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 played by salts in the metabolic process and in host resistance to disease.

Rats were used as experimental animals and trypanosomes as the infectious agent. Rats from the same stock were kept on a synthetic diet* from which one or another cation was eliminated. After a certain period equal numbers of rats of approximately the same age or weight were infected with *Tr. evansi,* each rat receiving the same number of trypanosomes intraperitoneally. The duration of the infection was used as an index of individual resistance.

The results indicate a decreased resistance in the rats on a salt deficient diet as compared with those maintained on a full or standard diet. A summary of the results obtained is shown in Table I.

TABLE I.

Series	No. of Rats	Salt Deficient	Average Weight	Dose	Average Survival Time
1.	4	K free	26-29	2,500	18 days
	4	Mg. free	,, ,,	,,	16 ,,
	4	Standard	,, ,,	,,	22 ,,
2.	3	Na† free	23.5	6,000	17 ,,
	4	Mg. free	36	6,000	20 ,,
	3	Standard	39	6,000	24 ,,
3.	6	Mg. poor	58	10,000	18.3 ,,
	6	Mg. rich	67	,,	18.0 ,,
	4	Standard	51	,,	21.0 ,,
4.‡	2	Ca free	26.5	5,000	26 ,,
	3	Na free	27.0	,,	19 2/3 days

†The Na rats were of about the same age as the others but much smaller in weight.
‡Second generation.

It is evident that elimination of any of the important salts causes a reduction in resistance, the average survival time being 20-30% less than on a full diet. The rats fed diets poor in salt remain dwarfed, with the exception of Mg., but the general adequacy of the diet is indicated by the fact that the animals grew to maturity, reproduced normally, and weaned their young in the usual time. The Mg. deficient rats grow quite as rapidly as those kept on the full diet; nevertheless, like the others, they manifest a lower resistance to infection.

*Casein, 15%
Starch, 54.4%
Butter fat, 8.0%
Lactose, 13.0%
Pure salt mixture, 9.6%
Vitamine supplement (lemon juice, tomato juice, yeast and cod liver oil).

Salt mixture, per 1000 cc. H_2O

Na_2CO_3	14.0 gm.	Citric acid	10.0 gm.
$Ca\ CO_3$	14.0 gm.	$FeCl_3$	0.4 gm.
$Mg\ Co_3$	4.0 gm.	HCl	11.3 gm.
$K_2\ CO_3$	14.0 gm.	H_3PO_4	17.0 gm.
		H_2SO_4	1.8 gm.

Parallel with the determination of the effect of salt deficient diets on resistance, it seemed important to ascertain the physiological effect of the elimination of various cations from the diet. The observations thus far have been limited to the effect on the basal metabolism. The animals received the same diet as the trypanosome infected rats and were kept in the same cages and under the same conditions. Before each test the animals were starved for 20 hours, and then placed in a slightly modified Benedict apparatus. The results are given in Table II, the data being the averages of many tests.

TABLE II.

Diet	O consumption per kilo, per hour.	Res. Quo.
Standard	1335	0.77
Na poor	1550	0.725
Ca ”	1540	0.77
K. ”	1271	0.75
Mg. ”	1170	0.77

The results indicate two things. First, that Ca and Na deficiency effect a higher oxygen consumption, while the K and Mg deficiency produce a reverse effect. This may account for the differences in the rate of growth. Second, while there is a definite change in the character of the respiratory quotient in the Na deficient rat, no such change occurs in the Ca., K or Mg deficient animals. Na deficiency apparently leads to a higher protein metabolism.

There is no apparent correlation between the disturbance in the quantitative metabolism and resistance, but there seems to be a definite relationship between the qualitative change and resistance. Na deficient animals have the same oxygen consumption as Ca deficient animals, and, a higher oxygen consumption rate than Mg deficient rats, but manifest a lower resistance than either of these groups. The Na deficient animals differ from the Ca and Mg and standard groups in the qualitative change of metabolism as indicated by the respiratory quotient, and this is correlated with lower resistance.

This line of investigation opens many possibilities. The cations evidently have a profound effect on metabolism and host resistance to infection. The experiments thus far were purposely radical in character in order to indicate the direction and nature of the changes effected. It remains to determine the effect of the partial elimination of the various cations from the diet on basal metabolism, specific dynamic action and resistance to various types of infections and toxins.

[1] Webster and Pritchet, *J. Exp. Med.*, 1924, xl, 397.