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Weight, Body Diameters and Age; Correlation Coefficients.*

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This is an attempt to improve the height-age style of weight prediction table currently used both for adults and for children. The measurements studied are: weight, net (W), age (A), stature (S), bi-cristal diameter of pelvic brim (Bc), bi-styloid diameter of wrist (Bs), bi-malleolar diameter of ankle (Bm). The material consists of private school boys aged 4 to 20 years, to the number of 810, except for the diameters of wrist and ankle with populations of 290 and 293 respectively. The linearity of some of the distribution plots is open to question. For instance, weight on stature looks curvilinear at the extremes and the criterion $n^2—r^2 = .0229 \pm .0072$. Nevertheless, I am told by other people familiar with statistics that the plots are sufficiently rectilinear for the present tentative analysis.

The resulting correlation coefficients may be examined in Table I. If other things be equal, that trait most highly correlated with weight would be expected to be the most dependable for predicting weight. If we note especially the relationship of weight to various traits, it appears that this is highest for stature, then bi-cristal, then bi-styloid, then age, and finally bi-malleolar. Furthermore the difference between r_{WA} and r_{WS} proves to be statistically significant; $.0379 \pm .0036$, yielding a ratio of the difference to its probable error of 10.4. Likewise the difference between r_{WA} and r_{WBc} is statistically significant: $.0240 \pm .0045$, ratio 5.3. But r of weight with bi-styloid diameter of the wrist, although larger than r_{WA}, is not significant: $.0047 \pm .0070$. Hence one may conclude that weight is best referred to stature, next best to bi-cristal diameter, only third best to age, while wrist diameter is not worth further consideration.

TABLE I.
Correlation coefficients, Zero Order, in Order of Magnitude.

Stature:Age	.9320 ± .0027	Weight:Bi-styloid	.8936 ± .0080
Weight:Stature	.9268 ± .0036	Weight:Age	.8889 ± .0054
Bi-cristal:Stature	.9234 ± .0035	Bi-cristal:Age	.8700 ± .0058
Weight:Bi-cristal	.9129 ± .0041	Weight:Bi-malleolar	.8606 ± .0103
Bi-styloid:Stature	.9028 ± .0074	Bi-styloid:Age	.8576 ± .0103
Bi-malleolar:Stature	.8971 ± .0076	Bi-malleolar:Age	.8334 ± .0124

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Other things, however, are not equal, and therefore partial correlation coefficients are desirable in order to render constant those variables which are likely to affect the straight correlation. The first order partials show that, when age is fixed, weight is slightly more highly correlated with bi-cristal diameter ($r = .61$) than with stature ($r = .59$), whereas when stature is fixed weight is more highly correlated with *bi-cristal* diameter (.39) than with age (.18).

The second order partials show that weight is distinctly more highly correlated with bi-cristal when stature and age are fixed ($r = .39$) than with age when stature and bi-cristal are constant ($r = .27$). Hence it may be expect d that the multiple correlation of weight with stature and bi-cristal will be better than with stature and age.

The multiple correlation coefficient R of weight on various pairs of traits, each pair containing stature, follows:

$R_{w(SBc)} = .9435 \pm .0026$ $R_{w(SBm)} = .9292 \pm .0054$
$R_{w(SBs)} = .9362 \pm .0049$ $R_{w(SA)} = .9294 \pm .0032$

Furthermore the difference between the first and last of these R's is statistically significant. $.0141 \pm .0015$, ratio 9.5. The difference betwe n the second and last R's $= .0068 \pm .0027$, yielding the ratio Diff./P.E. of Diff. $= 2.5$; this ratio should be 3 or more to be regarded as significant, and perhaps it might be that large if the number of Bistyloid measurements had been, instead of 290, as large as the number of Bi-cristal diameters, namely 810; in sum it seems more profitable to omit the wrist diameter for the present and to concentrate attention on the breadth of the pelvic brim (Bc).

The main inference seems that weight is less closely related to age than to certain body diameters, which therefore merit further study with a view to substitution for age in tables for prediction of normal weight.

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Relation of Salt Deficient Diets to Resistance to Infection.

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Recent experiments, notably those reported by Webster and Pritchett,[1] have shown that diet has a decided influence on susceptibility to infection. These investigations d alt with the vitamine fraction of the diet. It seemed to us of importance to ascertain the part