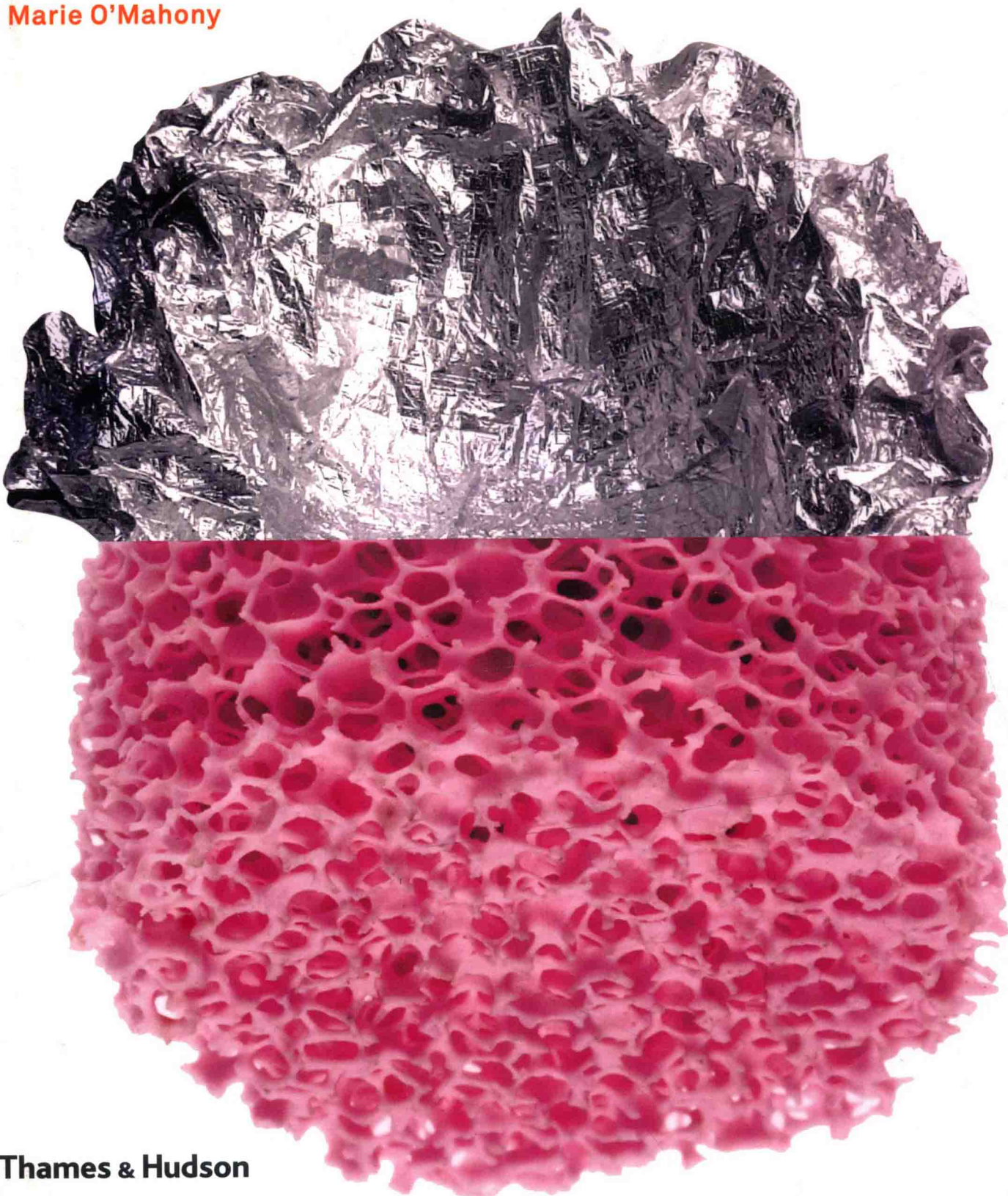


Advanced Textiles for Health and Wellbeing

Marie O'Mahony

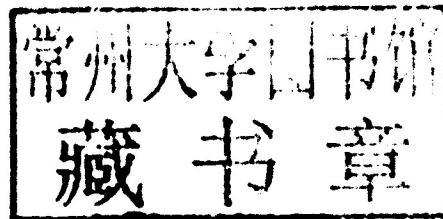


Thames & Hudson

Advanced Textiles for Health and Wellbeing

Marie O'Mahony

with 231 colour illustrations



Thames & Hudson

page 2: Composite, Design Composite
GmbH, Austria.

page 5: 3D nonwoven, Volz Luftfilter
GmbH, Germany.

First published in the United Kingdom
in 2011 by Thames & Hudson Ltd,
181A High Holborn, London WC1V 7QX

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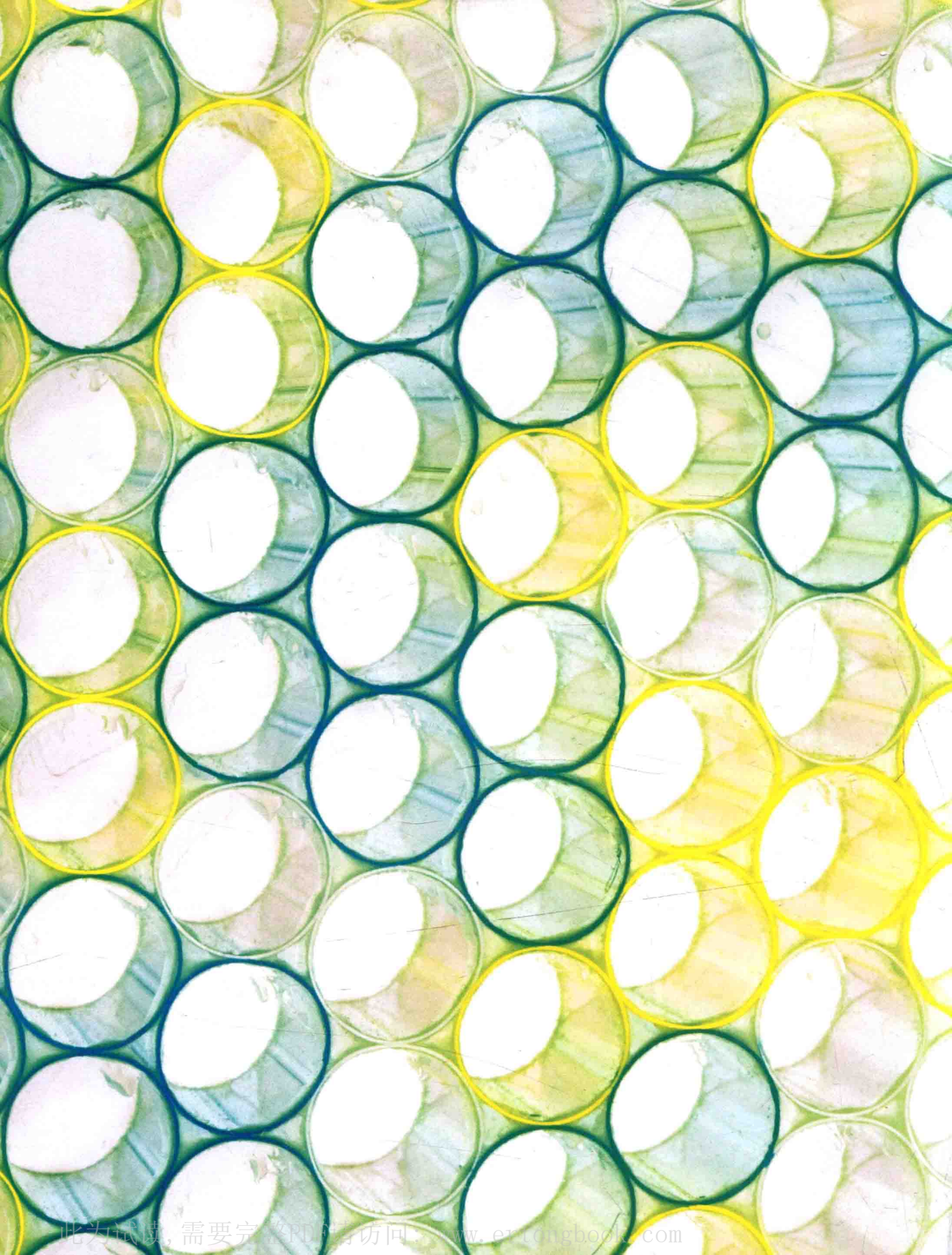
British Library Cataloguing-in-
Publication Data
A catalogue record for this book is
available from the British Library

ISBN 978-0-500-51587-7

Printed and bound in China by Toppan
Printing

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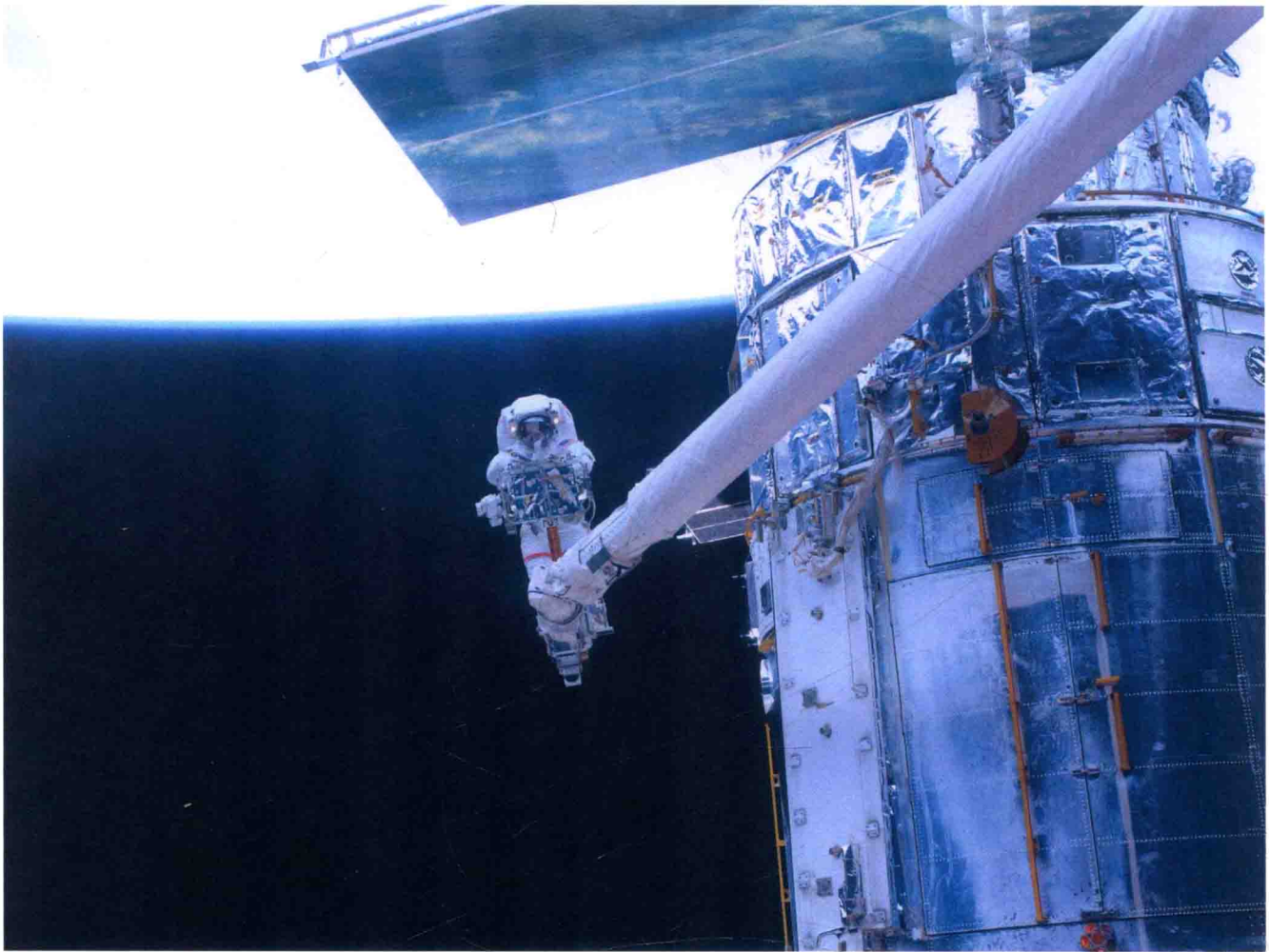
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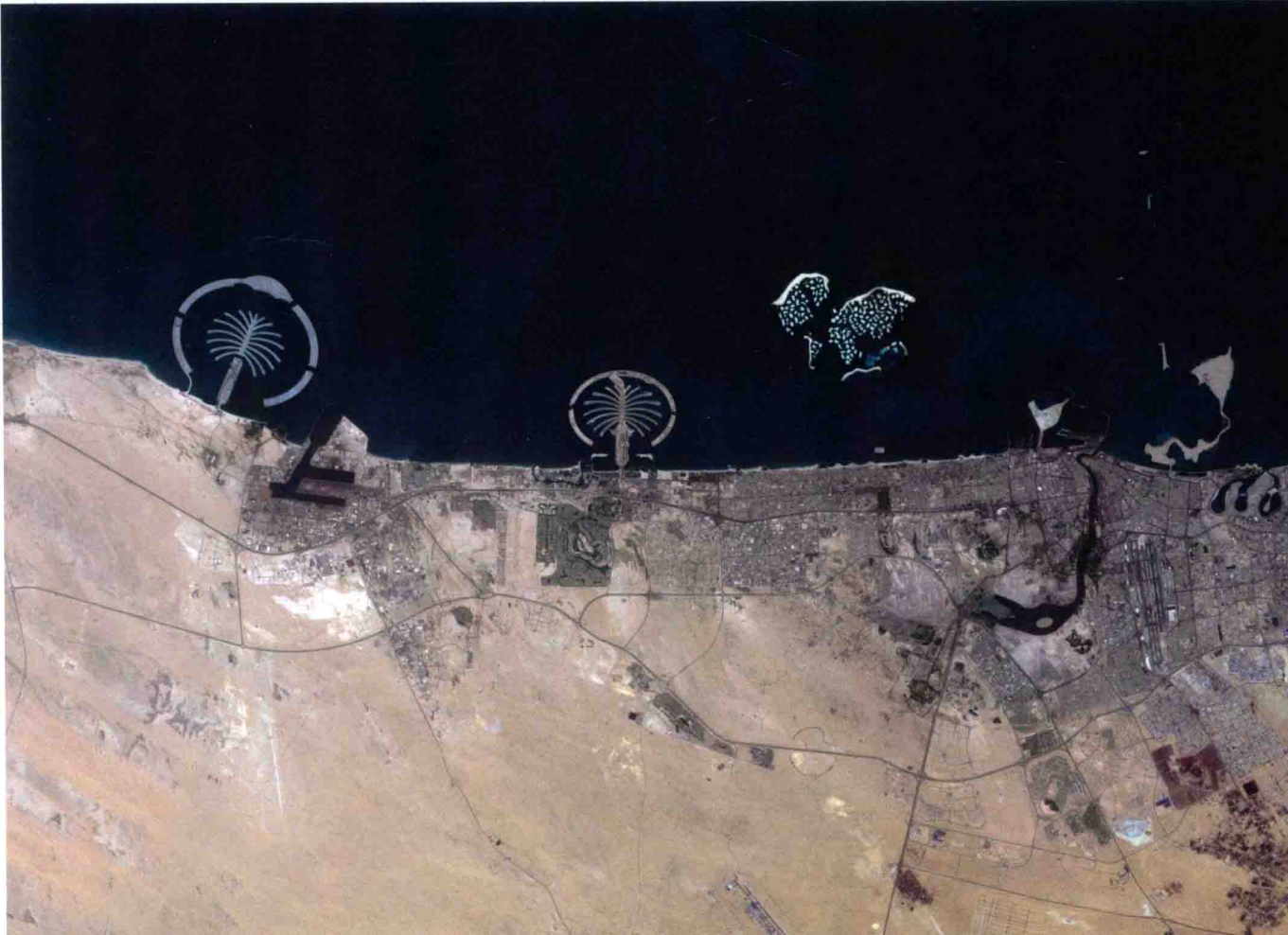
Spacewalk, NASA, USA, 2009.
The space industry has historically been behind many of the new textile-related technologies, particularly those relating to applications in health and safety. In-space applications range from the spacesuit to thermal blankets which protect the Hubble's electronics as shown here.

'There is nothing closer to the big bang of design, to its prime reason to exist, than objects that deal with self-preservation', Paola Antonelli, *Safe: Design Takes on Risk*, 2005

Avoiding death is the most fundamental human instinct. The majority try to avoid physical injury and fatality by taking active steps. However, for those who are not faced with the imminent possibility of death, it is not enough merely to be alive. Quality of life has become the new alchemy.

The early alchemists sought the elusive philosopher's stone and were part of a long spiritual tradition looking for the secret to eternal life. Our present knowledge of the strength and frailties of the human body not only helps us to live longer, healthier lives, but also gives us a hyperawareness of our mortality. We use all the means at our disposal to prevent damage to our bodies and to care for them. This extends to all aspects of our lives, from how we live and eat to the products we choose to buy. This has led to a significant growth in the market area of advanced textiles as they form the basis for many of the most innovative emerging designs.

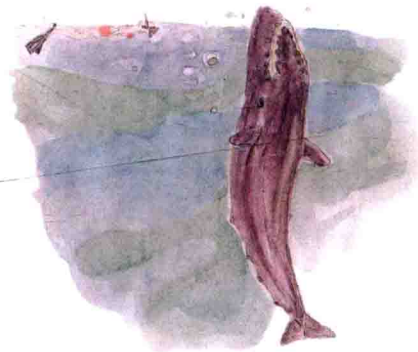
The World Islands, Nakheel, United Arab Emirates. This series of around 300 artificial islands has been shaped into the continents of the world. They include community islands, private homes, estate homes and resorts, including some luxury resorts. Geosynthetics have played a significant role in their development.



Venus Chair, Tokujin Yoshioka
Inc., Japan. The exhibition
installation of the designer's
'Venus' series of biotech
gel chairs that have been
grown from natural crystals
on a textile scaffold.







Roadrunner, Bill Burns, USA.
Watercolours from artist Bill Burns' 'Safety Gear for Small Animals' series which highlight the impact of human action on wildlife. The devices illustrated are human safety gear that has been resized to fit small animals.

While most fabrics can perform some protective or beneficial function, the focus of this book is to look at those that are specifically designed to contribute actively to our wellbeing. Part 1 looks at the materials themselves and Part 2 is given to the designs that utilize these materials.

The Fibers chapter shows how fibers are being formed in a great variety of ways using, for instance, techniques that allow synthetic fibers to be so highly engineered that they are finer than a human hair. It reveals how an unremarkable surface can house an intricate structure with a hollow centre that performs great feats of climate control or carries other benefits. 'Fabric structures' are building on the performance of these fibers, extending their capabilities through their construction. The range and indeed scale is breathtaking, from the tiniest medical stent invisible to the naked eye to large composites for the aerospace industry. 'Surfaces' such as embedding, coating and finishing add a further dimension to these materials and can also form the main function itself. Anti-microbial, anti-static, odour-absorbing and flame-retardant treatments are just some of those that are being used individually and increasingly in combination to provide multiples of performance. It seems the only limit to what is possible is the imagination of the textile and chemical engineer, who seem determined to prove that anything is possible.

Clothing is our most intimate daily contact with fabrics and it is here that we can find the widest range of applications. Garments that protect against chemical hazards, help keep us cool or



Ford Rouge Center, William McDonough + Partners, Dearborn, Michigan, 2003. The ten-acre living roof provides thermal and acoustic insulation for the workers and a home for wildlife as can be seen from the bird's eggs in the foreground.

eXasis, Rinspeed, Switzerland, 2007. Concept car from Frank M. Rinderknecht in a collaboration with Bayer MaterialScience AG to create a lightweight transparent body. The upholstery fabric is from Strähle + Hess and includes a Technogel cast textile for the arm and headrests.

warm, or help to build up our strength are all being developed and refined. Transportation sees textiles being used to provide acoustic and vibration control inside cars as well as providing lightweight and fuel-efficient composites for aeroplane wings or helicopter blades. Textiles have a long history of being used as habitats, with the traditional yurt now providing a blueprint for sustainable climate control. Buildings such as the Water Cube built in Beijing for the 2008 Olympic Games may look very different from a yurt, but they share a common desire