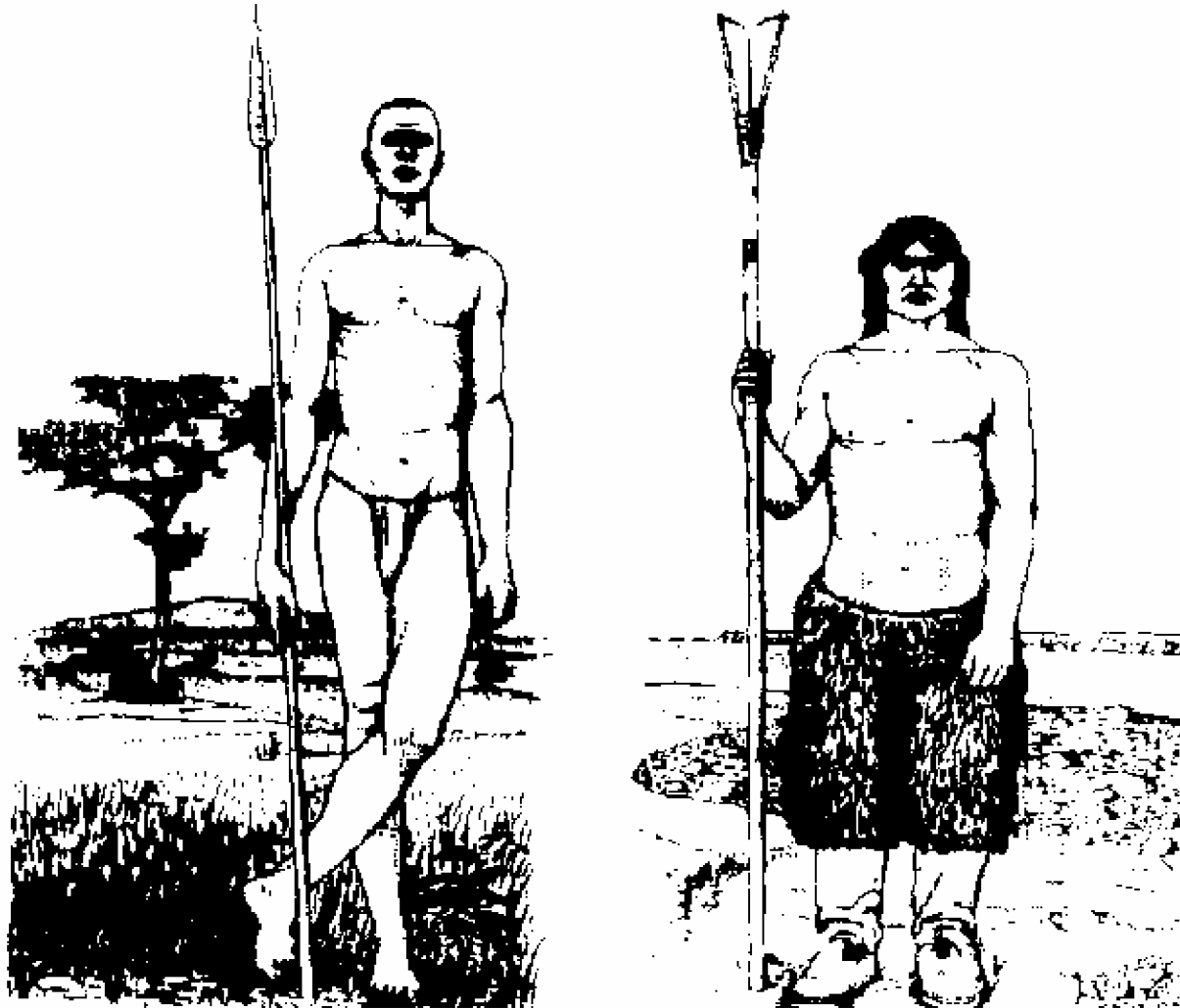


Thermal Regulation and Allen's Rule and Bergmann's Rule



Body Form and Size as Adaptations to Temperature Stress

- Allen's Rule: body form or shape is linear in warm climates and more rounded and compact in cold climates. Round forms have a smaller surface area to volume ratios.
- Bergmann's Rule: body size is large in cold climates and small in warm climates. Large bodies have a smaller surface area to volume ratios.
- Both of these rules cause systematic changes in the surface area to volume ratios.
- In cold climates where you need to retain heat, so bodies are larger and more compact.
- In warm climates where you need to expel heat, so bodies are smaller and more linear.

Bergmann's Rule, Latitude, Weight, and BSA/M

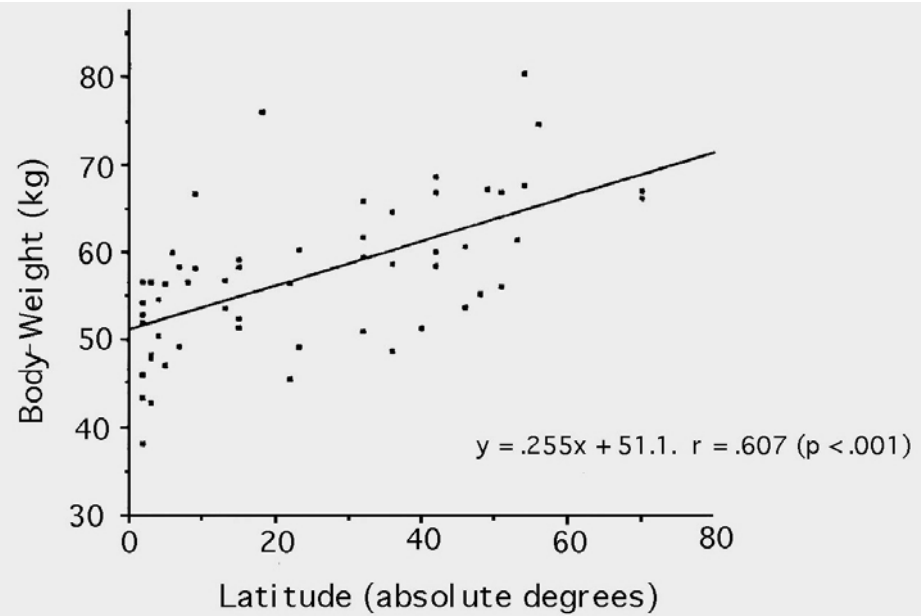


Fig. 7. Change in body weight with latitude in living populations (data from Table 2).

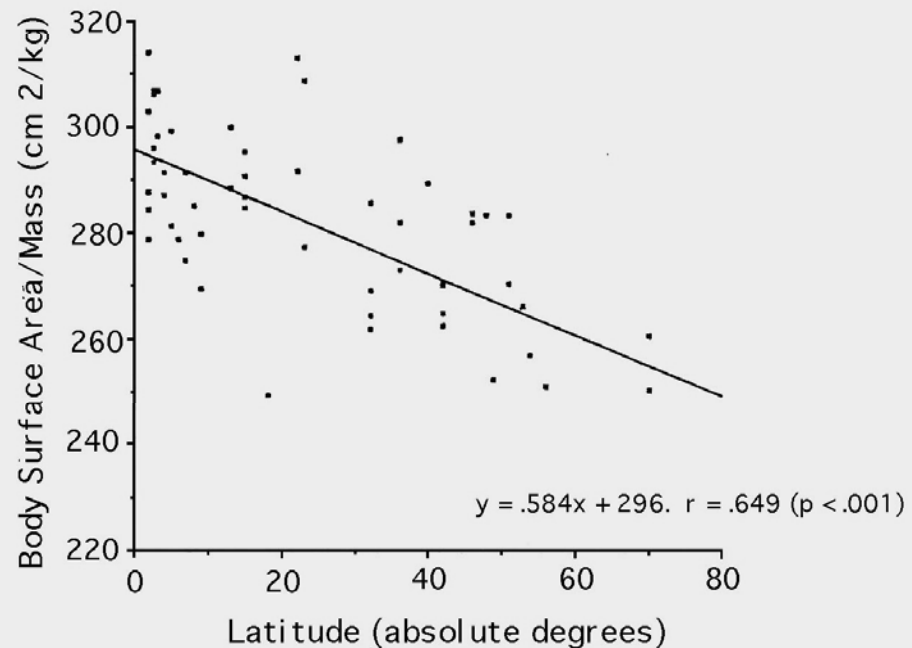


Fig. 8. Change in surface area/body mass with latitude in living human populations (data from table 2). Surface area calculated using the formula of DuBois and BuBois (1916).

Allen's Rule:
Latitude, Stature,
and Bi-iliac
Width. Note that
bi-iliac width is a
measure of body
linearity-
roundness

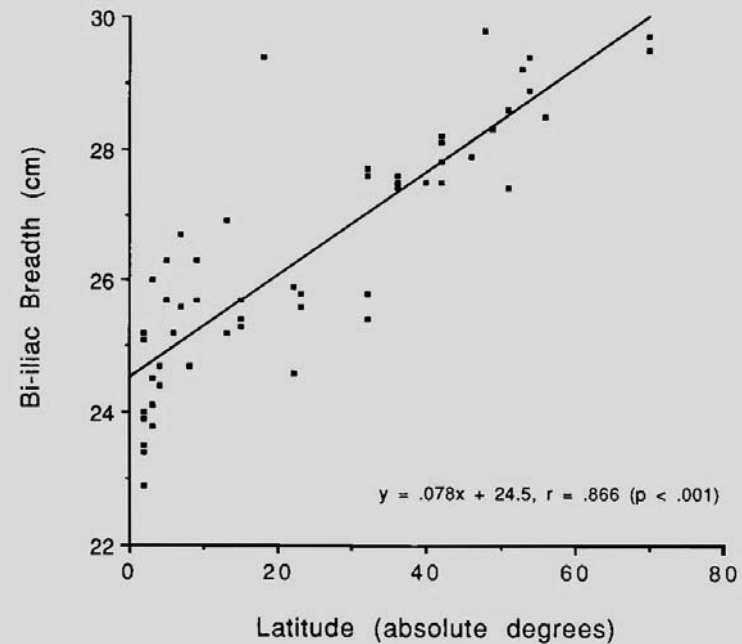


Fig. 5. Change in bi-iliac breadth with latitude in living human populations (data from Table 2).

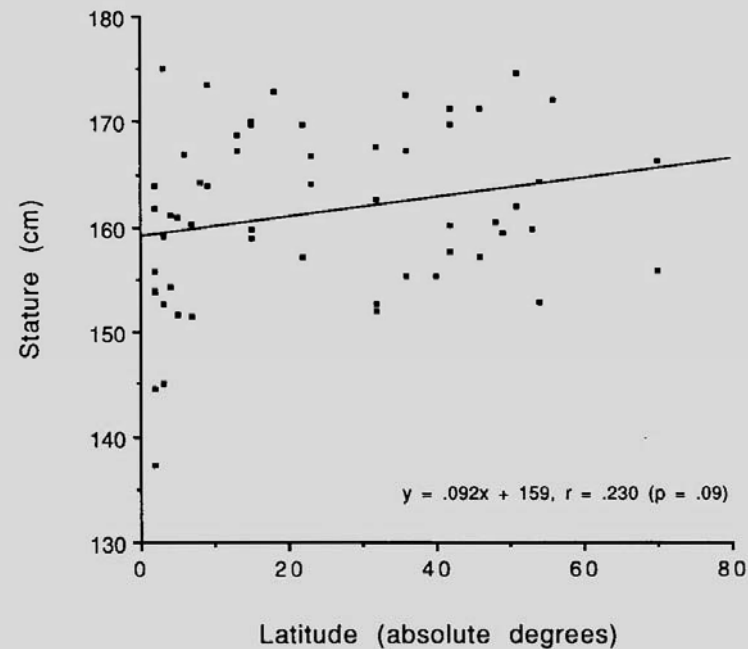


Fig. 6. Change in stature with latitude in living human populations (data from Table 2).

Crual Index in Relation to Temperature

