

# SGT NEWS



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## IN PRINT

The June 1996 issue of *Physics and Chemistry of Glasses* will contain papers on: The 'alexandrite' effect and optical properties of holmium metaphosphate glass; the structures of alkali metasilicate glasses by diffraction experiments and molecular dynamics simulations; multifrequency EPR spectroscopy and MNDO calculations for the interpretation of the Si-CN- defect centre detected in oxynitride glasses; characterisation of quaternary superionic  $\text{AgX-Ag}_2\text{O-MoO}_3\text{-P}_2\text{O}_5$  glasses (X=Cl,Br); near ultraviolet upconversion fluorescence and low temperature fluorescence properties in  $\text{Er}^{3+}$  doped  $\text{ZnCl}_2$  based glass; mixed alkali effect in the system  $\text{R}_2\text{O-PbO-P}_2\text{O}_5$ ; charge transfer transitions of copper(II) in drying silicate xerogels; ionic conductivity and Raman spectroscopic investigations of  $\text{B}_2\text{O}_3\text{-Na}_2\text{O-Na}_2\text{I}_2$  glasses; new glass forming systems based on  $\text{Bi}_2\text{O}_3$ ; and surface layer formation due to leaching and heat treatment of alkali-lead-silicate glass.

*Glass Technology* will contain papers on: OH-related capacitance-voltage recovery effect in MOS capacitors passivated by  $\text{ZnO-B}_2\text{O}_3\text{-SiO}_2\text{-Al}_2\text{O}_3\text{-P}_2\text{O}_5$  glasses with varied SrO contents; numerical simulation of bubble behaviour in glass melting tanks in particular the dissolved gas concentration; fracture strength of glass analysed by different testing procedures; and a Letter to the Editor on other methods of reducing  $\text{NO}_x$ , commenting on the Pilkington '3R process' and regenerative furnaces breathing pure oxygen.

Each issue also features a selection of abstracts taken from scientific, technical and business publications.

## FIBRE OPTICS APPLIED IN SECURITY SYSTEMS

Optical fibres as waveguides offer certain advantages over conductive cables when used as an intrusion detection sensor. Barry Griffiths, security systems manager with Remsdaq explained how these advantages have been exploited in a competitive market at a joint meeting of the SGT's North West Section, the Institute of Materials North West Ceramics Group and the Merseyside Section of the Institute of Measurement and Control. The meeting was held at Pilkington Glass Museum, St Helens on Tuesday 20 February.

Once optical fibre was the answer looking for the question. Now, thanks to concurrent developments of laser diodes, fibre splicing techniques and growing computer power, they are finding a growing number of applications. For high security systems where there is little to differentiate between other components, optical fibre sensors are proving to be a useful selling point.

Users prefer sensors that do not emit; any length of metal wire will act as an aerial whereas an optical fibre is entirely passive. Fibre optic sensors are also immune to interference, economic, intrinsically safe for use near flammable materials, they cannot be electrically bridged and they provide a high probability of detection.

Fibre can be used in three detection modes: Continuity - if the fibre is broken an alarm is activated; attenuation - a slight change in received signal strength indicates someone might be

interfering with the cable, compromising the data being transmitted; and interference - where disturbances to the fibre affect the phase of the signal.

Sensors are part of the first line of any security system and cannot act in isolation. A processing system filters the data for a particular zone and an alarm is sent through to a control point where it is verified, usually by an operator checking video images of the area. The optical fibre does not come on its own, it is part of a system which is worth a lot more than any one component.

A chain link fence can use a robust dual fibre cable with speckle pattern sensors. A ripple on the fence caused by the wind can be seen in altered interference patterns. Disturbances can be noted by the sensor and, if they go beyond a set threshold, set off an alarm. Any action, such as cutting or climbing the fence produces its own pattern. Data analysis programs can be taught to recognise typical seasonal patterns and weather conditions. A sensor can cover 1km of fencing per processor but, as this is beyond the range of video cameras, zones tend to be smaller.

A dual fibre cable product can be attached to walls to detect breakage in containment areas. There are several thousand explosive stores around the country that would benefit from an intrinsically safe security system and Remsdaq is



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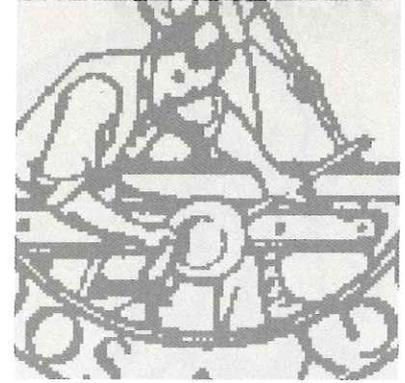
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working on its specification with explosives liaison officers from local police forces.

Buried cables may also provide an entry into the massive domestic security market. A grid of cables buried about 50mm below the surface can detect the foot steps of an intruder. It can be used to activate security lights in much the same way as passive infrared sensors.

Remsdaq provides systems for high security areas such as airports and prisons. The company is currently working on the deeper integration of sensors with alarm handling systems. The hardware for this exists and is proven, so most of the work is concentrated on software support. Relational databases and neural networks are being developed which combine



experiences and filter noise, cutting down on false alarms. Building management systems are becoming more sophisticated and the optical fibre sensor has to become just one component of this.

Man/machine interfaces are also being enhanced. Using the ever-present Windows operating system video and graphics can be combined to help deliver the best response to any threat. ■

## FUTURE PROSPECTS FOR THE IS MACHINE

*From John H Edgington.*

In a recent issue of *SGT News* (No 5, 1995) it was stated that future prospects for the IS machine were bleak, due to the high noise level it generates and its lack of flexibility to meet varying market requirements.

Both these comments are not accurate in the light of today's developments. The IS machine can now be fitted with Vertiflow mould cooling which reduces noise levels to 80dBA and in addition provides many other advantages such as productivity, higher quality containers and reduced operating costs.

The IS machine can meet low volume and high volume demands because of its range of section numbers (4, 6, 8, 10, 12 and 16 section machines) and mould centre sizes available. In addition it can be

changed from single to double to triple gob through the use of the movable top beam, quick change accessories and quick change plunger mechanisms. The Flexline System is a major development providing production flexibility.

Job changes are a problem which can be overcome through:

- Efficient production planning.
- Training of the job change team.
- Efficient planning of the job change operation.
- The effective use of paperwork such as job set-up records and maintenance records.

The report was correct regarding the lower productivity in the UK compared to the continent but that is a management problem not an IS machine problem.

**John H Edgington, FSGT,  
Doncaster, UK.**



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### NATIONAL RECOGNITION FOR TURNER MUSEUM

The Turner Museum of Glass at the University of Sheffield has received full registration from the Museums and Galleries Commission. Registration acknowledges the standards of collection management, documentation, interpretation and accessibility by the public.

The museum is within the Department of Engineering Materials on Floor E of the Sir Robert Hadfield Building. The collection was formed by Professor W E S Turner who founded the Department of Glass Technology and the Society of Glass Technology. It includes over 500 pieces and reflects the personal contacts he made at glass factories around the world.

The Turner Museum of Glass is open to visitors Monday to Friday, from 10.00am to 4.00pm. Further information can be obtained from **Barrie Holmes, Departmental Manager, Department of Engineering Materials, Sir Robert Hadfield Building, University of Sheffield, Sheffield S1 3JD, UK.**

### CONSERVATION OF GLASS

The revised paperback edition of *Conservation of Glass* by Roy Newton and Sandra Davison has recently been published by Butterworth Heinemann. The book provides one of the best sources of information on the nature of glass corrosion and the various treatments available. The publisher has arranged a reduced price for Society of Glass Technology Members of £20+£2.50 postage and packing.

Orders should be made through the Society. ■

## A 19TH CENTURY GLASSHOUSE AND FURNACE

Visitors to St Helens entering the town by the new link road from the M62 see a ruinous glass cone standing by the roadside. Built in the 1880s by Cannington Shaw, this sad relic was at one time a major contributor to the town's growth and prosperity. Dr Jenny Lewis of Liverpool University has excavated and recorded the structures that remain. She presented her findings at

a joint meeting of the North West Section and the Institute of Materials NW Ceramics Group. The meeting was held at the Pilkington Glass Museum.

The derelict Cannington Shaw site in the middle of the Ravenhead Industrial Area, together with the developing Hotties visitors centre, gives St Helens a unique position of having the two longest surviving relics of the early Siemens process applied to glass furnaces. English Heritage has given the Cannington building listed status and contracted Dr Lewis to record the structures that remain.

The building was used as an air raid shelter in World War 2 and was extensively modified internally, closing up many of the passages used by the glassworks. Dr Lewis' descriptions of the building layout and thoughts on other relics inspired much useful discussion and led to a further visit by members of the North West Section. ■

### HAND MADE EMISSIONS

The Hand Made Committee is organising a clinic discussion meeting on emission concerns. EPA limits may mainly affect producers of more than 5000 tonnes/year but acid polishing and lead have their own limits which are being tightened.

The meeting will be at the Whittington Inn, Kinver near Stourbridge in September. Further details can be obtained from **Jill Costello at the Society.**

# SGT NEWS



## SOL-GEL MATERIALS - HANDS ACROSS THE IRISH SEA

As a prelude to spring, Sheffield hosted the inaugural meeting of the UK/Ireland Sol-Gel Discussion Group. This informal group aims to raise the profile of sol-gel research in the UK and Ireland and to increase the flow of information between the diverse communities that use sol-gel materials. **REBECCA BUTCHER** and **DR MIKE TURNER** from the Department of Chemistry, University of Sheffield, report.

The attendance list illustrated this diversity with industrial and academic participants from a range of different disciplines, including chemists, physicists, material scientists, engineers, artists and dentists. The meeting was organised by John Wright of the University of Kent, with help from Peter James and Angela Seddon from Sheffield and administrative assistance from the Society of Glass Technology.

The meeting opened with Peter James outlining some of the work being carried out at Sheffield in the area of sol-gel materials, including projects in the CMM. These included work on: Coatings for strengthening glass; polymer composites; ormocers/ormosils; and hydroxyapatite films as dental materials.

Next up was Diane Holland from the Warwick Centre for Advanced Materials who focused on the preparation of interpenetrating polymer networks and their use as encapsulants for gas sensor devices. She touched on the use of solid state  $^{17}\text{O}$  NMR spectroscopy as a tool for characterising these materials and the ease of isotopic enrichment afforded by sol-gel processing. This tied in well with Mark Smith's work at the University of Kent physics department. He demonstrated the sort of information that  $^{17}\text{O}$  enrichment can give and sang the praises of this highly expensive isotope.

After coffee the discussion shifted to the applications of sol-gel films in electro-optics. A double act, Eric Yeatman and Emma Dawney, presented work from the Devices Group at Imperial College. Topics covered included the fabrication of low loss, buried channel waveguides and the impregnation of precursors for CDs and CdSe quantum dots.

The evening session centred around a display of posters and a lively discussion of the way forward for the group. This was eventually adjourned to the bar and went on long into the night. A variety of views were expressed and a number of actions agreed. These included staging an annual meeting (to be held at Imperial College in 1997), producing a group newsletter and establishing a database of sol-gel practitioners. A working party was elected to oversee these recommendations.

The next morning kicked off with Phillip Harrison from the University of Nottingham describing his work in sol-gel processing of rare earth metal catalysts. The session fired into life with an excellent talk on sol-gel derived oxygen sensors by Collette McDonagh of Dublin City University and was illuminated by an amusing and stimulating presentation by John Wright. He started off his talk by describing how he came to be interested in molecular materials and reminded the audience that Margaret Thatcher had once worked on Langmuir-Blodgett films. This rather scary thought led on to John's current work which centres on designing molecular and ion specific sensors using sol-gel materials.

The meeting was closed by Peter James with advertisements for the next meeting at Imperial College, and Sol-Gel '97, the premier international sol-gel conference, to be held in Sheffield in the summer of 1997. ■

## SOL-GEL 97

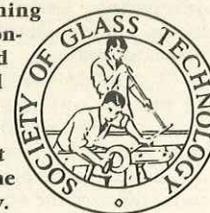
The Ninth International Workshop on Glasses, Ceramics, Hybrids and Nanocomposites from Gels will be held at Ranmoor Conference Centre, University of Sheffield between 31 August and 5 September 1997. The Workshop, held every two years since 1981, is the premier event for discussion of the latest developments in low temperature and chemical routes to glasses, ceramics and novel inorganic-organic hybrid composites. The meeting provides a bridge between scientific understanding and industrial application so that their enormous potential can be realised more effectively.

Topics covered include: Sol-gel chemistry; structure and properties of xerogels and aerogels; drying; sintering; crystallisation; coatings; membranes; powder catalysts; fibres; nanocomposites; ferroelectrics; magnetic materials; optics; biomaterials;

micropatterning; sealing; and joining.

The deadline for preliminary registration is 30 June 1996. Abstracts should be submitted before 1 March 1997 with notification of acceptance by 30 May. Registrations should be finalised by 1 July and manuscripts should be received by the organising committee by 1 July 1997. Dates for the Workshop have been chosen to allow participants to proceed to the Fifth International Symposium on Aerogels, provisionally fixed for 7-9 September 1997 in Montpellier, France.

Those planning to attend the conference should notify Jill Costello, Workshop Administrator at the Society of the Glass Technology.



**LOCAL SECTION CONTACTS**  
For details of forthcoming local section events in your area, contact the following. All SGT members and non-members welcome.

**London**  
- Mr P West,  
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**North East**  
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**North West**  
- Dr D Martlew,  
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# PERSONNEL MANAGEMENT IN THE GLASS INDUSTRY

**To the enlightened employer, there is a growing recognition that employees are an organisation's most valuable asset. Throughout Europe legislation has had a significant impact on relations in the workplace, breaking down some of the 'them and us' attitudes. Bill Jones, human resource manager at Royal Doulton Crystal, explained the implications of these rule changes to a Midlands Section meeting at Pedmore House, Stourbridge.**

Change in the workplace has matched the changes in society as industrialisation first progressed and then, more recently, receded. At the start of the industrial revolution things were pretty bad, only a few employers such as the Duke of Bridgewater, Wedgewood and Courtaulds recognising the contributions made by the workforce. The majority of firms could set on and lay off workers on a whim, without justification. It took until 1963 before any legislation for the workplace appeared.

The Contracts of Employment Act of 1963 put in place minimum periods of notice; one week after 26 weeks service, four weeks after five or more years service and guaranteed minimum payment during the period

of notice. This ended the hire and fire approach of the employers.

The 1964 Industrial Training Act recognised the need to educate workers by improving training provision; providing what industry needed and sharing the cost.

In 1965 the Redundancy Payments Act was introduced. This recognised an employee's length of service when redundancy payments were being calculated.

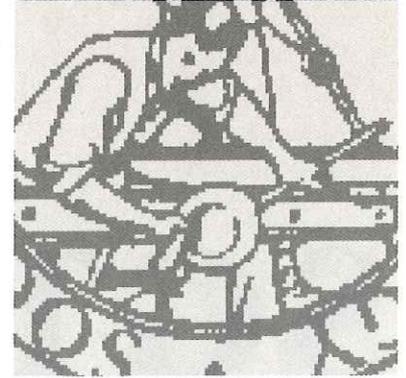
The 1970s saw a growing volume of legislation for equal pay, industrial relations, contracts and employment, trade unions and employment, equal opportunities and race relations. Some of these acts repeated previous acts, many dealt with trade unions. The 1980s and 1990s have seen more employment acts and other legislation which impinges on different operations within the workplace such as the 1984 Data Protection Act.

Legislation for the workplace of the 1990s now covers a wide range of matters including race, sex, union membership, itemised pay, time off to attend union meetings, pregnancy, whistleblowing on health and safety issues, guaranteed payments for workless days, sick pay, etc. This initially excluded workers of less than 21h/week but this has changed and everyone is now covered.

Employers now have to adopt rules, policies and procedures to meet all of their obligations under the law. These have to be defined and clearly set out. They have to work and be understood by employees. Policies must be kept under review and take account of any likely developments.

One piece of legislation due for enactment towards the end of 1996 is the Disabled Discrimination Act. This will replace the largely ineffective 3% quota system and for which exemption permits are too easy to obtain. The new act will impact every employer in the UK and all firms must start planning for it now.

A change of government would be another factor to plan for. If a Labour government was elected their promises of a minimum wage, action against age discrimination and the adoption of the Social Chapter of the Maastricht Treaty would all affect the workplace.



For a good employer the sum total of the legislation enacted has been to recognise the value and contribution of employees. It has altered the way people are treated in the workplace. Managing people is the new priority, getting the best from employees by encouragement rather than by coercion. Human resource management is a true description of this task and programmes such as 'Investors in People' are intended to promote participation and communication.

Confidence needs to be built up within the glass industry, in particular the crystal industry. Although change has meant the loss of many jobs in the past, change in the workplace should not mean further losses. ■

## ENGINEERING IN THE GLASS INDUSTRY OF THE FUTURE

The one day symposium of the Engineering Committee looking at future engineering practices in the glass industry will be held on Wednesday 2 October 1996 at Keresforth Hall, Barnsley. Seven speakers have been invited to contribute papers on: Future structuring; working practices; legislation; glass recycling; production; inspection; and packaging. Further details on the meeting can be obtained from Jill Costello at the Society.

## CORPORATE RATES AT QUEENS MOAT HOUSES

Members of the Society of Glass Technology can now stay at any of the hotels in the Queens Moat House chain and only have to pay corporate rates. The discounted rates at the 85 hotels in the group vary around the UK: Doncaster Moat House has twin bedrooms at £86.00 instead of £97.00, Newcastle Airport Moat House has twin bedrooms at £57.50 instead of £108.50 and in St Albans, the Hertfordshire Moat House has twin bedrooms at £57.50 instead of £80.00. All rates are fully inclusive of VAT at 17.5% and service charge.

Bookings can be made via Queens Moat House's central reservations office, Queens-Line on Local 0645 913914. Members must quote the Society name to ensure that the rates are correctly identified. A list of hotels and the various rates are available from the Society.



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## LIST OF CONSULTANTS

Several individual members, collectives and journal patrons within the Society of Glass Technology offer consultative services. The last listing of consultants appeared in June 1988 issue of Glass Technology and it is the Society's intention to revise this list, incorporating details of all potential sources of advice.

The listing will appear in the February 1997 issue and in electronic form as a section on a future World Wide Web site the Society may be developing. Once established, the listing will be updated and published every two years.

A detailed submission form will be mailed out to all members in August. Final deadline for publication will be 1 November. Further details can be obtained from the editorial office at the Society.