WOODfocus

ISSUE NO. 4 SPRING 2001

The magazine of the Institute of Wood Science

THE INSTITUTE LAUNCHES A NEW COURSE

The launch of **The Foundation Course on Timber** this summer represents a major initiative being the first time in the history of the **institute** that a totally new course has been added to the established and nationally recognised Certificate and Associate Courses.

The Foundation Course is intended for newcomers to the timber and allied industries including users of timber and wood products. it is also suited to those with some experience in timber who wish to improve their product knowledge.

The Course is presented in two workbooks designed primarily for *distance learning* with the support of a mentor.

Book one: The Material
- Timber, the nature of wood
- Panel Products

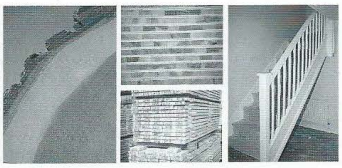
Book two: Timber uses
- Carcassing
- Joinery

On successful completion of the Course Workbooks and Examination candidates will be issued with the Institute's **Timber Studies Award.**

Hitherto this award has been available through the study of certain approved courses and an appropriate examination set and marked by the Institute, for example the Diploma Series run by the former Timber Trade Training Association. The launch of the Institute's Foundation Course will now become the approved study route for this award.

The Course, whilst being self-contained, has been specially written to form an introduction to the IWSc Certificate Course.

A brochure has been prepared for the Course and is included with the mailing of' this issue of **Wood Focus.** Further copies of the brochure are available from the Institute and we, at head office, will be pleased to answer any questions on the Course, to advise on the methods of study and the costs,



The Institute acknowledges the help and support of the Timber Trade Federation in the development of the Course.

WOOD 2001 - INNOVATION DESIGN AND MANUFACTURE

The Institute's National Conference 27th and 28th September, Marriott City Centre Hotel, Liverpool

Conference day, Friday 28th September. The speakers and their papers

Hugh Mackay MIWSc
Stuart Milne Timber Systems, Aberdeen
Timber Frame - A Sustainable Revolution

Nigel Braden
Nigel Braden Timber, Chiddingly, East Sussex
Chestnut - British Hardwoods in Construction as used in the New Woodland Enterprise Centre, East Sussex

Dr Peter Beele AIWSc
FIRA International Ltd, Stevenage
Innovation - Creating Room for Growth in Furniture

Stephen Wright
George Barnsdale & Sons Ltd, Spalding, Lincs
Developing CAD/CAM Techniques for Batch Window Production

Archie McConnel
McConnel Wood Products, Thornhill, Dumfriesshire
Selling Timber as a Design Product, from a Sawmill Perspective

Martin Spence
HLD Ltd, Gainsborough, Lincs
Bridging the Credibility Gap - developing the use of Treated Softwoods for Timber Bridge Structures

Terry Williams
Jaguar Cars, Halewood, Merseyside
Development of Veneer use within manufacture of Motor Vehicles

Pre-Conference Day, Thursday 27th September.

Factory visit to Jaguar Cars Ltd, Halewood, Mersyside to complement the paper on veneers and their use in motor vehicles.

For the wives and partners of those attending the conference, a range of visits to outstanding and interesting city attractions will be available.

The conference brochure and booking form will be mailed to members of the IWSc, TRADA, FIRA and TTF during the early summer.

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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CONTENTS

Title	Pages
Framing up for the Future	2-3
Repair of Historic Joinery	4-5
Company Profile: SCA Timber (UK) Ltd	6-7
Boron as a Wood Preservative	8-9
Book Review / Tribute: Freda Robinson	10
Training Matters	11
Branch News	12

FRAMING UP FOR THE FUTURE

The Association for the Protection of Rural Scotland (APRS) published a booklet in 1999 in which the historical and current practice of timber frame construction is explained.

As a follow-on from the article by David Scott, Technical Director of the Timber and Brick Consortium, published in the last but one issue of Wood Focus, the Institute has obtained permission from the APRS to reproduce a section of their booklet. The section chosen illustrates how well the basic concept of timber frame house construction can be adapted to suit widely differing architectural styles, geographical locations and historical tradition

Highland Birchwoods

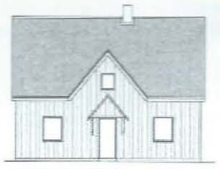
In September 1998 Highland Birchwoods launched its Appropriate Rural Housing Project. This three year project is supported by the Scottish Executive through the Rural Challenge Fund, Highlands and Islands Enterprise, Highland Council, the Millennium Commission, the Forestry Commission and via Europe through Highlands and Islands Partnership Programme. The project has been developed in collaboration with various other organisations including APRS, the Cairngorms Partnership, the Crofters Commission, Robert Gordon University, the Royal Incorporation of Architects in Scotland, Scottish Homes, the Timber Growers Association and the Timber Research and Development Association (TRADA).

The Scottish Highlands and Islands is an area of acute housing need with people often living in sub-standard or temporary accommodation. Consequently, around 10,000 new houses will be required over the next decade. Many of these new houses will be constructed in rural areas by individuals often on very low budgets who cannot afford conventional professional design input. In this situation the purchaser has little choice except to buy a standard kit-house. Unfortunately the design, construction and siting of the kit-house packages currently being built are considered by many, professionals and public alike, to be inappropriate to the area. Consequently, many organisations have attempted to improve the design and siting of rural housing in Scotland. Notable examples have been designed and sometimes built. However, these isolated examples have so far failed to make an impact upon mainstream housing provision.

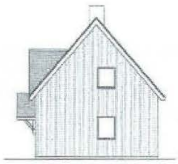
The project aims to support the development of a new standard for rural housing by developing, demonstrating and promoting low cost house designs and has three components:

- developing supply chains for locally sourced building products and skills;
- providing support and advice for a network of demonstration buildings;
- producing technical and promotional material.

The project is founded upon the belief that rural housing which is informed by an ethos of diversity, quality, appropriateness and a spirit of belonging is not incompatible with affordability, the widespread use of local materials, and with high environmental standards. It focuses upon improving the supply and use of locally sourced and native timber and builds upon the best existing practice in the UK and similar European climatic zones. Above all the project is a practical attempt to develop a new vernacular suitable for rural housing in the region.

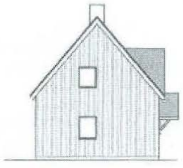


NORTH ELEVATION



WEST ELEVATION

SOUTH ELEVATION



EAST ELEVATION

Appropriate rural housing design, Birch Genus, © Simpson & Brown Architects (1999)

Within the umbrella of this overall project, Mandy Ketchin of Simpson & Brown Architects has developed a range of commercially viable timber-framed, timber-clad house types that reflect market requirements, the availability of local materials, and the traditions and climate of rural Scotland. The houses have been designed with all-round sustainability in mind and are as energy-efficient as possible within a realistic budget.

The designs reflect local culture and tradition without being pastiche: they fuse traditional forms, details and materials in a wholly contemporary manner, employing an innovative approach but based on tried and tested technology. They take advantage of locally sourced products as much as possible including external cladding, structural timber, windows and doors, flooring etc.

The designs are adaptable for both the public and private sector including barrier free options and scope for subsequent extendability. The generic designs include options for 2-3 bedrooms and 3-4 people. A wide range of options is provided by variations in response to different site aspect and orientation, for different internal layouts, for different levels of specification, for different design detailing, and for extendability up to five bedrooms and up to eight people, and with associated workshop or office accommodation if required.

Costs can be tailored to suit most budgets. While an economy version has been developed to meet housing association cost yardsticks, the range can also provide a level of design and specification to meet requirements of the highest quality. The range of options gives potential purchasers all the advantages of a one-off design responding to their individual needs and their individual site, but without the full cost of professional fees, thus bringing high quality design within the reach of people with modest budgets.

The first of these houses are expected to be completed on site in 2000, one based on the Birch genus for a private client at Struy near Beauly, and one based on the barrier free Silver Birch genus for the rental market in Strathspey.

Ivor Davies, Project Manager, Highland Birchwoods and Mandy Ketchin, Simpson and Brown Architects

Dualchas Building Design - A New Longhouse

This house was developed with a simple objective: to develop an affordable alternative to the brochure kit-house. The kit-house is the most common form of building in the Highlands, yet its alien form is despoiling the Highland landscape - thus threatening an economy which is highly dependent on tourism. We therefore wanted a house which was unmistakably Highland, yet modern; a house which could be seen as part of the cultural regeneration of the Highlands. To do this we sought inspiration from the true vernacular of the Highlands, the black house.

Architecture is as important to the culture of a community as the language and the music. Great strides have been made in recent years to invigorate the Gaelic language and song however, very little has been done for the culture of the built form. The use of the American-inspired kit-house demonstrates that Highlanders, as well as Highland architects, still lack confidence in their own architectural heritage. The black house is still seen by many as a symbol of backwardness and poverty, little more than a shelter. To us it is a marvel of purpose and an inspiration for a modern Highland house design.

The black house, linear and low in form, and made of local materials, slotted into the landscape; a reflection of the elements, topography and the poverty of the people. The low form and curved walls deflected the wind, reducing heat loss and damage. Openings were to the sheltered east side of the building, with the prevailing south westerly wind hitting the blank south and west walls. The plan was open, with the fire and kitchen being the centre of the home. The fire would be the focal point around which the family would gather and its heat would radiate throughout the house with the soot-filled thatch acting as a good insulant. The thick walls and earthen floors would retain the heat of the ever present fire.

From the black house we developed an updated longhouse. It meant discarding old materials for new and bringing in modern appliances. It meant retaining some of the basic principles of the old design rather than sentimentalities of the old construction such as thatch and stone.

The house had to be able to qualify for Scottish Homes Rural Home Ownership grant so could be no bigger than 70 square metres and have a construction cost of no greater than £35,000. Affordability was paramount. However, this did not mean building the cheapest house available. It meant maximising the grant and building the most spacious house we could within budget and size limits.

It was decided that timber frame was the most suitable form of construction, as it is cheap, simple to build and can be erected quickly, essential for Skye's capricious weather. The linear form of the building meant that the walls of the house were easily spanned, cutting down on the timber required in the trusses. These were built on site, with no factory involvement, ensuring more work and money for local joiners - not the kit-house companies.

The form also allowed it to fit into the landscape effectively, and was orientated with the main glazing facing east and south to the morning sun and the spectacular views. The house is sheltered to the north and west by an embankment, with small punctured windows to the west and north. This means the house makes great use of passive solar gain. The siting below the embankment also shields the house from the south westerly winds, greatly reducing heat loss through the action of the wind.

Energy efficiency has not only been addressed in the siting and orientation of the house, but by using a 150 millimetre stud wall, which allows for the insertion of more insulation. Combined with a 100 millimetre wide cavity, this also allows the wall to be thicker and more traditional than that used in standard timber frame detailing, giving a solidity essential to Scottish architecture. The longhouse walls are finished with smooth render.

Internally the house reflects the open-plan nature of the black house, to ensure a feeling of spaciousness. Superfluous spaces to Highland living such as a formal reception hall and a separate dining room have been eliminated. From a wind-lobby the visitor enters into the kitchen, the heart of the Highland home, with a central fire acting as the focal point to the living area. The living room is open to the apex of the roof, which adds drama, something usually sadly lacking in a kit-house. The house has also been planned so that it is readily adaptable, both in the loft spaces being usable, and the way it can be extended.

While this is simple architecture, we feel that in its simplicity it may have an answer to the scourge of the alien kit-house. The Highlands needs more housing if its young people are to stay and its economy and culture are to develop. The challenge is, how do we do this without ruining its majestic beauty in the process?

Alasdair and Neil Stephen, Dualchas Building Design, Isle of Skye

A new longhouse in its setting
Isle of Skye
Dualchas Building Design
APRS Annual Awards 1999, Commended

A new longhouse, Isle of Skye
Dualchas Building Design
APRS Annual Awards 1999, Commended

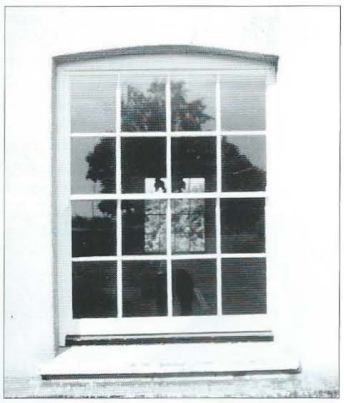
The Repair of Historic Joinery

Joseph Bispham MSc (Conservation) AIWSc

The neglected and historic window is seen by many home owners as a burden needing replacement. When carefully repaired however this very same window will become an asset to the building and part of our historic joinery stock worthy of appreciation.

Conservation through repair is an ethic much spoken of, but, with regards to the repair of external joinery of historical importance, windows, doors, door cases, hoods etc. it is still to be fully understood how positive and permanent a repair can be.

Often the house-holder is not fully convinced (nor in many cases is the professional) that a repair is the positive response and is the preferred choice to that of replacement. Unsure of the final results of a repair a house-holder could be persuaded onto the replacement route by a window company representative, surveyor, builder or architect. This may occur before or after the conservation officer visits, if they are notified at all, the house-holder informing the said officer that the old windows fell apart when the builder touched them.



Historic window (box frame ©1790 Sashes after 1850) which neededextensive repairs to the sill and lower frame. The picture shows the completed repair and the window restored to full working order.

English Heritage estimate that 10million sashes have been stripped from Britain's Georgian and Victorian homes and many of the 40million still remaining face a similar fate.

Much of what has been removed could and should have been saved through repair. I say this based on personal inspection of a considerable number of sashes and frames that were, on examination, quite repairable, but later to find many having been replaced, box frames and all.

The loss of historic fabric in the unnecessary removal of such an element is not just a loss of the important joinery detail, many 18c windows for example have fine hand run mouldings. The loss is so much more and seems endless. Glass, crown spun or cylinder, is irreplaceable today so fine. With its particular tint original glass is fundamental to the historical vertical sash and box frame system; sashes are counter balanced with weights that hang inside the styles to the box frame, these weights are kept to a minimum because of the thin gauge of glass that was being produced at the time. Replacement today with modern glass, much thicker and heavier than the original, will mean that the weights are inadequate to counterbalance the sashes, resulting them not working properly. The other elements which contribute to these historic items are the internal architrave's, the catches, pulleys, fittings and the weights, all making for a unique combination.

The cleverly worked out proportions of these historic joinery items as they form part of the external element or facade of a building are unique to a period.

But here's the news we don't have to!

What we need is to heighten awareness to the importance of these elements and stop removing and scrapping quite repairable pieces of joinery and to work on the premise that these joinery elements must be repaired.

What must be on offer from the professional to the owner of historic property is the confidence in the longevity of a good repair, the knowledge to specify quality materials for repairs and most importantly, the ability to recognize the correct integrated material once specified. In the understanding *of* the repair ethic in conservation, the theory of good craft practice, that of recognizing the splicing required to complete a sound repair to historic joinery, is of equal importance.

Once a repair is completed it will serve for as long as the original item is kept in good working order, a sound repair becomes part of the original structure. Their are many excellent carpenter and joiners, that can, once shown the methods, complete an extensive repair to these historic elements whilst drawing personal satisfaction from the process.

Most of our historic joinery stock today has survived because it was originally constructed from wood of quality, much of this timber originating from Polish forests in the 17th and 18th centuries. The supply of quality pine softwood (*Pinus* sylvestris) for joinery was quickly recognized at the time for its workability, durability and ease of seasoning, in turn leading to thin section mouldings and box sections.

The reason that it was of such fine quality was that most of this pine was taken from medieval forests, this Baltic pine owes its durability to age before felling and its growth rate, felled from old stands many of the trees being 200 years old, their growth rate can plainly be seen in the annual early and late woods showing a pattern of tight rings of slow growth common to timber from the Upper Gulf regions of the Baltic and the far north of Russia.

Many of the problems that have caused failure in windows stem from a basic lack of maintenance and poor quality repairs, both in their execution and the materials used. This is especially true in a poorly designed and finished interface with other building materials.

Given that it is rare that a joinery item cannot be repaired whet do we need to qualify in undertaking such a repair?

As an example for discussion I will use a fairly common case of wet rot that has affected the sill and the base to the box frame and the bottom vertical sash.

1. Cause of failure;

The cause of failure can be seen as a result of lack of maintenance, cracked, loose and missing putty, the bottom sash has been seated to the sill (to cut out draughts) the sill has been covered in zinc and the meeting rails are out of line.

On inspecting the window a number of conclusions as to how the window has been used and abused will become apparent.

Little or no paint to protect the surface of the wood to the exterior will mean that the exterior surface to the wood will have degraded. The lack of putty and cracked putty will mean further ingress of water.

The sealing of sashes to each other, with the bottom sash being sealed to the sill, is a common occurrence, as is the sill being covered. The sealing up of sashes in an attempt to keep out draughts and water usually exacerbates the problem. Water finding its way through will have become trapped leading, as invariably happens when water is trapped in joints and between timber components, to the rotting of the wood.

2. Extent and method of repair

Very important is the analysis of damage and the extent of repairs needed

to complete the project. The project in this case is to leave a window in working order with minimal loss of historic fabric following an extensive repair.

The case study that we use as an example here means we will need to have;

A new bottom rail to the bottom sash.
The side style to one side will need to be spliced to remove the rot.
A complete new sill will need to be fixed.
Rot at the junction of the box frame and the sill means that the base to the box frame on both sides will need to

All rotten wood removed, stiles, mullions and sill cut away at angles to take new timber repair

be replaced.

Minimal intervention is a principle of good conservation practice In the repairs to exterior joinery it must be remembered, that to execute a good repair some of the sound wood on the original joinery must be removed to firmly secure the new wood to the original joinery item. Attempted fixing to degraded wood Will lead to failure of the joint between old and new.

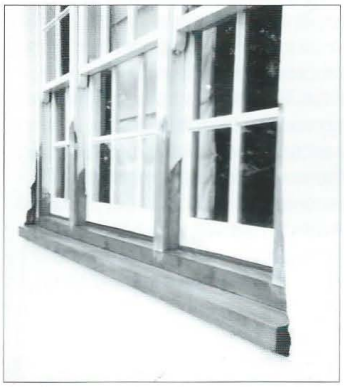
A close inspection of the original construction will show not only the construction methods employed, but also the quality and type of wood originally used.

Any new sections used will need to be of the same dimensions and matching profiles of the original joinery.

The section size of a new sill is of equal importance and will probably need to be specially machined to match the profile of the original. The replacement must also be in the same timber species matching as nearly as possible the character, growth rate and similarity of the original.

In splicing the new sections of sash styles the method of repair needs to be chosen so as to remove as little as necessary of the original material. Care should be taken that none of the original moulding that forms part of the style section that is to be spliced should be removed. The cut line to take the new splice on the existing frame will be to the back of any mouldings.

The success of the repair is in the glued splice, which will marry the two pieces of wood together as one. The splice cut should be long and running at a shallow angle to the grain of the wood. A short 45 degree splice amounts to



Repair complete. New sill, mullions and stiles repaired with quality softwood. Acute cuts to splices facilitate successful outcome

almost end grain fixing.

3. Materials that are to be used.

Much of our historic joinery was constructed from close grain fine textured quality material. The material used in the repair needs to match as near as possible. This will lessen the differential movement at the point between old and new.

The extra costing in the specification of a quality timber used for a repair should never be in question, repairs by their nature are Labour intensive, so set against the cost of the labour the material cost is minimal. I estimate that the monetary savings for a repair based on our case study, executed with an inferior material would represent a maximum of 12% of the total cost. The selection of new wood for completing the repair is an important stage as this determines the success of the repair in the long term

Each repair will need to be assessed on its own merit with regards to the quality and run of grain in the wood that makes up the original construction. The most common timber used for sashes constructed in the 17th to 19th centuries was Baltic pine. It is now much more difficult to source material of the same quality and durability.

Today the managed plantation softwood forests aim to produce timber as quickly and as economically as possible. This faster grown timber is not as durable as that from mature trees that were obtainable up until the start of the 20th century. Much of this faster grown softwood will be used in construction, after being pressure impregnated. Generally this type of timber is unsuited to quality repairs of historic joinery.

In the specification of wood for repairs it is still possible to obtain quality timber from an established timber merchant. In practice I would use redwood from as far north as possible in Sweden, Finland or Russia or maybe North American Douglas fir.

The redwood would need to be selected piece by piece from a really reliable source of U/S grade timber and the Douglas fir would need to have been graded to No. 2 clear and better. And even here a piece by piece selection may be necessary.

The moisture content of the timber to be used is also very important. It is likely that the stocks sourced will have been kiln dried. But to what moisture content? At the inspection stage moisture content readings will have been taken of the historic joinery in the zones of sound wood, especially in the areas where splicing in new wood is going to take place.

The timber selected needs to match this moisture content within a % or two if subsequent movement is to be avoided.

It is likely that, due to the generally less durable nature of the current imports of redwood (not necessarily the Douglas fir though) that the timber will be preservatively treated. Before fixing it is essential that the preservative carrying fluids have fully evaporated and that, when fixed, the timber is correctly primed and sealed, especially exposed end grain.

Tackled in this way the work and designs of the carpenters of past centuries can be restored and maintained in a style that does credit to both them and those carrying out the restoration.

Elmia Wood 2001 International Trade Fair 6 – 9 June

Elmia Wood are presenting a "Lumberman Safari" as a fresh approach to catch the attention of those attending wood machining trade shows.

The "Safari" is a complete travel package with a range of excursions, seminars and hands-on workshops. The emphasis is on seeing the machines in action at Premier Sawmills in South Sweden with their operators on hand to answer questions on both the technicalities and practicalities of the machinery and the processes.

For further information contact:
Alan Sherrard at Elmia AB, JönKöping
Email: alan.sherrard@elmia.se
or visit the web pages on
www.elmia.se/wood

COMPANY PROFILE – SCA Timber UK

Investing in futures

SCA Timber is investing in the future, through a mixture of environmental stewardship, business chain development and training & education for those working with softwoods. "We must make our industry attractive to new recruits of all ages. To bring quality minds into the timber trade we must increase our professionalism, and we can only do this through a concerted effort on education," says Rob Simpson MIWSc, SCA Timber's managing director.

With over 150 year's experience in sawmilling and forest management, SCA established its own timber sales unit in the UK in 1996 based at Grove Wharf near Scunthorpe. The company imports slow-growing northern Swedish redwood and whitewood from its own forests and is part of the Forest Products arm of the multinational SCA Group. It oversees annual deliveries of around 170,000m^3 of redwood and whitewood to Customers ranging from timber merchants to well-known names in the furniture and joinery professions.

SCA's first group of customer trainees at the company's Munksund sawmill in northern Sweden, revising for their exam with trainer Jim Coulson, IWSc Vice-President

SCA Timber recently began its own training programme, using its expertise to provide a working knowledge of softwoods for employees in the industry. The SCA Timber course has now been accredited by the IWSc: successful candidates completing the course and examination will receive the IWSc Timber Studies Award. This will serve them as an entry-level qualification for the Institute's full Certificate Course.

The SCA Timber course is tailored to the needs of customers and groups together those of a similar knowledge-level. The course tutor is the Institute's vice-president, Jim Coulson AIWSc. Only a small number of trainees are accepted on each course, which runs at an input level of one day a month over five months. The final exam is taken at SCA's ultra-modern Munksund sawmill in northern Sweden, which recently received £30 million of investment.

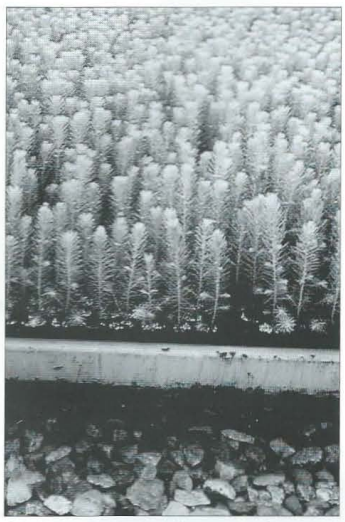
The first group of SCA trainees, based in the north of England at the premises Howarth Timber, took their course exam in Sweden in March. The second group, based in the south of England are using premises kindly provided by J F Goodwille of Waterlooville, Portsmouth. They will visit Sweden in mid-May. Interest is rising rapidly and Rob Simpson expects a course to start in the Midlands as soon as dates can be agreed.

"Attracting young people into industry has become more difficult over the years: we lack the glamorous image of the service sector," comments SCA's Rob Simpson. "We were very pleased to welcome our own school-leaver trainee, Andrew Ireson, to our team last autumn. The applicants for the position all had good A-level grades. There are high calibre young people out there and the timber industry must capture them to ensure its own future. Investing in training is the only way to make our industry progress," concludes Rob Simpson.

As part of a day of environmental education, SCA's customer trainees visit the company's Norbotten forest district in the care of local SCA forest district officer Mr Christer Berglund

Mr Simpson himself began his career in the industry in the craft sector and wants to extend the trade's confidence in, and enthusiasm for, its own product. "We are highly supportive of efforts made by Wood for Good in promoting timber as a material. The general public has a natural enthusiasm for wood but it needs a campaign such as Wood for Good to re-awaken their appreciation. I would encourage everyone to get

involved, however small a part they feel they can play," Rob Simpson says.



Some 50 million new saplings are produced each year in SCA's Bogrundet tree nursery, the largest nursery of its kind in the world

SCA Timber is also investing in the long-term future of the industry through sustainable forest management. Its forestry department in Sweden replants 3 trees for each one harvested and has increased its standing volume of timber by 40% since the 1940s. The company owns the largest tree nursery of its kind in the world at Bogrundet, producing 50 million saplings each year. Active forest management also helps towards reducing the effects of climate change.

SCA surveys the biodiversity in its forests as part of its ecological landscape planning process. Biodiversity conservation is a key feature of Forest Stewardship Council certification. SCA's forests became FSC-certified in January 1999

Owning around two million hectares of forest land in Sweden, SCA gained Forest Stewardship Council certification in 1999. FSC Chain-of-Custody certification is also now in place throughout the company's supply chain from its sawmills to Grove Wharf in the UK. Enabling proof of sustainable forest origins is essential to those now servicing the growing demand for FSC-labelled products in the retail sector.

SCA's environmental care extends across its Forest Products business. All of SCA's forest-related operations in Sweden are certified to ISO14001 standards. Forest industry by-products such as branches, wood chips and sawdust are either utilised in SCA's publication papers and packaging manufacturing, or re-processed into biofuels: SCA owns Norrbränseln, Europe's largest forest biofuels business.

Moving closer to its customers through means such as FSC-certification, SCA Timber hopes to increase efficiency throughout the business chain, resulting in a greater market for wood products. It has set up a humidity-controlled facility at its Grove Wharf warehouse to provide timber with customised moisture content for furniture industry customers, and has helped to develop the RELAX™ method of kilning.

Conventionally-kilned softwoods can have a greater moisture content in the centre of the piece than at the outside edges. Varying temperatures and humidity during storage and handling can increase drying stresses within the timber, and these may result in distortion and shakes. RELAX™ kilning counteracts these problems. Under the RELAX™ system, timber is dried to a specified moisture content in the centre of the piece. Moisture is then returned to the drier outer layer using large quantities of steam. The result is an even moisture content and stress-free timber.

SCA's investment in research and technology keeps its focus firmly on the future of timber production. In its forestry operations, computerised logging is controlled by global positioning satellite technology, giving precise instructions to the harvesters in the field to an accuracy of within two metres. At the sawmills, scanning machinery grades the incoming logs. Computer-controlled sawing and planing methods are used to provide customer-specific requirements.

Following its £30 million investment at Munksund in 1999, another £7 million investment has just been sanctioned to further improve grading and kilning facilities. A programme of stepped investment has also been announced at Tunadal sawmill, commencing with £2.5 million to streamline production and increase product flow through the sawmill. Through training, trade and technology, SCA is truly 'investing in futures'.

Camilla Hair

SCA's first group of trainees at the outset of their course last year at the premises of Howarth Timber with trainer Jim Coulson, centre

Boron as a Wood Preservative

David E. Woodbridge FIWSc

In the first issue of Wood Focus in the Autumn of 1999 we published an article on coatings for timber. In this, and subsequent issues we will be presenting articles on preservation treatments for wood, looking at some of the changes and developments in the industry.

The use of boron-containing timber preservatives has been researched and carried out for well over fifty years. In 1935, for example, borate compounds were found to be an effective treatment against the Lyctus powder post beetle that was causing problems in Australia. About ten years later research using boron was being carried out in New Zealand for the preservation treatment of plantation grown Radiata pine for use in construction work. The timber components in question were those that, in use, were not in ground contact. Examples included flooring, stud framing and roof timbers.

This work subsequently resulted in the wide scale use of boron salts in a statutory pre-treatment process so that today, 50 years on, the post-war housing stock of New Zealand is essentially free from wood boring beetle problems despite Radiata pine being an excellent medium for such pests.

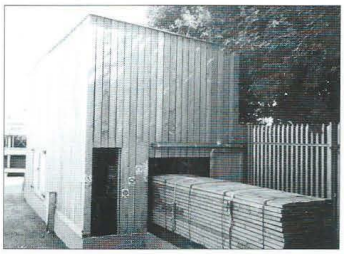
Boron itself is obtained from naturally occurring borate minerals which are mined in several parts of the world. The mineral tincal (borax) is the most significant source of commercially used boron treatments. It is from these that the highly soluble preservative salts are produced. One such is the now widely used disodium octaborate tetrahydrate (DOT). DOT is marketed in various parts of the world under the title *Tim-bor®*.

As a wood preservative boron provides protection against all forms of wood destroying organisms and is therefore an appropriate protection against fungal decay and wood boring beetles.

Like most wood preservatives borates have advantages and disadvantages. Boron salts have particular environmental advantages; They are white and odourless, are not flammable or combustible and they have low acute oral and dermal toxicity. They are not known to be carcinogenic and therefore have a low toxicity profile. One possible disadvantage has been the perceived lack of flexibility in the application processes. Until recently *Tim-bor* was only thought to be suitable for diffusion treatments of green timber. However, following a re-evaluation of the product during the 90's it is now fully approved for high and low pressure applications to seasoned timbers as well (BBA certificate 93/2893).

Once treated and dried the presence of boron in timber allows it to be painted in the conventional way and no special precautions are necessary when applying adhesives and sealants. Although the presence of boron (a hygroscopic salt) in timber does not significantly alter the equilibrium moisture content it does increase the electrical conductivity of the material and will tend to give an artificially high moisture content reading when using an electrical resistance type of meter. The presence of the boron salts in normally dry timber will not set up a corrosive action with metal fixings. In fact, boron salts are corrosion inhibitors in a range of commercial applications.

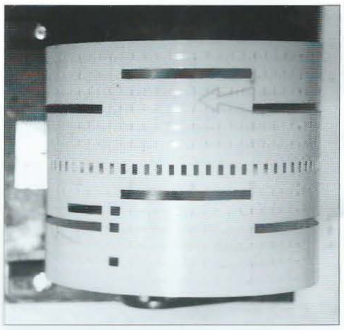
During the preparation of this article the writer visited the *Tim-bor* plant of Soar Valley Timber Ltd in Leicestershire. The company have a vacuum pressure plant with a pressure vessel that can take up to 7.2 m lengths.



The fully enclosed treatment plant at Soar Valley Timber Ltd

Because of the colourless nature of the salts they add a yellow dye to the treatment solution. Whilst, through time, the dye will fade, it serves to clearly differentiate between treated and untreated timber at the point of sale, delivery and initial use.

The treatment cycle that the company uses for standard charges of European red and whitewood is automatically controlled by a revolving punched loop.



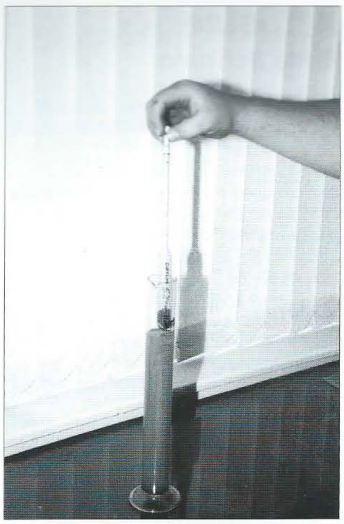
The punched rotary loop that automatically controls the treatment cycle

Initial vacuum	15 minutes
Atmospheric pressure	15 minutes
final vacuum	20 minutes

For less permeable timbers or for higher loadings of the preservative the cycle times are altered and positive pressure can be applied.

The 20 minute final vacuum is to ensure that the charge is taken from the vessel in a near dry state and there is no requirement for a period of time during which the timber must be allowed to drain.

Not a drip in sight! A charge immediately after treatment



The measurement of solution strength using a hydrometer

On a weekly basis the strength of the treatment solution, set at 5%, is checked with a hydrometer which measures the specific gravity of the liquid. Every month samples of treated timber are sent for laboratory analysis to check the dry salt retention level.

Timber treated in this way can be sawn or planed at the time of treatment but, as with all wood preservatives, should not be re-worked unless suitable on-site treatment is available to treat, for example, cross-cut ends or lapped joints. The full range of uses for which *Tim-bor* will provide in the various hazard conditions is shown in the table below:

as, for example, the leach resistant CCA treatment, is not an indication that occasional, short term, wetting will reduce the protection level. The British Board of Agrement (BBA) certificate 93/2893 on *Tim-bor* states that "The preservative is satisfactory for application to softwood and is an effective and permanent preservative against fungal decay and insect attack for wood in Hazard Classes 1, 2 and 3 (when coated) situations as defined in BS EN 335-1 where wood is under cover and fully protected from the weather but where high environmental humidity can lead to occasional but not persistent wetting".

Soar Valley Timber chose the Tim-bor vacuum system after careful consideration of the other systems available in view of the ease of use, the handling on-site of the boron, the ability to treat both sawn and planed timber, and to be able to apply a non-intrusive stain to identify treated timber. With the nature of the company's business being focused particularly on the construction sector they have found that boron treated timber meets all the requirements except for the few items that are, or may be, in ground contact. From a plant management point of view the fact that chemicals have a low toxicity profile and therefore do not fall within the HSE R list of hazardous chemicals is an obvious advantage.

One of the reasons for choosing boron wood preservative for this first timber

Table 1: Specified minimum net dry salt retention (3.5kg/m³ Tim-bor is required for each application in order to gain a 0.33% retention to be determined by analysis)

Timber Description	European Hazard Class EN: 335-1, 1992	Hazard	Service Usage
Interior timbers	1	Insect attack	Structural timbers and joinery in areas subject to *Hylotrupes* sp. or *Anobium* sp. attack.
	1	Decay and/or insect attack	Timbers used in farming, for insulation or refridgeration purposes or in buildings with high humidity.
	2	Decay and/or insect attack	Timbers in contact with or encased in brickwork or concrete e.g. Joists, lintels, fillets, grounds.
Exterior timber not in ground contact	2	Decay and/or insect attack	Window frames and sashes, door frames and all exposed woodwork on the face of a building which is normally painted

(Tim-bor®, UK Industrial Pre-Treatment)

The question of the preservative not being fixed in the timber in the same way preservative article is the lack of information on boron treatments that is printed in the currently available timber textbooks used by students studying the Institute's Certificate and Associate Courses, both of which contain important sections on durability and timber treatments.

At the BWPDA Convention in 1995 the paper presented by J.D. Lloyd and M.J. Manning of Borax concluded ..... "that borates will play an increasing role in wood treating compositions is now beyond doubt and in reality, borates have the potential of leading the wood preservation industry far into the 21st Century.

Quite how true this prophecy will prove to be remains to be seen, especially when one considers other recent developments in water-borne treatments in the wood preservation field world wide.

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Boron as a wood preservative
D.R. Carr.

BWPDA Annual Convention 1995
Developments in Borate Preservation Technology
J.D. Lloyd and M.J. Manning

The Professional Treater December 1996
Borax Europe and Cementone Beaver start pre-treatment revolution

Tim-bor Technical Information Sheet for users of treated timber

Tim-bor UK Industrial pre-treatment specification guide

Tim-bor UK Industrial pre-treatment

Tim-bor Just the facts

Tim-bor Safety Data Sheet

BBA: *Tim-bor* Industrial Wood Preservative

Further information regarding *Tim-bor* is available from Borax Europe Ltd. (Ralph.rudnick@Borax.com)

ACKNOWLEDGEMENTS

The author thanks Dr Peter Fitzsimmons, AIWSc, of Wykamol and Mr Stuart Small of Soar Valley Timber Ltd for their help in preparing this article.

Book Review

Silva: The Tree In Britain

Author Archie Miles

Published by Ebury Press. A Felix Dennis Book 400pp. 23 x 32.5cm. Numerous colour plates. Index. Price £30 (hardback) ISBN 0 09 186788 6.

Review by Peter Garthwaite OBE

Foreword by David Bellamy OBE, and chapters contributed by John White, former Research Dendrologist and Curator of the Westonbirt Arboretum; Stephen Daniels, Landscape Architect; Simon Brett, wood engraver; Kim Taplin, writer and poet; Anne Mcintyre, medical herbalist.

I turned the pages of this book with mounting admiration for the superb photographs by the author, who travelled the length and breadth of Britain to take them in the right setting. The photographs do not demonstrate anything of the silviculture of trees, but their place in the environment, and bring out, as no other book that I have seen, the character of each species in its various annual phases with true artistry. The silviculture is dealt within the text, particularly by John White in his chapter.

The first half of the book deals with the history and evolution of the tree in Britain, including fruit trees and orchards. Introduced species are not neglected; in fact Sycamore, Larch and Sweet Chestnut are given equal prominence to native trees in chapter one. The text also includes a reference to the fact that 2,500 species of tree are suitable for growing in this country compared with only 35 native species. Many of the introduced species are illustrated, some of them extremely beautiful and useful, both for timber and as habitats.

The second half of the book includes contributions from Stephen Daniels, Simon Brett, and Kim Taplin on 'Trees and Woods in English Art', a chapter on "Woodcrafts and Industries' by the author, 'Trees, Folklore and Medicine' by Anne McIntyre and the final chapter 'Conservation and Tree Planting' by John White.

Members will know the outstanding quality of Walnut timber for furniture and the nuts for eating. But how many are aware of its medicinal purposes, even to this day? Anne Mcintyre lists the following ailments that the leaves, picked before mid-July, will relieve ***"indigestion, peptic ulcers, gastritis, gastroenteritis, nausea and diarrhoea".*** Externally, she says, ***"the leaves can be made into a tea which makes a good lotion for cold sores, chilblains and excessive perspiration".*** She lists several other conditions that this tea will ease. This fascinating chapter, written with additional material by Archie Miles, lists 34 trees, various parts of which have been or are now being used for medicinal purposes.

The final chapter, 'Conservation and Reforestry', by John White, contains many words of wisdom and deep knowledge born of wide experience and research. He says that most tree habitats in Britain have a long history of human interference, and therefore very few British trees are actually native i.e. growing in their present location entirely naturally. He gives a most valuable table on p.343 of 'Alternative Species that can be used in various situations. The list includes Tropical Hardwoods look-alike timber producers — Black Locust, London Plane and Yew are listed in this category. Other categories are decorative timber trees in hot, dry conditions, unusually high-quality amenity trees; trees for wet places; and several other categories. He then goes on to give a full description of each tree and its silvicultural requirements etc... All beautifully illustrated by Archie Miles' stunning photographs.

There are four Appendices — 'Tree Measuring', 'Tree Planting' (which is mainly about planting trees in urban areas and parks); 'Tree Organisations' (in which Woodland Heritage gets full and honourable coverage); and 'Arboreta'; 'The Top 20 Tree Collections'.

P.F. Garthwaite. OBE.

This review is reproduced with the kind permission of the Editor of The Woodland Heritage Journal (Issue No 5 Winter 1999/Spring 2000)

Woodland Heritage

For some years the IWSc has supported the Woodland Heritage and from time to time articles from their journal have been published in Wood Focus.

In order that the aims and activities of both the Institute of Wood Science and the Woodland Heritage can be made known to their respective members the latter's journal is enclosed with this issue of Wood Focus and our magazine will be distributed to their members during the next month.

A Tribute.

Freda Robinson

In the Autumn of last year we were very sad to record the death of Freda Robinson.

During her fourteen years with the Institute she had become known to many, both as the person at the end of the phone in the office and when she attended the Annual Conferences. At the time of her death a notice was printed in the Journal Winter issue and in the TTJ together with a circular sent out by the Institute to Council and Committee members and present and past officers. The tribute printed below will recall Freda to the minds of all that knew her.

Freda was a very dear friend and a most excellent personal assistant throughout the time that I was working at Hughenden. Initially, she acted as my secretary when I was Director of the Chipboard Promotion Association at the time when we moved our office to TRADA Headquarters from Esher, In June 1983. Her position became full-time from the following January, until the CPA closed its office at TRADA at the end of June 1985.

I seem to remember that Freda returned to her previous employment at the paper mills at Wooburn Green although she continued to help me with occasional secretarial work until my retirement in 1989.

However, at the start of 1986, when I was appointed the first Director of the Institute of Wood Science, the opportunity came to move the Institute's office from London to Hughenden. Jennifer Jepson, who was then the Secretary to the Institute, was disinclined to move from London and so Freda was appointed Secretary in March 1986. (IWSc. Jour.vol10 no5 1986 p 182). Her new duties involved the use of a computer, attending committee meetings to take minutes, invigilating at examinations, and giving all kinds of help to the Officers of the Institute and its members and students. All this she did with imagination and friendly humour, to everyone's delight.

It is to her credit that she saw the work through to her retirement earlier this year and it is a tragedy that she did not have longer to be with her family and friends at her new home at Stone near Aylesbury.

I for one, shall miss her and have reason to be grateful for her help and good humour throughout the time we worked together.

Ian Lee FIWSc
Wheatley, 27 November 2000

TRAINING MATTERS

Timber Technology - Model answers to examination questions

This model answer is taken from the publication Wood and was originally printed in 1948. It was written by Harold T. Eyres FIWSc and author of ***Introducing Wood*** *which, back in those early post war years was one of the first books to attempt to bridge the gap between the Commercial and the Scientific approach to timber. The course for which the model answer related was the Timber Development Association Timber Technology Final Examination - the forerunner of the IWSc Certificate Course and examination. The text of the model answer has been very slightly adjusted to suit modern terminology.*

Briefly explain the principles to be kept in mind in converting timber. Explain how you would convert:

(a) Douglas fir for flooring
(b) Teak for maximum figure
(c) Oak for maximum figure
(d) Sycamore for fiddleback figure
(e) Beech for plane blocks

There are three main objects which a mill operator may have in mind when converting his timber. He may wish either:

(a) To produce the maximum saleable produce from his logs, or
(b) to produce the maximum proportion of special dimensions; or
(c) to produce the maximum high-grade stock.

In pursuing these objects or any combination of them, he will be guided by considerations of economy in machine-hours and the need to balance his rate of production with his capacity to stock or despatch his produce.

Several considerations in respect of the five items are:-

(a) Douglas fir for flooring: to avoid "shelling" (separation along the annual rings) on the face of the boards. They should be cut so that the angle of the grain (annual rings) to the face is greater than $33^{1}/_{3}°$. This is not difficult to achieve in Douglas fir owing to the large diameter of the logs.

(b) Teak for maximum figure: the word "figure" in relation to teak is used to cover more than one feature. In the first place it is applied to the characteristic pattern seen on the face of a flat sawn board (the tangential face). The maximum figure of this type would be produced by peeling the log into veneers. It may be noted that the cause of the figure is the ring of early wood vessels which, being surrounded by lighter coloured soft tissue (initial parenchyma) show as a series of inverted V's on the face. (Nowadays this is usually referred to as Crown Cut).

Another type of figure can be produced only from logs which contain distortions in their grain. The consequent changes in inclination of the fibres are visible on the polished faces of a veneer or board cut through them, since they reflect the light with varying intensity.

(c) Oak for maximum figure. The timber must be cut so that the rays enter the face at an acute angle. This exposes the oblique section of the ray to the surface of the board and produces the pattern known as Silver figure. This is, of course, what is commercially described as quarter sawing.

(d) Sycamore for fiddleback figure. This type of figure can be produced only from logs in which the grain follows a rapidly undulating course (similar to the contours of corrugated paper). A knife-cut through a radial face "cuts the tops of the waves" and allows the regular changes in inclination of the fibres to show on the surface.

(e) Beech for plane blocks. In order to ensure even wear on the bottom of the plane, this should be a flat-sawn (tangential) face. The grain should have a slightly downward tendency from front to back in order to reduce the risk of any "plucking-out" as the base of the plane wears.

Ireland sets an example in Group Study of the Institute's Certificate and Associate Courses

It is not always appreciated that the Republic of Ireland has a considerable forestry resource. Areas of forest are to be found in various parts of the country covering a total area close to 500,000 hectares. The controlling body is COILLTE whose headquarters are located in Dublin with managed 'branches' located in each of the main forest zones.

With a resource of this magnitude it is necessary to employ numerous staff, with a wide range of skills. At present there are around 1200 staff managing and harvesting the products of the forests.

COILLTE recognise the importance and value in training giving active encouragement to those expressing an interest in work related courses.

Interest was indeed shown when the Institute of Wood Science Certificate Course was offered. A creditable 19 employees were enrolled and even more creditable was the age range, from 30 to 55.

The exam results were equally creditable with a 100% pass rate including 2 distinctions and a national prize.

When offered the opportunity for advanced study at Associateship level, 11 candidates accepted and enrolled. They decided to continue their studies in the U.K. choosing Warwickshire College at Leamington, and commenced studies in March 2000.

As a reminder, the Associate Course comprises:-

Two compulsory modules:
i) Wood as a Material
ii) Handling and Processing Wood

One Optional Module* - (Choice of 4)
One Dissertation

* or a substitution of an acceptable and appropriate qualification.

The course is available as Distance Learning, however on this occasion, it was considered advantageous to provide some formal lecture/tutorials for the Compulsory Modules and the 11 students travelled to Warwickshire College for a week where, fortunately, accommodation is available on campus The time also enabled an introduction to the Optional Module(s).

Course tutors have since travelled to Ireland providing continuous support and preparation for the IWSc exam in October. In the compilation of the final result considerable weighting is given to the assessment of the Compulsory Modules, this is seen as incentive for students during their course studies.

The Dissertation

This invariably causes the most problems for Associateship students. Most of whom are unfamiliar with the rigours experienced on courses normally associated with graduate training.
The Institute actively encourages work related projects and COILLTE in recognition of mutual benefits have given both time and materials for practical experiments and research.

Tutorial support also continues with some face to face or using telephone, fax or Email.

This group of students plan to complete all the components of the course by the Autumn 2001.

T.E. Shaw FIWSc
Warwickshire College

List of tuition centers for the Institute's courses

BCT, Morecambe
Glenn Sharples (Tel: 01524 832052)

Buckinghamshire Chilterns University College, High Wycombe
Dr Kavin Maher (Tel: 01494 522141)

Enterprise Ireland, Dublin
Dr Jos Evertsen FIWSc
(Tel: 00353 1 808 2635)

Isle of Wight College
Martin Wall AIWSc (Tel: 01983 526631)

Liverpool Community College
Greg Prescott (Tel 0151 252 4885)

East Antrim Institute
Tom McFadden (Tel: 028 90855000)

TRADA Technology Ltd., High Wycombe & Rotherham
Susan Farrow AIWSc
(Tel: 01709 720215)

Technology for Timber, Ripon
Jim Coulson AIWSc
(Tel: 01765 601010)

Warwickshire College & Moreton Morrell College
Tom Shaw FIWSc & Erle Smith FIWSc
(Tel: 01926 318235)

BRANCH NEWS

Western Counties Branch

The last Western Counties branch meeting was held in March 1999 when Timbmet Ltd of Cumnor Hill, Oxford organised a very informative visit. Unfortunately only three IWSc members turned up including myself and following a series of poor attendances at earlier meetings it was decided to suspend activities. I prepared a questionnaire in an attempt to understand the decline in participation in branch activities in the South West. The membership (114) is distributed between Gloucestershire (19%), Wiltshire (15%), Bristol (13%), Hampshire (13%), South Wales (13%) and Devon (10%) but stretches as far as Penzance.

From the 114 questionnaires sent to Western Counties Branch members 33 were returned representing 29% of the membership. Of these correspondents 76% were interested in attending meetings and 54% preferred evening meetings. The most popular preferences for meeting locations were Bristol (38%) and Gloucester (27%). Members were most interested in technical lectures (17%) and historical lectures and visits (15%) but there was significant interest in wood science (13%), outside visits to companies (12%), joinery activities (11%), furniture making (10%), forest tours (9%) and woodland walks (8%). The least interest was aroused by social events (5%) although a free buffet has always been provided before or after indoor meetings. Programmes have covered a wide range of activities over the past few years in line with with the respondents' interests.

Other suggestions for meetings included talks on environmental issues, the web, IT, crafts and skills. An encouraging 33% of correspondents were prepared to organise a lecture or visit in their area and two individuals were prepared to join the Western Counties Branch Committee. Five members were sent information at incorrect or changed addresses, a problem currently being remedied by the Institute's new Membership Secretary Christine Bradshaw. Four letters were received from retired members expressing support but finding difficulty with attending meetings due to age.

Based on the above evidence, I judge the Western Counties Branch to be non-viable in terms of attracting at least fifteen IWSc members to monthly meetings. The reasons include the wide geographical spread of the membership, the lack of local college or university courses in wood science, the upward shift in the age profile and general apathy. The branch committee has also been affected by problems associated with pressures of work and health. In conclusion there may be scope for running a reduced programme of meetings based in the Bristol/ Gloucester region, where most of the membership is concentrated, but attendances would most likely be low.

Dr Martin Ansell FIWSc

Yorkshire Branch

It is almost two years since the Yorkshire Branch held it's last meeting. Too long for an area with intense timber trade activity. Yorkshire members will soon be asked to comment on the future existence of their Branch and hopefully, how it can be developed into a valuable and worthwhile organisation. Already we have suggestions for meetings and visits in the region, including a potential trip to the new, state of the art, wood fuel power station at Eggborough. We now have to generate enough interest to make talks and visits worthwhile for our hosts.

Please use this opportunity to put forward your views; it could be your last!

Please feel free to contact me;
NPRyan@Archchemicals.com

Neil Ryan AIWSc

Scottish Branch

The seminar at Scotbuild on 16th November 2000 at the SECC in Glasgow was a very successful event! The seminar suite was full and we also had people standing at the back. Between our timber engineering seminar on the James Jones Timber I Beam and Geoff Bagnall's session on Bruynzeel construction panels and fire retardant treatments for timber and plywood we had 48 people signing our guest book. All this and a positive write up in *TTJ timber and wood products*. The Scottish Branch members are being circulated with a short programme of events for the early part of the year. The first of these, held on March 14th was on health and safety in the timber and wood using industries.

Andrew Gibson AIWSc

Southern Counties Branch

A meeting has been arranged for March 15th in Chichester to re-form the branch which has been inactive since last year. It is hoped that a modest programme can be arranged along with the election of officers and a committee to manage the activities.

D.E. Woodbridge FIWSc

South African Branch

Plans are in hand to hold the first formal meeting of the Branch during the Sabie Forest Fair which will be running from the 3rd to 5th of May.
This fair is a biannual international event.

Malaysian Branch

Discussions are progressing with Dr Ratnesingham, FIWSc with the intention to establish a branch (or Chapter) in Malaysia.
Both Dr Richard Murphy, FIWSc and Dr Martin Ansell, FIWSc are visiting the country and plan to meet with Dr Ratnesingham.
Earlier in the year Michael Buckley, FIWSc was touring in the Far East and was able to have useful preliminary talks with Dr Ratnesingham.

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)
East Midlands - Tom Shaw FIWSc (01789 840605)
Ireland - Dr. Jos Evertsen FIWSc (00 3531 8082635)
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 (01977 671771)

Overseas

Australia - Dr. Harry Greaves (+61 3 9889 0764)
South Africa - Don Priest (013 7642352)

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

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