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EDITORIAL NOTE

Readers of this Forest Notes will not receive it before New Year, but every attempt has been made to speed up the compilation.

Thanks are due to those who responded to the call for assistance, and especially to the Southern Region who dominate this issue.

FORESTERS WIN FOR HAVING A GO

by Alan Lush

What a shame that it takes the State's 150th Anniversary bullabaloo to engender enough enthusiasm in the community for it to organise such activities as the hundred or so "Back to's", the Parmelia Yacht Race, Skylab and the numerous other special functions. They have reintroduced communal activities which used to be the rule before our leisure became occupied with television and a myriad of individual pursuits. A sprinkling of 150th events has reminded us of the fun and spirit of community and it is my hope that this will continue.

Ironically, those of us in the south were given some of the more lavish celebrations through television; however, our own Back to Pemberton, Back to Fonty's, and the Blackwood Valley Anniversary Marathon Relay have been fantastic;

- fantastic for the fun and excitement of active participation;
- fantastic for the spirit of community;
- fantastic for the renewal of old acquaintances.

Back in July the idea of a Marathon Relay Race in the Blackwood River Valley was announced to the public. It generated the enthusiasm among foresters that led to two teams being nominated for this 58 km race between Boyup Brook and Bridgetown. Five competitors made up each team which initially came from the Southern Regional group, and Inventory and Planning. Last minute injury forced the withdrawal of the I & P team, however, forestry was represented by the following athletes:

First leg - Running - Greg Strelein.

Commenced at Boyup Brook Sports Ground at 9.30 a.m. and continued for 12 km along bitumen and gravel roads to the Blackwood River.

Second leg - Canoeing - Owen Ritson.

Downstream for 7.3 km, including sections of broken water, to terminate at the historic Jayes Bridge where a picnic lunch was had in a very carnival atmosphere.

Third leg - Swimming - Per Christensen.

Resuming after lunch, this leg carried the race 700 m downstream where Per left the water and sprinted 100 m to his equestrian team mate.

Fourth leg - Horse riding - Warwick Bradshaw.

This section followed the scenic Blackwood River Valley for 16 km through mainly wooded country, pastureland and along gravel roads.

Fifth and final leg - Cycling - Roger Underwood.

22 km of gruelling work through mainly hilly (mostly up - according to Roger) terrain to the Bridgetown Agricultural Showground.

Forestry finished fifteenth out of fifty-four teams - a tremendous feat considering the calibre of competition from the many semi-professional sportsmen involved.

Not only did family and friends support our team but over ninety silk screened T-shirts were sold to promote and sponsor it. Shirts were ordered throughout the Department, from Yancehp to Walpole, which goes to show that we still have a spirit of community - the Forestry Community.

I was proud to be associated with the team, and judging by the enthusiasm expressed for the race, there will be another one next year.

If you are an athlete, aspire to be an athlete, or just want to be associated with one, drop me a note and I will keep you informed on next year's development.

1979, our 150th Anniversary year, has been great, mate. Particularly for those of us in the South, who have joined in to have a go.

AN ADMIRABLE PLACE

by L. Talbot

"Mr Augustus Gregory proceeds almost immediately on an exploratory expedition to examine the district marked in the map as Lanark, and situate between Sussex and Albany districts.

The coast line of this district was traversed by Mr Preston when he was boat wrecked during the early days of the colony, and he laid down several rivers which discharge themselves into the sea at this locality, and among them the Donnelly, to which most of the southern cattle spearers resort after a foray. It will be of some interest to know to which of the inland rivers these outlets are connected, and it is of colonial importance to know whether this terra incognita offers facilities for the depasturing of stock or the cultivation of grain."

So began a new item in a Perth newspaper of 1852, and of course the 'terra incognita' it refers to is that same area that many foresters now refer to as "The Wild Country". The area shown on early maps as Lanark covers most of this same country. It lay between Cape Beaufort and Chatham Island, with its east and west boundaries formed by parallel lines running north from those two points; and its northern boundary formed by an east-west line passing through about the present site of Palgarup.

The news item continued:

"Considering the length of time to colony has been settled it seems extraordinary that a tract of country so near the settled districts should have been so long unknown and we are glad to find that the Governor has determined that the blank spaces shall no longer exist."

It was extraordinary indeed that this district had remained so long, not only unsettled but largely unexplored, considering it lay so close to Albany, Augusta and the Vasse, three of the longest settled districts in the colony. Perhaps the settlers of those districts found this land too wild, even for them. Certainly the explorers who had attempted to examine it earlier - Bannister, Clarke and Gregory, once before, - had found it so.

This second expedition of Gregory's was to do little to alter the situation. On his return the newspapers disappointedly reported that the land he had traversed offered little inducement for settlement, nor had he found any harbours along the coast. However, he was able to report that he had discovered some magnificent "bluegum (karri) forest - one fallen tree measuring 140 feet to the first limb and about five feet in diameter." He had seen very few natives and those he did see were "perfectly quiet."

The reference to the quiet natives, no doubt stemmed from reports, current about that time, that natives had been spearing cattle in the Vasse district and then retreating to the Donnelly River where they were safe from pursuit. Gregory was accompanied on this expedition by a Constable Scott, who went along specifically to investigate the Donnelly spearers. He claimed to have tracked them as far as that river "where they eluded further search."

Scott warned the few natives they did encounter to have nothing to do with the "beef-eaters."

Another explorer of the Region, William Nairn Clarke, had had some interesting plans for settling the Nornalup district, as early as 1841; but he was unable to gain any support from the authorities and nothing came of his plans. He wrote several letters to the Colonial Secretary in which he proposed that a station be formed at Nornalup as a preparatory step to its later colonization and to prevent the Americans from unlawfully taking away any of the valuable timber from the nearby forests, "which" he wrote "will be a source of future wealth to the colony".

He claimed that a ship anchored off the bar, in the shelter of Saddle Island could remain for months while a cargo of spars for masts, yards, etc., was got from the magnificent forests on the shores of the rivers and estuary; and, at the same time, the ship could be engaged in bay whaling between Point Nuyts and Point Ramie.

In one of his letters he wrote "I offer my humble services to the government on receiving adequate remuneration and payment for outlay to form an establishment on the Estuary of Nornalup where there is an admirable site for a town and commence a fishery on a large scale, and if His Excellency will allow it I should like to have ten years lease of Saddle Island for the purpose of procuring salt and breeding pigs - "

"As I conceive that these views of mine are calculated for the benefit of the Colony at large and will lead the way to sources of wealth yet untried I hope that His Excellency will regard them in a favourable light".

The Governor was not sympathetic and Clarke got neither the remuneration he requested, payment of outlay for his two exploratory expeditions, nor a lease on Saddle Island."

There was a shortage of Government funds in those days too it seems.

In another letter Clarke referred to two sealers, who had for some months been living on Sandy Island, near Cape Chatham. Their names were Genible and White. They had talked in Albany of a large river debouching into the ocean not far beyond Sandy Island, its waters being fresh almost to its mouth. They claimed to have gone up this river for about twelve miles, hunting kangaroo; but they were not, as Clarke wrote, "Curious about objects more important to others." They described it as "a river quiet and gently flowing but the bar is dangerous at times."

Clarke made use of sealers to obtain information whenever he could do so, but being a very proud and haughty person, he went to some pains on more than one occasion to assure the Governor that he did not associate with such uncouth fellows. As he put it: " - As useful information is only to be obtained by hearing the remarks of such people, certainly not the most polished of the human race, I felt no hesitation in extracting all I could. They added that there was fresh water on Sandy Island and abundance of mutton birds and that from Cape Chatham to Point Entreasteaux all the mainland is a sheet of inlets. Allowing for the exaggeration natural to all such people, still enough is left to excite a good deal of curiosity and tempt future enterprises."

There is a footnote to this letter in which Clarke again assures the "Government" that he would have nothing to do with people 'whose principles are very abhorrent in every particular' and that when he hired a boat he also hired a "steerer named Solomon Aspinall late pilot to King George's Sound who understands boat navigation to east and west of King George's Sound".

Two other events of interest which occurred in this district were, in 1866, the escape of four convicts from Warren Bridge Road Gang, and in 1892, the discovery of a 50 year old skeleton and a quantity of money and other articles, near the Donnelly River.

The four convicts who absconded one November evening, hoped to walk to South Australia; but they found the going in the karri forests and coastal swamps so exhausting that after about six weeks they gave themselves up at Albany. One of them wrote an account of their experiences which was published in the 'Inquirer" soon after their surrender.

They took with them a quantity of flour and damper which they had earlier concealed in the bush about half a mile down the river. When this gave out they lived on a few wallabies, kangaroo rats, that they succeeded in snaring, supplemented at times by roasted roots, fish and a goanna.

They had to force their way through extremely dense thickets and at times through wide swamps " - in which there was eighteen inches of water and six inches of mud".

Some idea of the hard going can be gleaned from this quotation:

"Travelled through about two miles of bluegum country but found the underwood and dead timber so thick that it took us four hours to accomplish the distance, we then reached what I should call tea tree scrub, through which we travelled about seven miles in about as many hours, the scrub being about five feet in height. This was a fearful days work and we could never have done it had there not been plenty of fresh water with which we refreshed ourselves, we afterwards came to a very dense thicket with upright scrub about the thickness of a walking stick and growing so closely that we had to take it in turns to break down the sticks; and after working for twelve hours we had the satisfaction of being quite sure that no mounted police in the world could follow us up, on the other hand, we had only made two miles and our provisions were nearly all gone".

At times, of course, travelling was much easier and they welcomed the black-boy flats and stretches of open red gum forest and rolling sand hills, but thickets were encountered frequently.

Although they set over thirty snares each night, they usually succeeded in catching only one or two kangaroo rats and other wallabies. Their best haul yielded "Two kangaroo rats and an iguana caught during the night and were very much enjoyed, the latter reptile I fancied the most delicious morsel I had tasted for a very long time".

Other accounts of food gathering included this: "After travelling five miles through a thinly grassed country, arrived at a beautiful spring of

cool fresh water, with lots of roots growing about, such as we had seen the natives eat when en route from Busselton to the Warren; we therefore camped at once, digging, roasting and eating roots until night; we also put by a supply for the road".

From then on these roots were to be a major source of food for them. Soon after leaving the spring they came to " - a fearful thicket, but there was no alternative and we went at it like fowls through a cornfield and succeeded in doing a mile in four hours".

Ten days after escaping they came to an inlet, which they had earlier seen from a high road some miles inland. Possibly this was Broke Inlet. Here they caught some fish, some of which weighed about two pounds and which the writer described as "fine fresh water trout".

They spent some time here smoking some of the fish to take with them, using " - a sort of green bush, which we afterwards believed to be the poison plant". The writer continued: " We ate some of the smoked fish with the roots we had saved. Soon after the meal I heard Hooley call for assistance, I was going towards him but fell in the attempt, experiencing a most dreadful thumping sensation in the head, which was followed by severe vomiting and bleeding at the nose, Smith and Ellis were also taken ill with the same symptoms, and before night we were all laying at deaths door, with the greatest difficulty we managed to crawl around the fire, but no one was equal to the exertion of putting on a piece of wood".

Two days later they were able to resume their journey but Hooley unwisely ate some more of the smoked fish and was again violently ill. He was sick for the remainder of their journey and a great burden to his companions, so that by the time they reached Torbay they had all had enough and decided to go into Albany and surrender. Except the author of their story, - whose name, unfortunately, is nowhere mentioned, - he did not want to give himself up at Albany but decided instead to return to the Warren and surrender there. So against the advice of his friends he set out along the coast and succeeded in getting almost back there, but by then he was so weak and exhausted he could go no further and lay down in the sand hills, not caring whether he lived or died. He was found by a Mr Mottram who took him to his home and, eventually, on horse back back to the Warren Bridge.

The discovery in 1892 by Mr George Giblett of Balgarrup, of a skeleton that had been buried in drift sand near the Donnelly River for more than fifty years, uncovered a mystery that has never been satisfactorily resolved. With the skeleton was a quantity of money and various other articles including an iron kettle, broad axehead, tin mug, tin tray, pocket knife, hand auger, a flint, pinfire cartridge, small bottle, three lead sinkers, pincers, butcher's steel, two knives, portion of a sextant, trouser buttons, a brass naval button, thirteen pieces of blue and white willow pattern pottery, portions of clothing and other odds and ends, as well as thirteen sovereigns, ten Spanish dollars and three English silver coins. The dates on the sovereigns ranged from 1817 to 1832.

Local folklore at Pemberton has it that the skeleton was found in the Yeagerup sand dunes close to Lake Yeagerup, which is also known locally as 'Dead Man's Lake" and although it has now been long forgotten elsewhere, there was in the past, much conjecture about the identity of the dead man.

Considering that it took four months or more to sail from England to Australia, the 1832 sovereign makes it unlikely - though not impossible - that he was one of the party of nine men who disappeared between Albany and Augusta in 1832.

In about the 1930's Mr Alfred Bussell wrote a paper on the Southwest Aborigines and in it referred to a story they had told him, of a white man who lived among them about four generations before. Bussell spoke the native language and claimed to understand their ways. He suggested that the skeleton found by Giblett was, very likely, that of this mysterious white man, who Bussell believed must have been a ship-wrecked sailor. He wrote "This story is a record of facts, told from father to son for about four generations or more - the men and women in this story really did exist, so that the story must be pretty well true, I believe from the name they gave the place where they found this white man - Jerrymungup, that his name was, or he called himself to the blacks, Jerry Monk, or perhaps Jerry Monger - hence the name Jerrymungup. The reason I think it might be so, is because I know their mode of constructing name places so well".

Bussell's suggestions about the identify of the skeleton are of course just conjecture and in any case be believed the man was living with the blacks before the white settlers came, in which case the 1832 coin rules him out also.

A more likely solution was one put forward by Mr H.C. Prinsep. He had been informed by a Dr Green, who, it seems, had lived at Augusta at one time, that in the early days of the colony a Fremantle trader named Cass used to visit Augusta in his cutter, with a stock of drapery, hardware, etc., to sell to the settlers. In 1835, against the advice of Dr Green, Cass set sail from Augusta in very stormy weather and neither he, his man nor the cutter were ever seen again. Prinsep believed that the articles and money found with the skeleton pointed to it being the remains of the trader, and he pointed out, that had the cutter been unable to round the Leeuwin in the stormy weather, the prevailing winds would have driven it towards the Donnelly River.

So, Jerry Monger, Cass, an unknown sealer, or shipwrecked sailor, the mystery still remains, along with those of the nine men of 1832 and the six open graves discovered by Clarke near Nornalup in 1841.

Even today, after 150 years of settlement this strip of Coast Country remains a wilderness area, difficult of access, wild, windswept, challenging and fascinating and there are many of who hope it will always be so.

RECENT DEVELOPMENT AT WEST MANJIMUP NURSERY

by A.W. Walker

The optimum method of Karri Regeneration is the Seed Tree System. For a number of very good reasons this method cannot be used exclusively. Some of these reasons are:

1. Karri Seed Availability: Assured seed crops may only occur one year in six, at worst, with a normal cycle of about 4 years.

2. The Regeneration Burning Capacity: Current availability of men and equipment during suitable burning weather has seen a best ever achievement of about 2500 ha in one season (and that is a quite remarkable effort). The current level of cutting is about 2000 ha per year of karri types.

   Therefore, the alternative of "holding" areas until a good seed year, is not desirable, as the result could be a task of 8000 to 10 000 ha of regeneration burning in one summer.

3. To balance sawlog and chipwood intakes and yet remain within the numerous other constraints on cutting, it is necessary to clear fall some coupes regardless of availability of seed.

The alternatives to the Seed Tree System of Regeneration (so called "artificial methods") are:
1. Direct Seeding and
2. Manual Planting

The scarcity and cost of karri seed does not permit any more than 300 ha of direct sowing per annum.

(Establishment of Karri Seed Production Areas will see increased use of direct sowing of improved seed in about 8-10 years).

This leaves manual planting of karri seedlings as the best possible regeneration alternative in non-seed years.

The requirement for karri seedlings has grown from 120 000 in 1973 to 3 million in 1979. This massive increase has required a rapid development of the karri nursery at West Manjimup, which is now the largest open-root eucalypt nursery in Australia.

The big development began in 1976/77 when a huge dam (capacity 11 million gallons) was constructed to supplement water supplies from two small dams on the location. Dozers and excavators worked under lights to finish the job on time. New paddocks were cleared and ripped, stumps blown, bracken controlled by intensive cultivation.

Considerable equipment was required to satisfy the irrigation requirement.

A 100 h.p. electric motor was transferred from a Ludlow sawmill and harnessed up to a Southern Cross 100mm pump. 2300 metres of P.V.C. mains and sub-mains were installed. 800 standpipes and sprinklers were purchased, and fitted to 6000 metres of aluminium pipes. Tractors,

implements and service equipment were acquired and immediately pressed into service.

The demanding exercise in logistics was supported by equally important inputs from Divisional, Research and Workshop staff and employees.

Traditional (pine) nursery techniques were used to grow the open-rooted seedlings. However, specific problems of weed and fungal control had to be solved quickly as they developed, with little time for experimenting with alternative chemicals or techniques.

A reciprocating root pruner was built at Manjimup workshops and it satisfies the requirement to regularly undercut the marri tap root with minimal disturbance to the seedlings.

Paralleling the rapid increase in requirement for open-rooted karri was an equally demanding need for container grown seedlings from West Manjimup for Departmental use.

Rehabilitation of log landings and associated snig tracks in karri areas is an ongoing requirement and 96 ha were planted with container stock in 1978. Gravel pit and dieback rehabilitation, landscaping and amenity plantings in the Southern Region are regular requirements. In addition, *E. muelleriana* is required for mixed karri/*E. muelleriana* plantings in 1979 and subsequent years, for future pole requirements.

Central Region requirements include tuart for Busselton, mixed eucalypts for Nannup and Kirup and salt tolerant eucalypts for Collie catchment replantings.

A total of nearly 500 000 container seedlings were established in 1979.

Besides the standard 6cm jiffy pot containers, experiments with paper pots and 3cm jiffy pots have been so successful that the majority of container karri is now grown in these smaller containers. Trials with species such as *E. gomphocephala, E. resinifera, E. globulus* and *E. camaldulensis,* in paper pots have been extremely encouraging and provided that survival and initial growth match nursery performance, a move towards greater use of paper pot stock for F.D. purposes should develop. The cost savings for paper pot seedlings are quite significant.

Approximate costs for karri in 1979 are:

Standard	6cm jiffy pots	10¢ per tree
	4cm paper pots	5¢ per tree
Open-rooted karri seedlings		1.5¢ per tree

The expansion work at West Manjimup is now complete but work is continuing on refining and improving techniques for both open-rooted and container grown seedling production.

RESOURCE ONE

During September a National Symposium on Hydrology was held in Perth, and associated with it, a large exhibition was arranged in the grounds of Dumas House in West Perth.

The exhibition was called RESOURCE ONE because there can be little doubt that water is our most important resource. Resource I was planned by a committee representing the Public Works Department, Metropolitan Water Board, Department of Agriculture, C.S.I.R.O., and the Forests Department, and was one of the most successful items on the WAY '79 calendar. More than 50 000 people passed through Resource I, over a period of two weeks, many people returning for a second visit.

The Department was involved in 3 sections of the display -

(a) Recreational and Environmental Use of Water

The display was a working model of the hydrologic cycle showing the recreational and environmental involvement of people in this cycle. The model was built by Scott Properjohn and showed eighty of the Life-be-in-it characters engaged in 35 recreational activities. The display later was transferred to the 1979 Royal Show at Claremont in the C.U.E. pavilion.

(b) Catchment Management to Protect Water Quality

This exhibit featured the fragile nature of stream purity with the aid of photographs, graphics and a seven minute audio visual programme. It was prepared by the Metropolitan Water Board and the Forests Department.

(c) Catchment Management for Increased Water Production

The exhibit was presented by C.S.I.R.O., Public Works and the Forests Department and incorporated an on-site Pinus radiata tree enclosed in plastic (a "Greenwood" tree) and monitoring equipment to measure transpiration rates.

KARRI AND THE OAK FORESTS OF DEAN

A TALE OF TWO FORESTS

by R.J. Underwood

The dismay and disquiet in sections of the public mind over the "destruction" or "irreversible changes" being wrought upon the karri forest by the current surge of harvesting for sawlogs and chipwood is naturally of concern to all foresters. The continuing outcry over the "woodchip project", as the combined operation seems indelibly to have been branded, is partly an expression of the rapid growth of popular conservation issues which have emerged in the Western World in the last 10 to 15 years. It is also an understandable lay reaction to the aesthetics of large-scale clearfelling. Very few people actually enjoy the notion of splendid and beautiful forests being cut down; none find the sight of a recently burnt coupe attractive or inspiring. Indeed, most foresters themselves, cannot escape a sense of loss, when they reflect upon what they knew was there, and is now gone, despite their knowledge of the markets which must be supplied, the jobs and families sustained and the virgin forest reserves which are set aside.

However, by virtue of their training, experience and conditioning, foresters are (perhaps fortunately) endowed with unusual patience and foresight when it comes to forest operations. The future is easily visualised, so that rather than the immediate scene of devastation, they see instead the burgeoning hillsides of regrowth, the dense stands of saplings and poles turning their leaves to the wind, and then ultimately, the new towering and gleaming forests, alive with lorrikeets at the blossom, steaming boles filtering the misty sunshine of a Pemberton winter's afternoon.

Some of us have also been fortunate enough to extend our vision backwards in time, in places where the life cycles of forests have revolved many times, leaving their imprint upon the pages of history. Few other experiences put our local problems so clearly into perspective.

My personal experiences in this vein occurred (like so many other Australian foresters before me) when I was in Europe last year. For example, in the Hartz Mountains in Germany, we saw clearfellings being made in a 120-year-old spruce forest - the third such deliberate rotation on that area. But the really enduring experience for me, was the "discovery" of the Forest of Dean in the southwest of England near the Welsh border.

The Forest of Dean is perhaps the best loved forest in Britain. Like the New Forest, it is one of the rare survivors of the ancient Royal Forests of England. Its magnificent stands of oak, beech and chestnut are today revered as a National Heritage.

However, this beautiful forest is more than a special gem in one of the most fascinating landscapes in Britain. It also stands as a living reminder of what can be the endpoint of centuries of exploitation, depredation and successive regenerations, and of the various complex interactions between a forest and human society.

For Dean has had an astoundingly checkered history. Even more astounding is the degree to which this history is documented. For a period extending back nearly 2000 years, records and accounts have been meticulously maintained. These can be reconstructed into a vivid story, which recreates the forest's struggle for survival in the face of all the familiar depredations which so preoccupy us to this day: mining, wide-scale clearfelling, disease, storm, overgrazing, and clearing for agriculture.

The story of the Forest of Dean has been told many times (for the best account, see "Royal Forest" A History of Dean's woods as producers of Timber by C.E. Hart, 1966. - It is the main source for this paper). But, it is worth setting down again as a perspective to the current situation in the karri forests of W.A.

The tale begins in prehistoric times when early Bronze Age tribes occupied sites in the forest and began the first clearances for tillage, browsing of flocks and charcoal burning. With the coming of the Iron Age, excavations for iron ore began. To this point, the evidence is archeological, but written records and the first map of the forest appeared after the Roman invasion in 55 B.C. Major inroads then began in earnest and over the next 200 years, the area of forest was reduced by nearly one-third. Roads were constructed (part of one of which remains and can be walked upon today), stone quarries opened up, iron mines extended and extensive fellings made for constructional timbers for the Roman forts, settlements and bridges. At this time, the first exotic tree was introduced - the sweet chestnut - which the Romans brought from Spain and planted widely in southern England (where it is today universally regarded and admired as a native species).

Through Anglo-Saxon times, forest clearances for agriculture steadily cut into the original stands, and it was not until after the Norman invasion in 1066 that the first forest laws were introduced. These were aimed at preservation of hunting reserves for the King and his Barons.

The "Woods of Dene" were carefully documented in the Doomsday Book (1086) in terms of their value for fattening swine (on acorns and beech nuts), construction timber, arrows, iron ore and charcoal. The Doomsday Book also drew attention to the deleterious effects of commoning (grazing) and deer browsing on the regeneration of seedlings and growth of coppice shoots - an early note of silvicultural concern.

The forest was formally vested in the Crown in 1155, and placed in the custody of a Sheriff appointed by the King. Over the next century, considerable "afforestation" (meaning in those times enclosures to keep out the peasantry and their stock) was carried out. This was greatly resented, and the records of the King's Courts in this period are full of harsh punishments for illegal grazing, poaching of venison and illegal cutting of timber.

But, throughout this period (the 13th century) by far the most destructive element was the production of charcoal which was used in the smelting and forging of iron. A report to the King in 1270 instanced "the great destruction of the forest" being wrought by the charcoal burners. Apparently, little could be done to stop it - or perhaps no serious

effort was made - and by the end of the 13th century, the forest area was reduced to only 45 000 acres (from over 100 000 acres in 55 B.C.). Cut-over areas were not regenerated, mainly due to an exceedingly thorough harvest of acorns and beech nuts by the peasants for swine fodder.

According to a contemporary observer, "A great despoiling" of the forest had been done.

But, worse was to follow and virtual anarchy reigned in the forest during the 14th and 15th centuries. Not until the time of Henry VIII was a policy of conservation of trees and woods proclaimed. Albeit for hunting purposes rather than forestry, the new enclosures were effectively put in and ruthlessly maintained, thus permitting a prolonged period in which natural regeneration became established in the devastated woodlands. The acorns which fell at that time (the latter part of the 16th century) were to grow the oaks which made England a mighty naval power in the centuries ahead. This was perceived by at least one foreign power, for it is recorded that the commanders of the Spanish Armada (in 1588) carried express instructions that "if when landed they should not be able to subdue the English nation, they should yet be sure not to leave a tree standing in the Forest of Dean".

By 1615, despite continuing depredation by the charcoal burners, who supplied rapidly expanding iron-works in southern England, Dean was acknowledged "a storehouse of naval timber".

In the late 17th century, amidst the turmoil of the Civil War, deliberate planned reforestation with timber trees commenced. Workmen were employed for fencing and ditching the enclosures and for the collection and sowing of acorns and beech nuts. Natural seedlings (wildlings) were transplanted to restock waste land. One contractor in 1660 was paid 9 pence a thousand for lifting and transplanting 23 400 oak and beech seedlings. No longer was natural replenishment of the forest to be left to nature.

During the time of Cromwell, some 3000 acres were replanted and programmes of thinning, pruning and cleaning introduced.

But, despite all these advances, a period of decline in the forest again set in towards the end of the 18th century. Two factors were involved: (i) the vast quantities of timber required for England's great naval and merchant fleets and (ii) the development of the coal mining industry. Rich and accessible seams of coal underlayed much of the prime woodlands of Dean. Rural populations were growing quickly and to the ever-present problem of grazing was added the depredatory effects of surface and deep coal mining and requirements for mining timbers. The authorities fought a losing battle and "trees were even stolen in the night". According to another report, "in a few years the whole forest must be destroyed". The oaks which had germinated in the time of Henry VIII were virtually clean cut for naval timber.

An alarmed Navy petitioned the Government. A Commission of Enquiry was appointed in 1798 and Nelson himself visited Dean in 1802. He reported scathingly on the deficiencies of oak for shipbuilding purposes, the "shameful wastage" of timber, the problems of mining and grazing and the need for "preserving and encouraging the growth of timber in the King's forest". All this came at the height of the Napoleonic Wars, when

England's Navy was its "wooden walls". The Dean Forest (Timber) Act of 1808 resulted. This specified, amongst many silvicultural and conservation measures, a massive replanting programme. Contracts for the regeneration of thousands of acres were let.

Between 1808 and 1818:

100 miles of new fencing were erected;

25 miles of stone walls were built;

70 miles of earthern banks and gorse hedges were thrown up; and

11 00 acres of plantations were established.

(Remember that all this was still 10 years before the Parmelia set out for the Swan River Colony and a century before the first mill was built at Pemberton).

The planting contract specified 2722 trees to the acre. Holes were dug at 4 feet spacing. Each hole was sown with an acorn, except that in every 10th hole a 5 year old oak seedling was planted and in every 100th hole a 5 year old chestnut. On soils considered unsuitable to oak, planting of ash, elm, sycamore, Norway spruce, European larch, Scots pine and even *Pinus pinaster* were made.

The acorn sowings proved disappointing and many areas were later replanted with one or two - year old oak seedlings, transplanted from nurseries.

Meanwhile, the cutting for ship building and mining timbers continued unabated through this period. By 1850, Dean was predominantly a forest of young, even-aged plantations.

But, at about this time the era of the wooden ship came to an abrupt end. The last order for Naval Timber was 550 loads in 1855. All of a sudden the forests planted in 1808-1818 had lost their major market! Although planting and tending continued into the 1870s, by now the Government was viewing Dean as something to be disposed of as quickly and cheaply as possible. Fortunately for posterity, a new class of defenders emerged: the professional forester, many of whom were now coming back to England after European training and experience in the colonial forest services in India and S.E. Asia. Amongst these was the famous Sir William Schlich, who visited Dean many times and was one of the foresters instrumental in maintaining its integrity at that time.

Into the 20th century, and the strategic value of Dean vindicated the efforts of those who had fought to save it a few decades earlier. During both World War I and World War II, when Britain was blockaded, huge quantities of sawtimber, pitwood, charcoal and pulp were produced from the Forest of Dean. Wherever possible, this timber was obtained as thinnings from the great plantations established in the time of Nelson. But, clearfellings were also necessary and in many of these areas, the old hardwoods were converted to coniferous plantations (because of concern at the slow growth rate of the native hardwoods) and these now cover about 40% of the forest.

There have been a number of policy changes in recent years. The Forestry Commission now espouses a policy of multiple-use and most of the old

hardwood stands at Dean, are set aside for amenity, recreation and "preservation of the national heritage". It is these magnificent stands of oak, beech and chestnut (most of them originally planted at 4 x 4 spacing between 1808 and 1818) which are the focus of attention for most visitors to the forest today. The future of these stands, which have suffered some severe storm, insect and squirrel damage over the years, is currently a matter of great popular debate, any proposed felling and regeneration being regarded by conservation groups with disquiet and dismay.

But, wasn't this were we came in? Indeed it was, our story has come a full circle. Who knows but that the thousands of karri trees we are planting today will become the National Heritage which must be "saved" and "defended" by the generations of the future. Or, perhaps, they will be used again, rotation following rotation, supplying forest products for the nation as the need arises.

Whatever happens, a study of the vicissitudes of the Forest of Dean over the last 2000 years is reassuring. It would be nice to think that centuries ahead a similar history of the karri forest could be written, and that our regeneration work today will be regarded by posterity as a farsighted and determined operation aimed at preserving the life-stream of a magnificent forest.

Personally, I could not think of a better ideal at which to aim.

ROYAL SHOW 1979

This year the Royal Agricultural Show was conducted for an additional week as part of the WAY '79 celebrations. The Department's exhibit was manned for the whole period of 16 days, mainly by staff from the Extension Branch.

The exhibit consisted of a display caravan with photographs of old and new activities in the forest, some maps of the progress in dedication of State forests and an audio-visual programme which briefly traced the history of the forests since 1829.

The outdoors display featured flowering native shrubs in a stream setting and a large model of the WAY '79 swan. The model was made by Frank Serafini, the carpenter at Como and was made of jarrah, sheoak and pine.

The veteran 1939 MACK fire tender was also exhibited, and on the Tuesday, Wednesday and Thursday of the first week, Tom Brittain and Bob Rado of Manjimup demonstrated some of the old skills with broad axe, wedges and adze to square some timber and to build a split rail fence from some really high quality jarrah.

A new series of six 'posters' was offered for sale, depicting the karri forest, jarrah, blackbutt, tingle, Christmas tree and a set of flowering banksias.

AERIAL SEEDING OF KARRI

by Cameron Schuster

At present there are three proven techniques for ensuring the regeneration of cut over karri forest. These include the seed tree method of natural regeneration; the hand planting of nursery raised open rooted seedlings; and the broadcast seeding of clay pelleted karri seed at an application rate of 45 000 seeds per hectare.

One technique which, before 1979, had received little attention is the application of seed from the air. However, the technique is used extensively in Victoria and Tasmania to regenerate cut over areas of mountain ash, alpine ash and other species in the montane regions of those states.

In early May 1979, the Forests Department carried out a demonstration trial of aerial seeding in Weld 4 coupe, south of the old Shannon townsite. The object of the trial was to determine the possible operational advantages, in terms of cost and time, of the technique; while at the same time examining the establishment stocking of karri regeneration on the coupe.

The coupe chosen, Weld 4, was 40 hectares in area, and rectangular in shape, which seemed ideal for laying out flight lines. As no light aeroplanes exist in W.A. specifically for forestry aviation, the plane chosen for the seeding was a Piper Pawnee agricultural aircraft, with a front mounted hopper. The aeroplane could spread to a swate width of 18 metres, from approximately 50 metres above the ground. The flight lines were 18 metres apart, and were marked on the ground by red weather balloons, floating some 20 metres above the ground.

The aircraft's spreading mechanism could only spread material accurately as low as 20kg/ha. This posed a problem as the rate of seeding we were to use (45 000 seeds per hectare as for normal broadcast seeding) only involved 0.5kg/ha of pelleted seed, which required bulking (with Potato Manure E) to 6kg/ha for hand broadcast seeding. However, as the area involved was so small (40 ha) we decided to bulk the pelleted seed to 20 kg/ha rather than spend a great deal of time altering the mechanism to suit. For larger areas it would be economic to alter the spreader mechanism to allow a lower rate of application.

The operation itself went very smoothly with an average spreading time of less than one minute per hectare, and a cost of $3 per hectare for the aeroplane. Both of these figures would be reduced considerably in a large scale operation, particularly plane costs per unit area, which could be halved.

Recently (October, 1979) a regeneration assessment was completed on the coupe, with the following results:

Stocked $4m^2$ (1 milacre) plots (30% acceptable minimum)	41%
Stocked $16m^2$ (4 milacre) plots (60% acceptable minimum)	62%
Number of seedlings per ha (1500 acceptable minimum)	2430

By all measures the stocking produced is acceptable and compares favourably with areas regenerated by hand broadcast seeding.

Aerial seeding of karri seems to be worthy of further operational size trials to perfect our techniques. The two greatest advantages of the technique obvious at present, are the low cost per unit area, and the speed with which areas can be regenerated (40 ha takes 35 minutes by aeroplane; approximately 30 man days for hand planting; and approximately 10 man days by hand broadcast seeding).

At present the major disadvantages are the seeding of roads within coupes, and landings (these can be missed with hand planting or broadcast seeding) which waste seed; and the relative shortage of karri seed. Large supplies of karri seed would be needed if this technique (or indeed hand broadcast seeding) were to be attempted on a large scale. Current initiatives, including the establishment of a karri seed orchard network, may alleviate this shortage in the future.

HEED THESE SAFETY TIPS

The probability that 2000 UK construction industry workers will be killed and about 40 000 seriously injured over the next decade has prompted our British counterpart, "MF News", to suggest the following safety precautions, which are just as relevant to the Australian scene:

- A careful operator is the best insurance against accidents.
- Check that transmission is in neutral before starting an engine.
- Never use the machine for transporting people.
- Park on level ground, apply the parking brake, place the bucket flat on the ground and lower any other hydraulic equipment to ground level.
- Never smoke whilst refuelling.
- When checking radiator coolant level, protect your hand with a thick cloth and always slacken the radiator cap gradually to release internal pressure before taking it off.
- When servicing a machine with the bucket raised, always fit a safety bar. Never clean, lubricate or repair a machine with the engine running.
- Ensure that there are no people in the working area.
- Never travel downhill with the engine in neutral.
- Ensure that ventilation is adequate when working a machine inside a building.
- Never load dumptrucks over the roof of the cab.
- At knock-off time, remove all excess dirt from buckets, tracks, grab handles and platforms. It makes for safer operation and you can see any leaks or damage.
- Whenever possible, make the machine childproof. In Britain young vandals do at least $2 million damage yearly to machines on construction sites.

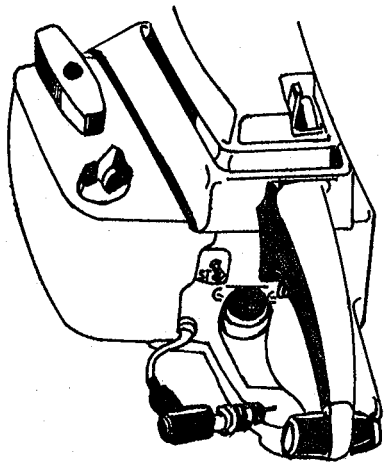
Extract from MF (Massey Ferguson) Power Profit No. 37 of December 1978.

DID YOU KNOW THAT?

The electronic (or capacitor discharge) ignition systems used on many of the latest model chain saws sold today can be ruined by cranking the saw over without having the high tension lead grounded.

Capacitor discharge systems use a generator to charge a large capacitor and then current is drawn from the capacitor for the ignition spark. However, should the saw continue to be cranked without a way for the charge to jump to ground, the capacitor can be charged to such an extent that the electronic module is ruined. This occurs whether you have the ignition switch on or off.

So, next time you take out the spark plug and crank the engine to clear a flooded cylinder, make sure you ground the lead directly on the frame or keep the lead attached to the spark plug and hold the spark plug against some metal part. Avoid an expensive replacement.



SAFETY NOTE: When cranking the engine, it is a good idea to turn the ignition off, as there is potentially a very dangerous situation caused by the open spark plus fuel being expelled from the flooded cylinder.

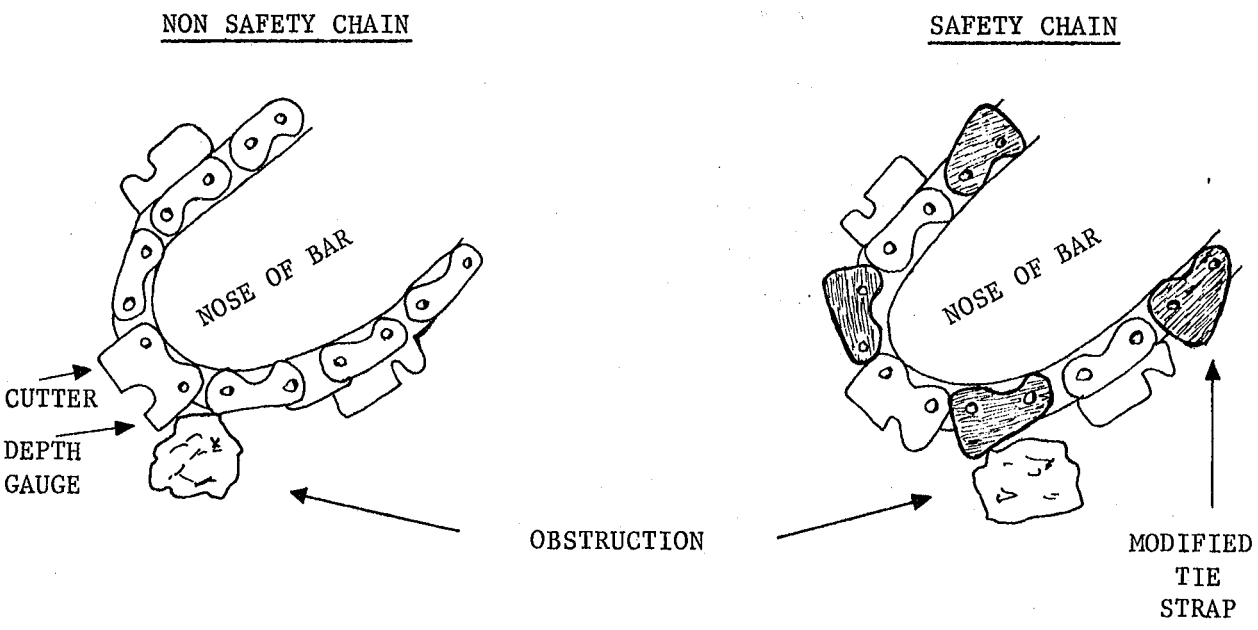
CHAINSAW KICK-BACK

Chainsaw kick-back is one of the most common causes of chainsaw accidents. It usually occurs when the tip of the cutter bar meets an obstruction which falls between the rear of one cutter and the depth gauge of the next cutting link of the chain. When the depth gauge hits the obstruction an opposing force is delivered to the cutter bar because the depth gauge will not cut through the obstruction. The cutter bar is thrown out of the cut and can hit the operator if he is in line with the cutter bar when this occurs.

Safety Chain

Safety chain has a modified tie strap which is shaped to deflect objects up to the level of the top of the depth gauge. This reduces the incidence and severity of hick-back.

Some safety chains have modified drive links instead of modified tie straps. The same purpose is served by both types of links.



When safety chain is used the modified tie strap by a cam like action feeds the depth gauge past the obstruction reducing the risk of kick-back and the severity of kick-back should one occur.

Remember no matter what precautions are taken there is always the possibility of a kick-back.

You should always be prepared for a kick-back and use a saw equipped with features designed to minimise the effects of kick-back, e.g. chain brake.