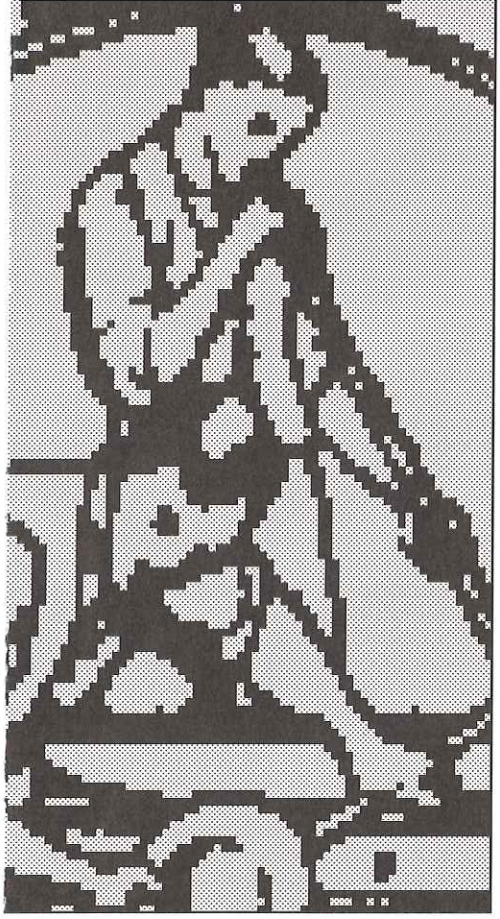

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SGT NEWS

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HAND-MADE GLASS... BEYOND THE CRYSTAL BALL

Eight years on from the original consultation of his 32% lead crystal ball, Maurice Wallage has again used his fund of wisdom and experience to review the state of the hand-made crystal industry. The conclusions he drew were presented to a joint meeting of the North West Section and the Institute of Materials, NW Ceramics Group.

Since glass was first mass-produced, the exact line between designer and artisan has never been easy to draw. Frequently during earlier centuries, the respective parts played by the chemist evolving new recipes, the designer exploring new techniques and the craftsman at the fire were combined in one person.

As blowing glass became more commercialised, it required the work of a team, the individual contributions becoming more specialised. There were always some brilliantly creative men who spanned all the talents but until the end of the 19th century, most glassmaking had settled down to a highly specialised, industrialised craft. About that period a new attitude fuelled by the arts and crafts movement arose among many talented artists.

Brilliant men, such as Carder at Stevens and Williams, Northwood and Richardson at Thomas Webb and craftsmen at other crystal houses, were producing a wide variety of glassware. Frederick Carder left his mark not only on the Stourbridge industry but also on glassmaking in the USA where he founded the famous Steuben Glassworks. The advancements in design and manufacture by these master craftsmen generated considerable artistic product achievements which the crystal houses maintained until the Second World War.

Following the war, there was a dominant buyers' market and the hand-made glass manufacturers lost their way artistically. The benefits of technological developments in equipment and furnaces, instead of providing a creative spark, heralded a decline in the ability or commercial acumen of the industry to produce imaginative designs.

The demand for articles outside the run-of-the-mill tableware was closed and other companies in other countries have captured the market. Steuben in America produces magnificent glassware, all with technology taken from the Stourbridge area by Carder 90 years ago. Four examples from their present range, as illustration of this point, are 'The Crown of Oberon', 'Romeo and Juliet', 'Roundabout' and 'A Modern Suite of Glass', works which cost a substantial amount of money but the lines sell.

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IN PRINT

The August 1993 issue of *Glass Technology* **features papers on the effects of lightweighting on impact performance, mathematical models of laser irradiation, characterisation of mineral glass fibres and the modelling of optical fibre drawing. Two reports from the Refractories and Chemical Analysis Committees on fusion cast refractories and x-ray fluorescence techniques are included in the proceedings.**

Physics and Chemistry of Glasses **has a selection of papers covering irradiation and heat treatment of ion exchange glasses, optical basicity of sodium borate glass, thermoelectric power in chalcogenide thin films, redox reactions in glass melts, structural relaxation during sol-gel processing, influence of surface charge on the kinetics of glass reactions, anomalous ultrasonic velocity in caesium borate glasses and extremely modified calcium and rubidium borate glasses.**

REFRACTORIES REPORTS

A collection of seven technical papers from the Refractories Committee has been prepared to give a general understanding and appreciation of the wide range of refractories usage within the glass industry. The work represents several years' effort by members of the Committee, past and present and has only previously been available through the Proceedings section of *Glass Technology*. **It is intended to update the published information with responses to the latest developments and changes in operational practices.**

The Refractories Committee Report is available to SGT Members, priced at £5, while the non-member rate is £8. Copies can be ordered through the Society's office.

► *CONTINUED*

There must be room for makers of such pieces in the UK. The beginnings of the answer may yet prove to lie in the studio glass movement.

In 1962, the movement was born from a seminar held at the Toledo Museum of Glass in Ohio. From there, studio glass suddenly became a viable field for the artist to work with on his or her own; the material rather than the craft then attracted attention and frequently artists were struggling to blow a decent bubble, with clumsy execution being overlooked in favour of 'personal expression'.

But what have those 30 momentous years produced? Firstly, technical and art colleges and latterly universities have added studio glass courses to their curriculum. Encouraged with the backing of such organisations as the Worshipful Company of Glass Sellers of London, or commercially by such massive companies as Corning in the USA, the design, manufacture and especially the quality of studio glass has grown beyond any possible prediction of what was then a non-computerised crystal ball 30 years ago.

The movement is not going to produce substitutes for English full lead crystal, capable of having fine wine served in them. But the artistic skill and technical ability involved could perhaps become an alternative supplier to the crystal market.

Examples of British artists in this field include: Adrian Sankey at his purpose-made glasshouse in Ambleside, who sells suites of glasses direct from his studio (they were much admired when the Society held its Spring Meeting at Grange-over-Sands in May 1992); Clare Henshaw, winner of the 1992 Glass Sellers Award; Stephen Bradley, a dedicated cameo artist, somehow failing to gain recognition at the moment; Siddy Langley of Maidenhead, using iridised free blown glass seen in galleries throughout the world; Tony Stern of Battersea, a most successful artist who exports his works worldwide; and Amanda Brisbane, a worker of very large sand cast pieces for installation as centrepieces in public areas.

The hand-made industry also has machine-made competition from Europe, principally France, Germany and Italy. Machine-made can have a lower lead content, thus it is less vulnerable to attack from the lead leaching lobby. It is also dishwasher proof. Hand-made is in the order of 12 times the price of the machine-made alternative.

Will the route at the beginning of the next century take the remaining crystal houses back to producing exquisite glassware such as that which we have seen produced earlier? Or can we, by the year 2000, undergo dramatic innovation? Whether process or product, we must mobilise what is left of the R & D capability to emerge with upgraded or substitute methods.

Technology may give us, for example, synthesised batch, employing soluble materials, fully homogenised before being fed to the furnace; or maybe even a dishwasher proof glass, with similar properties to 30% lead-bearing glasses.

The chances are that manufacturers will continue to rely on the basic techniques familiar to us today, even though their furnaces may be platinum-lined and may automatically feed slugs of glass to the end of the blower's iron (to give credulity to the hand-made image), ultimately destined for the robot-controlled cutting, polishing and packaging machines.

Society of Glass Technology, 20 Hallam Gate Road, Sheffield S10 5BT. Tel 0742 663168. Fax 0742 665252.

COMMITTEE FOCUS

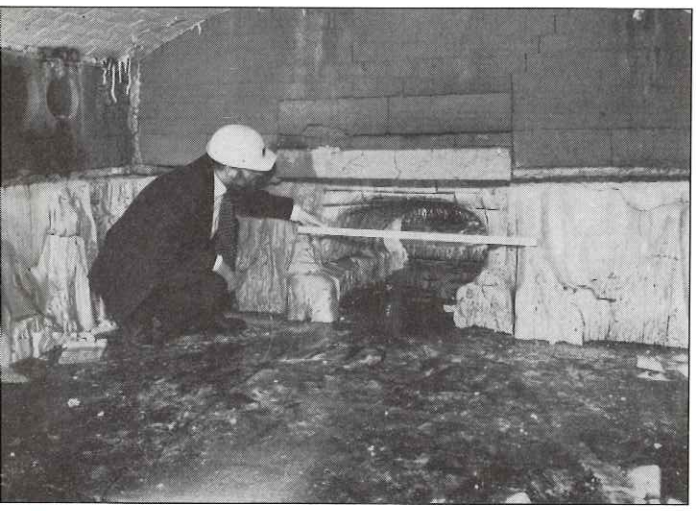
The Refractories Committee has for many years been the Society's largest and most active committee, representing the major UK glass producers, the refractories industry, engineering contractors and research organisations. Five well attended meetings are held annually at glass plants and refractories works, usually with a tour around the site as part of the agenda.

Its history goes back to before the formation of standing committees in 1930. As early as July 1918, Council charged the Refractories Research and Specifications Committee to undertake tests and devise specifications on materials most suitable for glass furnace construction. Their results were published the following year.

The Committee has arranged several successful clinic meetings on subjects of general interest. The next is planned for October 1993 to debate the future of regenerators in the light of developments in oxy-fuel melting. Another future project intended for coverage involves the environmental issues affecting all glass plants and refractories suppliers. Case studies are being compiled on refractory disposal problems and all health and safety aspects will be considered.

WHY NOT 15 YEARS?

Furnace designs may be reaching a critical stage where production demands erode any gains made in serviceable life. The Refractories Committee's clinic meeting questioned the feasibility of the 15 year furnace. The solutions are not solely operational or technological; accounting practices may have to change to realise the next step forward.



The benefits of improving furnace life are seductive but the initial design parameters cannot always anticipate changes in demand, regulations or the development of new materials. Of the furnaces in operation today, many are pulling beyond their original capacity, have changed colour or have more cullet than expected.

The flux line is the point of highest wear in a float glass furnace but it is also easy to get to and repair. A container furnace has a flatter wear profile so as it nears the end of its life, the failure point is less predictable. Should a furnace design with a view to long life take in a shutdown and partial replacement of high wear components to extend durability?

A long furnace life starts on the drawing board, where initial specifications are considered. The key to long life is to have as flexible design as possible and one that uses less fuel; the heat should be concentrated on the melt not the superstructure. Some components of the furnace may need to be changed within the overall lifetime, notably the forehearth and the throat, where it may be more viable economically to use cheaper refractories.

Repairs in order to extend operational life have been seen as necessary only when something critical has happened. Outside contract repairers are brought in when enough jobs have built up to justify their call out. Fosbel is offering a contract maintenance scheme which starts one year before the expected end of life and extends the life by up to two years. It offers regular check-ups and repairs to high wear areas, even below glass level. Justifying the extra costs to the accounts department has been one of the factors which has delayed this practice from wider acceptance.

Oxy-fuel melting can boost the efficiency of a furnace, especially if the burner blocks have been designed for a retrofit. For new furnace designs, 100% oxy fuel eliminates the need to have regenerators and tightens flame control, reducing structure temperature. This overall extension of design life must be seen as a major step forward. The interest generated is a major indicator in itself.