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ANTHROPOMETRY OF THE HANDS OF MALE AIR FORCE FLIGHT PERSONNEL

JOHN W. GARRETT

MARCH 1970

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AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
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FOREWORD

This report was prepared by the Anthropology Branch, Human Engineering Division, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio. This research was performed in support of Project 7184, "Human Performance in Advanced Systems," Task 718408, "Anthropology for Design," and Work Unit 003, "Anthropometry."

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The art work is by Mr. Jerome Ingram of the University of Dayton's Graphic Arts Department. The photographs are by Mr. James Weir, Aeronautical Systems Division, Photographic Branch. Mrs. Lara Green and Mr. Milton Alexander posed for the photographs.

This technical report has been reviewed and is approved.

C. H. KRATOCHVIL, Colonel, USAF, MC
Commander
Aerospace Medical Research Laboratory

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SECTION I

INTRODUCTION

This report presents hand-size data of a representative sample of Air Force flight personnel. These data and the various statistical relationships provide the design engineer with both dimensional information and, hopefully, insight into possible solutions or compromises on specific problems. The manner of data presentation has been selected to aid the engineer in finding readily the most usable information; hence, the emphasis on describing each dimension and on the corresponding *means*, *standard deviations*, and the *5th-95th percentile values*. For those readers familiar with the author's *Anthropometry of the Air Force Female Hand* (Garrett, 1969), the formats in both publications are deliberately identical to facilitate comparisons.

SECTION II

TH ' HAND SURVEY

The data was collected during the Summer of 1968 at Wright-Patterson Air Force Base, Ohio, Malmstrom Air Force Base, Montana, and Robins Air Force Base, Georgia. An attempt was made to select a sample which corresponded with the much larger sample of Air Force personnel included in the Anthropology Branch's major anthropometric survey of 1967.* Table 1 lists certain comparisons between this sample and that of the 1967 survey.

TABLE I

Comparative Data

		Age	*Hand Breadth*	*Hand Circ.: Metacarpale*
USAF Males 1967 Survey Means & (S.D.s)	N = 2420	30.0 yrs (6.3 yrs)	3.5 in. (0.2 in.)	8.5 in. (0.4 in.)
USAF Males Study Sample Means & (S.D.s)	N = 148	31.5 yrs (7.1 yrs)	3.5 in. (0.2 in.)	8.5 in. (0.4 in.)

Additionally, sample distribution over geographic regions and Air Force Commands was considered desirable to enhance the representativeness of the sample. Table II reflects Air Force Command assignments of this sample; Table III lists the survey sample by age, rank, and rating. Tables II and III are presented as information to identify this study sample and are not indicative of the total Air Force distribution.

*Anthropology Branch and Antioch College, Unpublished Data from 1967 USAF Anthropometric Survey, Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio.

TABLE II

Air Force Command Assignments of Sample

Air Force Command	*# of Subjects*	*% of Total*
Strategic Air Command	92	62
Military Airlift Command	43	29
Air Defense Command	5	4
Continental Air Command	2	1
Air Force Communications Service	6	4

TABLE III

Distribution of Survey Sample by Rank, Age, and Aeronautical Rating

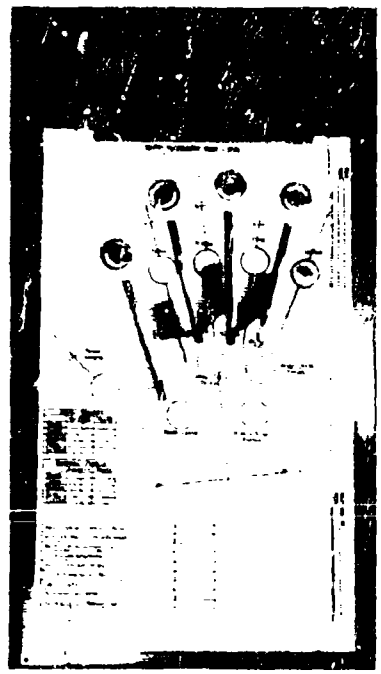
Rank	*# In Sample*	*Age*	*# In Sample*	*Aeronautical Rating*	*# In Sample*
Lt Col	9	20	2	Command Pilot	13
		21	4		
Major	25	22	2	Master Navigator	2
		23	7		
Captain	42	24	7	Senior Pilot	25
		25	12		
1Lt	17	26	19	Senior Navigator	11
		27	3		
2Lt	1	28	5	Pilot	25
		29	7		
CMSgt	1	30	5	Navigator	18
		31	8		
MSgt	12	32	5	Airborne Radio Operator	6
		33	4		
TSgt	8	34	12	Boom Operator	6
		35	7		
SSgt	16	36	5	Helicopter Crew	14
		37	5		
Sgt	13	38	5	Gunner	6
		39	2		
A1c	3	40	0	Loadmaster	9
		41	4		
Amn	1	42	2	Flight Engineer	13
		43	1		
		44	5		
		45	5		
		46	0		
		47	4		
		48	0		
		49	1		

SECTION III

METHODS

The actual measuring procedure for this study was identical to that outlined in detail in *Anthropometry of the Air Force Female Hand*, (Garrett, 1969). Most of the length and breadth measurements were obtained using a measuring board adapted from one developed and used by the David Clark Company, Wooster, Massachusetts. This measuring device is illustrated in the figure below. Circumferences of the wrist, fist and hand were taken with a steel measuring tape following conventional anthropometric techniques. Pictoral and verbal descriptions accompany the statistics for each dimension.

All measurements were secured on the 148 subjects' right hands. A discussion of right versus left hand anthropometry in *X-Ray Anthropometry of the Hand* (Vicinus, 1962, pgs 27-31) concludes that the right hand tends to be slightly larger than the left.



THE MEASURING BOARD

The raw data were edited and summary statistics computed according to techniques and procedures developed by Mr. Edmund Churchill, Antioch College (Churchill, E., 1966, pp 40-75; Hertzberg, et al., 1963, pp 23-24).

The following pages contain the summary statistics for each of the 56 hand dimensions measured. The mean, standard error of the mean, standard deviation, standard error of the standard deviation, range, coefficient of variation, skewness, kurtosis, sample size, and selected percentiles are given for each dimension. The coefficient of variation is merely the standard deviation expressed as a percentage of the mean; thus, C.V. = (100.0 x SD/M)%. The values of the listed measures of symmetry and kurtosis provide a basis for judging whether the shape of a distribution of data values resembles that of the normal distribution. For the normal distribution, the measure of symmetry equals 0 and the measure for kurtosis equals 3. A distribution with values close to these will, in general, have a shape similar to that of the normal distribution. Conversely, values for these measures markedly differ from 0 and 3 will usually indicate distributions which differ substantially from the normal one.

The measure of symmetry is computed as the third moment (the average value of the third powers of the deviations from the mean) divided by the third power of the standard deviation. The measure of kurtosis is the fourth moment divided by the fourth power of the standard deviation.*

In addition are presented data summaries by commissioned status, a correlation matrix, bivariate tables, multiple regression equations and nomographs.

One interesting result is revealed in the data summaries: commissioned versus non-commissioned status. This is the extremely close similarity in the size of the hands of the two groups of personnel. Many of the differences are within measuring error, none exceeds a 0.1 inch difference. The results of the female hand survey (Garrett 1969) showed a significant difference in hand size between the commissioned and non-commissioned groups. The reasons for this difference were not apparent and would require research beyond the scope of these anthropometric surveys.

*Personal communication—Mr. E. Churchill quoted in Garrett, 1969.

SECTION IV

SUMMARY DATA

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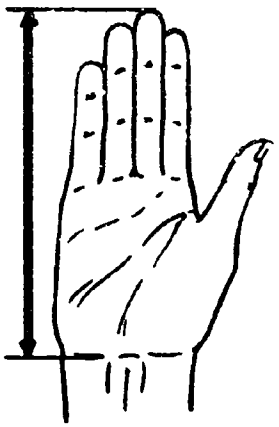
(1)



HAND LENGTH

Subject's right hand is extended, palm up. With the bar of the sliding caliper parallel to the long axis of his hand, measure the distance from the wrist crease baseline to the tip of the longest finger.

MEAN: 7.76 in.; 19.72 cm
STANDARD DEVIATION: 0.37 in.; 0.93 cm
5th PERCENTILE: 7.21 in.; 18.32 cm
95th PERCENTILE: 8.33 in.; 21.15 cm

Range:	6.81-8.98 in.	
Coefficient of Variation:	4.73%	[calculated on unrounded data]
Kurtosis:	3.22	
Skewness:	0.21	
Sample Size:	148	

In.	*Percentiles**	*Cm.*
7.21	5th	18.32
7.34	10th	18.64
7.41	15th	18.81
7.46	20th	18.94
7.50	25th	19.06
7.55	30th	19.17
7.59	35th	19.28
7.63	40th	19.39
7.68	45th	19.50
7.73	50th	19.62
7.78	55th	19.75
7.83	60th	19.88
7.89	65th	20.03
7.95	70th	20.18
8.01	75th	20.35
8.09	80th	20.54
8.17	85th	20.75
8.25	90th	20.97
8.33	95th	21.15

*The percentile values for a particular set of data are treated as though plotted on normal probability graph paper, and a smooth curve fitted to the points by conventional curve-fitting procedures.

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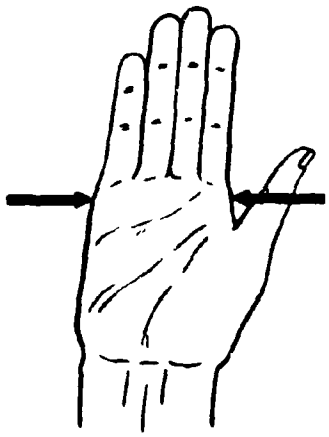

HAND BREADTH;

METACARPALE

Subject's right hand is extended, palm down, thumb held away from the fingers. With the bar of the sliding caliper lying across the back of his hand, measure the breadth of the hand between metacarpal-phalangeal joints II and V.

MEAN: 3.53 in.; 8.96 cm
STANDARD DEVIATION: 0.16 in.; 0.40 cm
5th PERCENTILE: 3.28 in.; 8.32 cm
95th PERCENTILE: 3.82 in.; 9.71 cm

Range:	3.00-3.94 in.
Coefficient of Variation:	4.51 %
Kurtosis:	3.21
Skewness:	0.17
Sample Size:	148

In.	*Percentiles*	*Cm.*
3.28	5th	8.32
3.34	10th	8.49
3.38	15th	8.58
3.40	20th	8.65
3.43	25th	8.70
3.45	30th	8.75
3.46	35th	8.80
3.48	40th	8.84
3.50	45th	8.89
3.52	50th	8.93
3.54	55th	8.98
3.56	60th	9.03
3.58	65th	9.08
3.60	70th	9.14
3.63	75th	9.21
3.66	80th	9.29
3.70	85th	9.39
3.75	90th	9.51
3.82	95th	9.71

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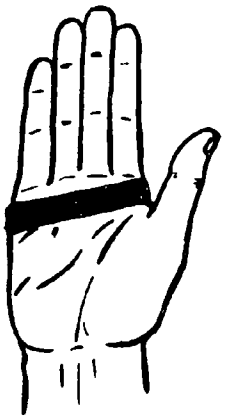
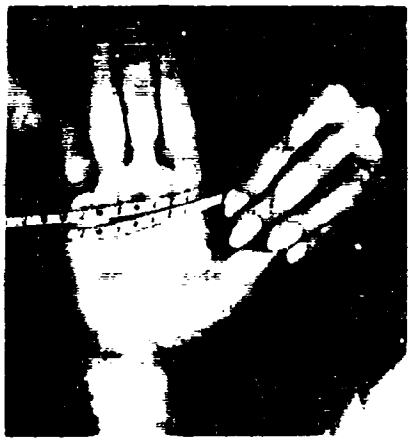


HAND CIRCUMFERENCE;

METACARPALE



Subject's right hand is extended, palm down, thumb held away from the fingers. With the tape passing over metacarpal-phalangeal joints II and V, measure the circumference of the hand.

MEAN: 8.50 in.; 21.59 cm
STANDARD DEVIATION: 0.35 in.; 0.90 cm
5th PERCENTILE: 7.88 in.; 20.02 cm
95th PERCENTILE: 9.09 in.; 23.08 cm

Range:	7.76-9.61 in.
Coefficient of Variation:	4.17%
Kurtosis:	2.97
Skewness:	0.30
Sample Size:	148

In.	*Percentiles*	*Cm.*
7.88	5th	20.02
8.06	10th	20.47
8.15	15th	20.70
8.21	20th	20.85
8.26	25th	20.98
8.30	30th	21.09
8.34	35th	21.19
8.38	40th	21.30
8.43	45th	21.40
8.47	50th	21.51
8.51	55th	21.62
8.56	60th	21.74
8.61	65th	21.87
8.67	70th	22.02
8.73	75th	22.18
8.80	80th	22.36
8.89	85th	22.57
8.98	90th	22.81
9.09	95th	23.08

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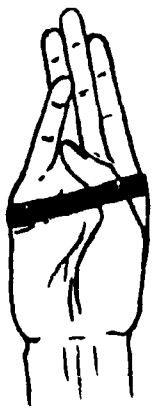

HAND CIRCUMFERENCE;

METACARPALE, MINIMUM

Subject extends and narrows his right hand as much as possible. With the tape passing over metacarpal-phalangeal joints II and V, measure the circumference of the hand.

MEAN: 10.01 in.; 25.43 cm
STANDARD DEVIATION: 0.52 in.; 1.31 cm
5th PERCENTILE: 9.26 in.; 23.53 cm
95th PERCENTILE: 10.99 in.; 27.91 cm

Range:	8.54-11.46 in.
Coefficient of Variation:	5.15%
Kurtosis:	3.25
Skewness:	0.19
Sample Size:	148

In.	*Percentiles*	*Cm.*
9.26	5th	23.53
9.38	10th	23.82
9.48	15th	24.09
9.58	20th	24.32
9.66	25th	24.53
9.73	30th	24.72
9.80	35th	24.90
9.87	40th	25.06
9.93	45th	25.22
9.99	50th	25.38
10.05	55th	25.54
10.12	60th	25.69
10.18	65th	25.86
10.25	70th	26.03
10.33	75th	26.23
10.42	80th	26.45
10.53	85th	26.74
10.69	90th	27.15
10.99	95th	27.91

(5)

HAND CIRCUMFERENCE;

FINGERTIPS EVEN

Subject taps his five fingertips [illegible] on any flat surface. With the fingertips held even, measure the circumference of the hand around the mid-points of the proximal phalanges of all five digits.

MEAN: 8.96 in.; 22.77 cm
STANDARD DEVIATION: 0.86 in.; 2.19 cm
5th PERCENTILE: 7.73 in.; 19.62 cm
95th PERCENTILE: 10.58 in.; 26.87 cm

Range:	6.57-11.42 in.
Coefficient of Variation:	9.63%
Kurtosis:	2.79
Skewness:	0.44
Sample Size:	148

In.	*Percentiles*	*Cm.*
7.73	5th	19.62
8.05	10th	20.45
8.19	15th	20.79
8.27	20th	21.01
8.35	25th	21.21
8.43	30th	21.40
8.50	35th	21.60
8.59	40th	21.82
8.68	45th	22.05
8.79	50th	22.32
8.90	55th	22.62
9.03	60th	22.94
9.18	65th	23.31
9.34	70th	23.73
9.53	75th	24.20
9.74	80th	24.75
9.99	85th	25.38
10.28	90th	26.11
10.58	95th	26.87

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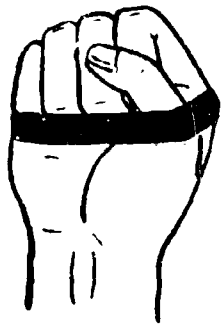

FIST CIRCUMFERENCE

Subject makes a tight fist with his thumb tucked against the middle phalanges of digits II and III. With the tape passing over the metacarpal-phalangeal joints of all five digits, measure the circumference of the fist.

MEAN: 11.66 in.; 29.61 cm
STANDARD DEVIATION: 0.53 in.; 1.35 cm
5th PERCENTILE: 10.76 in.; 27.34 cm
95th PERCENTILE: 12.54 in.; 31.86 cm

Range:	10.35-12.99 in.
Coefficient of Variation:	4.54%
Kurtosis:	2.65
Skewness:	0.02
Sample Size:	148

In.	*Percentiles*	*Cm.*
10.76	5th	27.34
10.96	10th	27.83
11.09	15th	28.17
11.20	20th	28.44
11.29	25th	28.67
11.37	30th	28.88
11.45	35th	29.08
11.52	40th	29.26
11.59	45th	29.44
11.66	50th	29.62
11.73	55th	29.79
11.80	60th	29.97
11.87	65th	30.15
11.94	70th	30.34
12.02	75th	30.54
12.11	80th	30.77
12.22	85th	31.03
12.35	90th	31.36
12.54	95th	31.86

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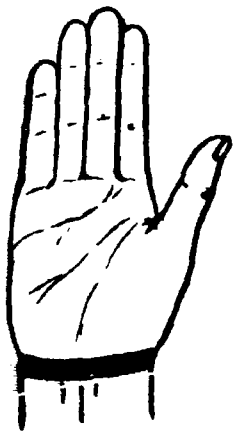

WRIST CIRCUMFERENCE

Subject's right hand is extended. With the tape perpendicular to the long axis of the forearm, measure the circumference of the wrist at the level of the wrist crease.

MEAN: 6.89 in.; 17.50 cm
STANDARD DEVIATION: 0.37 in.; 0.94 cm
5th PERCENTILE: 6.30 in.; 15.99 cm
95th PERCENTILE: 7.52 in.; 19.09 cm

Range:	5.94-7.87 in.
Coefficient of Variation:	5.39%
Kurtosis:	3.00
Skewness:	0.21
Sample Size:	148

In.	*Percentiles*	*Cm.*
6.30	5th	15.99
6.42	10th	16.31
6.51	15th	16.53
6.58	20th	16.71
6.64	25th	16.86
6.69	30th	16.99
6.74	35th	17.11
6.79	40th	17.23
6.83	45th	17.35
6.88	50th	17.46
6.92	55th	17.58
6.97	60th	17.70
7.02	65th	17.82
7.07	70th	17.95
7.13	75th	18.01
7.19	80th	18.26
7.27	85th	18.45
7.36	90th	18.71
7.52	95th	19.09

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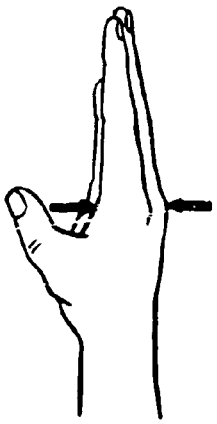
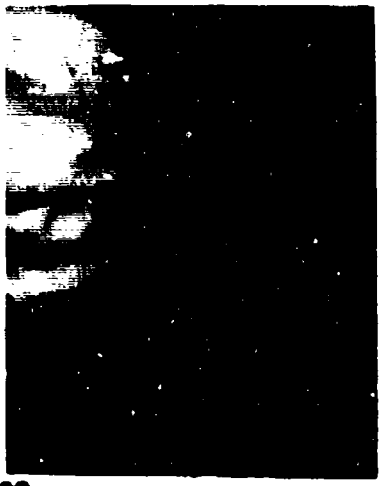


HAND THICKNESS;

METACARPALE III



Subject's right hand is extended. With the sliding caliper, measure the maximum thickness of the metacarpal-phalangeal joint of digit III.

MEAN: 1.29 in.; 3.29 cm
STANDARD DEVIATION: 0.08 in.; 0.20 cm
5th PERCENTILE: 1.17 in.; 2.98 cm
95th PERCENTILE: 1.42 in.; 3.61 cm

Range:	1.10-1.46 in.
Coefficient of Variation:	5.99%
Kurtosis:	2.34
Skewness:	−0.07
Sample Size:	148

In.	*Percentiles*	*Cm.*
1.17	5th	2.98
1.19	10th	3.01
1.20	15th	3.05
1.22	20th	3.09
1.23	25th	3.13
1.25	30th	3.17
1.26	35th	3.21
1.28	40th	3.24
1.29	45th	3.27
1.30	50th	3.30
1.31	55th	3.33
1.32	60th	3.35
1.33	65th	3.38
1.34	70th	3.41
1.35	75th	3.44
1.36	80th	3.47
1.38	85th	3.50
1.39	90th	3.54
1.42	95th	3.61

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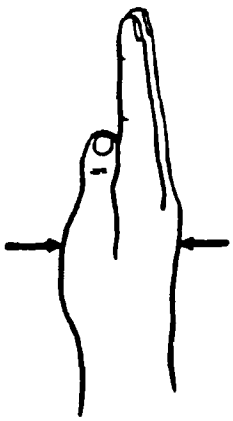
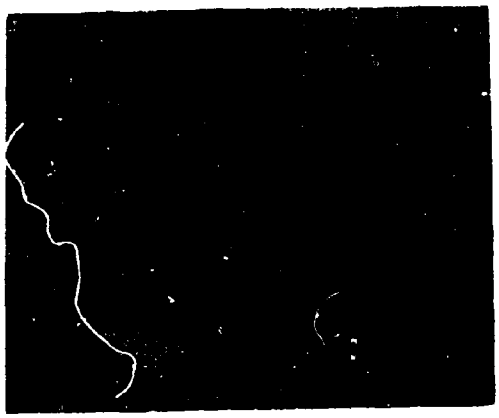


HAND DEPTH;

THENAR PAD



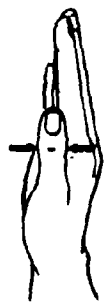
Subject's right hand is extended with the thumb lying adjacent to the volar surface of digit II. With the sliding caliper, measure the maximum depth from the volar side of the thenar pad to the dorsal surface of the hand.

MEAN: 2.43 in.; 6.19 cm
STANDARD DEVIATION: 0.18 in.; 0.45 cm
5th PERCENTILE: 2.17 in.; 5.50 cm
95th PERCENTILE: 2.77 in.; 7.02 cm

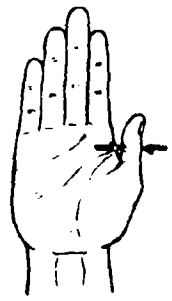
Range:	1.97-2.91 in.
Coefficient of Variation:	7.27%
Kurtosis:	3.04
Skewness:	0.37
Sample Size:	148

In.	*Percentiles*	*Cm.*
2.17	5th	5.50
2.24	10th	5.67
2.27	15th	5.78
2.30	20th	5.84
2.32	25th	5.89
2.34	30th	5.94
2.35	35th	5.98
2.37	40th	6.03
2.39	45th	6.07
2.41	50th	6.12
2.43	55th	6.18
2.46	60th	6.24
2.48	65th	6.30
2.51	70th	6.38
2.54	75th	6.46
2.58	80th	6.56
2.63	85th	6.67
2.69	90th	6.82
2.77	95th	7.02

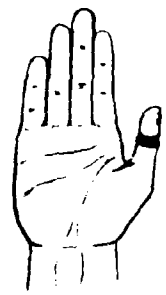
INTERPHALANGEAL JOINT — DIGIT 1



BREADTH



DEPTH



CIRCUMFERENCE

Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the interphalangeal joint of digit 1. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$*, calculate the circumference of the joint.

	Breadth	*Depth*	*Circumference*
MEAN:	**0.90 in.; 2.29 cm**	**0.79 in.; 2.02 cm**	**2.67 in.; 6.79 cm**
STANDARD DEVIATION:	**0.05 in.; 0.13 cm**	**0.06 in.; 0.15 cm**	**0.15 in; 0.38 cm**
5th PERCENTILE:	**0.82 in.; 2.07 cm**	**0.70 in.; 1.78 cm**	**2.41 in.; 6.12 cm**
95th PERCENTILE:	**0.99 in.; 2.51 cm**	**0.89 in.; 2.25 cm**	**2.92 in.; 7.41 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	5.72%	7.46%	5.58%
Kurtosis:	2.35	3.97	2.50
Skewness:	−0.01	−0.42	0.00
Sample Size:	148		

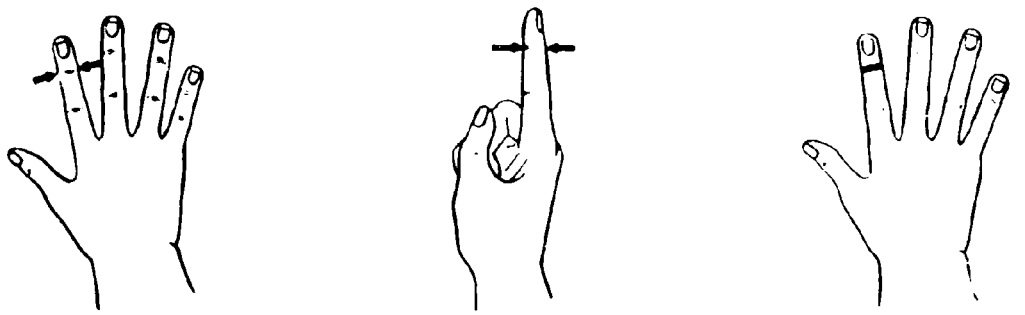
Percentiles

%	*Bd*	*Dp*	*Circ*
5	0.82 in.	0.70 in.	2.41 in.
10	0.83 in.	0.72 in.	2.48 in.
15	0.84 in.	0.74 in.	2.52 in.
25	0.86 in.	0.76 in.	2.57 in.
50	0.90 in.	0.79 in.	2.67 in.
75	0.94 in.	0.84 in.	2.78 in.
85	0.96 in.	0.86 in.	2.84 in.
90	0.97 in.	0.87 in.	2.87 in.
95	0.99 in.	0.89 in.	2.92 in.

*The formula used presents an approximation of the joint circumference. The figure given will vary from the true circumference as the shape of the joint varies from that of an ellipse; a = measured joint breadth; b = measured joint depth.

(13-15)

DISTAL INTERPHALANGEAL JOINT — DIGIT 2



BREADTH DEPTH CIRCUMFERENCE

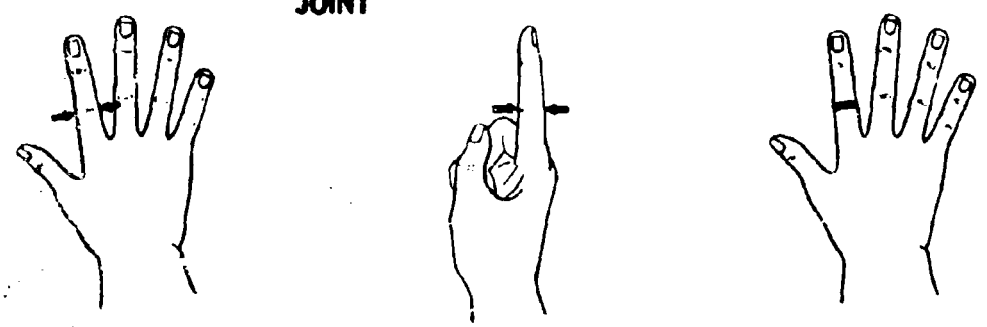
Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the distal interphalangeal joint of digit 2. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

	Breadth	*Depth*	*Circumference*
MEAN:	**0.72 in.; 1.84 cm**	**0.61 in.; 1.55 cm**	**2.10 in.; 5.34 cm**
STANDARD DEVIATION:	**0.05 in.; 0.12 cm**	**0.05 in.; 0.13 cm**	**0.13 in.; 0.33 cm**
5th PERCENTILE:	**0.65 in.; 1.65 cm**	**0.54 in.; 1.36 cm**	**1.91 in.; 4.85 cm**
95th PERCENTILE:	**0.80 in.; 2.04 cm**	**0.69 in.; 1.75 cm**	**2.29 in.; 5.81 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	6.44%	8.58%	6.25%
Kurtosis:	3.04	6.61	3.45
Skewness:	0.01	1.22	0.37
Sample Size: 148			

	Percentiles		
%	*Bd*	*Dp*	*Circ*
5	0.65 in.	0.54 in.	1.91 in.
10	0.66 in.	0.55 in.	1.94 in.
15	0.68 in.	0.56 in.	1.97 in.
25	0.69 in.	0.57 in.	2.01 in.
50	0.73 in.	0.61 in.	2.10 in.
75	0.76 in.	0.64 in.	2.20 in.
85	0.78 in.	0.66 in.	2.25 in.
90	0.79 in.	0.67 in.	2.27 in.
95	0.80 in.	0.69 in.	2.29 in.

PROXIMAL INTERPHALANGEAL JOINT — DIGIT 2



BREADTH DEPTH CIRCUMFERENCE

Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the proximal interphalangeal joint of digit 2. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

	Breadth	*Depth*	*Circumference*
MEAN:	**0.84 in.; 2.15 cm**	**0.77 in.; 1.94 cm**	**2.53 in.; 6.43 cm**
STANDARD DEVIATION:	**0.05 in.; 0.13 cm**	**0.05 in.; 0.12 cm**	**0.14 in.; 0.36 cm**
5th PERCENTILE:	**0.77 in.; 1.96 cm**	**0.69 in.; 1.75 cm**	**2.30 in.; 5.84 cm**
95th PERCENTILE:	**0.94 in.; 2.37 cm**	**0.85 in.; 2.16 cm**	**2.80 in.; 7.10 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	5.97%	6.56%	5.54%
Kurtosis:	4.66	3.67	2.74
Skewness:	−0.14	−0.01	0.13
Sample Size: 148			

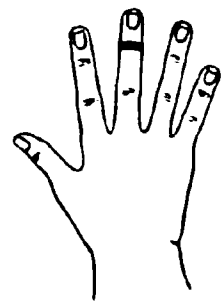
Percentiles

%	*Bd*	*Dp*	*Circ*
5	0.77 in.	0.69 in.	2.30 in.
10	0.78 in.	0.71 in.	2.35 in.
15	0.79 in.	0.72 in.	2.58 in.
25	0.81 in.	0.73 in.	2.43 in.
50	0.85 in.	0.76 in.	2.53 in.
75	0.88 in.	0.80 in.	2.62 in.
85	0.89 in.	0.82 in.	2.68 in.
90	0.91 in.	0.83 in.	2.72 in.
95	0.94 in.	0.85 in.	2.80 in.

DISTAL INTERPHALANGEAL JOINT — DIGIT 3

BREADTH

DEPTH



CIRCUMFERENCE

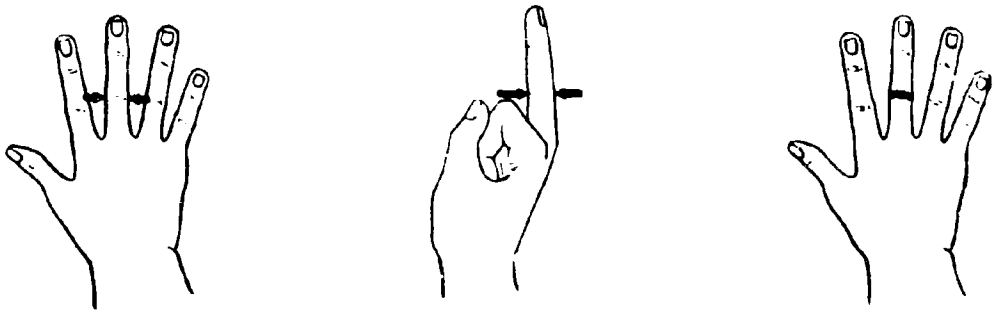
Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the distal interphalangeal joint of digit 3. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

	Breadth	*Depth*	*Circumference*
MEAN:	**0.72 in.; 1.84 cm**	**0.63 in.; 1.60 cm**	**2.13 in.; 5.41 cm**
STANDARD DEVIATION:	**0.05 in.; 0.12 cm**	**0.05 in.; 0.13 cm**	**0.13 in.; 0.34 cm**
5th PERCENTILE:	**0.65 in.; 1.65 cm**	**0.54 in.; 1.38 cm**	**1.92 in.; 4.87 cm**
95th PERCENTILE:	**0.80 in.; 2.04 cm**	**0.71 in.; 1.81 cm**	**2.36 in.; 5.98 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	6.43%	8.28%	6.28%
Kurtosis:	2.86	4.53	2.61
Skewness:	−0.02	0.64	0.02
Sample Size: 148			

	Percentiles		
%	*Bd*	*Dp*	*Circ*
5	0.65 in.	0.54 in.	1.92 in.
10	0.66 in.	0.56 in.	1.96 in.
15	0.67 in.	0.57 in.	1.99 in.
25	0.69 in.	0.59 in.	2.03 in.
50	0.73 in.	0.63 in.	2.13 in.
75	0.76 in.	0.66 in.	2.22 .
85	0.77 in.	0.68 in.	2.27 in.
90	0.78 in.	0.69 in.	2.31 in.
95	0.80 in.	0.71 in.	2.36 in.

PROXIMAL INTERPHALANGEAL JOINT — DIGIT 3



BREADTH DEPTH CIRCUMFERENCE

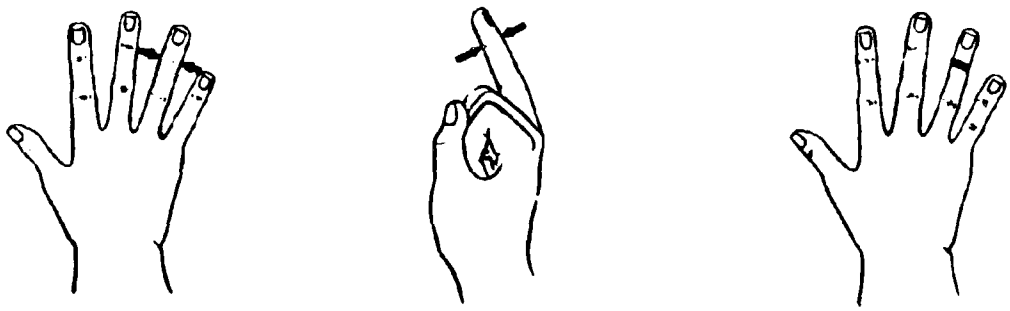
Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the proximal interphalangeal joint of digit 3. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

	Breadth	*Depth*	*Circumference*
MEAN:	**0.86 in.; 2.18 cm**	**0.79 in.; 2.01 cm**	**2.60 in.; 6.60 cm**
STANDARD DEVIATION:	**0.05 in.; 0.14 cm**	**0.06 in.; 0.14 cm**	**0.15 in.; 0.39 cm**
5th PERCENTILE:	**0.78 in.; 1.97 cm**	**0.70 in.; 1.79 cm**	**2.37 in.; 6.02 cm**
95th PERCENTILE:	**0.95 in.; 2.41 cm**	**0.89 in.; 2.26 cm**	**2.84 in.; 7.20 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	6.32%	7.08%	5.86%
Kurtosis:	6.16	3.00	2.93
Skewness:	−0.78	0.22	0.03
Sample Size:	148		

	Percentiles		
%	*Bd*	*Dp*	*Circ*
5	0.78 in.	0.70 in.	2.37 in.
10	0.80 in.	0.72 in.	2.40 in.
15	0.81 in.	0.73 in.	2.43 in.
25	0.83 in.	0.75 in.	2.49 in.
50	0.86 in.	0.79 in.	2.60 in.
75	0.90 in.	0.83 in.	2.70 in.
85	0.92 in.	0.85 in.	2.75 in.
90	0.93 in.	0.87 in.	2.79 in.
95	0.95 in.	0.89 in.	2.84 in.

DISTAL INTERPHALANGEAL JOINT — DIGIT 4



BREADTH DEPTH CIRCUMFERENCE

Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the distal interphalangeal joint of digit 4. Using the formula $C=2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

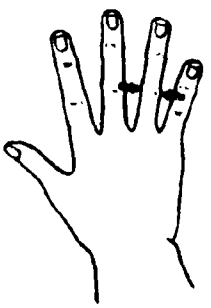
	Breadth	*Depth*	*Circumference*
MEAN:	**0.68 in.; 1.72 cm**	**0.60 in.; 1.51 cm**	**2.00 in.; 5.08 cm**
STANDARD DEVIATION:	**0.04 in.; 0.11 cm**	**0.05 in.; 0.13 cm**	**0.12 in.; 0.31 cm**
5th PERCENTILE:	**0.61 in.; 1.55 cm**	**0.51 in.; 1.30 cm**	**1.81 in.; 4.59 cm**
95th PERCENTILE:	**0.76 in.; 1.92 cm**	**0.68 in.; 1.73 cm**	**2.23 in.; 5.67 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	6.41%	8.74%	6.10%
Kurtosis:	3.67	6.20	3.42
Skewness:	−0.08	1.15	0.50
Sample Size: 148			

Percentiles

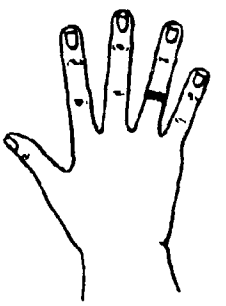
%	*Bd*	*Dp*	*Circ*
5	0.61 in.	0.51 in.	1.81 in.
10	0.62 in.	0.53 in.	1.85 in.
15	0.63 in.	0.55 in.	1.88 in.
25	0.65 in.	0.56 in.	1.92 in.
50	0.67 in.	0.59 in.	1.99 in.
75	0.71 in.	0.62 in.	2.07 in.
85	0.72 in.	0.64 in.	2.13 in.
90	0.74 in.	0.66 in.	2.17 in.
95	0.76 in.	0.68 in.	2.23 in.

PROXIMAL INTERPHALANGEAL JOINT — DIGIT 4



BREADTH

DEPTH



CIRCUMFERENCE

Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the proximal interphalangeal joint of digit 4. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

	Breadth	*Depth*	*Circumference*
MEAN:	**0.79 in.; 2.02 cm**	**0.74 in.; 1.89 cm**	**2.42 in.; 6.14 cm**
STANDARD DEVIATION:	**0.05 in.; 0.13 cm**	**0.05 in., 0.13 cm**	**0.15 in.; 0.37 cm**
5th PERCENTILE:	**0.71 in.; 1.80 cm**	**0.66 in.; 1.67 cm**	**2.18 in.; 5.54 cm**
95th PERCENTILE:	**0.88 in.; 2.23 cm**	**0.84 in.; 2.12 cm**	**2.67 in.; 6.79 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	6.61%	7.04%	6.07%
Kurtosis:	3.80	3.51	3.01
Skewness:	−0.26	0.16	0.15
Sample Size: 148			

Percentiles

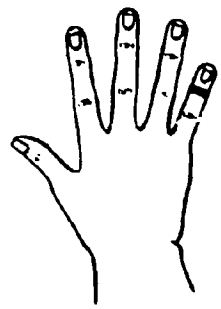
%	*Bd*	*Dp*	*Circ*
5	0.71 in.	0.66 in.	2.18 in.
10	0.73 in.	0.68 in.	2.23 in.
15	0.74 in.	0.70 in.	2.26 in.
25	0.76 in.	0.71 in.	2.31 in.
50	0.79 in.	0.74 in.	2.41 in.
75	0.83 in.	0.78 in.	2.52 in.
85	0.85 in.	0.80 in.	2.57 in.
90	0.86 in.	0.82 in.	2.61 in.
95	0.88 in.	0.84 in.	2.67 in.

(81-88)

DISTAL INTERPHALANGEAL JOINT — DIGIT 5

BREADTH

DEPTH



CIRCUMFERENCE

Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the distal interphalangeal joint of digit 5. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

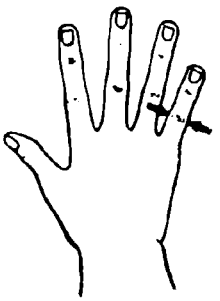
	Breadth	*Depth*	*Circumference*
MEAN:	**0.62 in.; 1.57 cm**	**0.54 in.; 1.37 cm**	**1.83 in.; 4.64 cm**
STANDARD DEVIATION:	**0.05 in.; 0.12 cm**	**0.05 in.; 0.13 cm**	**0.13 in.; 0.32 cm**
5th PERCENTILE:	**0.54 in.; 1.37 cm**	**0.46 in.; 1.17 cm**	**1.62 in.; 4.11 cm**
95th PERCENTILE:	**0.69 in.; 1.76 cm**	**0.61 in.; 1.55 cm**	**2.05 in.; 5.20 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	7.51%	9.13%	6.99%
Kurtosis:	2.88	4.95	3.08
Skewness:	−0.19	0.77	0.23
Sample Size: 148			

Percentiles

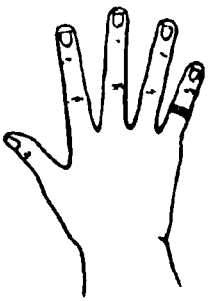
%	*Bd*	*Dp*	*Circ*
5	0.54 in.	0.46 in.	1.62 in.
10	0.56 in.	0.48 in.	1.66 in.
15	0.57 in.	0.49 in.	1.69 in.
25	0.59 in.	0.51 in.	1.74 in.
50	0.62 in.	0.54 in.	1.83 in.
75	0.65 in.	0.57 in.	1.91 in.
85	0.67 in.	0.59 in.	1.95 in.
90	0.68 in.	0.60 in.	1.99 in.
95	0.69 in.	0.61 in.	2.05 in.

PROXIMAL INTERPHALANGEAL JOINT — DIGIT 5



BREADTH

DEPTH



CIRCUMFERENCE

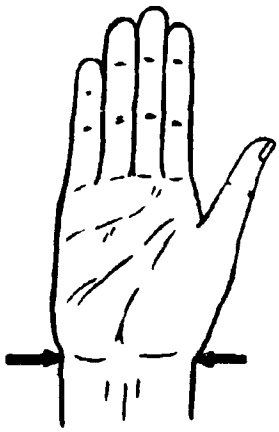
Subject's right hand is extended. With the sliding caliper, measure the maximum breadth and maximum depth of the proximal interphalangeal joint of digit 5. Using the formula $C = 2\pi\sqrt{\frac{a^2+b^2}{2}}$, calculate the circumference of the joint.

	Breadth	*Depth*	*Circumference*
MEAN:	**0.70 in.; 1.77 cm**	**0.66 in.; 1.67 cm**	**2.13 in.; 5.40 cm**
STANDARD DEVIATION:	**0.06 in.; 0.14 cm**	**0.05 in.; 0.12 cm**	**0.14 in.; 0.36 cm**
5th PERCENTILE:	**0.61 in.; 1.55 cm**	**0.58 in.; 1.47 cm**	**1.92 in.; 4.88 cm**
95th PERCENTILE:	**0.79 in.; 2.01 cm**	**0.75 in.; 1.89 cm**	**2.36 in.; 6.00 cm**

	Bd	*Dp*	*Circ*
Coefficient of Variation:	7.81%	7.45%	6.72%
Kurtosis:	2.90	3.32	3.53
Skewness:	0.11	0.41	0.47
Sample Size: 148			

	Percentiles		
%	*Bd*	*Dp*	*Circ*
5	0.61 in.	0.58 in.	1.92 in.
10	0.63 in.	0.59 in.	1.94 in.
15	0.64 in.	0.60 in.	1.97 in.
25	0.66 in.	0.62 in.	2.02 in.
50	0.70 in.	0.65 in.	2.12 in.
75	0.74 in.	0.69 in.	2.22 in.
85	0.76 in.	0.71 in.	2.27 in.
90	0.77 in.	0.72 in.	2.31 in.
95	0.79 in.	0.75 in.	2.36 in.

(87)



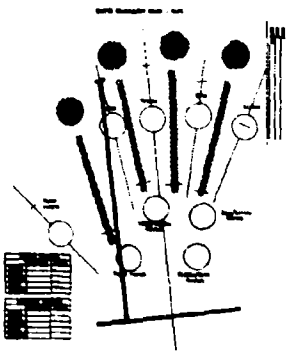
WRIST BREADTH

Subject's right hand and wrist lie on the measuring board. With the sliding caliper, measure the breadth of the wrist at the level of the wrist crease baseline.

MEAN: 2.67 in.; 6.78 cm
STANDARD DEVIATION: 0.15 in.; 0.37 cm
5th PERCENTILE: 2.47 in.; 6.26 cm
95th PERCENTILE: 2.88 in.; 7.33 cm

Range:	2.32-3.11 in.
Coefficient of Variation:	5.44%
Kurtosis:	2.87
Skewness:	0.32
Sample Size:	148

Percentiles		
In.		*Cm.*
2.47	5th	6.26
2.49	10th	6.33
2.51	15th	6.39
2.54	20th	6.44
2.56	25th	6.49
2.58	30th	6.54
2.60	35th	6.59
2.62	40th	6.64
2.64	45th	6.70
2.66	50th	6.75
2.68	55th	6.80
2.70	60th	6.86
2.72	65th	6.92
2.75	70th	6.98
2.77	75th	7.05
2.80	80th	7.11
2.83	85th	7.19
2.86	90th	7.26
2.88	95th	7.33



DIGIT 1 HEIGHT;

PERPENDICULAR TO WRIST CREASE

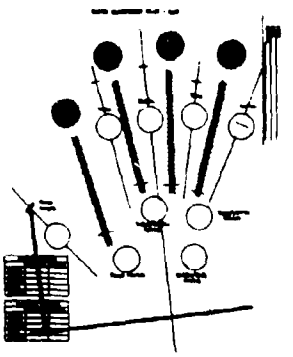
Measured on the data blank, the perpendicular distance from the wrist crease baseline to the midpoint of the tip of digit 1.

MEAN: 3.95 in.; 10.03 cm
STANDARD DEVIATION: 0.36 in.; 0.92 cm
5th PERCENTILE: 3.42 in.; 8.70 cm
95th PERCENTILE: 4.54 in.; 11.53 cm

Range:	2.91-5.00 in.
Coefficient of Variation:	9.17%
Kurtosis:	3.05
Skewness:	0.15
Sample Size:	148

In.	*Percentiles*	*Cm.*
3.42	5th	8.70
3.50	10th	8.89
3.57	15th	9.07
3.63	20th	9.22
3.69	25th	9.36
3.74	30th	9.50
3.79	35th	9.63
3.84	40th	9.75
3.89	45th	9.88
3.94	50th	10.00
3.99	55th	10.13
4.04	60th	10.25
4.09	65th	10.38
4.14	70th	10.52
4.20	75th	10.67
4.26	80th	10.83
4.34	85th	11.01
4.42	90th	11.23
4.54	95th	11.53

(89)



DIGIT 2 HEIGHT;

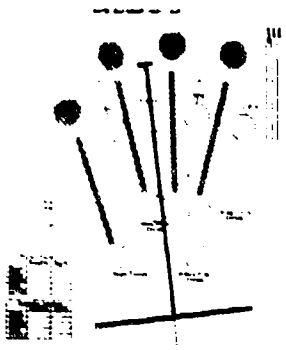
PERPENDICULAR TO WRIST CREASE

Measured on the data blank, the perpendicular distance from the wrist crease baseline to the midpoint of the tip of digit 2.

MEAN: 7.21 in.; 18.32 cm
STANDARD DEVIATION: 0.35 in.; 0.88 cm
5th PERCENTILE: 6.65 in.; 16.89 cm
95th PERCENTILE: 7.84 in.; 19.92 cm

Range:	6.38-8.15 in.
Coefficient of Variation:	4.80%
Kurtosis:	2.75
Skewness:	0.18
Sample Size:	148

Percentiles		
In.		*Cm.*
6.65	5th	16.89
6.77	10th	17.20
6.85	15th	17.40
6.92	20th	17.57
6.97	25th	17.71
7.02	30th	17.84
7.07	35th	17.95
7.11	40th	18.07
7.16	45th	18.17
7.20	50th	18.28
7.24	55th	18.39
7.29	60th	18.51
7.33	65th	18.62
7.38	70th	18.75
7.44	75th	18.89
7.50	80th	19.06
7.58	85th	19.25
7.68	90th	19.51
7.84	95th	19.92



DIGIT 3 HEIGHT;

PERPENDICULAR TO WRIST CREASE

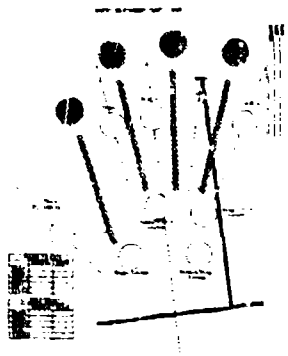
Measured on the data blank, the perpendicular distance from the wrist crease baseline to the midpoint of the tip of digit 3.

MEAN: 7.69 in.; 19.52 cm
STANDARD DEVIATION: 0.36 in.; 0.92 cm
5th PERCENTILE: 7.12 in.; 18.10 cm
95th PERCENTILE: 8.28 in.; 21.04 cm

Range:	6.77-8.98 in.
Coefficient of Variation:	4.72%
Kurtosis:	3.24
Skewness:	0.29
Sample Size:	148

Percentiles		
In.		*Cm.*
7.12	5th	18.10
7.26	10th	18.43
7.33	15th	18.62
7.38	20th	18.75
7.43	25th	18.87
7.47	30th	18.98
7.51	35th	19.09
7.56	40th	19.20
7.60	45th	19.31
7.65	50th	19.43
7.70	55th	19.55
7.75	60th	19.68
7.81	65th	19.83
7.87	70th	19.98
7.93	75th	20.15
8.01	80th	20.34
8.09	85th	20.56
8.19	90th	20.80
8.28	95th	21.04

(41)



DIGIT 4 HEIGHT;

PERPENDICULAR TO WRIST CREASE

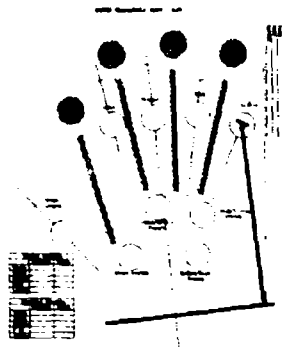
Measured on the data blank, the perpendicular distance from the wrist crease baseline to the midpoint of the tip of digit 4.

MEAN: 7.16 in.; 18.20 cm
STANDARD DEVIATION: 0.35 in.; 0.88 cm
5th PERCENTILE: 6.69 in.; 17.00 cm
95th PERCENTILE: 7.78 in.; 19.76 cm

Range:	6.20 8.35 in.
Coefficient of Variation:	4.83%
Kurtosis:	3.09
Skewness:	0.37
Sample Size:	148

In.	*Percentiles*	*Cm.*
6.69	5th	17.00
6.78	10th	17.22
6.83	15th	17.35
6.87	20th	17.45
6.91	25th	17.55
6.95	30th	17.65
6.99	35th	17.74
7.03	40th	17.85
7.07	45th	17.96
7.11	50th	18.07
7.16	55th	18.19
7.22	60th	18.33
7.27	65th	18.47
7.33	70th	18.63
7.40	75th	18.80
7.48	80th	19.00
7.57	85th	19.22
7.67	90th	19.48
7.78	95th	19.76

(42)



DIGIT 5 HEIGHT;

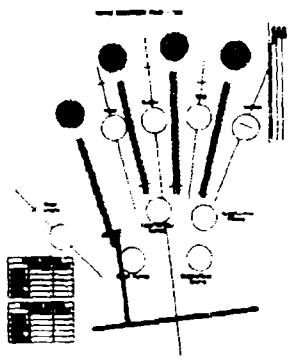
PERPENDICULAR TO WRIST CREASE

Measured on the data blank, the perpendicular distance from the wrist crease baseline to the midpoint to the tip of digit 5.

MEAN: 5.75 in.; 14.60 cm
STANDARD DEVIATION: 0.32 in.; 0.80 cm
5th PERCENTILE: 5.24 in.; 13.30 cm
95th PERCENTILE: 6.26 in.; 15.90 cm

Range:	4.88-6.69 in.
Coefficient of Variation:	5.50%
Kurtosis:	3.22
Skewness:	0.09
Sample Size:	148

In.	*Percentiles*	*Cm.*
5.24	5th	13.30
5.38	10th	13.66
5.45	15th	13.84
5.50	20th	13.97
5.54	25th	14.08
5.58	30th	14.17
5.62	35th	14.27
5.65	40th	14.36
5.69	45th	14.45
5.73	50th	14.55
5.77	55th	14.65
5.81	60th	14.76
5.86	65th	14.87
5.90	70th	15.00
5.96	75th	15.14
6.02	80th	15.29
6.09	85th	15.47
6.17	90th	15.68
6.26	95th	15.90



CROTCH 1 HEIGHT

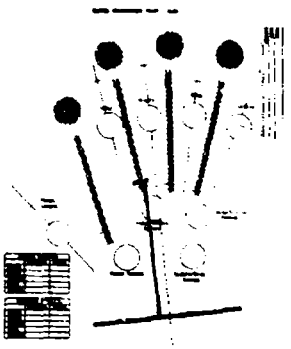
Measured on the data blank, the perpendicular distance from the wrist crease baseline to the level of hand crotch 1.

MEAN: 2.68 in.; 6.81 cm
STANDARD DEVIATION: 0.23 in.; 0.60 cm
5th PERCENTILE: 2.31 in.; 5.85 cm
95th PERCENTILE: 3.06 in.; 7.78 cm

Range:	2.13-3.23 in.
Coefficient of Variation:	8.73%
Kurtosis:	2.61
Skewness:	0.15
Sample Size:	148

In.	*Percentiles*	*Cm.*
2.30	5th	5.85
2.40	10th	6.09
2.45	15th	6.22
2.49	20th	6.32
2.52	25th	6.40
2.55	30th	6.47
2.58	35th	6.55
2.61	40th	6.62
2.63	45th	6.69
2.66	50th	6.77
2.70	55th	6.85
2.73	60th	6.93
2.77	65th	7.02
2.80	70th	7.12
2.85	75th	7.23
2.89	80th	7.35
2.95	85th	7.48
3.00	90th	7.63
3.06	95th	7.78

(44)



CROTCH 2 HEIGHT

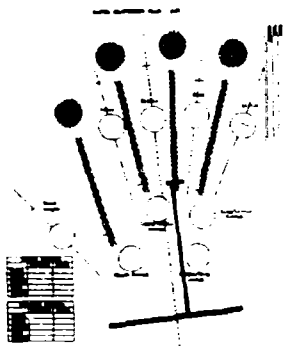
Measured on the data blank, the perpendicular distance from the wrist crease baseline to the level of hand crotch 2.

MEAN: 4.35 in.; 11.05 cm
STANDARD DEVIATION: 0.24 in.; 0.60 cm
5th PERCENTILE: 4.00 in.; 10.17 cm
95th PERCENTILE: 4.76 in.; 12.08 cm

Range:	3.78-5.08 in.
Coefficient of Variation:	5.43%
Kurtosis:	2.97
Skewness:	0.38
Sample Size:	148

In.	*Percentiles*	*Cm.*
4.00	5th	10.17
4.07	10th	10.34
4.12	15th	10.45
4.15	20th	10.54
4.18	25th	10.62
4.21	30th	10.70
4.24	35th	10.77
4.27	40th	10.84
4.30	45th	10.92
4.33	50th	10.99
4.36	55th	11.07
4.39	60th	11.15
4.43	65th	11.24
4.46	70th	11.34
4.51	75th	11.44
4.55	80th	11.56
4.61	85th	11.70
4.67	90th	11.87
4.76	95th	12.08

(45)



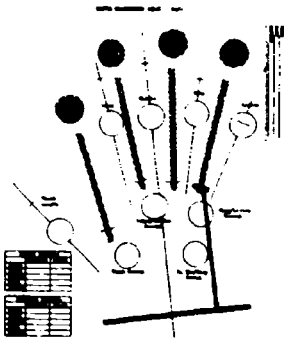
CROTCH 3 HEIGHT

Measured on the data blank, the perpendicular distance from the wrist crease baseline to the level of hand crotch 3.

MEAN: 4.28 in.; 10.87 cm
STANDARD DEVIATION: 0.23 in.; 0.58 cm
5th PERCENTILE: 3.97 in.; 10.09 cm
95th PERCENTILE: 4.67 in.; 11.86 cm

Range:	3.82-5.00 in.
Coefficient of Variation:	5.32%
Kurtosis:	3.29
Skewness:	0.54
Sample Size:	148

In.	*Percentiles*	*Cm.*
3.97	5th	10.09
3.99	10th	10.14
4.03	15th	10.24
4.07	20th	10.33
4.11	25th	10.43
4.14	30th	10.52
4.17	35th	10.60
4.21	40th	10.68
4.24	45th	10.76
4.27	50th	10.84
4.30	55th	10.92
4.33	60th	11.00
4.36	65th	11.08
4.40	70th	11.17
4.43	75th	11.25
4.47	80th	11.35
4.51	85th	11.46
4.57	90th	11.61
4.67	95th	11.86



CROTCH 4 HEIGHT

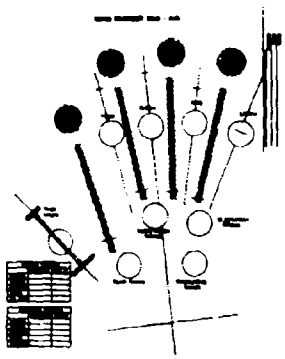
Measured on the data blank, the perpendicular distance from the wrist crease baseline to the level of hand crotch 4.

MEAN: 3.83 in.; 9.72 cm
STANDARD DEVIATION: 0.20 in.; 0.51 cm
5th PERCENTILE: 3.54 in.; 8.98 cm
95th PERCENTILE: 4.15 in.; 10.53 cm

Range:	3.35-4.53 in.
Coefficient of Variation:	5.28%
Kurtosis:	3.26
Skewness:	0.45
Sample Size:	148

In.	*Percentiles*	*Cm.*
3.54	5th	8.98
3.58	10th	9.09
3.61	15th	9.18
3.65	20th	9.26
3.68	25th	9.34
3.71	30th	9.41
3.73	35th	9.48
3.76	40th	9.55
3.79	45th	9.62
3.82	50th	9.69
3.84	55th	9.76
3.87	60th	9.83
3.90	65th	9.91
3.93	70th	9.99
3.97	75th	10.07
4.00	80th	10.17
4.04	85th	10.27
4.09	90th	10.39
4.15	95th	10.53

(47)



DIGIT 1 LENGTH;

FINGERTIP TO CROTCH LEVEL

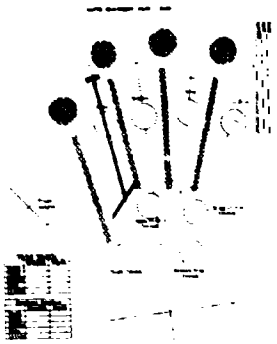
Measured on the data blank, the distance along the axis of digit 1 from the midpoint of the tip of digit 1 to the level of hand crotch 1.

MEAN: 2.31 in.; 5.87 cm
STANDARD DEVIATION: 0.18 in.; 0.45 cm
5th PERCENTILE: 1.99 in.; 5.07 cm
95th PERCENTILE: 2.59 in.; 6.57 cm

Range:	1.85-2.76 in.
Coefficient of Variation:	7.63%
Kurtosis:	2.71
Skewness:	−0.10
Sample Size:	148

In.	*Percentiles*	*Cm.*
1.99	5th	5.07
2.08	10th	5.27
2.12	15th	5.39
2.16	20th	5.49
2.19	25th	5.57
2.22	30th	5.64
2.24	35th	5.70
2.27	40th	5.76
2.29	45th	5.82
2.31	50th	5.88
2.34	55th	5.93
2.36	60th	5.99
2.38	65th	6.05
2.41	70th	6.12
2.44	75th	6.19
2.46	80th	6.26
2.50	85th	6.34
2.54	90th	6.44
2.59	95th	6.57

(48)



DIGIT 2 LENGTH;

FINGERTIP TO CROTCH LEVEL

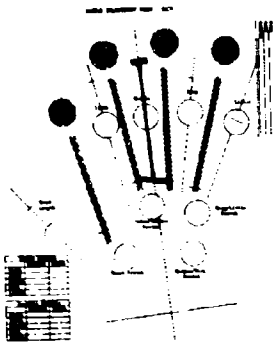
Measured on the data blank, the distance along the axis of digit 2 from the midpoint of the tip of digit 2 to the level of hand crotch 2.

MEAN: 2.96 in.; 7.53 cm
STANDARD DEVIATION: 0.18 in.; 0.46 cm
5th PERCENTILE: 2.69 in.; 6.83 cm
95th PERCENTILE: 3.23 in.; 8.19 cm

Range:	2.52-3.58 in.
Coefficient of Variation:	6.09%
Kurtosis:	3.32
Skewness:	0.33
Sample Size:	148

In.	*Percentiles*	*Cm.*
2.69	5th	6.83
2.73	10th	6.94
2.77	15th	7.03
2.80	20th	7.11
2.83	25th	7.19
2.86	30th	7.26
2.89	35th	7.33
2.91	40th	7.39
2.94	45th	7.46
2.96	50th	7.52
2.99	55th	7.58
3.01	60th	7.64
3.03	65th	7.71
3.06	70th	7.77
3.09	75th	7.84
3.12	80th	7.91
3.15	85th	7.99
3.18	90th	8.08
3.23	95th	8.19

(49)



DIGIT 3 LENGTH;

FINGERTIP TO CROTCH LEVEL

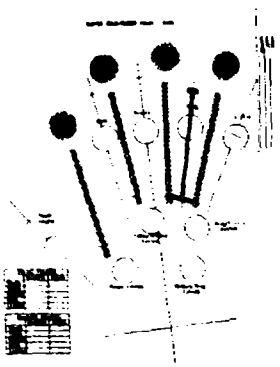
Measured on the data blank, the distance along the axis of digit 3 from the midpoint of the tip of digit 3 to the average level of hand crotch 2-3.

MEAN: 3.37 in.; 8.57 cm
STANDARD DEVIATION: 0.20 in.; 0.51 cm
5th PERCENTILE: 3.08 in.; 7.82 cm
95th PERCENTILE: 3.73 in.; 9.47 cm

Range:	2.87-3.94 in.
Coefficient of Variation:	6.00%
Kurtosis:	2.78
Skewness:	0.32
Sample Size:	148

In.	*Percentiles*	*Cm.*
3.08	5th	7.82
3.12	10th	7.93
3.16	15th	8.02
3.19	20th	8.10
3.22	25th	8.18
3.25	30th	8.26
3.28	35th	8.33
3.31	40th	8.40
3.33	45th	8.47
3.36	50th	8.53
3.39	55th	8.60
3.42	60th	8.68
3.44	65th	8.75
3.48	70th	8.83
3.51	75th	8.91
3.55	80th	9.01
3.59	85th	9.12
3.65	90th	9.26
3.73	95th	9.47

(50)



DIGIT 4 LENGTH;

FINGERTIP TO CROTCH LEVEL

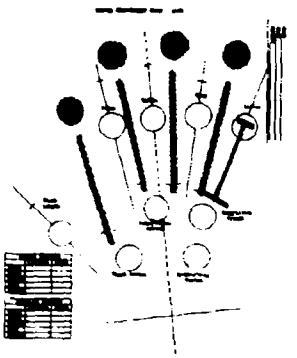
Measured on the data blank, the distance along the axis of digit 4 from the midpoint of the tip of digit 4 to the average level of hand crotch 3-4.

MEAN: 3.17 in.; 8.05 cm
STANDARD DEVIATION: 0.19 in.; 0.47 cm
5th PERCENTILE: 2.93 in.; 7.44 cm
95th PERCENTILE: 3.52 in.; 8.93 cm

Range:	2.68-3.66 in.
Coefficient of Variation:	5.87%
Kurtosis:	2.77
Skewness:	0.39
Sample Size:	148

In.	*Percentiles*	*Cm.*
2.93	5th	7.44
2.95	10th	7.50
2.98	15th	7.57
3.00	20th	7.63
3.03	25th	7.69
3.05	30th	7.75
3.07	35th	7.81
3.10	40th	7.87
3.12	45th	7.93
3.15	50th	7.99
3.17	55th	8.06
3.20	60th	8.13
3.23	65th	8.20
3.26	70th	8.28
3.29	75th	8.36
3.33	80th	8.46
3.38	85th	8.58
3.43	90th	8.72
3.52	95th	8.93

(51)



DIGIT 5 LENGTH;

FINGERTIP TO CROTCH LEVEL

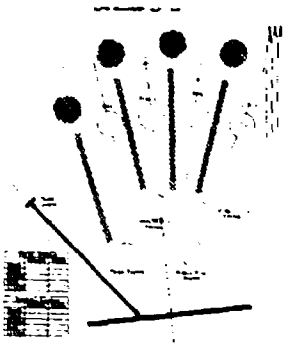
Measured on the data blank, the distance along the axis of digit 5 from the midpoint of the tip of digit 5 to the level of hand crotch 4.

MEAN: 2.42 in.; 6.14 cm
STANDARD DEVIATION: 0.18 in.; 0.47 cm
5th PERCENTILE: 2.14 in.; 5.44 cm
95th PERCENTILE: 2.75 in.; 6.99 cm

Range:	1.93-3.03 in.
Coefficient of Variation:	7.63%
Kurtosis:	3.08
Skewness:	0.30
Sample Size:	148

In.	*Percentiles*	*Cm.*
2.14	5th	5.44
2.21	10th	5.61
2.25	15th	5.71
2.27	20th	5.77
2.29	25th	5.83
2.31	30th	5.88
2.33	35th	5.93
2.35	40th	5.98
2.37	45th	6.03
2.40	50th	6.08
2.42	55th	6.14
2.44	60th	6.21
2.47	65th	6.27
2.50	70th	6.35
2.53	75th	6.44
2.57	80th	6.54
2.62	85th	6.65
2.68	90th	6.80
2.75	95th	6.99

(52)



DIGIT 1 LENGTH;

TOTAL, TIP TO WRIST CREASE

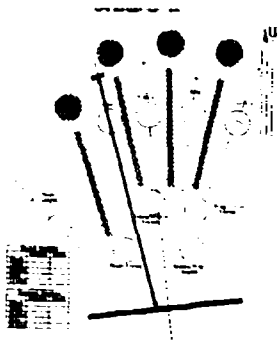
Measured on the data blank, the distance along the axis of digit 1 from the midpoint of the tip of digit 1 to the wrist crease baseline.

MEAN: 5.00 in.; 12.70 cm
STANDARD DEVIATION: 0.45 in.; 1.13 cm
5th PERCENTILE: 4.35 in.; 11.05 cm
95th PERCENTILE: 5.78 in.; 14.68 cm

Range:	3.70-6.38 in.
Coefficient of Variation:	8.91%
Kurtosis:	3.26
Skewness:	0.22
Sample Size:	148

In.	*Percentiles*	*Cm.*
4.35	5th	11.05
4.45	10th	11.31
4.54	15th	11.54
4.62	20th	11.73
4.69	25th	11.91
4.75	30th	12.07
4.81	35th	12.22
4.87	40th	12.37
4.93	45th	12.51
4.98	50th	12.66
5.04	55th	12.80
5.10	60th	12.95
5.16	65th	13.10
5.22	70th	13.26
5.29	75th	13.43
5.37	80th	13.63
5.46	85th	13.87
5.58	90th	14.18
5.78	95th	14.68

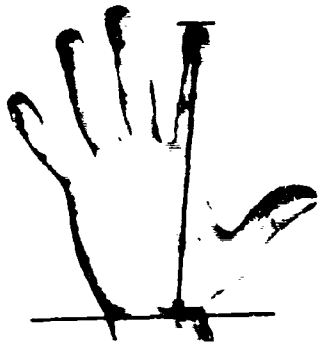
(53)



DIGIT 2 LENGTH;

TOTAL, TIP TO WRIST CREASE

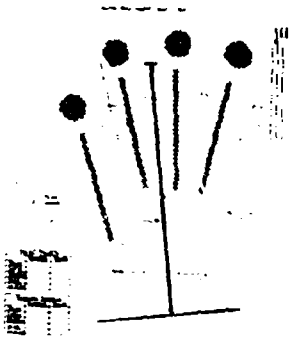
Measured on the data blank, the distance along the axis of digit 2 from the midpoint of the tip of digit 2 to the wrist crease baseline.



MEAN: 7.29 in.; 18.52 cm
STANDARD DEVIATION: 0.35 in.; 0.88 cm
5th PERCENTILE: 6.74 in.; 17.13 cm
95th PERCENTILE: 7.90 in.; 20.06 cm

Range:	6.42-8.23 in.
Coefficient of Variation:	4.75%
Kurtosis:	2.77
Skewness:	0.16
Sample Size:	148

In.	*Percentiles*	*Cm.*
6.74	5th	17.13
6.85	10th	17.41
6.93	15th	17.60
6.99	20th	17.76
7.05	25th	17.90
7.10	30th	18.02
7.14	35th	18.14
7.19	40th	18.26
7.23	45th	18.37
7.28	50th	18.48
7.32	55th	18.59
7.37	60th	18.71
7.41	65th	18.83
7.46	70th	18.96
7.52	75th	19.10
7.58	80th	19.26
7.66	85th	19.45
7.75	90th	19.69
7.90	95th	20.06



DIGIT 3 LENGTH;

TOTAL, TIP TO WRIST CREASE

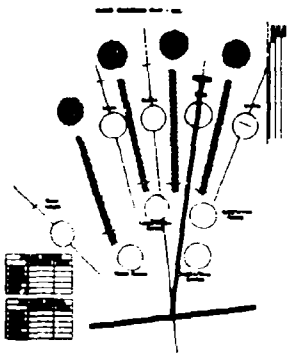
Measured on the data blank, the distance along the axis of digit 3 from the midpoint of the tip of digit 3 to the wrist crease baseline.

MEAN: 7.69 in.; 19.52 cm
STANDARD DEVIATION: 0.36 in.; 0.92 cm
5th PERCENTILE: 7.12 in.; 18.10 cm
95th PERCENTILE: 8.28 in.; 21.04 cm

Range:	6.77-8.98 in.
Coefficient of Variation:	4.72%
Kurtosis:	3.24
Skewness:	0.29
Sample Size:	148

Percentiles		
In.		*Cm.*
7.12	5th	18.10
7.26	10th	18.43
7.33	15th	18.62
7.38	20th	18.75
7.43	25th	18.87
7.47	30th	18.98
7.51	35th	19.09
7.56	40th	19.20
7.60	45th	19.31
7.65	50th	19.43
7.70	55th	19.55
7.75	60th	19.68
7.81	65th	19.83
7.87	70th	19.98
7.93	75th	20.15
8.01	80th	20.34
8.09	85th	20.56
8.19	90th	20.80
8.28	95th	21.04

(55)



DIGIT 4 LENGTH;

TOTAL, TIP TO WRIST CREASE

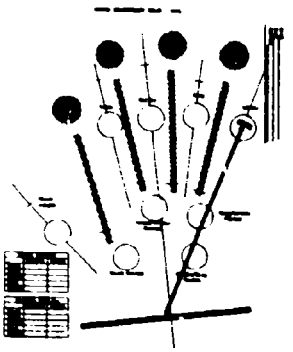
Measured on the data blank, the distance along the axis of digit 4 from the midpoint of the tip of digit 4 to the wrist crease baseline.

MEAN: 7.37 in.; 18.72 cm
STANDARD DEVIATION: 0.36 in.; 0.91 cm
5th PERCENTILE: 6.90 in. 17.52 cm
95th PERCENTILE: 7.98 in.; 20.28 cm

Range:	6.54-8.58 in.
Coefficient of Variation:	4.84%
Kurtosis:	2.97
Skewness:	0.41
Sample Size:	148

Percentiles		
In.		*Cm.*
6.90	5th	17.52
6.98	10th	17.73
7.03	15th	17.85
7.07	20th	17.95
7.11	25th	18.05
7.14	30th	18.15
7.18	35th	18.25
7.23	40th	18.36
7.27	45th	18.47
7.32	50th	18.59
7.37	55th	18.72
7.43	60th	18.86
7.49	65th	19.01
7.55	70th	19.18
7.62	75th	19.36
7.70	80th	19.57
7.79	85th	19.79
7.89	90th	20.04
7.98	95th	20.28

(56)



DIGIT 5 LENGTH;

TOTAL, TIP TO WRIST CREASE

Measured on the data blank, the distance along the axis of digit 5 from the midpoint of the tip of digit 5 to the wrist crease baseline.

MEAN: 6.54 in.; 16.61 cm
STANDARD DEVIATION: 0.36 in . 0.91 cm
5th PERCENTILE: 5.95 in.; 15.11 cm
95th PERCENTILE: 7.13 in.; 18.10 cm

Range:	5.59-7.64 in.
Coefficient of Variation:	5.47%
Kurtosis:	3.19
Skewness:	0.21
Sample Size:	148

In.	*Percentiles*	*Cm.*
5.95	5th	15.11
6.12	10th	15.55
6.21	15th	15.77
6.27	20th	15.92
6.31	25th	16.03
6.35	30th	16.14
6.39	35th	16.24
6.43	40th	16.34
6.47	45th	16.44
6.51	50th	16.54
6.56	55th	16.65
6.60	60th	16.77
6.65	65th	16.90
6.71	70th	17.04
6.77	75th	17.20
6.84	80th	17.38
6.92	85th	17.59
7.02	90th	17.83
7.13	95th	18.10

SECTION V

DATA SUMMARIES: COMMISSIONED VS. NON-COMMISSIONED PERSONNEL

		OFFICERS ONLY N = 94				ENLISTED MEN ONLY N = 54			
		Inches		Centimeters		Inches		Centimeters	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	Hand Length	7.77	0.36	19.73	0.91	7.75	0.39	19.70	0.99
2	Hand Breadth; Metacarpale	3.52	0.16	8.94	0.40	3.55	0.16	9.02	0.41
3	Hand Circumference; Metacarpale	8.48	0.36	21.53	0.92	8.54	0.35	21.69	0.88
4	Hand Circumference; Metacarpale, Minimum	9.97	0.49	25.33	1.24	10.07	0.56	25.57	1.41
5	Hand Circumference; Fingertips Even	8.93	0.87	22.68	2.22	8.97	0.81	22.78	2.06
6	Fist Circumference	11.63	0.52	29.55	1.33	11.71	0.54	29.73	1.38
7	Wrist Circumference	6.88	0.36	17.47	0.92	6.91	0.39	17.56	0.99
8	Hand Thickness; Metacarpale III	1.29	0.08	3.28	0.20	1.30	0.08	3.30	0.20
9	Hand Depth; Thenar Pad	2.41	0.17	6.13	0.42	2.48	0.19	6.29	0.49
10	Digit 1: Interphalangeal Joint; Breadth	0.90	0.05	2.29	0.13	0.91	0.05	2.31	0.13
11	Digit 1: Interphalangeal Joint; Depth	0.79	0.06	2.00	0.16	0.80	0.06	2.04	0.14
12	Digit 1: Interphalangeal Joint; Circumference	2.66	0.15	6.76	0.39	2.70	0.14	6.85	0.36
13	Digit 2: Distal Interphalangeal Joint; Breadth	0.72	0.05	1.84	0.12	0.73	0.04	1.85	0.11
14	Digit 2: Distal Interphalangeal Joint; Depth	0.60	0.05	1.53	0.13	0.62	0.05	1.58	0.14
15	Digit 2: Distal Intrplgl Joint; Circumference	2.09	0.13	5.32	0.32	2.13	0.14	5.40	0.35
16	Digit 2: Proximal Interphalangeal Joint; Breadth	0.84	0.06	2.14	0.14	0.85	0.04	2.16	0.11
17	Digit 2: Proximal Interphalangeal Joint; Depth	0.76	0.04	1.93	0.11	0.77	0.06	1.96	0.14
18	Digit 2: Proximal Intrplgl Joint; Circumference	2.52	0.14	6.41	0.36	2.55	0.14	6.48	0.35
19	Digit 3: Distal Interphalangeal Joint; Breadth	0.72	0.05	1.84	0.13	0.73	0.04	1.84	0.10
20	Digit 3: Distal Interphalangeal Joint; Depth	0.63	0.05	1.59	0.13	0.64	0.05	1.62	0.13
21	Digit 3: Distal Intrplgl Joint; Circumference	2.12	0.14	5.39	0.35	2.14	0.13	5.44	0.32
22	Digit 3: Proximal Interphalangeal Joint; Breadth	0.86	0.06	2.18	0.15	0.86	0.04	2.19	0.11
23	Digit 3: Proximal Interphalangeal Joint; Depth	0.79	0.05	2.01	0.13	0.80	0.06	2.03	0.16
24	Digit 3: Proximal Intrplgl Joint; Circumference	2.59	0.16	6.58	0.40	2.62	0.15	6.65	0.37
25	Digit 4: Distal Interphalangeal Joint; Breadth	0.68	0.04	1.72	0.11	0.67	0.05	1.71	0.11
26	Digit 4: Distal Interphalangeal Joint; Depth	0.59	0.05	1.51	0.13	0.60	0.05	1.52	0.13
27	Digit 4: Distal Intrplgl Joint; Circumference	2.00	0.12	5.09	0.31	2.00	0.12	5.08	0.30
28	Digit 4: Proximal Interphalangeal Joint; Breadth	0.80	0.06	2.02	0.14	0.79	0.05	2.01	0.12
29	Digit 4: Proximal Interphalangeal Joint; Depth	0.74	0.05	1.89	0.12	0.75	0.06	1.89	0.15
30	Digit 4: Proximal Intrplgl Joint; Circumference	2.42	0.15	6.15	0.38	2.41	0.14	6.13	0.36

		Inches $\bar{X}$; SD	Centimeters $\bar{X}$; SD	Inches $\bar{X}$; SD	Centimeters $\bar{X}$; SD
31	Digit 5: Distal Interphalangeal Joint; Breadth	0.62; 0.04	1.57; 0.11	0.62; 0.05	1.57; 0.13
32	Digit 5: Distal Interphalangeal Joint; Depth	0.54; 0.05	1.37; 0.12	0.55; 0.05	1.39; 0.13
33	Digit 5: Distal Intrplgl Joint; Circumference	1.82; 0.12	4.63; 0.31	1.84; 0.14	4.66; 0.34
34	Digit 5: Proximal Interphalangeal Joint; Breadth	0.70; 0.06	1.78; 0.14	0.70; 0.05	1.77; 0.14
35	Digit 5: Proximal Interphalangeal Joint; Depth	0.65; 0.05	1.66; 0.12	0.66; 0.05	1.69; 0.13
36	Digit 5: Proximal Intrplgl Joint; Circumference	2.12; 0.14	5.39; 0.36	2.14; 0.14	5.43; 0.36
37	Wrist Breadth	2.67; 0.15	6.79; 0.38	2.66; 0.14	6.76; 0.35
38	Digit 1 Height; Perpendicular to Wrist Crease	3.96; 0.34	10.06; 0.87	3.92; 0.39	9.97; 0.99
39	Digit 2 Height; Perpendicular to Wrist Crease	7.22; 0.35	18.34; 0.88	7.21; 0.35	18.31; 0.89
40	Digit 3 Height; Perpendicular to Wrist Crease	7.69; 0.35	19.52; 0.89	7.69; 0.39	19.52; 0.99
41	Digit 4 Height; Perpendicular to Wrist Crease	7.16; 0.33	18.19; 0.85	7.17; 0.37	18.21; 0.95
42	Digit 5 Height; Perpendicular to Wrist Crease	5.73; 0.29	14.55; 0.73	5.78; 0.36	14.67; 0.91
43	Crotch 1 Height	2.68; 0.22	6.82; 0.56	2.69; 0.25	6.82; 0.65
44	Crotch 2 Height	4.36; 0.21	11.06; 0.54	4.35; 0.27	11.04; 0.70
45	Crotch 3 Height	4.28; 0.20	10.86; 0.51	4.29; 0.27	10.88; 0.68
46	Crotch 4 Height	3.82; 0.18	9.69; 0.45	3.85; 0.24	9.77; 0.60
47	Digit 1 Length; Fingertip to Crotch Level	2.32; 0.17	5.88; 0.44	2.30; 0.18	5.83; 0.46
48	Digit 2 Length; Fingertip to Crotch Level	2.96; 0.19	7.53; 0.47	3.00; 0.17	7.52; 0.44
49	Digit 3 Length; Fingertip to Crotch Level	3.37; 0.20	8.57; 0.51	3.37; 0.21	8.57; 0.53
50	Digit 4 Length; Fingertip to Crotch Level	3.17; 0.19	8.05; 0.48	3.17; 0.19	8.05; 0.47
51	Digit 5 Length; Fingertip to Crotch Level	2.40; 0.18	6.10; 0.45	2.45; 0.20	6.21; 0.51
52	Digit 1 Length; Total, Tip to Wrist Crease	5.02; 0.42	12.75; 1.06	4.96; 0.49	12.61; 1.23
53	Digit 2 Length; Total, Tip to Wrist Crease	7.30; 0.35	18.54; 0.89	7.28; 0.35	18.49; 0.88
54	Digit 3 Length; Total, Tip to Wrist Crease	7.69; 0.35	19.52; 0.89	7.69; 0.39	19.52; 0.99
55	Digit 4 Length; Total, Tip to Wrist Crease	7.36; 0.34	18.70; 0.86	7.39; 0.39	18.76; 1.00
56	Digit 5 Length; Total, Tip to Wrist Crease	6.51; 0.33	16.54; 0.83	6.59; 0.41	16.73; 1.03

SECTION VI

CORRELATION MATRIX FOR ALL VARIABLES

CORRELATION MATRIX FOR MALE HANDS

		1	2	3	4	5	6	7	8	9	10
1	HAND LENGTH		.545	.586	.519	.102	.561	.566	.393	.347	.376
2	HAND BREADTH, META	.545		.885	.728	.228	.739	.705	.340	.489	.447
3	HAND CIRC,METACARP	.586	.885		.789	.290	.754	.741	.365	.519	.410
4	HAND CIRC,META,MIN	.519	.728	.789		.334	.689	.651	.372	.507	.412
5	HAND CIRC,TIPS EVN	.102	.228	.290	.334		.222	.168	-088	.243	.021
6	FIST CIRCUMFERENCE	.561	.739	.754	.689	.222		.681	.381	.473	.444
7	WRIST CIRCUMF-ENCE	.566	.705	.741	.651	.168	.681		.513	.479	.529
8	HAND THICK AT META	.393	.310	.365	.372	-088	.381	.513		.407	.340
9	HND DPTH,THENR PAD	.347	.489	.519	.507	.243	.473	.479	.407		.340
10	DIG 1 JOINT BRDTH	.376	.447	.410	.412	.021	.444	.529	.340	.340	
11	DIGIT 1 JOINT DPTH	.437	.509	.519	.544	-004	.535	.567	.402	.294	.515
12	DIGIT 1 JOINT CIRC	.469	.547	.532	.550	.005	.552	.628	.417	.360	.870
13	DIG 2 DST JNT BDTH	.341	.466	.453	.386	-114	.454	.555	.393	.330	.616
14	DIG 2 DST JNT DPTH	.426	.480	.478	.458	-172	.482	.510	.336	.381	.397
15	DIG 2 DST JNT CIRC	.450	.558	.552	.502	-173	.546	.630	.438	.421	.596
16	DIG 2 PR JNT BRDTH	.413	.558	.554	.532	.026	.536	.643	.534	.343	.588
17	DIG 2 PR JNT DPTH	.478	.464	.460	.413	-050	.516	.588	.433	.334	.466
18	DIG 2 PR JNT CIRC	.490	.590	.584	.537	-001	.592	.696	.541	.380	.602
19	DIG 3 DST JNT BDTH	.402	.535	.518	.506	.017	.506	.629	.468	.397	.560
20	DIG 3 DST JNT DPTH	.445	.481	.514	.440	-139	.512	.527	.416	.330	.353
21	DIG 3 DST JNT CIRC	.478	.586	.596	.546	-067	.586	.670	.504	.427	.527
22	DIG 3 PR JNT BRDTH	.402	.560	.514	.475	.008	.508	.577	.501	.340	.607
23	DIG 3 PR JNT DPTH	.503	.509	.479	.476	.026	.564	.647	.497	.387	.478
24	DIG 3 PR JNT CIRC	.528	.617	.579	.546	.003	.626	.702	.577	.421	.624
25	DIG 4 DST JNT BDTH	.231	.357	.378	.371	-029	.327	.422	.365	.258	.433
26	DIG 4 DST JNT DPTH	.350	.446	.465	.389	-175	.448	.511	.371	.297	.335
27	DIG 4 DST JNT CIRC	.351	.485	.505	.454	-113	.467	.565	.442	.331	.456
28	DIG 4 PR JNT BRDTH	.439	.582	.533	.496	.012	.497	.616	.431	.336	.560
29	DIG 4 PR JNT DPTH	.501	.464	.449	.450	-009	.517	.627	.491	.346	.463
30	DIG 4 PR JNT CIRC	.532	.593	.554	.531	.008	.569	.695	.512	.393	.576

CORRELATION MATRIX FOR MALE HANDS

		1	2	3	4	5	6	7	8	9	10
31	DIG 5 DST JNT BDTH	.272	.415	.407	.371	-013	.388	.448	.341	.328	.381
32	DIG 5 DST JNT DPTH	.362	.447	.483	.395	-103	.474	.462	.429	.390	.409
33	DIG 5 DST JNT CIRC	.373	.509	.523	.436	-119	.511	.554	.451	.412	.459
34	DIG 5 PR JNT BRDTH	.427	.567	.545	.532	.011	.508	.606	.445	.315	.501
35	DIG 5 PR JNT DPTH	.470	.410	.439	.425	-100	.489	.580	.438	.292	.502
36	DIG 5 PR JNT CIRC	.515	.570	.574	.562	-038	.575	.682	.503	.348	.574
37	WRIST BREADTH	.441	.519	.581	.488	.339	.564	.678	.295	.387	.319
38	DIGIT 1 HT PERP WC	.611	.318	.350	.223	-065	.286	.324	.153	.073	.273
39	DIGIT 2 HT PERP WC	.899	.520	.572	.440	.004	.530	.537	.307	.278	.383
40	DIGIT 3 HT PERP WC	.975	.534	.575	.500	.047	.560	.559	.403	.353	.375
41	DIGIT 4 HT PERP WC	.931	.514	.557	.487	.087	.529	.527	.426	.376	.358
42	DIGIT 5 HT PERP WC	.804	.445	.496	.431	.115	.470	.484	.379	.323	.281
43	CROTCH 1 HEIGHT	.583	.384	.405	.305	-155	.340	.438	.252	.193	.400
44	CROTCH 2 HEIGHT	.843	.468	.486	.419	-033	.496	.508	.330	.294	.397
45	CROTCH 3 HEIGHT	.818	.434	.474	.422	.062	.467	.497	.297	.317	.336
46	CROTCH 4 HEIGHT	.723	.437	.472	.431	.136	.436	.483	.266	.379	.269
47	DIGIT 1 TIP-CROTCH	.572	.219	.248	.253	.240	.295	.203	.098	.114	.158
48	DIGIT 2 TIP-CROTCH	.655	.398	.496	.357	.071	.442	.330	.212	.215	.204
49	DIGIT 3 TIP-CROTCH	.826	.477	.512	.436	.063	.494	.424	.378	.289	.297
50	DIGIT 4 TIP-CROTCH	.801	.476	.516	.413	.133	.483	.407	.368	.312	.272
51	DIGIT 5 TIP-CROTCH	.625	.421	.457	.358	.106	.448	.359	.299	.243	.225
52	DIGIT 1 TIP-WRIST	.632	.306	.351	.248	-011	.275	.323	.193	.079	.250
53	DIGIT 2 TIP-WRIST	.903	.508	.570	.447	.034	.525	.529	.317	.276	.365
54	DIGIT 3 TIP-WRIST	.975	.534	.575	.500	.047	.560	.559	.403	.353	.375
55	DIGIT 4 TIP-WRIST	.929	.534	.564	.483	.051	.542	.537	.415	.380	.380
56	DIG 1 JOINT BRDTH	.806	.469	.503	.423	.046	.467	.493	.364	.331	.334

CORRELATION MATRIX FOR MALE HANDS

	11	12	13	14	15	16	17	18	19	20
1 HAND LENGTH	.437	.469	.341	.426	.450	.413	.478	.490	.402	.445
2 HAND BREADTH, META	.509	.547	.466	.480	.558	.558	.464	.590	.535	.481
3 HAND CIRC,METACARP	.519	.532	.453	.478	.552	.554	.460	.584	.518	.514
4 HAND CIRC,META,MIN	.544	.550	.386	.458	.502	.532	.413	.537	.506	.440
5 HAND CIRC,TIPS EVN	-004	.005	-114	-172	-173	.026	-050	-001	.017	-139
6 FIST CIRCUMFERENCE	.535	.552	.454	.482	.546	.536	.516	.592	.506	.512
7 WRIST CIRCUMF-ENCE	.567	.628	.555	.510	.630	.643	.588	.696	.629	.527
8 HAND THICK AT META	.402	.417	.393	.336	.438	.534	.433	.541	.468	.416
9 HND DPTH,THENR PAD	.294	.360	.330	.381	.421	.343	.334	.380	.397	.330
10 DIG 1 JOINT BRDTH	.515	.870	.616	.397	.596	.588	.466	.602	.560	.353
11 DIGIT 1 JOINT DPTH		.861	.513	.496	.586	.569	.558	.644	.482	.509
12 DIGIT 1 JOINT CIRC	.861		.657	.508	.682	.667	.580	.714	.609	.483
13 DIG 2 DST JNT BDTH	.513	.657		.411	.839	.652	.531	.670	.771	.444
14 DIG 2 DST JNT DPTH	.496	.508	.411		.834	.375	.423	.448	.409	.606
15 DIG 2 DST JNT CIRC	.588	.682	.839	.834		.602	.559	.655	.706	.744
16 DIG 2 PR JNT BRDTH	.569	.667	.652	.373	.602		.565	.903	.605	.408
17 DIG 2 PR JNT DPTH	.558	.580	.531	.423	.559	.565		.859	.477	.472
18 DIG 2 PR JNT CIRC	.644	.714	.670	.448	.655	.903	.859		.617	.496
19 DIG 3 DST JNT BDTH	.482	.609	.771	.409	.706	.605	.477	.617		.483
20 DIG 3 DST JNT DPTH	.509	.483	.444	.806	.744	.408	.472	.496	.463	
21 DIG 3 DST JNT CIRC	.564	.626	.704	.711	.846	.580	.545	.638	.860	.856
22 DIG 3 PR JNT BRDTH	.516	.651	.631	.300	.549	.775	.449	.706	.688	.549
23 DIG 3 PR JNT DPTH	.591	.608	.494	.429	.541	.565	.774	.748	.504	.515
24 DIG 3 PR JNT CIRC	.640	.725	.654	.432	.638	.769	.698	.833	.666	.511
25 DIG 4 DST JNT BDTH	.365	.467	.536	.294	.500	.405	.297	.402	.742	.347
26 DIG 4 DST JNT DPTH	.466	.453	.408	.768	.704	.383	.381	.439	.456	.626
27 DIG 4 DST JNT CIRC	.500	.549	.569	.662	.740	.469	.411	.506	.706	.729
28 DIG 4 PR JNT BRDTH	.481	.606	.628	.344	.575	.709	.451	.673	.687	.357
29 DIG 4 PR JNT DPTH	.621	.614	.511	.394	.528	.585	.744	.744	.519	.487
30 DIG 4 PR JNT CIRC	.614	.683	.638	.409	.616	.721	.668	.791	.679	.464

CORRELATION MATRIX FOR MALE HANDS

	11	12	13	14	15	16	17	18	19	20
31 DIG 5 DST JNT BDTH	.358	.434	.516	.375	.531	.374	.245	.362	.682	.366
32 DIG 5 DST JNT DPTH	.490	.513	.463	.740	.717	.406	.400	.455	.442	.797
33 DIG 5 DST JNT CIRC	.493	.550	.576	.653	.733	.466	.375	.483	.655	.683
34 DIG 5 PR JNT BRDTH	.519	.592	.588	.391	.574	.684	.429	.640	.630	.419
35 DIG 5 PR JNT DPTH	.522	.588	.511	.478	.581	.533	.619	.639	.511	.541
36 DIG 5 PR JNT CIRC	.596	.677	.629	.499	.661	.700	.587	.729	.648	.546
37 WRIST BREADTH	.366	.385	.216	.276	.295	.325	.413	.412	.411	.334
38 DIGIT 1 HT PERP WC	.332	.342	.314	.278	.343	.320	.382	.389	.221	.332
39 DIGIT 2 HT PERP WC	.426	.463	.391	.432	.479	.390	.525	.504	.377	.438
40 DIGIT 3 HT PERP WC	.423	.457	.345	.445	.460	.403	.497	.494	.411	.465
41 DIGIT 4 HT PERP WC	.417	.442	.352	.413	.444	.402	.461	.475	.430	.428
42 DIGIT 5 HT PERP WC	.373	.376	.299	.395	.399	.358	.407	.420	.411	.388
43 CROTCH 1 HEIGHT	.431	.481	.418	.322	.427	.391	.449	.467	.355	.366
44 CROTCH 2 HEIGHT	.450	.490	.380	.455	.465	.389	.495	.466	.379	.434
45 CROTCH 3 HEIGHT	.377	.410	.325	.414	.426	.341	.392	.405	.343	.372
46 CROTCH 4 HEIGHT	.343	.355	.291	.370	.379	.317	.311	.349	.364	.313
47 DIGIT 1 TIP-CROTCH	.168	.185	.185	.166	.211	.186	.247	.238	.145	.181
48 DIGIT 2 TIP-CROTCH	.266	.263	.275	.279	.324	.267	.389	.360	.274	.311
49 DIGIT 3 TIP-CROTCH	.338	.362	.260	.327	.346	.338	.442	.426	.357	.391
50 DIGIT 4 TIP-CROTCH	.346	.351	.245	.332	.340	.310	.424	.402	.365	.384
51 DIGIT 5 TIP-CROTCH	.354	.327	.251	.328	.337	.335	.419	.414	.327	.354
52 DIGIT 1 TIP-WRIST	.330	.329	.299	.274	.332	.320	.393	.394	.219	.343
53 DIGIT 2 TIP-WRIST	.424	.450	.373	.414	.458	.387	.525	.502	.367	.427
54 DIGIT 3 TIP-WRIST	.423	.457	.345	.445	.460	.403	.497	.494	.411	.465
55 DIGIT 4 TIP-WRIST	.427	.462	.365	.432	.462	.417	.466	.407	.433	.431
56 DIG 3 DST JNT DPTH	.399	.422	.339	.425	.440	.385	.418	.443	.431	.398

CORRELATION MATRIX FOR MALE HANDS

		21	22	23	24	25	26	27	28	29	30
1	HAND LENGTH	.478	.402	.503	.528	.231	.350	.351	.439	.501	.532
2	HAND BREADTH, META	.586	.560	.509	.617	.357	.446	.485	.562	.464	.593
3	HAND CIRC,METACARP	.596	.514	.479	.579	.378	.465	.505	.533	.449	.554
4	HAND CIRC,META,MIN	.546	.475	.476	.546	.371	.389	.454	.496	.450	.531
5	HAND CIRC,TIPS EVN	-067	.008	.026	.003	-029	-175	-113	.012	-009	.008
6	FIST CIRCUMFERENCE	.586	.508	.584	.626	.327	.448	.467	.497	.517	.569
7	WRIST CIRCUMF-ENCE	.670	.577	.647	.702	.422	.511	.565	.616	.627	.695
8	HAND THICK AT META	.504	.501	.497	.577	.365	.371	.442	.431	.491	.512
9	HND DPTH,THENR PAD	.427	.340	.387	.421	.256	.297	.331	.336	.346	.393
10	DIG 1 JOINT BRDTH	.527	.607	.478	.624	.433	.335	.456	.560	.463	.576
11	DIGIT 1 JOINT DPTH	.564	.516	.591	.640	.365	.466	.500	.481	.621	.614
12	DIGIT 1 JOINT CIRC	.626	.651	.608	.725	.467	.453	.549	.606	.614	.683
13	DIG 2 DST JNT BDTH	.704	.631	.494	.654	.536	.408	.569	.628	.511	.538
14	DIG 2 DST JNT DPTH	.711	.300	.429	.432	.294	.768	.662	.344	.394	.409
15	DIG 2 DST JNT CIRC	.846	.549	.541	.638	.500	.704	.740	.575	.528	.616
16	DIG 2 PR JNT BRDTH	.580	.775	.565	.769	.405	.383	.469	.709	.585	.721
17	DIG 2 PR JNT DPTH	.545	.449	.774	.698	.297	.381	.411	.451	.744	.668
18	DIG 2 PR JNT CIRC	.638	.706	.748	.833	.402	.439	.506	.673	.744	.791
19	DIG 3 DST JNT BDTH	.860	.688	.504	.686	.742	.436	.706	.667	.519	.679
20	DIG 3 DST JNT DPTH	.856	.349	.515	.511	.347	.826	.729	.357	.487	.464
21	DIG 3 DST JNT CIRC		.592	.578	.682	.627	.740	.835	.600	.567	.652
22	DIG 3 PR JNT BRDTH	.592		.527	.875	.541	.355	.530	.826	.542	.769
23	DIG 3 PR JNT DPTH	.578	.527		.868	.334	.445	.479	.511	.638	.751
24	DIG 3 PR JNT CIRC	.682	.875	.868		.505	.474	.589	.762	.786	.866
25	DIG 4 DST JNT BDTH	.627	.541	.334	.505		.359	.801	.602	.427	.583
26	DIG 4 DST JNT DPTH	.740	.355	.445	.474	.359		.839	.403	.471	.492
27	DIG 4 DST JNT CIRC	.835	.530	.479	.589	.801	.839		.599	.544	.647
28	DIG 4 PR JNT BRDTH	.600	.826	.511	.762	.602	.403	.599		.589	.892
29	DIG 4 PR JNT DPTH	.567	.542	.638	.786	.427	.471	.544	.589		.885
30	DIG 4 PR JNT CIRC	.652	.769	.751	.866	.583	.492	.647	.892	.885	

CORRELATION MATRIX FOR MALE HANDS

	21	22	23	24	25	26	27	28	29	30
31 DIG 5 DST JNT BDTH	.608	.507	.313	.474	.797	.390	.706	.543	.365	.514
32 DIG 5 DST JNT DPTH	.725	.368	.408	.463	.401	.866	.778	.365	.446	.458
33 DIG 5 DST JNT CIRC	.780	.520	.426	.555	.699	.734	.868	.546	.472	.576
34 DIG 5 PR JNT BRDTH	.599	.728	.491	.694	.533	.393	.564	.784	.535	.743
35 DIG 5 PR JNT DPTH	.605	.462	.698	.665	.406	.510	.560	.487	.695	.661
36 DIG 5 PR JNT CIRC	.684	.684	.667	.772	.531	.511	.636	.730	.690	.796
37 WRIST BREADTH	.439	.335	.494	.475	.304	.257	.338	.407	.424	.461
38 DIGIT 1 HT PERP WC	.307	.242	.362	.357	.126	.261	.242	.248	.366	.349
39 DIGIT 2 HT PERP WC	.462	.343	.478	.484	.210	.336	.332	.378	.482	.485
40 DIGIT 3 HT PERP WC	.494	.411	.507	.536	.235	.358	.358	.435	.499	.529
41 DIGIT 4 HT PERP WC	.489	.415	.483	.519	.285	.346	.380	.441	.517	.543
42 DIGIT 5 HT PERP WC	.451	.361	.437	.457	.264	.322	.360	.375	.436	.462
43 CROTCH 1 HEIGHT	.401	.323	.434	.441	.231	.339	.348	.340	.464	.453
44 CROTCH 2 HEIGHT	.458	.388	.489	.509	.272	.388	.400	.451	.511	.544
45 CROTCH 3 HEIGHT	.403	.362	.409	.446	.265	.358	.379	.406	.435	.482
46 CROTCH 4 HEIGHT	.388	.370	.367	.423	.267	.321	.352	.379	.401	.447
47 DIGIT 1 TIP-CROTCH	.178	.142	.257	.230	.071	.072	.098	.168	.263	.246
48 DIGIT 2 TIP-CROTCH	.335	.187	.315	.303	.066	.166	.140	.159	.302	.256
49 DIGIT 3 TIP-CROTCH	.422	.334	.425	.448	.139	.231	.219	.311	.394	.394
50 DIGIT 4 TIP-CROTCH	.421	.329	.423	.436	.181	.231	.246	.317	.442	.428
51 DIGIT 5 TIP-CROTCH	.383	.288	.403	.393	.191	.248	.280	.315	.396	.406
52 DIGIT 1 TIP-WRIST	.312	.241	.372	.361	.124	.255	.237	.248	.369	.349
53 DIGIT 2 TIP-WRIST	.449	.341	.480	.483	.200	.320	.316	.374	.482	.482
54 DIGIT 3 TIP-WRIST	.494	.411	.507	.536	.235	.358	.358	.435	.499	.529
55 DIGIT 4 TIP-WRIST	.487	.426	.477	.524	.279	.357	.384	.456	.518	.554
56 DIG 4 PR JNT CIRC	.468	.384	.453	.480	.270	.348	.379	.389	.453	.480

CORRELATION MATRIX FOR MALE HANDS

		31	32	33	34	35	36	37	38	39	40
1	HAND LENGTH	.272	.362	.373	.427	.470	.515	.441	.611	.899	.975
2	HAND BREADTH, META	.415	.447	.509	.567	.410	.570	.519	.318	.520	.534
3	HAND CIRC,METACARP	.407	.483	.523	.545	.439	.574	.581	.350	.572	.575
4	HAND CIRC,META,MIN	.371	.396	.436	.532	.425	.562	.468	.223	.440	.500
5	HAND CIRC,TIPS EVN	-013	-183	-119	.011	-100	-038	.339	-065	.004	.047
6	FIST CIRCUMFERENCE	.388	.474	.511	.508	.469	.575	.564	.286	.530	.560
7	WRIST CIRCUMF-ENCE	.448	.482	.554	.606	.560	.682	.678	.324	.537	.559
8	HAND THICK AT META	.341	.429	.451	.445	.438	.503	.295	.153	.307	.403
9	HND DPTH,THENR PAD	.328	.390	.412	.315	.292	.348	.367	.073	.278	.353
10	DIG 1 JOINT BRDTH	.381	.409	.459	.501	.502	.574	.319	.273	.383	.375
11	DIGIT 1 JOINT DPTH	.358	.490	.493	.519	.522	.596	.366	.332	.426	.423
12	DIGIT 1 JOINT CIRC	.434	.513	.550	.592	.588	.677	.385	.342	.463	.457
13	DIG 2 DST JNT BDTH	.516	.463	.576	.588	.511	.629	.216	.314	.391	.345
14	DIG 2 DST JNT DPTH	.375	.740	.653	.391	.478	.499	.276	.278	.432	.445
15	DIG 2 DST JNT CIRC	.531	.717	.733	.574	.561	.661	.295	.343	.479	.460
16	DIG 2 PR JNT BRDTH	.374	.406	.466	.684	.533	.700	.325	.320	.390	.403
17	DIG 2 PR JNT DPTH	.243	.400	.375	.429	.619	.587	.413	.382	.525	.497
18	DIG 2 PR JNT CIRC	.362	.455	.483	.640	.639	.729	.412	.369	.504	.494
19	DIG 3 DST JNT BDTH	.682	.442	.655	.630	.511	.648	.411	.221	.377	.411
20	DIG 3 DST JNT DPTH	.366	.797	.683	.419	.541	.546	.334	.332	.438	.465
21	DIG 3 DST JNT CIRC	.608	.725	.780	.599	.605	.684	.439	.307	.402	.494
22	DIG 3 PR JNT BRDTH	.507	.368	.520	.728	.462	.684	.335	.242	.343	.411
23	DIG 3 PR JNT DPTH	.313	.408	.426	.491	.698	.667	.494	.362	.478	.507
24	DIG 3 PR JNT CIRC	.474	.463	.555	.694	.665	.772	.475	.357	.484	.536
25	DIG 4 DST JNT BDTH	.797	.401	.699	.533	.406	.531	.304	.126	.210	.235
26	DIG 4 DST JNT DPTH	.390	.866	.734	.393	.510	.511	.257	.261	.336	.358
27	DIG 4 DST JNT CIRC	.706	.778	.868	.564	.560	.636	.338	.242	.332	.358
28	DIG 4 PR JNT BRDTH	.543	.365	.546	.784	.467	.730	.407	.248	.378	.435
29	DIG 4 PR JNT DPTH	.365	.446	.472	.535	.695	.690	.424	.366	.482	.499
30	DIG 4 PR JNT CIRC	.514	.456	.576	.743	.661	.796	.461	.349	.465	.529

CORRELATION MATRIX FOR MALE HANDS

	31	32	33	34	35	36	37	38	39	40
31 DIG 5 DST JNT BDTH		.447	.857	.605	.387	.569	.339	.122	.223	.271
32 DIG 5 DST JNT DPTH	.447		.837	.417	.523	.539	.257	.277	.361	.375
33 DIG 5 DST JNT CIRC	.857	.837		.610	.543	.661	.360	.234	.345	.380
34 DIG 5 PR JNT BRDTH	.605	.417	.610		.510	.885	.392	.279	.372	.433
35 DIG 5 PR JNT DPTH	.387	.523	.543	.510		.845	.375	.265	.447	.478
36 DIG 5 PR JNT CIRC	.569	.539	.661	.885	.845		.441	.313	.472	.524
37 WRIST BREADTH	.339	.257	.360	.392	.375	.441		.152	.366	.407
38 DIGIT 1 HT PERP WC	.122	.277	.234	.279	.265	.313	.152		.767	.645
39 DIGIT 2 HT PERP WC	.223	.361	.345	.372	.447	.472	.366	.767		.933
40 DIGIT 3 HT PERP WC	.271	.375	.380	.433	.478	.524	.407	.645	.933	
41 DIGIT 4 HT PERP WC	.323	.360	.396	.460	.475	.554	.375	.563	.861	.950
42 DIGIT 5 HT PERP WC	.329	.331	.383	.446	.481	.531	.327	.469	.735	.828
43 CROTCH 1 HEIGHT	.228	.355	.342	.366	.377	.430	.133	.820	.733	.623
44 CROTCH 2 HEIGHT	.281	.402	.405	.429	.462	.516	.315	.683	.884	.882
45 CROTCH 3 HEIGHT	.314	.367	.402	.422	.393	.472	.281	.544	.775	.845
46 CROTCH 4 HEIGHT	.324	.319	.375	.392	.375	.444	.327	.349	.620	.739
47 DIGIT 1 TIP-CROTCH	.055	.105	.085	.192	.190	.222	.227	.652	.613	.584
48 DIGIT 2 TIP-CROTCH	.110	.214	.186	.194	.295	.276	.325	.542	.770	.673
49 DIGIT 3 TIP-CROTCH	.180	.245	.246	.326	.375	.399	.405	.507	.774	.839
50 DIGIT 4 TIP-CROTCH	.213	.240	.259	.358	.345	.399	.399	.549	.760	.815
51 DIGIT 5 TIP-CROTCH	.220	.240	.269	.457	.449	.517	.300	.442	.640	.649
52 DIGIT 1 TIP-WRIST	.126	.279	.238	.290	.277	.325	.154	.961	.765	.864
53 DIGIT 2 TIP-WRIST	.215	.344	.329	.374	.438	.469	.373	.756	.995	.936
54 DIGIT 3 TIP-WRIST	.271	.375	.380	.433	.478	.524	.407	.645	.933	.000
55 DIGIT 4 TIP-WRIST	.316	.371	.400	.473	.463	.537	.376	.589	.874	.952
56 DIGIT 3 HT PERP WC	.324	.351	.391	.453	.486	.538	.302	.516	.760	.834

CORRELATION MATRIX FOR MALE HANDS

		41	42	43	44	45	46	47	48	49	50
1	HAND LENGTH	.931	.804	.583	.843	.818	.723	.572	.655	.826	.801
2	HAND BREADTH, META	.514	.445	.384	.468	.434	.437	.219	.398	.477	.476
3	HAND CIRC,METACARP	.557	.496	.405	.488	.474	.472	.248	.496	.512	.516
4	HAND CIRC,META,MIN	.487	.431	.305	.419	.422	.431	.253	.357	.436	.413
5	HAND CIRC,TIPS EVN	.087	.115	-155	-033	.062	.136	.240	.071	.063	.133
6	FIST CIRCUMFERENCE	.529	.470	.340	.496	.467	.436	.295	.442	.494	.483
7	WRIST CIRCUMF-ENCE	.527	.484	.438	.568	.497	.483	.203	.350	.424	.407
8	HAND THICK AT META	.426	.379	.252	.330	.297	.286	.098	.212	.378	.368
9	HND DPTH,THENR PAD	.376	.323	.193	.294	.317	.379	.114	.215	.289	.312
10	DIG 1 JOINT BRDTH	.358	.281	.400	.397	.336	.269	.158	.204	.297	.272
11	DIGIT 1 JOINT DPTH	.417	.373	.431	.450	.377	.343	.168	.266	.338	.346
12	DIGIT 1 JOINT CIRC	.442	.376	.481	.490	.410	.355	.185	.263	.362	.351
13	DIG 2 DST JNT BDTH	.352	.299	.418	.380	.325	.291	.185	.275	.260	.245
14	DIG 2 DST JNT DPTH	.413	.395	.322	.453	.414	.370	.166	.279	.327	.332
15	DIG 2 DST JNT CIRC	.444	.399	.427	.485	.426	.379	.211	.324	.346	.340
16	DIG 2 PR JNT BRDTH	.402	.358	.391	.389	.341	.317	.186	.267	.338	.310
17	DIG 2 PR JNT DPTH	.461	.407	.449	.495	.392	.311	.247	.389	.442	.424
18	DIG 2 PR JNT CIRC	.475	.420	.467	.486	.405	.349	.238	.360	.426	.402
19	DIG 3 DST JNT BDTH	.438	.411	.355	.379	.343	.364	.145	.274	.357	.365
20	DIG 3 DST JNT DPTH	.428	.388	.366	.434	.372	.313	.181	.311	.391	.384
21	DIG 3 DST JNT CIRC	.489	.451	.401	.458	.403	.388	.178	.335	.422	.421
22	DIG 3 PR JNT BRDTH	.415	.361	.323	.388	.362	.370	.142	.167	.334	.329
23	DIG 3 PR JNT DPTH	.483	.437	.434	.489	.409	.367	.257	.315	.425	.423
24	DIG 3 PR JNT CIRC	.519	.457	.441	.509	.446	.423	.230	.303	.446	.436
25	DIG 4 DST JNT BDTH	.285	.264	.231	.272	.268	.267	.071	.066	.139	.181
26	DIG 4 DST JNT DPTH	.346	.321	.339	.388	.358	.321	.072	.166	.231	.231
27	DIG 4 DST JNT CIRC	.380	.360	.348	.400	.379	.352	.098	.140	.219	.246
28	DIG 4 PR JNT BRDTH	.4[illegible]	.375	.340	.451	.406	.379	.168	.159	.311	.317
29	DIG 4 PR JNT DPTH	.517	.436	.464	.511	.435	.401	.263	.302	.394	.442
30	DIG 4 PR JNT CIRC	.543	.462	.453	.544	.482	.447	.246	.256	.394	.426

CORRELATION MATRIX FOR MALE HANDS

	41	42	43	44	45	46	47	48	49	50
31 DIG 5 DST JNT BDTH	.323	.329	.228	.281	.314	.324	.055	.110	.180	.213
32 DIG 5 DST JNT DPTH	.360	.331	.355	.402	.367	.319	.105	.214	.245	.240
33 DIG 5 DST JNT CIRC	.396	.383	.342	.405	.402	.375	.085	.186	.246	.259
34 DIG 5 PR JNT BRDTH	.460	.446	.366	.429	.422	.392	.192	.194	.326	.358
35 DIG 5 PR JNT DPTH	.475	.481	.377	.462	.393	.375	.190	.295	.375	.345
36 DIG 5 PR JNT CIRC	.534	.531	.430	.516	.472	.444	.222	.276	.399	.399
37 WRIST BREADTH	.375	.327	.133	.315	.261	.327	.227	.325	.405	.399
38 DIGIT 1 HT PERP WC	.563	.469	.820	.683	.544	.349	.652	.542	.507	.549
39 DIGIT 2 HT PERP WC	.861	.735	.733	.884	.775	.620	.613	.770	.774	.780
40 DIGIT 3 HT PERP WC	.950	.828	.623	.882	.845	.739	.584	.673	.839	.815
41 DIGIT 4 HT PERP WC		.909	.566	.840	.869	.826	.550	.593	.753	.801
42 DIGIT 5 HT PERP WC	.909		.483	.730	.806	.823	.480	.504	.622	.676
43 CROTCH 1 HEIGHT	.566	.483		.723	.572	.392	.369	.431	.425	.470
44 CROTCH 2 HEIGHT	.840	.730	.723		.896	.735	.503	.414	.534	.572
45 CROTCH 3 HEIGHT	.869	.806	.572	.696		.885	.429	.340	.459	.495
46 CROTCH 4 HEIGHT	.826	.823	.392	.735	.885		.360	.262	.402	.436
47 DIGIT 1 TIP-CROTCH	.550	.480	.369	.503	.429	.360		.540	.551	.578
48 DIGIT 2 TIP-CROTCH	.593	.504	.431	.414	.340	.262	.540		.837	.787
49 DIGIT 3 TIP-CROTCH	.753	.622	.425	.534	.459	.402	.551	.837		.913
50 DIGIT 4 TIP-CROTCH	.801	.676	.470	.572	.495	.436	.578	.787	.913	
51 DIGIT 5 TIP-CROTCH	.676	.723	.407	.482	.428	.371	.450	.626	.680	.774
52 DIGIT 1 TIP-WRIST	.589	.509	.805	.679	.555	.368	.669	.560	.530	.574
53 DIGIT 2 TIP-WRIST	.869	.746	.720	.876	.775	.621	.624	.778	.784	.795
54 DIGIT 3 TIP-WRIST	.950	.828	.623	.882	.845	.739	.584	.673	.839	.815
55 DIGIT 4 TIP-WRIST	.990	.888	.588	.857	.868	.820	.553	.587	.751	.796
56 DIGIT 4 TIP-CROTCH	.902	.975	.537	.754	.805	.806	.469	.507	.628	.676

CORRELATION MATRIX FOR MALE HANDS

		51	52	53	54	55	56
1	HAND LENGTH	.625	.632	.903	.975	.929	.806
2	HAND BREADTH, META	.421	.306	.508	.534	.534	.469
3	HAND CIRC,METACARP	.457	.351	.570	.575	.564	.503
4	HAND CIRC,META,MIN	.358	.248	.447	.500	.483	.423
5	HAND CIRC,TIPS EVN	.106	-011	.034	.047	.051	.046
6	FIST CIRCUMFERENCE	.448	.275	.525	.560	.542	.487
7	WRIST CIRCUMF-ENCE	.359	.323	.529	.559	.537	.493
8	HAND THICK AT META	.299	.193	.317	.403	.415	.364
9	HND DPTH,THENR PAD	.243	.079	.276	.353	.380	.331
10	DIG 1 JOINT BRDTH	.225	.250	.365	.375	.380	.334
11	DIGIT 1 JOINT DPTH	.354	.330	.424	.423	.427	.399
12	DIGIT 1 JOINT CIRC	.327	.329	.450	.457	.462	.422
13	DIG 2 DST JNT BDTH	.251	.299	.373	.345	.365	.339
14	DIG 2 DST JNT DPTH	.328	.274	.414	.445	.432	.425
15	DIG 2 DST JNT CIRC	.337	.332	.458	.460	.462	.440
16	DIG 2 PR JNT BRDTH	.335	.320	.387	.403	.417	.385
17	DIG 2 PR JNT DPTH	.419	.393	.525	.497	.466	.418
18	DIG 2 PR JNT CIRC	.414	.394	.502	.494	.487	.443
19	DIG 3 DST JNT BDTH	.327	.219	.367	.411	.433	.431
20	DIG 3 DST JNT DPTH	.354	.343	.427	.465	.431	.398
21	DIG 3 DST JNT CIRC	.383	.312	.449	.494	.487	.468
22	DIG 3 PR JNT BRDTH	.288	.241	.341	.411	.426	.384
23	DIG 3 PR JNT DPTH	.403	.372	.480	.507	.477	.453
24	DIG 3 PR JNT CIRC	.393	.361	.483	.536	.524	.480
25	DIG 4 DST JNT BDTH	.191	.124	.200	.235	.279	.270
26	DIG 4 DST JNT DPTH	.248	.255	.320	.358	.357	.348
27	DIG 4 DST JNT CIRC	.280	.237	.316	.358	.384	.379
28	DIG 4 PR JNT BRDTH	.315	.248	.374	.435	.456	.389
29	DIG 4 PR JNT DPTH	.396	.369	.482	.499	.518	.453
30	DIG 4 PR JNT CIRC	.406	.349	.482	.529	.554	.480

CORRELATION MATRIX FOR MALE HANDS

	51	52	53	54	55	56
31 DIG 5 DST JNT BDTH	.220	.126	.215	.271	.316	.324
32 DIG 5 DST JNT DPTH	.240	.279	.344	.375	.371	.351
33 DIG 5 DST JNT CIRC	.269	.238	.329	.360	.400	.391
34 DIG 5 PR JNT BRDTH	.457	.290	.374	.433	.473	.453
35 DIG 5 PR JNT DPTH	.449	.277	.438	.478	.463	.486
36 DIG 5 PR JNT CIRC	.517	.325	.469	.524	.537	.538
37 WRIST BREADTH	.300	.154	.373	.407	.376	.302
38 DIGIT 1 HT PERP WC	.442	.981	.756	.645	.589	.516
39 DIGIT 2 HT PERP WC	.640	.766	.995	.933	.874	.760
40 DIGIT 3 HT PERP WC	.649	.664	.936	.000	.952	.834
41 DIGIT 4 HT PERP WC	.676	.569	.369	.950	.990	.902
42 DIGIT 5 HT PERP WC	.723	.509	.746	.828	.865	.975
43 CROTCH 1 HEIGHT	.407	.805	.720	.623	.588	.537
44 CROTCH 2 HEIGHT	.482	.679	.876	.882	.857	.754
45 CROTCH 3 HEIGHT	.428	.555	.775	.645	.868	.805
46 CROTCH 4 HEIGHT	.371	.368	.621	.739	.820	.806
47 DIGIT 1 TIP-CROTCH	.450	.669	.624	.584	.553	.469
48 DIGIT 2 TIP-CROTCH	.626	.560	.778	.673	.587	.507
49 DIGIT 3 TIP-CROTCH	.680	.530	.784	.839	.751	.628
50 DIGIT 4 TIP-CROTCH	.774	.574	.793	.815	.796	.676
51 DIGIT 5 TIP-CROTCH		.464	.650	.649	.674	.735
52 DIGIT 1 TIP-WRIST	.464		.766	.664	.598	.524
53 DIGIT 2 TIP-WRIST	.650	.766		.936	.876	.758
54 DIGIT 3 TIP-WRIST	.649	.664	.936		.952	.834
55 DIGIT 4 TIP-WRIST	.674	.598	.876	.952		.902
56 DIGIT 5 TIP-WRIST	.735	.524	.758	.834	.902	

SECTION VII

MULTIPLE REGRESSION EQUATIONS

1. All variables based on HAND LENGTH and FIST CIRCUMFERENCE
2. All variables based on HAND LENGTH and HAND CIRCUMFERENCE
3. All variables based on HAND LENGTH and HAND BREADTH

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(1)

1	HAND LENGTH	=	-16.043	+	0.912LENGTH	-	0.118FIST/C	SE	= 8.358
2	HAND BREADTH- META	=	11.041	+	0.892LENGTH	+	0. FIST/C	SE	= 3.087
3	HAND CIRC,METACARP	=	3.524	+	0.929LENGTH	+	0.008FIST/C	SE	= 2.777
4	HAND CIRC,META,MIN	=	2.306	+	0.811LENGTH	+	0.019FIST/C	SE	= 5.043
5	HAND CIRC,TIPS EVN	=	5.333	+	0.296LENGTH	-	0.015FIST/C	SE	= 3.627
6	FIST CIRCUMFERENCE	=	5.957	+	0.308LENGTH	+	0.031FIST/C	SE	= 3.368
7	WRIST CIRCUMFERENCE	=	-7.372	+	0.457LENGTH	+	0.013FIST/C	SE	= 2.794
8	HAND THICK AT META	=	-2.579	+	0.406LENGTH	+	0.013FIST/C	SE	= 2.738
9	HND DPTH,THENR PAD	=	-10.855	+	0.304LENGTH	+	0.044FIST/C	SE	= 3.650
10	DIG 1 JOINT BRDTH	=	-15.403	+	0.705LENGTH	-	0.074FIST/C	SE	= 6.981
11	DIGIT 1 JOINT DPTH	=	8.772	+	0.883LENGTH	+	0.007FIST/C	SE	= 3.172
12	DIGIT 1 JOINT CIRC	=	-0.195	+	1.001LENGTH	+	0. FIST/C	SE	= 0.
13	DIG 2 DST JNT BDTH	=	5.596	+	0.938LENGTH	-	0.003FIST/C	SE	= 2.736
14	DIG 2 DST JNT DPTH	=	3.885	+	0.721LENGTH	+	0.005FIST/C	SE	= 4.519
15	DIG 2 DST JNT CIRC	=	-9.542	+	0.407LENGTH	-	0.006FIST/C	SE	= 4.653
16	DIG 2 PR JNT BRDTH	=	-1.652	+	0.573LENGTH	+	0.001FIST/C	SE	= 2.829
17	DIG 2 PR JNT DPTH	=	5.868	+	0.533LENGTH	-	0.004FIST/C	SE	= 3.089
18	DIG 2 PR JNT CIRC	=	15.416	+	0.401LENGTH	+	0.012FIST/C	SE	= 3.456
19	DIG 3 DST JNT BDTH	=	8.092	+	0.026LENGTH	+	0.033FIST/C	SE	= 1.158
20	DIG 3 DST JNT DPTH	=	5.510	+	0.016LENGTH	+	0.033FIST/C	SE	= 1.048
21	DIG 3 DST JNT CIRC	=	3.532	+	0.023LENGTH	+	0.035FIST/C	SE	= 1.004
22	DIG 3 PR JNT BRDTH	=	8.608	+	0.009LENGTH	+	0.023FIST/C	SE	= 1.038
23	DIG 3 PR JNT DPTH	=	4.854	+	0.010LENGTH	+	0.030FIST/C	SE	= 1.084
24	DIG 3 PR JNT CIRC	=	0.301	+	0.029LENGTH	+	0.048FIST/C	SE	= 1.252
25	DIG 4 DST JNT BDTH	=	-1.326	+	0.036LENGTH	+	0.033FIST/C	SE	= 1.129
26	DIG 4 DST JNT DPTH	=	-1.916	+	0.037LENGTH	+	0.036FIST/C	SE	= 1.099
27	DIG 4 DST JNT CIRC	=	0.450	+	0.022LENGTH	+	0.035FIST/C	SE	= 1.169
28	DIG 4 PR JNT BRDTH	=	-0.727	+	0.021LENGTH	+	0.035FIST/C	SE	= 1.092
29	DIG 4 PR JNT DPTH	=	14.905	+	0.088LENGTH	+	0.121FIST/C	SE	= 3.087
30	DIG 4 PR JNT CIRC	=	6.812	+	0.081LENGTH	+	0.104FIST/C	SE	= 2.726
31	DIG 5 DST JNT BDTH	=	3.214	+	0.089LENGTH	+	0.113FIST/C	SE	= 2.667
32	DIG 5 DST JNT DPTH	=	15.269	+	0.047LENGTH	+	0.089FIST/C	SE	= 2.715
33	DIG 5 DST JNT CIRC	=	5.944	+	0.048LENGTH	+	0.105FIST/C	SE	= 2.780
34	DIG 5 PR JNT BRDTH	=	4.809	+	0.020LENGTH	+	0.043FIST/C	SE	= 1.069
35	DIG 5 PR JNT DPTH	=	4.413	+	0.027LENGTH	+	0.041FIST/C	SE	= 1.169
36	DIG 5 PR JNT CIRC	=	3.242	+	0.032LENGTH	+	0.036FIST/C	SE	= 1.124
37	WRIST BREADTH	=	-0.072	+	0.032LENGTH	+	0.039FIST/C	SE	= 1.166
38	DIGIT 1 HT PERP WC	=	2.445	+	0.040LENGTH	+	0.031FIST/C	SE	= 1.012
39	DIGIT 2 HT PERP WC	=	-1.301	+	0.040LENGTH	+	0.046FIST/C	SE	= 1.115
40	DIGIT 3 HT PERP WC	=	0.262	+	0.044LENGTH	+	0.034FIST/C	SE	= 1.094
41	DIGIT 4 HT PERP WC	=	0.253	+	0.040LENGTH	+	0.029FIST/C	SE	= 1.038
42	DIGIT 5 HT PERP WC	=	10.732	+	0.091LENGTH	+	0.121FIST/C	SE	= 2.786
43	CROTCH 1 HEIGHT	=	3.866	+	0.112LENGTH	+	0.136FIST/C	SE	= 2.888
44	CROTCH 2 HEIGHT	=	4.656	+	0.124LENGTH	+	0.110FIST/C	SE	= 2.919
45	CROTCH 3 HEIGHT	=	-1.289	+	0.115LENGTH	+	0.111FIST/C	SE	= 2.834
46	CROTCH 4 HEIGHT	=	48.829	+	0.217LENGTH	+	0.421FIST/C	SE	= 5.668
47	DIGIT 1 TIP-CROTCH	=	36.619	+	0.234LENGTH	+	0.581FIST/C	SE	= 9.312
48	DIGIT 2 TIP-CROTCH	=	142.375	-	0.267LENGTH	+	0.464FIST/C	SE	=21.290
49	DIGIT 3 TIP-CROTCH	=	12.089	+	0.264LENGTH	+	0.376FIST/C	SE	= 6.606
50	DIGIT 4 TIP-CROTCH	=	17.927	+	0.052LENGTH	+	0.134FIST/C	SE	= 3.015
51	DIGIT 5 TIP-CROTCH	=	2.728	+	0.975LENGTH	+	0.014FIST/C	SE	= 2.065
52	DIGIT 1 TIP-WRIST	=	11.583	+	0.059LENGTH	+	0.033FIST/C	SE	= 1.765
53	DIGIT 2 TIP-WRIST	=	10.077	+	0.062LENGTH	+	0.134FIST/C	SE	= 3.933
55	DIGIT 4 TIP-WRIST	=	17.953	+	0.076LENGTH	+	0.192FIST/C	SE	= 2.660
56	DIGIT 5 TIP-WRIST	=	31.277	+	0.313LENGTH	+	0.270FIST/C	SE	= 6.746

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1	HAND LENGTH	=	-25.994	+	0.847LENGTH	-	0.057HAND/C	SE = 8.452
2	HAND BREADTH, META	=	6.012	+	0.868LENGTH	+	0.045HAND/C	SE = 3.069
3	HAND CIRC,METACARP	=	1.863	+	0.972LENGTH	+	0.025HAND/C	SE = 2.772
4	HAND CIRC,META,MIN	=	1.159	+	0.817LENGTH	+	0.035HAND/C	SE = 5.041
5	HAND CIRC,TIPS EVA	=	10.237	+	0.320LENGTH	-	0.065HAND/C	SE = 3.599
6	FIST CIRCUMFERENCE	=	1.341	+	0.288LENGTH	+	0.082HAND/C	SE = 3.332
7	WRIST CIRCUMF-ENCE	=	-8.117	+	0.454LENGTH	+	0.024HAND/C	SE = 2.792
8	HAND THICK AT META	=	-4.764	+	0.396LENGTH	+	0.037HAND/C	SE = 2.728
9	HAND DPTH,THENR PAD	=	-12.093	+	0.303LENGTH	+	0.067HAND/C	SE = 3.650
10	DIG 1 JOINT BRDTH	=	-22.015	+	0.662LENGTH	-	0.032HAND/C	SE = 7.027
11	DIGIT 1 JOINT DPTH	=	4.335	+	0.859LENGTH	+	0.052HAND/C	SE = 3.150
12	DIGIT 1 JOINT CIRC	=	-7.195	+	1.011LENGTH	+	0. HAND/C	SE = 0.
13	DIG 2 DST JNT BDTH	=	3.813	+	0.896LENGTH	+	0.015HAND/C	SE = 2.733
14	DIG 2 DST JNT DPTH	=	1.921	+	0.711LENGTH	+	0.025HAND/C	SE = 4.516
15	DIG 2 DST JNT CIRC	=	-15.194	+	0.376LENGTH	+	0.046HAND/C	SE = 4.641
16	DIG 2 PR JNT BRDTH	=	0.405	+	0.585LENGTH	-	0.019HAND/C	SE = 2.826
17	DIG 2 PR JNT DPTH	=	6.472	+	0.536LENGTH	-	0.011HAND/C	SE = 3.088
18	DIG 2 PR JNT CIRC	=	12.694	+	0.399LENGTH	+	0.039HAND/C	SE = 3.446
19	DIG 3 DST JNT BDTH	=	8.213	+	0.329LENGTH	+	0.042HAND/C	SE = 1.175
20	DIG 3 DST JNT DPTH	=	4.490	+	0.016LENGTH	+	0.050HAND/C	SE = 1.049
21	DIG 3 DST JNT CIRC	=	2.414	+	0.021LENGTH	+	0.055HAND/C	SE = 0.998
22	DIG 3 PR JNT BRDTH	=	7.093	+	0.073LENGTH	+	0.044HAND/C	SE = 1.019
23	DIG 3 PR JNT DPTH	=	3.746	+	0.037LENGTH	+	0.049HAND/C	SE = 1.076
24	DIG 3 PR JNT CIRC	=	-0.358	+	0.030LENGTH	+	0.068HAND/C	SE = 1.267
25	DIG 4 DST JNT BDTH	=	-2.131	+	0.036LENGTH	+	0.049HAND/C	SE = 1.133
26	DIG 4 DST JNT DPTH	=	-2.717	+	0.036LENGTH	+	0.054HAND/C	SE = 1.100
27	DIG 4 DST JNT CIRC	=	-0.688	+	0.019LENGTH	+	0.056HAND/C	SE = 1.160
28	DIG 4 PR JNT BRDTH	=	-1.844	+	0.019LENGTH	+	0.055HAND/C	SE = 1.088
29	DIG 4 PR JNT DPTH	=	13.287	+	0.093LENGTH	+	0.169HAND/C	SE = 3.132
30	DIG 4 PR JNT CIRC	=	4.068	+	0.077LENGTH	+	0.159HAND/C	SE = 2.721
31	DIG 5 DST JNT BDTH	=	-0.144	+	0.083LENGTH	+	0.176HAND/C	SE = 2.653
32	DIG 5 DST JNT DPTH	=	10.927	+	0.034LENGTH	+	0.154HAND/C	SE = 2.661
33	DIG 5 DST JNT CIRC	=	2.809	+	0.042LENGTH	+	0.164HAND/C	SE = 2.764
34	DIG 5 PR JNT BRDTH	=	3.450	+	0.017LENGTH	+	0.068HAND/C	SE = 1.058
35	DIG 5 PR JNT DPTH	=	3.346	+	0.025LENGTH	+	0.063HAND/C	SE = 1.166
36	DIG 5 PR JNT CIRC	=	1.496	+	0.027LENGTH	+	0.062HAND/C	SE = 1.103
37	WRIST BREADTH	=	-2.037	+	0.026LENGTH	+	0.068HAND/C	SE = 1.143
38	DIGIT 1 HT PERP WC	=	2.899	+	0.046LENGTH	+	0.035HAND/C	SE = 1.040
39	DIGIT 2 HT PERP WC	=	0.286	+	0.053LENGTH	+	0.044HAND/C	SE = 1.184
40	DIGIT 3 HT PERP WC	=	0.998	+	0.052LENGTH	+	0.036HAND/C	SE = 1.129
41	DIGIT 4 HT PERP WC	=	0.742	+	0.045LENGTH	+	0.035HAND/C	SE = 1.061
42	DIGIT 5 HT PERP WC	=	6.356	+	0.091LENGTH	+	0.177HAND/C	SE = 2.808
43	CROTCH 1 HEIGHT	=	3.652	+	0.127LENGTH	+	0.174HAND/C	SE = 3.004
44	CROTCH 2 HEIGHT	=	3.186	+	0.127LENGTH	+	0.155HAND/C	SE = 2.954
45	CROTCH 3 HEIGHT	=	-3.430	+	0.113LENGTH	+	0.164HAND/C	SE = 2.845
46	CROTCH 4 HEIGHT	=	-0.290	+	0.097LENGTH	+	1.091HAND/C	SE = 8.011
47	DIGIT 1 TIP-CROTCH	=	13.633	-	0.424LENGTH	+	0.958HAND/C	SE =20.747
48	DIGIT 2 TIP-CROTCH	=	33.728	+	0.276LENGTH	+	0.966HAND/C	SE = 8.582
49	DIGIT 3 TIP-CROTCH	=	-6.500	+	0.202LENGTH	+	0.658HAND/C	SE = 6.148
50	DIGIT 4 TIP-CROTCH	=	13.603	+	0.243LENGTH	+	0.212HAND/C	SE = 2.980
51	DIGIT 5 TIP-CROTCH	=	0.407	+	0.965LENGTH	+	0.039HAND/C	SE = 2.051
52	DIGIT 1 TIP-WRIST	=	11.683	+	0.061LENGTH	+	0.043HAND/C	SE = 1.774
53	DIGIT 2 TIP-WRIST	=	3.305	+	0.039LENGTH	+	0.236HAND/C	SE = 3.832
55	DIGIT 4 TIP-WRIST	=	2.768	+	0.016LENGTH	+	0.368HAND/C	SE = 1.880
56	DIGIT 5 TIP-WRIST	=	34.410	+	0.356LENGTH	+	0.317HAND/C	SE = 7.007

(3)

1	HAND LENGTH	=	-23.697	+	0.859LENGTH	-	0.189BR*DTH	SE	= 8.437
2	HAND BREADTH, META	=	9.760	+	0.888LENGTH	+	0.023BR*DTH	SE	= 3.086
3	HAND CIRC,METACARP	=	0.958	+	0.918LENGTH	+	0.079BR*DTH	SE	= 2.766
4	HAND CIRC,META,MIN	=	1.494	+	0.812LENGTH	+	0.074BR*DTH	SE	= 5.041
5	HAND CIRC,TIPS EVN	=	9.611	+	0.317LENGTH	-	0.143BR*DTH	SE	= 3.598
6	FIST CIRCUMFERENCE	=	7.505	+	0.32[illegible]LENGTH	+	0.259BR*DTH	SE	= 3.38[illegible]
7	WRIST CIRCUMFERENCE	=	-7.809	+	0.456LENGTH	+	0.[illegible]5BR*DTH	SE	= 2.792
8	HAND THICK AT META	=	-3.865	+	0.402LENGTH	+	0.066BR*DTH	SE	= 2.732
9	HND DPTH,THENR PAD	=	-10.358	+	0.311LENGTH	+	0.124BR*DTH	SE	= 3.659
10	DIG 1 JOINT BRDTH	=	-21.693	+	0.664LENGTH	-	0.085BR*DTH	SE	= 7.025
11	DIGIT 1 JOINT DPTH	=	6.864	+	0.974LENGTH	+	0.064BR*DTH	SE	= 3.165
12	DIGIT 1 JOINT CIRC	=	-2.195	+	1.001LENGTH	+	0.[illegible]BR*DTH	SE	= [illegible]
13	DIG 2 DST JNT BDTH	=	4.371	+	0.921LENGTH	+	0.119BR*DTH	SE	= 2.735
14	DIG 2 DST JNT DPTH	=	4.331	+	0.724LENGTH	+	0.058BR*DTH	SE	= 4.520
15	DIG 2 DST JNT CIRC	=	-14.963	+	0.377LENGTH	+	0.168BR*DTH	SE	= 4.639
16	DIG 2 PR JNT BRDTH	=	-1.312	+	0.576LENGTH	-	0.078BR*DTH	SE	= 2.829
17	DIG 2 PR JNT DPTH	=	6.845	+	0.538LENGTH	-	0.035BR*DTH	SE	= 3.087
18	DIG 2 PR JNT CIRC	=	13.899	+	0.393LENGTH	+	0.074BR*DTH	SE	= 3.449
19	DIG 3 DST JNT BDTH	=	7.629	+	0.007LENGTH	+	0.112BR*DTH	SE	= 1.154
20	DIG 3 DST JNT DPTH	=	4.776	+	0.017LENGTH	+	0.113BR*DTH	SE	= 1.039
21	DIG 3 DST JNT CIRC	=	2.527	+	0.022LENGTH	+	0.129BR*DTH	SE	= [illegible].984
22	DIG 3 PR JNT BRDTH	=	7.921	+	0.007LENGTH	+	0.088BR*DTH	SE	= 1.027
23	DIG 3 PR JNT DPTH	=	4.267	+	0.078LENGTH	+	0.117BR*DTH	SE	= 1.071
24	DIG 3 PR JNT CIRC	=	.362	+	0.034LENGTH	+	0.147BR*DTH	SE	= 1.268
25	DIG 4 DST JNT BDTH	=	-1.895	+	0.036LENGTH	+	0.111BR*DTH	SE	= 1.127
26	DIG 4 DST JNT DPTH	=	-1.539	+	0.041LENGTH	+	0.136BR*DTH	SE	= 1.113
27	DIG 4 DST JNT CIRC	=	[illegible].227	+	0.023LENGTH	+	0.116BR*DTH	SE	= 1.167
28	DIG 4 PR JNT BRDTH	=	-[illegible].735	+	0.025LENGTH	+	0.1[illegible]7BR*DTH	SE	= 1.104
29	DIG 4 PR JNT DPTH	=	13.87[illegible]	+	0.095LENGTH	+	0.396BR*DTH	SE	= 3.086
30	DIG 4 PR JNT CIRC	=	5.142	+	0.082LENGTH	+	0.36[illegible]BR*DTH	SE	= 2.695
31	DIG 5 DST JNT BDTH	=	2.[illegible]09	+	[illegible]093LENGTH	+	0.378BR*DTH	SE	= 2.654
32	DIG 5 DST JNT DPTH	=	13.671	+	0.[illegible]46LENGTH	+	0.314BR*DTH	SE	= 2.685
33	DIG 5 DST JNT CIRC	=	5.144	+	0.153LENGTH	+	0.346BR*DTH	SE	= 2.777
34	DIG 5 PR JNT BRDTH	=	3.916	+	0.023LENGTH	+	0.152BR*DTH	SE	= 1.05[illegible]
35	DIG 5 PR JNT DPTH	=	2.813	+	0.023LENGTH	+	[illegible].1[illegible]28BR*DTH	SE	= 1.126
36	DIG 5 PR JNT CIRC	=	0.926	+	[illegible].025LENGTH	+	[illegible].15[illegible]8BR*DTH	SE	= 1.062
37	WRIST BREADTH	=	-1.893	+	0.027LENGTH	+	0.16[illegible]8BR*DTH	SE	= 1.121
38	DIGIT 1 HT PERP WC	=	2.924	+	0.[illegible]46LENGTH	+	[illegible].064BR*DTH	SE	= 1.033
39	DIGIT 2 HT PERP WC	=	-[illegible]	+	[illegible]LENGTH	+	0.117BR*DTH	SE	= 1.161
40	DIGIT 3 HT PERP WC	=	0.837	+	[illegible].051LENGTH	+	0.091BR*DTH	SE	= 1.116
41	DIGIT 4 HT PERP WC	=	1.363	+	0.043LENGTH	+	0.068BR*DTH	SE	= 1.[illegible]66
42	DIGIT 5 HT PERP WC	=	9.549	+	0.096LENGTH	+	0.4[illegible]28BR*DTH	SE	= 2.776
43	CROTCH 1 HEIGHT	=	2.865	+	0.120LENGTH	+	0.443BR*DTH	SE	= 2.892
44	CROTCH 2 HEIGHT	=	2.[illegible]03	+	0.120LENGTH	+	0.418BR*DTH	SE	= 2.855
45	CROTCH 3 HEIGHT	=	-2.[illegible]26	+	0.1[illegible]LENGTH	+	0.364BR*DTH	SE	= 2.83[illegible]
46	CROTCH 4 HEIGHT	=	27.453	+	0.139LENGTH	+	1.799BR*DTH	SE	= 4.047
47	DIGIT 1 TIP-CROTCH	=	24.238	+	0.219LENGTH	+	2.[illegible]8BR*DTH	SE	= 8.91[illegible]
48	DIGIT 2 TIP-CROTCH	=	137.925	-	0.248LENGTH	+	1.541BR*DTH	SE	= 21.266
49	DIGIT 3 TIP-CROTCH	=	46.552	+	0.358LENGTH	+	2.048BR*DTH	SE	= 8.07[illegible]
50	DIGIT 4 TIP-CROTCH	=	5.164	+	0.260LENGTH	+	1.328BR*DTH	SE	= 6.375
51	DIGIT 5 TIP-CROTCH	=	19.191	+	0.072LENGTH	+	0.365BR*DTH	SE	= 3.[illegible]96
52	DIGIT 1 TIP-WRIST	=	1.142	+	0.959LENGTH	+	0.077BR*DTH	SE	= 2.354
53	DIGIT 2 TIP-WRIST	=	13.276	+	0.[illegible]71LENGTH	+	0.064BR*DTH	SE	= 1.79[illegible]
55	DIGIT 4 TIP-WRIST	=	7.804	+	0.062LENGTH	+	0.468BR*DTH	SE	= 3.892
56	DIGIT 5 TIP-WRIST	=	35.777	+	0.362LENGTH	+	0.735BR*DTH	SE	= 6.945

SECTION VIII

BIVARIATE FREQUENCY TABLES

Page

Hand Length and Hand Breadth; Metacarpale 71

Hand Length and Hand Circumference; Metacarpale 72

Hand Length and Crotch 3 Height 73

Hand Circumference Metacarpale; and
Hand Circumference, Fingertips Even. 74

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HAND BREADTH; META.

HAND LENGTH	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10.0	TOTAL
22.70																					0.7			0.7
22.40																								0.
22.10																								0.
21.80																								0.
21.50														0.7										0.7
21.20													2.0					0.7					0.7	3.4
20.90										0.7			1.4		0.7		1.4		1.4		0.7	0.7		6.8
20.60											0.7	0.7	2.0		0.7	0.7		2.0						6.8
20.30										0.7	1.4	0.7	0.7	1.4		0.7	0.7			0.7	0.7			7.4
20.00										1.4	0.7	2.0	1.4		0.7	2.0	0.7			0.7			0.7	10.1
19.70						1.4		1.4	0.7	0.7		2.0	1.4			0.7		1.4	0.7					10.1
19.40						0.7	0.7		2.0	0.7		3.4	1.4	0.7	0.7	1.4				0.7				12.2
19.10	0.7							0.7	1.4	3.4	1.4	2.0	3.4	0.7	0.7		1.4							15.5
18.80								0.7	2.7	0.7	1.4	1.4	0.7	2.0	1.4		0.7		0.7					12.2
18.50		0.7				0.7		0.7	1.4	0.7			0.7											4.7
18.20							0.7	0.7	0.7		0.7	0.7	0.7	0.7										4.7
17.90						0.7		0.7		0.7				0.7										2.7
17.60				0.7																				0.7
17.30						0.7		0.7																1.4
	0.7	0.7	0.	0.7	0.	4.1	1.4	5.4	8.8	9.5	6.1	12.8	15.5	6.8	4.7	5.4	4.7	4.1	2.7	2.0	2.0	0.7	1.4	100.0

Bivariate Frequency Table for Hand Length and Hand Breadth; Meta.

r=.534 (for grouped data)

(All frequency values within the table are expressed as percentages. Dimensions are in centimeters.)

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HAND CIRC; META.

HAND LENGTH	19.75	19.95	20.15	20.35	20.55	20.75	20.95	21.15	21.35	21.55	21.75	21.95	22.15	22.35	22.55	22.75	22.95	23.15	23.35	23.55	23.75	23.95	24.15	24.35	TOTAL
22.70																				0.7					0.7
22.40																									0.
22.10																									0.
21.80																									0.
21.50												0.7													0.7
21.20												0.7	0.7	0.7				0.7						0.7	3.4
20.90										1.4	0.7				1.4	1.4		0.7	0.7	0.7					6.8
20.60								0.7	0.7	0.7	0.7		0.7	1.4	0.7	1.4									6.8
20.30							0.7	2.0		1.4			1.4		1.4						0.7				7.4
20.00						0.7		2.0	0.7	1.4	0.7	0.7	0.7	0.7	1.4	1.4									10.1
19.70		0.7		0.7		2.0		0.7	0.7	1.4	0.7	0.7	0.7		0.7	0.7					0.7				10.1
19.40			0.7	1.4	0.7	0.7	1.4	1.4		2.0		1.4	0.7		0.7	0.7		0.7							12.2
19.10		0.7	0.7		1.4	0.7	1.4	2.7	2.0	1.4	2.0	0.7	0.7	0.7	0.7										15.5
18.80		0.7		0.7		0.7	1.4	2.7		0.7	2.7	0.7	0.7		0.7	0.7									12.2
18.50	0.7			0.7		1.4	0.7		0.7	0.7															4.7
18.20		0.7				0.7	0.7	1.4			0.7	0.7													4.7
17.90	0.7					0.7		0.7	0.7																2.7
17.60		0.7																							0.7
17.30		0.7			0.7																				1.4
	1.4	4.1	1.4	3.4	2.7	7.4	6.1	14.2	5.4	10.8	8.1	6.1	6.1	3.4	7.4	6.1	0.	2.0	0.7	1.4	1.4	0.	0.	0.7	100.0

Bivariate Frequency Table for Hand Length and Hand Circumference; Metacarpale

r=.575 (for grouped data)

(All frequency values within the table are expressed as percentages. Dimensions are in centimeters.)

CROTCH 3 HEIGHT

HAND LENGTH	9.75	9.95	10.15	10.35	10.55	10.75	10.95	11.15	11.35	11.55	11.75	11.95	12.15	12.35	12.55	12.75	TOTAL
22.70															0.7		0.7
22.40																	0.
22.10																	0.
21.80																	0.
21.50												0.7					0.7
21.20										2.7			0.7				3.4
20.90								1.4	1.4	1.4		1.4	0.7			0.7	6.8
20.60							0.7	2.0	1.4	2.7							6.8
20.30					0.7		0.7	2.0	2.0	1.4					0.7		7.4
20.00						1.4	3.4	2.0	2.0	0.7	0.7						10.1
19.70			0.7		0.7	1.4	2.7	2.7	2.0								10.1
19.40			1.4	1.4	0.7	3.4	0.7	2.0	2.7								12.2
19.10			2.0	2.0	6.1	2.7	1.4	1.4									15.5
18.80		0.7	2.7	2.0	4.7	2.0											12.2
18.50			0.7	2.0	1.4	0.7											4.7
18.20		0.7	2.7	0.7	0.7												4.7
17.90	0.7	0.7	1.4														2.7
17.60				0.7													0.7
17.30	1.4																1.4
	2.0	2.0	11.5	8.8	14.9	11.5	9.5	13.5	11.5	8.8	0.7	2.0	1.4	0.	1.4	0.7	100.0

Bivariate Frequency Table for Hand Length and Crotch 3 Height

r=.845 (for grouped data)

(All frequency values within the table are expressed as percentages. Dimensions are in centimeters.)

HAND CIRC; META.

HAND CIRC.; FINGERTIPS EVEN	19.75	19.95	20.15	20.35	20.55	20.75	20.95	21.15	21.35	21.55	21.75	21.95	22.15	22.35	22.55	22.75	23.95	23.15	23.35	23.55	23.75	23.95	24.15	24.35	TOTAL
28.90														0.7											0.7
28.40																									0.
27.90																									0.
27.40															0.7										0.7
26.90							0.7			0.7	0.7		0.7		0.7	1.4									4.7
26.40						0.7		1.4	1.4		0.7		0.7			0.7									5.4
25.90		0.7						1.4		0.7					0.7										3.4
25.40				0.7				1.4	0.7											0.7					3.4
24.90				0.7		0.7			0.7	0.7															2.7
24.40		0.7		0.7						0.7	0.7	0.7						0.7							4.1
23.90													0.7	0.7		0.7					0.7			0.7	3.4
23.40						0.7					0.7	1.4			1.4	0.7		0.7							5.4
22.90		0.7						0.7		2.0	2.0	1.4	0.7		0.7	2.0									10.1
22.40							0.7	2.7		2.0	0.7	0.7			2.0				0.7	0.7					10.1
21.90		0.7					1.4	1.4	0.7	1.4	0.7	0.7	2.0	1.4	1.4	0.7		0.7							12.8
21.40				1.4		1.4	1.4	2.7	0.7		0.7		0.7								0.7				9.5
20.90			0.7		0.7	0.7	1.4	1.4	1.4	1.4	0.7	0.7	0.7	0.7											10.1
20.40		0.7	0.7		0.7	0.7	0.7	0.7		1.4															5.4
19.90		0.7				2.0		0.7			0.7														4.1
19.40	0.7				0.7	0.7																			2.0
18.90	0.7				0.7																				1.4
18.40																									0.
17.90																									0.
17.40																									0.
16.90												0.7													0.7
	1.4	4.1	1.4	3.4	2.7	7.4	6.1	14.2	5.4	10.8	8.1	6.1	6.1	3.4	7.4	6.1	0.	2.0	0.7	1.4	1.4	0.	0.	0.7	100.0

Bivariate Frequency Table for Hand Circumference; Fingertips Even and Hand Circumference; Metacarpale

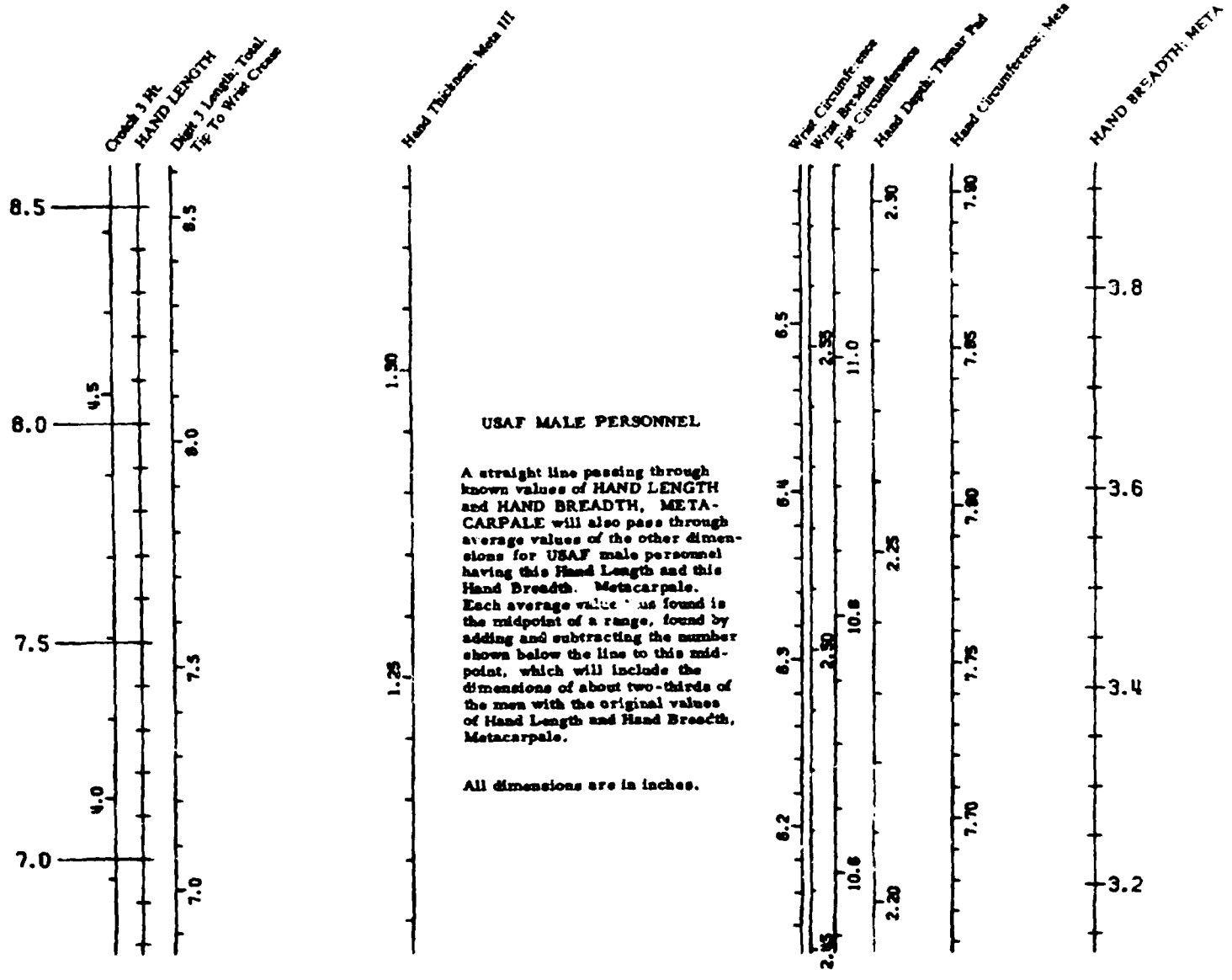
r=.290 (for grouped data)

(All frequency values within the table are expressed as percentages. Dimensions are in centimeters.)

SECTION IX

NOMOGRAPHS

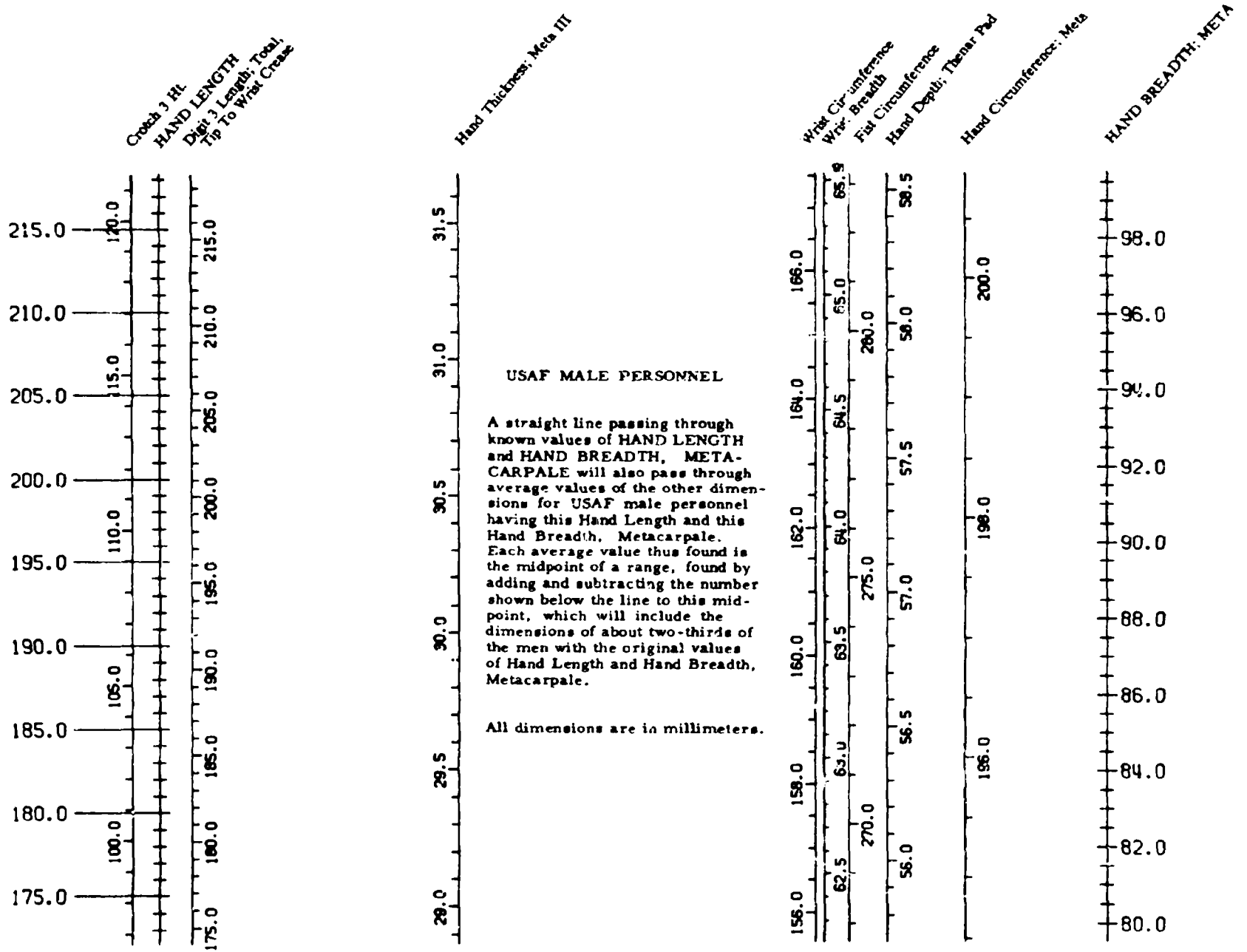
1. English Units of Measurement
2. Metric Units of Measurement



USAF MALE PERSONNEL

A straight line passing through known values of HAND LENGTH and HAND BREADTH, METACARPALE will also pass through average values of the other dimensions for USAF male personnel having this Hand Length and this Hand Breadth, Metacarpale. Each average value found is the midpoint of a range, found by adding and subtracting the number shown below the line to this midpoint, which will include the dimensions of about two-thirds of the men with the original values of Hand Length and Hand Breadth, Metacarpale.

All dimensions are in inches.



USAF MALE PERSONNEL

A straight line passing through known values of HAND LENGTH and HAND BREADTH, METACARPALE will also pass through average values of the other dimensions for USAF male personnel having this Hand Length and this Hand Breadth, Metacarpale. Each average value thus found is the midpoint of a range, found by adding and subtracting the number shown below the line to this midpoint, which will include the dimensions of about two-thirds of the men with the original values of Hand Length and Hand Breadth, Metacarpale.

All dimensions are in millimeters.

APPENDIX

GLOVE PROCUREMENT TARIFF

One immediate application of the recent Air Force anthropometric surveys is a suggested change in the existing glove procurement tariff for Air Force gloves for male personnel. The present tariff is listed in section A of table IV. The anthropometric information compiled in the Anthropology Branch's 1967 survey of the group of 2420 male personnel* reflects a change in the distribution of the sizes of hands covered by the 12-size glove program used for the Air Force pressure gloves. A new tariff to incorporate this change is listed in section B of table IV.

TABLE IV

GLOVE PROCUREMENT TARIFF

Section A—1956 Tariff		*Section B—Revised Tariff*	
Size	*Pairs Per Thousand*	*Size*	*Pairs Per Thousand*
A	55	A	18
B	62	B	40
C	34	C	6
D	140	D	87
E	208	E	301
F	80	F	24
G	74	G	112
H	167	H	256
I	84	I	63
J	24	J	16
K	43	K	64
L	29	L	13

*Anthropology Branch and Antioch College, Unpublished Data from 1967 Anthropometric Survey, AMRL, WPAFB, Ohio.

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13. ABSTRACT

This report contains descriptions of and data on 56 anthropometric dimensions of the hands of 148 male Air Force flight personnel. Selected dimensional comparisons indicate that this sample is representative of the total group of Air Force flight personnel. Summary statistics presented include the means, standard deviations, ranges, selected percentiles, and coefficients of variation. Also included are data on the age, rank, major Air Command, and commissioned status of the sample; a complete matrix of intercorrelations among the anthropometric dimensions; bivariate tables; multiple regression equations; and nomographs for selected combinations of dimensions. A tariff for the U.S. Air Force 12-size glove program revised to reflect the latest anthropometric data is presented in the appendix.

DD FORM 1 NOV 65 1473

Security Classification

Security Classification

14 KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Anthropology						
Anthropometry						
Hands						
Hand Measurements						
Body Size						
Glove Tariffs						

Security Classification

SUPPLEMENTARY

INFORMATION

Replacement for page 66, AMRL-TR-69-42, Garrett, J.W., Anthropometry of Hands of Male Air Force Flight Personnel.

AD-709 883

M	Regression Equations in Terms of Hand Length and Hand Circumference						
1 HAND LNGTH	= (1.000)H.L.	+ (0.000)H.C.	+(0.000)	R =1.000	SE = .0		
2 HAND BRDTH META	= (.017)H.L.	+ (.383)H.C.	+(.356)	R = .886	SE = .1		
3 HAND CIRC METACARP	= (0.000)H.L.	+ (1.000)H.C.	+(0.000)	R =1.000	SE = .1		
4 HAND CIRC META MIN	= (.122)H.L.	+ (1.375)H.C.	+(-.185)	R = .792	SE = .		
5 ~~HAND CIRC TIPS EVN~~	~~= (-.244)H.L.~~	~~+ (.853)H.C.~~	~~+(9.165)~~	~~R = .302~~	~~SE =2.~~		
6 FIST CIRC	= (.263)H.L.	+ (.371)H.C.	+(3.460)	R = .768	SE = .1		
7 WRIST CIRC	= (.203)H.L.	+ (.651)H.C.	+(-.558)	R = .759	SE = .1		
8 HAND THICK AT META	= (.059)H.L.	+ (.046)H.C.	+(1.133)	R = .427	SE = .1		
9 HND DPTH THENR PAD	= (.032)H.L.	+ (.240)H.C.	+(.377)	R = .522	SE = .1		
10 DIG 1 JOINT BRDTH	= (.029)H.L.	+ (.042)H.C.	+(.811)	R = .443	SE = .1		
11 DIGIT 1 JOINT DPTH	= (.033)H.L.	+ (.067)H.C.	+(-.077)	R = .544	SE = .		
12 DIGIT 1 JOINT CIRC	= (.093)H.L.	+ (.165)H.C.	+(1.295)	R = .566	SE = .		
13 DIG 2 DST JNT BDTH	= (.015)H.L.	+ (.051)H.C.	+(.443)	R = .462	SE = .1		
14 DIG 2 DST JNT DPTH	= (.031)H.L.	+ (.050)H.C.	+(-.141)	R = .511	SE = .1		
15 DIG 2 DST JNT CIRC	= (.063)H.L.	+ (.161)H.C.	+(.523)	R = .574	SE = .		
16 DIG 2 PR JNT BRDTH	= (.019)H.L.	+ (.069)H.C.	+(.286)	R = .565	SE = .1		
17 DIG 2 PR JNT DPTH	= (.041)H.L.	+ (.037)H.C.	+(.333)	R = .527	SE = .1		
18 DIG 2 PR JNT CIRC	= (.087)H.L.	+ (.181)H.C.	+(.007)	R = .612	SE = .1		
19 DIG 3 DST JNT BDTH	= (.019)H.L.	+ (.057)H.C.	+(.235)	R = .532	SE = .1		
20 DIG 3 DST JNT DPTH	= (.031)H.L.	+ (.056)H.C.	+(-.220)	R = .544	SE = .		
21 DIG 3 DST JNT CIRC	= (.072)H.L.	+ (.182)H.C.	+(.061)	R = .617	SE = .		
22 DIG 3 PR JNT BRDTH	= (.023)H.L.	+ (.056)H.C.	+(.302)	R = .529	SE = .		
23 DIG 3 PR JNT DPTH	= (.051)H.L.	+ (.044)H.C.	+(.054)	R = .552	SE = .1		
24 DIG 3 PR JNT CIRC	= (.121)H.L.	+ (.178)H.C.	+(.371)	R = .624	SE = .		
25 DIG 4 DST JNT BDTH	= (.002)H.L.	+ (.045)H.C.	+(.709)	R = .378	SE = .1		
26 DIG 4 DST JNT DPTH	= (.017)H.L.	+ (.057)H.C.	+(-.056)	R = .475	SE = .1		
27 DIG 4 DST JNT CIRC	= (.028)H.L.	+ (.157)H.C.	+(1.136)	R = .510	SE = .		
28 DIG 4 PR JNT BRDTH	= (.027)H.L.	+ (.061)H.C.	+(.171)	R = .555	SE = .1		
29 DIG 4 PR JNT DPTH	= (.051)H.L.	+ (.034)H.C.	+(.150)	R = .536	SE = .1		
30 DIG 4 PR JNT CIRC	= (.126)H.L.	+ (.152)H.C.	+(.374)	R = .610	SE = .		
31 DIG 5 DST JNT BDTH	= (.007)H.L.	+ (.050)H.C.	+(.352)	R = .409	SE = .1		
32 DIG 5 DST JNT DPTH	= (.017)H.L.	+ (.060)H.C.	+(-.261)	R = .493	SE = .		
33 DIG 5 DST JNT CIRC	= (.035)H.L.	+ (.165)H.C.	+(.387)	R = .529	SE = .		
34 DIG 5 PR JNT BRDTH	= (.025)H.L.	+ (.070)H.C.	+(-.234)	R = .561	SE = .1		
35 DIG 5 PR JNT DPTH	= (.042)H.L.	+ (.033)H.C.	+(.129)	R = .512	SE = .1		
36 DIG 5 PR JNT CIRC	= (.105)H.L.	+ (.166)H.C.	+(-.255)	R = .615	SE = .1		
37 WRIST BREADTH	= (.061)H.L.	+ (.202)H.C.	+(1.216)	R = .594	SE = .		
38 DIGIT 1 HT PERP WC	= (.612)H.L.	+ (-.013)H.C.	+(-1.758)	R = .611	SE = .		
39 DIGIT 2 HT PERP WC	= (.813)H.L.	+ (.067)H.C.	+(.841)	R = .901	SE = .1		
40 DIGIT 3 HT PERP WC	= (.961)H.L.	+ (.006)H.C.	+(.440)	R = .975	SE = .1		
41 DIGIT 4 HT PERP WC	= (.871)H.L.	+ (.017)H.C.	+(.557)	R = .931	SE = .		
42 DIGIT 5 HT PERP WC	= (.673)H.L.	+ (.034)H.C.	+(.594)	R = .805	SE = .		
43 CROTCH 1 HEIGHT	= (.340)H.L.	+ (.054)H.C.	+(-1.277)	R = .588	SE = .		
44 CROTCH 2 HEIGHT	= (.547)H.L.	+ (-.006)H.C.	+(.393)	R = .843	SE = .1		
45 CROTCH 3 HEIGHT	= (.513)H.L.	+ (-.005)H.C.	+(.862)	R = .818	SE = .1		
46 CROTCH 4 HEIGHT	= (.373)H.L.	+ (.042)H.C.	+(1.458)	R = .725	SE = .1		
47 DIGIT 1 TIP-CROTCH	= (.314)H.L.	+ (-.066)H.C.	+(1.103)	R = .582	SE = .1		
48 DIGIT 2 TIP-CROTCH	= (.274)H.L.	+ (.087)H.C.	+(.248)	R = .669	SE = .1		
49 DIGIT 3 TIP-CROTCH	= (.439)H.L.	+ (.024)H.C.	+(-.505)	R = .827	SE = .1		
50 DIGIT 4 TIP-CROTCH	= (.384)H.L.	+ (.037)H.C.	+(-.321)	R = .803	SE = .1		
51 DIGIT 5 TIP-CROTCH	= (.275)H.L.	+ (.072)H.C.	+(-.337)	R = .635	SE = .1		
52 DIGIT 1 TIP-WRIST	= (.769)H.L.	+ (-.037)H.C.	+(-2.060)	R = .632	SE = .1		
53 DIGIT 2 TIP-WRIST	= (.829)H.L.	+ (.061)H.C.	+(1.033)	R = .904	SE = .1		
54 DIGIT 3 TIP-WRIST	= (.961)H.L.	+ (.006)H.C.	+(.440)	R = .975	SE = .1		
55 DIGIT 4 TIP-WRIST	= (.892)H.L.	+ (.030)H.C.	+(.482)	R = .929	SE = .1		
56 DIGIT 5 TIP-WRIST	= (.762)H.L.	+ (.047)H.C.	+(.569)	R = .807	SE = .1		

* Deleted