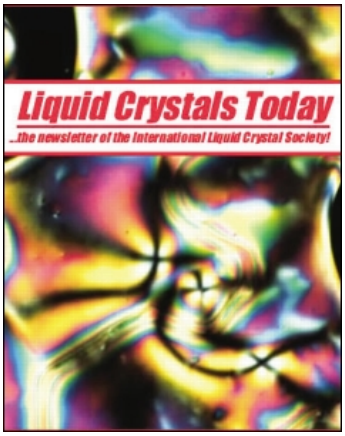

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Professor Frank M. Leslie

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Professor Frank M. Leslie

Recipient of the G. W. Gray Medal (1997)

'Mathematical models for liquid crystals'

By **I. W. Stewart**
Strathclyde University, Glasgow, UK

Frank Leslie gained his Honours degree in mathematics from St Andrews University, via Queen's College, Dundee, in 1957. While occupying the position of Assistant Lecturer in Mathematics at Manchester University, he completed his PhD in 1961 under the joint supervision of Professor M. J. Lighthill and Dr B. Morton on problems of flow in the open thermal siphon and viscoelasticity in liquids. This was followed by a one year position as a Research Associate in Mathematics at Massachusetts Institute of Technology in 1961. In 1962 Frank Leslie returned to Britain as a lecturer at Newcastle University. It was at MIT where Frank first noticed the work of Jerry Ericksen, but it was not until Frank arrived at Newcastle that Albert Green in the Mathematics Department there suggested to him that he ought to look more closely at Ericksen's recent papers on anisotropic liquids. It was when Frank Leslie was a Visiting Professor in Mechanics at John Hopkins University that he finally met with Ericksen in Baltimore in the autumn of 1966. Ericksen was influential upon future work on flow problems in nematic liquid crystals and encouraged him to focus on mathematical models with applications to liquid crystals. On his return to Britain Frank Leslie accepted the position of Senior Lecturer in Mathematics at Strathclyde University, Glasgow, in 1968, becoming a Reader in 1971, Personal Professor in 1979 and Professor of Mathematics in 1982. Since arriving at Strathclyde he has welcomed countless visitors and researchers to the Mathematics Department and has himself visited many liquid crystal groups throughout the world, in addition to holding Visiting Professorships at the Universities of Hokkaido, Pisa and Tulane, to name but a few.

Theoretical developments in nematic modelling arose from Frank Leslie's original work on nematics and his consequent research has influenced every theoretical and experimental group. His most influential papers are undoubtedly 'Some constitutive equations for anisotropic fluids' in Q. J. *Mech. Appl. Math.*, 19 (1966) 357–370 and 'Some constitutive equations for liquid crystals' in *Arch. Rat. Mech. Anal.*, 28 (1968) 265–283. Soon afterwards, upon Peter Raynes' suggestion, Frank visited the liquid crystal group at RSRE in 1975 and has been a regular visitor and consultant to this group since then, readily acknowledging his debt to RSRE, now DERA, at Malvern, Worcestershire. It was here that Mike Clark, Ian Shanks and Peter Raynes gave Frank the impetus to carry on with modelling flow problems in nematics.

In 1987 I was extremely fortunate to be offered a Post-doctoral Fellowship under the direction of Frank Leslie. This position involved developing his seminal continuum theory to include models for smectic C liquid crystals. With his extensive contacts in the liquid crystal community this project lead to fruitful collaboration with Roy Sambles' group at Exeter and David Tilley at Essex. This work was co-ordinated by Mike Clark (who had moved from RSRE) at the liquid crystal display division at the GEC Hirst Research Centre in Wembley, where Frank was also a consultant from 1986 to 1994. The smectic modelling developed from these meetings is currently influencing most theoretical and experimental groups in smectic liquid crystals around the world. Throughout this period Frank also maintained his links with DERA Malvern, more recently collaborating with Cliff Jones and his colleagues. In recent years, he has also been involved with liquid crystal modelling through European Network programmes coming into contact with groups led by Georges Durand and Roberto Bartolino. He has always sustained a general interest and activity in a broader sense by being on the editorial boards on many prestigious liquid crystal and mathematical journals and has remained an enthusiastic supporter of the British Liquid Crystal Society, being elected Chairman from 1987 to 1991.

Frank was elected a Fellow of the Institute of Mathematics and its Applications in 1969 and a Fellow of the Institute of Physics in 1978. He was further elected a Fellow of the Royal Society of Edinburgh and a Member of the John Hopkins Society of Scholars in 1980 and received the annual Award of the Royal Society of Rheology in1982. In 1995 he was elected a Fellow of the Royal Society of London and, in the same year, was awarded the distinguished Sykes Gold Medal from St Andrews University for his DSc degree. It is impossible to estimate the impact and extent to which Frank's ideas and concepts have influenced the world-wide activities in nematic and smectic liquid crystals. As will be agreed by all his collaborators, former postgraduates and post-doctoral workers and the many researchers who have had the pleasure of coming into contact with him, it is a fitting recognition that with such a career record he has been chosen as the recipient of the 1997 G. W. Gray Medal of the British Liquid Crystal Society.