CORRESPONDENCE

Dept. of Geriatric Medicine,
Royal Free Hospital,
Pond Street,
LONDON NW3

To the Editor:

Dear Sir,

STRENGTH TRAINING AND CROSS-SECTIONAL AREA OF MUSCLES

As my friend Dr. R. J. Maughan pointed out in his recent paper in the Journal (Maughan, Watson and Weir, 1984) any discussion of the effect of training on the relationship between the strength and the cross-sectional area of a muscle should take into account the effect of changing the angle of pennation of the muscle fibres. In his discussion Dr. Maughan refers to his finding that, in untrained subjects, an inverse relationship exists between the strength/cross-sectional area ratio and the cross-sectional area of the quadriceps ($r = -0.55$). This apparent relationship is, however, an artefact. Significant inverse correlation will always be found between A/B and B.

To demonstrate this point, I used the Random Number Generator programme of a Texas Instruments TI-59 calculator to produce 35 pairs of numbers. One of each pair was drawn from a hypothetical, normally distributed, population with mean = 742 and standard deviation = 100 (*i.e.* corresponding to Maughan's untrained subjects' strength measurements). Similarly, the other number in each pair was generated as though it was derived from a normally distributed population with mean = 81.6 and standard deviation = 11.8 (*i.e.* corresponding to Maughan's subjects' cross-sectional area data). Calculation of the correlation coefficient for the relationship between these random values for strength/cross-sectional area and cross-sectional area confirmed the expected, highly significant, negative correlation ($r = -0.77$).

Although Maughan's data are interesting and valuable, part of his interpretation is founded on a spurious relationship.

Yours sincerely,

Archie YOUNG

Reference

Maughan, R. J., Watson, J. S. and Weir, J., 1984 "Muscle strength and cross-sectional area in man: a comparison of strength-trained and untrained subjects". Brit.J.Sports Med. 18: 149-157.

BOOK REVIEW

Title: **PHYSICAL STRUCTURE OF OLYMPIC ATHLETES: PART II. KINANTHROPOMETRY OF OLYMPIC ATHLETES**

Editor: J. E. L. Carter (plus 16 Authors and co-Authors)

Publishers: S. Karger-Basel, Volume 18 of a Medicine and Sport Science Series edited by E. Jokl and M. Hebbelinck, 1984

Price: $94 245 pages 43 figs. 40 tables

This is a second "follow-on" volume to Part 1, the account of the anthropometric data compiled in the Montreal Olympic Games Anthropological Project (MOGAP) in 1978. That volume was reviewed in BJSM Volume 16, page 267, December 1982 and the present work bears many of the same hallmarks.

Of the twelve courses in the book, no fewer than seven are authored or co-authored by J. E. L. Carter whose influence must therefore be recognised. The menu covered *includes*; a review of past studies on Olympic Athletes; age and body size in Olympic Athletes; somatotypes of Olympic Athletes; proportionality of Olympic Athletes; skinfolds and body composition of Olympic Athletes; growth status of Olympic Athletes less than 18 years of age; etc. There are in addition, chapters on "genetics" and on "social and demographic influences on the physique of the Olympic Athlete". The use of "Comparative Factor analyses of Anthropometric Variables for Athletes at Mexico City and Montreal Olympic Games" and an "analysis of Olympic and World Records in Track and Field and in Swimming etc." round off the meal. All-in-all this is a comprehensive review of an anthropometric databank obtained primarily from self-selected Olympic aspirants which becomes more representative as we come up to the games in Montreal.

The overall view is of a very attractive book with much original data. Each chapter appears in turn accompanied by more than adequate selections of references. Diagrams are clear and legible and the legends brief: (perhaps sometimes a little too brief). Given the undoubted attraction of the material in the book and given the very acceptable way it is presented, why is it that one is left with just a slight sense of disappointment that there is not more lasting and solid sustenance? I sense that the general reader is left with an awareness of the dearth of real understanding of the biological significance of this bolus of data no matter how skilfully, carefully, and accurately acquired. Rarely, of course, do authors now publish calibration, validation and reproductibility data so it must all be taken on trust anyway.

In an early part of the text kinanthropometry is defined "as the study of human size, shape, proportion, composition, maturation and gross function, in order to understand growth, exercise, performance and nutrition". We have obviously some way to go. Many of the "conclusions" tend to the descriptive rather than interpretive aspects of the human condition.

Nevertheless the book is an exciting (if a little difficult) read for the generalist, an encouraging token to those determined to bring mensuration to the fore and a compulsory purchase for anyone with a pretence to personal academic involvement in the field.

I must heartily recommend this book to any working library used by students of human performance, as a source book for dissertation.

J. MacGregor