The Changing Size and Shape of Australian Women.

Kathleen Margaret Berry
Bachelor of Education
(Adelaide College of Arts and Education)

This thesis was undertaken within the Department of Anatomical Sciences at The University of Adelaide in fulfilment of the requirement of the degree of Master of Medical Science.

Supervisor
Professor M Henneberg.
Abstract

This study investigates body size and shape of present-day Australian women. The need for such investigations results from the fact that secular trends in body size and shape change these characteristics every few decades. As body size and shape change, there is a need to update metric data used for clothing design. Morphometric photographs and measurements of 38 anthropometric characteristics were taken of 163 women aged from 18 to 82 years coming from various socio-economic circumstances. Their average body height and weight matched Australian Bureau of Statistics data for South Australian women. The anthropometric characteristics were selected for their usefulness in the clothing industry. In comparison with earlier studies of adult Australian women, especially the one conducted in 1926-28 by Berlei, the participants of the present study were only slightly taller (about 11 mm), but much heavier (about 6 kg); this produced an average Body Mass Index of 24.7. Participants also differed from British and American women. These findings indicate a need for an anthropometric survey of Australian women to provide current data for industrial purposes. As a pilot study to this end averages and standard deviations of all 36 anthropometric dimensions and weight were tabulated. Furthermore, based on standard morphometric photographs of anterior, posterior and the lateral aspect of standing women, five body types were identified. They resemble the letters of the alphabet I, A, H, X and XH. For each figure type basic anthropometric dimensions were tabulated. This study can be considered a pilot study for a larger, fully representative anthropometric survey but its results already show an occurrence of a significant trend towards overweight.
# Table of Contents

**Abstract** .......................................................................................................................... i

**Acknowledgements** ......................................................................................................... ii

**Table of Contents** ............................................................................................................. iii

**List of Figures** .................................................................................................................... ix

**Table of contents** ............................................................................................................... xi

**Chapter 1: Introduction** ..................................................................................................... 1

- Biological characteristics of the human body ..................................................................... 1
- Objectives of the thesis ........................................................................................................ 3
- Presentation of the thesis ................................................................................................ .... 3

**Chapter 2: Literature Review** .......................................................................................... 4

- Introduction ........................................................................................................................ 4
- Anthropometry .................................................................................................................... 4
- Morphology ......................................................................................................................... 7
- Typology ............................................................................................................................. 8
- Somatotyping ...................................................................................................................... 8
- Female Somatotyping ......................................................................................................... 10
- Historical perspective of secular trends ............................................................................ 12
- Causes of secular trends in height ....................................................................................... 13
- Secular trends in overweight and obesity .......................................................................... 13
- Attitudes of health practitioners and health professionals in relation to obesity ............. 15
- Self reported data: issues of concern ................................................................................ 15
- Increase of obesity in childhood and adolescence ............................................................ 16
- Causes of overweight and obesity ..................................................................................... 17
- Obesity and morbidity ........................................................................................................ 19
- Conicity Index .................................................................................................................... 20
Averages for body dimensions of the S.A Women 1998-1999 ........................................... 92
Relationship between body dimensions and age ...................................................................... 95
Neck circumference with age .................................................................................................. 96
Bust circumference with age .................................................................................................. 97
Waist circumference with age ................................................................................................ 98
Upper hip circumference with age ......................................................................................... 99
Lower hip circumference and age ........................................................................................ 100
Centre front length with age .................................................................................................. 101
Front neck point to bust point length with age ..................................................................... 102
Bust separation width with age ............................................................................................... 103
Across chest width with age .................................................................................................. 104
Shoulder length with age ....................................................................................................... 105
Centre back length and age .................................................................................................... 106
Across back width with age ..................................................................................................... 107
Side length measurement with age ......................................................................................... 108
Armhole circumference with age ........................................................................................... 109
Upper arm circumference with age ........................................................................................ 110
Outside sleeve length with age ............................................................................................... 111
Waist to floor length with age ................................................................................................. 112
Thigh circumference with age ................................................................................................ 113
Inleg measurement with age ................................................................................................. 114
Front to back crotch length with age ..................................................................................... 115
Height with age ...................................................................................................................... 116
Weight with age ..................................................................................................................... 117
Weight with height ................................................................................................................ 118
Secular trends of current Australian women with previous Australian literature. ....... 121
Height over time. ........................................................................................................ 122
Comparison of height within age groups of previous literature. .............................. 123
Weight over time. ..................................................................................................... 124
Average weight of Australian women compared in age groups to previous literature. .... 125
Comparison of Australian secular trend to overseas secular trend data..................... 126
Height over time between Australian women and overseas women. ........................ 127
Weight over time between Australian women and overseas women. ....................... 128
Results of the analysis of standardised photographs .............................................. 129
Figure type I. ......................................................................................................... 130
Figure type A. ...................................................................................................... 131
Figure type X. ...................................................................................................... 132
Figure type H. ...................................................................................................... 133
Figure type XH....................................................................................................... 134
Averages for figure type I. ..................................................................................... 135
Averages for figure type A. .................................................................................... 136
Averages for figure type X. .................................................................................... 137
Averages for figure type H. .................................................................................... 138
Averages for figure type XH.................................................................................. 139
One way ANOVA analysis test. .............................................................................. 140

Chapter 5: Discussions ............................................................................................ 141
Introduction ........................................................................................................... 141
Secular trends of current South Australian women compared to prior Australian studies. ............................................................................................ 141
Australian women compared with women from overseas ............................................. 143
Comparison of South Australian women to Australian Standard (1997) ....................... 146
Comparison of clothing standards to changes in shape and size of South Australian women.
.................................................................................................................................... 146
Implication of current Australian women's size and shape on clothing design and the production industry of women's ready made clothing ................................................. 148

Chapter 6: Conclusions .................................................................................................. 149
References ...................................................................................................................... 150
Appendices .................................................................................................................... 162