APPENDIX 1
SOURCES

UMIST: DEPARTMENT OF TEXTILES

Most of the work described in this book comes from research in the Department of Textiles, UMIST, under the direction of Professor John Hearle. It started with the purchase of a scanning electron microscope with a grant from the Science Research Council in 1967, together with five-year funding for an experimental officer and a technician. Since 1972, the staff have been supported by general UMIST funds; a second grant from SERC enabled a replacement SEM to be bought in 1979; industrial sponsors, listed below, have contributed through membership of the Fibre Fracture Research Group; special research grants have been made by the Ministry of Defence (SCRDE, Colchester, and RAE, Farnborough) and jointly by the Wool Research Organization of New Zealand (WRONZ) and the Wool Foundation (IWS); and other research programmes and contract services have contributed indirectly to our knowledge.

Pat Cross was the first SEM experimental officer and she was followed in 1969 by Brenda Lomas, who retired in 1990. Trevor Jones then took on responsibility for microscopy in the Department of Textiles in addition to photography. Over the years, many staff and students have contributed to the research. Their names are given below. Some have worked wholly on fibre fracture problems. Others have used fracture studies as an incidental element in their work.

PERSONNEL

The following people at UMIST have contributed to the research.

Academic staff

J.D. Berry	Aspects of fibre breakage
C.P. Buckley	Mechanics of tensile fracture, general direction
C. Carr	Fabric studies
W.D. Cooke	Pilling in knitwear, conservation studies
G.E. Cusick	Abrasion testing, some wear studies
K. Greenwood	Ballistic impact
W.Y. Hamad	Wood-pulp fibres, confocal microscopy
J.W.S. Hearle	General direction
I. Karacan	Studies of Kevlar
M.A. Wilding	Tensile fracture, general direction

Professional staff

D.J. Clarke	Instrument development
C.R. Cork	Archaeological textiles and other studies
P.M. Cross	Microscopy techniques, single fibre fractures
B. Lomas	Microscopy and other techniques, wear studies

Technicians

D. Ball	Instrument developer
S. Butt	Instrument developer
L. Crosby	Scanning electron microscopy
C. Green	Scanning electron microscopy
J.T. Jones	Photography
R.E. Litchfield	Scanning electron microscopy

A. McClellan	Instrument development
J.T. Sparrow	Scanning electron microscopy
H. Splitt	Instrument developer
A. Williams	Scanning electron microscopy

Academic visitors

N.E. Dweltz	Abrasion study
Bhuvenesh C. Goswami	Comparative study of nylon fracture
A. Rast-Eicher	Archaeological textiles
M.A.I. Sultan	Ballistic impact
C.Y. Zhou	Twist and tension in Kevlar

Research students

R. Ahmed	Cotton yarn abrasion
I.A.O. Bahari	Biaxial rotation fatigue
K. Banks	Archaeological textiles
J.A. Batchelor	Archaeological textiles
B.H. Bhutta	Heat-set fibres
A.R. Bunsell	Tensile fatigue
S.F. Calil	Biaxial rotation fatigue
I.E. Clark	Biaxial rotation fatigue
C.R. Cork	Ballistic impact
F. Dadashian	Breaks of Tencel
M. Goksoy	Biaxial rotation fatigue of cotton; surface abrasion
Binode C. Goswami	Flex fatigue
R. Greer	Heat setting
M. Habibullah	Thermomechanical properties
N. Hasnain	Biaxial rotation fatigue of cotton
B.C. Jariwala	Flex fatigue
D.C. Jones	Photodegradation of wool, atomic force microscopy
F.S.H. Kassam	Rupture of tear webbing
L. Konopasek	Tensile fatigue
T. Laksophee	Wool/mohair abrasion
K. Liolios	Biaxial rotation fatigue
R. Mandal	Heat-treated fibres
M. Miraftab	Flex fatigue
B. Parvizi	Flex fatigue
A. Sengonul	Fatigue of HMPE; carpet wear
J.T. Sparrow	Tensile failure of cotton
R. Stanton	Kinkbands
E.A. Vaughn	Tensile fatigue
B.S. Wong	Rotation over a pin
Y. Zhu	Oxidised PAN fibres

Undergraduates and summer student workers

A. Chan
A. Clarke
J. Griffiths
A.D. Hearle
A. Kaynak
S.R. Moore
P. Noone
S.J. Watson

FIBRE FRACTURE RESEARCH GROUP

The following organizations have joined in sponsorship for part or all of the period 1972–1987:

Albany International Research (formerly FRL), USA
Allied Fibers, USA
AKZO, Netherlands
Carrington-Viyella, UK
Celanese, USA
Chemiefaser Lenzing, Austria
Courtaulds, UK
Du Pont, USA
H and T Marlow (formerly Hawkins and Tipson), UK
Hoechst, Germany
Imperial Chemical Industries (ICI), UK
International Institute for Cotton (IIC), UK

International Wool Secretariat (IWS), UK
Marks and Spencer, UK
Monsanto, USA
Phone-Poulenc, France
Strattwell Developments, UK
TEFO, Sweden
Teijin, Japan
Toray, Japan
US Army European Office, UK

In the provision of materials, information, valuable advice, and discussion, the following have made particular contributions:

G.A. Carnaby, WRONZ (carpets)
M. El-Masri, Strattwell (rental textiles)
J. Flory, Exxon (ropes)
M.R. Parsey. H and T Marlow (ropes)
W. Puchegger, Chemiefaser Lenzing (rayon)
G. Stevens, RAE (tensile fatigue)
R.A. Stocks, SCRDE (Service clothing)
J. Swallow, RAE (service items)
R.D. Van Veld, Du Pont (fibres)
M. Webb, RAE (service items)

MATERIALS FOR EXAMINATION

Specimens for examination have come from a variety of sources. Some items — worn clothing, hair, etc. — have been given casually by people in contact with the laboratory. Others have come in for special investigations.

Particularly well-documented samples have been supplied by:

Du Pont (light-degraded nylon)
H and T Marlow (ropes)
Hampton Court Palace Conservation Studio, London
IWS (worn trousers)
OCIMF, through John Flory, Exxon (ropes)
P and S Filtration (filter fabrics)
RAE (service items)
SCRDE (service clothing)
Scapa-Porritt (felts)
Shirley Institute (sheets, shirts and samples of machine abraded fabrics)
Strattwell Developments (rental textiles and clothing)
Textile Conservation Centre (Hampton Court), London
Victoria and Albert Museum, London
Vindolanda Trust, Cumbria
Whitworth Gallery, Manchester
G.M. Vogelsang-Eastwood, Leiden
WRONZ and IWS (carpets)

PROVISION OF PICTURES AND INFORMATION

Stephen Banfield, TTI Ltd, UK
Edward Boyes and Gerald Lavin, DU PONT, USA
T.R. Burrow, Courtaulds, UK
Anthony Bunsell, Ecole des Mines de Paris, France.
Robert Burling-Claridge, WRONZ, New Zealand.
Jose Charvet, Stevens Institute, USA
Hawthorne Davis, North Carolina State University, USA.
Karlheinz Foos, Bayeischen Kriminalamtes, Germany.
Bhuvenesh Goswami, Clemson University, USA
Sarah Holmes, University of Texas, USA
Michael Huson, CSIRO, Geelong, Australia.
Elizabeth Norton, University of Cambridge, UK
David Salem and Sigrid Ruetsch, TRI, Princeton, USA.
H.S.S. Sharma, Queen's University, Belfast, UK
Alan Swift, Consultant, UK
Hiroko Yokura, Shiga University, Japan

APPENDIX 2
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Note: Readers are also referred to Chapter 50, "The Diversity of Fibre Failure", for a classification of fibre breaks according to type, cause and structure.

Index terms **Links**