*HT +$   | 1.14 .61   |
| 15C KNEE HEIGHT/SIT    | .863  | $.007*WT + .316*HT -$   | 1.12 .52   |
| 16C POPLITEAL HEIGHT   | .849  | $-.003*WT + .320*HT -$  | 3.72 .49   |
| 17C BUTTOCK-KNEE LGTH  | .846  | $.028*WT + .247*HT +$   | 3.23 .64   |
| 18C BUST DEPTH         | .768  | $.042*WT - .109*HT +$   | 10.46 .54  |
| 19C WAIST DEPTH        | .779  | $.042*WT - .121*HT +$   | 9.41 .54   |
| 20C CHEST BREADTH      | .795  | $.034*WT - .056*HT +$   | 10.22 .44  |
| 21C WAIST BREADTH      | .758  | $.043*WT - .077*HT +$   | 9.33 .62   |
| 22C HIP BREADTH        | .802  | $.042*WT - .016*HT +$   | 9.40 .58   |
| 23C SHOULDER BREADTH   | .817  | $.040*WT - .030*HT +$   | 13.19 .50  |
| 24C NECK CIRCUMFERENCE | .649  | $.021*WT + .004*HT +$   | 9.71 .47   |
| 25C SHOULDER CIRC      | .844  | $.103*WT - .131*HT +$   | 34.31 1.13 |
| 26C CHEST CIRC AT SCYE | .845  | $.101*WT - .170*HT +$   | 31.23 1.08 |
| 27C BUST CIRCUMFERENCE | .840  | $.127*WT - .264*HT +$   | 34.88 1.35 |
| 28C CHEST C BELOW BUST | .822  | $.095*WT - .162*HT +$   | 27.29 1.11 |
| 29C WAIST CIRC         | .827  | $.135*WT - .312*HT +$   | 30.13 1.50 |
| 30C HIP CIRCUMFERENCE  | .907  | $.126*WT - .093*HT +$   | 26.91 1.04 |
| 31C VERTICAL TRUNK CIR | .850  | $.097*WT + .350*HT +$   | 25.29 1.50 |
| 32C ARM CIRC AT SCYE   | .822  | $.044*WT - .033*HT +$   | 11.07 .54  |
| 33C BICEPS CIRC, FLXD  | .862  | $.047*WT - .112*HT +$   | 11.55 .45  |
| 34C ELBOW CIRC, FLXD   | .676  | $.020*WT + .039*HT +$   | 5.08 .47   |
| 35C FOREARM CIRC, FLXD | .766  | $.027*WT - .026*HT +$   | 7.80 .37   |

\*WEIGHT IN POUNDS; STATURE IN INCHES

TABLE 11B CONTINUED  
MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

CORE MEASUREMENTS: ENGLISH UNITS\*

|                        | R    |                      | SE    | EST  |
|------------------------|------|----------------------|-------|------|
| 36C WRIST CIRC         | .666 | .008*WT + .017*HT +  | 3.64  | .20  |
| 37C UPPER THIGH CIRC   | .910 | .098*WT - .181*HT +  | 21.07 | .74  |
| 38C KNEE CIRCUMFERENCE | .820 | .039*WT - .009*HT +  | 9.13  | .50  |
| 39C CALF CIRCUMFERENCE | .789 | .045*WT - .059*HT +  | 11.65 | .60  |
| 40C ANKLE CIRC         | .642 | .016*WT + .013*HT +  | 5.21  | .38  |
| 41C SHOULDER LENGTH    | .377 | .001*WT + .055*HT +  | 2.24  | .39  |
| 42C INTERSCYE BACK     | .479 | .023*WT + .010*HT +  | 11.22 | .81  |
| 43C INTERSCYE FRONT    | .576 | .018*WT + .031*HT +  | 8.69  | .56  |
| 44C BACK ARC, BUST     | .780 | .058*WT - .123*HT +  | 16.75 | .77  |
| 45C BACK ARC, WAIST    | .800 | .066*WT - .152*HT +  | 14.92 | .81  |
| 46C BACK ARC, HIP      | .801 | .067*WT - .081*HT +  | 15.04 | .87  |
| 47C WAIST BACK         | .521 | .003*WT + .200*HT +  | 2.85  | .89  |
| 48C WAIST FRONT        | .439 | .016*WT + .087*HT +  | 6.77  | .93  |
| 49C NECK-BUSTPOINT LGT | .570 | .026*WT - .012*HT +  | 7.29  | .67  |
| 50C AXILLA-WAIST LEVEL | .284 | 0.000*WT + .110*HT + | 2.04  | .95  |
| 51C SLEEVE INSEAM      | .747 | -.002*WT + .312*HT - | 2.01  | .68  |
| 52C SLEEVE OUTSEAM     | .782 | .001*WT + .351*HT -  | 1.47  | .73  |
| 53C CROTCH LENGTH      | .644 | .066*WT + .097*HT +  | 13.77 | 1.64 |
| 54C HEAD CIRCUMFERENCE | .444 | .010*WT + .051*HT +  | 17.03 | .58  |
| 55C HEAD BREADTH       | .317 | .004*WT - .001*HT +  | 5.29  | .20  |
| 56C HEAD LENGTH        | .396 | .002*WT + .029*HT +  | 5.24  | .24  |
| 57C PALM LENGTH        | .586 | 0.000*WT + .045*HT + | 1.00  | .17  |
| 58C HAND BREADTH       | .543 | .003*WT + .013*HT +  | 1.85  | .13  |
| 59C HAND CIRCUMFERENCE | .568 | .007*WT + .030*HT +  | 4.41  | .28  |
| 60C HAND LENGTH        | .638 | .002*WT + .081*HT +  | 1.41  | .27  |
| 61C INSTEP LENGTH      | .661 | .005*WT + .076*HT +  | 1.49  | .29  |
| 62C FOOT LENGTH        | .715 | .005*WT + .112*HT +  | 1.73  | .34  |
| 63C HEEL-ANKLE CIRC    | .718 | .013*WT + .085*HT +  | 4.95  | .40  |
| 64C FOOT BREADTH       | .523 | .004*WT + .017*HT +  | 1.87  | .17  |
| 65C HEEL BREADTH       | .501 | .004*WT + .003*HT +  | 1.68  | .14  |
| 66C FOOT CIRCUMFERENCE | .615 | .011*WT + .039*HT +  | 4.95  | .35  |
| 67C INSTEP CIRC        | .616 | .013*WT + .039*HT +  | 5.02  | .39  |
| 68C ANKLE HEIGHT       | .518 | -.002*WT + .090*HT - | 1.24  | .34  |
| 69C SPHYRION HEIGHT    | .403 | 0.000*WT + .032*HT + | .49   | .20  |

\*WEIGHT IN POUNDS; STATURE IN INCHES

TABLE 12A

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

## TRADITIONAL SERIES: METRIC UNITS\*

|                        | R    |                      | SE EST     |
|------------------------|------|----------------------|------------|
| 1T CERVICALE HEIGHT    | .979 | .024*WT + .898*HT -  | 7.02 1.23  |
| 2T SUPRASTERNAL HT     | .985 | .023*WT + .848*HT -  | 6.49 .96   |
| 3T SUBSTERNAL HEIGHT   | .933 | .031*WT + .697*HT -  | 1.14 1.79  |
| 4T ELBOW HEIGHT        | .935 | .052*WT + .657*HT -  | 7.24 1.71  |
| 5T KNUCKLE HEIGHT      | .823 | .020*WT + .493*HT -  | 10.28 2.25 |
| 6T TROCHANTERIC HT     | .847 | .027*WT + .562*HT -  | 6.98 2.35  |
| 7T GLUTEAL FURROW HT   | .836 | -.021*WT + .544*HT - | 13.00 2.23 |
| 8T TIBIALE HEIGHT      | .843 | -.008*WT + .331*HT - | 9.25 1.33  |
| 9T ACROMION-RADIALE    | .803 | .022*WT + .190*HT -  | 1.32 .99   |
| 10T RADIALE-STYLION    | .694 | .015*WT + .146*HT -  | .23 1.06   |
| 11T ELBOW-CENTER GRIP  | .693 | .017*WT + .176*HT +  | 2.66 1.27  |
| 12T ELBOW REST HEIGHT  | .308 | -.001*WT + .132*HT - | .66 2.60   |
| 13T THIGH CLEARANCE HT | .807 | .137*WT - .062*HT +  | 17.37 .77  |
| 14T ABDOM-EXTEN DEPTH  | .806 | .270*WT - .122*HT +  | 25.74 1.54 |
| 15T BISPINOUS BREADTH  | .584 | .131*WT + .029*HT +  | 10.80 1.79 |
| 16T BIACROMIAL BREADTH | .536 | .080*WT + .036*HT +  | 25.12 1.36 |
| 17T ABDOM-EXTEN BROTH  | .731 | .227*WT + .039*HT +  | 10.21 2.04 |
| 18T THIGH-THIGH BROTH  | .846 | .331*WT - .063*HT +  | 28.90 1.74 |
| 19T WAIST C, OMPHALION | .858 | .850*WT - .293*HT +  | 73.49 4.06 |
| 20T HIP CIRC, SITTING  | .919 | .721*WT - .053*HT +  | 64.02 2.69 |
| 21T VERT TRUNK CIRC S  | .806 | .413*WT + .457*HT +  | 47.75 4.29 |
| 22T AXILLARY ARM CIRC  | .882 | .291*WT - .113*HT +  | 28.76 1.22 |
| 23T BICEPS CIRC RELAX  | .908 | .300*WT - .135*HT +  | 30.06 1.08 |
| 24T FOREARM CIRC RELAX | .843 | .153*WT - .032*HT +  | 19.42 .80  |
| 25T SUBSCAPULAR SKNFLD | .721 | .058*WT - .035*HT +  | 3.65 .42   |
| 26T TRICEPS SKINFOLD   | .724 | .046*WT - .017*HT +  | 1.78 .34   |
| 27T BICEPS SKINFOLD    | .704 | .035*WT - .014*HT +  | 1.05 .27   |
| 28T SUPRAILIAC SKNFLD  | .748 | .069*WT - .032*HT +  | 2.79 .47   |

\*WEIGHT IN KILOGRAMS; STATURE IN CENTIMETERS

TABLE 12B

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

## TRADITIONAL SERIES: ENGLISH UNITS\*

|                        | R    |                      | SE    | EST  |
|------------------------|------|----------------------|-------|------|
| 1T CERVICALE HEIGHT    | .979 | .004*WT + .898*HT -  | 2.72  | .48  |
| 2T SUPRASTERNAL HT     | .985 | .004*WT + .848*HT -  | 2.54  | .38  |
| 3T SUBSTERNAL HEIGHT   | .933 | .006*WT + .697*HT -  | .51   | .71  |
| 4T ELBOW HEIGHT        | .935 | .009*WT + .657*HT -  | 2.81  | .67  |
| 5T KNUCKLE HEIGHT      | .823 | .004*WT + .493*HT -  | 4.10  | .89  |
| 6T TROCHANTERIC HT     | .847 | .005*WT + .562*HT -  | 2.77  | .93  |
| 7T GLUTEAL FURROW HT   | .836 | -.003*WT + .544*HT - | 5.21  | .88  |
| 8T TIBIALE HEIGHT      | .843 | -.001*WT + .331*HT - | 3.70  | .52  |
| 9T ACROMION-RADIALE    | .803 | .004*WT + .190*HT -  | .53   | .39  |
| 10T RADIALE-STYLION    | .694 | .003*WT + .146*HT -  | .13   | .42  |
| 11T ELBOW-CENTER GRIP  | .693 | .003*WT + .176*HT +  | 1.05  | .50  |
| 12T ELBOW REST HEIGHT  | .308 | 0.000*WT + .132*HT - | .28   | 1.02 |
| 13T THIGH CLEARANCE HT | .807 | .024*WT - .062*HT +  | 6.90  | .30  |
| 14T ABDOM-EXTEN DEPTH  | .806 | .048*WT - .122*HT +  | 10.16 | .60  |
| 15T BISPINOUS BREADTH  | .584 | .023*WT + .029*HT +  | 4.30  | .70  |
| 16T BIACROMIAL BREADTH | .536 | .014*WT + .036*HT +  | 9.93  | .54  |
| 17T ABDOM-EXTEN BRDTH  | .731 | .041*WT + .039*HT +  | 3.96  | .80  |
| 18T THIGH-THIGH BRDTH  | .846 | .059*WT - .063*HT +  | 11.39 | .69  |
| 19T WAIST C, OMPHALION | .858 | .152*WT - .293*HT +  | 28.91 | 1.60 |
| 20T HIP CIRC, SITTING  | .919 | .129*WT - .053*HT +  | 25.17 | 1.06 |
| 21T VERT TRUNK CIRC S  | .806 | .074*WT + .457*HT +  | 18.77 | 1.69 |
| 22T AXILLARY ARM CIRC  | .882 | .052*WT - .113*HT +  | 11.32 | .48  |
| 23T BICEPS CIRC RELAX  | .908 | .054*WT - .135*HT +  | 11.78 | .42  |
| 24T FOREARM CIRC RELAX | .843 | .027*WT - .032*HT +  | 7.69  | .32  |
| 25T SUBSCAPULAR SKNFLO | .721 | .010*WT - .035*HT +  | 1.48  | .17  |
| 26T TRICEPS SKINFOLD   | .724 | .008*WT - .017*HT +  | .73   | .14  |
| 27T BICEPS SKINFOLD    | .704 | .006*WT - .014*HT +  | .44   | .11  |
| 28T SUPRAILIAC SKNFLO  | .748 | .012*WT - .032*HT +  | 1.14  | .18  |

\*WEIGHT IN POUNDS; STATURE IN INCHES

TABLE 13A

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

## WORKSPACE SERIES: METRIC UNITS\*

|                        | R    |                         | SE EST     |
|------------------------|------|-------------------------|------------|
| 1W OVERHEAD REACH HT   | .924 | $-.003*WT + 1.254*HT -$ | 4.58 3.47  |
| 2W FUNCTIONAL REACH    | .582 | $.078*WT + .334*HT +$   | 12.24 3.69 |
| 3W FUNCT REACH EXTEND  | .582 | $.064*WT + .462*HT +$   | 4.20 4.76  |
| 4W OVERHEAD REACH SIT  | .756 | $.101*WT + .673*HT +$   | 13.57 4.33 |
| 5W FUNCTIONAL LEG LTH  | .806 | $-.001*WT + .699*HT -$  | 4.71 3.43  |
| 6W WEIGHT              | .997 | $1.004*WT + .024*HT -$  | 1.80 .60   |
| 7W STATURE             | .994 | $-.001*WT + .992*HT +$  | 5.89 .75   |
| 8W OVERHEAD REACH BRD  | .619 | $.137*WT + .026*HT +$   | 22.42 1.52 |
| 9W BENT TORSO HEIGHT   | .510 | $-.010*WT + .605*HT +$  | 28.22 6.75 |
| 10W BENT TORSO BREADTH | .646 | $.148*WT + .035*HT +$   | 25.65 1.55 |
| 11W KNEELING HEIGHT    | .959 | $0.000*WT + .684*HT +$  | 10.80 1.35 |
| 12W KNEELING LEG LNTH  | .812 | $.044*WT + .389*HT -$   | 1.04 2.03  |
| 13W BENT KNEE HT SUPIN | .693 | $.056*WT + .220*HT +$   | 6.40 1.84  |
| 14W HORI LG KNEES BENT | .828 | $-.022*WT + .905*HT +$  | 5.04 4.02  |

\*WEIGHT IN KILOGRAMS; STATURE IN CENTIMETERS

TABLE 13B

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S  
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE

WORKSPACE SERIES: ENGLISH UNITS\*

|                        | R    |                       | SE    | EST  |
|------------------------|------|-----------------------|-------|------|
| 1W OVERHEAD REACH HT   | .924 | 0.000*WT + 1.254*HT - | 1.87  | 1.37 |
| 2W FUNCTIONAL REACH    | .582 | .014*WT + .334*HT +   | 4.81  | 1.45 |
| 3W FUNCT REACH EXTEND  | .582 | .011*WT + .462*HT +   | 1.71  | 1.88 |
| 4W OVERHEAD REACH SIT  | .756 | .018*WT + .673*HT +   | 5.35  | 1.70 |
| 5W FUNCTIONAL LEG LTH  | .806 | 0.000*WT + .699*HT -  | 1.88  | 1.35 |
| 6W WEIGHT              | .997 | .456*WT + .061*HT -   | 1.88  | .60  |
| 7W STATURE             | .994 | 0.000*WT + .992*HT +  | 2.30  | .29  |
| 8W OVERHEAD REACH BRD  | .619 | .025*WT + .026*HT +   | 8.76  | .60  |
| 9W BENT TORSO HEIGHT   | .510 | -.001*WT + .605*HT +  | 11.01 | 2.66 |
| 10W BENT TORSO BREADTH | .646 | .026*WT + .035*HT +   | 10.15 | .61  |
| 11W KNEELING HEIGHT    | .959 | 0.000*WT + .684*HT +  | 4.25  | .53  |
| 12W KNEELING LEG LNGTH | .812 | .008*WT + .389*HT -   | .43   | .80  |
| 13W BENT KNEE HT SUPIN | .693 | .010*WT + .220*HT +   | 2.52  | .72  |
| 14W HORI LG KNEES BENT | .828 | -.003*WT + .905*HT +  | 1.86  | 1.58 |

\*WEIGHT IN POUNDS; STATURE IN INCHES

**BLANK PAGE**

## BIBLIOGRAPHY

- Churchill, Edmund, Thomas Churchill, John T. McConville, and Robert M. White. 1977. Anthropometry of Women of the U. S. Army--1977, Report No. 2 - The Basic Univariate Statistics, Technical Report NATICK/TR-77/024, U. S. Army Natick Research and Development Command, Natick Massachusetts. (AD A044 806)
- Churchill, Thomas, Edmund Churchill, John T. McConville, and Robert M. White. 1977. Anthropometry of Women of the U. S. Army--1977, Report No. 3 - Bivariate Frequency Tables, Technical Report NATICK/TR-77/028, U. S. Army Natick Research and Development Command, Natick, Massachusetts. (AD A046 692)
- Laubach, Lloyd L., John T. McConville, Edmund Churchill, and Robert M. White. 1977. Anthropometry of Women of the U. S. Army--1977, Report No. 1 - Methodology and Survey Plan, Technical Report NATICK/TR-77/021, U. S. Army Natick Research and Development Command, Natick, Massachusetts. (AD A043 715)
- McConville, John T., Edmund Churchill, Thomas Churchill, and Robert M. White. 1977. Anthropometry of Women of the U. S. Army--1977, Report No. 5 - Comparative Data for U. S. Army Men, Technical Report NATICK/TR-77/029, U. S. Army Natick Research and Development Command, Natick, Massachusetts. (AD A048 591)