

Conference Report
19th International Power Sources Symposium



Dr George Donaldson recipient of the Frank Booth award.

The 19th International Power Sources Symposium was held in Brighton, UK, between 24 and 26 April 1995. Well attended, the return to the town which hosted the Symposium between 1962 and 1986 was welcomed by the delegates. Held in the five-star luxury Thistle Hotel on Brighton's famous seafront, this Symposium was noteworthy for a number of innovations.

For the first time there was a Exhibition, incorporating stands from European and American manufacturers or distributors of batteries displaying their charging, control and monitoring equipment. The second change being the 'Bourner Lecture'.

Mrs Sheila Bourner, Secretary to the Symposium since it started in 1958, died in 1993. In her memory, the organizing Committee have introduced the 'Bourner Lecture', which was given by Mr Ken Lillie, Chief Engineer of the Rover Car Group's Advanced Technology Centre at the University of Warwick. His talk, entitled 'Electric Cars — Third time Lucky?', traced their history from the turn of the century, when the internal combustion engine was immature, to research during oil crises of the 1970s and 1980s to the present, third, upsurge in interest now that environmental issues are driving many organizations into large-scale research and testing. Describing the requirements of an electric car, his major comment about a suitable battery was to emphasize the need for high power outputs, rather than an 'ultimate' in energy density.

The wealth and variety of topics offered in the papers enabled the organizers to present a well-balanced programme over the three days as well as an interesting and varied poster session.

The first day was devoted to aqueous rechargeable batteries, reflecting the enormous upsurge in charge-control and capacity-monitoring techniques; there were three papers and a poster on this subject. Emphasizing the importance of metal-hydrogen technology for space applications, four papers from the USA discussed nickel- and silver-hydrogen systems and tests on

nickel–metal hydride cells. Reflecting the broadly based but generally academic content of the Symposium, two of these were scientific, while the others discussed the technology of the systems. Professor Conway from the University of Ottawa gave a lucid comparison between batteries and supercapacitors.

The morning of the second day included the 'Bourner Lecture' and was devoted to aqueous systems, with a Norwegian contribution which updated their work on in-sea magnesium–oxygen cells. Only three lead/acid papers were in this session, but they covered modelling, performance in photovoltaic applications, and a Swedish paper on a high power semi-bipolar design of lead/acid battery. The University of Southampton recounted their activities in using micro-electrode sensors to follow the charge/discharge processes of minute areas of lead/acid plates.

The second half of the Conference was devoted mainly to non-aqueous lithium anode primary and secondary cells. Emphasizing the importance of the 'lithium-ion' system, (lithium intercalating carbon anode with a variety of cathodes), four papers and several posters described researches in this area, including a joint French/UK paper on batteries for radio-communications applications, the design of polymer electrolyte systems and their use in munitions telemetry and space vehicles. A Japanese poster detailed the construction and performance of the lithium-ion/lithium cobalt oxide system.

Another Japanese presentation illustrated the use of atomic force spectroscopy and scanning auger electron microscopy for the examination of the working surface of lithium electrodes. A French and a South Korean paper each described work on thin-film cells using transition metal or manganese oxides as cathodes.

A major topic for the third day was battery safety and disposal. British Gas presented results from a wide-ranging safety test programme which had evaluated candidate lithium primary cells for their next generation of gas meters. The University of Leicester discussed the jungle of regulations as well as the problems and solutions to the disposal of primary batteries.

Presented as a keynote speech, a joint Canadian/American paper was given by Mr J Gucinski from the Crane Division of the Naval Surface Weapons Center. In it he summarized the findings of a team which examined the state of the North American Battery Industry in relation to its ability to provide the small number of military batteries now required.

Also from Canada were two papers concerning the specification of lithium batteries for use in aircraft. These papers produced lively discussion among the multi-national audience. Primary lithium systems were the subject of a paper on their use for implantable cardiac defibrillators, whilst a joint Russian/French contribution discussed the changes in structure of the carbon cathode during the discharge of thionyl chloride cells.

Traditionally, this Symposium has only a few presentations on fuel cells. This year, a Canadian paper and a British poster presented different aspects of modelling, whilst one from the University of Loughborough on electrode fabrication was supplemented by three other posters: one on test equipment for fuel cells, the others dealing with separators for intermediate temperature and for alkaline electrolyte cells. The final afternoon of the Symposium was given over to high temperature systems — sodium–sulfur for possible use by the Royal Netherlands Navy, Russian work on a $\text{CuCl}-\text{CuCl}_2$ melt as a cathode and an American paper on electrolytes for lithium–iron disulfide thermal batteries.

Of the thirty-two posters presented, ten embraced the work on ambient temperature lithium anode cells, while six were about various primary and secondary molten salt and solid electrolyte systems.

As in past years the Frank Booth award (named after the founder of these Meetings) was presented; on this occasion the award was made by Chairman, Mr Tom Keily to Dr George Donaldson, from the Canadian Department of National Defence and an attendee and presenter of papers at these Symposia since 1980.

Nearly two hundred delegates, thirty-seven papers, thirty-two posters, contributions from eighteen Nations, with an agenda which covered most of the modern battery systems emphasizes the versatility of this year's Symposium. With the return to Brighton — many refer to the 'Brighton Symposium' — and wide facilities for delegates, many considered that this was the most successful event for several years. The organizing Committee are already planning for the April 1997 Symposium, an event that will be special, being the 20th Conference since the series began in 1958. Advance information about the 1997 Symposium will be available in January 1996.

Copies of the hard-covered printed book 'Power Sources 15', containing the text of all papers and abstracts of the posters may be obtained from: The Secretary, International Power Sources Symposium, PO Box 85, Crowborough, East Sussex, TN6 1DW, UK, cost £ 80.00, plus £ 10.00 postage and packing.

Austin Attewell
Proceedings Editor