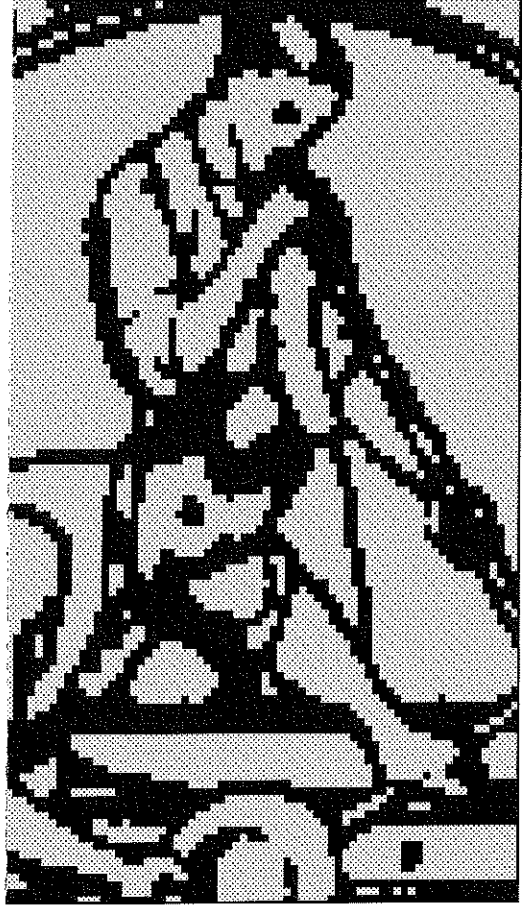

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SGT NEWS

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YOUNG ENGINEERS AWARD

In co-operation with Glass Training Ltd, the SGT's Engineering Committee has created an award scheme for young glass industry engineers.

The Colin Mayers Award is named after an individual who was active in the Society for many years, prior to his sad death in 1988. After graduating from university, he joined Clayton Mayers Ltd, becoming Managing Director in 1960. When this family company changed hands, however, he created Colin Mayers Ltd, a business that has become well known for developing the use of computers and robots for different aspects of glass production.

When Colin Mayers died in 1988, he left a bequest of £500 to the SGT. Subsequently, the Society's Engineering Committee has drawn up a scheme in collaboration with Sheffield-based Glass Training Ltd to create the Colin Mayers Award.

The Award is open to any person connected with the UK glass industry who is under the age of 21 on October 31st 1992 (the closing date for entries). Entries will comprise a written presentation of 1000 words, plus diagrams, on an engineering- oriented project. The winner will receive an appropriate item to the value of £150, one year's free membership of the SGT and a certificate. Further information from the SGT at Thornton, 20 Hallam Gate Rd, Sheffield S10 5BT.

MIXING MAINTENANCE WITH SILICON NITRIDE

A consultant's appraisal of planned maintenance, the search for alternatives to lead for crystal glasses and the development of silicon nitride... these were the themes of separate poster sessions presented at a North East Section meeting, held last April.

JOHN HENDERSON reports.

According to management consultant and North East Section member Bill Brookes, planned maintenance has come full circle. He believes that we are now using maintenance techniques employed in the Victorian era. To illustrate his point, Mr Brookes took the audience on a short tour through the history of maintenance techniques, describing how first generation maintenance during the post Industrial Revolution era up to pre-1950 was based largely on over-engineered machines, tended by a 'minder with an oil can'.

The second generation saw the beginnings of planned maintenance; with increasing machine complexity, increased data was required and as increasing amounts of data became available, the computer came of age. In the third generation, maintenance employed the benefits of cheap computing power, component reliability prediction, predictive maintenance and failure mode identification. Sensors were often used to give a machine or component 'signature'.

The point where the circle closed is fourth generation maintenance, improved predictive systems giving new techniques to industry, namely total productive maintenance (TPM), reliability centred maintenance (RCM) and results oriented maintenance (ROM). The example used to illustrate this point came from the aerospace industry, where large machine tools such as horizontal millers each have a skilled man responsible for them; not only is he responsible for the quality and output of the work but also for the machine's routine maintenance. Working closely with such machines (riding on them in some cases), the operator builds up an affinity with them. There is a console with all the latest predictive systems but operators rarely rely on them as they 'know' their machine. Indeed it is often said that the systems are for others, not for the operators.

Bill Brookes concluded by saying that he hoped his ideas would prove to be true, as it was about time some 'humanity' was brought back into engineering.

ALTERNATIVES TO LEAD FOR CRYSTAL

John Henderson told his audience how all good detective stories involve the sifting of information for clues and separating fact from fiction. The search for a 'safer' crystal has elements of the detective story but may not have a happy ending.

Good lead crystal is colourless, bright and heavy. These are characteristics of its composition, high refractive index and high specific gravity. Crystal has held the public's interest and fascination for many years and yet, if some are to be believed, its very life is threatened by that element which gives it its desirable qualities...lead. Lead is toxic and its replacement by another element which gives the same or similar properties to glass but is not toxic

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is engaging crystal makers throughout the world.

A study of the Periodic Table shows that the majority of elements are unsuitable by the nature of their chemistry to act as effective substitutes for lead. The application of glass chemistry to the remaining elements further reduces the list until the likely candidates number nine or 10. Some of the list are ruled out by rarity and expense (although this may not always be the case) and it is no coincidence that most of those left are well known to glassmakers. However, when the toxicity of these elements is considered, the most frequently used substitute is found to be as toxic as lead. Others in the list are less toxic but involve compromises with the desirable qualities of crystal.

Lead has been the focus of some attention lately and has had some bad press but some of the possible substitutes are little better or involve compromises. This is a very fruitful area for further investigation.

SILICON NITRIDE

Colin Gill of Sunderland Polytechnic gave a brief but coherent overview of silicon nitride and how research work at Sunderland was contributing to the further commercialisation of this special ceramic.

Silicon nitride seemed to be a product with almost limitless potential when it was first produced; it has a low expansion, high temperature strength, chemical stability, good thermal shock and creep resistance and good electrical resistance. Progress, however, was not as rapid as many expected. There had been a lack of consistency about the product, inadequate development of the production process, limited full-scale testing and an inadequate design database, all of which led to the full potential of silicon nitride being unrealised.

One of the factors governing the use of silicon carbide is the ability to fashion intricate components from silicon and then nitride them without any appreciable change in dimension. The 22% volume change associated with nitriding is all accommodated within the pores.

Research which has been carried out at Sunderland has shown how the particle size of the original silicon is critical to the final strength of the silicon nitride. Such are the improvements that have been achieved that Sunderland Polytechnic has now been approached by a major manufacturer wishing to apply their findings to commercial production. It may be that this work will help silicon nitride fulfil its potential.

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SGT STAFF PROFILE

Accounts Assistant Christine Brown was born in 1962 in Scunthorpe, Lincolnshire (now South Humberside). In 1973, her father's work brought the family to live in Sheffield, where Christine attended Ecclesfield Comprehensive School. After passing her O levels, she commenced work in the sales department of a small local cutlery firm and continued her education during her employment, attending day release courses to obtain BEC General and National Certificates.

She married Alan in 1983 and after the birth of their son, Matthew, in 1988 decided to continue her career on a part-time basis. This led to her joining the SGT staff in 1989 as Accounts Assistant, with responsibility for all aspects of the organisation's book-keeping and finances, from issuing invoices to preparing quarterly accounts for internal information and annual accounts for the auditors. The work also carries incidental responsibilities for the SGT's smaller sales operations (monographs, ties etc).

Christine's interests include photography and keeping fit in the local gymnasium. She also enjoys trips and outings with her family.

OUR GRASS ROOTS

The Local Sections are (to mix metaphors) our life-blood. On joining the SGT, members are registered with the Section where they live or work or in a Section of their own choice if more convenient. In addition, all Local Section meetings are freely open to non-members to introduce them to the benefits of SGT membership.

For its first 10 years, the SGT was controlled centrally by the Council, which met in Sheffield. But Turner foresaw that there would be a need for decentralisation at some time in the future and submitted a memorandum to Council in February 1927. One of the arguments used then has a familiar ring: "By suitable choice of papers or topics for discussion, younger members of the glass industry could be brought to take an active interest in the proceedings and thus gradually to be trained for service in the more important meetings of the Society".

Early in 1929, Verney Stott of the National Physical Laboratory suggested that the SGT should form a scientific glassware section but was persuaded by Turner (now there's an interesting term - persuaded?) that it would be more appropriate to form a London Section. The recommendation was approved by Council and subsequently by the 117th Ordinary Meeting of the SGT held on May 15th 1929, in the Chemistry Lecture Theatre of University College, London. The newly formed Section held its first meeting in October that year and other Sections followed: Midlands in 1933; Yorkshire in 1934; India in 1940; North West in 1944; North East in 1946; and Scotland in 1953.

The members of a Section control its affairs via an elected committee, with its own officers and a programme of local meetings is held throughout the winter session (generally September to April/May). These will normally include a social gathering and an annual dinner/dance, as well as technical and scientific papers, works visits etc.