Textiles and the Skin
Current Problems in Dermatology

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Textiles and the Skin

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Contents

VII Foreword

What Should Dermatologists Know about Textiles

1 What Dermatologists Should Know about Textiles
Swerev, M. (Boennigheim)

What Should Textile Experts Know about Skin

24 What Textile Engineers Should Know about the Human Skin
Elsner, P. (Jena)

Textiles in the Prevention and Treatment of Skin Disease

35 Clothing and Thermoregulation
Havenith, G. (Leicester)

50 Clothing as Solar Radiation Protection
Menter, J.M. (Atlanta, Ga.); Hatch, K.L. (Tucson, Ariz.)

64 Laundering in the Prevention of Skin Infections
Kurz, J. (Boennigheim)

82 Functional Textiles in Prevention of Chronic Wounds, Wound Healing and Tissue Engineering
Wollina, U. (Jena); Heide, M.; Müller-Litz, W.; Obenauf, D. (Greiz); Ash, J. (Kenmore, Qld)

98 Medical Elastic Compression Stockings in the Treatment of Venous Insufficiency
van Geest, A.J. (Maastricht); Franken, C.P.M.; Neumann, H.A.M. (Rotterdam)

108 Compression Treatment after Burns
Wienert, V. (Aachen)
### Textiles as a Cause of Skin Disease

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td><strong>Occupational Contact Dermatitis in the Textile Industry</strong></td>
<td>Wigger-Alberti, W.; Elsner, P. (Jena)</td>
</tr>
<tr>
<td>123</td>
<td><strong>Irritant Dermatitis to Detergents in Textiles</strong></td>
<td>Matthies, W. (Düsseldorf)</td>
</tr>
<tr>
<td>139</td>
<td><strong>Textile Dyes as Allergic Contact Allergens</strong></td>
<td>Hatch, K.L. (Tucson, Ariz.)</td>
</tr>
<tr>
<td>156</td>
<td><strong>Formaldehyde as a Textile Allergen</strong></td>
<td>Fowler, J.F. (Louisville, Ky.)</td>
</tr>
<tr>
<td>166</td>
<td><strong>Cutaneous Immediate-Type Reactions to Textiles</strong></td>
<td>Bircher, A.J. (Basel)</td>
</tr>
</tbody>
</table>

171 **Author Index**

172 **Subject Index**
Philosophers tell us that man is an ‘unfinished being’. This is certainly true in that man (Homo sapiens) has had to devise a ‘second skin’ called clothing, a product made from a material called fabric. Properly engineered (designed) fabrics and clothing permit people to (a) live in most of the locations on planet earth from Sahara Desert to Polar region environmental conditions, (b) explore lake and ocean depths as well as the earth’s moon, and (c) travel in interplanetary space. Clothing also functions to protect people from hazardous substances in their environment.

For millennia, textile fabrics have been improved to assist in thermal and moisture regulation to and from the human body through engineering of fibers, yarns and fabric construction, and developing fabric finishes. Fabric can thus be designed to (a) offer a specific rate of loss of insensible perspiration thus assisting the skin in conserving essential levels of body fluids or to cool the body, (b) offer specific rates of heat loss to keep the body in a cold environment at its critical internal temperature, (c) keep cold water from reaching the skin and causing the body to become too cold, (d) absorb solar ultraviolet radiation and toxic gases, (e) and completely block the transport of harmful fluids such as blood-containing pathogens through it. Now, new technologies are permitting the production of ‘intelligent’ textiles; textiles capable of sensing changes in environmental conditions or body functioning and responding to those changes. Fabrics may now contain a chemical that senses a change in environmental temperature and respond by releasing heat when the temperature decreases. Fabrics today may have integrated sensors to detect heart arrhythmia and respond by alerting the wearer of this physiological event. Other fabrics may contain carrier molecules that absorb substances from the skin, detect
changes in levels of those substances, and respond by releasing a therapeutic or cosmetic compound to the skin.

The wearing of a ‘second skin’ is, unfortunately, not without problems. Potential health risks are introduced. Most fabrics that people wear every day are flammable materials and thus can burn the skin if accidentally ignited. Fabrics contain colorants and chemical-finish compounds that may transfer to skin and may be the cause of allergic contact dermatitis. Fabrics can serve as ‘reservoirs’ and thus hold potentially harmful chemicals as pesticides near the skin surface. Fabrics that are meant to protect from a hazardous substance may not permit the necessary amounts of heat and moisture transfer from the skin to the external environment under all wearing conditions.

While a considerable amount has been published in recent years about the interaction of textiles (fabrics) and skin, the information is so widely scattered that researchers, dermatologists, and others interested in learning about this important subject have had difficulty finding it. Therefore, we, the editors of this volume, thought it beneficial to collect into this volume in the series *Current Problems in Dermatology* information about the major advances in the interaction of textiles and the skin, both those beneficial to people and those that pose a threat to the health and well-being of people. We regret that not all aspects of the topic could be covered and are hopeful that you agree that sensible choices were made. Certainly, with the breathtaking advances in textile technology and skin bioengineering, the field will advance rapidly and another volume will be necessary.

The editors are indebted to the contributing experts who shared their experience as authors and co-authors. Their engagement is gratefully acknowledged. Finally, we would like to thank the staff of Karger AG, Basel, for their kind help with the project.

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*Walter Wigger-Alberti*

Jena and Tucson, 2003