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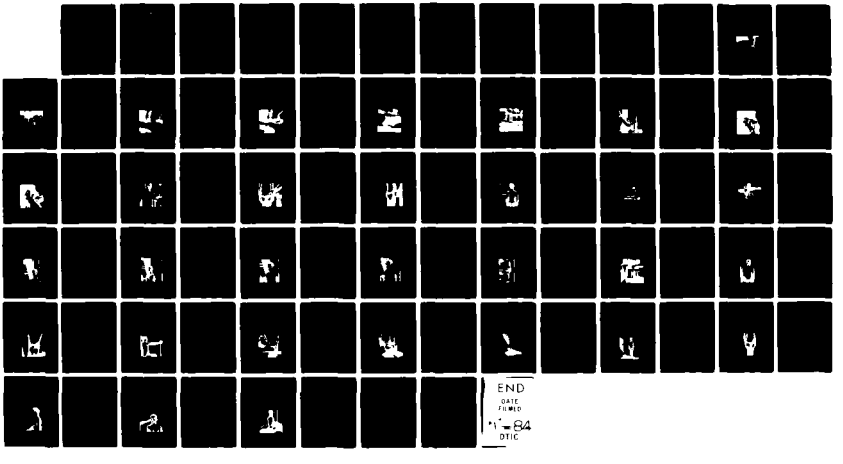

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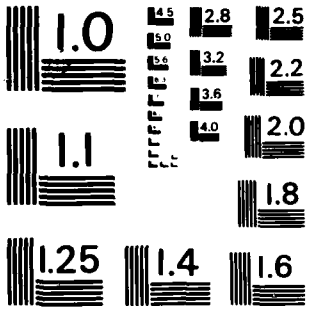

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DEPARTMENT OF DEFENCE

DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION

AERONAUTICAL RESEARCH LABORATORIES

MELBOURNE, VICTORIA

SYSTEMS REPORT 15

AUSTRALIAN TRI-SERVICE ANTHROPOMETRIC SURVEY, 1977:

PART 2. Survey results: Combined Services AIRCREW group

by

K. C. HENDY

Approved for Public Release

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SYSTEMS REPORT 15

AUSTRALIAN TRI-SERVICE ANTHROPOMETRIC SURVEY, 1977:

PART 2. Survey results: Combined Services AIRCREW group

by

K. C. HENDY

SUMMARY

An anthropometric survey of approximately 3000 male members of the three Australian military branches was conducted during 1977. Part 2 of this nine-part document contains the results of the analysis for the combined services AIRCREW group data. This group is an amalgamation of 456 aircrew from Air Force, Army and Navy branches.

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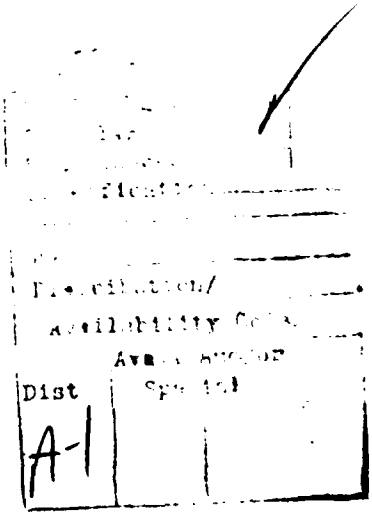
16. *ABSTRACT*

An anthropometric survey of approximately 3000 male members of the three Australian military branches was conducted during 1977. Part 2 of this nine-part document contains the results of the analysis for the combined services AIRCREW group data. This group is an amalgamation of 456 aircrew from Air Force, Army and Navy branches.

CONTENTS



1. INTRODUCTION

Part 2 of Systems Report 15 contains the results of an analysis performed on the combined services AIRCREW data group. This group is an amalgamation of three groups which were sampled independently in the original sample selection procedure. The sampling procedure and subsequent combination of these groups are described in Part 1 of Reference 1 which details the scientific conduct of the survey. Other groups subjected to separate analysis are reported in Parts 3 to 9 of Reference 1.

The composition of the combined AIRCREW group is as follows:

	Number
AIR	
Aircrew	190
ARMY	
Aviation	88
NAVY	
Fleet Air Arm	178
Total:	456

An analysis was performed on the AIRCREW data and summary statistics derived. The results of this analysis are presented in Tables 1 to 33. An index to the tabulated results appears in the contents listing of this document. For convenience in using the information, a Visual Index and alphabetical listing precedes Table 1. The photographs accompanying the Tables are to illustrate technique only.

2. SITTING POSTURE

For all sitting measurements the height of the hydraulic stool was adjusted so that with the subject sitting erect, back free of the wall, the line joining the femoral marks was horizontal and with his feet flat on the floor the line joining the upper and lower fibular marks was vertical.

Without changing the position of his legs after adjusting the stool the subject sat erect, back free of the wall with the trunk straight, upper arms vertical, elbows resting lightly against the sides and the forearms extended so that the hands rested on mid-thighs. The shoulders were equally relaxed.

Note: In Tables 1 to 33

—— unsmoothed data and 'Normal' fit

xxx 3rd order Gram Charlier fit

REFERENCES

1. Hendy, K. C.: *Australian Tri-service Anthropometric Survey, 1977:*

   PART 1. Survey planning, conduct, data handling and methods of analysis.

   PART 3. Survey results: Air Force TRANSPORT and CATERING group.

   PART 4. Survey results: Air Force TECHNICAL and CLERICAL group.

   PART 5. Survey results: Army CATERING group.

   PART 6. Survey results: Army TECHNICAL group.

   PART 7. Survey results: Army WEAPON USERS and OTHERS group.

   PART 8. Survey results: Navy CLEARANCE DIVER group.

   PART 9. Survey results: Navy CONSOLIDATION group.

   Aeronautical Research Laboratories, Systems Report 15. Fishermen's Bend, Melbourne, Australia, 1979.

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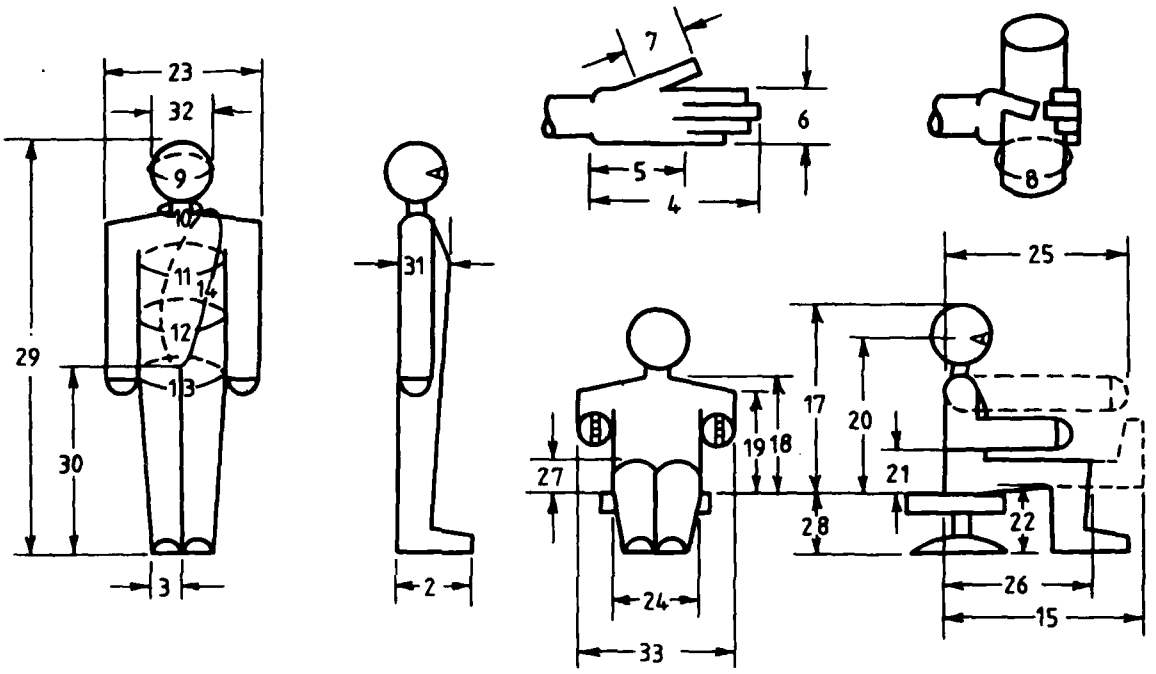
VISUAL INDEX

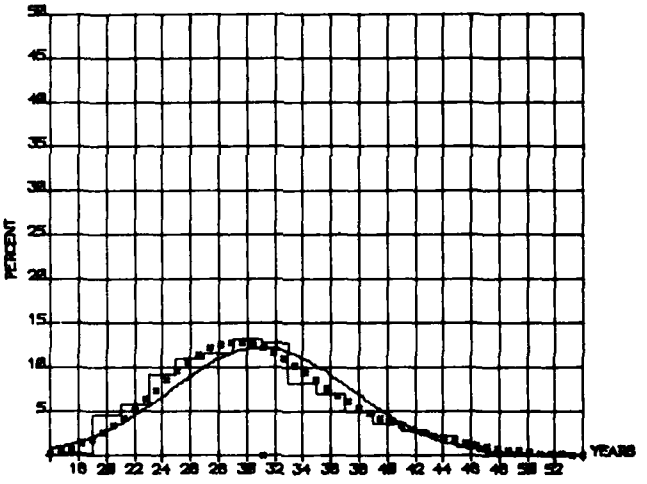


Measurement	Table	Measurement	Table
Acromial Height—Sitting	19	Head Circumference	9
Age	1	Hip Breadth	24
Bideltoid Breadth	23	Inner Hand Grip Circumference	8
Buttock Circumference	13	Inter-Elbow Breadth	33
Buttock–Heel Length	15	Mass	16
Buttock–Knee Length	26	Neck Circumference	10
Chest Circumference	11	Palm Length	5
Chest Depth	31	Popliteal Height	22
Crotch Height	30	Shoulder Height—Sitting	18
Elbow Rest Height	21	Sitting Height	17
Eye Height—Sitting	20	Stature	29
Foot Breadth	3	Stool Height	28
Foot Length	2	Thigh Clearance Height	27
Functional Reach	25	Thumb Length	7
Hand Breadth	6	Vertical Trunk Circumference	14
Hand Length	4	Waist Circumference	12
Head Breadth	32		

TABLE 1

Age (years)

Number of Subjects	: 456
Mean	: 31·1
Standard Deviation	: 6·5
Coefficient of Skewness	: 0·64
Coefficient of Kurtosis	: 0·43
Range of Data	: 19–57



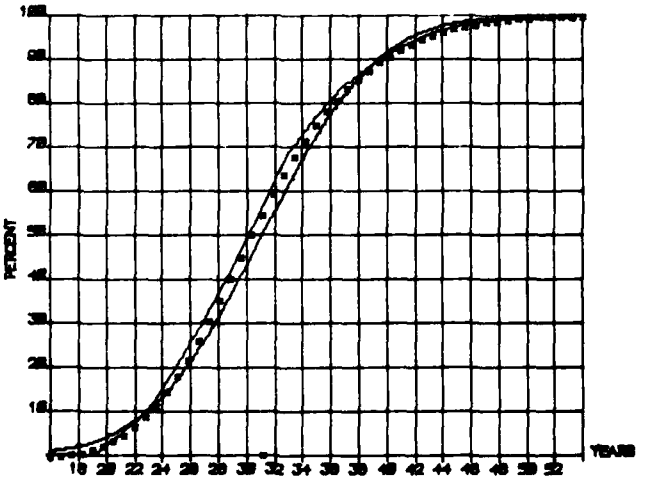


TABLE 2

Foot Length

Subject stands with his left foot in the foot-box, heel against the back wall and the medial side of the foot in contact with the side wall of the box. The datum edge is brought up to touch the most prominent toe. Record the distance of the datum edge from the back wall of the foot-box.

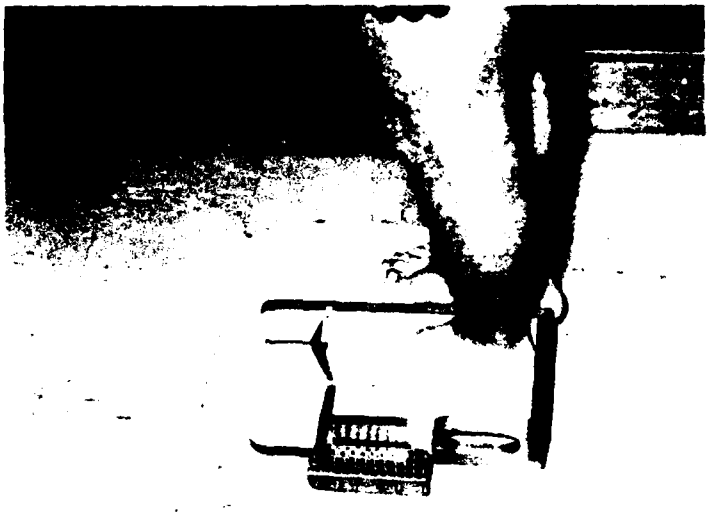


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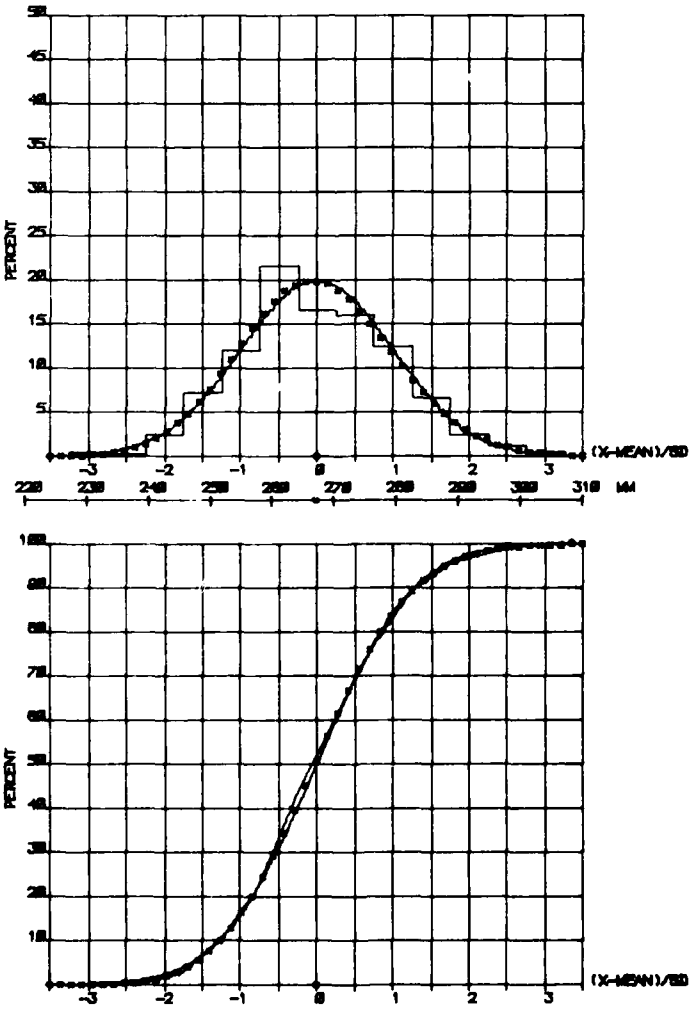
TABLE 2

Foot Length (mm)

Number of Subjects:	: 456
Mean:	: 267·1
Standard Deviation:	: 12·3
Coefficient of Skewness:	0·14
Coefficient of Kurtosis	: −0·12
Range of Data	: 231–304



1st percentile 240
3rd percentile 245
5th percentile 247
10th percentile 252
15th percentile 254
20th percentile 257
25th percentile 259
30th percentile 260
40th percentile 264
50th percentile 267
60th percentile 270
70th percentile 273
75th percentile 275
80th percentile 277
85th percentile 280
90th percentile 283
95th percentile 288
97th percentile 291
99th percentile 297

TABLE 3

Foot Breadth

Subject stands with his left foot in the foot-box, heel against the back wall and the medial side of the foot in contact with the side wall of the box. The datum edge is brought into light contact with the widest aspect of the foot. Record the distance of the datum edge from the side wall of the foot-box.

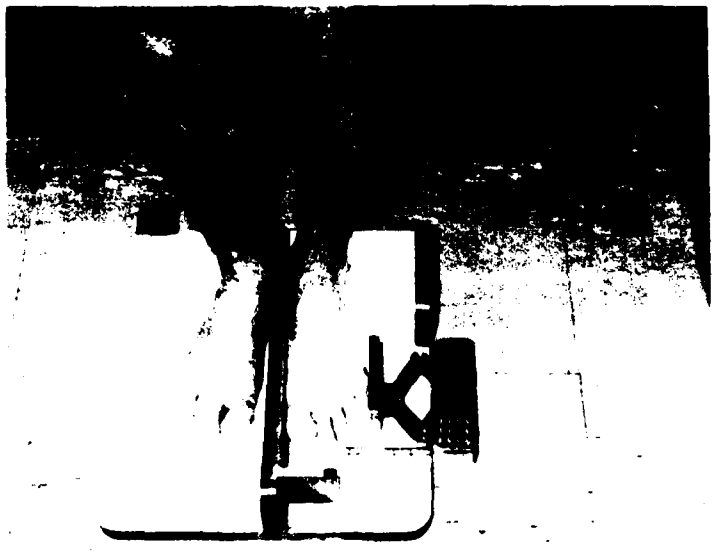
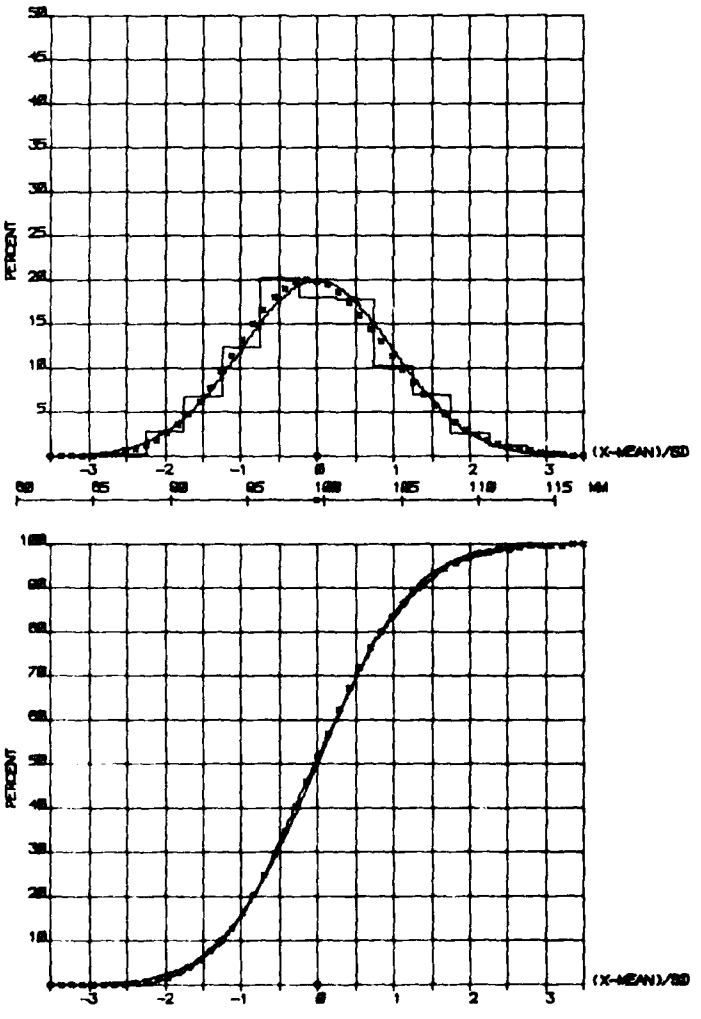


TABLE 3

Foot Breadth (mm)

Number of Subjects	: 456
Mean	: 99·5
Standard Deviation	: 4·9
Coefficient of Skewness	: 0·24
Coefficient of Kurtosis	: 0·14
Range of Data	: 87–114



1st percentile	89
3rd percentile	91
5th percentile	92
10th percentile	93
15th percentile	94
20th percentile	95
25th percentile	96
30th percentile	97
40th percentile	98
50th percentile	99
60th percentile	101
70th percentile	102
75th percentile	103
80th percentile	104
85th percentile	105
90th percentile	106
95th percentile	108
97th percentile	109
99th percentile	112

TABLE 4

Hand Length

Subject's left hand is fully extended and supinated in the axis of the forearm, fingers together. With the bar of the sliding calipers parallel to the longitudinal axis of the hand, measure the distance from the tip of the third digit to the wrist mark at the first major skin crease proximal to the base of the hypothenar eminence.

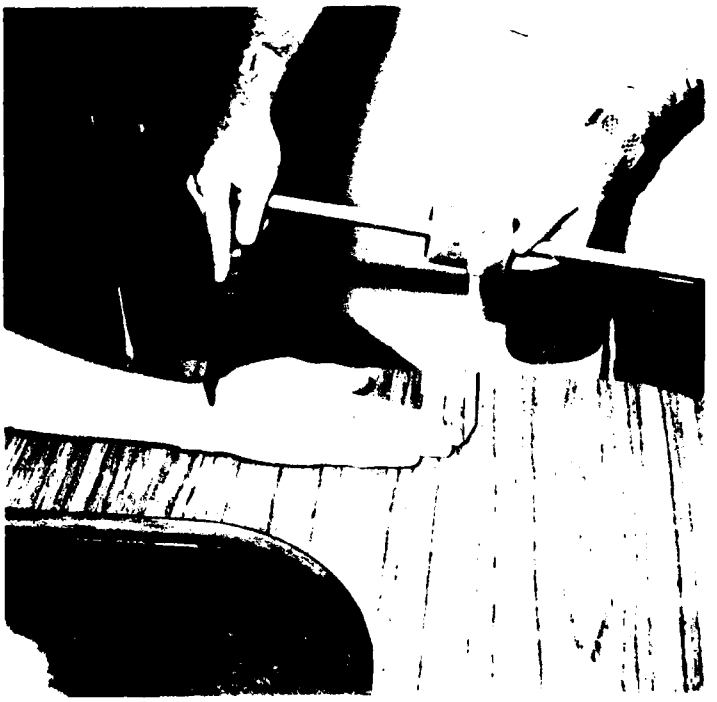
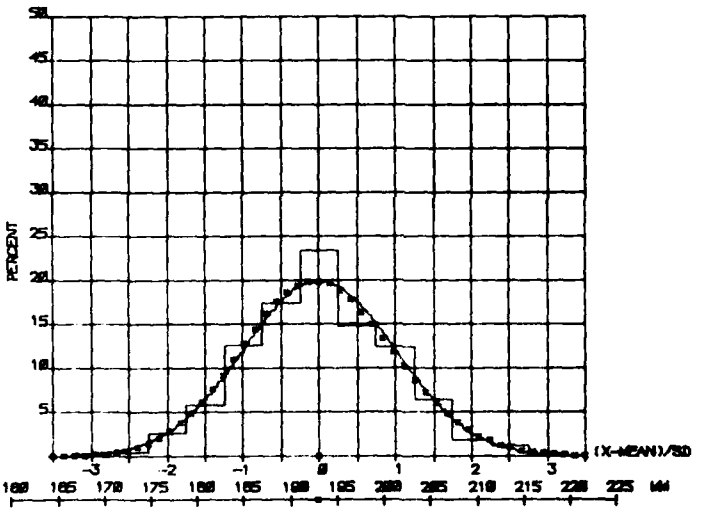
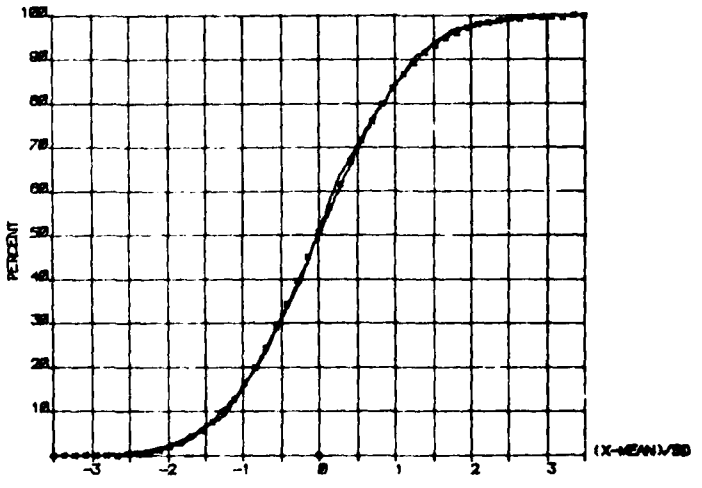


TABLE 4

Hand Length (mm)

Number of Subjects:	456
Mean	193·0
Standard Deviation	8·2
Coefficient of Skewness:	0·12
Coefficient of Kurtosis :	−0·23
Range of Data	170–217





1st percentile 175
3rd percentile 178
5th percentile 180
10th percentile 183
15th percentile 185
20th percentile 186
25th percentile 187
30th percentile 189
40th percentile 191
50th percentile 193
60th percentile 195
70th percentile 197
75th percentile 198
80th percentile 200
85th percentile 201
90th percentile 204
95th percentile 207
97th percentile 209
99th percentile 213

TABLE 5

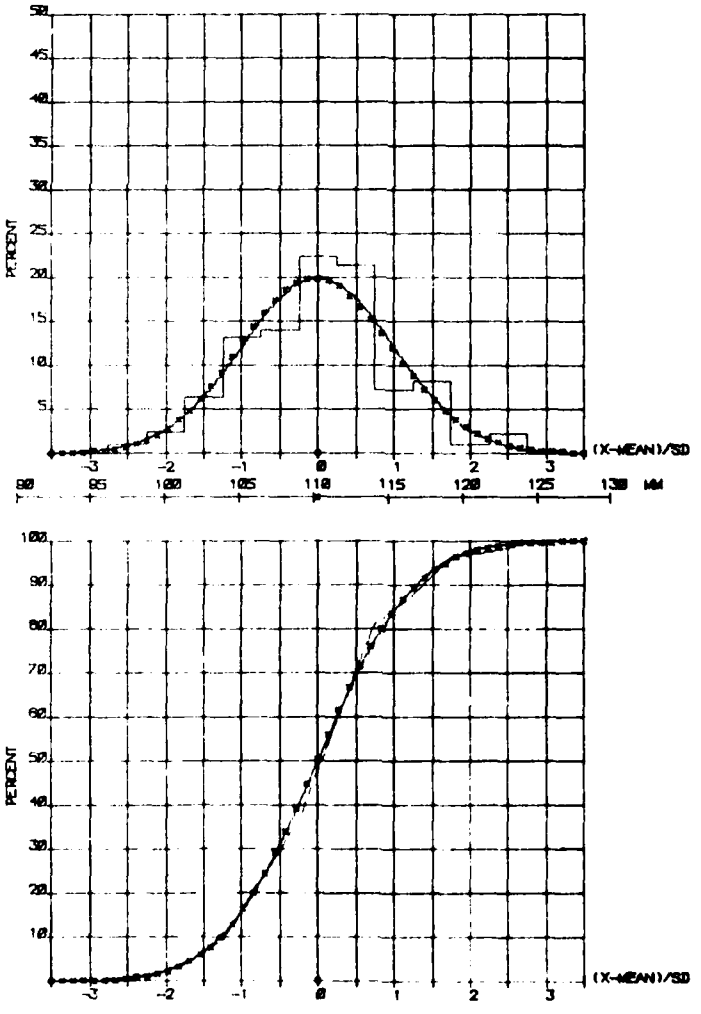
Palm Length

Subject's left hand is fully extended and supinated in the axis of the forearm, fingers together. With the bar of the sliding calipers parallel to the longitudinal axis of the hand, measure the distance from the skin fold at the junction of the third digit and the palm of the hand to the wrist mark at the first major skin crease proximal to the base of the hypothenar eminence.

TABLE 5

Palm Length (mm)

Number of Subjects	: 456
Mean	: 110·3
Standard Deviation	: 5·1
Coefficient of Skewness	: 0·09
Coefficient of Kurtosis	: −0·12
Range of Data	: 97–125



1st percentile	99
3rd percentile	101
5th percentile	102
10th percentile	104
15th percentile	105
20th percentile	106
25th percentile	107
30th percentile	108
40th percentile	109
50th percentile	110
60th percentile	111
70th percentile	113
75th percentile	114
80th percentile	115
85th percentile	116
90th percentile	117
95th percentile	119
97th percentile	120
99th percentile	123

TABLE 6

Hand Breadth

Subject's left hand is fully extended and supinated in the axis of the forearm, fingers together with the thumb held away from the hand. Using the sliding calipers measure the distance across the distal ends of the metacarpal bones.

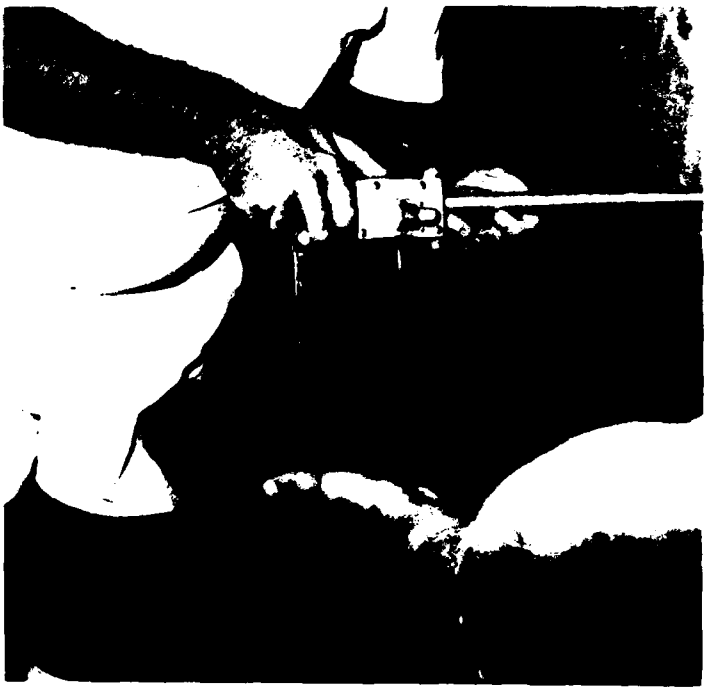
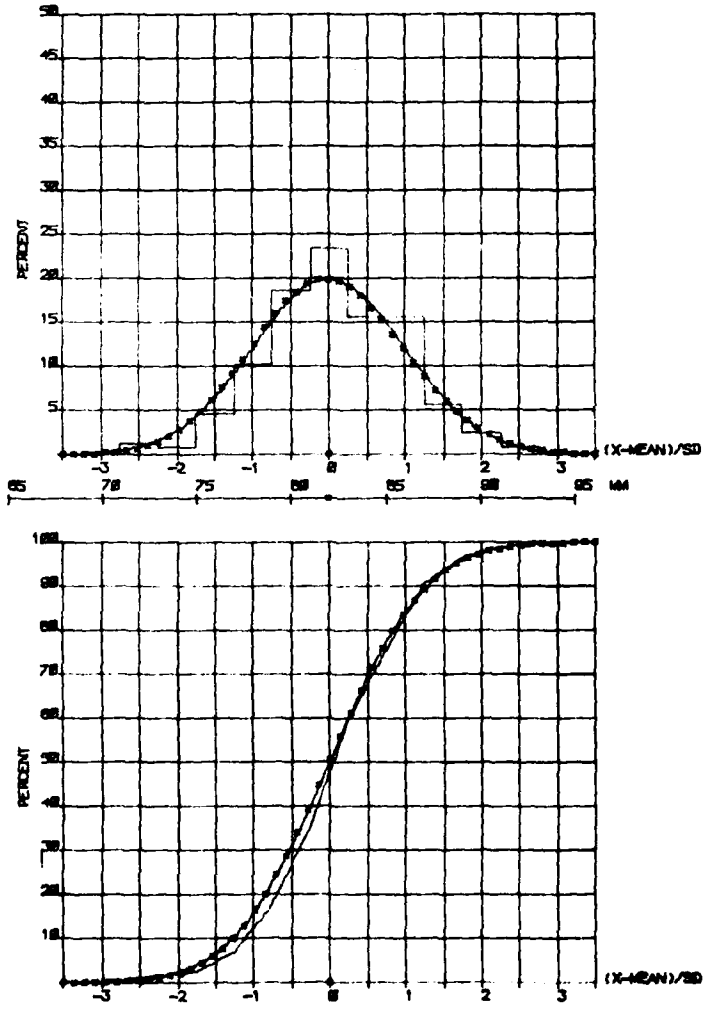


TABLE 6

Hand Breadth (mm)

Number of Subjects	: 456
Mean	: 82·0
Standard Deviation	: 4·0
Coefficient of Skewness	: 0·08
Coefficient of Kurtosis	: 0·46
Range of Data	: 68–95



1st	percentile 73
3rd	percentile 74
5th	percentile 75
10th	percentile 77
15th	percentile 78
20th	percentile 79
25th	percentile 79
30th	percentile 80
40th	percentile 81
50th	percentile 82
60th	percentile 83
70th	percentile 84
75th	percentile 85
80th	percentile 85
85th	percentile 86
90th	percentile 87
95th	percentile 89
97th	percentile 90
99th	percentile 92

TABLE 7

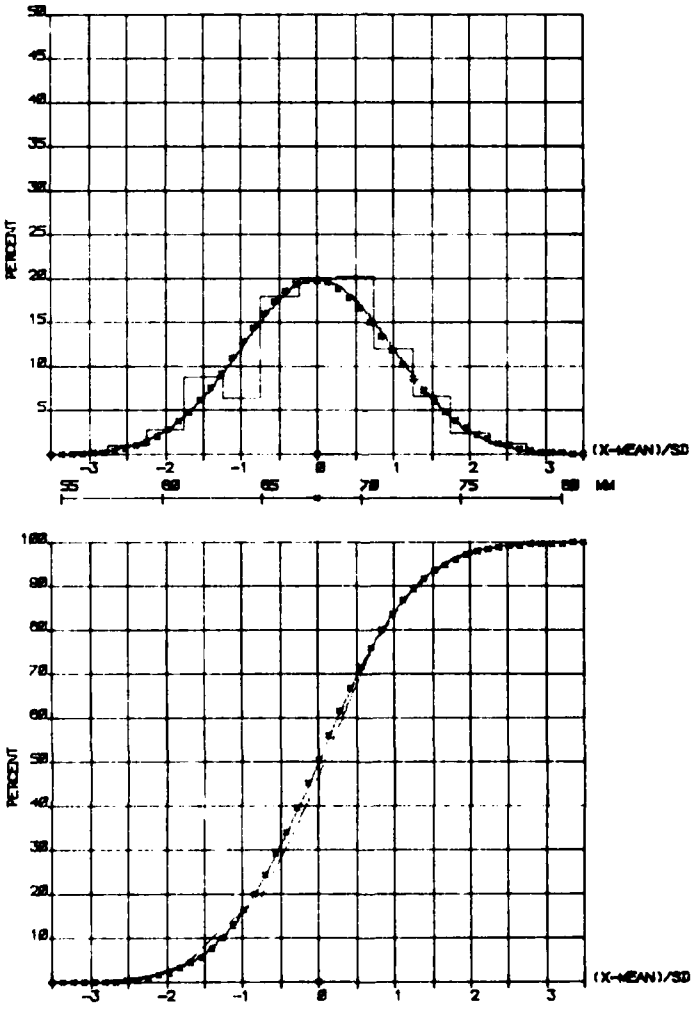
Thumb Length

Subject's left hand is fully extended and pronated in the axis of the forearm, fingers together with the thumb held away from the hand. With the bar of the sliding calipers parallel to the longitudinal axis of the thumb, measure the distance from the tip of the thumb to the thumb mark at the first metacarpophalangeal joint.

TABLE 7

Thumb Length (mm)

Number of Subjects:	456
Mean	67·8
Standard Deviation	3·8
Coefficient of Skewness:	0·10
Coefficient of Kurtosis	—0·04
Range of Data	57–79



1st percentile 59
3rd percentile 61
5th percentile 62
10th percentile 63
15th percentile 64
20th percentile 65
25th percentile 65
30th percentile 66
40th percentile 67
50th percentile 68
60th percentile 69
70th percentile 70
75th percentile 70
80th percentile 71
85th percentile 72
90th percentile 73
95th percentile 74
97th percentile 75
99th percentile 77

TABLE 8

Inner Hand Grip Circumference

The measuring device is a cone of linearly increasing diameter. The subject grips the cone firmly from behind with the left hand at the maximum diameter at which the thumb and third digit may be lightly opposed. The point of opposition lies over the line scribed on the front of the cone. The Inner Hand Grip Circumference is the circumference of the cone in a horizontal plane containing the point of opposition.

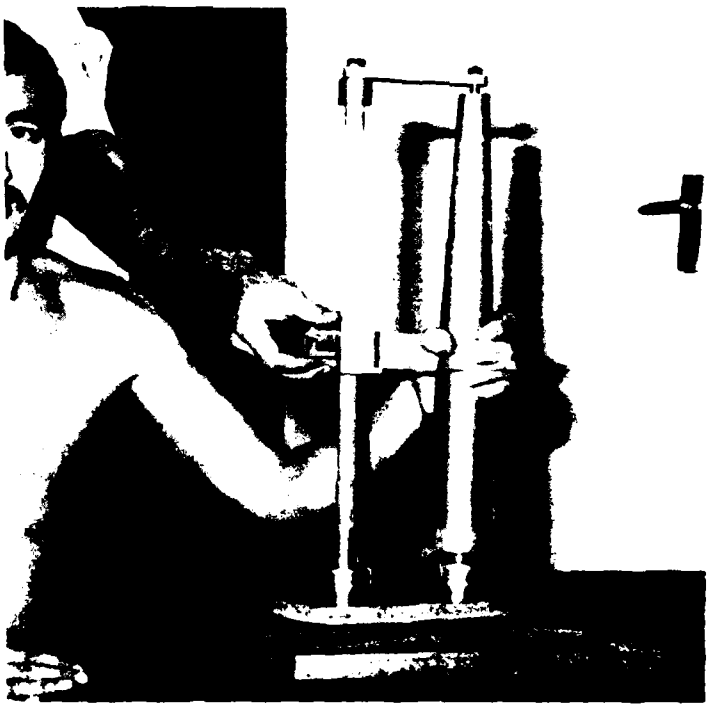
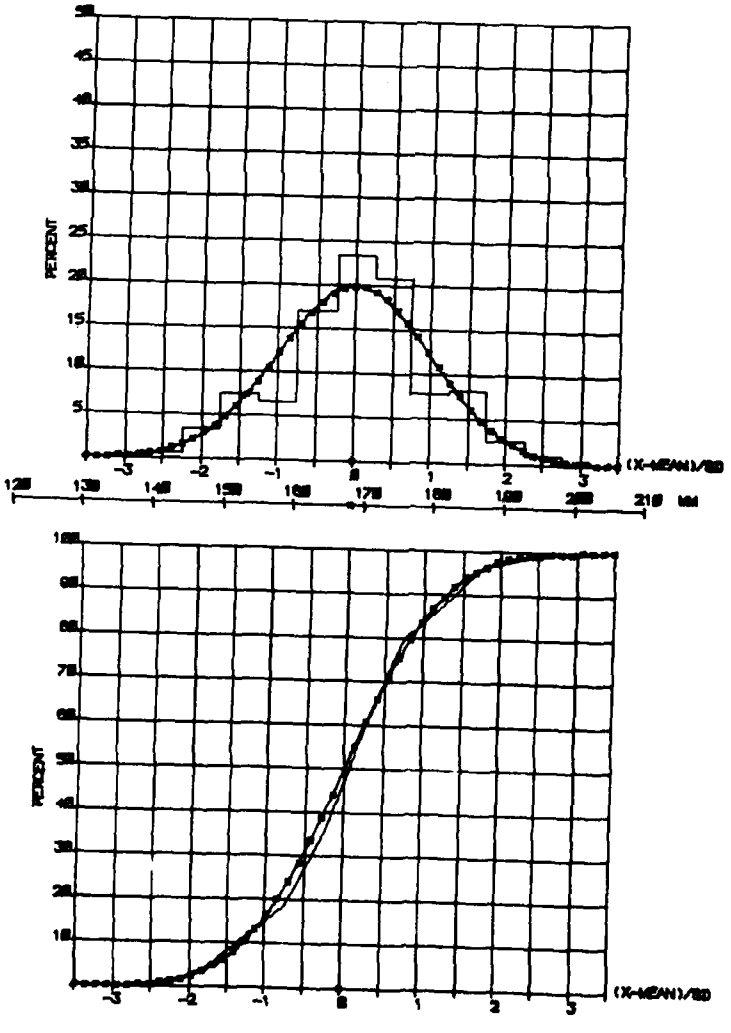


TABLE 8

Inner Hand Grip Circumference (mm)

Number of Subjects	: 456
Mean	: 168·1
Standard Deviation	: 10·8
Coefficient of Skewness	: −0·04
Coefficient of Kurtosis	: 0·00
Range of Data	: 138–204



1st percentile 143
3rd percentile 148
5th percentile 150
10th percentile 154
15th percentile 157
20th percentile 159
25th percentile 161
30th percentile 162
40th percentile 165
50th percentile 168
60th percentile 171
70th percentile 174
75th percentile 175
80th percentile 177
85th percentile 179
90th percentile 182
95th percentile 186
97th percentile 188
99th percentile 193

TABLE 9

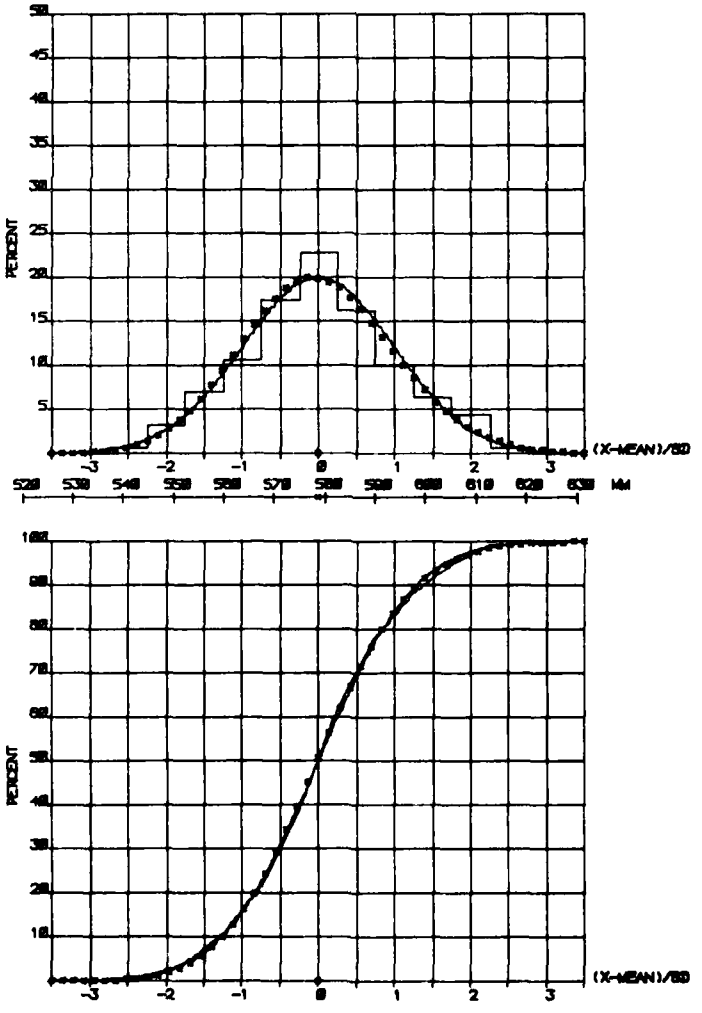
Head Circumference

Subject sits erect, looking straight ahead. Measure the maximum head circumference, the tape passing just over the brow ridges and over the occiput, using just sufficient tape tension to flatten the hair.

TABLE 9

Head Circumference (mm)

Number of Subjects	: 456
Mean:	: 578·8
Standard Deviation	: 15·1
Coefficient of Skewness:	0·16
Coefficient of Kurtosis :	−0·09
Range of Data	: 540–633



1st percentile 545
3rd percentile 551
5th percentile 555
10th percentile 560
15th percentile 563
20th percentile 566
25th percentile 568
30th percentile 571
40th percentile 575
50th percentile 578
60th percentile 582
70th percentile 586
75th percentile 589
80th percentile 591
85th percentile 594
90th percentile 598
95th percentile 604
97th percentile 608
99th percentile 616

TABLE 10

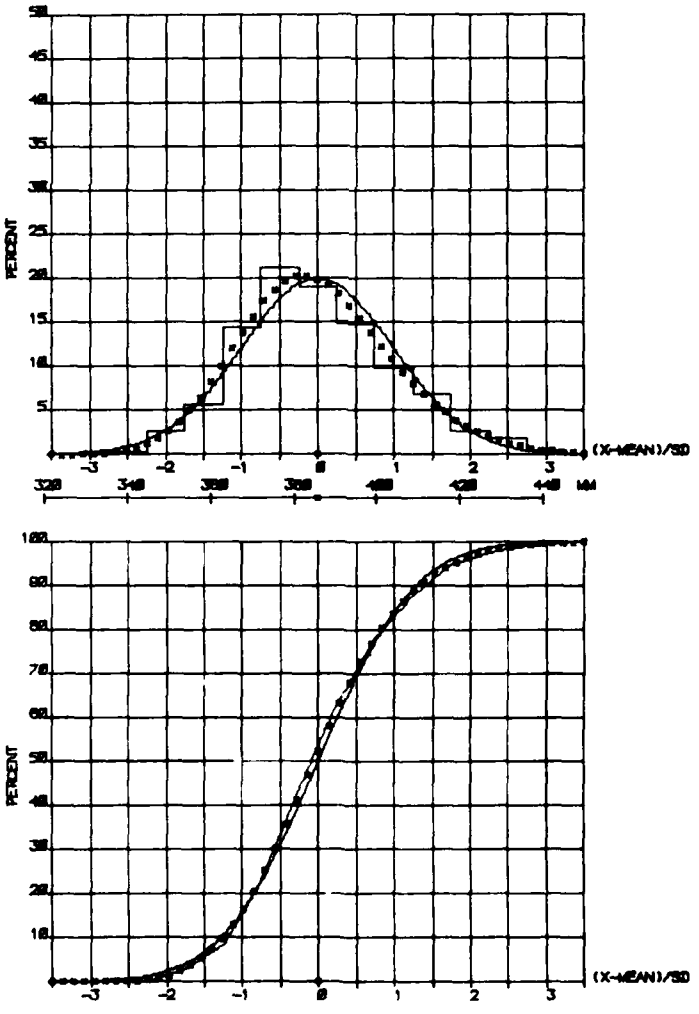
Neck Circumference

Subject sits erect, looking straight ahead. Measure the circumference of the neck ensuring that the tape is at right angles to the longitudinal axis of the neck and that the datum edge of the tape passes over the tip of the thyroid cartilage.

TABLE 10

Neck Circumference (mm)

Number of Subjects	: 456
Mean	: 385·8
Standard Deviation	: 18·3
Coefficient of Skewness	: 0·38
Coefficient of Kurtosis	: 0·18
Range of Data	: 343–454



1st percentile	348
3rd percentile	354
5th percentile	357
10th percentile	363
15th percentile	367
20th percentile	370
25th percentile	373
30th percentile	375
40th percentile	380
50th percentile	385
60th percentile	389
70th percentile	394
75th percentile	397
80th percentile	401
85th percentile	405
90th percentile	410
95th percentile	418
97th percentile	423
99th percentile	433

TABLE 11

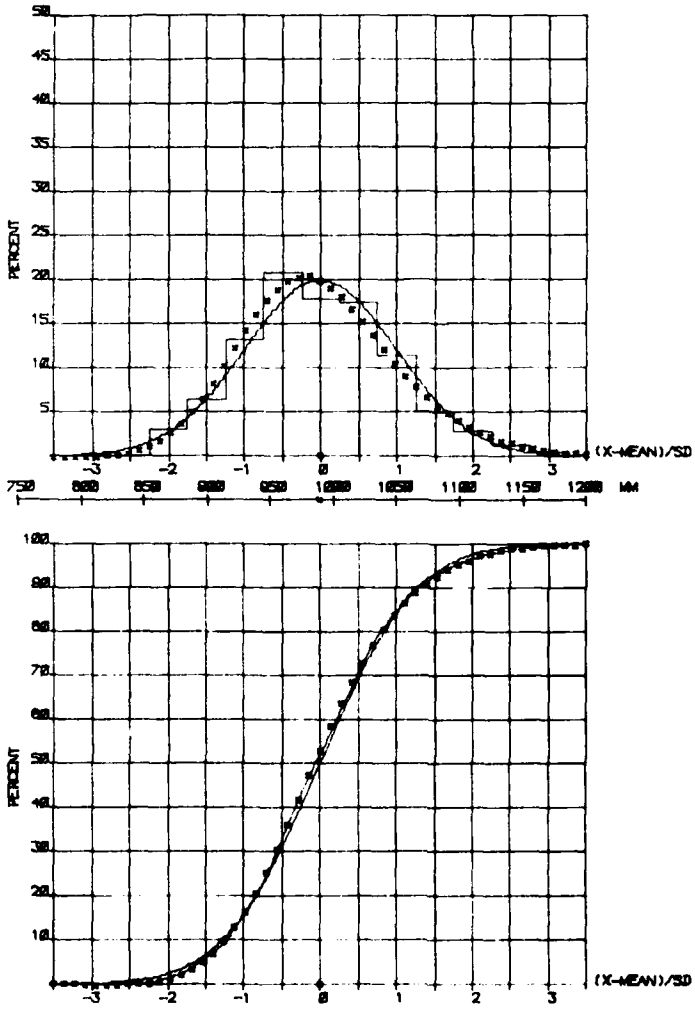
Chest Circumference

Subject stands erect, feet approximately 100 mm apart, with arms away from the sides. The tape is passed horizontally around the chest, aligning the datum edge with the nipples and the chest marks made on the subject's back. The arms are lowered, tape alignment checked and Chest Circumference measured at the end of a normal inspiration.

TABLE 11

Chest Circumference (mm)

Number of Subjects	: 456
Mean	: 989·1
Standard Deviation	: 60·3
Coefficient of Skewness	: 0·44
Coefficient of Kurtosis	: 0·39
Range of Data	: 854–1247



1st percentile	867
3rd percentile	886
5th percentile	896
10th percentile	914
15th percentile	927
20th percentile	937
25th percentile	946
30th percentile	955
40th percentile	970
50th percentile	985
60th percentile	1000
70th percentile	1017
75th percentile	1027
80th percentile	1038
85th percentile	1052
90th percentile	1070
95th percentile	1097
97th percentile	1115
99th percentile	1147

TABLE 12

Waist Circumference

Subject stands erect, heels approximately 100 mm apart, with arms away from the sides. The tape is passed horizontally around the waist, aligning the datum edge with the umbilicus and the waist marks made on the subject's back. The arms are lowered, tape alignment checked, and the Waist Circumference measured.

TABLE 12

Waist Circumference (mm)

Number of Subjects : 456

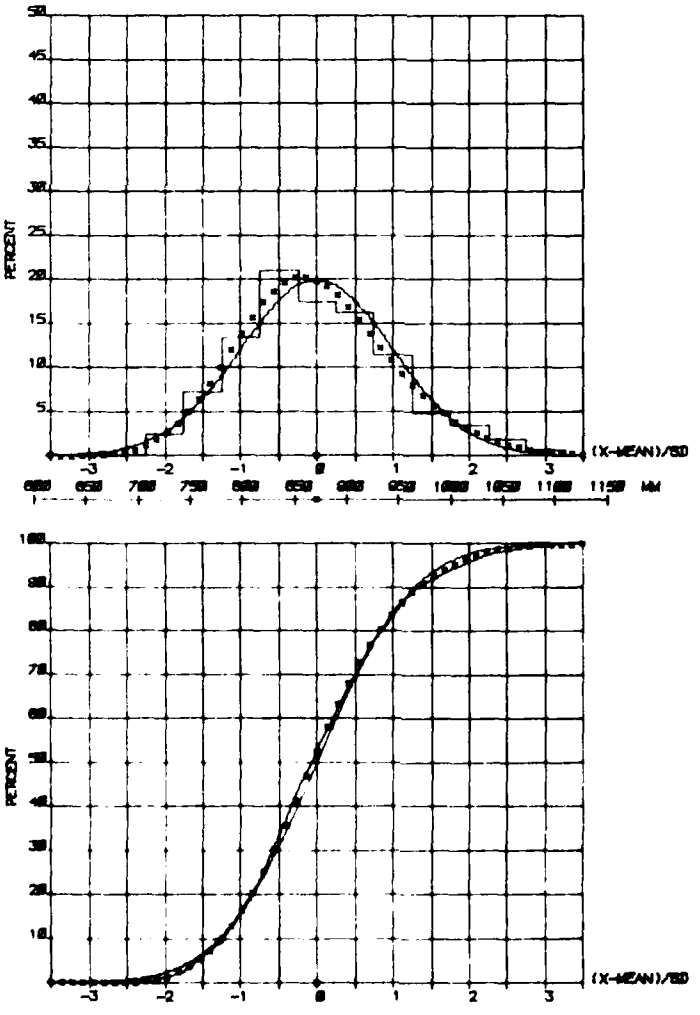
Mean : 871·5

Standard Deviation : 73·0

Coefficient of Skewness: 0·38

Coefficient of Kurtosis : −0·11

Range of Data : 710–1092



1st percentile	721
3rd percentile	745
5th percentile	758
10th percentile	781
15th percentile	796
20th percentile	809
25th percentile	820
30th percentile	830
40th percentile	849
50th percentile	867
60th percentile	886
70th percentile	906
75th percentile	918
80th percentile	932
85th percentile	948
90th percentile	969
95th percentile	1001
97th percentile	1021
99th percentile	1060

TABLE 13

Buttock Circumference

Subject stands erect, feet together. Measure Buttock Circumference with the tape passing horizontally around the maximum posterior protuberance of the buttocks.

TABLE 13

Buttock Circumference (mm)

Number of Subjects : 456

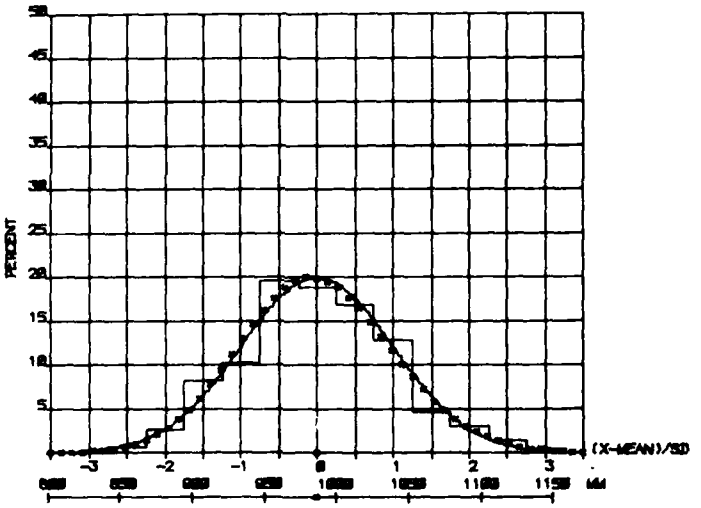
Mean : 986·3

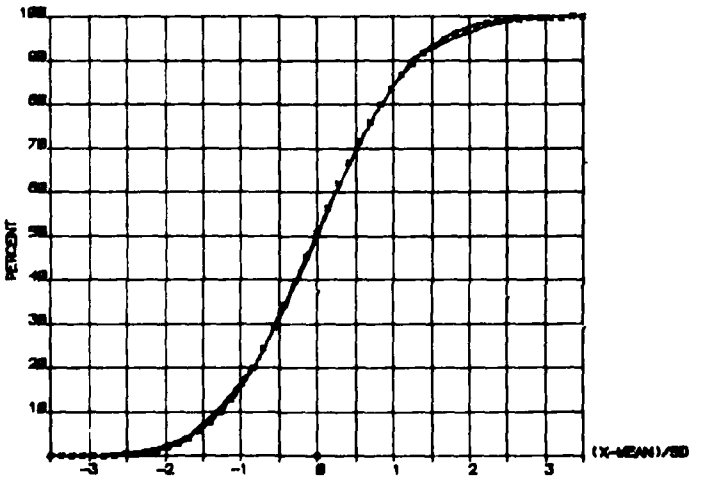
Standard Deviation : 52·7

Coefficient of Skewness : 0·16

Coefficient of Kurtosis : −0·07

Range of Data : 848–1143





1st percentile	870
3rd percentile	891
5th percentile	902
10th percentile	920
15th percentile	932
20th percentile	942
25th percentile	950
30th percentile	958
40th percentile	972
50th percentile	985
60th percentile	998
70th percentile	1013
75th percentile	1021
80th percentile	1030
85th percentile	1041
90th percentile	1055
95th percentile	1075
97th percentile	1089
99th percentile	1115

TABLE 14

Vertical Trunk Circumference

Subject stands erect, looking straight ahead, heels approximately 100 mm apart and the arms relaxed by the sides. Measure Vertical Trunk Circumference, passing the tape back over the left shoulder, the datum edge aligned with the 90 mm shoulder mark, down between the buttocks, through the crotch to the left of the genitals and up the front of the trunk spanning all body hollows. Adjust the tape tension so that firm pressure is applied to the crotch without indenting the shoulder.

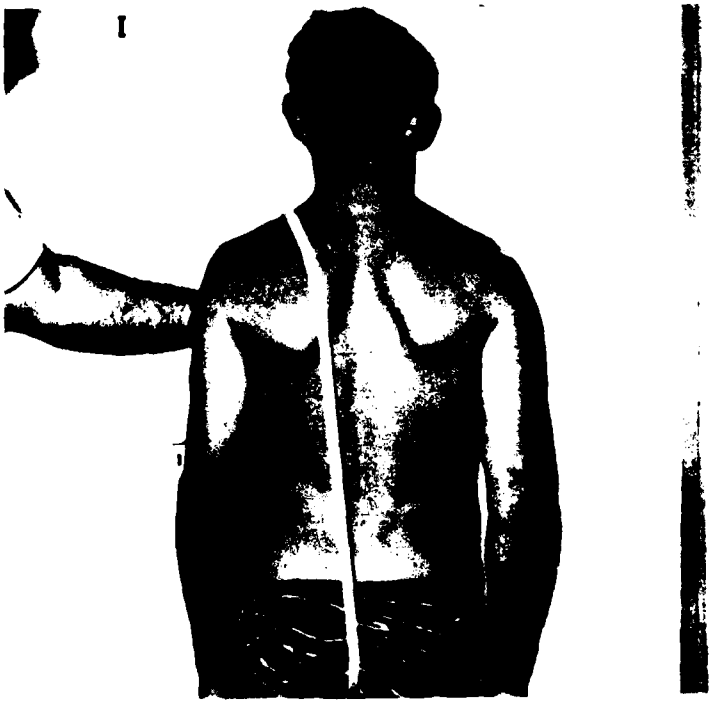
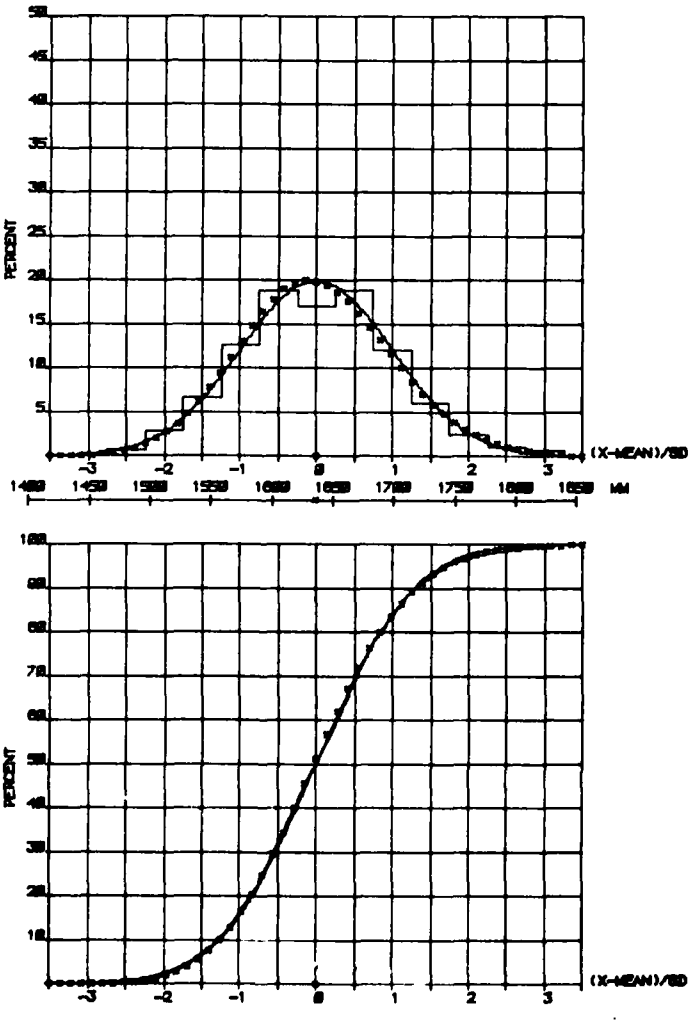


TABLE 14

Vertical Trunk Circumference (mm)

Number of Subjects	: 456
Mean	: 1635·7
Standard Deviation	: 62·4
Coefficient of Skewness	: 0·19
Coefficient of Kurtosis	: 0·05
Range of Data	: 1477–1830



1st percentile 1499
3rd percentile 1523
5th percentile 1536
10th percentile 1557
15th percentile 1571
20th percentile 1583
25th percentile 1593
30th percentile 1602
40th percentile 1618
50th percentile 1634
60th percentile 1650
70th percentile 1667
75th percentile 1677
80th percentile 1688
85th percentile 1701
90th percentile 1717
95th percentile 1742
97th percentile 1758
99th percentile 1789

TABLE 15

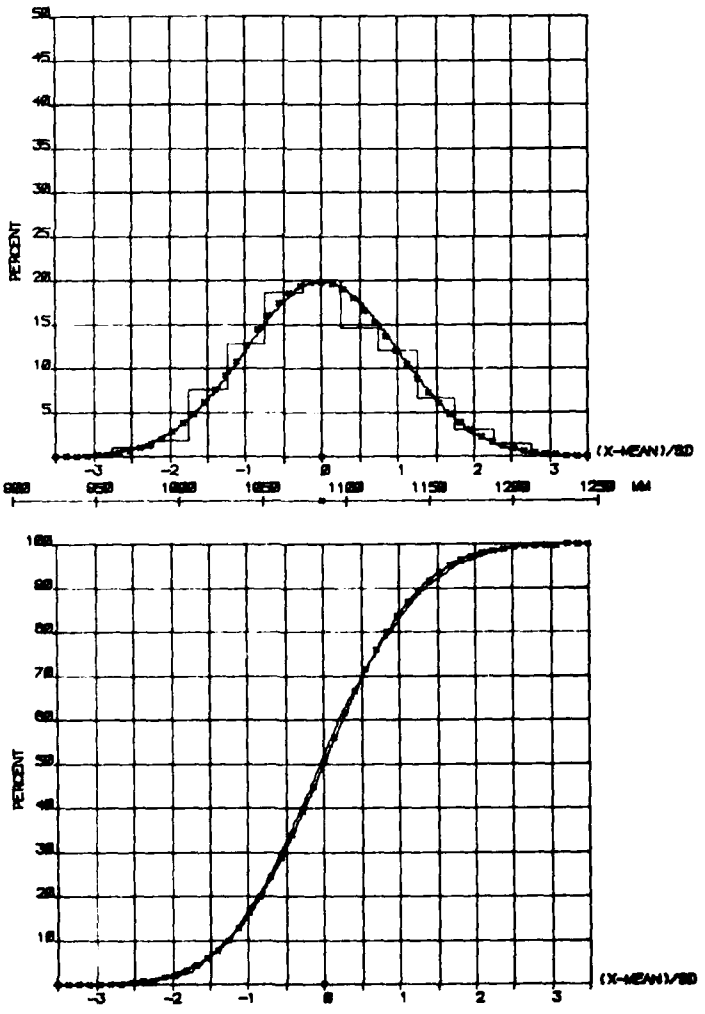
Buttock–Heel Length

Subject sits on the measuring rig with both legs out straight and the knees locked. The subject is instructed to '. . . push your buttocks as far as possible into the back wall'. Before the subject relaxes, the foot block is brought up to the left heel and the distance of the datum edge from the rear wall of the measuring device is recorded.

TABLE 15

Buttock–Heel Length (mm)

Number of Subjects	: 456
Mean	: 1085·1
Standard Deviation	: 45·5
Coefficient of Skewness	: 0·08
Coefficient of Kurtosis	: −0·21
Range of Data	: 963–1205



1st percentile	982
3rd percentile	1001
5th percentile	1011
10th percentile	1027
15th percentile	1038
20th percentile	1047
25th percentile	1054
30th percentile	1061
40th percentile	1073
50th percentile	1084
60th percentile	1096
70th percentile	1108
75th percentile	1115
80th percentile	1123
85th percentile	1132
90th percentile	1144
95th percentile	1161
97th percentile	1172
99th percentile	1194

TABLE 16

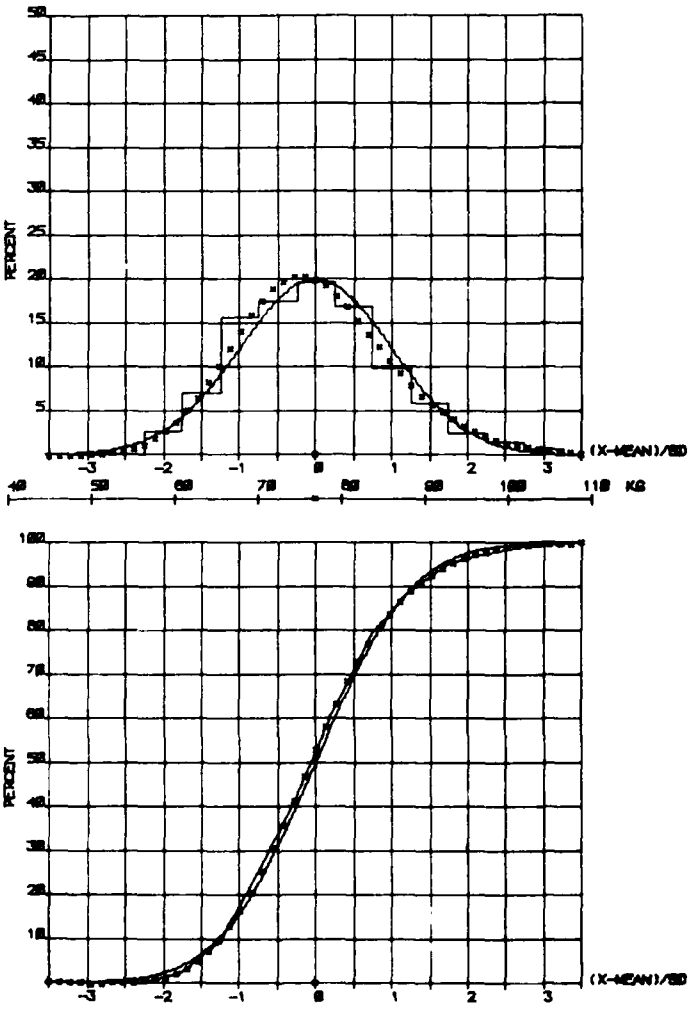
Mass

The mass of the subject is recorded standing on a spring scale (subject wearing briefs only).

TABLE 16

Mass (kg)

Number of Subjects	: 456
Mean	: 76·9
Standard Deviation	: 9·1
Coefficient of Skewness	: 0·41
Coefficient of Kurtosis	: 0.17
Range of Data	: 56·5–110·0



1st percentile	58·3
3rd percentile	61·1
5th percentile	62·8
10th percentile	65·5
15th percentile	67·4
20th percentile	69·0
25th percentile	70·4
30th percentile	71·7
40th percentile	74·0
50th percentile	76·2
60th percentile	78·6
70th percentile	81·1
75th percentile	82·6
80th percentile	84·3
85th percentile	86·4
90th percentile	89·0
95th percentile	93·0
97th percentile	95·7
99th percentile	100·5

TABLE 17

Sitting Height

The subject holds the sitting posture. The datum edge is brought down in the midsagittal plane until light contact is made with the vertex. Record the height of the datum edge from the floor. Sitting Height equals datum height less Stool Height.

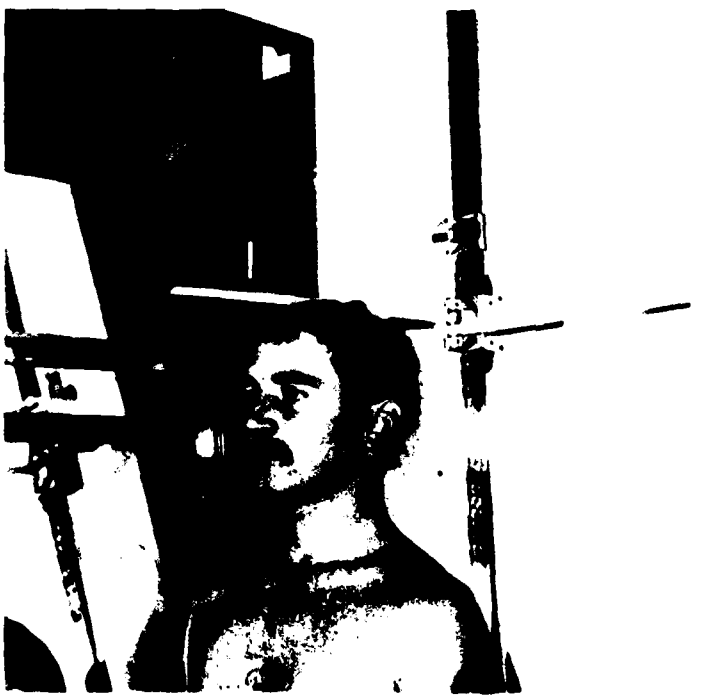


TABLE 17

Sitting Height (mm)

Number of Subjects : 456

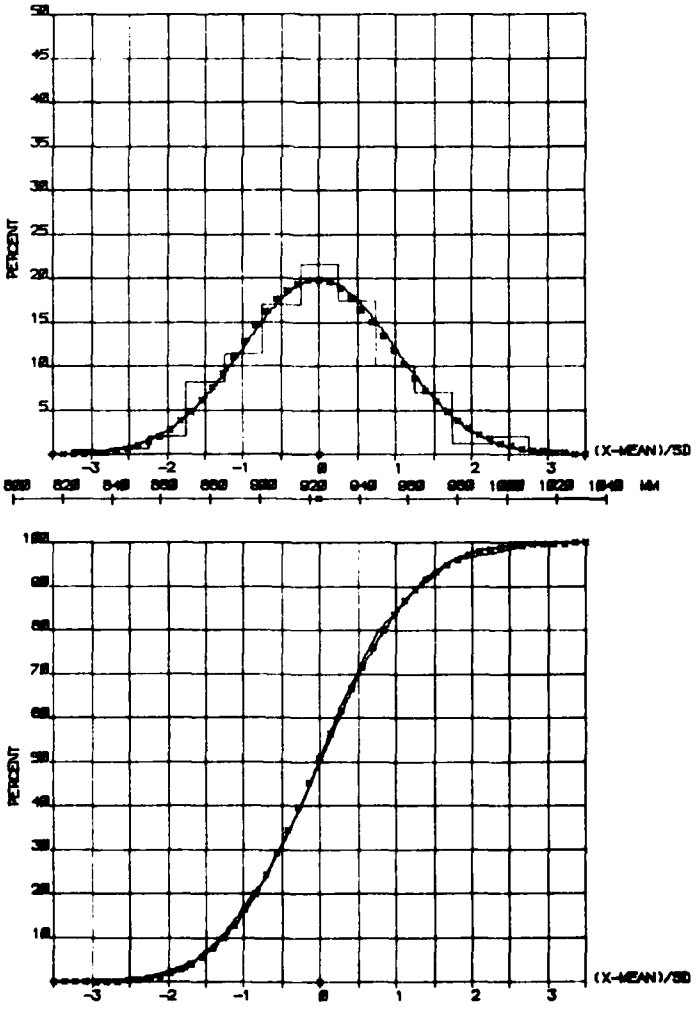
Mean : 923·9

Standard Deviation : 30·8

Coefficient of Skewness: 0·12

Coefficient of Kurtosis : 0·17

Range of Data : 833–1021



1st percentile 855
3rd percentile 867
5th percentile 874
10th percentile 885
15th percentile 892
20th percentile 898
25th percentile 903
30th percentile 907
40th percentile 916
50th percentile 923
60th percentile 931
70th percentile 940
75th percentile 944
80th percentile 950
85th percentile 956
90th percentile 964
95th percentile 976
97th percentile 983
99th percentile 998

TABLE 18

Eye Height (Sitting)

The subject holds the sitting posture. The datum line is brought up until the reflections of this line and the centre of the subject's left pupil, in the mirror opposite, are coincident. Record the height of the datum line from the floor. Eye Height equals datum height less Stool Height.

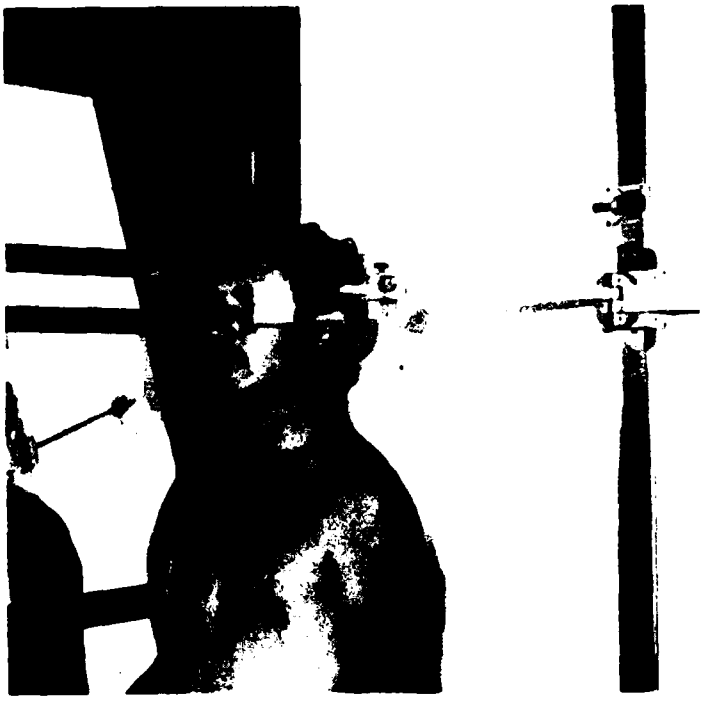
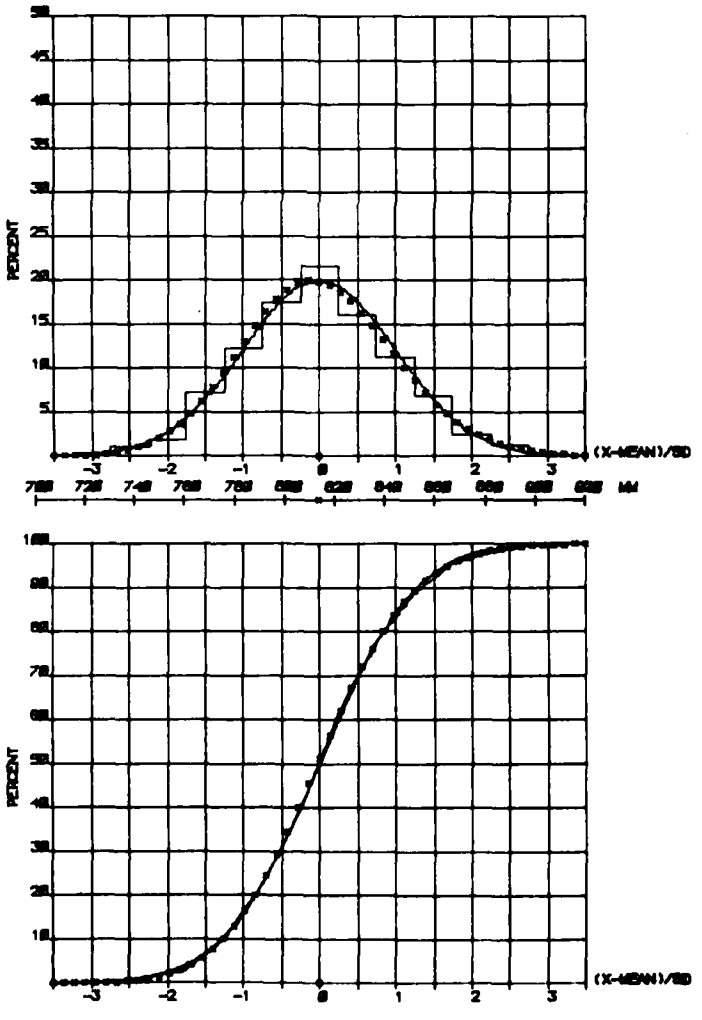


TABLE 18

Eye Height (Sitting) (mm)

Number of Subjects	: 456
Mean	: 813·8
Standard Deviation	: 30·4
Coefficient of Skewness	: 0·17
Coefficient of Kurtosis	: 0·27
Range of Data	: 725–923



1st percentile 747
3rd percentile 759
5th percentile 765
10th percentile 775
15th percentile 782
20th percentile 788
25th percentile 793
30th percentile 797
40th percentile 805
50th percentile 813
60th percentile 821
70th percentile 829
75th percentile 834
80th percentile 839
85th percentile 845
90th percentile 853
95th percentile 865
97th percentile 873
99th percentile 888

TABLE 19

Shoulder Height (Sitting)

The subject holds the sitting posture. The datum edge is brought down until light contact is made with the 90 mm mark on the left shoulder. Record the height of the datum edge from the floor. Shoulder Height equals datum height less Stool Height.

TABLE 19

Shoulder Height (Sitting) (mm)

Number of Subjects : 456

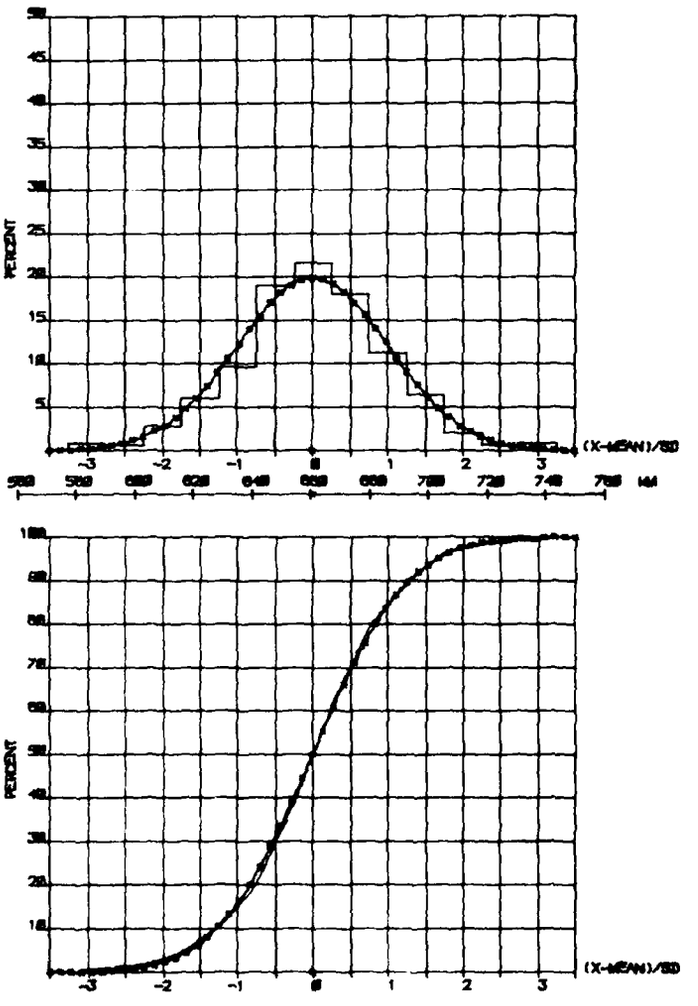
Mean : 660·7

Standard Deviation : 25·6

Coefficient of Skewness: −0·01

Coefficient of Kurtosis : 0·43

Range of Data : 581–742



1st percentile 601
3rd percentile 612
5th percentile 618
10th percentile 628
15th percentile 634
20th percentile 639
25th percentile 643
30th percentile 647
40th percentile 654
50th percentile 661
60th percentile 667
70th percentile 674
75th percentile 678
80th percentile 682
85th percentile 687
90th percentile 693
95th percentile 703
97th percentile 709
99th percentile 720

TABLE 20

Acromial Height (Sitting)

The subject holds the sitting posture. The datum edge is brought down until light contact is made with the left acromial mark. Record the height of the datum edge from the floor. Acromial Height equals datum height less Stool Height.

TABLE 20

Acromial Height (Sitting) (mm)

Number of Subjects : 456

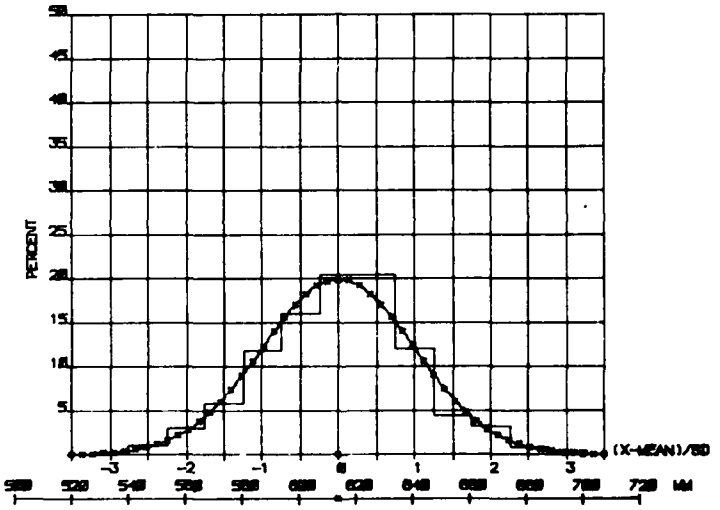
Mean : 613·9

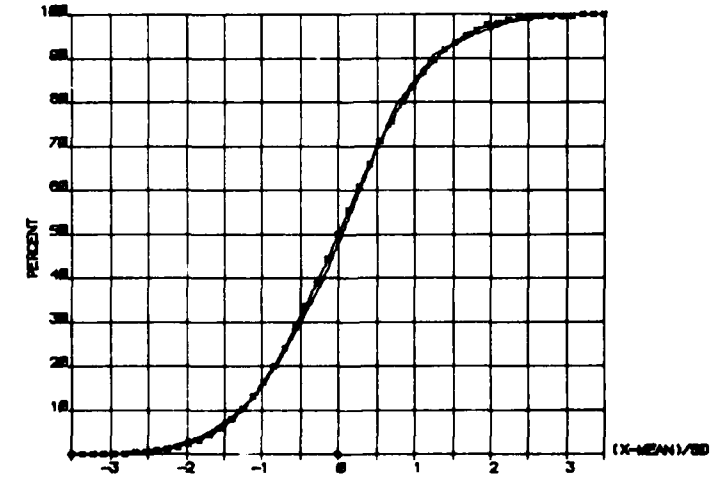
Standard Deviation : 26·7

Coefficient of Skewness: 0·00

Coefficient of Kurtosis : 0·25

Range of Data : 536–699





1st percentile 552
3rd percentile 564
5th percentile 570
10th percentile 580
15th percentile 586
20th percentile 591
25th percentile 596
30th percentile 600
40th percentile 607
50th percentile 614
60th percentile 621
70th percentile 628
75th percentile 632
80th percentile 636
85th percentile 642
90th percentile 648
95th percentile 658
97th percentile 664
99th percentile 676

TABLE 21

Elbow Rest Height

The subject holds the sitting posture except that the forearms are raised and extended forwards horizontally. The hands and fingers are extended in the vertical plane containing the forearm. The datum edge is brought up to make contact with the lower edge of the left olecrannon. Record the height of the datum edge from the floor. Elbow Rest Height equals datum height less Stool Height.

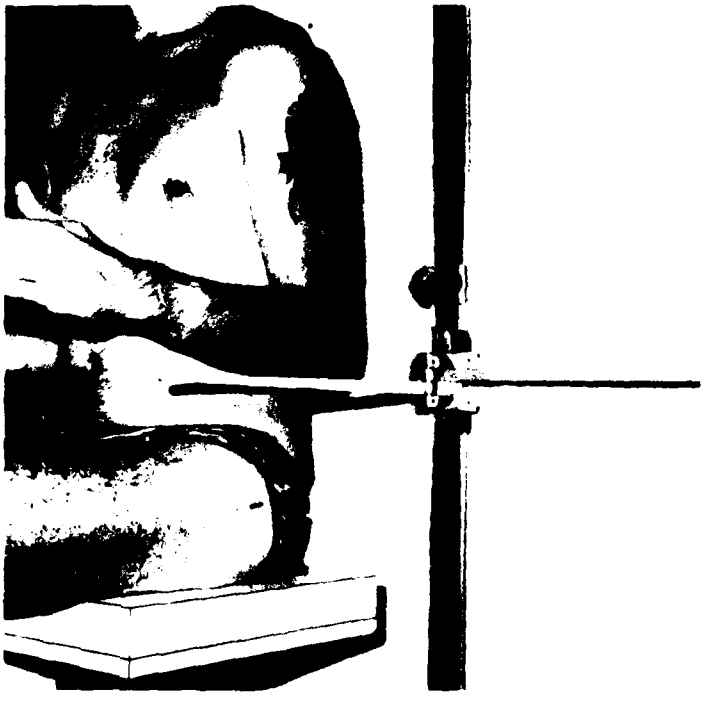
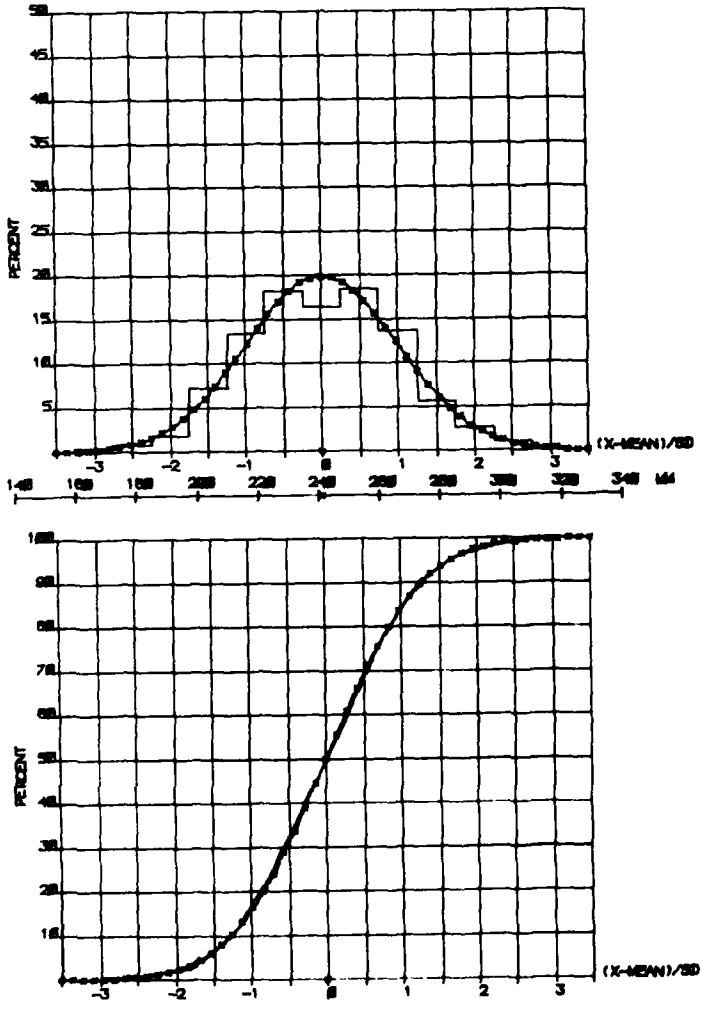


TABLE 21

Elbow Rest Height (mm)

Number of Subjects:	456
Mean	241·3
Standard Deviation	25·1
Coefficient of Skewness:	−0·01
Coefficient of Kurtosis :	−0·16
Range of Data	167–318



1st percentile 183
3rd percentile 194
5th percentile 200
10th percentile 209
15th percentile 215
20th percentile 220
25th percentile 224
30th percentile 228
40th percentile 235
50th percentile 241
60th percentile 248
70th percentile 255
75th percentile 258
80th percentile 262
85th percentile 267
90th percentile 273
95th percentile 283
97th percentile 288
99th percentile 300

TABLE 22

Popliteal Height

The subject holds the sitting posture. With the sliding calipers measure the vertical distance from the floor to the underside of the tendon of the left biceps femoris muscle where it joins the calf.

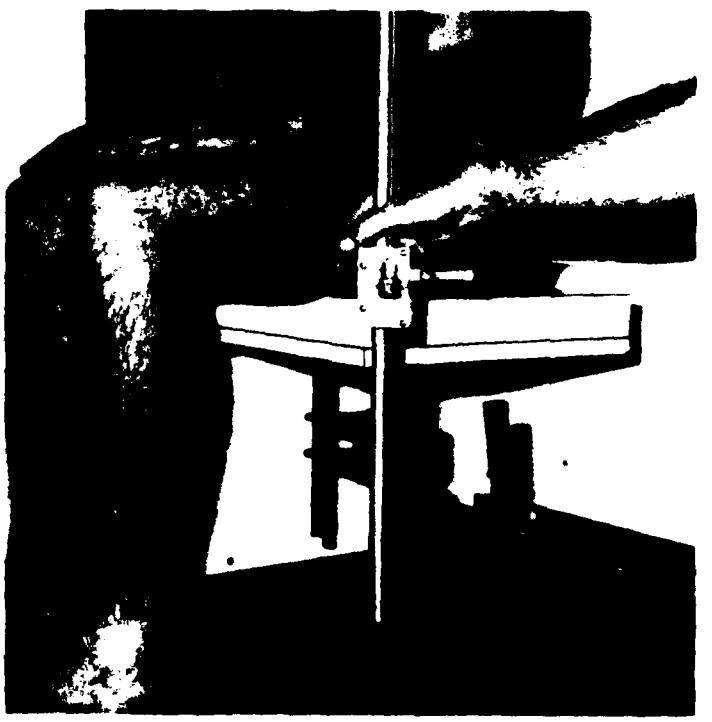
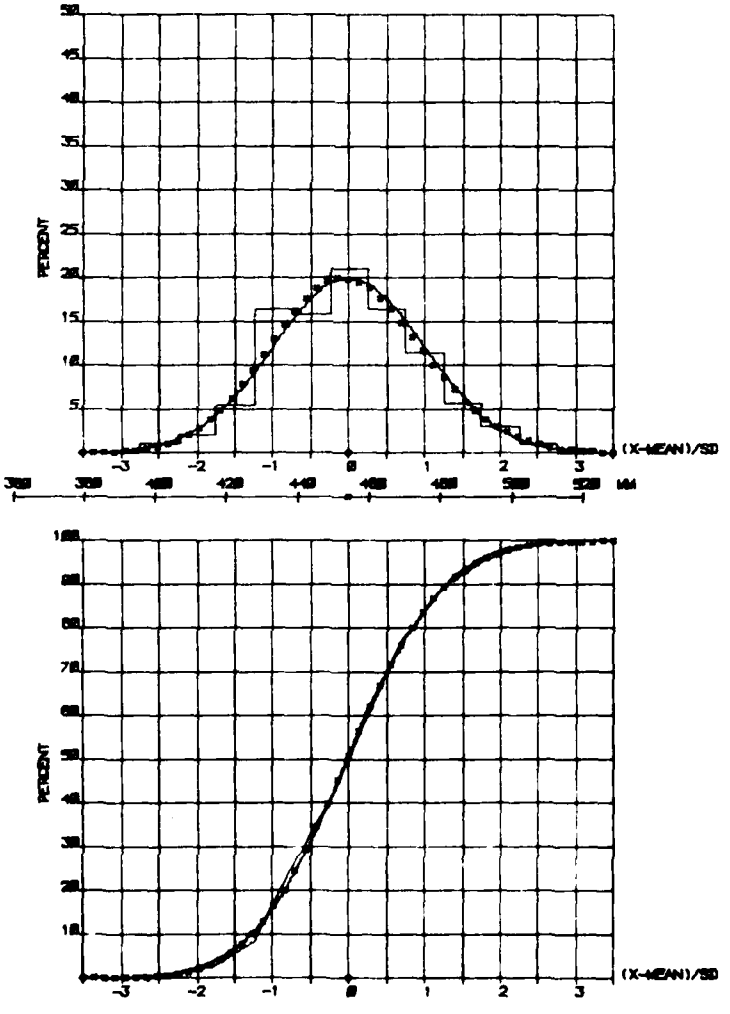


TABLE 22

Popliteal Height (mm)

Number of Subjects	: 456
Mean	: 454.2
Standard Deviation	: 21·3
Coefficient of Skewness	: 0·16
Coefficient of Kurtosis	: −0·25
Range of Data	: 397–513



1st percentile 407
3rd percentile 415
5th percentile 420
10th percentile 427
15th percentile 432
20th percentile 436
25th percentile 440
30th percentile 443
40th percentile 448
50th percentile 454
60th percentile 459
70th percentile 465
75th percentile 468
80th percentile 472
85th percentile 476
90th percentile 482
95th percentile 490
97th percentile 496
99th percentile 506

TABLE 23

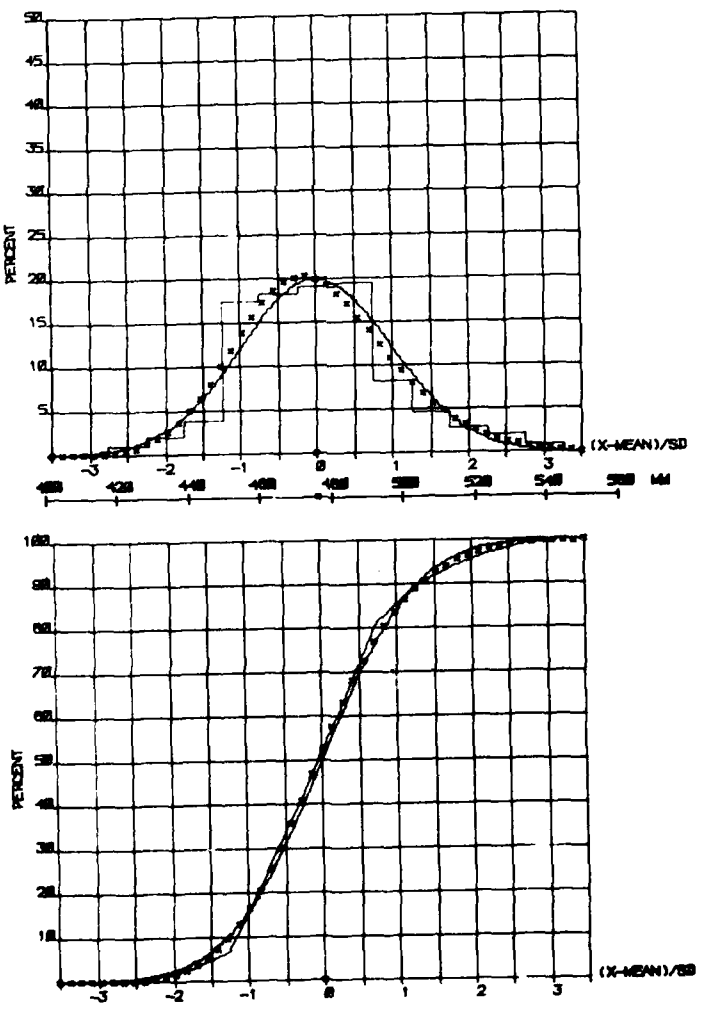
Bideltoid Breadth

The subject moves across to his right-hand side until the right deltoid muscle is brought into light contact with the perspex wall panel. The circle of skin in contact with the perspex has a diameter of approximately 30 mm (this is monitored in the mirror). The subject regains the sitting posture and the datum edge is moved horizontally until light contact is made with the most distal portion of the left deltoid prominence. Record the distance of the datum edge from the end wall.

TABLE 23

Bideltoid Breadth (mm)

Number of Subjects	: 456
Mean	: 476·3
Standard Deviation	: 21·2
Coefficient of Skewness	: 0·36
Coefficient of Kurtosis	: 0·32
Range of Data	: 419–543



1st percentile 432
3rd percentile 439
5th percentile 443
10th percentile 450
15th percentile 454
20th percentile 458
25th percentile 461
30th percentile 464
40th percentile 470
50th percentile 475
60th percentile 480
70th percentile 486
75th percentile 490
80th percentile 494
85th percentile 498
90th percentile 504
95th percentile 514
97th percentile 520
99th percentile 531

TABLE 24

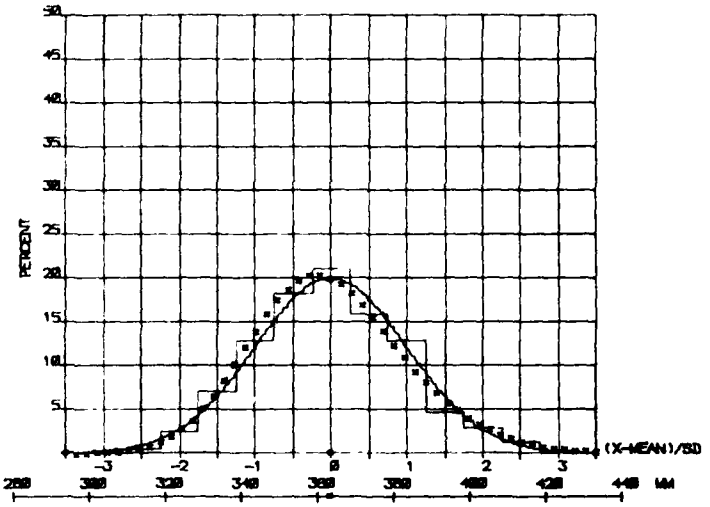
Hip Breadth

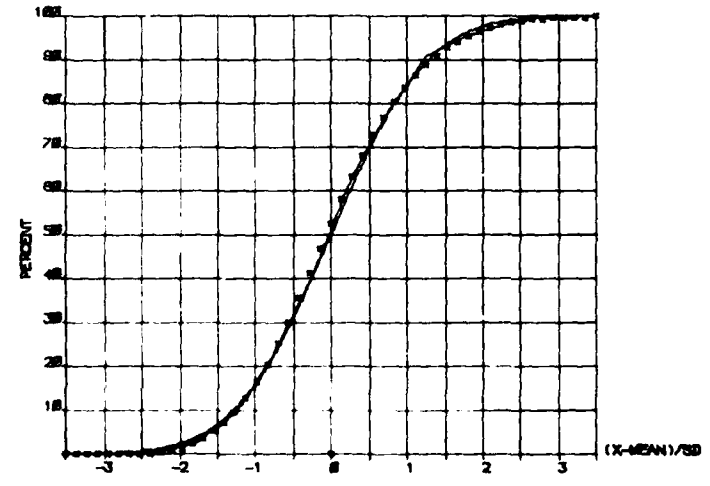
Subject moves across to his right-hand side so that the fleshy part of his right hip makes light contact with the perspex wall panel (monitored in the mirror). The subject's knees are brought together; feet are flat on the floor. The datum edge is moved horizontally until light contact is made with the widest region of the left hip. Record the distance of the datum edge from the end wall.

TABLE 24

Hip Breadth (mm)

Number of Subjects	: 456
Mean	: 363·3
Standard Deviation	: 20·0
Coefficient of Skewness	: 0·39
Coefficient of Kurtosis	: 0·73
Range of Data	: 314–459





1st percentile 322
3rd percentile 329
5th percentile 332
10th percentile 338
15th percentile 343
20th percentile 346
25th percentile 349
30th percentile 352
40th percentile 357
50th percentile 362
60th percentile 367
70th percentile 373
75th percentile 376
80th percentile 380
85th percentile 384
90th percentile 390
95th percentile 399
97th percentile 404
99th percentile 415

TABLE 25

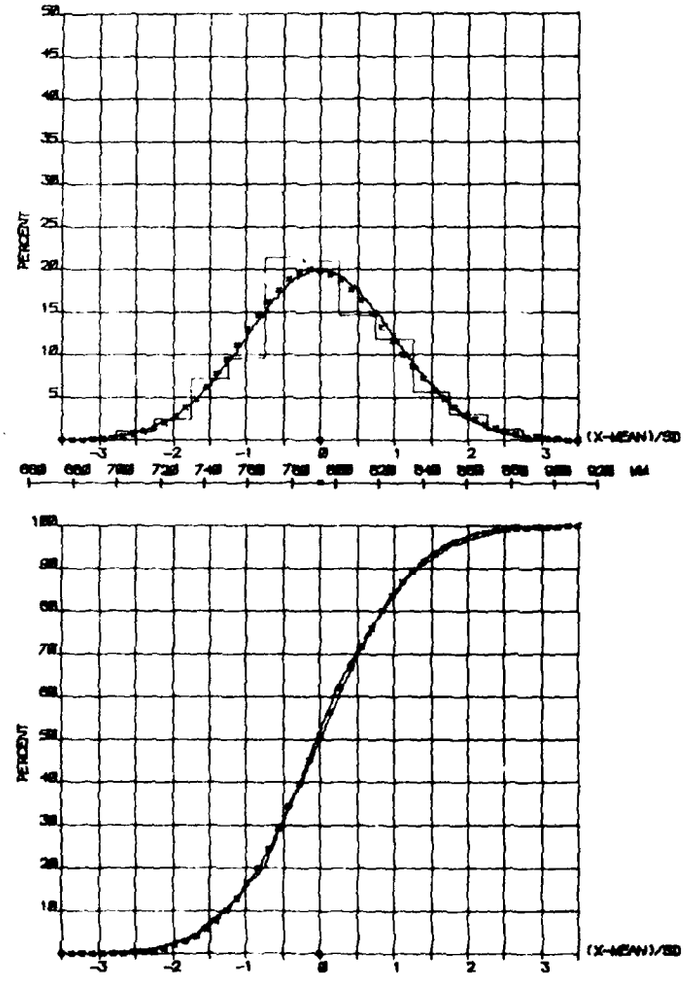
Functional Reach

The subject sits erect looking straight ahead at the reflection of his pupils in the mirror directly in front of him. Both shoulder blades are symmetrically and lightly touching the perspex panel in the end wall of the measuring rig (monitored in the mirror). The arms are extended forward horizontally and the hand is pronated with the tip of the index finger touching the extended thumb (which is held in the plane of the extended arm). The datum edge is moved horizontally until contact is made with the tip of the left thumb. Record the distance of the datum edge from the end wall.

TABLE 25

Functional Reach (mm)

Number of Subjects	: 456
Mean	: 793·1
Standard Deviation	: 33·8
Coefficient of Skewness:	0·16
Coefficient of Kurtosis :	0·03
Range of Data	: 709–906



1st	percentile 718
3rd	percentile 732
5th	percentile 739
10th	percentile 750
15th	percentile 758
20th	percentile 764
25th	percentile 770
30th	percentile 775
40th	percentile 784
50th	percentile 792
60th	percentile 801
70th	percentile 810
75th	percentile 815
80th	percentile 821
85th	percentile 828
90th	percentile 837
95th	percentile 850
97th	percentile 859
99th	percentile 875

TABLE 26

Buttock–Knee Length

The subject sits erect, feet flat on the floor and thighs parallel to the rear wall of the measuring rig. The subject is instructed to '. . . push your buttocks back until you have equal pressure on both buttocks against the perspex wall'. Both shoulder blades are symmetrically and lightly touching the perspex panel in the end wall of the measuring rig. The datum edge is moved horizontally until contact is made with the most forward prominence of the left patella. Record the distance of the datum edge from the end wall.

TABLE 26

Buttock–Knee Length (mm)

Number of Subjects : 456

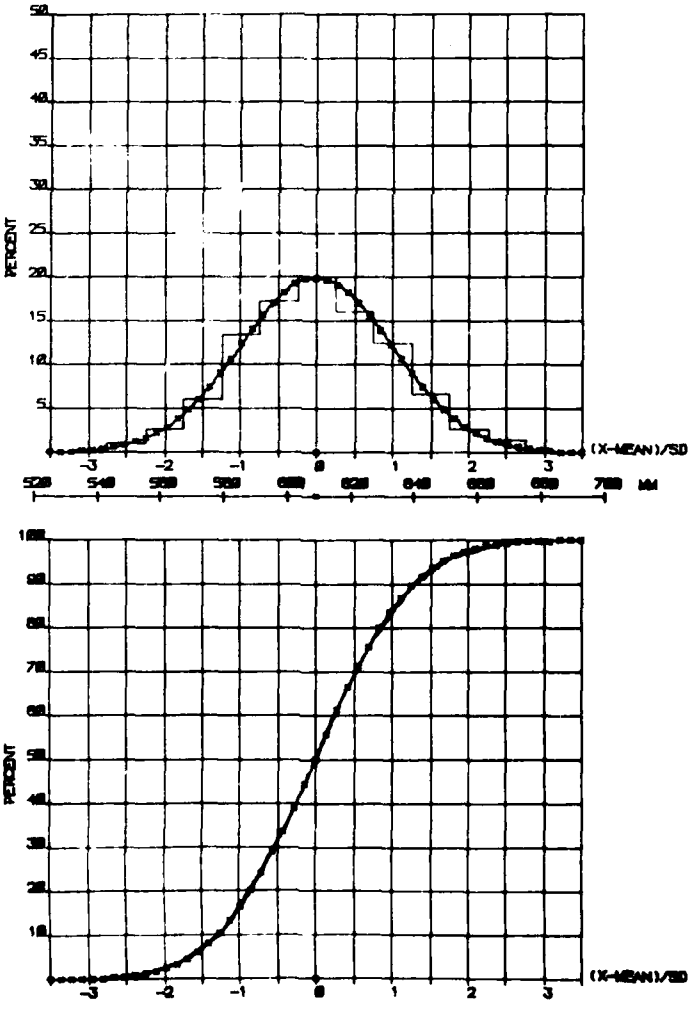
Mean : 609·2

Standard Deviation : 24·0

Coefficient of Skewness: 0·02

Coefficient of Kurtosis : −0·22

Range of Data : 541–670



1st percentile 554
3rd percentile 564
5th percentile 570
10th percentile 578
15th percentile 584
20th percentile 589
25th percentile 593
30th percentile 597
40th percentile 603
50th percentile 609
60th percentile 615
70th percentile 622
75th percentile 625
80th percentile 629
85th percentile 634
90th percentile 640
95th percentile 649
97th percentile 654
99th percentile 665

TABLE 27

Thigh Clearance Height

The subject sits erect, feet flat on the floor, arms hanging vertically and lightly touching the sides. The datum edge is brought down to make light contact with the highest point on the left thigh. Record the height of the datum edge from the floor. Thigh Clearance Height equals datum height less Stool Height.

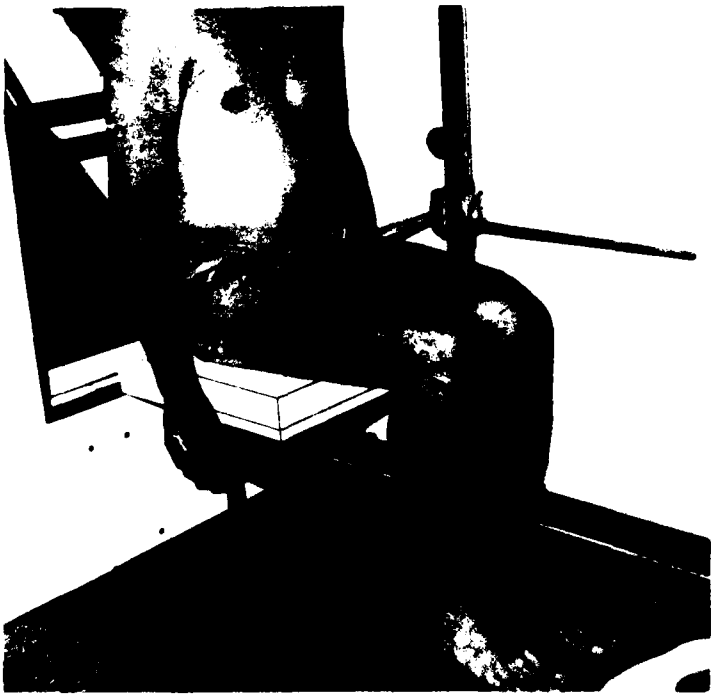


TABLE 27

Thigh Clearance Height (mm)

Number of Subjects : 456

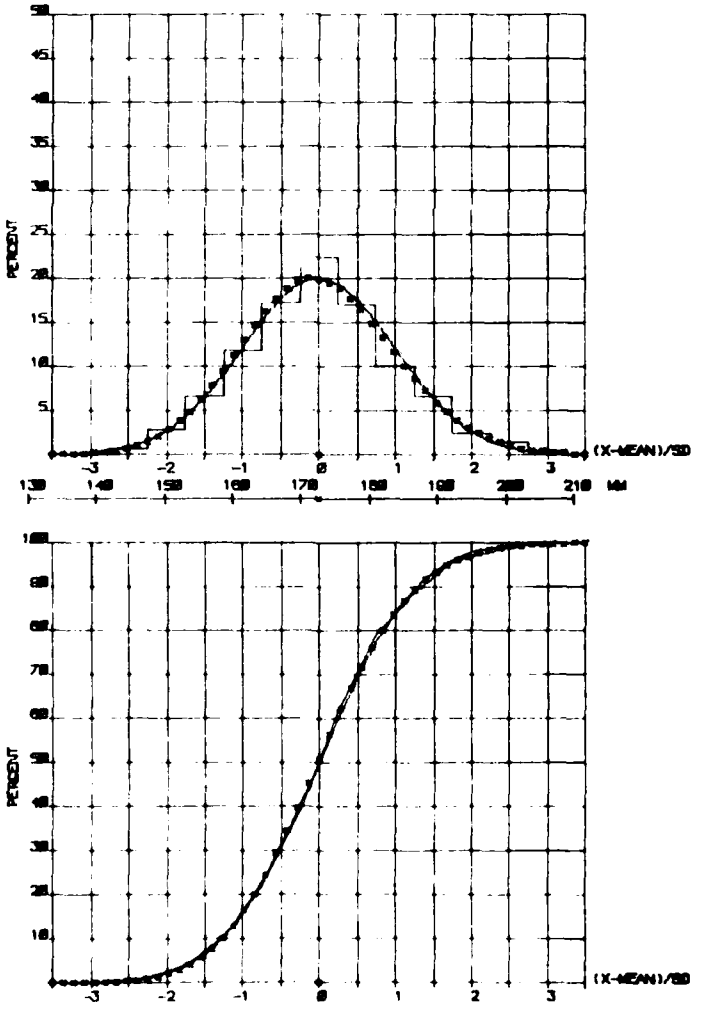
Mean : 172·6

Standard Deviation : 11·2

Coefficient of Skewness: 0·15

Coefficient of Kurtosis : 0·19

Range of Data : 135–208



1st percentile 148
3rd percentile 152
5th percentile 155
10th percentile 158
15th percentile 161
20th percentile 163
25th percentile 165
30th percentile 167
40th percentile 169
50th percentile 172
60th percentile 175
70th percentile 178
75th percentile 180
80th percentile 182
85th percentile 184
90th percentile 187
95th percentile 191
97th percentile 194
99th percentile 200

TABLE 28

Stool Height

The subject stands and moves away from the stool. The datum edge is brought down to make contact with the upper surface of the stool seat. Record the height of the datum edge from the floor.

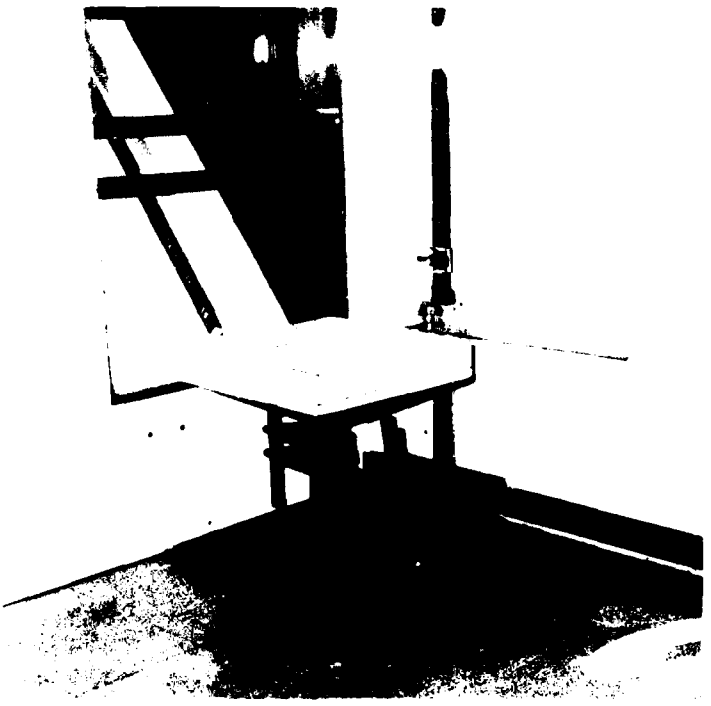
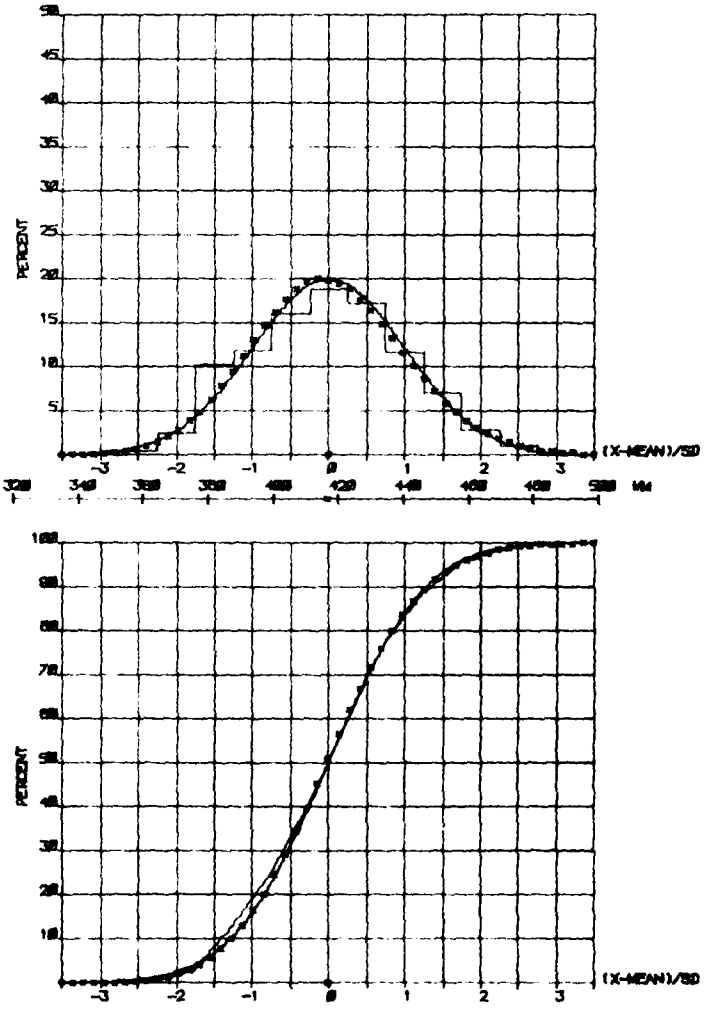


TABLE 28

Stool Height (mm)

Number of Subjects	: 456
Mean	: 416·7
Standard Deviation	: 23·4
Coefficient of Skewness	: 0·16
Coefficient of Kurtosis	: −0·31
Range of Data	: 361–492



1st percentile	365
3rd percentile	374
5th percentile	379
10th percentile	387
15th percentile	392
20th percentile	397
25th percentile	401
30th percentile	404
40th percentile	410
50th percentile	416
60th percentile	422
70th percentile	428
75th percentile	432
80th percentile	436
85th percentile	441
90th percentile	447
95th percentile	456
97th percentile	462
99th percentile	474

TABLE 29

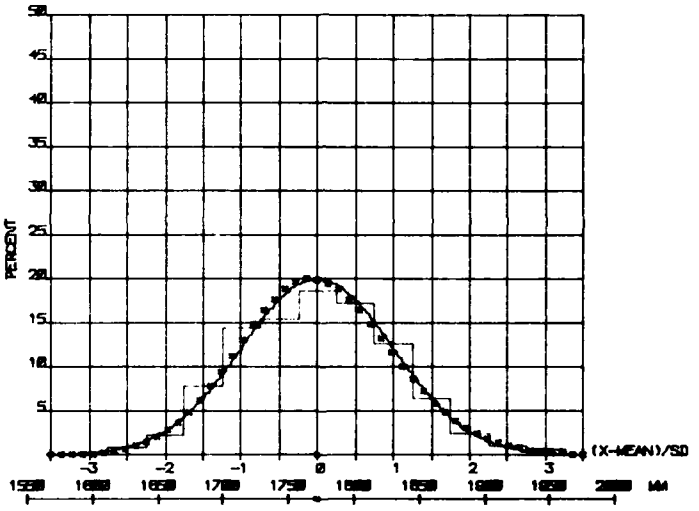
Stature

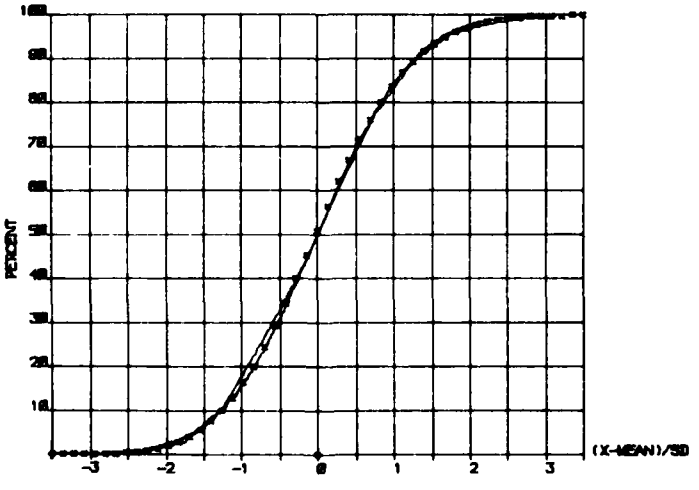
The subject stands erect, looking straight ahead, heels together and back free of the wall. The datum edge is brought down in the midsagittal plane until light contact is made with the vertex. Record the height of the datum edge from the floor.

TABLE 29

Stature (mm)

Number of Subjects	: 456
Mean	: 1771·7
Standard Deviation	: 58·2
Coefficient of Skewness	: 0·16
Coefficient of Kurtosis	: −0·21
Range of Data	: 1632–1950





1st percentile	1643
3rd percentile	1666
5th percentile	1678
10th percentile	1698
15th percentile	1711
20th percentile	1722
25th percentile	1732
30th percentile	1740
40th percentile	1755
50th percentile	1770
60th percentile	1785
70th percentile	1801
75th percentile	1810
80th percentile	1820
85th percentile	1832
90th percentile	1847
95th percentile	1870
97th percentile	1885
99th percentile	1914

TABLE 30

Crotch Height

The subject stands erect looking straight ahead with heels approximately 100 mm apart. The datum edge is pushed up into the floor of the perineum, taking care not to impinge on the buttocks or the genitals. Record the height of the datum edge from the floor.

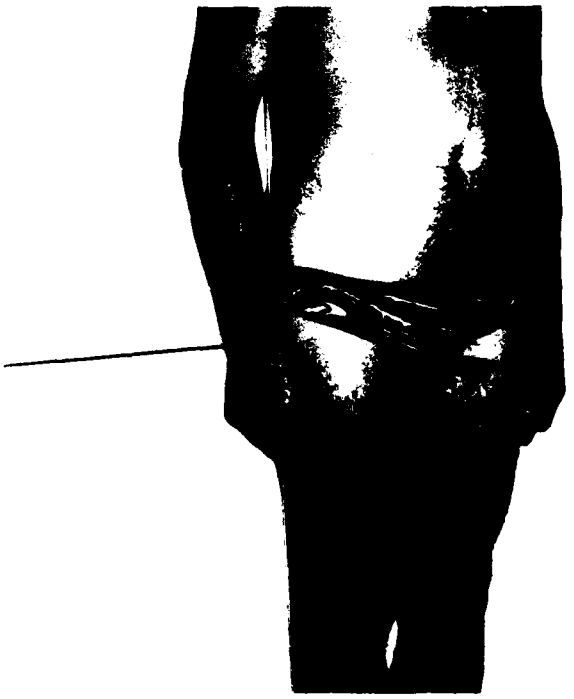
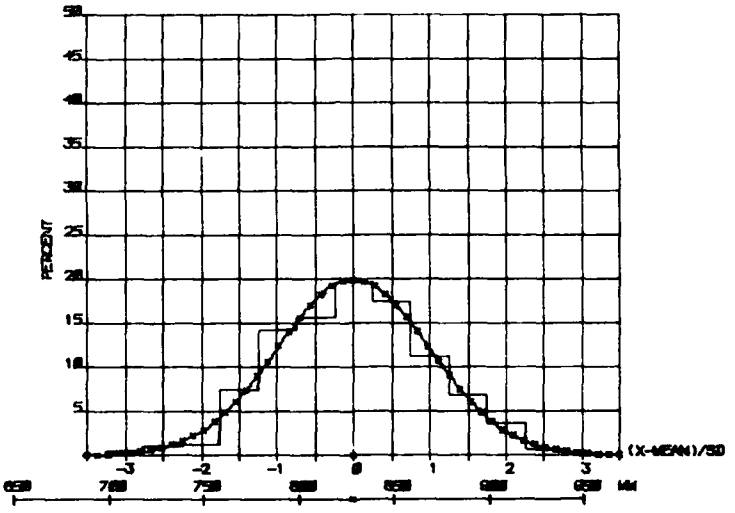
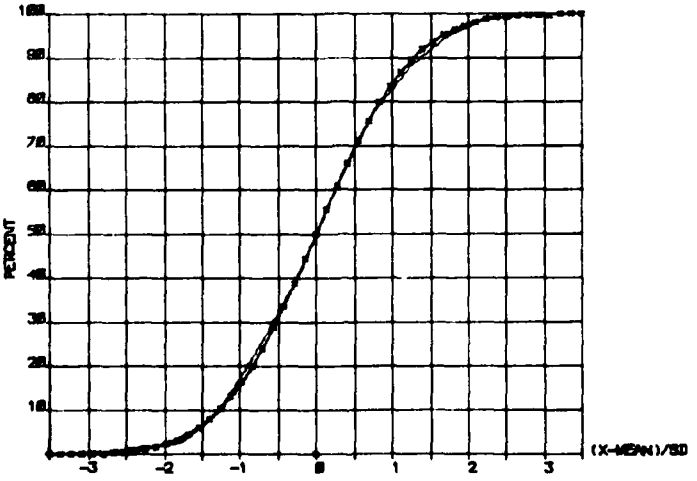


TABLE 30

Crotch Height (mm)

Number of Subjects	: 456
Mean	: 828·4
Standard Deviation	: 40·1
Coefficient of Skewness	: 0·00
Coefficient of Kurtosis	: −0·10
Range of Data	: 702–946





1st percentile 735
3rd percentile 753
5th percentile 763
10th percentile 777
15th percentile 787
20th percentile 795
25th percentile 801
30th percentile 807
40th percentile 818
50th percentile 828
60th percentile 839
70th percentile 849
75th percentile 855
80th percentile 862
85th percentile 870
90th percentile 880
95th percentile 894
97th percentile 904
99th percentile 922

TABLE 31

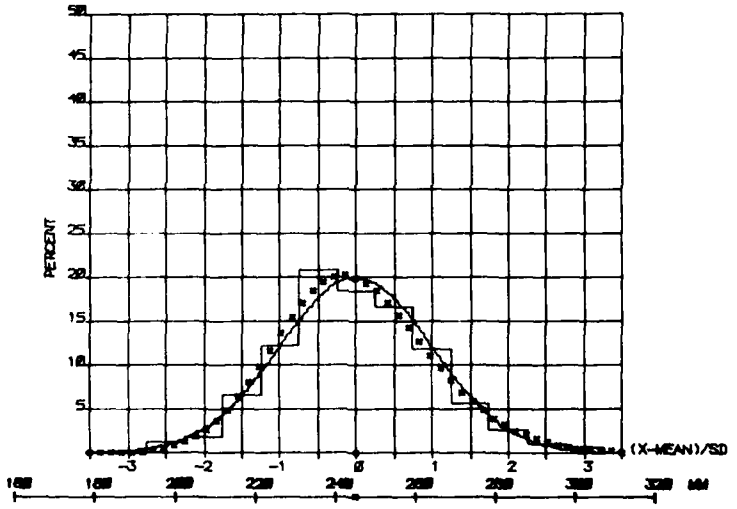
Chest Depth

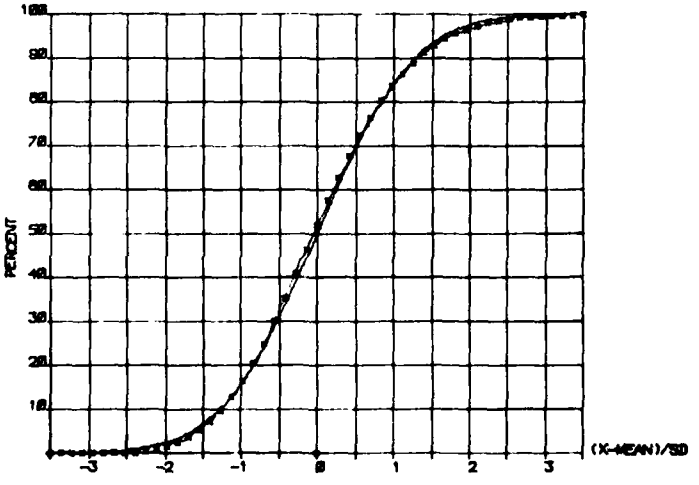
The subject stands erect with arms relaxed by the sides. With the bar of the sliding calipers held horizontally and parallel to the midsagittal plane at the level of the left nipple, measure Chest Depth at the end of a normal inspiration.

TABLE 31

Chest Depth (mm)

Number of Subjects : 456
Mean : 245·1
Standard Deviation : 19·0
Coefficient of Skewness: 0·31
Coefficient of Kurtosis : 0·39
Range of Data : 199–320





1st percentile 205
3rd percentile 212
5th percentile 215
10th percentile 221
15th percentile 225
20th percentile 229
25th percentile 232
30th percentile 234
40th percentile 239
50th percentile 244
60th percentile 249
70th percentile 254
75th percentile 257
80th percentile 261
85th percentile 265
90th percentile 270
95th percentile 278
97th percentile 283
99th percentile 293

TABLE 32

Head Breadth

The subject sits, looking straight ahead. With the sliding calipers held in a horizontal plane and applying sufficient pressure with the jaws of the calipers to flatten the hair, measure the maximum head breadth in the coronal plane.

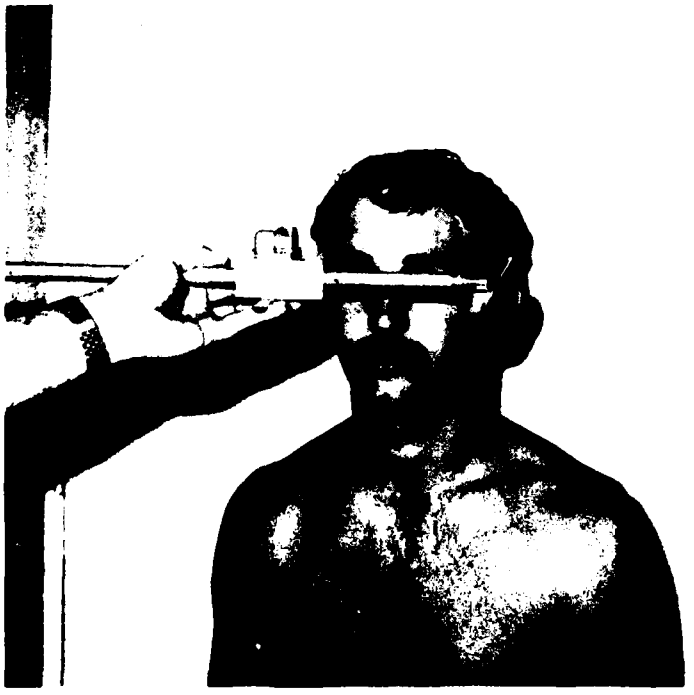
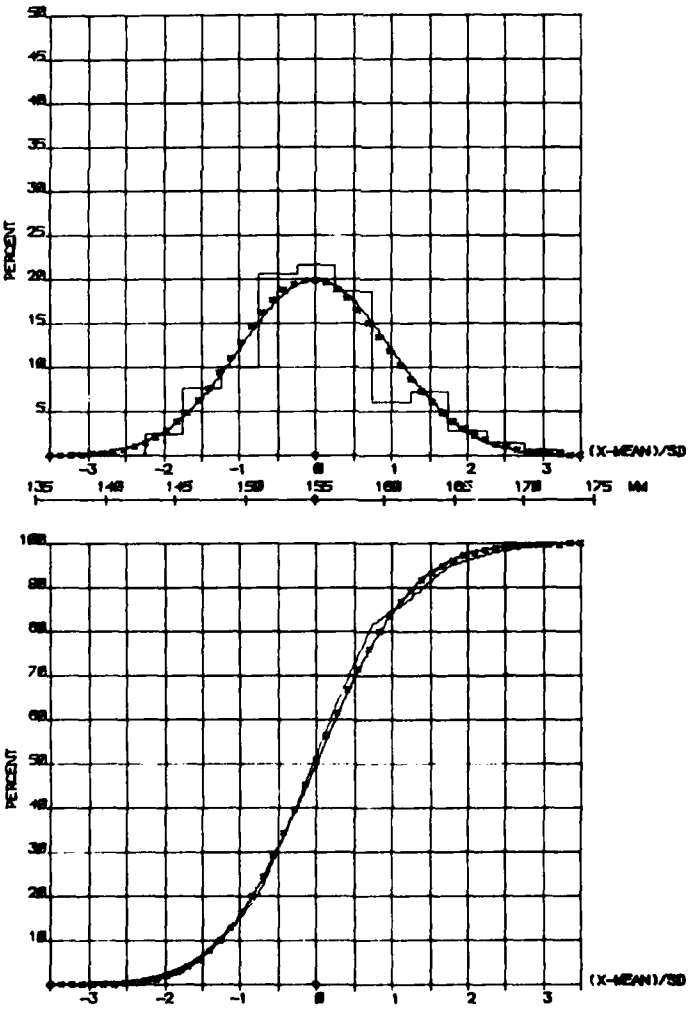


TABLE 32

Head Breadth (mm)

Number of Subjects	: 456
Mean	: 155·0
Standard Deviation	: 5·4
Coefficient of Skewness	: 0·14
Coefficient of Kurtosis	: 0·37
Range of Data	: 134–172



1st percentile 143
3rd percentile 145
5th percentile 146
10th percentile 148
15th percentile 149
20th percentile 150
25th percentile 151
30th percentile 152
40th percentile 154
50th percentile 155
60th percentile 156
70th percentile 158
75th percentile 159
80th percentile 160
85th percentile 161
90th percentile 162
95th percentile 164
97th percentile 166
99th percentile 168

TABLE 33

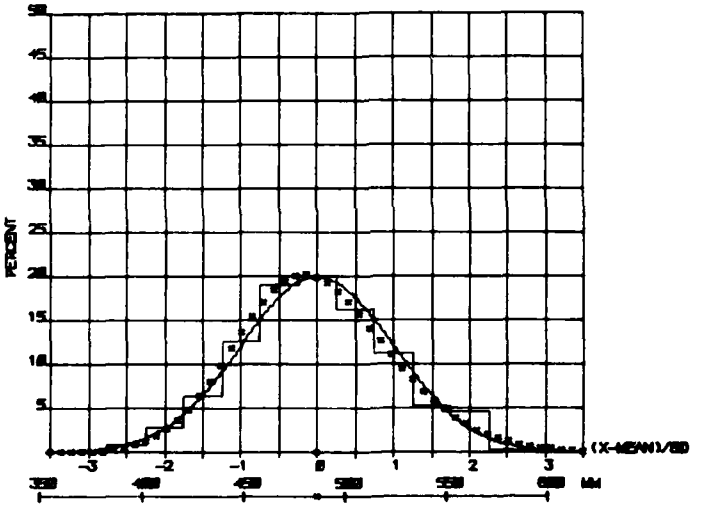
Inter-Elbow Breadth

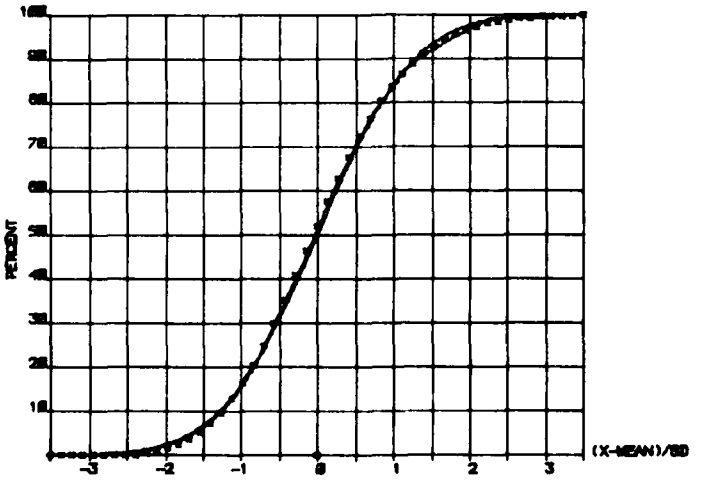
The subject sits erect, upper arms vertical, elbows lightly touching the sides, forearms extended forwards horizontally and palms resting lightly on the support bar. With the sliding calipers measure the horizontal distance between the most distal projections of the lateral epicondyles of the humeri.

TABLE 33

Inter-Elbow Breadth (mm)

Number of Subjects	: 456
Mean	: 486·6
Standard Deviation	: 37·6
Coefficient of Skewness	: 0·32
Coefficient of Kurtosis	: 0·24
Range of Data	: 399–624





1st percentile 408
3rd percentile 421
5th percentile 428
10th percentile 440
15th percentile 448
20th percentile 454
25th percentile 460
30th percentile 465
40th percentile 475
50th percentile 485
60th percentile 494
70th percentile 505
75th percentile 511
80th percentile 518
85th percentile 526
90th percentile 536
95th percentile 552
97th percentile 563
99th percentile 582

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