Summer 1989 Vol. 4 No. 1

Forestry and Forest Products
NEWSLETTER

The Forestry and Forest Products Industry Council

Sen John Button

Introduction

The Australian Manufacturing Council (AMC) and the Industry Councils facilitate international competitiveness in manufacturing industry by providing effective tripartite forums and advisory bodies for the Government.

The Councils also foster a more co-operative relationship between employers, unions and government by developing a joint understanding and a greater consensus of views about the issues facing manufacturing industry.

The Forestry and Forest Products Industry Council (FAFPIC) is one of six Industry Councils appointed under the umbrella of the Australian Manufacturing Council. Most of the major sectors of manufacturing industry, such as the processed food and automotive industries are represented by Industry Councils.

FAFPIC reports to both me and my colleague, the Minister for Resources, Senator Peter Cook. The Council is chaired by Mr Chris Northover, the Federal Secretary of the Pulp and Paper Workers Federation of Australia.

The Council has representation from all sectors of the industry; sawn timber, pulp, paper, printing and furniture. The state Forest Services, the CSIRO and the Department of Industry, Technology and Commerce and the Department of Primary Industry and Energy are also represented.

The forestry and forest products industries are Australia's second largest manufacturing industry. The gross value of production of the forestry and logging industry was about $6b in 1985/86. In that year value added by the wood using industries was approximately 1% of GDP. Taken as a whole, the forestry and wood products sector directly employed about 86,000 people and exported $348M worth of wood products (mainly woodchips). Imports of wood products amounted to $1.4b.

Given the importance of these industries to the Australian economy, FAFPIC has an important function in identifying and addressing problems which impede the industries development.

FAFPIC Work Program

In its earlier work program FAFPIC addressed problems associated with resource availability, consistent with the industry's potential for growth and international competitiveness.

A growth plan for the industry was developed which suggested that with an investment of $2b over the next 43 years the estimated resource shortfall of 14.4M m^3/yr of resource could be overcome. The Council considers that if the plan was implemented, employment would increase by 125,000 jobs and the annual industry balance of payment deficit of $1b today will be reduced to $35M by 1995, will come into balance between 2010–2015, and run into surplus between 2015–2030. If such a plan is not implemented, it is estimated, the annual industry balance of payments deficit will progressively deterioriate from $1b–$2.9b.

The Council has prepared an information kit on the Growth Plan

Sen John Button

in this issue...

Editor: Susan Lucas
Address for correspondance: CSIRO Division of Forestry and Forest Products, Private Bag 10, Clayton, Vic, 3168
Telephone: (03) 542 2244. Telex: AA 35675. FAX: (03) 543 6613. ISSN 1032-4232

CSIRO AUSTRALIA

which is being distributed throughout the industry. In its present 2-year term, greater emphasis will be given to identifying opportunities. The objectives of the current work program are to:

- Maintain an up-to-date assessment of the industry's international competitiveness;
- Identify opportunities and constraints to value added production in the hardwood sawmilling sector;
- Identify opportunities for import substitution in paper and paper products;
- Identify factors influencing innovation and product development in the softwood sector.

Outlined below are four projects which have been developed to achieve these objectives. In addition FAFPIC has already completed a statement on the potential role of hardwood plantations, and is also developing a project proposal for the furniture sector.

Industry Competitiveness

FAFPIC has extensively analysed the international competitiveness of the forestry and forest products industry. It completed a stocktake of the industry and in 1985 commissioned Jaakko Poyry, international consultants in the forest products industry, to provide an assessment of the international competitiveness of the Australian industry.

This report included a detailed comparison of wood, energy and labour costs in Australia, with those of our major competitors. The relative prices of products were determined for "typical" existing plants and hypothetical "world-scale" plant.

The report concluded that given the availability of sufficient resource to establish "world-scale" plants that the Australian industry was internationally competitive in a range of wood products.

As a major element of its work program, FAFPIC has decided to review the Jaakko Poyry Report. The purpose of the review is to assess whether exchange rate fluctuations or changes in wood and energy prices have, since 1985, affected our relative competitive position. The Council expects to conclude the review by mid-1989.

Value Added Production in Hardwood Sawmilling Sector

The Council has established a working party to review the opportunities and constraints to value added production in the hardwood sawmilling sector.

It is proposed that the study will involve desk research on the main trends in the hardwood sector and a number of comparative case studies of firms engaged in value added production and those firms limiting their activities to the green sawn timber stage.

The study would highlight the medium/longer term prospects for value added production *vis a`vis* the green sawn timber market and identify the main barriers to value added production faced by firms. On the basis of this study, the Council would make appropriate recommendations to Government and the industry on future action.

Work on this project has already commenced and it is due for completion by mid-1989.

Import Substitution in Paper and Paper Products

This project aims to identify the scope for import substitution in paper and paper products and to identify measures which would increase the use of Australian paper and paper products. Australia has a huge trade deficit in paper and paper products. FAFPIC is in a good position to consider the issue as members include representation from the major paper and paper products manufacturers and major paper users from the printing industry. This is also a timely project as tariff levels on imported paper are being reduced while the number of local firms supplying the Australian market has increased. The issues that will be considered include price, quality, range of papers supplied, security of supply and marketing.

Innovation in the Softwood Sector

The Australian Manufacturing Council is surveying three industry sectors to examine the factors influencing innovation. FAFPIC agreed that the softwood sector should be surveyed as part of that general study.

In its previous work FAFPIC had noted that this sector needed to improve its product and process development in order to maintain its market share in the face of strong import competition and to open up export opportunities.

I believe that Tripartite bodies, such as FAFPIC have an important role in facilitiating the changes needed to improve the international competitiveness of manufacturing industry.

Improved competitiveness requires joint action by employers, unions and government. The basis of effective joint action is a common perception of the factors and an understanding of the issues at hand.

FAFPIC provides a unique national forum for dialogue between the parties to develop joint understanding on the issues affecting the competitiveness of the forestry and forest products industry and a means of communicating this understanding throughout industry.

FAFPIC has been very successful in developing that joint understanding and will continue to play an important role in improving the competitiveness of the forest and forest products industry.

John N Button

(John N. Button)
Minister for Industry, Technology and Commerce

Sen Button and Brian Myers

Forestry and the Greenhouse Effect

Trevor H. Booth
CSIRO Division of Forestry and Forest Products, Canberra

What is the Greenhouse Effect?

The Greenhouse Effect is the name given to a global warming expected to be brought about by an increase in the atmospheric concentration of carbon dioxide (CO_2) and other gases, such as methane and chlorofluorocarbons. Human activity since the Industrial Revolution has steadily added gases to the atmosphere, which cause heat to be trapped that would otherwise escape to space.

Over the last one hundred years the average temperature at the earth's surface has risen by about 0.5°C. Gifford (1988) has outlined upper and lower bound scenarios for climate change by 2025 AD. The upper bound scenario assumes per capita fossil fuel consumption would be two and a half times greater than it is today. This global average would still be much less than Australia's current per capita consumption. Under these conditions annual average temperatures in south-eastern Australia would rise by about 4°C. The lower bound scenario assumes global fossil fuel consumption could be reduced by half despite an inevitably larger world population than today. Under these conditions annual average temperatures in south-eastern Australia would rise by only 0.5°C.

Significant changes in Australia's rainfall patterns have already been measured during the last one hundred years (Pittock 1983). In the future, rainfall patterns are likely to be affected by temperature changes. Increasing summer rainfall and decreasing winter rainfall is possible over much of Australia, but predictions of the exact magnitude of changes in specific regions are highly speculative.

What causes the Greenhouse Effect?

Figure 1 shows the approximate relative contributions of various gases to the greenhouse effect. It shows how gases other than CO_2 are expected to account for about half the expected warming of the Earth by about 2025. Though other gases contribute to the greenhouse effect the increase in atmospheric carbon dioxide is the most important factor. Its atmospheric concentration is increasing at about 0.5% per year. This rise is due mainly to the burning of coal, oil and gas.

Methane is thought to contribute about 12% to the warming effect. It is produced mainly from ruminant animals, rice paddies and industrial activities. The level of atmospheric methane is increasing by about 1% per year. The burning of wood makes a small contribution, perhaps around 5%, to the total methane production.

Mr Trevor Booth

Nitrous oxide contributes about 8 % to the warming effect. It is generated as a result of burning fossil fuels and using nitrogenous fertilizers. The burning of biomass, including wood, also makes a contribution to nitrous oxide production. Nitrous oxide levels are increasing at about 0.25% per year.

Other greenhouse gases include ozone and chlorofluorocarbons (see Pearman 1988 for details), but neither are produced as a result of forestry activities.

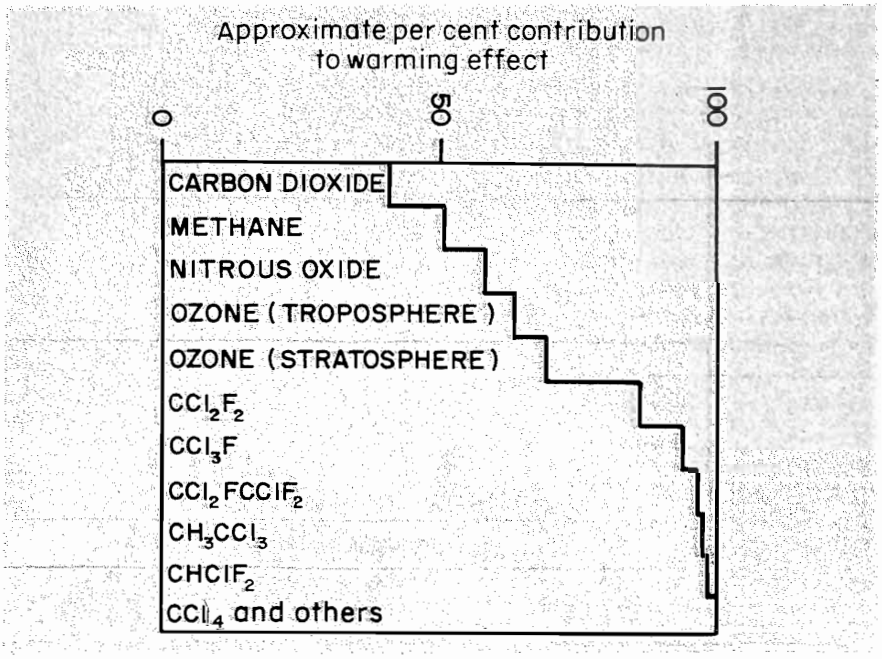

Fig. 1. The cumulative contribution of greenhouse gases to global warming. (Simplified from Ramanathan *et al.* 1985).

What are the major carbon reservoirs and how large are the flows between them?

As carbon dioxide is the most important greenhouse gas it's helpful to understand how carbon moves between the atmosphere, oceans, biosphere and fossil reserves. King, De Angelis and Post (1987) have produced a diagram showing the major carbon reservoirs and flows between them (see Figure 2).

Notice that exchanges between the atmosphere and the biosphere and the atmosphere and the oceans are thought to be nearly in balance. However, about 5 Gt (gigatonnes i.e. thousand million tonnes) of carbon are added to the atmosphere each year as a result of burning fossil fuels.

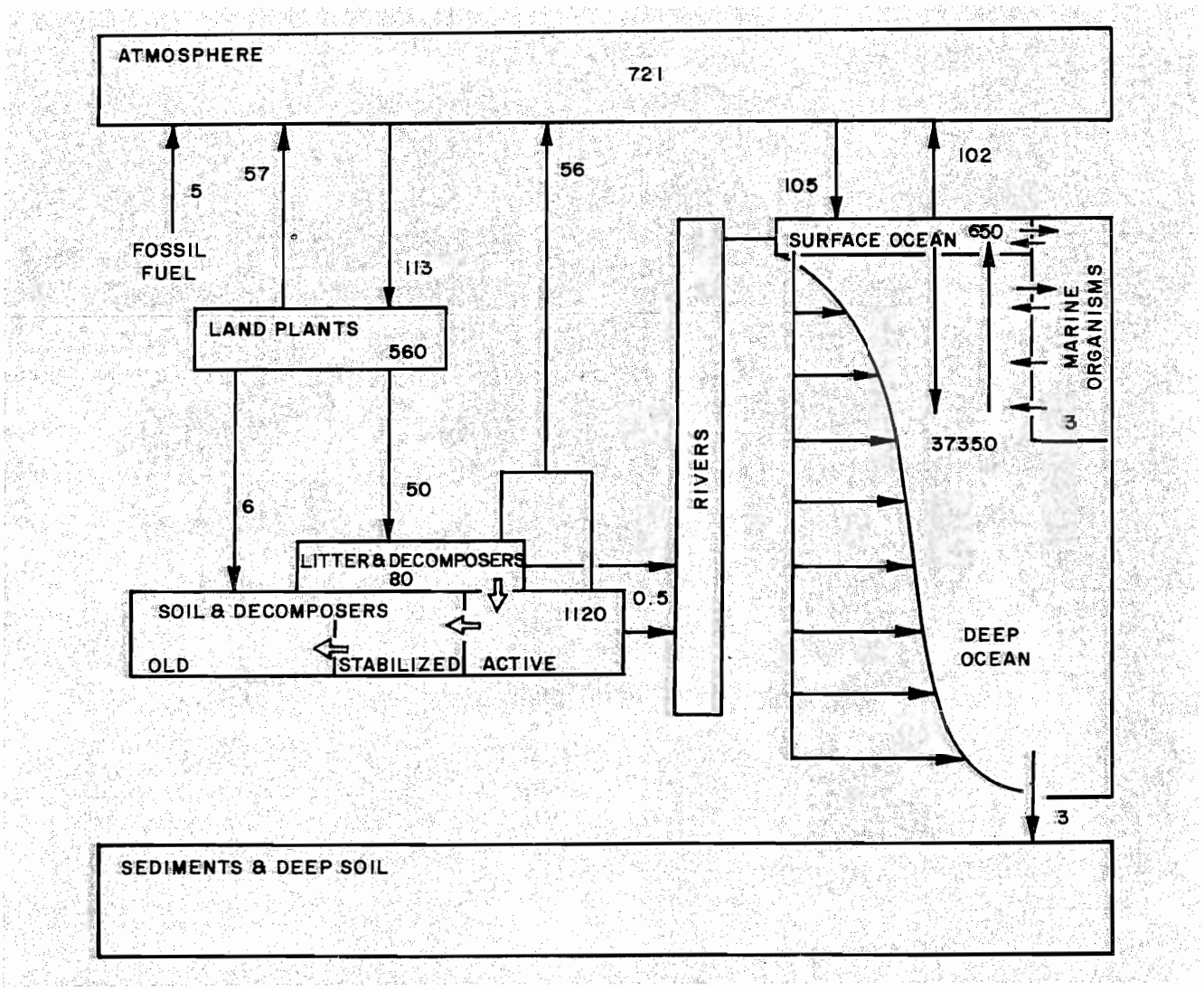

Fig. 2. Global carbon reservoirs and flows. (From King, DeAngelis and Post 1987). *Quantities are shown in Gt (thousands of millions of tonnes) with flows on an annual basis.*

This unnatural addition leads to an annual increase of a 2.9 Gt in atmospheric carbon (Pearman 1988). Unused coal, oil and gas reserves are estimated to hold about 7500 Gt carbon (Pearman 1988), so unless fossil fuel usage is regulated there is considerable potential for further increases. In comparison, additions of carbon to the atmosphere as a result of burning and decomposition following land clearing are estimated to be between 0.57–1.15 Gt per annum (Beckmann 1988).

Figure 2 shows that the oceans have the capacity to hold enormous amounts of carbon, but chemical buffering and poor mixing restrict their ability to absorb fossil fuel CO_2 on time scales of decades (Pearman 1988).

Can forests make a contribution to reducing the greenhouse effect?

Forests take in carbon dioxide to use in photosynthesis. Can planting forests help to slow the increase in atmospheric carbon dioxide?

Let's consider Australia's coniferous plantations, which total about one million hectares growing at about 20 $m^3/ha/yr$ stem volume. Assuming an average density of 500 kg/m^3 this is an annual increment of 10 tonnes/ha/yr or 10 million tonnes in total. Assuming 50% of the dry weight is carbon, this corresponds to five million tonnes of carbon in stem production (R. E. McMurtrie, *pers. comm.*). Approximately this amount of carbon is removed from the atmosphere for stem production by the Australian coniferous plantations each year. A further two and a half million tonnes of carbon is removed for branch and coarse root production. Carbon is also used in other biomass components, such as needles and fine roots, but is held in small amounts for relatively short periods. Some allowance should also be made for carbon released as a result of burning fossil fuels used during planting, thinning, harvesting and processing (Wells 1984). So, the net removal of atmospheric carbon per annum from Australia's coniferous plantations would be less than seven and a half million tonnes for stem, branch and coarse root production.

As mentioned above, the amount of carbon released worldwide as a result of burning fossil fuels is about five thousand million tonnes. So, it is clear that enormous new areas of highly productive forests would need to be planted to significantly reduce the effect of burning fossil fuels. The action would also only be effective as long as the timber produced was neither burnt nor allowed to decay. While it is unlikely that reafforestation could be a solution on its own, it could provide a significant contribution to a combined response to slow the rate of global warming over the next 50 years. These actions might also

include strong policies to increase efficiency of energy use, to discourage fossil fuel use and to encourage solar energy use (Mintzer 1987). As the Australia-wide Greenhouse 88 conference recommended "programs to reduce deforestation and increase afforestation should be implemented as a matter of urgency" (Anon. 1988).

Implications of the greenhouse effect for forestry practice

There is no deforestation of crown productive forests in Australia. Native forests are being harvested and then regenerated. How does the management of existing native forests affect atmospheric carbon dioxide levels?

Figure 3 shows how the rate of growth of a native forest changes as it ages (Attiwill 1979). In this case, growth is shown as basal area increment, but the pattern for total volume growth would be somewhat similar. At first the growth rate is slow and relatively little atmospheric carbon is used. In the case of the example shown, basal area growth peaks at about 45 years. About this time the amount of atmospheric carbon used would be at a maximum. As competition between the individual trees increases growth rates decline and the amount of carbon used also declines. As growth rates decline an increasing amount of carbon is released from the forest to the atmosphere. Figure 4 shows proportionate changes in the allocation of productivity as the forest ages. Increases in biomass and heartwood formation initially hold considerable amounts of atmospheric carbon. As the forest grows older an increasing proportion of productivity goes to litter production and tree mortalities, which would lead to relatively rapid carbon release.

The management strategy which would remove the most atmospheric carbon dioxide would keep the forest growing as rapidly as possible, and also ensure that carbon was not quickly released from the timber removed. Uses such as furniture manufacture and house-framing are likely to delay carbon release for periods of decades. Until recently only sawlogs have been suitable for such uses. Now, the development of Scrimber by this Division means that even small diameter wood can be made suitable for these uses (Weiss, *pers. comm.*).

On the other hand, pulping for paper holds carbon for a relatively short time; the average life of paper products being only about two years (Gifford, *pers. comm.*). Though harvesting for pulp is unlikely to produce any net benefit as far as reducing atmospheric carbon is concerned, it is not detrimental in the long term. As long as trees are replanted the same amounts of carbon will be removed from the atmosphere as are released. In this way, all commercial forestry activities "pay their dues" as far as the greenhouse effect is concerned. In contrast, the use of steel for house framing relies heavily on using fossil fuel reserves built up over millions of years.

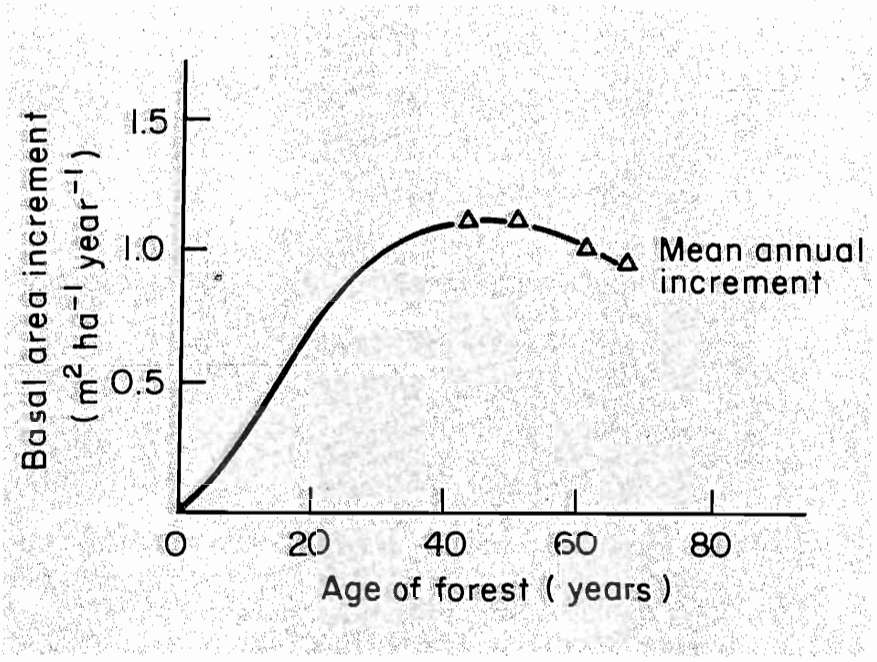

Fig. 3. Mean annual basal area increment for a Eucalyptus obliqua forest (Attiwill 1979).

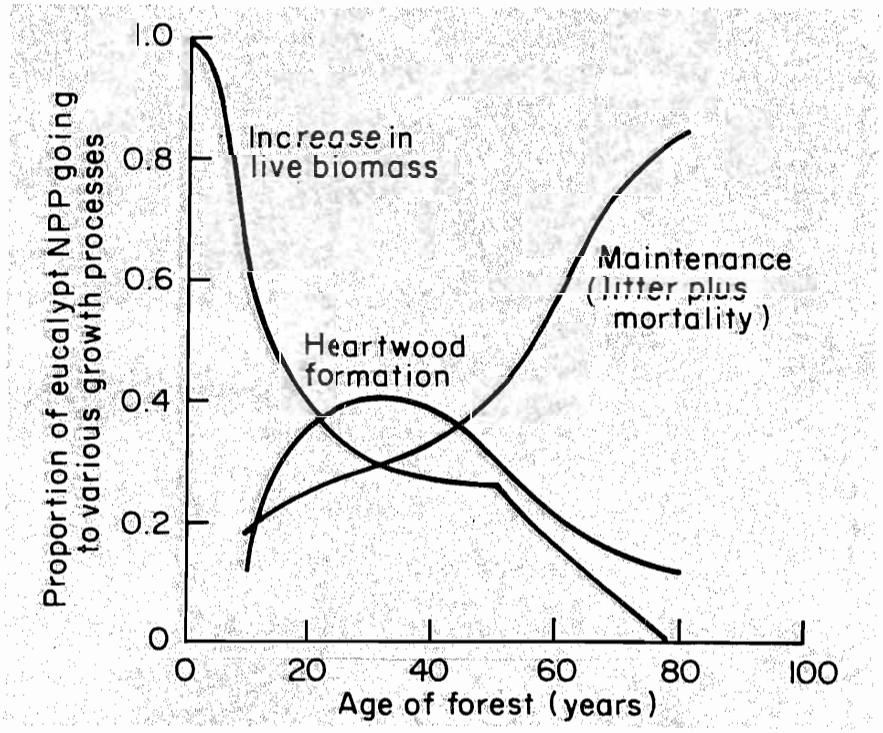

Fig. 4. *Changes with age in the proportion of eucalypt net primary production going to various growth processes* (Attiwill 1979).

What are the consequences of the greenhouse effect for forestry in Australia?

A first review of the effects of climate change on Australia's forests noted that the effects are "likely to be surprisingly large and extremely complex" (Pittock 1987). Possible effects on tree growth, species composition in natural forests and fire frequency were briefly outlined.

Tree growth may be stimulated by the direct effects of increased carbon dioxide on photosynthesis, but nutrient

deficiencies may prevent growth benefits from being realised (Barlow and Conroy 1988).

Large alterations in forest types and distribution have taken place in the past over periods of hundreds of years as a result of climate change. However, the rate of climatic change has never been so rapid as that anticipated in the next fifty years. Studies of the suitability of Australian species for environments overseas are providing a valuable preview of how species may adapt to different conditions (Booth *et al.* 1988).

Pittock (1987) noted the consequences of increased bushfire hazard for forestry. However, more information is needed on likely changes in relative humidity before accurate predictions of fire hazard can be made (Beer *et al.* 1988). Booth and McMurtrie (1988) have examined the possible effects of climate change on Australia's *Pinus radiata* resource. They analysed present and possible future climatic conditions at all major *P. radiata* sites. They also used a computer model to examine growth in detail at two sites. This analysis considered the direct effects of carbon dioxide on growth, as well as its indirect effects on temperature and rainfall. Overall the analysis suggested that some *P. radiata* sites might enjoy increases in growth rates, whilst others might experience declines. Some tentative suggestions were made about which plantations might be most affected. Disease risks and yield prediction methods might also be affected by climate change.

Whilst increases in growth might be realized at some coniferous plantation sites, timber prices in Australia may be seriously affected by greatly increased coniferous timber supplies from the northern hemisphere (Binkley 1988).

On the other hand, Pittock (1987) has suggested that increased concern about energy use will not only lead to "a new emphasis on wood as a renewable energy source" but also as "a cheaper and more environmentally desirable alternative to steel and aluminium in the construction industry".

Climate change is likely to provide both problems and opportunities for the forest industry. The most encouraging aspect is that forestry is a sustainable activity, which can also make some contribution to minimising the problems of climate change.

What should the forest industry do about the greenhouse effect?

It should be clear from the previous sections that there are considerable uncertainties about the magnitude of climate change and its effects on forest growth and health. More reliable information is needed urgently, as native forests and plantations take many years to mature. Unlike most agricultural activities, the opportunity to respond to climatic change on a year-to-year basis does not exist in forestry.

To predict the consequences of the greenhouse effect more data are needed to describe present conditions and to follow the rate of climate change. The forest industry should provide leadership to establish a nationwide system to monitor climate, tree growth and tree health at major plantation and native forests locations. This need not be expensive as some growth and climate data are already gathered, but stronger coordination could be developed between research groups. Present yield prediction methods assume that climatic conditions stay basically the same; there may be year-to-year variations, but these are expected to "average out" over a rotation. It seems almost certain that this assumption will not be true in the future. The only way to predict growth accurately in the future will be through an understanding of how growth processes relate to environment.

The CSIRO Division of Forestry and Forest Products has put considerable effort in the last few years into a Biology of Forest Growth (BFG) program. Part of this program has been concerned with developing computer models, which can predict tree growth under varying environmental conditions.

As noted above, increased atmospheric carbon dioxide has complex direct and indirect effects on plant growth. Extending the models to deal with these conditions will not be simple, but they offer the only way to plan reliably in a changing environment. The forest industry should vigorously support the further development and application of these models.

Current tree breeding programs are based on performance under existing climatic conditions. Urgent efforts will be needed to understand genotype-environment interactions, so appropriate recommendations can be made for genotypes best suited to particular sites under changing environmental conditions.

References

Attiwill, P.M. (1979). Nutrient cycling in a Eucalyptus obliqua (L'Herit.) forest. III. Growth, biomass and net primary production. *Aust. J. Bot.* **27:** 439-58.

Anon. (1988). Greenhouse 88 : draft conference statement and proposed action. Commission for the Future, Canberra. 3 pp.

Barlow, E.W.R. and Conroy, J. (1988). Influence of elevated atmospheric carbon dioxide on the productivity of Australian forestry plantations. In G.I. Pearman (ed.) *Greenhouse: planning for climate change.* CSIRO, Melbourne pp. 520-533.

Beckmann, R. (1988). The greenhouse effect - not all bad? *Ecos* **57:** 14-18.

Beer, T., Gill, A.M. and Moore, P.H.R. (1988). Australian bushfire danger under changing climatic regimes. In G.I. Pearman (ed.) *Greenhouse: planning for climate change.* CSIRO, Melbourne pp. 421-427.

Binkley, C.S. (1988). A case study of the effects of CO_2 induced climatic warming on forest growth and the forest sector B. Economic effects on the World's forest sector. In M.L. Parry, T.R. Carter and N.T. Konijn (eds.) *The Impact of Climatic Variations on Agriculture.* vol. 1. Kluwer, Dordrecht pp. 197-218.

Booth, T.H. and McMurtrie, R.E. (1988). Climatic change and *Pinus radiata* plantations in Australia. In G. I. Pearman (ed.) *Greenhouse: planning for climate change.* CSIRO, Melbourne. pp. 534-545.

Booth, T.H., Nix, H.A., Hutchinson, M.F. and Jovanovic, T.(1988). Niche analysis and tree species introduction. *For. Ecol. Manage.* **23:** 47-59.

Gifford, R. (1988). Two scenarios for atmospheric and climate change by 2025 AD. Prepared for Greenhouse 88 workshop. 5pp.

King, A.W., DeAngelis, D.L. and Post, W.M. (1987). *The seasonal exchanges of carbon dioxide between the atmosphere and the terrestrial biosphere: extrapolation from site-specific models to regional models.* Oak Ridge National Laboratory, Environmental Sciences Division, Publication no. 2988. 281pp.

Mintzer, I. (1987). *A Matter of Degrees: the Potential for Controlling the Greenhouse Effect.* World Resources Institute Publications, Holmes, PA, USA. 70pp.

Pearman, G.I. (1988). Greenhouse gases: evidence for atmospheric changes and anthropogenic causes. In G.I. Pearman (ed.) *Greenhouse: planning for climate change.* CSIRO, Melbourne. pp. 3-21.

Pittock, A.B. (1983). Recent climatic change in Australia: Implications for a CO_2-warmed earth. *Climatic Change*, **5:** 321-340.

Pittock, A.B. (1987). Forests beyond 2000 — effects of atmospheric change. *Aust. For.* **50:** 205-215.

Ramanathan, V., Cicerone, R.J., Singh, H.B. and Kiethl, J.T. (1985). Trace gas trends and their potential role in climatic change. *J. Geophys. Res. D.* **90:** 5547-5566.

Wells, K.F. (1984). Primary energy inputs to plantation forestry. *Energy Agric.* **3:** 383-96.

CSIRO, Monash University and the Pulp and Paper Industry

— A Unique Initiative

Recently 14 professional engineers and scientists returned to full-time study leading to the conferring of a Master's degree in Engineering Science in Pulp and Paper Technology. The venture results from an initiative of the Pulp and Paper Manufacturers' Federation of Australia and will be undertaken at Monash University with the assistance of the CSIRO Division of Forestry & Forest Products. The course is offered by the Department of Chemical Engineering and will operate under the auspices of the new National Institute of Pulp and Paper Technology. It is funded by the Pulp and Paper Manufacturers' of Australia at a cost of $500 000 p.a.

This initiative matches closely the objectives of the Federal Government to engender research and development of importance to Australia's future industrial structure, as stated by the Prime Minister when describing recent cabinet discussion concerning increased funding for R&D.

The course aims to increase the technology and expertise in the Australian pulp and paper industry by improving operation efficiency and its international competitiveness. The means used to achieve these goals will be:

1. to provide students with a thorough understanding of the scientific, engineering and economic principles underlying the processes and products of the pulp and paper industry,
2. to exemplify these principles through the discussion of processes, equipment, products and management, with emphasis on recent technology.

The philosophy of the course is to emphasise basic principles and their practical applications. This approach is considered necessary to equip the technologist for problem solving and innovation, the latter usually flows from an understanding of the fundamental physical and chemical principles embodied in the processes and equipment employed. Successful application of these principles requires that relevant cost factors be understood.

The course structure aims to achieve this philosophy through the use of lectures, laboratory components at Monash University and CSIRO, industry visits and a major field project involving 2–3 months full-time on a mill project site or an appropriate project may be carried out at the university or CSIRO.

CSIRO's decision to be involved with this unique venture has not been taken lightly. Our enthusiasm is generated from a strong belief in the necessity for further "tertiary" education in the pulp and paper industry. There is a need to provide a basic grounding in the principles and technology involved in the pulp and paper industry. The close proximity of the Chemical Engineering Department and CSIRO Division of Forestry and Forest Products will encourage strong interaction and cooperation between the two groups in developing, in the long term, a centre of excellence in R & D for the industry.

Imre Lele, Chairman of the Pulp & Paper Manufacturers Federation of Australia and Managing Director of APM states he is delighted at the appointment of Dr Harry Cullinan to the chair of Pulp & Paper Technology at Monash University. Dr Cullinan is formerly the Dean of Institute of Paper Chemistry, Wisconsin, which is the leading educational and research establishment for the pulp and paper industry in the USA. While CSIRO has recently appointed a Senior Technical Officer to supervise the practical component of the course.

Index
Forest Products Newsletter
July 1985–Dec. 1988

Additions and Corrections to "Divisions of Forest Products, Chemical Technology, and Chemical and Wood Technology — The Last 20 Years"

The above article appeared in the final issue of the Forest Products Newsletter (Vol. 3, No. 4, Spring, 1988).

The following names should be included in the list in the first column on page 6: Hilton Hergt (Physics), Paul Lesse (Mathematics), Graham Mackay (Seasoning), Jean Melvin (Wood Chemistry), Jack Nicholls (Silviculture and Wood Quality), Peter Moglia (Plywood), Rupert Palmer (Adhesives), Dick Pankevicius (Adhesives) and S.H. Tham (Wood Chemistry).

The following names should be added to the list of those from the Division of Forest Products who are still working in the Division of Forestry and Forest Products (bottom of second column on page 6): Peter Collins, Peter Fitzgibbon, Rosemary Hamilton, Tom Syers, John Yuritta and Noel Whelan (who was responsible to Jack Pattison in D.F.P.).

Among the D.F.P. people who have died since 1971 are Jock Hebron, Henry Karpovich, Cliff Kenery, Audrey Lightfoot, Bernie Lovelock, Joan Page, Jack Stephenson, Frank Priest and Anna Yuritta.

Many other names could be added to the list of those in research support and other categories who have retired or moved on during the period reviewed (second column, page 6). These include: Bob Adamson, Tom Armstrong, Les Ball, Charlie Bamford, Helen Barry, Bob Bray, Fred Bowers, Jean Cameron, Sue Collins, Doug Coole, Phyllis Coombs, Lloyd Craven, Jack Crisp, Dick Cullen, Jock Currie, Margot Colquitt (Preston), Bill Dean, Jim Diskin, Brenda Duffy, Stan Edmondson, Ray Farrelly, Karen Galbally (O'Neill), Faye Gallagher, George Garland, Sue Garland (Ward), Frank Grant, Bill Halley, Harry Heath, Lynne Heath, Leo Henry, Bob Hall, Joe Hope, Henry Hunter, Ron Johnson, Alan Jones, Bill Kreig, Harold Ledger, Tom Leonard, Kevin Lester, A.F. Levens, Miss B.J. Lloyd, Stewart Lunn, Jack Lyons, Margery Mallinson, Ken Murray, Ean McArthur, Mike McKiterick, Doris Newcombe, J.E. Nicholson, Joyce Nilan, Lee Nimmo, Barry O'Donohue, Stan Panow, Fred Peplar, Bill Poynter, Rita Purcell, Cliff Rice, Peter Robinson, David Rolfe, Heather Rolfe, Bram Rundle, Kay Sammut, Andrea Sanderson, David Sanderson, Warren Seaman, Norm Shores, Pauline Sims, Betty Stanbridge, Ron Stanbridge, Maureen Stepan, A. Stevenson, Sergei Tostowless, George Thompson, Averil Toyne, Bob Truscott, Kevin Turner, George Williams, Les Wilson and M. Ziakis.

In captions to two illustrations (pages 2 and 3) reference to Dr R.W. "Murray" should of course read "Muncey". The late Ray Bournon's name has been spelt incorrectly in three places ("Bouruon", "Bourn" and "Bournow").

Huntly Higgins

Gottstein Wood Science Course, February 13–17,

The J.W. Gottstein Memorial Trust is a major forest products industry-based educational trust fund, with three areas of ongoing activity the Gottstein Fellowship, industry seminars and industry study tours.

The above course was held over 5 days at the University of Melbourne. The aim of the course was to provide a greater understanding of the nature of wood through the study of variable properties of wood and bark which affect behaviour during processing and its end use. It looked at the potential for the development of new products based on various wood types and processing techniques. It also provided an appreciation of international trends in the forest products industries.

The participants were addressed by a number of national and international experts in their fields, a summary of their talks will be given in the next issue of the newsletter. Whilst the after dinner speakers Drs Syd Shea and Robert Bain and Mr Imre Lele were both thought provoking and entertaining.

The organisers of the course Ted Hillis, Bill Keating and Ian Ferguson are to be congratulated on providing a well rounded course that achieved the aims it set out to do, that is to inform executives and consultants within the forest products industries of the dynamic nature and the potential of the product they deal with.

Institute of Wood Science

The Australian Branch of the Institute of Wood Science held a 2-day seminar on the *Preservative treated timber: its specification, care and application* on the 12–13 April, 1989 at CSIRO Division of Forestry and Forest Products, Highett, Melbourne.

Thirteen papers were presented covering such topics as: Agencies affecting the performance of timber; wood preservation and durability as methods of control; standards and quality control; how the consulting engineer ensures compliance — a case study and the environmental aspects of wood preservation.

FPRAP Database

Forest Products Research Advisory Panel Database on current research projects (1985) has been asked by SCF to be included in the Australian Rural Research In Progress database. ARRIP is a national database available for searching through CSIRO AUSTRALIS. It contains comprehensive details on current rural research projects being conducted in all agricultural fields. Clearance is currently being sought from members of FPRAP to initiate the conversion of the projects over to this electronic medium.

Forest Industries in Australia

The Centre for International Economics released in November 1988 *Forest industries in Australia — an economy wide perspective*, on behalf of National Association of Forest Industries (NAFI) and the Forest Industries Campaign Association (FICA). The report indicates that the forest industries will gain significantly and make a more valuable contribution to the national economy and community living standards if their international competitiveness can be improved. The report goes on to state "but their competitiveness is inhibited by insecure access to forest resources, which is a result of conflict between forest industries and other users of public forests. Bans on forest exports and on access to hardwood log supplies would lead to a significant curtailment of the industries' activities, a deterioration in Australia's trade balance and hence reduced national income and living standards".