WOOD focus
ISSUE NO. 8 SPRING 2003
The magazine of the Institute of Wood Science

THE NEW DIRECTOR—A PROFILE

Jim Lumsden MCIPD MIWSc,who took up the role as Director of the Institute on 1st May 2003, is no stranger to the world of wood. Jim has spent 30 years in the industry and has gained much knowledge and experience along the way.

A career in Human Resource Management leaves the new director well placed to take the Institute to the next phase of its development.

Jim Lumsden MCIPD MIWSc, Jim Coulson AIWSc FFB (President) and David Woodbridge FIWSc

Reflecting on recent activities at the Institute he complemented David Woodbridge on the positive developments during his term of office. In particular, the introduction of the new Foundation Course, which has revitalised the demand for the Institute's training services and with it activity in general. In addition, the introduction of Wood Focus, the Institute's magazine that has added so much to member communication. David will continue to support the Institute as editor of Wood Focus and Chair the working party reviewing the content of the Certificate Course.

With a strong training background, Jim has spent many years in the development of people and their careers. He is a member of the Chartered Institute of Personnel Development and a Member of this Institute. His background will be most useful to the continuing development of the Institute and we are happy to welcome him into his new role.
Jim has strong views on the future role of the Institute and shared these with the Council prior to his appointment. He sees creation of member value is an absolute priority for the new director. He strongly believes that an Institute must firstly listen to the membership to get their views on the role played by the Institute.

Does the Institute offer good value for the annual membership fee? And is it influential? In his view, members do value the status IWSc carries and many acknowledge the IWSc has helped their career development. He further believes that the Institute speaks with authority on professional matters representing the interests of its members.

Referring to the gap left when the Timber Trade Training Association was wound up due to lack of support, he sees an opportunity to strengthen our relationship and work with other trade bodies, particularly the Timber Trade Federation and TRADA, who he believes share the Institute's vision of education and training. Jim aims to continue the work with these partners to further develop the education and training provision for the membership and the Industry.

He welcomes the joint initiative with the TTF to construct and circulate a Questionnaire for TTF members seeking their views on the content of the Certificate Course. Jim intends to consult more with members on a wider range of training and development matters.

Increasing membership will be another priority and a planned membership drive with a poster campaign will be recommended to the Council for their consideration.

Developing and promoting the CPD (Continuing Professional Development) programme is another priority. Having spent many years in assisting others with their career development, Jim considers that learning never ceases regardless of the age or experience of the individual. CPD enables members to continue with their personal development and often providing opportunities for advancement.

He believes that the challenges facing the Industry are rapidly changing and the Institute and its partners need to continually improve our response to meet the future challenge.

IWSc
INSTITUTE of WOOD SCIENCE

The IWSc National Conference
Newcastle upon Tyne 9th October 2003

Wood Solutions-Theory & Practice

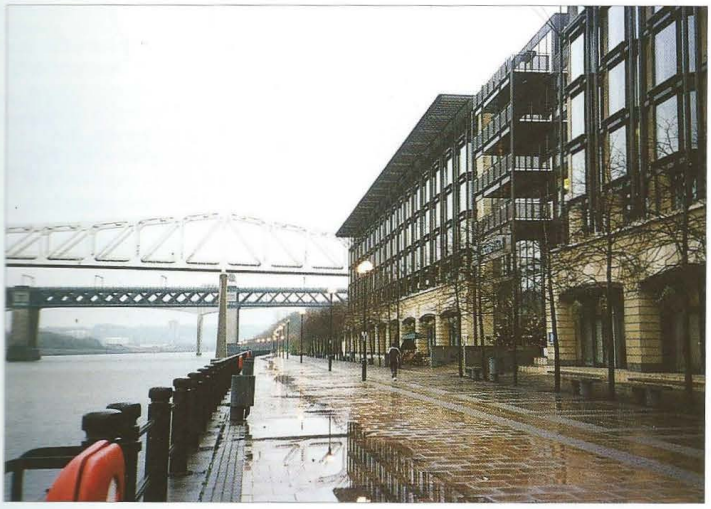
The Institute's National Conference for 2003 will build on the success of the 2002 event held in Cardiff, and which was full reported in the autumn issue of this magazine.

The 2003 programme has been prepared to attract a maximum response from those within the timber industry and from architects, engineers and users of timber and wood based products. It is hoped that students in timber technology, architecture and engineering will also be encouraged to attend.

The Conference will contain papers and case studies that directly address the issues and solutions for the use of timber in sustainable designs along with issues concerning the theory and practice of Forest Certification.

The durability of timber and heat treatment will be discussed as will timber engineering.

of the River Tyne and has first class conference facilities, circulation areas and exhibition space. For the delegates who choose to be resident many of the rooms overlook the river. There will be a President's reception and Conference Dinner on the previous evening, October 8th.



Architectural case studies will include presentations by speakers from the internationally known practices of Edward Cullinan Architects and the Renzo Piano Building Workshop.

The Copthorne Hotel, where the Conference is to be held, is situated in a stunning location on the waterfront

The location offers good access by road, train and air and the Northeast of England has seen many exciting developments in recent years. With the added advantage of the hotel being within walking distance of the City Centre the location provides a fitting venue for the 2003 Conference.

CORPORATE MEMBERS

The Council of Management wish to record its thanks to those listed below for their support as Corporate Members:

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Akzo Nobel Woodcare
Anglo-Norden (Forest Products) Ltd
Arch Timber Protection Ltd
British Woodworking Federation
BSW Timber plc
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TTJ
Weyerhaeuser Europe Ltd

A promotional flyer is being circulated to Members and a full brochure and registration form is to be prepared. If you require any further information in the meantime, please contact the Institute's Head Office.

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The Delight Factor

Peter Ross, BSc DIC CEng MICE - Consultant, Ove Arup and Partners Ltd

This paper was presented at the Institute's 2002 Convention in Cardiff on the 11th October

Vitruvius' commendably brief definition of the qualities which a good building should have – venustas, utilitas e firmitas, translated by Henry Wotton out of sequence, but with an ear for rhythm, as *commodity, firmness, and delight* – have not to my mind been bettered, and stand as the three fundamental aims of the designer. The first two, of course, are obligatory in the sense that all buildings must be safe, and should certainly be useful to their owners. Delight is a more elusive aim, because it implies something beyond the visually satisfactory, and I mention it because I believe that timber, above the other structural materials, is the most capable of providing what we could call **the delight factor.**

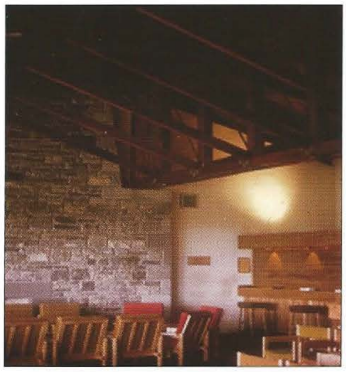
We need this factor because timber is not always the cheapest structural option for frames which are larger than those for general domestic construction. Steel, for instance, is universally used for the frames of supermarkets and do-it-yourself warehouses, where economics are the principal design aim.

If we are to justify the use of timber, we will have to take a broader view of its 'assets' such as:

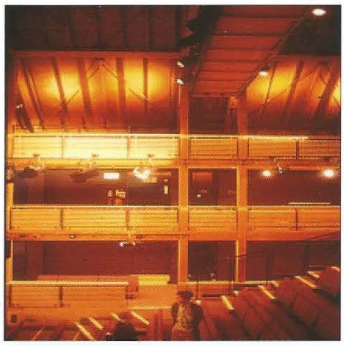
- Its visual and tactile qualities (the delight factor)
- Clarity of construction
- The possibility of eliminating other finishing elements
- Insulation value
- Ease of connection to other elements
- Potentially low-maintenance finishes
- Uniquely renewable and potentially sustainable.

When these factors are taken into consideration, timber can often be shown to be a 'best buy'. The two 'families' of timber are softwoods and hardwoods, the latter can be divided into two groups, namely; tropical hardwoods and temperate hardwoods. Their properties are diverse, as are their costs. Table 1, see below, gives indicative costs of a few commonly used species. Remember that actual prices depend on grade, size of order and wastage.

For interior work, where durability is not an issue, the softwoods are the cheapest option. The roof of **Bedlington Golf Clubhouse** is supported over the lounge by a simple truss with main members of timber, and steel rod diagonals. Flying struts from the bottom boom break the span of the rafters. (Architects: Faulkner-Brown, Hendy, Watkinson, Stonor, with OAP).



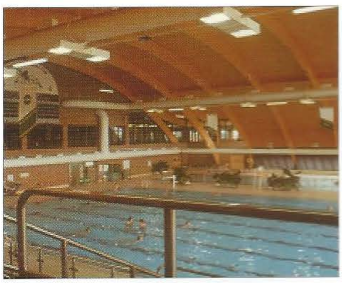
The Auditorium of **Frensham Heights Music School** is completely framed in timber, using a barn-like form with internal posts at the edge of the balconies. The timber members are redwood glulams, treated with fire retardant after fabrication. Joints are bolted, using metal flitch plates (Timber frame design award, TIA 2001, Architects: Burrell, Foley Fisher. Engineers: Colin Toms).



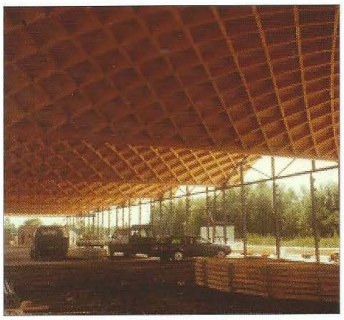
The technique of gluing laminations together enables the fabrication of elements which are limited only by the restrictions of transport. At the **Littledown Sports Centre, Bournemouth,** these three-pin arches span forty metres. The roof deck is simple tongue and groove boarding spanning directly between the arches. (Architects: W H Saunders, Engineers: Baker Martin Partnership).

Table1 Indicative species costs

Cost £/m³	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
Softwood	**C16 C27** Whitewood				Douglas fir									Western red cedar						
				Redwood				S. yellow pine		Pitch pine										
Tropical Hardwoods						Idigbo			Iroko											
							Sapele													
Temperate Hardwoods							White ash		No.1 **40**				**50** First and seconds					American, black walnut		
					yellow poplar				American white/red oak											
	(25: Thickness in mm)						European oak (green)					**25**			**50**				**75**	
												European oak (seasoned)								



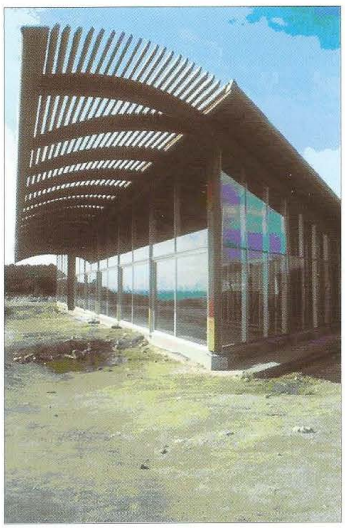
Much recent innovation is based on a re-working of ideas of earlier years. At the **Oko – Zentrum** (ecological centre) at Hamm, in Germany, the original lamella roof scheme (based on a simple barrel vault, with steel ties at the eaves) was turned through 90° and spanned the building as a series of shells, acting compositely with a board roof of LVL (laminated veneer lumber). (Architects: HHS, Dusseldorf, with OAP).



In the halls of the **Grand Palais, Lille,** the composite roof trusses have a bottom flange of thin glulams, bolted to shear diagonals and top compression members of steel. These trusses are purely functional, but provide an easily accessible service space, together with a non-industrial finish. (Architect: Rem Koolhas, with OAP).

In all these examples the timber has been used internally. For applications outside the weather envelope of the building the durability of the timber becomes a consideration. Other speakers have addressed the issues of preservation and coatings, and I will look at examples which rely on the natural durability of the timber.

At the **Bousquet House in Corsica** the main frame is an iroko glulam, enabling it to pass through the front glazed wall. Iroko also has very small movement characteristics, otherwise it would not be prudent to use such thin slats for the *bris-soleil*. (Architect: Sir Norman Foster, with OAP)



There is no reason why the principles of good design should not be applied to relatively humble structures, such as this small **Footbridge at Wylam** leading from the former cottage hospital (now a housing estate) to the railway station. it is in keruing, a moderately durable and very strong tropical hardwood. Since keruing has a tendency to raised-grain, the handrail is in utile. No applied finishes, and stainless steel bolts, make this a minimum maintenance structure. (Architect: Waring and Netts, Newcastle-upon-Tyne, with OAP).

The temperate hardwoods, are dominated by European oak, but are otherwise thought of more as joinery timbers.

However, laminated American white oak was chosen for the courtyard roof at **Portcullis House, London,** which is spanned by an open diagonal lattice, with node connections in stainless steel. The paired members are each only 200 x 100mm in cross-section, spanning a space measuring 47m x 25m. A high timber strength is needed to cope with peak loadings, and so a programme of testing was undertaken at BRE which resulted in a strength classification of D50 for the material, (approximately twice the normally available highest grade of softwood). (Architect: Sir Michael Hopkins, with OAP).

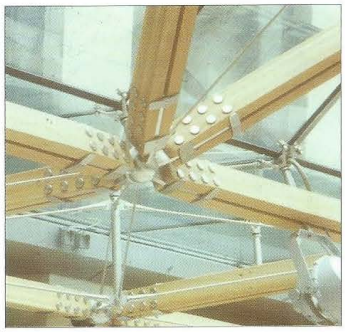


Table 2 lists common structural species under the conventional durability headings. The choice in softwoods is now limited to Douglas fir and larch (MD), and western red cedar (D). Since many of the tropical hardwoods are very durable and possess high strengths, but are nonetheless within the medium cost range, their popularity is not surprising.

Following on from this work, the American Hardwood Export Council have commissioned tests on three more species (red oak, white ash and yellow poplar, *Liriodendron tulipifera*) which all gave strengths in the range D40-D50.

It is hoped to publish the results shortly in the form of species properties for use with both permissible stress and limit state design codes. While the timbers are obviously more expensive than the common softwoods, a design which utilises their full strength will considerably reduce the effect of the cost differential.

These, then are some of the technical options. Designers are warned that timber is a hard road compared to steel, with all its design aids. And the 'solve-everything' welded connection cannot be replicated with glue, due to the weakness of the perpendicular-to-grain properties of timber.

And the delight factor? I leave you to judge.

Table 2 The natural durability and strengths of common species

	Not Durable	Slightly durable	Moderately durable	Durable	Very durable
Softwoods		Redwood (C16-27) Whitewood (C16-27)	Douglas fir C27 Larch C27	Western red cedar C16	
Tropical Hardwoods			Keruing D60		Teak D40 Iroko D40 Greenheart D75 Opepe D50
Temperate Hardwoods	Beech Birch Horse chestnut	American red oak D50 English elm		European oak D30-D40 Sweet chestnut <D30 American white oak D50	Ekki D60
	Sapwood of all species		For external use without preservatives		

A viewpoint on the timber trade in the 21st Century

by Richard Stimpson AWSc

Marcus Aurelius, Roman Emperor AD121 - 180 bears comparison with contemporary values and virtues. His campaigns against the Barbarians were expressed by stoic philosophy and thoughts. The building of empires brings with it changes to the existing principles of commerce and industry. And we in the Timber Industry and Allied Trades are under great pressure for change in the direction ahead. The science and understanding of wood, its properties, qualities and working behaviour is indeed an art and produces many skills in transforming the log to a mechanical or decorative advantage. Due to our Industry and its historic diverse complexity, the pure economics of commerce can no longer accept the increasing costs of labour involvement, be it a skilled artisan or the price for manual involvement. The science of ergonomics (man and machine technology) remains the only answer for cost effective production. And unless we can expand and invest further in this direction we may lose for good the markets for timber and timber products that we have benefited from for so many years. We see change also in the sale and distribution of machined wood goods. And those companies who have taken early advantage of supply to the end consumer and general public know full well the direction of profitable pursuit. But will it be at the cost of a lack of selection and a 'Hobson's Choice' attitude that the client may have to accept. Market forces will no doubt decide that for us. The softwood, 10% moisture content, machined to profile cut to length and shrink-wrapped, ready to take away, is here to stay. And the value of Wooden Antiques will go through the roof. So keep an eye on your piece of Chippendale dear friends!

TRAINING MATTERS

In January David Woodbridge visited Dublin again, this time to induct a record number of 53 delegates on to the Institute's Foundation Course. The occasion was presided over by the new Chairman of the Irish Timber Trade Association, Mr Joe Coulston and the Vice Chairman Mr Christy Conway.

It is anticipated that a number of the first group of Irish Candidates to take the Timber Studies Course last year will be proceeding onto the Certificate Course

Left to right: Christy Conway - Vice Chairman ITTA, David Woodbridge - Director IWSc, Joe Coulston - Chairman ITTA

The Use of Arsenic in Treated Timber – Regulatory Debate draws to a conclusion

by Gordon Ewbank AIWSc, Osmose U.K.

On 27th November, the EU Limitations Committee and Working Group on Dangerous Substances, with industry representatives in attendance, met to discuss and vote on the autumn draft for consultation of their proposed amendment to the Marketing and Use Directive concerning substances and preparations containing arsenic. This followed a period of many months of meetings, presentations and written comments from treaters, formulators and users of treated wood alike, during which the timber preservation industry as a whole has reacted strongly to the initial proposals published over a year and a half ago. The early draft would have effectively eliminated the use of arsenic as a wood preservative in Europe, and with it the tried and tested Chromated Copper Arsenate (CCA) system.

After some relatively minor amendments, the EU Committee voted to pass the document and the approved Directive has now gone back to the European Commission for formal approval (standard procedure) and publication in the Official Journal. The Directive was published in January of this year. Member States then have 18 months to translate this Directive into their national legislation, ie, by Q3 2004.

The Committee had responded to the comments received by agreeing to a slightly extended list of permitted uses for arsenic treated wood in the Annex to the Directive, which now includes timber to be used -

- as structural timber in public and agricultural buildings, office buildings and industrial premises;
- in bridges and bridgework;
- as constructional timber in freshwater areas and brackish waters, e.g. jetties and bridges;
- as noise barriers;
- in avalanche control;
- in highway safety fencing and barriers;
- as debarked round conifer livestock fence posts;
- in earth retaining structures;
- as electric power transmission and telecommunications poles;
- as railway sleepers.

Examples of uses where CCA treated wood may not be used include –

- in residential or domestic constructions, whatever the purpose;
- in any application where there is a risk of repeated skin contact;
- in marine waters;
- for agricultural purposes other than for livestock fence posts and structural uses;
- in any application where the treated wood may come into contact with intermediate or finished products intended for human and/or animal consumption;

A key principle which underlies the examples above is embodied in the Annex, as follows –

Relating to wood treated with CCA solutions in industrial installations : this may be placed on the market for professional and industrial use provided that the structural integrity of the wood is required for human or livestock safety and skin contact by the general public during its service life is unlikely.

The process has now effectively moved on to implementation at a national level. To that end, DEFRA is calling together a Working Group to draft a Guidance Note to accompany UK legislation. This group will include relevant industry Trade Associations (eg. BWPDA, UKFPA etc.) and will address such issues as detailed interpretation of the 'permitted' list and the implementation timetable. In this context, there would appear to be some small degree of flexibility in the interpretation of the list of permitted uses, providing the key principle above is adhered to.

Other elements of the agreed Directive text include the following –

- Treated wood may not be placed on the market before fixation of the preservative is completed. In practice, early indications are that the existing (varied) national rules on this may simply be left in place (ie. For the UK this means "for 48 hours or until surface dry").
- Labelling of treated wood is required when 'placed on the market'. This wording could reasonably be taken to mean that pack labels would be sufficient, considering that essentially only 'professional' markets are to be served under these restrictions, and this point will need to be clarified in the UK Guidance Note. The required wording of such labels is –
  - *'For professional and industrial installation and use only, contains arsenic'.*
  - *'Wear gloves when handling this wood. Wear a dust mask and eye protection when cutting or otherwise crafting this wood. Waste from this wood shall be treated as hazardous by an authorized undertaking'.*
- This Directive does not apply to CCA treated wood already in place. This point is clearly stated.
  Pressure impregnated timber is a unique and distinct building material. The processes of industrial pre-treatment enhance the properties and performance of wood and make it something better than it would have otherwise been – allowing timber to be used to its full potential. The enhanced durability afforded to timber by this means have helped build market and consumer confidence in timber as a constructional material.

Treatment Plant

The key benefits of preserved wood, many of which are environmental factors, can be summarised as follows:-

- reduces the need for more costly remedial treatment and building refurbishment at a later date
- pre-treatment allows the use of perishable and non-durable timber species and the sapwood of all species where they might otherwise be discarded or have a short service life. This makes the most of the timber resource and contributes to waste minimisation. It reduces pressure on more naturally durable, higher value species.
- compared with alternative materials of comparable durability, the cost and energy input of pre-treated wood production is low.
- by extending its service life, pre-treatment acts to lock carbon into timber for longer, so making a positive contribution to the greenhouse effect 'balance'. (carbon dioxide is absorbed by growing trees and released again when timber is digested by fungi).

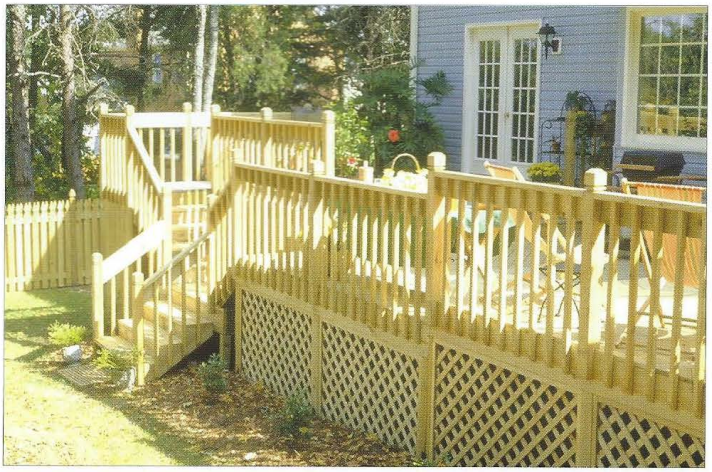
Osmose have a range of alternatives to CCA for those companies operating in markets where the use of CCA treated wood is restricted from Q3 2004.
Our timber preservative products are segmented into and marketed under three distinct brands, Osmose Naturewood, Protim Clearchoice and Osmose Lifewood

Osmose Naturewood

Applies to timber that has been pressure treated with Osmose copper-based preservatives like Celcure AC for external applications both in-ground contact and out-of-ground contact

Protim Clearchoice

Applies to timber that has been treated with PROTIM Aqeos or Drysol for use in internal construction and joinery projects (eg timber-frame trussed rafters and doors and windows). The timber is also suited for external out of ground contact applications when used in conjunction with a coating.



Osmose Lifewood

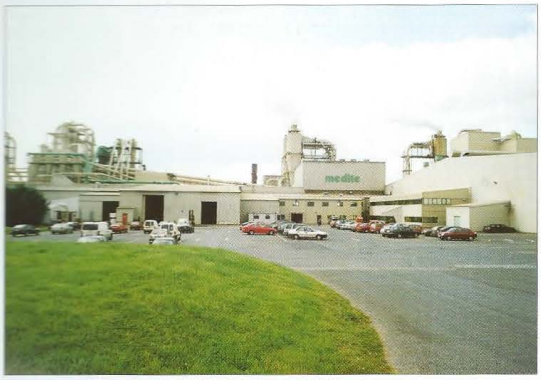
Applies to timber that has been preserved with Osmose Celcure AO CCA (copper chrome arsenate) preservative or Osmose Celcure CCB (copper chrome boron) preservative for use in external timbers, in-ground contact and out-of ground.

The full text is available on the Commission website. Osmose is continuing to be actively involved in the consultation process and we will continue to keep customers informed on all these developments. Now that the way forward has become clearer, we would recommend that any pre-treaters who have not yet reviewed their own position in the light of these changes start to do so now.

COMPANY PROFILE – WEYERHAEUSER EUROPE LTD

Medite, a brand that gets more out of MDF

When Medite MDF was first introduced into the UK, a conscious decision was made to place an emphasis on specialist versions – flame-retardant, moisture-resistant, exterior – that would attract a wider industrial audience. Merely producing a standard, albeit high quality, form of MDF, was not seen as an option. In effect, it would have meant having only a commodity product with a limited market.



Extended Medite MDF plant at Clonmel, Ireland

The decision to greatly widen the scope of Medite was made in 1983 and is one that has been vindicated many times since. Architects and designers swiftly discovered that Medite MDF, with its smooth surfaces, stability, and exceptionally clean and precise cutting properties, is a notably creative material. And, with the availability of special versions, it was one that could be used for virtually anything.

Today, a massive amount of interior panelling, in shops, offices, hotels, and other commercial property, is provided by Medite FR, either Class 1 or Class 0. Medite Exterior is widely used for signage, and increasingly for shopfronts, either for components or for the complete frontages. It's also extensively used for exterior housing components, including cladding and fascias. Medite 313 moisture-resistant has found major uses in kitchen and bathroom furniture, skirting and architectural mouldings.

The above provides no more than a snapshot of the myriad uses of MDF. Scientifically formulated to provide a range of specific benefits, it is still finding new uses, especially in the construction sector, more than 20 years after the first boards appeared in the UK market.

It is a popularity that is spilling over into the DIY sector. This is hardly surprising since virtually every time Handy Andy or Laurence Llewellyn-Bowen, or some other DIY celebrity, find themselves in a fix, with a bookcase, a coffee table, a door, or a table to produce, they call MDF to the rescue.

The increasing availability of lighter weight, standard MDF – Medite LITE has just become available – will undoubtedly further stimulate this trend.

Medite's recognition, right from the start, that there was vast potential for MDF, especially for specialised versions, has helped to ensure that, in the UK, it remains the brand leader.

While the brand name has been retained, the company has had three US owners, the latest being Weyerhaeuser, one of the world's most powerful forest industries companies. In 2002 it had annual sales of US $18.5 billion. It employs around 58,000 people in 18 countries. It is also an environmentally progressive organisation, strictly defining its 40 million acres of forest – largely in the US and Canada, but also also in Australia, New Zealand, and Uruguay – as being available for 'sustainable wood production while protecting important natural resources'.


Part of the newly-installed Medite MDF continuous press plant at Clonmel

It reflects the kind of corporate strength allied to clear objectives that instils confidence. Medite remains the brand name for MDF produced at Clonmel. It forms part of Weyerhaeuser's Composite Panels Business in Europe, which also incorporates two French wood-based panel plants, Mediland, producer of the similarly-named MDF, and Darbo, a particleboard brand.

In the past few years all three plants have been reinvigorated.

At Clonmel, a new US$39 million continuous press plant has just come into operation. This line is similar in design to the other continuous press Medite MDF line previously introduced in 1994. Together the two lines have the potential to provide 400,000 cu m of Medite MDF annually.

Both lines provide a great deal of flexibility. The latest plant, with a continuous press that is 43m long and 2.75m wide, enables very wide panel of considerable length to be produced.

Furthermore, Forest Stewardship Council (FSC) labelling on all Medite MDF provides consumers with the assurance that the product uses raw material from well-managed Coillte (the Irish state forestry company) forests. There is an increase number of professional specifiers, as well as leading DIY supermarkets, and retailers, who will only accept wood products that have been independently certified as fulfilling a range of economic, social and environmental criteria.

At Weyerhaeuser Europe's plants in France, Mediland has had an exhaustive overhaul of its press and ancillary systems. One result of this has been the development of a range of speciality products, including lightweight MDF, as well as thicknesses up to 38mm.

At nearby Weyerhaeuser Darbo, a US $23 million investment has helped to virtually double capacity at this particleboard plant. The company's annual output now includes 150,000 cu m of melamine-faced particleboard, Darbo Deco, from a new, specialised production line.

"All our European plants are strong both in equipment and people," says Geoff Rhodes, Weyerhaeuser Europe's marketing and sales director, and current president of the Timber Trade Federation. "We are already making very good progress. It's no wonder that there is a marked air of confidence among Weyerhaeuser's European operations".

Case 1
Medite Exterior for a touch of style

One of the UK's most interesting housing developments – it has two parks, houses in a wide variety of styles and prices (at the top end currently close to £1 million), plus its own bus route to take London rail commuters to the local station – is finding that Medite Exterior MDF is an ideal material for a variety of uses.

One developer, having determined to build a number of six-bedroom Queen Anne-Style houses, was insistent that the distinctive stone porticos found on the originals, should be replicated in detail using a modern housing material. Stone, it was calculated, would be expensive, difficult to source, and involve lengthy construction times.

Medite Exterior MDF has provided precisely the detail and appearance required, but at a comparatively low cost.

Medite Exterior MDF portico on Queen Anne-style housing

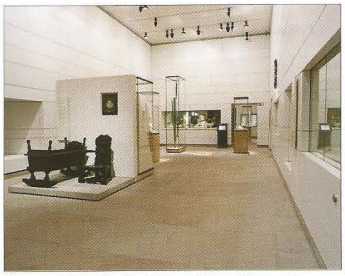
The new porticos, in three different designs – flat, pitched, and curved – were made using 18mm thickness exterior MDF fixed to an internal softwood frame. For the curved porticos, 6mm Medite Exterior, laminated to form 24mm thicknesses, was used.

Case 2
How Medite ZF helps keep the air cleaner

At the £64 million Museum of Scotland, recently built in the heart of Edinburgh, extensive use is made of Medite ZF (zero-formaldehyde), an MDF to which no formaldehyde, in any form, is added during manufacture. Otherwise it retains all the normal characteristics of MDF – smooth surfaces, clean cutting and routing without splintering or breakout, high strength screwholding, and excellent consistency and stability.

Medite ZF was originally developed specifically for use in environmentally-sensitive interiors, such as museums, laboratories, nursing homes, hospitals, nurseries, and schools.

At the Museum of Scotland, Medite ZF is used throughout the 12,500 sq m interior – for wall panelling, showcases and museum furniture.



Some of the Medite ZF wall panelling and showcases at the Museum of Scotland

A key advantage, so far as many museums are concerned, is that the board's virtually formaldehyde-free composition, plus a special sealant coating, ensures full protection for valuable artefacts that might otherwise be affected by even small levels of air pollution. The Museum of Scotland, for instance, has a number of delicate items, including the Monymusk Reliquary (circa AD 750) and carved walrus ivory Lewis chessmen from the 12th century.

Medite ZF far outperforms the E1 European low formaldehyde (LF) standard and the HUD 24 standard in the US. Although formaldehyde is found naturally in wood, and no wood products are entirely free from formaldehyde, independent tests have shown that the free formaldehyde content of Medite ZF is less than 1mg/100g. Formaldehyde emissions from Medite ZF are well below general ambient outdoor levels.

Case 3
For fire protection, use Medite FR

Weyerhaeuser Europe's Medite FR (available in Class 1 and Class O versions) is used throughout many commercial and office buildings both in the UK and overseas to provide decorative, safe panelling.

At the European Bank, in the City of London, sycamore-veneered and laminated Medite FR is used throughout corridors and offices, and has provided eyecatching curved walls in conference rooms.

The architects also seized on an extended use for this flame-retardant MDF. Recognizing the considerable demand for storage (and the need to save space wherever possible), it introduced floor-to-ceiling cupboards

Storage constructed from Medite FR doubles as partition walling between offices

which also double as effective, safe partitioning between offices.

Case 4
Precise profiles with no knots or splinters

One of the key advantages of Medite MDF is to combine mirror-smooth surfaces with precise, splinter-free profiles when it is machined. One result of this is an increasingly wide application for skirtings, architraves, and architectural profiles. It also has the benefit of being knot-free and easily painted.

Medite 313 skirtings and architectural mouldings in newly-refurbished London apartments, at the White House

At the White House (formerly the Shell Downstream office building), on the South Bank, near Waterloo, in London, Medite 313 moisture-resistant MDF has been cut and machined to custom-designed profiles and used throughout the 375-apartment, 12-storey building.

Several miles of Medite 313, in 5m lengths, swiftly cut to size and easily fitted, helped to ensure the speedy completion of this major refurbishment.

The Green Oak Carpentry Company Ltd

by David Woodbridge FIWSc

Founded in 1990 by Andrew Holloway and situated in the wooded countryside of Hampshire is The Green Oak Carpentry Company. It is a company that specializes in the fabrication of both new timber structures and the restoration of old timber buildings. Although one might assume their work is carried out in green oak, this is not necessarily true and of the projects discussed during my visit both Swedish redwood and British grown larch are within the scope of their work and expertise. What is common to all is the use of timber, frequently in substantial dimensions, in an unseasoned, or 'green' state.

Working with engineers and their own design architect, Matthew Hoad, they have mastered construction techniques at the forefront of timber design, notably the recent grid shell building at the Weald and Downland Open Air Museum. This structure was featured in the autumn 2002 Wood Focus. On the other hand they both respect and apply medieval carpentry solutions in modern day structures. These may be highly complex and will be constructed at their workshop and framing yard by skilled carpenters, the only real deviation from the past being the use of power tools for some of the heavier conversion and shaping work.

Some of the diversity in work carried out can be seen in the examples of work in progress at the time of my visit.

One of their workshops was dominated by some very substantial oak beams that were being shaped and jointed to form the main support members of a **new bridge for the National Trust at Polesden Lacey**, near Dorking. The pictures show one of the principal timbers being adjusted by the delicate use of a fork lift truck to centre the beam with the datum line marked out on the workshop floor. This process is just as medieval craftsmen would have done in what is known as 'lofting'; except that they would not have had the benefit of the FLT! Accurate setting out is vital in order to achieve the desired profile and counter-

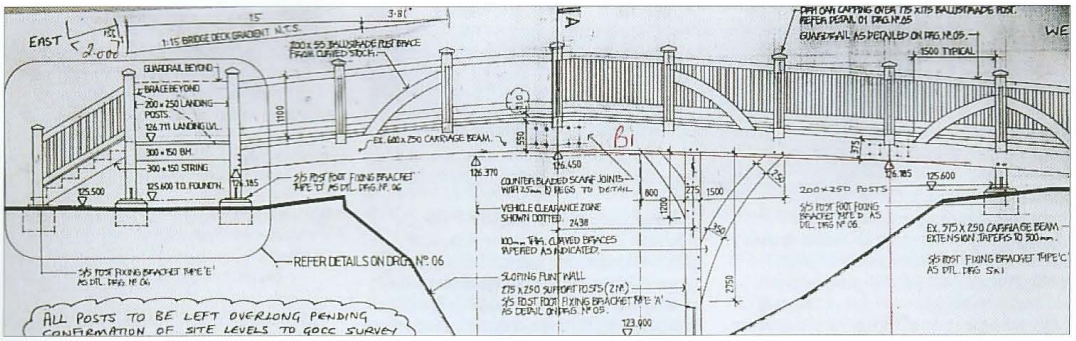
General view of one of the Green Oak Company Workshops and the fork lift truck (FLT) being used to assist in the centering a bridge beam over the datum line.

Centering the beam with the datum line on the floor using a plumb bob

bladed scarf joints that fit perfectly on assembly.

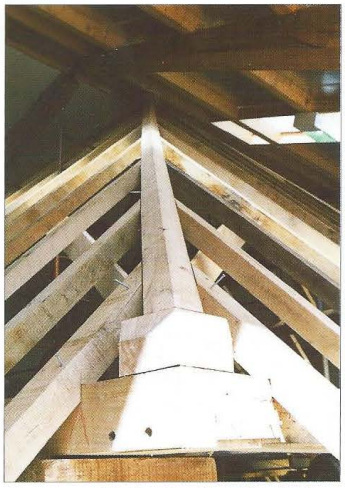
Curved members are selected to suit the braces that can be seen on the plan. They are then numbered and stored ready for assembly.

Curved members stored ready for assembly. Locations for such members can be seen on the plan.



Elevation (looking South) of the new 20m bridge for the National Trust at Polesden Lacey, near Dorking

Another workshop was being used to build an intricate pyramid roof in oak for a **new boathouse at near Cromer, in Norfolk**. To say that the workshop was



View of one of the four hip rafters, showing the external corner detailing and the intersections with the common rafters.

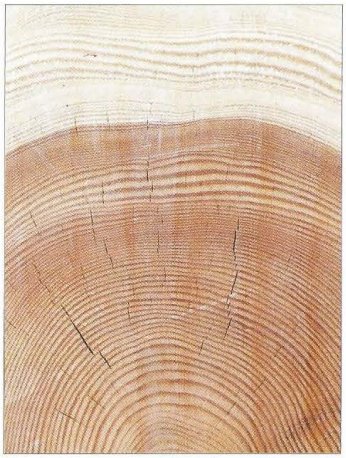
bursting at the seams is perhaps a little too dramatic, however the structure was, it has to be said, an extremely tight fit. Nonetheless the value of working in the dry, especially when one considers the complexity of the structure, is a great advantage.

The complex corner design as seen from the interior of the structure showing the individually cut, shaped and jointed components

Another project under construction, this time on the actual site, is the **new Learning Resource Centre at Harper Adams University College.** The timber used in this very large structure is Swedish redwood. The timber had been selected from standing trees and cut specially to suit the size and length

Overall view of the Harper Adams University College frame during construction

General view of the interior of the structure showing the arcade posts and principal rafters



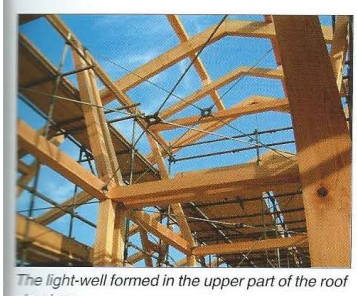
Detail of the transverse face of one of the Swedish redwood timbers used showing the variation in 120 years of growth rate attributable to the cycles of forest thinning and log extraction

specification from a private Swedish estate that has been owned by the same family since the 11th century. That is not to say that the trees selected were from that time, however they were in excess of two hundred years old and contained many of the characteristics of virgin growth timber, namely a high resin content, a deep reddish heartwood, a density at the upper end of the range expected for the species and, as a result, prominent zones of latewood. What was also interesting to see from the end grain of one of the timbers, was the effects of selective thinning that had taken place in the past. From the picture one can see two zones where the growth rate has increased due to more light being let into the forest. This then slows as the canopy closes and the woodland is left for another 50 years or so before the next round of selective felling. What is curious in the sample photographed is the width and age of the sapwood. Maybe the foresters amongst our readers would like to comment?

The design of this large building too is a complex one with a roof span of some 11 metres. The construction calls for a central line of arcade posts onto which sits a saddle truss, each supporting two of the 125 x 325mm principal rafters. As with the oak designs, the redwood is being used green and for the turned arcade posts a relieving saw cut that runs

Detail of the base of an arcade post showing the flitch plate ground connection and the stress-relieving saw cut

The saddle truss arrangement capping the arcade post and supporting a pair of principal rafters

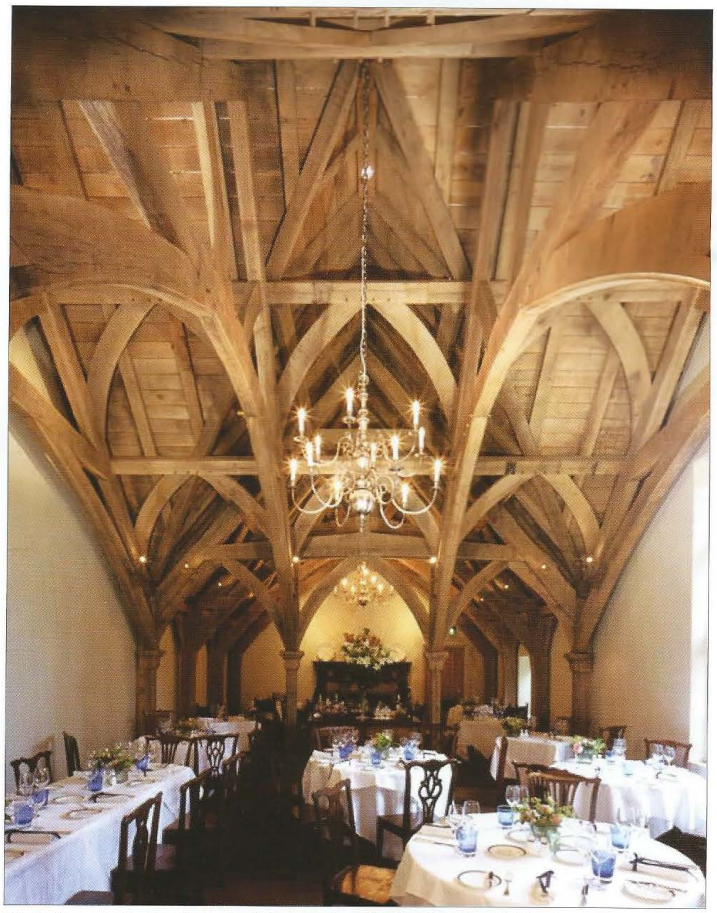


The light-well formed in the upper part of the roof structure.

2/3rds of the way in towards the centre of each post was applied. This was, we were told, performing really well and limiting other drying checks to little more than some shallow surface fissures.

For some contracts the Company have to match new additions with existing styles and structures. **A grade 1 listed building** that is now a hotel near Egham has had a new restaurant built. Early design ideas by the client included the use a steel structure encased in wood. The Green Oak Carpentry Company however won the day with a solution in solid oak, and a solution that was more economic as well.

The above examples give an idea of how the Company achieves a marriage between the vernacular tradition and sophisticated timber engineering. It is also clear that within the Company there is a remarkably high level of carpentry skills and a flair for arriving at solutions that are achievable and that work in practice. Their work does them credit and what is more, they are doing their bit towards ensuring that wood, a naturally renewable resource, is used in a way that is both uniquely variable and which, for many applications, has few (if any) competitors.



View of the complex sling-braced oak trusses above the Great Fosters Hotel restaurant area

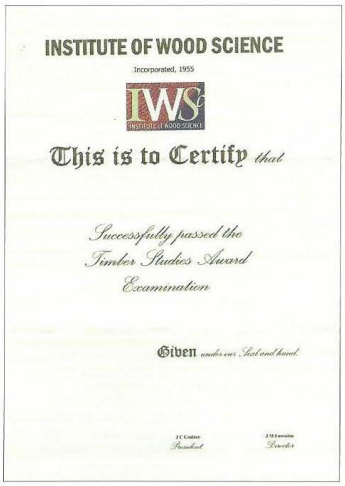
David Woodbridge reflects on the last ten years at the Institute

As I hand over the responsibilities of Directorship to Jim Lumsden I have been taking stock of the passage of events over the last 10 years. The significant landmarks are recorded below:

In 1993 I was appointed **Editor of the Journal,** a task that I greatly enjoyed and which played a great part in my own CPD during the years up to 2000 when the post of Editor passed to Barry Matthews.

In 1999, soon after the appointment as Continuing Professional Development (CPD) Officer, I introduced the 'new-look' IWSc Newsletter, enlarged and re-titled ***Wood Focus***. This has become a popular vehicle for technological reports that have a direct relevance to the timber industry and articles that are of value to students studying the Institute's courses. Further pages are dedicated to a company profile, training matters, branch items and regional news.

Two other significant developments took place during this period. Firstly, the launch of the **Institute's web site** and secondly, the recognition of certain TTTA training courses by examination for the **IWSc Timber Studies Award**. This


INSTITUTE OF WOOD SCIENCE

Incorporated, 1955

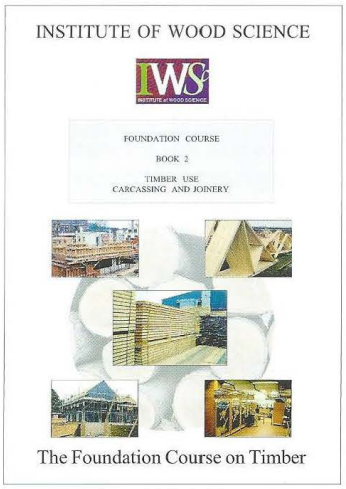
This is to Certify that

Successfully passed the Timber Studies Award Examination

Given under our Seal and hand

award was extended to include the Courses run by Technology for Timber and BCT. However with the closure of the TTTA a major step was taken in the decision to add a Foundation Course to the Institute's Course Structure. Now only those students taking the Foundation Course exam can qualify for the above award.

In 2000 it was agreed that I would be appointed as Deputy Director in readiness to take over from Maurice Holloway when he retired. During this period work went ahead in the production of the **Foundation Course in Timber**, written by Dr



The Foundation Course on Timber

John Brazier. I edited the document and coordinated its printing. The course was launched in the summer of 2001 and has gone from strength to strength. It is now widely used in the timber trade throughout the UK and Ireland.

On becoming Director one of the first major tasks was to sort out the Membership database and office regime generally, following the retirement, and subsequent sad death, of Freda Robinson. This task was made possible by the experienced help and enthusiasm of Christine Bradshaw, who joined the Institute soon after the closure of the TTTA.

At about this time, work was underway to endeavour to get the Institute's Courses approved by the QCA. This entailed putting in place an intricate raft of quality control measures, management systems and student tracking methods. Although it was later agreed not to continue to pursue the QCA's approval, the systems put in place continue to be used and refined. With the administration of the volume of course registrations, issuing of books and examinations, that we are now experiencing these systems are invaluable.

During the years under review the Institute ran its **Annual Conference** in Windsor, Dublin, The Lake District, Chichester, Liverpool and Cardiff. All, in their way, were very successful and as Director I worked closely with the President in office and handling the administration and brochure design from Head Office. The only exception to this being the Lake District Conference, which was handled by Dave Carney. Changes then occurred. Firstly for the Liverpool Conference, when Geoff Bagnall handled a substantial amount of the administration arrangements and brochure design. And secondly, at Cardiff, where the whole Conference theme took on a new dimension with the employment of Michael Buckley's professional promotion organisation, Turnstone Communications. A contract that has now been renewed for the 2003 Conference at Newcastle.

During the last few months work has begun to gather momentum for the major revision of the **Certificate Course**. New writers for the modules have been engaged along with some fundamental changes to the way the Course is structured and how it will be studied. All this will, we hope, make it more attractive to candidates both within the timber industries and with timber specifiers and users too.

One of my particular tasks, and a very enjoyable one at that, during my time as Director was to visit all the **TTF Regional Timber Trade Associations** in the UK and Ireland along with several of the major companies, all with the express purpose of putting the Institute firmly on the map and in so doing to promote both membership and the sale of the courses. I know that this will be a continuing activity that Jim Lumsden will pursue with enthusiasm and efficiency.

During the years since 1993 I have, to varying degrees depending on my job description at the time, worked under six Presidents. Whilst in Office all six of them have brought their own experience, expertise, wisdom and visions for the progress and future of the Institute. Also, I would be at fault if I did not thank the many Members who have supported much of what I have been doing at and for the Institute over the last few years, especially the various Committee Members and Committee Chairmen, without whose help a lot of the initiatives would never have got off the ground. And my thanks too for the noble support at Head Office provided by the ever patient Christine Bradshaw.

David Woodbridge. April 2003

The IWSc Certificate Course Hardwood Project.

For those readers who have taken the **Certificate Course** and gained their CMIWSc status, the last project will no doubt be embedded in their memory as one of the most challenging, informative and interesting in the whole Course.

For those not familiar with the Course, a word of explanation. This project is very much a 'hands-on' one and requires the student to acquire a range of hardwood samples, both from temperate and tropical sources, and to produce a detailed description of each along with an accurately drawn and labelled transverse section. One of the purposes of this 'end-grain' drawing is to learn the skill of using a hand lens to recognise and identify the anatomical features such as the shape, size and distribution of vessels, the presence and formation patterns of parenchyma and the presence (or absence) of deposits and to relate these to the physical characteristics of the wood, its density, texture, permeability, grain, figure etc. In doing so, the student not only learns to "read" a piece of wood but is able to know, if he or she has access to reference specimens or an atlas of end-grain photomicrographs, whether or not it is correctly named.

Earlier this year one of my students, Paul Arthur of Morgan Timber, Rochester, completed the Course and, in the Examination, gained a well earned Distinction.

David Woodbridge

Printed below is one of Arthur's Hardwood Project pages.

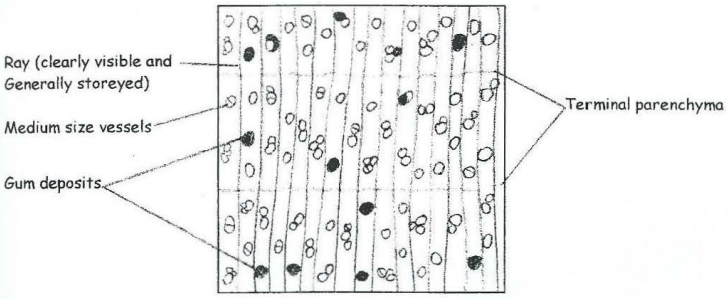
Common Name: AMERICAN MAHOGANY

Other names: Mexican, Honduras, Brazilian etc - according to origin

Botanical name: *Swietenia macrophylla*

Distribution: Widely distributed in Central and South America

Cross Section:



Properties:

Density:	560 kg/m^3
Hardness:	Medium/Soft - softer than alder
Growth Rings:	Diffuse porous, growth rings demarcated by terminal parenchyma
Grain:	Generally interlocked, but there is a fair amount straight grained timber
Figure:	Storeyed rays produce ripple marks on tangential faces. Irregular grain can produce fiddleback, blister, stripe, mottle or roe figuring
Texture:	Medium
Colour:	Reddish-brown darkening upon exposure
Sapwood Difference:	Not distinguishable
Movement:	Small
Drying:	Dries fairly rapidly without much checking or distortion
Workability:	Works excellently with machines to a smooth finish unless deep interlocked grain is present which can cause tearing and pick up
Durability:	Durable
Permeability:	Extremely resistant
Uses:	Used mainly in special purpose high class joinery and furniture production due to its limited availability and high cost. Also used in boat work for planking and cabin fittings. Suitable also for fine, small model making.

INSTITUTE OF WOOD SCIENCE
CORPORATE MEMBERSHIP

The benefits to Corporate Member Organisations

- They will be listed in the Institute Journal and the Wood Focus
- They will be listed in the Membership page of the Institute publications
- They will be entitled to use the Institute's Logo on letter headings, etc.
- They will be entitled to appoint a non-voting representative to attend all General Meetings
- They will receive a copy of each issue of the Journal
- They will receive multiple copies of each issue of the Wood Focus for circulation to staff
- They will be entitled to attend the annual Conference at membership rates
- They will be entitled to a 20% discount on all the workbooks for theIWSc Courses
- They will receive a Certificate indicating Corporate Membership
- They can place their areas of technical expertise on the Institute's Web Site
- They can display their logo on the Institute's Web Site with a hyperlink to their own site

The benefits to the Institute include:

- A level of financial support that helps us to improve the coursematerial and workbooks available
- To help us achieve a wider circulation of Institute publications, for example Wood Focus and Conference brochures.
- To provide us with possible companies and organizations to profile in Woodfocus and in so doing, for the Company to contribute an extra, one off payment (negotiable) toward the printing costs of the magazine.

During the current financial year the minimum level of subscription
for Corporate Membership is £250.00 + VAT.

IWSc INSTITUTE of WOOD SCIENCE

The Foundation Course on Timber

IWSc INSTITUTE of WOOD SCIENCE

IWSc Timber Studies Award

A Course on Timber for newcomers to the timber industry and for those who have some work experience and wish to extend their product knowledge

BRANCH NEWS

Centre for Advanced Wood Processing and the headquarters of the recently inaugurated Canadian Branch in British Columbia

April 2003 Events Update

Impact of Improved Joint Designs on Production Costs & Performance of Wooden Windows

April 25th 2003, 12.30pm - 4.30pm, CAWP, Vancouver, BC

This workshop will present the results of a new CAWP research, project on the machining of joints used for sash corners in wooden windows and the relative performance of the different types of joints. The workshop will cover machining processes, strength tests, and moisture uptake for Douglas fir, hemlock and western red cedar. The afternoon concludes with an open discussion of the future technical and research needs of the wooden window segment. Free workshop open to industry participants, buffet lunch will be served prior to event. Please RSVP to cawp@cawp.ubc.ca.

Wood Finishing-Skills Module 1 - Surface Preparation & Spraying

May 10th 2003, Conestoga College, Kitchener, ON

Spraying continues to be the most popular finish application method in wood products manufacturing. What are the proper techniques and procedures to achieve a quality sprayed finish? Combining classroom and practical sessions, this hands-on workshop covers substrates and their attributes, choosing and using abrasives, machine sanding, spraying techniques, and troubleshooting common problems. BOOK EARLY as space is limited and these workshops fill very quickly.

Wood Finishing Skills Module 2- Finishing Equipment

June 7th 2003, Conestoga College, Kitchener, ON

Today's industrial finishers must possess the ability to understand the equipment they use, conduct minor repairs and maintenance, and make informed contributions to the purchase decisions of future equipment. This course provides a technical analysis of the flow of material from its source, through the equipment and onto the product. Building on their understanding of this process, participants will learn how to increase transfer efficiency, produce a higher quality product, and save money. View PDF.

Wood Finishing Skills Module 3- Finishing Materials & Application Techniques

June 28th 2003, Conestoga College, Kitchener, ON

Practical workshop in a small group setting, covering handling and preparation of finishing materials, substrate alteration, selecting finishing steps, topcoats, rubbing and polishing, specialty finish effects, colour matching and finish testing. Book early as space is limited. View PDF

Wood Finishing Trends and Technologies Seminar 2003

October 31st to November 2nd 2003, International Centre, Mississauga, ON

During the Woodworking Machinery and Supply Expo 2003 CAWP will hold two seminars featuring expert speakers covering a variety of topics related to improving wood finishing operations and profitability. For more information please contact cawp@cawp.ubc.ca.

In-Plant Training - Did you know that many of CAWP's programs can be delivered at your company's location? Benefits include eliminating travel costs and time away, reduced per-person costs and course content tailored to your company's specific situation. Contact Iain Macdonald Associate Director today to discuss how CAWP can assist with your custom training needs. More information is also available on our in-plant training pages.

Scottish Branch

Report on the official opening of the Centre for Timber Engineering (CTE) On Fri 17 Jan 2003 Napier University, 10 Colinton Road, Edinburgh

The UK's new Centre for Timber Engineering was opened officially with speeches from Prof Joan Stringer, the Principal & Vice Chancellor of Napier University,
John Kissock , Joint Managing Director of James Jones & Sons Ltd,
David Bills, Director General of the Forestry Commission,
Iain Gray MSP , Minister for Enterprise, Transport and Lifelong Learning and Prof Ban Seng Choo, Director of CTE.

After the speeches and the unveiling of the Commemorative Plaque there was a tour of the CTE Structures Laboratory where a Truss Roof System and the smaller of two Timber Bridges

were undergoing structural testing. Outside the lab we were able to walk on the 15 metre Timber Bridge shown in the photo placing a load of about 4 Tonnes on it. The bridge stood up to this load without any difficulty and without putting any strain onto the two steel tension cables connecting the two ends.

Andrew Gibson AIWSc, Chairman, Scottish Branch

REGIONAL CONTACTS

For information on branch and/or regional and overseas activities, the contacts are:

Bath and the South West - Dr. Martin Ansell FIWSc (01225 826432)
Chilterns and Thames Valley - Dr. Vic Kearley AIWSc (01494 563091)
Midlands - Tom Shaw FIWSc (01789 840605)
Ireland - Sean McNamara (Fax: +00 3531 6246188)
Liverpool and the North West - Geoff Bagnall CMIWSc (0151 724 1206)
London - John Park AIWSc (01252 522545)
Scotland - Andrew Gibson AIWSc (01416 321299)
South Coast - Patrick Gilbert MIWSc (023 9259 2715)
North East - Jim Coulson AIWSc (01765 601010)
Yorkshire - Neil Ryan AIWSc (01302 802226)

Overseas

Australia - Jeff Hann (e-mail: jhann@unimelb.edu.au)
Canada - Prof. Philip D Evans (e-mail: phevans@interchg.ubc.ca)

For details of individual and corporate membership, contact the Institute direct.

INSTITUTE of WOOD SCIENCE
Stocking Lane, Hughenden Valley, High Wycombe, Buckinghamshire HP14 4NU
Telephone: 01494 565374 Fax: 01494 565395 Email: info@iwsc.org.uk
Website: http://www.iwsc.org.uk

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