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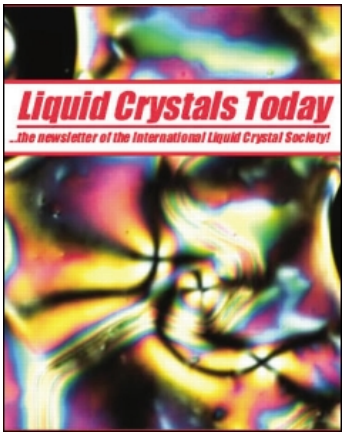

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PROFESSOR MARIAN MIESOWICZ, 1907-1992: *A Scientific Appreciation*

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PROFESSOR MARIAN MIESOWICZ, 1907—1992: *A Scientific Appreciation*

from Professor J A Janik,
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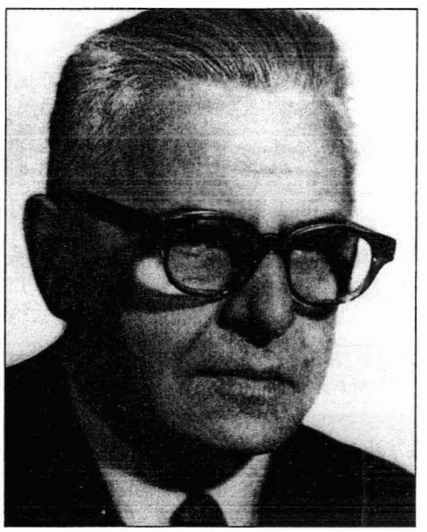

Professor Marian Miesowicz

Marian Miesowicz, former Professor at the Mining Academy and the Institute of Nuclear Physics at Kraków, died on April 5th, 1992.

Professor Miesowicz was born in Lwów on November 21, 1907. He studied physics at the Jagellonian University in Kraków. As a young graduate researcher he became interested in liquid crystals, under the inspiration of Mieczyslaw Jezewski, then Professor of Physics at the Mining Academy. His peak achievement in this research, carried out during the 1920s and 30s, was the discovery of the anisotropic viscosity in nematic liquid crystals.

During the Second World War, Miesowicz changed his field of interest in physics. He left the field of liquid crystals and became involved in problems of cosmic radiation, which later on transformed into the broad field of high energy and elementary particle physics. He remained faithful to this field until his death. However, liquid crystal matters interested him during his whole life, and I remember many interesting discussions with him on that subject. Miesowicz also participated in two International liquid crystal conferences: in Bordeaux in 1978, and in Bangalore in 1982.

As I have mentioned before, Miesowicz' main achievement in liquid crystals was his discovery in 1935 of the anisotropy of viscosity. He then suggested an exceptionally clever and convincing experiment, which he afterwards realised for the nematic PAA and PAP. In this experiment one observed a decreasing amplitude of oscillations of a balance, whose one arm carried a quartz plate immersed in the nematic substance. The direction (or motion) (up and down) of the plate was parallel to the plate surface. From the damping decrement of the oscillations one was able to calculate the viscosity coefficient. By carrying out the experiment in a magnetic field orienting the sample it was possible to determine the viscosities for a direction parallel to the nematic director, **n**, for a direction parallel to the velocity gradient in the nematic liquid, grad **v**, and for a direction perpendicular to both vectors, **n** and grad **v**. These three components of the viscosity tensor — η_1, η_2, and η_3 — have an important property: their definition (as introduced by Miesowicz) is very clear and natural. In the officially accepted terminology these coefficients are called "the Miesowicz viscosities". Their values for PAA at 122°C (in the nematic phase) are: $\eta_1 = 2.4 \pm 0.05$; $\eta_2 = 9.2 \pm 0.4$; and $\eta_3 = 3.4 \pm 0.3$ centipoise, as determined by Miesowicz. It is worth noting that the accuracy of Miesowicz' experiments was so good that no significant improvement has been reported until the present time.

Let me make a historical remark at this point. It is well known that the nematic PAA (as also PAP) looks like an ordinary liquid, and one should remember that in the 1930s a paradigm claiming that the properties of liquids are isotropic was generally accepted. In connection with this Miesowicz related a story: When an outstanding physicist from Kraków, Professor Konstanty Zakrzewski, was informed about Miesowicz' results, he could not believe that they were correct since they were in conflict with the above mentioned paradigm. He changed his mind after spending several days with Miesowicz in the laboratory. Then he realised that it was the paradigm that had to be rejected.

Miesowicz' results on viscosity were published in 1935 in the relatively little known Bulletin of the Polish Academy of Sciences and Letters, in German. After the Second World War, Miesowicz published a new version of that work in *Nature*, **158**, 27 (1946). Then the Miesowicz viscosities became widely known. Every year until now — almost half a century later — references and quotations appear to what was originally viewed as a violation of the paradigm.

Editorial note: *An interesting perspective on Miesowicz' work is given in "Liquid Crystals in my Memories and Now — The Role of Anisotropic Viscosity in Liquid Crystals Research", M Miesowicz, Mol. Cryst. Liq. Cryst., 1983,* ***Vol 97,*** *pp1-11.*

Aerodynamic and Heat Transfer Testing *(continued from page 5)*

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