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Anthropological Observations on the Anglo-Indians of Calcutta.

Statistical Analysis of Measurements of Seven Characters.

By

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ANTHROPOLOGICAL OBSERVATIONS ON THE ANGLO-INDIANS OF CALCUTTA.

Part III. Statistical Analysis of Measurements of Seven Characters.

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Foreword.

The first part of the present study was published in 1922 and the second part in 1931. In the foreword to the second part, I had explained the reasons why publication was being delayed. The original and chief aim of the present investigations was to compare the measurements on the Anglo-Indians with corresponding measurements on Indian castes and tribes as well as on groups of European origin with a view to throwing some light on the question of "origin of human races by fusion". I pointed out that one of the outstanding difficulties standing in the way of such a task was the lack of suitable statistical tools.

It is gratifying to note that considerable progress has been made in this matter since the publication of the previous part of this volume. Prof. R. A. Fisher has recently reviewed the whole question in the *Annals of Eugenics* (Vol. VIII, Part IV, pp. 376-386). In this paper he has given a connected account of the work done on discriminant functions by himself and other workers in London, the work on tests of significance in the case of multiple characters by H. Hotelling in the United States, and the work on what Fisher calls Mahalanobis's Generalized Distance by workers of the Statistical Laboratory in Calcutta. The Generalized Distance (D^2-statistic) has been accepted as a convenient single measure of the amount of divergence in the mean values of different characters between different samples or groups. Since the publication of the above paper some more work has been done by Fisher himself in London and by S. N. Roy of Calcutta, which will be shortly published and which will furnish, when necessary numerical tables have been prepared, other tools for inter-racial or inter-group comparisons.

I may state here that the coefficients of correlation explicitly occur in the Generalized Distance as well as in the more recent work of Fisher and of S. N. Roy. Besides the usual statistics relating to frequency distributions I am therefore giving here also those relating to the coefficients of correlation between seven characters.[1] This will enable the comparison of the Anglo-Indian material for these seven characters with other material as soon as numerical tables become available. Work on the preparation of such numerical tables has been already started.

In the foreword to Part I, I had also pointed out the material difficulties standing in the way of comparative studies in anthropometry,

[1] Stature, Head Length, Head Breadth, Nasal Length, Nasal Breadth, Zygomatic Breadth and Upper Facial Length for which detailed measurements were published on pp. 139-143 of Part II of the present volume.

namely, the lack of standardization in the measurements on the living. Unfortunately this difficulty remains as acute as ever as no appreciable progress has been made in this matter since 1931.

In investigations on race mixture another great difficulty is the lack of reliable information regarding the parental history of the sample. A general review of the subject has been recently given by J. C. Trevor in a paper entitled " Some Anthropological Characters of Hybrid Populations " in the *Eugenic Review* (Vol. XXX, No. 1, April 1938) in which the present series of measurements on Anglo-Indians has also been taken into consideration[1].

For convenience of reference I am giving here a summary of the conclusions reached by Trevor in the above.

" The mean values of quantitative characters are intermediate in the hybrid population where there is a clear distinction between the parental groups,...the variabilities of the hybrid population do not, on the whole, tend to be peculiarly high or peculiarly low, and...the distributions...in the hybrid population are approximately normal in form and...apparently always unimodal."

It will be remembered that the last two results confirm what I had pointed out in the case of Stature and Head Length in the two previous parts of the present memoir.

In view of the fact that the attempt at detailed comparison must be abandoned for the present, the results of the statistical reductions are given in this paper with very few comments.

Section I.—Frequency Distributions.

The Pearsonian frequency constants of the seven characters for the total sample of 200 individuals are given in Table 1. The coefficient of variation lies between 4·08 and 8·72. The variability between individuals is lowest in the case of Stature (4·08), Head Breadth (4·09), Head Length (4·75); it is appreciably greater for Zygomatic Breadth (6·08) and Upper Facial Length (7·80); while the two nasal measurements have the largest variability of 8·63 and 8·72 for Nasal Breadth and Nasal Length respectively. The variabilities of Cephalic and Nasal indices are much higher and are 11·36 and 12·15 respectively.

The symmetry of the distribution as measured by the Pearsonian β_1-coefficient is small in every case and statistically negligible. The flatness of the curves (kurtosis) as measured by the β_2-coefficient lies between 2·7 and 4·07; the departure from the theoretical value of 3·0 for a truly normal (Gauss-Laplacian) distribution being statistically negligible in every case.

The goodness of fit for graduation by normal curves is shown in Table 2. Observed and calculated frequencies are given in detail for each character; and the observed value of the Chi-square coefficient is shown at the bottom in each case together with the available degrees of freedom; and the probability of occurrence of deviations equal to

[1] I am indebted to Mr. J. C. Trevor for drawing my attention to a printing mistake in the list of measurements published on page 143 in Part II of the present volume. In Card No. 18, subject No. 165, the correct value of stature is 1,672 mm., as given in Part I and not 1,572 mm. as given in Part II.

or larger than the observed deviations from calculated values is given by the values of P for each character. It will be noticed that the lowest value of this probability is about 12 per cent. for Nasal Length, while all the other values are greater. This shows that the results of graduation are entirely satisfactory. We may conclude, therefore, that, in the case of samples of about 200 individuals, the different anthropological characters studied here conform quite satisfactorily to the normal distribution.

It will be remembered that the present material mostly consists of measurements of individuals of age above 20, but there were 1 subject of age 15 years, 4 subjects of age 16 years, 8 of 17 years, 9 of 18 years and 24 of 19 years. In view of this heterogeneity in the age composition of the sample I have given in Table 3 the mean values, standard deviations, and coefficients of variation separately for the immature group of 46 individuals between 15 and 19 years, and the adult group of 145 individuals between 20 and 48 years.

The results do not call for any special remarks. The mean values for the adult group are in every case larger showing the effect of growth with age. This shows the general tendency although in most cases, owing to the small size of the samples, the differences do not attain the level of statistical significance.

Section II.—Change with Age.

In order to study the change with age of the different characters, cubic equations of regression on age were fitted for the various characters, and the actual equations are shown in Table 4.

The observed mean values for each character for each age group are given in Table 5 for comparison with the calculated values as obtained from the cubic equations of regression.

The detailed analysis of variance showing the improvement due to fitting cubic equations is given in Table 6. For testing the significance of these regressions the relevant five per cent. and one per cent. values of the ratio of variances are given in the Table below :—

Five per cent. and One per cent. Values of the Ratio of Variances.

Degrees of Freedom		Five per cent Values	One per cent Values
$n_2=162$	$n_1=1$	3·91	6·81
	2	3·07	4·75
	3	2·67	3·91
	25	1·58	1·90
	28	1·55	1·87

In Table 6 the ratio of variances which are significant at the five per cent. level are marked with a single star (*), and those significant at the one per cent. value with two stars (**).

It will be seen that for Stature the differences due to age are rather irregular, and are satistically insignificant in the case of Head Length and Head Breadth. In the case of Nasal Length, Nasal Breadth, Zygomatic Breadth and Upper Facial Length the regressions appear to be significant, so that in the case of these characters there is definite evidence of change with age. In the case of Head Length and Head Breadth maturity appears to have been reached earlier.

Section III.—Correlation between Different Characters.

In view of its importance I have made a detailed investigation of the correlation between the seven characters for which individual measurements were published on pages 139-143 of Part II of this volume. Here also I have considered the question separately for the 46 individuals between 15 and 19 years, and 145 individuals between 20 and 48 years, as well as for the whole group of 200 individuals including 9 for whom age records are not available.

The actual values of the coefficients of correlation for (i) age-group 15-19 years ; (ii) age-group 20-48 years ; and (iii) for the whole group of 200 individuals are given in Table 7. Significant values at the five per cent. level are marked with a star (*).

We may now briefly consider the actual values of the coefficients of correlation. For the age-group 15-19 years, only five of the coefficients of correlation are statistically significant at the five per cent. level. This is, no doubt, to a great extent due to the small size of the sample which consists of only 46 individuals. The highest correlation (+·7357 ±·0684) was observed between Nasal Length and Upper Facial Length, which is, of course, just what is to be expected, as Nasal Length actually forms a part of Upper Facial Length. Next comes a group of three characters Head Length, Nasal Breadth, and Zygomatic Breadth which are all correlated with one another with an intensity of about +0·4 ; the actual values being +·4176 ±·1231 for Nasal Breadth and Head Length, +·4014 ±·1250 for Zygomatic Breadth and Head Length, and +·3876 ±·1267 for Zygomatic Breadth and Nasal Breadth.

For the adult group of 20-48 years the sample is much larger and consists of 145 individuals. It is not surprising, therefore, that a much larger number of the coefficients of correlation, namely 14 out of 21, are now statistically significant.

The first thing deserving notice is the fact that 20 out of the 21 coefficients are positive ; and the single negative coefficient between Nasal Length and Nasal Breadth is very small,—·0150 ±·0833, and statistically negligible. In the immature group, seven of the coefficients were negative, but none of them was statistically significant. In fact for the pooled data for 200 individuals all the coefficients are positive.

The largest coefficient in the adult group is that between Nasal Length and Upper Facial Length (+0·6345 ±·0498) just as in the case of the immature group. As already pointed out, this is, simply due to the fact that Nasal Length forms a large portion of the Upper Facial Length. Omitting this particular coefficient, none of the other coefficients exceed 0·4, showing that the organic correlation between different characters is not strong.

The different characters show considerable variations in regard to their correlations with the other characters. Thus Zygomatic Breadth appears to be correlated significantly with all the other six measurements ; while Nasal Breadth is the most independent character and shows a moderate correlation of about +0·26 with only two characters Zygomatic Breadth and Head Length. Stature is significantly correlated with all characters except Nasal Breadth ; Head Length with all others except Nasal Length and Upper Facial Length ; Head Breadth with all others except Nasal Breadth and Upper Facial Length ; and Nasal Length with all characters except Head Length and Nasal Breadth ; Upper Facial Length is significantly correlated with Stature and Zygomatic Breadth besides Nasal Length. The results are practically the same for the pooled data.

We get the same general ordering if we take the magnitude of the correlations into consideration. Thus, omitting the special case of Nasal and Upper Facial Length, for the pooled data, we find that Zygomatic Breadth and Stature have on the whole the highest correlations ; next come Head Length, Head Breadth, and Upper Facial Length ; while Nasal Length and Nasal Breadth show greatest independence.

Section IV.—Linearity of the Regressions.

We may now consider a different aspect of the problem, namely, how far the correlations are linear. We require for this purpose the detailed analysis of variance which is given separately for the two age-groups and the pooled data in the three sets of Tables 8, 9 and 10 respectively.

These tables show for each character (*a*) the total mean square deviation or variance, (*b*) the variance between groups or arrays, and (*c*) the variance within groups or arrays. The variance between groups is then further broken up into (*d*) the variance due to the linear regression, and (*e*) that due to deviations from linearity.

For the age-group 15-19, the deviations appear to be significant at the five per cent. level in only one case, namely, the regression of Zygomatic Breadth on Head Breadth which has an observed ratio of variances of 2·29 against a five per cent. expected value of 2·12. For the adult group, the ratio of variances for deviations from linearity is 4·78 against a five per cent. value of 1·71 in the case of the regression of Stature on Head Length ; and is 2·13 against a five per cent. expected value of 1·79 for the regression of Zygomatic Breadth on Head Breadth. For the pooled data none of the regressions show any significant deviation from linearity at the five per cent. level.

For each of the age groups we have 42 regressions, and for the two age-groups a total of 84 regressions. At the five per cent. level of significance we expect that, even when deviations from linearity do not really exist in fact, four of the ratio of variances are likely to come out significant by chance. In actual fact we find that in three cases only the results appear to deviate significantly from linearity. This can clearly have arisen from errors of sampling. We conclude, therefore, that even in the two age-groups on the whole there is no significant deviation from

linearity. This is, of course, fully confirmed by the fact that in the pooled data none of the 42 regressions show any significant departure from linearity.

In view of the fact that in advanced statistical analysis the product variances are often required I am giving the observed values separately for the two age-groups of 15-19 years and 20-48 years as well as for the pooled data for all ages in Table 11. The statistic given is defined by $a_{ij}=s_i\ s_j.\ r_{ij}$, where s_i and s_j are the standard deviations of the i-th and j-th characters respectively, and r_{ij} is the coefficient of correlation between the two. When i=j, the value reduces to the variances or the squares of the standard deviations which are shown in the diagonal cells.

Summary.

We find then that the seven characters studied here are not independent, but show various degrees of correlation among themslves. The coefficients are all positive; and, with the exception of Nasal Length and Upper Facial Length where there is a mechanical cause for a high correlation, the actual magnitudes of the correlations are all on the whole small and do not exceed 0·4. Within the limits of error of sampling, the regressions also appear to be linear. The system therefore may be conveniently described as a multivariate normal distribution with small or moderate positive linear correlations between the different characters.

Table 1.—*Statistical constants relating to Frequency Distributions.*

(All age-groups. N=200. Absolute values in millimetres.)

Character	Mean value with Standard Error	Standard Deviation with Standard Error	Coefficient of variation with S. E.	β_1—Coefficient with S. E	β_2—Coefficient with S. E.
(1)	(2)	(3)	(4)	(5)	(6)
Stature . . .	1656·79±4·7836	67·65±3·3825	4·08±0·2043	0·0219±0·0441	3·5416±0·8507
Head Length .	182·46±0·6124	8·66±0·4330	4·75±0·2380	0·0415±0·1071	3·8295±1·3906
Head Breadth .	142·64±0·4122	5·83±0·2915	4·09±0·2047	0·0010±0·0010	2·7121±0·2286
Nasal Length .	50·14±0·3090	4·37±0·2185	8·72±0·4393	0·2420±0·3322	4·0664±2·1117
Nasal Breadth .	35·58±0·2171	3·07±0·1535	8·63±0·4347	0·0006±0·0014	3·6782±1·0134
Zygomatic Breadth	119·81±0·5155	7·29±0·3645	6·08±0·3051	0·1527±0·2039	3·6408±1·1108
Upper Facial Length	65·39±0·3606	5·10±0·2550	7·80±0·3923	0·0180±0·0436	3·7236±1·3339
Cephalic Index .	78·37±0·6294	8·90±0·4450	11·36±0·5751	0·0949±0·1038	3·1523±0·4531
Nasal Index . .	71·43±0·6135	8·68±0·4338	12·15±0·6162	0·2307±0·2459	3·6652±1·1218

TABLE 2.—*Graduation by Normal Curves: Goodness of Fit.*

STATURE			HEAD LENGTH			HEAD BREADTH			NASAL LENGTH		
Class Intervals	Frequency		Class Intervals	Frequency		Class Intervals	Frequency		Class Intervals	Frequency	
	Observed	Expected		Observed	Expected		Observed	Expected		Observed	Expected
(1·1)	(1·2)	(1·3)	(2·1)	(2·2)	(2·3)	(3·1)	(3·2)	(3·3)	(4·1)	(4·2)	(4·3)
1440—1560 mm	12·00	14·99	154—169 mm	10·00	12·11	127—133 mm	11·00	9·69	38—46 mm	11·50	15·56
1560—1580 „	10·00	10·44	169—172 „	14·00	10·90	133—135 „	9·50	8·99	46—48 „	23·00	18·14
1580—1600 „	11·00	14·66	172—175 „	15·00	16·52	135—137 „	9·50	14·52	48—50 „	23·50	28·71
1600—1620 „	20·50	18·83	175—178 „	13·00	22·18	137—139 „	17·50	19·66	50—52 „	46·50	35·19
1620—1640 „	31·00	21·34	178—181 „	30·00	26·37	139—141 „	32·50	25·08	52—54 „	37·00	35·67
1640—1660 „	25·00	23·73	181—184 „	32·50	27·78	141—143 „	32·50	26·83	54—56 „	25·00	29·91
1660—1680 „	17·50	23·38	184—187 „	30·00	25·23	143—145 „	20·50	27·04	56—58 „	14·50	19·43
1680—1700 „	19·50	21·06	187—190 „	21·50	21·57	145—147 „	20·00	22·86	58—60 „	9·50	10·51
1700—1720 „	22·00	16·85	190—193 „	20·00	15·85	147—149 „	16·00	18·19	60—74 „	9·50	6·88
1720—1740 „	11·50	13·22	193—196 „	4·50	10·31	149—151 „	13·00	12·43			
1740—1760 „	5·00	9·14	196—214 „	9·50	11·18	151—153 „	10·50	7·36			
1760—1860 „	15·00	12·36				153—171 „	7·50	7·35			
TOTAL	200·00	200·00	..	200·00	200·00	..	200·00	200·00	..	200·00	200·00
	$\chi^2=11·96$, D. F.$=9$			$\chi^2=12·01$, D. F.$=8$			$\chi^2=9·14$, D. F.$=9$			$\chi^2=10·14$, D. F.$=6$	
	$P=0·2183$			$P=0·1509$			$P=0·4251$			$P=0·1247$	

TABLE 2.—*Graduation by Normal Curves: Goodness of Fit*—contd.

Nasal Breadth			Zygomatic Breadth			Upper Facial Length		
Class Intervals	Frequency		Class Intervals	Frequency		Class Intervals	Frequency	
	Observed	Expected		Observed	Expected		Observed	Expected
(5·1)	(5·2)	(5·3)	(6·1)	(6·2)	(6·3)	(7·1)	(7·2)	(7·3)
26—30 mm	8·00	6·42	90—108 mm	8·50	10·52	50—56 mm	5·50	6·29
30—32 ,,	10·50	16·97	108—110 ,,	10·50	7·50	56—58 ,,	11·00	8·14
32—34 ,,	37·00	36·90	110—112 ,,	13·00	10·44	58—60 ,,	11·50	14·03
34—36 ,,	60·50	50·83	112—114 ,,	9·50	14·50	60—62 ,,	14·00	21·82
36—38 ,,	46·00	47·07	114—116 ,,	13·50	17·35	62—64 ,,	34·00	28·43
38—40 ,,	23·00	27·64	116—118 ,,	13·50	20·73	64—66 ,,	35·00	30·84
40—46 ,,	15·00	14·17	118—120 ,,	29·50	21·36	66—68 ,,	35·50	30·14
			120—122 ,,	28·50	21·95	68—70 ,,	22·00	24·02
			122—124 ,,	17·50	20·14	70—72 ,,	14·00	17·27
			124—126 ,,	20·50	16·54	72—74 ,,	7·50	10·11
			126—128 ,,	13·00	13·55	74—88 ,,	10·00	8·91
			128—130 ,,	8·50	9·57			
			130—132 ,,	4·00	6·75			
			132—134 ,,	10·00	9·10			
TOTAL .	200·00	200·00		200·00	200·00		200·00	200·00
	$\chi^2=5·55$, D. F.$=4$			$\chi^2=14·73$, D. F.$=11$			$\chi^2=10·13$, D. F.$=8$	
	P$=0·2386$			P$=0·1976$			P$=0·2567$	

TABLE 3.—*Statistical Constants relating to Frequency Distributions.*

Character	Mean value with Standard Error	Standard Deviation with Standard Error	Coefficient of variation with Standard Error
	Age Group 15—19 years, N=46		
Stature . . .	1646·30±11·1894	75·89±7·9121	4·61±0·4817
Head Length . .	181·78±1·3226	8·97±0·9352	4·93±0·5152
Head Breadth . .	142·35±0·8154	5·53±0·5765	3·88±0·4050
Nasal Length . .	48·59±0·6016	4·08±0·4254	8·40±0·8820
Nasal Breadth . .	34·63±0·4526	3·07±0·3200	8·87±0·9320
Zygomatic Breadth .	117·15±1·0763	7·30±0·7611	6·23±0·6516
Upper Facial Length .	63·85±0·7033	4·77±0·4973	7·47±0·7827
	Age Group 20—48 years, N=145		
Stature . . .	1659·93±5·4553	65·69±3·8574	3·96±0·2329
Head Length . .	182·30±0·7051	8·49±0·4985	4·66±0·2743
Head Breadth . .	142·77±0·5008	6·03±0·3541	4·22±0·2483
Nasal Length . .	50·59±0·3621	4·36±0·2560	8·62±0·5100
Nasal Breadth . .	35·81±0·2558	3·08±0·1809	8·60±0·5088
Zygomatic Breadth .	120·38±0·5929	7·14±0·4193	5·93±0·3494
Upper Facial Length .	65·89±0·4302	5·18±0·3042	7·86±0·4645

TABLE 4.—*Non-linear Regression on Age.*

(N = 191. Absolute measurements in mm.)

Character	Cubic Equation of Regression on Age (t=years)			
(1)	(2)			
Stature . . .	Y=1645·2471	—13·5324 t	+0·7415 t^2	—0·01069 t^3
Head Length . .	Y= 179·5459	—1·4542 t	+0·0710 t^2	—0·00824 t^3
Head Breadth . .	Y= 171·3794	—3·5696 t	+0·1353 t^2	—0·00157 t^3
Nasal Length . .	Y= 23·8112	+1·9150 t	—0·0702 t^2	+0·00065 t^3
Nasal Breadth . .	Y= 27·1259	+0·6506 t	—0·0143 t^2	+0·00009 t^3
Zygomatic Breadth .	Y= 89·5022	+2·1949 t	—0·0428 t^2	+0·00019 t^3
Upper Facial Length .	Y= 42·8450	+1·8791 t	—0·0468 t^2	+0·00036 t^3
Cephalic Index . .	Y= 90·9972	—1·2977 t	+0·0416 t^2	—0·00040 t^3
Nasal Index . .	Y= 77·6140	—0·4450 t	+0·0070 t^2	+0·00001 t^3

TABLE 5.—*Variations with Age.*

(Calculated from cubic regression on age. All absolute measurements in mm.)

Age in Years	Stature		Head Length		Head Breadth		Nasal Length		Nasal Breadth	
	Observed	Calculated	Observed	Calculated	Observed	Calculated	Observed	Calculated	Observed	Calculated
(1)	(2·1)	(2·2)	(3·1)	(3·2)	(4·1)	(4·2)	(5·1)	(5·2)	(6·1)	(6·2)
15	1446·00	1632·60	179·50	180·54	144·00	142·98	44·00	46·70	38·00	34·04
16	1651·00	1634·46	175·75	180·60	144·50	142·46	50·05	47·45	34·75	34·37
17	1624·75	1635·88	182·63	180·70	139·75	142·00	48·12	48·07	33·38	34·65
18	1638·44	1639·48	183·22	180·85	143·44	141·80	47·44	48·60	35·11	34·83
19	1666·17	1642·49	182·29	181·04	142·47	141·68	49·04	49·14	34·70	35·04
20	1633·21	1645·74	179·27	181·26	141·37	141·53	49·68	49·48	34·16	35·21
21	1680·75	1649·16	181·12	181·51	141·37	141·37	50·00	49·94	36·06	35·38
22	1658·47	1652·68	181·32	181·78	142·58	141·59	50·58	50·30	36·26	35·54
23	1644·13	1656·68	184·50	182·06	139·12	141·65	48·38	50·51	35·38	35·68
24	1642·91	1659·71	183·00	182·35	143·37	141·90	44·72	50·65	38·00	35·80
25	1619·00	1663·08	183·00	182·65	147·00	142·00	53·16	50·87	35·50	35·91
26	1653·00	1666·26	179·50	182·95	142·50	142·39	52·12	51·00	35·75	36·00
27	1711·38	1669·18	186·44	183·23	144·67	142·62	49·56	51·06	35·22	36·08
28	1664·80	1671·76	183·40	183·51	144·80	142·98	51·80	51·14	35·20	36·15
29	1648·00	1673·93	181·88	183·77	142·75	143·30	52·50	51·21	35·62	36·21
30	1683·33	1675·62	182·33	184·00	141·50	143·59	52·50	51·12	35·66	36·25
31	1716·00	1676·76	190·00	184·20	143·00	143·92	56·00	51·04	35·00	36·28
32	1667·67	1677·28	188·00	184·37	143·00	144·11	49·50	50·97	38·83	36·31
33	1676·33	1677·10	180·33	184·49	150·00	144·45	51·00	50·89	32·00	36·32
35	1698·67	1674·96	189·33	184·60	147·00	144·74	47·66	50·70	36·00	36·33
38	1644·00	1673·24	180·00	184·29	139·00	144·80	52·00	50·35	37·00	36·27
39	1662·00	1667·37	188·00	184·05	141·00	144·60	50·00	50·28	38·50	36·24
40	1848·00	1650·30	186·00	183·72	154·00	144·40	52·00	50·16	35·50	36·20
41	1638·00	1645·90	164·00	183·31	142·00	144·00	50·00	50·12	35·00	36·15
42	1730·00	1632·28	190·00	182·81	147·00	143·56	53·00	50·08	37·00	36·10
43	1540·00	1621·18	173·00	182·80	132·00	143·00	43·00	50·03	35·00	36·05
44	1610·00	1609·59	190·00	181·49	150·00	142·25	52·00	50·00	36·00	36·00
45	1598·00	1594·44	182·00	180·68	144·00	141·36	55·00	50·05	36·00	35·94
48	1574·00	1541·92	170·00	177·51	138·00	137·72	47·00	50·11	35·00	35·74

TABLE 5.—*Variations with Age*—contd.

(Calculated from cubic regression on age. All absolute measurements in mm.)—*contd.*

Age in Years.	Zygomatic Breadth		Upper Facial Length		Cephalic Index		Nasal Index	
	Observed	Calculated	Observed	Calculated	Observed	Calculated	Observed	Calculated
(1)	(7·1)	(7·2)	(8·1)	(8·2)	(9·1)	(9·2)	(10·1)	(10·2)
15	124·00	114·00	56·00	61·73	80·90	79·49	86·40	72·54
16	113·00	114·70	64·50	62·42	82·40	79·18	68·78	72·32
17	114·05	115·57	62·88	63·06	76·58	78·92	69·84	72·11
18	119·00	116·34	62·33	63·63	78·46	78·70	75·06	71·92
19	117·07	117·16	64·96	64·19	78·33	78·51	71·13	71·75
20	116·04	117·87	64·74	64·62	78·96	78·36	69·04	71·58
21	120·09	118·65	64·56	65·00	78·12	78·25	72·39	71·44
22	117·09	119·30	64·72	65·50	78·75	78·16	71·97	71·31
23	117·02	120·06	66·13	65·92	75·71	78·11	73·46	71·20
24	122·07	120·67	64·27	66·14	78·46	78·08	77·05	71·10
25	120·05	121·00	65·67	66·27	80·38	78·07	66·87	71·02
26	124·00	121·28	69·76	66·65	79·54	78·08	69·90	70·96
27	119·04	121·78	64·00	66·91	77·77	78·11	71·36	70·92
28	123·08	122·00	67·00	67·00	79·08	78·15	68·50	70·89
29	124·00	122·05	67·87	67·01	78·76	78·21	68·09	70·89
30	121·00	122·10	68·33	66·94	77·69	78·27	68·23	70·90
31	131·00	122·25	75·00	67·00	75·30	78·34	62·50	70·93
32	122·03	122·30	64·50	66·98	76·07	78·42	78·83	70·98
33	119·03	122·35	66·00	66·95	83·37	78·50	62·73	71·05
35	125·06	122·30	65·00	66·90	77·63	78·65	75·93	71·25
38	120·00	121·80	65·00	66·85	77·20	78·83	71·10	71·70
39	123·00	121·50	65·00	66·80	75·50	78·87	77·00	71·89
40	127·00	121·10	70·00	66·44	82·80	78·89	67·30	72·10
41	120·00	120·90	62·00	66·35	86·60	78·89	70·00	72·34
42	120·00	120·50	70·00	66·32	77·40	78·87	69·75	72·60
43	110·00	120·20	65·00	66·24	76·30	78·82	81·40	72·88
44	122·00	119·87	71·00	66·00	78·90	78·75	69·20	73·18
45	116·00	119·37	66·00	65·83	84·70	78·65	65·40	73·51
48	126·00	117·63	62·00	65·50	75·80	78·14	74·50	74·63

Table 6.—*Analysis of Variance: Non-Linear Regression on Age.*

(N = 191.)

Variance due to	D. F.	Sum of Squares	Variance	Ratio of Variances
(1)	(2)	(3)	(4)	(5)
Stature				
Linear Regression	1	12864·98	12864·98	3·09
Improvement	2	15957·89	7978·95	1·90
Cubic Regression	3	28822·87	9607·62	2·30
Deviation from Cubic	25	180220·04	7208·80	1·73*
Between Age Groups	28	209042·91	7465·82	1·79*
Within Age Groups	162	675513·00	4169·83	
Head Length				
Linear Regression	1	118·80	118·80	1·61
Improvement	2	347·85	173·93	2·36
Cubic Regression	3	466·65	155·55	2·11
Deviation from Cubic	25	1457·12	58·28	0·79
Between Age Groups	28	1933·77	69·06	0·94
Within Age Groups	162	11950·99	73·77	
Head Breadth				
Linear Regression	1	71·84	71·84	2·11
Improvement	2	76·75	38·38	1·13
Cubic Regression	3	148·59	49·53	1·45
Deviation from Cubic	25	934·24	37·37	1·10
Between Age Groups	28	1082·83	38·67	1·13
Within Age Groups	162	5521·37	34·08	
Nasal Length				
Linear Regression	1	90·83	90·83	5·00*
Improvement	2	124·07	62·03	3·41*
Cubic Regression	3	214·90	71·63	3·94**
Deviation from Cubic	25	363·96	14·56	0·80
Between Age Groups	28	578·86	20·67	1·14
Within Age Groups	162	2942·83	18·16	

* Significant at 5 per cent. level. ** Significant at 1 per cent. level.

TABLE 6.—*Analysis of Variance : Non-Linear Regression on Age*—contd.

(N = 191.)

Variance due to	D. F.	Sum of Squares	Variance	Ratio of Variances
(1)	(2)	(3)	(4)	(5)
NASAL BREADTH				
Linear Regression . . .	1	41·01	41·01	4·68*
Improvement	2	11·67	5·84	0·67
Cubic Regression . . .	3	55·68	18·56	2·12
Deviation from Cubic . .	25	257·17	10·29	1·17
Between Age Groups . .	28	312·85	11·17	1·28
Within Age Groups . . .	162	1418·75	8·76	
ZYGOMATIC BREADTH				
Linear Regression . . .	1	496·63	496·63	10·61**
Improvement	2	325·48	162·74	3·47*
Cubic Regression . . .	3	822·11	274·04	5·85**
Deviation from Cubic . .	25	1034·86	41·39	0·88
Between Age Groups . .	28	1856·97	66·32	1·42
Within Age Groups . . .	162	7586·73	46·83	
UPPER FACIAL LENGTH				
Linear Regression . . .	1	172·69	172·69	6·76**
Improvement	2	91·59	45·79	1·79
Cubic Regression . . .	3	264·28	88·09	3·45*
Deviation from Cubic . .	25	539·75	21·59	0·85
Between Age Groups . .	28	804·03	28·71	1·12
Within Age Groups . . .	162	4137·72	25·54	
CEPHALIC INDEX				
Linear Regression . . .	1	0·61	0·61	0·03
Improvement	2	56·04	28·02	1·44
Cubic Regression . .	3	56·65	18·88	0·97
Deviation from Cubic . .	25	480·39	19·21	0·98
Between Age Groups . .	28	537·04	19·18	0·98
Within Age Groups . . .	162	3160·67	19·51	

* Significant at 5 per cent. level. ** Significant at 1 per cent. level.

Table 6.—*Analysis of Variance : Non-Linear Regression on Age*—concld.

(N=191.)

Variance due to	D. F.	Sum of Squares	Variance	Ratio of Variances
(1)	(2)	(3)	(4)	(5)
Nasal Index				
Linear Regression . . .	1	16·86	16·86	0·23
Improvement	2	60·40	30·20	0·41
Cubic Regression . . .	3	77·26	25·75	0·35
Deviation from Cubic . .	25	2150·67	86·03	1·18
Between Age Groups . .	28	2227·93	79·57	1·09
Within Age Groups . . .	162	11855·53	73·18	

Table 7.—*Coefficients of Correlation between Characters.*

Characters	Age 15—19 years, N=46	Age 20—48 years, N=145	All Ages, N=200
(1)	(2)	(3)	(4)
Stature and Head Length	0·2462 ± 0·1400	0·3977* ± 0·0702	0·3576* ± 0·0618
,, ,, Head Breadth	—0·0541 ± 0·1486	0·2690* ± 0·0773	0·1930* ± 0·0682
,, ,, Nasal Length	0·1707 ± 0·1447	0·1638* ± 0·0811	0·1758* ± 0·0687
,, ,, Nasal Breadth . . .	0·0732 ± 0·1483	0·1476 ± 0·0815	0·1279 ± 0·0697
,, ,, Zygomatic Breadth . . .	0·2863 ± 0·1369	0·2733* ± 0·0771	0·2684* ± 0·0658
,, ,, Upper Facial Length . .	0·1537 ± 0·1456	0·3060* ± 0·0755	0·2871* ± 0·0650
Head Length and Stature	0·2462 ± 0·1400	0·3977* ± 0·0702	0·3576* ± 0·0618
,, ,, ,, Head Breadth . .	0·0347 ± 0·1489	0·2401* ± 0·0785	0·2034* ± 0·0680
,, ,, ,, Nasal Length . . .	—0·2549 ± 0·1394	0·0949 ± 0·0826	0·0149 ± 0·0709
,, ,, ,, Nasal Breadth . .	0·4176* ± 0·1231	0·2075* ± 0·0797	0·2551* ± 0·0663
,, ,, ,, Zygomatic Breadth . .	0·4014* ± 0·1250	0·3299* ± 0·0743	0·3501* ± 0·0622
,, ,, ,, Upper Facial Length .	—0·1108 ± 0·1472	0·1446 ± 0·0816	0·0954 ± 0·0702
Head Breadth and Stature	—0·0541 ± 0·1486	0·2690* ± 0·0773	0·1930* ± 0·0682
,, ,, ,, Head Length . .	0·0347 ± 0·1489	0·2401* ± 0·0785	0·2034* ± 0·0680
,, ,, ,, Nasal Length . .	0·3226* ± 0·1336	0·1915* ± 0·0803	0·2066* ± 0·0679
,, ,, ,, Nasal Breadth . .	0·0995 ± 0·1476	0·0564 ± 0·0831	0·0715 ± 0·0705
,, ,, ,, Zygomatic Breadth .	0·0532 ± 0·1486	0·2514* ± 0·0781	0·2162* ± 0·0676
,, ,, ,, Upper Facial Length .	0·1714 ± 0·1447	0·1027 ± 0·0825	0·1282 ± 0·0697

* Significant values are marked with a star (*).

TABLE 7.—*Coefficients of Correlation between Characters*—contd.

Characters	Age 15—19 years, N = 46	Age 20—48 years, N = 145	All Ages, N = 200
(1)	(2)	(3)	(4)
Nasal Length and Stature	0·1707 ± 0·1447	0·1638* ± 0·0811	0·1758* ± 0·0687
„ „ „ Head Length	—0·2549 ± 0·1394	0·0949 ± 0·0826	0·0149 ± 0·0709
„ „ „ Head Breadth	0·3226* ± 0·1336	0·1915* ± 0·0803	0·2066* ± 0·0679
„ „ „ Nasal Breadth	—0·0604 ± 0·1485	—0·0150 ± 0·0833	0·0024 ± 0·0709
„ „ „ Zygomatic Breadth	—0·1821 ± 0·1441	0·2322* ± 0·0788	0·1359 ± 0·0696
„ „ „ Upper Facial Length	0·7357* ± 0·0684	0·6345* ± 0·0498	0·6587* ± 0·0401
Nasal Breadth and Stature	0·0732 ± 0·1483	0·1476 ± 0·0815	0·1279 ± 0·0697
„ „ „ Head Length	0·4176* ± 0·1231	0·2075* ± 0·0797	0·2551* ± 0·0663
„ „ „ Head Breadth	0·0995 ± 0·1476	0·0564 ± 0·0831	0·0715 ± 0·0705
„ „ „ Nasal Length	—0·0604 ± 0·1485	—0·0150 ± 0·0833	0·0024 ± 0·0709
„ „ „ Zygomatic Breadth	0·3876* ± 0·1267	0·1902* ± 0·0803	0·2611* ± 0·0661
„ „ „ Upper Facial Length	—0·0123 ± 0·1488	0·0531 ± 0·0831	0·0567 ± 0·0707
Zygomatic Breadth and Stature	0·2863 ± 0·1369	0·2733* ± 0·0771	0·2684* ± 0·0658
„ „ „ Head Length	0·4014* ± 0·1250	0·3299* ± 0·0743	0·3501* ± 0·0622
„ „ „ Head Breadth	0·0532 ± 0·1486	0·2514* ± 0·0781	0·2162* ± 0·0676
„ „ „ Nasal Length	—0·1821 ± 0·1441	0·2322* ± 0·0788	0·1359 ± 0·0696
„ „ „ Nasal Breadth	0·3876* ± 0·1267	0·1902* ± 0·0803	0·2611* ± 0·0661
„ „ „ Upper Facial Length	—0·1409 ± 0·1461	0·3123* ± 0·0752	0·2178* ± 0·0675
Upper Facial Length and Stature	0·1537 ± 0·1456	0·3060* ± 0·0755	0·2871* ± 0·0650
„ „ „ „ Head Length	—0·1108 ± 0·1472	0·1446 ± 0·0816	0·0954 ± 0·0702
„ „ „ „ Head Breadth	0·1714 ± 0·1447	0·1027 ± 0·0825	0·1282 ± 0·0697
„ „ „ „ Nasal Length	0·7357* ± 0·0684	0·6345* ± 0·0498	0·6587* ± 0·0401
„ „ „ „ Nasal Breadth	—0·0123 ± 0·1488	0·0531 ± 0·0831	0·0567 ± 0·0707
„ „ „ „ Zygomatic Breadth	—0·1409 ± 0·1461	0·3123* ± 0·0752	0·2178* ± 0·0675

* Significant values are marked with a star (*).

TABLE 8.—*Analysis for Testing Non-linearity of Regression.*

(Age Group 15—19 years, N = 46)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
HEAD LENGTH ON STATURE						
Linear Regression	1	219·55	219·55	2·60	4·15	$r = +0·2462$
Deviation from Linearity	12	695·83	57·99	0·69	2·07	$r^2 = 0·0606$
Between Group	13	915·38	70·41	0·83	2·04	$\eta^2 = 0·2528$
Within Group	32	2705·95	84·56			
TOTAL	45	3621·33	80·47			
HEAD BREADTH ON STATURE						
Linear Regression	1	4·02	4·02	0·11	4·15	$r = -0·0541$
Deviation from Linearity	12	223·45	18·62	0·52	2·07	$r^2 = 0·0029$
Between Group	13	227·47	17·50	0·49	2·04	$\eta^2 = 0·1655$
Within Group	32	1146·96	35·84			
TOTAL	45	1374·43	30·54			
NASAL LENGTH ON STATURE						
Linear Regression	1	21·85	21·85	1·37	4·15	$r = +0·1707$
Deviation from Linearity	12	217·24	18·10	1·13	2·07	$r^2 = 0·0291$
Between Group	13	239·09	18·39	1·15	2·04	$\eta^2 = 0·3187$
Within Group	32	511·06	15·97			
TOTAL	45	750·15	16·67			
NASAL BREADTH ON STATURE						
Linear Regression	1	2·27	2·27	0·22	4·15	$r = +0·0732$
Deviation from Linearity	12	98·42	8·20	0·81	2·07	$r^2 = 0·0054$
Between Group	13	100·69	7·75	0·77	2·04	$\eta^2 = 0·2376$
Within Group	32	323·03	10·09			
TOTAL	45	423·72	9·42			
ZYGOMATIC BREADTH ON STATURE						
Linear Regression	1	196·48	196·48	3·76	4·15	$r = +0·2863$
Deviation from Linearity	12	530·13	44·18	0·85	2·07	$r^2 = 0·0820$
Between Group	13	726·61	55·89	1·07	2·04	$\eta^2 = 0·3031$
Within Group	32	1670·32	52·20			
TOTAL	45	2396·93	53·27			
UPPER FACIAL LENGTH ON STATURE						
Linear Regression	1	24·19	24·19	1·05	4·15	$r = +0·1537$
Deviation from Linearity	12	261·11	21·76	0·94	2·07	$r^2 = 0·0236$
Between Group	13	285·30	21·95	0·95	2·04	$\eta^2 = 0·2784$
Within Group	32	739·63	23·11			
TOTAL	45	1024·93	22·78			

TABLE 8.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 15—19 years, N = 46).

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON HEAD LENGTH						
Linear Regression	1	15712·54	15712·54	2·47	4·16	$r = +0·2462$
Deviation from Linearity	13	46492·14	3576·32	0·56	2·05	$r^2 = 0·0606$
Between Group	14	62204·68	4443·19	0·70	2·02	$\eta^2 = 0·2400$
Within Group	31	196967·04	6353·78			
TOTAL	45	259171·72	5759·37			
HEAD BREADTH ON HEAD LENGTH						
Linear Regression	1	1·66	1·66	0·04	4·16	$r = +0·0347$
Deviation from Linearity	13	213·69	16·44	0·44	2·05	$r^2 = 0·0012$
Between Group	14	215·35	15·38	0·41	2·02	$\eta^2 = 0·1567$
Within Group	31	1159·08	37·39			
TOTAL	45	1374·43	30·54			
NASAL LENGTH ON HEAD LENGTH						
Linear Regression	1	48·75	48·75	2·55	4·16	$r = -0·2549$
Deviation from Linearity	13	109·14	8·40	0·44	2·05	$r^2 = 0·0650$
Between Group	14	157·89	11·28	0·59	2·02	$\eta^2 = 0·2105$
Within Group	31	592·26	19·11			
TOTAL	45	750·15	16·67			
NASAL BREADTH ON HEAD LENGTH						
Linear Regression	1	73·90	73·90	7·54*	4·16	$r = +0·4176$*
Deviation from Linearity	13	46·18	3·55	0·36	2·05	$r^2 = 0·1744$
Between Group	14	120·08	8·58	0·88	2·02	$\eta^2 = 0·2834$
Within Group	31	303·64	9·79			
TOTAL	45	423·72	9·42			
ZYGOMATIC BREADTH ON HEAD LENGTH						
Linear Regression	1	386·28	386·28	6·95*	4·16	$r = +0·4014$*
Deviation from Linearity	13	287·98	22·15	0·40	2·05	$r^2 = 0·1612$
Between Group	14	674·26	48·16	0·87	2·02	$\eta^2 = 0·2813$
Within Group	31	1722·67	55·57			
TOTAL	45	2396·93	53·27			
UPPER FACIAL LENGTH ON HEAD LENGTH						
Linear Regression	1	12·59	12·59	0·47	4·16	$r = -0·1108$
Deviation from Linearity	13	187·40	14·42	0·54	2·05	$r^2 = 0·0123$
Between Group	14	199·99	14·29	0·54	2·02	$\eta^2 = 0·1951$
Within Group	31	824·94	26·61			
TOTAL	45	1024·93	22·78			

TABLE 8.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 15—19 years, N = 46)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON HEAD BREADTH						
Linear Regression	1	758·08	758·08	0·12	4·13	$r = -0·0541$
Deviation from Linearity	10	51431·24	5143·12	0·84	2·12	$r^2 = 0·0029$
Between Group	11	52189·32	4744·48	0·78	2·07	$\eta^2 = 0·2014$
Within Group	34	206982·40	6087·72			
TOTAL	45	259171·72	5759·37			
HEAD LENGTH ON HEAD BREADTH						
Linear Regression	1	4·36	4·36	0·06	4·13	$r = +0·0347$
Deviation from Linearity	10	1114·22	111·42	1·51	2·12	$r^2 = 0·0012$
Between Group	11	1118·58	101·69	1·38	2·07	$\eta^2 = 0·3089$
Within Group	34	2502·75	73·61			
TOTAL	45	3621·33	80·47			
NASAL LENGTH ON HEAD BREADTH						
Linear Regression	1	78·08	78·08	5·80*	4·13	$r = +0·3226$*
Deviation from Linearity	10	213·93	21·39	1·58	2·12	$r^2 = 0·1041$
Between Group	11	292·01	26·55	1·97	2·07	$\eta^2 = 0·3893$
Within Group	34	458·14	13·47			
TOTAL	45	750·15	16·67			
NASAL BREADTH ON HEAD BREADTH						
Linear Regression	1	4·19	4·19	0·41	4·13	$r = +0·0995$
Deviation from Linearity	10	72·89	7·29	0·72	2·12	$r^2 = 0·0099$
Between Group	11	77·08	7·01	0·69	2·07	$\eta^2 = 0·1819$
Within Group	34	346·64	10·20			
TOTAL	45	423·72	9·42			
ZYGOMATIC BREADTH ON HEAD BREADTH						
Linear Regression	1	6·78	6·78	0·16	4·13	$r = +0·0532$
Deviation from Linearity	10	961·37	96·14	2·29*	2·12	$r^2 = 0·0028$
Between Group	11	968·15	88·01	2·09*	2·07	$\eta^2 = 0·4039$
Within Group	34	1428·78	42·02			
TOTAL	45	2396·93	53·27			
UPPER FACIAL LENGTH ON HEAD BREADTH						
Linear Regression	1	30·11	30·11	1·32	4·13	$r = +0·1714$
Deviation from Linearity	10	220·94	22·09	0·97	2·12	$r^2 = 0·0294$
Between Group	11	251·05	22·82	1·00	2·07	$\eta^2 = 0·2449$
Within Group	34	773·88	22·76			
TOTAL	45	1024·93	22·78			

TABLE 8.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 15—19 years, N = 46)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON NASAL LENGTH						
Linear Regression	1	7548·38	7548·38	1·17	4·11	$r = +0·1707$
Deviation from Linearity	8	19294·62	2411·83	0·37	2·21	$r^2 = 0·0291$
Between Group	9	26843·00	2982·56	0·46	2·16	$\eta^2 = 0·1036$
Within Group	36	232328·72	6453·58			
TOTAL	45	259171·72	5759·37			
HEAD LENGTH ON NASAL LENGTH						
Linear Regression	1	235·35	235·35	2·75	4·11	$r = -0·2549$
Deviation from Linearity	8	300·50	37·56	0·44	2·21	$r^2 = 0·0650$
Between Group	9	535·85	59·54	0·69	2·16	$\eta^2 = 0·1480$
Within Group	36	3085·48	85·71			
TOTAL	45	3621·33	80·47			
HEAD BREADTH ON NASAL LENGTH						
Linear Regression	1	143·06	143·06	4·98*	4·11	$r = +0·3226$*
Deviation from Linearity	8	197·55	24·69	0·86	2·21	$r^2 = 0·1041$
Between Group	9	340·61	37·85	1·32	2·16	$\eta^2 = 0·2478$
Within Group	36	1033·82	28·72			
TOTAL	45	1374·43	30·54			
NASAL BREADTH ON NASAL LENGTH						
Linear Regression	1	1·54	1·54	0·16	4·11	$r = -0·0604$
Deviation from Linearity	8	74·36	9·29	0·97	2·21	$r^2 = 0·0036$
Between Group	9	75·90	8·43	0·88	2·16	$\eta^2 = 0·1791$
Within Group	36	347·82	9·61			
TOTAL	45	423·72	9·42			
ZYGOMATIC BREADTH ON NASAL LENGTH						
Linear Regression	1	79·44	79·44	1·51	4·11	$r = -0·1821$
Deviation from Linearity	8	423·26	52·91	1·01	2·21	$r^2 = 0·0331$
Between Group	9	502·70	55·86	1·06	2·16	$\eta^2 = 0·2097$
Within Group	36	1894·23	52·62			
TOTAL	45	2396·93	53·27			
UPPER FACIAL LENGTH ON NASAL LENGTH						
Linear Regression	1	554·80	554·80	56·29*	4·11	$r = +0·7357$*
Deviation from Linearity	8	115·30	14·41	1·46	2·21	$r^2 = 0·5413$
Between Group	9	670·10	74·46	7·55*	2·16	$\eta^2 = 0·6538$
Within Group	36	354·83	9·86			
TOTAL	45	1024·93	22·78			

TABLE 8.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 15—19 years, N = 46)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON NASAL BREADTH						
Linear Regression	1	1389·16	1389·16	0·23	4·09	$r = +0·0732$
Deviation from Linearity	6	27347·40	4557·90	0·75	2·35	$r^2 = 0·0054$
Between Group	7	28736·56	4105·22	0·68	2·26	$\eta^2 = 0·1109$
Within Group	38	230435·16	6064·08			
TOTAL	45	259171·72	5759·37			
HEAD LENGTH ON NASAL BREADTH						
Linear Regression	1	631·60	631·60	8·55*	4·09	$r = +0·4176$*
Deviation from Linearity	6	183·07	30·51	0·41	2·35	$r^2 = 0·1744$
Between Group	7	814·67	116·38	1·58	2·26	$\eta^2 = 0·2250$
Within Group	38	2806·66	73·86			
TOTAL	45	3621·33	80·47			
HEAD BREADTH ON NASAL BREADTH						
Linear Regression	1	13·60	13·60	0·41	4·09	$r = +0·0995$
Deviation from Linearity	6	113·87	18·98	0·58	2·35	$r^2 = 0·0099$
Between Group	7	127·47	18·21	0·55	2·26	$\eta^2 = 0·0927$
Within Group	38	1246·96	32·81			
TOTAL	45	1374·43	30·54			
NASAL LENGTH ON NASAL BREADTH						
Linear Regression	1	2·73	2·73	0·15	4·09	$r = -0·0604$
Deviation from Linearity	6	63·35	10·56	0·57	2·35	$r^2 = 0·0036$
Between Group	7	66·08	9·44	0·52	2·26	$\eta^2 = 0·0881$
Within Group	38	684·07	18·00			
TOTAL	45	750·15	16·67			
ZYGOMATIC BREADTH ON NASAL BREADTH						
Linear Regression	1	360·07	360·07	6·92*	4·09	$r = +0·3876$*
Deviation from Linearity	6	59·87	9·98	0·19	2·35	$r^2 = 0·0150$
Between Group	7	419·94	59·99	1·15	2·26	$\eta^2 = 0·1752$
Within Group	38	1976·99	52·03			
TOTAL	45	2396·93	53·27			
UPPER FACIAL LENGTH ON NASAL BREADTH						
Linear Regression	1	1·55	1·55	0·06	4·09	$r = -0·0123$
Deviation from Linearity	6	114·89	19·15	0·80	2·35	$r^2 = 0·0015$
Between Group	7	116·44	16·63	0·70	2·26	$\eta^2 = 0·1136$
Within Group	38	908·49	23·91			
TOTAL	45	1024·93	22·78			

TABLE 8.—*Analysis for Testing Non-linearity of Regression*—contd

(Age Group 15—19 years, N = 46)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON ZYGOMATIC BREADTH						
Linear Regression	1	21244·82	21244·82	2·93	4·18	$r = +0·2863$
Deviation from Linearity	15	27826·14	1855·08	0·26	2·02	$r^2 = 0·0820$
Between Group	16	49070·96	3066·94	0·53	2·00	$\eta^2 = 0·1893$
Within Group	29	210100·76	7244·85			
TOTAL	45	259171·72	5759·37			
HEAD LENGTH ON ZYGOMATIC BREADTH						
Linear Regression	1	583·59	583·59	6·46*	4·18	$r = +0·4014$*
Deviation from Linearity	15	418·19	27·88	0·31	2·02	$r^2 = 0·1612$
Between Group	16	1001·78	62·61	0·69	2·00	$\eta^2 = 0·2766$
Within Group	29	2619·55	90·33			
TOTAL	45	3621·33	80·47			
HEAD BREADTH ON ZYGOMATIC BREADTH						
Linear Regression	1	3·89	3·89	0·11	4·18	$r = +0·0532$
Deviation from Linearity	15	323·83	21·59	0·60	2·02	$r^2 = 0·0028$
Between Group	16	327·72	20·48	0·57	2·00	$\eta^2 = 0·2384$
Within Group	29	1046·71	36·09			
TOTAL	45	1374·43	30·54			
NASAL LENGTH ON ZYGOMATIC BREADTH						
Linear Regression	1	24·86	24·86	1·23	4·18	$r = -0·1821$
Deviation from Linearity	15	139·16	9·27	0·46	2·02	$r^2 = 0·0331$
Between Group	16	164·02	10·25	0·51	2·00	$\eta^2 = 0·2186$
Within Group	29	586·13	20·21			
TOTAL	45	750·15	16·67			
NASAL BREADTH ON ZYGOMATIC BREADTH						
Linear Regression	1	63·65	63·65	6·36*	4·18	$r = +0·3876$*
Deviation from Linearity	15	69·63	4·64	0·46	2·02	$r^2 = 0·1502$
Between Group	16	133·28	8·33	0·83	2·00	$\eta^2 = 0·3145$
Within Group	29	290·44	10·02			
TOTAL	45	423·72	9·42			
UPPER FACIAL LENGTH ON ZYGOMATIC BREADTH						
Linear Regression	1	20·36	20·36	0·73	4·18	$r = -0·1409$
Deviation from Linearity	15	198·95	13·26	0·48	2·02	$r^2 = 0·0199$
Between Group	16	219·31	13·71	0·49	2·00	$\eta^2 = 0·2140$
Within Group	29	805·62	27·78			
TOTAL	45	1024·93	22·78			

TABLE 8.—*Analysis for Testing Non-linearity of Regression*—concld.

(Age Group 15—19 years, N = 46)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON UPPER FACIAL LENGTH						
Linear Regression	1	6117·49	6117·49	0·93	4·12	$r = +0·1537$
Deviation from Linearity	9	23443·23	2604·80	0·40	2·16	$r^2 = 0·0236$
Between Group	10	29560·72	2956·07	0·45	2·12	$\eta^2 = 0·1141$
Within Group	35	229611·00	6560·31			
TOTAL	45	259171·72	5759·37			
HEAD LENGTH ON UPPER FACIAL LENGTH						
Linear Regression	1	44·49	44·49	0·52	4·12	$r = -0·1108$
Deviation from Linearity	9	565·84	62·87	0·73	2·16	$r^2 = 0·0123$
Between Group	10	610·33	61·03	0·71	2·12	$\eta^2 = 0·1685$
Within Group	35	3011·00	86·03			
TOTAL	45	3621·33	80·47			
HEAD BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	40·38	40·38	1·30	4·12	$r = +0·1714$
Deviation from Linearity	9	245·80	27·31	0·88	2·16	$r^2 = 0·0294$
Between Group	10	286·18	28·62	0·92	2·12	$\eta^2 = 0·2082$
Within Group	35	1088·25	31·09			
TOTAL	45	1374·43	30·54			
NASAL LENGTH ON UPPER FACIAL LENGTH						
Linear Regression	1	406·06	406·06	49·25*	4·12	$r = +0·7357$*
Deviation from Linearity	9	55·54	6·17	0·75	2·16	$r^2 = 0·5413$
Between Group	10	461·60	46·16	5·60*	2·12	$\eta^2 = 0·6153$
Within Group	35	288·55	8·24			
TOTAL	45	750·15	16·67			
NASAL BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	0·64	0·64	0·06	4·12	$r = -0·0123$
Deviation from Linearity	9	59·90	6·66	0·64	2·16	$r^2 = 0·0015$
Between Group	10	60·54	6·05	0·58	2·12	$\eta^2 = 0·1429$
Within Group	35	363·18	10·38			
TOTAL	45	423·72	9·42			
ZYGOMATIC BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	47·62	47·62	0·78	4·12	$r = -0·1409$
Deviation from Linearity	9	219·81	24·40	0·40	2·16	$r^2 = 0·0199$
Between Group	10	267·23	26·72	0·44	2·12	$\eta^2 = 0·1115$
Within Group	35	2129·70	60·85			
TOTAL	45	2396·93	53·27			

TABLE 9.—*Analysis for Testing Non-linearity of Regression*

(Age Group 20—48 years, N = 145)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
HEAD LENGTH ON STATURE						
Linear Regression	1	1642·20	1642·20	26·86*	3·92	$r = 0.3977^*$
Deviation from Linearity	17	1039·23	61·13	1·00	1·69	$r^2 = 0.1581$
Between Group	18	2681·43	148·97	2·44*	1·68	$\eta^2 = 0.2582$
Within Group	126	7703·53	61·14			
TOTAL	144	10384·90	72·12			
HEAD BREADTH ON STATURE						
Linear Regression	1	379·12	379·12	11·67*	3·92	$r = +0.2690^*$
Deviation from Linearity	17	767·79	45·16	1·39	1·69	$r^2 = 0.0723$
Between Group	18	1146·91	63·72	1·96*	1·68	$\eta^2 = 0.2188$
Within Group	126	4094·58	32·50			
TOTAL	144	5241·49	36·40			
NASAL LENGTH ON STATURE						
Linear Regression	1	73·45	73·45	3·83	3·92	$r = +0.1638$
Deviation from Linearity	17	245·58	14·45	0·75	1·69	$r^2 = 0.0268$
Between Group	18	319·03	17·72	0·92	1·68	$\eta^2 = 0.1165$
Within Group	126	2418·96	19·20			
TOTAL	144	2737·99	19·01			
NASAL BREADTH ON STATURE						
Linear Regression	1	29·73	29·73	3·11	3·92	$r = +0.1476$
Deviation Linearity	17	129·85	7·64	0·80	1·69	$r^2 = 0.0218$
Between Group	18	159·58	8·87	0·93	1·68	$\eta^2 = 0.1170$
Within Group	126	1204·39	9·56			
TOTAL	144	1363·97	9·47			
ZYGOMATIC BREADTH ON STATURE						
Linear Regression	1	547·51	547·51	11·80*	3·92	$r = +0.2733^*$
Deviation from Linearity	17	938·98	55·23	1·19	1·69	$r^2 = 0.0747$
Between Group	18	1486·48	82·58	1·78*	1·68	$\eta^2 = 0.2027$
Within Group	126	5845·65	46·39			
TOTAL	144	7332·14	50·92			
UPPER FACIAL LENGTH ON STATURE						
Linear Regression	1	362·09	362·09	14·36*	3·92	$r = +0.3060^*$
Deviation from Linearity	17	328·20	19·31	0·76	1·69	$r^2 = 0.0936$
Between Group	18	690·29	38·35	1·52	1·68	$\eta^2 = 0.1785$
Within Group	126	3176·95	25·21			
TOTAL	144	3867·23	26·86			

Table 9.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 20—48 years, N = 145)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
Stature on Head Length						
Linear Regression	1	98247·93	98247·03	25·29*	3·92	$r = +0.3977^*$
Deviation from Linearity	16	29717·31	1857·33	4·78*	1·71	$r^2 = 0.1581$
Between Group	17	127965·24	7527·37	1·94*	1·69	$\eta^2 = 0.2060$
Within Group	127	493334·08	3884·52			
Total	144	621299·32	4314·58			
Head Breadth on Head Length						
Linear Regression	1	302·03	302·03	8·28*	3·92	$r = +0.2401^*$
Deviation from Linearity	16	306·65	19·17	0·53	1·71	$r^2 = 0.0576$
Between Group	17	608·68	35·80	0·98	1·69	$\eta^2 = 0.1161$
Within Group	127	4632·81	36·48			
Total	144	5241·49	36·40			
Nasal Length on Head Length						
Linear Regression	1	24·65	24·65	1·34	3·92	$r = +0.0949$
Deviation from Linearity	16	373·41	23·34	1·27	1·71	$r^2 = 0.0090$
Between Group	17	398·06	23·42	1·27	1·69	$\eta^2 = 0.1454$
Within Group	127	2339·93	18·42			
Total	144	2737·99	19·01			
Nasal Breadth on Head Length						
Linear Regression	1	58·69	58·69	6·15*	3·92	$r = +0.2075^*$
Deviation from Linearity	16	94·04	5·88	0·62	1·71	$r^2 = 0.0430$
Between Group	17	152·73	8·98	0·94	1·69	$\eta^2 = 0.1120$
Within Group	127	1211·24	9·54			
Total	144	1363·97	9·47			
Zygomatic Breadth on Head Length						
Linear Regression	1	798·03	798·03	17·42*	3·92	$r = +0.3299^*$
Deviation from Linearity	16	717·32	44·83	0·98	1·71	$r^2 = 0.1088$
Between Group	17	1515·35	89·14	1·95*	1·69	$\eta^2 = 0.2067$
Within Group	127	5816·78	45·80			
Total	144	7332·14	50·92			
Upper Facial Length on Head Length						
Linear Regression	1	80·86	80·86	3·24	3·92	$r = +0.1446$
Deviation from Linearity	16	612·27	38·27	1·53	1·71	$r^2 = 0.0209$
Between Group	17	693·14	40·77	1·63	1·69	$\eta^2 = 0.1792$
Within Group	127	3174·10	24·99			
Total	144	3867·23	26·86			

TABLE 9.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 20—48 years, N = 145)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON HEAD BREADTH						
Linear Regression	1	44939·20	44939·20	11·16*	3·92	$r = +0·2690$*
Deviation from Linearity	13	52953·12	4073·32	1·01	1·79	$r^2 = 0·0723$
Between Group	14	97892·32	6992·31	1·74	1·76	$\eta^2 = 0·1576$
Within Group	130	523407·00	4026·21			
TOTAL	144	621299·32	4314·58			
HEAD LENGTH ON HEAD BREADTH						
Linear Regression	1	598·40	598·40	8·63*	3·92	$r = +0·2401$*
Deviation from Linearity	13	773·46	59·50	0·86	1·79	$r^2 = 0·0576$
Between Group	14	1371·85	97·99	1·41	1·76	$\eta^2 = 0·1321$
Within Group	130	9013·04	69·33			
TOTAL	144	10384·90	72·12			
NASAL LENGTH ON HEAD BREADTH						
Linear Regression	1	100·44	100·44	5·27*	3·92	$r = +0·1915$*
Deviation from Linearity	13	161·11	12·39	0·65	1·79	$r^2 = 0·0367$
Between Group	14	261·55	18·68	0·98	1·76	$\eta^2 = 0·0955$
Within Group	130	2476·45	19·05			
TOTAL	144	2737·99	19·01			
NASAL BREADTH ON HEAD BREADTH						
Linear Regression	1	4·34	4·34	0·45	3·92	$r = +0·0564$
Deviation from Linearity	13	98·95	7·61	0·78	1·79	$r^2 = 0·0032$
Between Group	14	103·29	7·38	0·76	1·76	$\eta^2 = 0·0757$
Within Group	130	1260·69	9·70			
TOTAL	144	1363·97	9·47			
ZYGOMATIC BREADTH ON HEAD BREADTH						
Linear Regression	1	463·42	463·42	10·64*	3·92	$r = +0·2514$*
Deviation from Linearity	13	1206·72	92·82	2·13*	1·79	$r^2 = 0·0632$
Between Group	14	1670·14	119·30	2·74*	1·76	$\eta^2 = 0·2278$
Within Group	130	5661·99	43·55			
TOTAL	144	7332·14	50·92			
UPPER FACIAL LENGTH ON HEAD BREADTH						
Linear Regression	1	40·78	40·78	1·43	3·92	$r = +0·1027$
Deviation from Linearity	13	125·84	9·68	0·34	1·79	$r^2 = 0·0105$
Between Group	14	166·62	11·90	0·42	1·76	$\eta^2 = 0·0431$
Within Group	130	3700·61	28·47			
TOTAL	144	3867·23	26·86			

TABLE 9.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 20—48 years, N = 145)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON NASAL LENGTH						
Linear Regression	1	16668·22	16668·22	3·94*	3·92	$r = +0·1638$*
Deviation from Linearity	13	54123·54	4163·35	0·98	1·79	$r^2 = 0·0268$
Between Group	14	70791·76	5056·55	1·19	1·76	$\eta^2 = 0·1139$
Within Group	130	550507·56	4234·67			
TOTAL	144	621299·32	4314·58			
HEAD LENGTH ON NASAL LENGTH						
Linear Regression	1	93·49	93·49	1·20	3·92	$r = +0·0949$
Deviation from Linearity	13	97·53	7·50	0·96	1·79	$r^2 = 0·0090$
Between Group	14	191·02	13·64	0·17	1·76	$\eta^2 = 0·0184$
Within Group	130	10193·88	78·11			
TOTAL	144	10384·90	72·12			
HEAD BREADTH ON NASAL LENGTH						
Linear Regression	1	192·27	192·27	5·21*	3·92	$r = +0·1915$*
Deviation from Linearity	13	252·52	19·42	0·53	1·79	$r^2 = 0·0367$*
Between Group	14	444·80	31·77	0·86	1·76	$\eta^2 = 0·0849$
Within Group	130	4796·69	36·90			
TOTAL	144	5241·49	36·40			
NASAL BREADTH ON NASAL LENGTH						
Linear Regression	1	0·31	0·31	0·03	3·92	$r = -0·0150$
Deviation from Linearity	13	48·98	3·77	0·37	1·79	$r^2 = 0·0002$
Between Group	14	49·29	3·52	0·35	1·76	$\eta^2 = 0·0361$
Within Group	130	1314·68	10·11			
TOTAL	144	1363·97	9·47			
ZYGOMATIC BREADTH ON NASAL LENGTH						
Linear Regression	1	395·30	395·30	8·10*	3·92	$r = +0·2322$*
Deviation from Linearity	13	589·14	45·32	0·93	1·79	$r^2 = 0·0539$
Between Group	14	984·45	70·32	1·44	1·76	$\eta^2 = 0·1343$
Within Group	130	6347·69	48·83			
TOTAL	144	7332·14	50·92			
UPPER FACIAL LENGTH ON NASAL LENGTH						
Linear Regression	1	1556·64	1556·64	92·54*	3·92	$r = +0·6345$*
Deviation from Linearity	13	123·83	9·53	0·57	1·79	$r^2 = 0·4025$
Between Group	14	1680·47	120·03	7·14*	1·76	$\eta^2 = 0·4345$
Within Group	130	2186·76	16·82			
TOTAL	144	3867·23	26·86			

TABLE 9.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 20—48 years, N = 145)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON NASAL BREADTH						
Linear Regression	1	13543·70	13543·70	3·12	3·91	$r = +0·1476$
Deviation from Linearity	8	21741·62	2717·70	0·63	2·00	$r^2 = 0·0218$
Between Group	9	35285·32	3920·59	0·90	1·94	$\eta^2 = 0·0568$
Within Group	135	586014·00	4340·84			
TOTAL	144	621299·32	4314·58			
HEAD LENGTH ON NASAL BREADTH						
Linear Regression	1	446·87	446·87	6·25*	3·91	$r = +0·2075^*$
Deviation from Linearity	8	284·05	35·51	0·50	2·00	$r^2 = 0·0430$
Between Group	9	730·92	81·21	1·14	1·94	$\eta^2 = 0·0704$
Within Group	135	9653·98	71·51			
TOTAL	144	10384·90	72·12			
HEAD BREADTH ON NASAL BREADTH						
Linear Regression	1	16·68	16·68	0·47	3·91	$r = +0·0564$
Deviation from Linearity	8	421·13	52·64	1·48	2·00	$r^2 = 0·0032$
Between Group	9	437·82	48·65	1·37	1·94	$\eta^2 = 0·0835$
Within Group	135	4803·67	35·58			
TOTAL	144	5241·49	36·40			
NASAL LENGTH ON NASAL BREADTH						
Linear Regression	1	0·62	0·62	0·03	3·91	$r = -0·0150$
Deviation from Linearity	8	140·54	17·57	0·91	2·00	$r^2 = 0·0002$
Between Group	9	141·16	15·68	0·82	1·94	$\eta^2 = 0·0516$
Within Group	135	2596·83	19·24			
TOTAL	144	2737·99	19·01			
ZYGOMATIC BREADTH ON NASAL BREADTH						
Linear Regression	1	265·03	265·03	5·16*	3·91	$r = +0·1902^*$
Deviation from Linearity	8	134·31	16·79	0·33	2·00	$r^2 = 0·0361$
Between Group	9	399·34	44·37	0·86	1·94	$\eta^2 = 0·0545$
Within Group	135	6932·80	51·35			
TOTAL	144	7332·14	50·92			
UPPER FACIAL LENGTH ON NASAL BREADTH						
Linear Regression	1	10·92	10·92	0·39	3·91	$r = +0·0531$
Deviation from Linearity	8	102·04	12·76	0·46	2·00	$r^2 = 0·0028$
Between Group	9	112·96	12·55	0·46	1·94	$\eta^2 = 0·0292$
Within Group	135	3754·27	27·81			
TOTAL	144	3867·23	26·86			

TABLE 9.—*Analysis for Testing Non-linearity of Regression*—contd.

(Age Group 20—48 years, N = 145)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON ZYGOMATIC BREADTH						
Linear Regression	1	46393·66	46393·66	10·84*	3·92	r = +0·2733*
Deviation from Linearity	20	48527·30	2426·36	0·57	1·70	r^2 = 0·0747
Between Group	21	94920·96	4520·05	1·06	1·68	η^2 = 0·1528
Within Group	123	526378·36	4279·50			
TOTAL	144	621299·32	4314·58			
HEAD LENGTH ON ZYGOMATIC BREADTH						
Linear Regression	1	1130·29	1130·29	16·62*	3·92	r = +0·3299*
Deviation from Linearity	20	889·25	44·46	0·65	1·70	r^2 = 0·1088
Between Group	21	2019·54	96·17	1·41	1·68	η^2 = 0·1945
Within Group	123	8365·36	68·01			
TOTAL	144	10384·90	72·12			
HEAD BREADTH ON ZYGOMATIC BREADTH						
Linear Regression	1	331·28	331·28	9·06*	3·92	r = +0·2514*
Deviation from Linearity	20	414·18	20·71	0·57	1·70	r^2 = 0·0632
Between Group	21	745·46	35·50	0·97	1·68	η^2 = 0·1422
Within Group	123	4496·03	36·55			
TOTAL	144	5241·49	36·40			
NASAL LENGTH ON ZYGOMATIC BREADTH						
Linear Regression	1	147·62	147·62	7·58*	3·92	r = +0·2322*
Deviation from Linearity	20	196·31	9·82	0·50	1·70	r^2 = 0·0539
Between Group	21	343·93	16·38	0·84	1·68	η^2 = 0·1256
Within Group	123	2394·07	19·46			
TOTAL	144	2737·99	19·01			
NASAL BREADTH ON ZYGOMATIC BREADTH						
Linear Regression	1	49·30	49·30	5·03*	3·92	r = +0·1902*
Deviation from Linearity	20	108·74	5·44	0·55	1·70	r^2 = 0·0361
Between Group	21	158·04	7·53	0·77	1·68	η^2 = 0·1159
Within Group	123	1205·93	9·80			
TOTAL	144	1363·97	9·47			
UPPER FACIAL LENGTH ON ZYGOMATIC BREADTH						
Linear Regression	1	377·22	377·22	14·80*	3·92	r = +0·3123*
Deviation from Linearity	20	374·04	18·70	0·74	1·70	r^2 = 0·0975
Between Group	21	751·27	35·77	1·41	1·68	η^2 = 0·1942
Within Group	123	3115·97	25·33			
TOTAL	144	3867·23	26·86			

TABLE 9.—*Analysis for Testing Non-linearity of Regression*—concld.

(Age Group 20—48 years, N = 145)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON UPPER FACIAL LENGTH						
Linear Regression	1	58171·63	58171·63	14·34*	3·92	$r = +0·3060$*
Deviation from Linearity	15	43891·57	2926·10	0·72	1·74	$r^2 = 0·0936$
Between Group	16	102063·20	6378·95	1·57	1·71	$\eta^2 = 0·1643$
Within Group	128	519235·92	4056·53			
TOTAL	144	621299·32	4314·58			
HEAD LENGTH ON UPPER FACIAL LENGTH						
Linear Regression	1	217·15	217·15	3·04	3·92	$r = +0·1446$
Deviation from Linearity	15	1039·39	69·29	0·97	1·74	$r^2 = 0·0209$
Between Group	16	1256·54	78·53	1·10	1·71	$\eta^2 = 0·1210$
Within Group	128	9128·36	71·32			
TOTAL	144	10384·90	72·12			
HEAD BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	55·28	55·28	1·40	3·92	$r = +0·1027$
Deviation from Linearity	15	126·25	8·42	0·21	1·74	$r^2 = 0·0105$
Between Group	16	181·53	11·35	0·29	1·71	$\eta^2 = 0·0346$
Within Group	128	5059·96	39·53			
TOTAL	144	5241·49	36·40			
NASAL LENGTH ON UPPER FACIAL LENGTH						
Linear Regression	1	1102·10	1102·10	94·17*	3·92	$r = +0·6345$*
Deviation from Linearity	15	137·94	9·20	0·78	1·74	$r^2 = 0·4025$
Between Group	16	1240·04	77·50	6·62*	1·71	$\eta^2 = 0·4529$
Within Group	128	1497·95	11·70			
TOTAL	144	2737·99	19·01			
NASAL BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	3·85	3·85	0·37	3·92	$r = +0·0531$
Deviation from Linearity	15	35·14	2·34	0·23	1·74	$r^2 = 0·0028$
Between Group	16	38·99	2·44	0·24	1·71	$\eta^2 = 0·0286$
Within Group	128	1324·98	10·35			
TOTAL	144	1363·97	9·47			
ZYGOMATIC BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	715·20	715·20	15·83*	3·92	$r = +0·3128$*
Deviation from Linearity	15	835·58	55·71	1·23	1·74	$r^2 = 0·0975$
Between Group	16	550·77	96·92	2·15*	1·71	$\eta^2 = 0·2115$
Within Group	128	5781·36	45·17			
TOTAL	144	7332·14	50·92			

TABLE 10.—*Analysis for Testing Non-linearity of Regression.*

(All Ages, N=200)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
HEAD LENGTH ON STATURE						
Linear Regression	1	1908·74	1908·74	31·86*	3·89	$r = +0·3576^*$
Deviation from Linearity	18	2230·66	123·93	2·07*	1·66	$r^2 = 0·1279$
Between Group	19	4139·40	217·86	3·64*	1·64	$\eta^2 = 0·2774$
Within Group	180	10785·12	59·92			
TOTAL	199	14924·52	75·00			
HEAD BREADTH ON STATURE						
Linear Regression	1	252·16	252·16	7·04*	3·89	$r = +0·1930^*$
Deviation from Linearity	18	802·38	44·58	1·40	1·66	$r^2 = 0·0373$
Between Group	19	1054·54	55·50	1·75*	1·64	$\eta^2 = 0·1558$
Within Group	180	5714·82	31·75			
TOTAL	199	6769·36	34·02			
NASAL LENGTH ON STATURE						
Linear Regression	1	117·27	117·27	6·32*	3·89	$r = +0·1758^*$
Deviation from Linearity	18	337·15	18·73	1·01	1·66	$r^2 = 0·0309$
Between Group	19	454·42	23·92	1·29	1·64	$\eta^2 = 0·1198$
Within Group	180	3337·94	18·54			
TOTAL	199	3792·36	19·06			
NASAL BREADTH ON STATURE						
Linear Regression	1	30·75	30·75	3·33	3·89	$r = +0·1279$
Deviation from Linearity	18	184·95	10·27	1·11	1·66	$r^2 = 0·0164$
Between Group	19	215·70	11·35	1·23	1·64	$\eta^2 = 0·1147$
Within Group	180	1664·18	9·25			
TOTAL	199	1879·88	9·45			
ZYGOMATIC BREADTH ON STATURE						
Linear Regression	1	762·64	762·64	15·47*	3·89	$r = +0·2684^*$
Deviation from Linearity	18	947·47	52·64	1·07	1·66	$r^2 = 0·0721$
Between Group	19	1710·11	90·01	1·83*	1·64	$\eta^2 = 0·1616$
Within Group	180	8873·39	49·30			
TOTAL	199	10583·50	53·18			
UPPER FACIAL LENGTH ON STATURE						
Linear Regression	1	426·54	426·54	18·06*	3·89	$r = +0·2871^*$
Deviation from Linearity	18	497·82	27·66	1·17	1·66	$r^2 = 0·0824$
Between Group	19	924·36	48·65	2·06*	1·64	$\eta^2 = 0·1786$
Within Group	180	4252·00	23·62			
TOTAL	199	5176·36	26·01			

TABLE 10.—*Analysis for Testing Non-linearity of Regression*—contd.

(All Ages, N = 200)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON HEAD LENGTH						
Linear Regression	1	116478·55	116478·55	27·87*	3·89	$r = +0·3576$*
Deviation from Linearity	17	37922·97	2230·76	0·53	1·67	$r^2 = 0·1279$
Between Group	18	154401·52	8577·86	2·05*	1·66	$\eta^2 = 0·1695$
Within Group	181	756348·48	4178·72			
TOTAL	199	910750·00	4576·63			
HEAD BREADTH ON HEAD LENGTH						
Linear Regression	1	280·17	280·17	8·16*	3·89	$r = +0·2034$*
Deviation from Linearity	17	272·37	16·02	0·47	1·67	$r^2 = 0·0414$
Between Group	18	552·54	30·70	0·89	1·66	$\eta^2 = 0·0816$
Within Group	181	6216·82	34·35			
TOTAL	199	6769·36	34·02			
NASAL LENGTH ON HEAD LENGTH						
Linear Regression	1	0·77	0·77	0·04	3·89	$r = +0·0149$
Deviation from Linearity	17	345·58	20·33	1·07	1·67	$r^2 = 0·0002$
Between Group	18	346·35	19·24	1·01	1·66	$\eta^2 = 0·0913$
Within Group	181	3446·01	19·04			
TOTAL	199	3792·36	19·06			
NASAL BREADTH ON HEAD LENGTH						
Linear Regression	1	122·33	122·33	13·17*	3·89	$r = +0·2551$
Deviation from Linearity	17	76·53	4·50	0·48	1·67	$r^2 = 0·0651$
Between Group	18	198·86	11·05	1·19	1·66	$\eta^2 = 0·1058$
Within Group	181	1681·02	9·29			
TOTAL	199	1879·88	9·45			
ZYGOMATIC BREADTH ON HEAD LENGTH						
Linear Regression	1	1296·90	1296·90	26·89*	3·89	$r = +0·3501$*
Deviation from Linearity	17	558·18	32·83	0·68	1·67	$r^2 = 0·1225$
Between Group	18	1855·08	103·06	2·14*	1·66	$\eta^2 = 0·1753$
Within Group	181	8728·42	48·22			
TOTAL	199	10583·50	53·18			
UPPER FACIAL LENGTH ON HEAD LENGTH						
Linear Regression	1	47·15	47·15	1·86	3·89	$r = +0·0954$
Deviation from Linearity	17	529·90	31·17	1·23	1·67	$r^2 = 0·0091$
Between Group	18	577·05	32·06	1·26	1·66	$\eta^2 = 0·1115$
Within Group	181	4599·31	25·41			
TOTAL	199	5176·36	26·01			

TABLE 10.—*Analysis for Testing Non-linearity of Regression*—contd.

(All Ages, N=200)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON HEAD BREADTH						
Linear Regression . .	1	33925·44	33925·44	7·82*	3·89	r = +0·1930*
Deviation from Linearity .	13	73979·48	5690·73	1·31	1·77	r^2 = 0·0373
Between Group .	14	107904·92	7707·49	1·78*	1·74	η^2 = 0·1185
Within Group . .	185	802845·08	4339·70			
TOTAL .	199	910750·00	4576·63			
HEAD LENGTH ON HEAD BREADTH						
Linear Regression . .	1	617·70	617·70	8·25*	3·89	r = +0·2034*
Deviation from Linearity .	13	456·75	35·13	0·47	1·77	r^2 = 0·0414
Between Group .	14	1074·45	76·75	1·03	1·74	η^2 = 0·0720
Within Group . .	185	13850·07	74·87			
TOTAL .	199	14924·52	75·00			
NASAL LENGTH OF HEAD BREADTH						
Linear Regression . .	1	161·89	161·89	8·85*	3·89	r = +0·2066*
Deviation from Linearity .	13	246·89	18·99	1·04	1·77	r^2 = 0·0427
Between Group .	14	408·78	29·20	1·60	1·74	η^2 = 0·1078
Within Group . .	185	3383·58	18·29			
TOTAL .	199	3792·36	19·06			
NASAL BREADTH ON HEAD BREADTH						
Linear Regression . .	1	0·60	0·60	1·00	3·89	r = +0·0715
Deviation from Linearity .	13	100·34	7·72	0·81	1·77	r^2 = 0·0051
Between Group .	14	109·94	7·85	0·82	1·74	η^2 = 0·0585
Within Group . .	185	1769·94	9·57			
TOTAL .	199	1879·88	9·45			
ZYGOMATIC BREADTH ON HEAD BREADTH						
Linear Regression . .	1	495·13	495·13	9·45*	3·89	r = +0·2162*
Deviation from Linearity .	13	391·16	30·09	0·57	1·77	r^2 = 0·0468
Between Group .	14	886·29	63·31	1·21	1·74	η^2 = 0·0837
Within Group . .	185	9697·21	52·42			
TOTAL .	199	10583·50	53·18			
UPPER FACIAL LENGTH ON HEAD BREADTH						
Linear Regression . .	1	85·13	85·13	3·26	3·89	r = +0·1282
Deviation from Linearity .	13	265·84	20·45	0·78	1·77	r^2 = 0·0164
Between Group .	14	350·97	25·07	0·96	1·74	η^2 = 0·0678
Within Group . .	185	4825·39	26·08			
TOTAL .	199	5176·36	26·01			

TABLE 10.—*Analysis for Testing Non-linearity of Regression*—contd.

(All Ages, N=200)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON NASAL LENGTH						
Linear Regression	1	28162·21	28162·21	6·14*	3·89	$r = +0·1758$*
Deviation from Linearity	13	34394·63	2645·74	0·58	1·77	$r^2 = 0·0309$
Between Group	14	62556·84	4468·35	0·97	1·74	$\eta^2 = 0·0687$
Within Group	185	848193·16	4584·83			
TOTAL	199	910750·00	4576·63			
HEAD LENGTH ON NASAL LENGTH						
Linear Regression	1	3·01	3·01	0·04	3·89	$r = +0·0149$
Deviation from Linearity	13	75·10	5·78	0·07	1·77	$r^2 = 0·0002$
Between Group	14	78·11	5·58	0·07	1·74	$\eta^2 = 0·0052$
Within Group	185	14846·41	80·25			
TOTAL	199	14924·52	75·00			
HEAD BREADTH ON NASAL LENGTH						
Linear Regression	1	288·97	288·97	8·63*	3·89	$r = +0·2066$*
Deviation from Linearity	13	288·41	22·19	0·66	1·77	$r^2 = 0·0427$
Between Group	14	577·38	41·24	1·23	1·74	$\eta^2 = 0·0853$
Within Group	185	6191·08	33·47			
TOTAL	199	6769·36	34·02			
NASAL BREADTH ON NASAL LENGTH						
Linear Regression	1	0·01	0·01	0·001	3·89	$r = +0·0024$
Deviation from Linearity	13	59·27	4·56	0·46	1·77	$r^2 = 0·00001$
Between Group	14	59·28	4·23	0·43	1·74	$\eta^2 = 0·0315$
Within Group	185	1820·60	9·84			
TOTAL	199	1879·88	9·45			
ZYGOMATIC BREADTH ON NASAL LENGTH						
Linear Regression	1	195·37	195·37	3·57	3·89	$r = +0·1359$
Deviation from Linearity	13	255·37	19·64	0·36	1·77	$r^2 = 0·0185$
Between Group	14	450·74	32·20	0·59	1·74	$\eta^2 = 0·0426$
Within Group	185	10132·76	54·77			
TOTAL	199	10583·50	53·18			
UPPER FACIAL LENGTH ON NASAL LENGTH						
Linear Regression	1	2246·15	2246·15	147·28*	3·89	$r = +0·6587$*
Deviation from Linearity	13	108·79	8·37	0·55	1·77	$r^2 = 0·4339$
Between Group	14	2354·94	168·21	11·03	1·74	$\eta^2 = 0·4549$
Within Group	185	2821·42	15·25			
TOTAL	199	5176·36	26·01			

TABLE 10.—*Analysis for Testing Non-linearity of Regression*—contd.

(All Ages, N=200)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variances		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON NASAL BREADTH						
Linear Regression	1	14899·62	14899·62	3·25	3·89	$r = +0·1279$
Deviation from Linearity	8	25157·22	3144·65	0·69	1·98	$r^2 = 0·0164$
Between Group	9	40056·84	4450·76	0·97	1·94	$\eta^2 = 0·0440$
Within Group	190	870693·16	4582·60			
TOTAL	199	910750·00	4576·63			
HEAD LENGTH ON NASAL BREADTH						
Linear Regression	1	971·20	971·20	13·59*	3·89	$r = +0·2551$*
Deviation from Linearity	8	371·26	46·41	0·65	1·98	$r^2 = 0·0651$
Between Group	9	1342·46	149·16	2·09*	1·94	$\eta^2 = 0·0900$
Within Group	190	13582·06	71·48			
TOTAL	199	14924·52	75·00			
HEAD BREADTH ON NASAL BREADTH						
Linear Regression	1	34·58	34·58	1·04	3·89	$r = +0·0715$
Deviation from Linearity	8	432·12	54·01	1·63	1·98	$r^2 = 0·0051$
Between Group	9	466·70	51·86	1·56	1·94	$\eta^2 = 0·0689$
Within Group	190	6302·66	33·17			
TOTAL	199	6769·36	34·02			
NASAL LENGTH ON NASAL BREADTH						
Linear Regression	1	0·02	0·02	0·001	3·89	$r = +0·0024$
Deviation from Linearity	8	132·47	16·56	0·86	1·98	$r^2 = 0·00001$
Between Group	9	132·49	14·72	0·76	1·94	$\eta^2 = 0·0349$
Within Group	190	3659·87	19·26			
TOTAL	199	3792·36	19·06			
ZYGOMATIC BREADTH ON NASAL BREADTH						
Linear Regression	1	721·68	721·68	14·23*	3·89	$r = +0·2611$*
Deviation from Linearity	8	226·17	28·27	0·56	1·98	$r^2 = 0·0682$
Between Group	9	947·85	105·32	2·08*	1·94	$\eta^2 = 0·0896$
Within Group	190	9635·65	50·71			
TOTAL	199	10583·50	53·18			
UPPER FACIAL LENGTH ON NASAL BREADTH						
Linear Regression	1	16·61	16·61	0·62	3·89	$r = +0·0567$
Deviation from Linearity	8	91·54	11·44	0·43	1·98	$r^2 = 0·0032$
Between Group	9	108·15	12·02	0·45	1·94	$\eta^2 = 0·0209$
Within Group	190	5068·21	26·67			
TOTAL	199	5176·36	26·01			

TABLE 10.—*Analysis for Testing Non-linearity of Regression*—contd.

(All Ages, N = 200)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON ZYGOMATIC BREADTH						
Linear Regression . .	1	65627·73	65627·73	14·50*	3·90	$r = +0·2684$*
Deviation from Linearity .	20	39666·91	1983·35	0·44	1·63	$r^2 = 0·0721$
Between Group .	21	105294·64	5014·03	1·11	1·61	$\eta^2 = 0·1156$
Within Group . .	178	805455·36	4525·03			
TOTAL .	199	910750·00	4576·63			
HEAD LENGTH ON ZYGOMATIC BREADTH						
Linear Regression . .	1	1828·85	1828·85	25·90*	3·90	$r = +0·3501$*
Deviation from Linearity .	20	527·72	26·39	0·37	1·63	$r^2 = 0·1225$
Between Group .	21	2356·57	112·22	1·59	1·61	$\eta^2 = 0·1579$
Within Group . .	178	12567·95	70·61			
TOTAL .	199	14924·52	75·00			
HEAD BREADTH ON ZYGOMATIC BREADTH						
Linear Regression . .	1	316·69	316·69	9·61*	3·90	$r = +0·2162$*
Deviation from Linearity .	20	588·25	29·41	0·89	1·63	$r^2 = 0·0468$
Between Group .	21	904·94	43·09	1·31	1·61	$\eta^2 = 0·1337$
Within Group . .	178	5864·42	32·95			
TOTAL .	199	6769·36	34·02			
NASAL LENGTH ON ZYGOMATIC BREADTH						
Linear Regression . .	1	70·01	70·01	3·47	3·90	$r = +0·1359$
Deviation from Linearity .	20	126·13	6·31	0·31	1·63	$r^2 = 0·0185$
Between Group .	21	196·14	9·34	0·46	1·61	$\eta^2 = 0·0517$
Within Group . .	178	3596·22	20·20			
TOTAL .	199	3792·36	19·06			
NASAL BREADTH ON ZYGOMATIC BREADTH						
Linear Regression . .	1	128·19	128·19	14·11*	3·90	$r = +0·2611$*
Deviation from Linearity .	20	134·45	6·72	0·74	1·63	$r^2 = 0·0682$
Between Group .	21	262·64	12·51	1·38	1·61	$\eta^2 = 0·1397$
Within Group . .	178	1617·24	9·09			
TOTAL .	199	1879·88	9·45			
UPPER FACIAL LENGTH ON ZYGOMATIC BREADTH						
Linear Regression . .	1	245·60	245·60	9·55*	3·90	$r = +0·2178$*
Deviation from Linearity .	20	355·35	17·77	0·69	1·63	$r^2 = 0·0474$
Between Group .	21	600·95	28·62	1·11	1·61	$\eta^2 = 0·1161$
Within Group . .	178	4575·41	25·70			
TOTAL .	199	5176·36	26·01			

TABLE 10.—*Analysis for Testing Non-linearity of Regression*—concld.

(All Ages, N = 200)

Source of Variation	Degrees of Freedom	Sum of Squares of Deviation	Variance (Mean Square)	Ratio of Variance		Coefficient of Correlation and Correlation Ratio
				Observed	5%	
(1·1)	(1·2)	(2·1)	(2·2)	(3·1)	(3·2)	(4)
STATURE ON UPPER FACIAL LENGTH						
Linear Regression	1	75046·71	75046·71	17·18*	3·89	$r = +0·2871$*
Deviation from Linearity	15	36145·85	2409·72	0·55	1·72	$r^2 = 0·0824$
Between Group	16	111192·56	6949·54	1·59	1·69	$\eta^2 = 0·1221$
Within Group	183	799557·44	4369·17			
TOTAL	199	910750·00	4576·63			
HEAD LENGTH ON UPPER FACIAL LENGTH						
Linear Regression	1	135·95	135·95	1·84	3·89	$r = +0·0954$
Deviation from Linearity	15	1244·70	82·98	1·12	1·72	$r^2 = 0·0091$
Between Group	16	1380·65	86·29	1·17	1·69	$\eta^2 = 0·0925$
Within Group	183	13543·87	74·01			
TOTAL	199	14924·52	75·00			
HEAD BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	111·33	111·33	3·15	3·89	$r = +0·1282$
Deviation from Linearity	15	181·03	12·07	0·34	1·72	$r^2 = 0·0164$
Between Group	16	292·36	18·27	0·52	1·69	$\eta^2 = 0·0432$
Within Group	183	6477·00	35·39			
TOTAL	199	6769·36	34·02			
NASAL LENGTH ON UPPER FACIAL LENGTH						
Linear Regression	1	1645·60	1645·60	152·06*	3·89	$r = +0·6587$*
Deviation from Linearity	15	166·28	11·09	1·02	1·72	$r^2 = 0·4339$
Between Group	16	1811·88	113·24	10·46	1·69	$\eta^2 = 0·4778$
Within Group	183	1980·48	10·82			
TOTAL	199	3792·36	19·06			
NASAL BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	6·03	6·03	0·60	3·89	$r = +0·0567$
Deviation from Linearity	15	26·29	1·75	0·17	1·72	$r^2 = 0·0032$
Between Group	16	32·32	2·02	0·20	1·69	$\eta^2 = 0·0172$
Within Group	183	1847·56	10·10			
TOTAL	199	1879·88	9·45			
ZYGOMATIC BREADTH ON UPPER FACIAL LENGTH						
Linear Regression	1	502·16	502·16	9·74*	3·89	$r = +0·2178$*
Deviation from Linearity	15	649·57	43·31	0·84	1·72	$r^2 = 0·0474$
Between Group	16	1151·73	71·98	1·40	1·69	$\eta^2 = 0·1088$
Within Group	183	9431·77	51·54			
TOTAL	199	10583·50	53·18			

TABLE 11.—*Values of Product Variances (in sq. mm.).*

Character	Stature	Head Length	Head Breadth	Nasal Length	Nasal Breadth	Zygomatic Breadth	Upper Facial Length.
(AGE GROUP 15—19 YEARS, N=46)							
Stature . . .	5759·3716	167·6267	—22·6844	52·8800	17·0489	158·5778	55·6444
Head Length . .	167·6267	80·4739	1·7213	—9·3360	11·4960	26·2787	—4·7453
Head Breadth .	—22·6844	1·7213	30·5434	7·2800	1·6871	2·1458	4·5209
Nasal Length .	52·8800	—9·3360	7·2800	16·6700	—0·7564	—5·4249	14·3360
Nasal Breadth .	17·0489	11·4960	1·6871	—0·7564	9·4159	8·6800	—0·5689
Zygomatic Breadth.	158·5778	26·2787	2·1458	—5·4249	8·6800	53·2652	—4·9093
Upper Facial Length	55·6444	—4·7453	4·5209	14·3360	—0·5689	—4·9093	22·7763
(AGE GROUP 20—48 YEARS, N=145)							
Stature . . .	4314·5786	221·8625	106·5806	46·9139	29·8472	128·0806	104·1583
Head Length . .	221·8625	72·1174	12·2988	3·5133	5·4217	19·9917	6·3638
Head Breadth .	106·5806	12·2988	36·3992	5·0386	1·0475	10·8231	3·2108
Nasal Length .	46·9139	3·5133	5·0386	19·0138	—0·2014	7·2247	14·3367
Nasal Breadth .	29·8472	5·4217	1·0475	—0·2014	9·4720	4·1753	0·8475
Zygomatic Breadth	128·0806	19·9917	10·8231	7·2247	4·1753	50·9176	11·5492
Upper Facial Length	104·1583	6·3638	3·2108	14·3367	0·8475	11·5492	26·8558
(ALL AGES, N=200)							
Stature . . .	4576·6332	209·5176	76·1528	51·9317	26·5950	132·4362	99·0432
Head Length .	209·5176	74·9976	10·2757	0·5370	6·7900	22·1080	4·2154
Head Breadth .	76·1528	10·2757	34·0169	5·2605	1·2818	9·1998	3·8147
Nasal Length .	51·9317	0·5370	5·2605	19·0571	0·0326	4·3254	14·6663
Nasal Breadth .	26·5950	6·7900	1·2818	0·0326	9·4466	5·8531	0·8880
Zygomatic Breadth	132·4362	22·1080	9·1998	4·3254	5·8531	53·1834	8·1017
Upper Facial Length	99·0432	4·2154	3·8147	14·6663	0·8880	8·1017	26·0118

MGIPC—M—III-8-11—7-5-40—370