2(1)

FOREST NOTES

FORESTS DEPARTMENT
PERTH
WESTERN AUSTRALIA

VOLUME 2 NUMBER 1

CONTENTS

- EDITORS' NOTE -

With this issue of 'Forest Notes' we offer you a change of format and a more sophisticated cover - which the more observant readers will notice immediately.

We consider this change to quarto size an improvement offering it without apologies and also with the thought that it brings us in line (at least in terms of page size) with such eminent publications as Time, I.F.A.Newsletter and Scrooge McDuck comics.

In this change-over we have been assisted to a large extent by various people in Head Office. To them all, our thanks.

Articles are now rolling at a splendid rate, but don't become complacent because we can still use more.

If your article is not included in this issue, don't worry. It may have been received a little late, or we may - struck by its excellent presentation and originality of thought - have reserved it to headline the June issue. We like to have a small carry over, since an early start can then be made on editing and Roneo preparation.

Remember: the closing date for the next issue is June 1st, 1964.

P.N.Hewett C.J.Edwards

JOINT EDITORS

ROTATION BURNING IN THE KARRI - WHY NOT?

by George Peet

After discussion with Southern officers, and seeing the fantastic concentration of fuel in much of the karri forest, one cannot but be highly impressed by the problems facing these officers in establishing intensive fire protection in the karri.

The main problem will be to get the initial burn over the area, so why not a major effort to surmount this first hurdle in the near future?

I fail to see any question as to whether or not it can be done, as there is ample evidence to suggest that it can. Excellent burns have been carried out in the karri, of equal quality to the best burns achieved in the jarrah. These burns have been done; therefore the same quality burn can be done again, and on a much larger scale, if the men and equipment are available to carry them out. I suggest that it would be possible to make the men and equipment available from the northern divisions.

The Spring burning season is generally earlier in the Jarrah Zone than the Karri. When conditions are suitable in the Karri, many of the Jarrah divisions will be tailing off their burning programme. It should be possible for each of these northern divisions to make a gang available to go south and assist with the karri programme. This would mean a big increase in the karri work force for a period, and to utilize it fully the areas would require advance preparation, i.e. cutting of working lanes, tracks cleaned up etc. As well as having men, the northern divisions also have tractors, and surely a number of these could be spared for a couple of months during the summer to complete this preparation.

Conceding that this programme would curtail projects in the north, the proportions of the protection problem in the karri surely warrant this effort. After all, one must consider the possibility of a fire starting in 20 ton to the acre fuel, covered by highly inflammable scrub, on a dangerous day and driven by a 30 mph wind. What's to stop it?--------The SEA would be my bet.

Once the initial burn is completed over the whole area, the problem must surely be considerably lessened. The walking lanes will have been established and should be capable of re-location for the next burn by the different levels of scrub. The fuel quantity will be much less, hence amenable to a wider range of burning conditions. If these points are conceded, then why not a concerted effort by all divisions, to get this problem broken in the next few years.

++++ ---------- ++++

PLANTATION SUBDIVISION

by A.A. Macdonald

What is the purpose of dividing a plantation, or any other forest into compartments? For ease of management and proper recording. A compartment is defined as the smallest unit of forest management, permanently described and within which the same treatment is applied.

A degree of homogeneity is implied if the crop is to receive the same treatment at the same time, but plantations usually comprise large areas of uniform forest, which might indicate that compartments can be very large. Therefore administrative convenience must be considered along with silvicultural treatment in forming compartments.

A compartment should have these attributes: contain one species or forest type; in uniform forest, be of one age class; be under the same regime of silvicultural treatment; be restricted to one geographical area; be sufficiently precise that it is not confused with its neighbour; be sufficiently limited in area that there is no need to describe parts separately for records or prescribing operations; be clearly and permanently defined. It should be of practical application, and this should be the first consideration when a plantation is to be divided into compartments. It is not sufficient to divide an area into convenient looking sections on a map according to preconceived ideas of shape or size.

Starting from scratch, given a proposed or newly established plantation block, subdivision might be considered along these lines:

1. Age, separate areas by ages; i.e. the first subdivision would be by years of planting.

2. Species, where there is more than one species, unless there is no essential difference in growth rates or proposed silvicultural treatment, each species should be accorded different compartments.

3. Location, areas of the same age and species which are in separate localities should be placed in separate compartments.

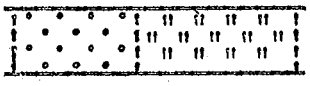
4. Site quality, (if known from soil types and growth rates of the species on comparable sites) provides the basis of further subdivision. If site quality can be worked into subdivision at an early stage it may avoid redrawing compartment boundaries later.

5. Administrative convenience. Subdivision at this stage may not have created compartments which are easy to manage. If they are very large it will lead to confusion, for example in pinpointing an area to which to direct a fire fighting gang. If they are very small, there will be very high compartment numbers, difficult to memorise, locate and map. Large areas can be divided into compartments on the basis of the extraction road

pattern; I would suggest no fixed maximum size, but feel that it should be about 100 acres. Small areas at first separated on age or site may often be grouped with near similar neighbours, to make a compartment to be treated as a stand of the average age or site class; if there is a very wide difference it may be necessary to retain the small compartments. Again I would not suggest and fixed minimum size, but feel that it should be about 25 acres in plantations of any scale.

Finally a system of compartments should be flexible in the early stages. Thus if site quality is not known, I suggest compartments should be large but capable of being split when site quality becomes apparent. Similarly it should be possible to merge smaller compartments made on expected site differences, if it transpires that the differences are not reflected in the crop.

A lot of hot air is written and talked about compartments and subdivision, probably this note included. But I feel that there should be no magic formula, what is required is a unit upon which to base day to day working in the same way as the farmer divides his property into paddocks.



CONSTRUCTING AN ENTOMOLOGICAL KILLING BOTTLE

by A.J. Hart

A simple entomological killing bottle can be constructed in the following way: -

Materials: One 4 oz. Nestle's instant coffee jar with screw -top lid
quantity of cotton wool
a small piece of stout paper
D.D.T. 20% water soluble para para isomer

Method:

Place the cottonwool in the bottom of the jar and pour about one tablespoonful of D.D.T. 20% over same with roughly equal parts of water, and place the paper over the cottonwool. The paper prevents tarsi and other appendages catching in the cottonwool. This killing bottle has proved very effective and is a much sweeter smelling piece of apparatus than the usual arsenical based killing bottle.

Tests made using both types of jar indicate that time taken to achieve a kill is about the same.

PUNCTUATION

Punctuation is not solely a matter of rules; it is also partly a matter of taste. It is based on two main principles:

1. It should serve the eye before the tongue and ear.

2. Subject to the demands of lucidity, the fewer stops the better.

Therefore the best punctuation is based on the structure, or syntax, of the sentence, not on the need to pause for breath; the pause for effect is a different matter, of which punctuation must of course take account.

SEMI-COLONS are not interchangeable with colons as many think. The semi-colon's function is simpler. When two parallel clauses are not linked by a conjunction, a stop heavier than a comma is usually needed between them; but a full stop may seem too heavy if they are closely associated in sense. A semi-colon is just the thing.

e.g. His first Note showed promise; his fifth showed attainment.

When there is a series of parallel clauses some of which themselves contain commas, semi-colons will avoid a glut of commas and leave the sentence with structure clear to the eye.

COLONS are most commonly used to introduce a quotation or direct speech and as a substitute for such words as viz, scil, that is to say, etc. This gives the colon quite enough to do without being summoned to the aid of the semi-colon. It should be noted that the colon and dash [:-] is no longer in favour.

THE DASH has a somewhat doubtful reputation, being often misused by the lazy as a handy all-purpose stop. Yet there are certain limited functions that it can perform better than any other stop:

1. The breaking off of a sentence.
2. Sometimes to deputise for the colon.
3. To introduce an afterthought, or to pull the reader up with a jerk.

THE HYPHEN is largely a matter of taste. Compounds graduate from separation through hyphenation into integration.

e.g. post office post-office postoffice

THE COMMA, the most ubiquitous and flexible, not to say slippery, of all stops, is the least susceptible to hard-and fast rules. The more questionable of its present uses are tabulated below:

1. Between phrases, clauses or short sentences joined by "and", a comma is usually superfluous.

e.g. The summer temperatures were severe, and the fire menace loomed.

2. The tendency to hedge adverbs and adverbial phrases about with commas is increasing.

e.g. Orders were given, though not, unfortunately, until the last minute, for the despatch of the bush fire brigade.

He was not run over, mercifully.

3. Participial clauses are very often the occasion of misplaced commas.

e.g. He found a match, and bending over, he struck it on the floor.

In this case the commas should follow "and" instead of preceding it, thus enclosing the participial clause within commas.

4. "Inversion" is also apt to attract the comma and is usually superfluous.

e.g. With this group, the DFO is out of sympathy.

If the sentence had read "The DFO is out of sympathy with this group" there would have been no thought of a comma, so why introduce one?

5. The problem of whether or not to introduce a comma between the last of a string of words, items, or short clauses is argumentative. It is suggested that having once declared your preference, you should follow it consistently.

6. The use and misuse of commas with relative clauses (including when, where, who, which, etc.) causes confusion or misinterpretation unless care is exercised.

e.g. He pulled over a chair and it caught on the edge of a rug which did not improve his frame of mind.

The object of his affections was Mary Smith, wife of the local butcher, who was dying of drink and consumption.

In the last example, the use or not of the last comma makes all the difference.

NOTE: These comments were extracted from C.V.Carey's booklet on "Punctuation" which is available in the library if you care to delve deeper into the subject.

!!!!!!!!!!!!

FIRE FIGHTING AND THE NUCLEAR THREAT

by P.N. Hewett

The fourth arm of National Defence is Civil Defence, and its role in the nuclear age is more important than ever before. It is of interest to consider the part likely to be played by the Forests Department following a nuclear attack on Perth.

A rational approach to nuclear warfare has been used by the Civil Defence experts, who have made the following observations.

1. The nuclear weapon will be carried by a Polaris type missile from a submarine.
2. When World War III commences, Australia can expect "strategic warning", by virtue of the likelihood that the U.S.A. and U.S.S.R. will hurl these things at each other first.
3. The missile warhead will probably be in the 10 megaton range and may be a "clean" weapon. i.e. a near-ground burst with limited fall-out.
4. Perth is an unlikely target at its present stage of development, but it is as well to be prepared if we can.

The Blast Pattern: Assuming that the weapon explodes at the Narrows Bridge, then the following zones of damage would follow a 10 megaton blast.

radius from blast	zone of damage	areas affected
0 - 4 miles	Ground Zero - total destruction	Victoria Park, Maylands, Claremont, Mt.Pleasant
4 - 7 miles	Zone 'B' - irreparable damage	Maida Vale, Guildford, Scarborough, East Fremantle
7 - 13 miles	Zone 'C' - moderate to severe damage	Jandakot, Swan View, Gosnells, Kalamunda, Gnangara

In Zone 'C', the Civil Defence forces will be able to do some effective work if they are organized and prepared. Serious fires will occur throughout 'C' Zone in a "fire belt" extending 13 miles from Ground Zero for a ground burst 10 megaton weapon. Secondary fires caused by electrical faults, domestic cooking fires etc., will occur further away again, but the residents will probably have to handle these fires themselves.

An attack on the 'C' Zone firebelt may well be the first task for existing fire fighting forces - the Metropolitan Fire Brigade, bush fire brigades, volunteer town brigades and the Forests Department.

It has been decreed that all fire fighting personnel will be under the command of the Fire Brigades Board but one wonders at the wisdom of this.

1. If Ground Zero is at the Narrows Bridge, then the belts of complete destruction and irreparable damage must account for 70 to 80% of the Fire Frigade Board stations, men and equipment.
2. The fire belt passes through Kalamunda, Swan View, Gnangara, Jandakot and Gosnells. Surely this will be a BUSH FIRE.
3. The Fire Stations are equipped and trained to fight house and building fires with reticulated water from hydrants. Any forester who has witnessed uniformed firemen at a fire with no hydrants or poor mains pressure, will recall that they pack up and go home. There will be no reticulated water within 25 miles or more of Perth, because of the shattering which will occur throughout the metropolitan system. The only supplies for fire fighting will be low level static water. The rural and F.D. forces are surely better equipped and trained to use these sources of supply.
4. On many sectors of the fire belt, there will be no water - static, mobile or any other kind! At a Mount Macedon Civil Defence School this possibility was suggested to a number of uniformed firemen and their invariable reply was "No water, no firefighting". The rural and Forests Department firefighters have met this problem repeatedly and must therefore be better prepared to take command of "dry" fire fighting attack.
5. Communications will be vital for all phases of Civil Defence, but in the firefighting business, the rural and Forests Department forces have existing, proven, radio communications. These groups must surely control the system with which they are familiar.

Subversive though these comments may seem, the writer believes that rural fire fightinh executives should assume command of the Fire Function after a nuclear attack.

-ooOOoo-

HELP!

The "New York State Conservationist" has published a list of pointers on what to do if you should become lost in the woods. The fifth and last recommendation is;

"Don't yell, don't run, don't worry and, above all, don't quit. Better yet - write to the Forest Service, USDA, Washington, D.C. and ask for their pamphlet No.0-23 'What to do when lost in the woods' ".

(Readers' Digest - Feb.1964)

EPICORMIC SHOOTS ON GREEN-PRUNED P.RADIATA

by F.H. McKinnell

The pruning regime introduced in 1960 was not without its ill-effects. It was found during 1961 that there was an abnormal number of epicormic shoots showing up on the newly pruned pines at Grimwade. It became apparent that if these shoots persisted, the pruning operation had been entirely wasted on up to 30% of the stems in some areas. Eventually it was found that the situation was not as serious as it had first appeared, and the following conclusions emerged from observations over the first two years following pruning:

1. The epicormic shoots are generally concentrated on the northern side of the stem, indicating that their production is stimulated by exposure to the heat and/or the light of the sun.

2. Shoots are found only on young trees and when the bark has thickened to the stage of being fissured, the exposure has no effect.

3. The shoots are more dense on trees with long internodes - such trees have a tendency to develop epicormics even when they are not pruned.

4. Most epicormics die off in the next twelve to eighteen months after pruning if they become shaded on the side toward the sun by growth of either upper branches or adjacent stems.

5. Where the shoots do not die off quickly, they produce a multidude of small knots which nullify the aim of early pruning to obtain clear wood.

6. In poorly stocked areas where the shoots do not soon become shaded over, they persist indefinitely. There is the case of an avenue of P.radiata on a farm near Newlands, where the epicormics resulting from the initial early pruning reached a length of 2'6" in 18 months and necessitated a second pruning operation. After the second pruning the bark was thick enough to be unaffected by exposure and no more epicormics were formed.

Where the shoots have the opportunity to develop to the extreme noted above, it is obviously futile to green prune with the object of producing 3" knotty core. It is essential therefore that early pruning of open, poorly stocked areas should be undertaken with caution.

LAND USE IN THE FOREST ZONE

by A.E. Rice

There seems to be a long-standing grievance against the Forests Department, on the part of some country Shire Councils and other rural organisations. They claim that we are selfishly withholding from selection, land which would otherwise be made fully productive in the hands of local farmers. In this regard, it is illuminating to examine the extent of utilisation on land already alienated for farming.

With the increasing coverage of our A P I plans, certain areas have been selected over the past 5 years for a study of the relationship between developed and un- (or under-) developed private property. First, all alienated land is picked out on the plans, then all A P I types indicating development such as cleared pasture, crops, ringbarking etc., are extracted, and the remaining undeveloped country can be expressed as a percentage of the total of alienated land.

So far the following Projects have been examined:

Locality	Date of photos.	Alienated land			Percent Un-developed
		Devel.	Undevel.	Total	
30 mile radius from Bunbury	1951-8	454000	173000	627000	28%
Denmark District	1957	13000	50000	63000	79%
Upper Blackwood Electorate	1951-9	377000	406000	783000	52%
Busselton-Augusta District	1955	82000	200000	282000	71%
Preston Valley District	1959	37000	52000	89000	58%

The Bunbury Project would not be representative of the agricultural areas as a whole, being located in the area of intensive development surrounding a regional capital; nor would it be fair to include the Denmark District due to its relative isolation from large distributing centres. Omitting these two Projects, the remaining three could be taken as a fairly representative sample of rural development, at least in the lower Southwest.

The period of time that has elapsed since the aerial photographs were taken must be considered, and the figures quoted refer back in some cases, to a state of development existing up to 13 years ago. Local officers will be in the best position to know if these figures still reflect a true state of affairs, or whether a boom in agricultural development has made them out-of-date.

From the above figures, it does not seem unreasonable to assume that approximately 50% of all alienated land in the Forest Zone is lacking

in development. This figure leaves a margin to account for further clearing since the photos were taken, and also the higher rate of development in the vicinity of the metropolitan area. Independent confirmation of this figure was given by the Commonwealth Bureau of Statistics in some 1961/62 figures supplied for the Shire of Manjimup. According to these, the total area of alienated land in the Shire is 249,000 acres, and the undeveloped area is 125,000 acres, i.e. approx. 51% of the total.

The preliminary Forest Inventory quotes the total area of alienated land in the Forest Zone as being over 9 million acres in 1960. 50% of this total represents 4.5 million acres of private property which is lacking in in development, or an area roughly equivalent to the present area of dedicated State Forest. This is a terrific slice of country that is neither being used for agricultural purposes nor for regulated timber production, with the exception of a tenth part of the area on which timber is reserved to the Crown.

Before embarking on costly development projects in the Kimberleys and far North, it might be worth our while to first consider this great area of unproven potential lying right in our own backyards.

QUOTES FROM THE ANNUAL REPORTS:

14 years ago ..... "The most serious problem was the private property fire which threatened or entered the protected forests. Compared with 99 in the previous year, the number rose this season to the record of 242."

58 years ago ..... "Serious fires occurred in many forests during the year, and much valuable timber was sacrificed. In a leading article in a morning paper it was contended that the eucalypt has the power of recovering from fire, and consequently suffers no harm. In the notes from a country correspondent of the same paper it was stated that 'the fire was confined to the State Forest, and consequently no harm was done'...Most forest fires are the result of direct incendiarism or criminal negligence."

SOME ASPECTS OF CONTROLLED BURNING IN THE JARRAH FOREST

by G.B. Peet

It is reasonable to claim that over the past three years, considerable progress has been achieved in improving the fire protection system in the Jarrah forest. This increased protection is due largely to greater annual coverage in controlled burning and sound planning in the allocation of this burning. Increased area production in controlled burning is due to many factors, e.g. closer officer supervision, better weather information, improved burning techniques, and one of the most important contributions, the installation of V.H.F.radio.

While conceding that this progress has been made, I feel there are certain aspects of the burning practice which require comment, and I hope these remarks will draw discussion from others faced with similar problems.

The two aspects on which I would like to comment are:

1. Preliminary planning, i.e. allocation of areas for burning, field inspection and prescribing of weather conditions for the actual burn.
2. The actual burning in spring and autumn.

Preliminary planning

My comment on the preliminary planning of controlled burning is that it is still far too rudimentary for the ambitious burning programmes which face most divisions. Obviously the prior inspection of the areas is extremely sound practice; the fuel quantity and type are defined as well as the topography and scrub type. Of course this information is vital if the burn is to be conducted on a calculated assessment of fire behaviour rather than a pure jag, into which the calculation degenerates if the areas are not inspected. One aspect of drawing up these prescriptions warrants further discussion.

There is little point in stating a method of burning which will have to be applied perhaps three or four months later than the inspection. This should exclude areas with special scrub or topographical problems which require a certain burning method to prevent risk to personal safety or to reduce forest damage. The actual weather conditions for the burn should be given in terms of fuel inflammability, of which a good measure can be obtained from the fire hazard rating. The fire hazard rating has the the advantage of allowing flexibility in weather conditions, while still reflecting degree of fuel inflammability.

For example, on non-rain affected fuel, after a dry night, a fire hazard of average summer may be obtained on a day with a maximum temperature of 80°F and a minimum RH of 30%. The same rating may be

obtained also on rain affected fuel, or after a moist overnight condition on a day of maximum temperature of 85°F and minimum RH of 25%. In fact there are a considerable number of weather conditions which give the same fire hazard rating and hence much the same degree of fuel inflammability. Thus, prescribing the weather conditions from fire hazard will allow sufficient flexibility in the definition to prevent wastage of burning days.

It is suggested that the proposed burning be broken into daily burn areas for one gang, say 1,000 to 1,500 acres, depending on the position of roads. To each area is assigned a hazard rating under which the area is to be burnt, e.g. an area of 4-year old fuel low scrub has assigned to it a rating of Average S 6.3 to 6.5. The actual numerical rating within the hazard term must be given, as there is a range of both weather conditions and the state of fuel inflammability within a hazard class e.g. moderate average S etc.

The individual areas can then be grouped into hazard rating classes for quick sorting on each burning day. For example, if there are 100,000 acres to burn, the area has been sorted into Spring and Autumn burning in areas of 1,000 acres. This results in 100 individual areas for which a hazard rating for burning has been described. Assign a job number to each burn e.g. 1 to 100, and sort into groups based on the prescribed hazard for burning. For example:

Spring burning.

Moderate	4.5 to 5.0	Jobs 1, 15, 20, 35, 40 etc.
Moderate	5.0 to 5.5	Jobs 2, 10, 21 etc.
Moderate	5.5 to 6.0	Jobs 16, 18, 25 etc.
Av. S.	6.0 to 6.3	Jobs 48, 53, 94 etc.

The same procedure will be required for Autumn. If there is sufficient variability in fuel types, it may be advisable to sort Spring burning into early and late. Tables have been prepared to assist in determining the fire hazard on any day; hence the organizing officer can work out the hazard for the division or areas within the division, and go straight to the table and obtain the burns for the day.

The next point is the edging of late Spring and Autumn burning in early Spring. More attention can be given to this operation as a considerable volume of work is still involved in mop up and patrol, and in suppressing escapes from controlled burns. In terms of obtaining area production of well burnt acres these operations are a pure waste of time, if they can be overcome by prior planting which gives proper preparation to the area.

In early Spring the ground wood is moist. Hence it is a reasonable risk to expect the edge to be dead by summer if the area is proposed for Autumn burning. Edging can be done at a rate of 5-10 miles per hour on reasonable tracks with a flame thrower and utility truck. If the strips are progressing in yearly sequence, i.e. this year's strip backing on to last year's burn, the amount of edging required will be finished in 1 to

2 weeks with two of the above units. The edge need not be deep - 2 chains is sufficient - just enough to prevent the edge trees from catching alight. If edging was planned properly, there would be considerably less effort spent in containing late Spring and Autumn burning.

The Actual Burning.

It is thought that having up to the minute weather information at the scene of the burn has amply demonstrated its value. This information has given the following advantages:

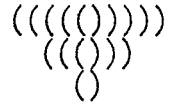
1. Fire behaviour, i.e. the rate of spread and flame height, is directly related to weather, particularly wind speed, temperature and relative humidity. If the actual weather readings are known, there is a reasonable chance of estimating probable fire behaviour. If not known, it becomes a personal estimate based on the feel of the air, degree of rustle in the leaves and other signs which range from reasonable to useless.

2. Experience in gauging fire behaviour will be gained more quickly and be of greater value is fire behaviour characteristics can be assessed against definite measures of weather, e.g. wind speed in miles per hour. A wind speed of 10 mph is much easier to remember than how the leaves rustled on that day.

Therefore it is considered that each division should have at least two towers equipped with wind speed meters and direction indicators. Most divisional headquarters have Stevenson screens with wet and dry bulb thermometers. On a burning day, readings of temperature and humidity should be taken every two hours and this information transmitted to the field crews carrying out the burning. Wind readings are most important and should be checked with the nearest tower as often as possible. The cost of equipping each division with robust wind meters and vanes will approximate £100. If a quarter increase in area production is experienced, with three gangs this equipment will be paid for in a week of burning. It is hard to assess how much increased area production will be achieved by providing weather information, but 100% increase in the burnt area has been obtained at Dwellingup, of which it is felt that at least $\frac{1}{4}$ can be allocated to having reliable up to the minute weather information at the scene of the burn. The installation of V.H.F. radio, strict officer supervision, and the alteration of techniques would account for the remaining 75%.

The use of wind speed and direction warrants further comment. Local wind direction in the forest is not an important factor except on steep slopes. The local wind direction will affect the direction of the spot fires in their initial development stage, but once the convection column gets into the upper wind stream, it is that win which controls the direction of movement of the fires. The towers are usually well placed to measure this wind stream and the burn plan should be based on the nearest tower wind readings, and not on local wind except on the steep slopes.

The method of lighting is all important and requires greater precision. Many hot burns under mild burning conditions are due simply to the method which was used for lighting. Too much fire is one of the greatest faults in controlled burning today. When fires join they flare at the junction zone, and this causes scorch. The amount of fire placed in any area is in direct proportion to the amount of junction zone. When lighting a burn I feel each single fire should be treated as a unit, and given sufficient room to burn so that it joins with the next fire at the end of the day when conditions are mild. It is common to see areas lit by 2 to 3 chain strips and lines of fire burning through the area quickly in one or two hours joining in the heat of the day. This causes unnecessary scorch because instead of minimising the junction zone, the opposite has occurred. Naturally there is a limit to how far a fire will run while burning at the the intensity required for controlled burning. On the average it appears that good controlled burning is experienced with fires of an average forward progress of from 1 chain per hour to 3 chains per hour. Therefore in a five hour burning period the strips will range from 5 chains to 15 chains apart with spots from $2\frac{1}{2}$ to $7\frac{1}{2}$ chains apart. The point I wish to make is: if the fire will run 15 chains, it should be allowed to do so and not given only 5 chains so that it joins with the next fire in the heat of the day. Bad lighting is largely due to the lighting tool which has been used. The pipe drip torch is a valuable lighting tool in early Spring when a lot of fire is required on damp fuel beds to get a burn. However I contend that they are a dangerous instrument in late Spring and Autumn when trying to keep correct spot distances. The fusee match is the answer to this problem and the torches should be stored as soon as the fuel beds dry sufficiently for spot fire burning.



The first attempt to restrict indiscriminate cutting of timber in the Swan River colony was made in 1840 when local governing bodies known as Town Trustees were to protect the forest resources of their neighbourhood as part of their duties. Two years later Governor Hutt made another attempt by declaring that no colonist was to be permitted to fall trees without a licence from the nearest Collector of Revenue, and the licensee could have no more than three fallen trees on the ground at one time. Following the first attempt to reduce waste, the colonial authorities' treatment of the problem scarcely contemplated anything beyond the mere registration of those engaged in the timber falling industry. Registration fees provided a useful addition to the colonial treasury.

EFFECTIVE WRITING

Many will remember an early issue of Forest Notes in which Mr.Wallace urged contributors to "Boil it Down". There is a wealth of literature on the subject of effective, concise writing and we are reprinting for your information the following extract from "Effective Business Report Writing". Try it out on your own efforts, or on the contents of Forest Notes.

GUNNING'S FOG INDEX:

"Gunning uses two elements in measuring readability: the number of words of three or more syllables in 100 words and the average sentence length in words. His method, though related to Flesch's reading ease formula, is much easier to apply and gives very much the same result. One can count the hard-word factor about as fast as he can skim the material, since few familiar words are of more than three syllables.

The following instructions are for applying Gunning's method of measuring readability:

1. Determine average sentence length. Jot down the number of words in successive sentences. For long pieces of writing take samples of 100 words. Divide total number of words by the number of sentences.

2. Find the percentage of hard words. Count the number of words of three syllables or more per 100 words. Don't count capitalized words, words that are combinations of short easy words (like bookkeeper or butterfly) or words that are verb forms made into three syllables by adding ed or es (like created or trespasses).

3. Figure Fog Index Add the two factors (Steps 1 and 2) and multiply by 0.4.

The Fog Index is thus determined in such a simple, easy way that no formula or device for computation is necessary. The following table is for interpreting the Fog Index :

INDEX	READING LEVEL - GRADE	READING LEVEL - BY MAGAZINE
17	University graduate	(No popular magazine is this difficult)
13	Matriculation	
12	Leaving	Atlantic Monthly
11	Sub-Leaving	Harpers
10	Junior	Time
9	Sub-Junior	Reader's Digest
8	1st Year High School	Ladies' Home Journal
7	Seventh Grade	True Confessions
6	Sixth Grade	comics (including Scrooge McDuck)

EASY-READING RANGE

TRACK SELECTION METHODS THROUGH KARRI SCRUB

by R.J.Underwood

A current method frequently used in the marking out of tracks through dense Karri scrub is for an officer with a compass to walk behind a D4 bulldozer directing the driver along a pre-determined bearing. This method has many advantages over previous techniques, but has one serious drawback: the inability of the compass man, two or three chains behind the machine, to maintain the necessary liaison with the 'dozer driver to ensure that the machine is kept on the correct course.

In the past this problem has been tackled in several ways. Some of these are:

(a) the officer carries a capacious bag, filled with rocks, over one shoulder. One or two of these missiles, hurled accurately, never fail to attract the attention of a wayward driver.

(b) a long rope with a noose at one end (this fits over the driver's head) trails behind the machine. A powerful jerk at the trailing end is often sufficient to indicate to the driver that he has strayed.

None of these methods has met with unqualified success, the cost of driver replacement and compensation payment in many cases becoming prohibitive.

A new method developed recently at Pemberton, however, is proving to be satisfactory.

The machine operator wears a modified horse's bridle and carries a thick metal bit between his teeth. To this bit a long pair of leather reins are firmly attached. The compass man, who holds the other end of the reins may thus quickly indicate to the driver which alignment is the correct one. The original cost of the equipment is low and the amount of time and frayed nerved saved is gratifyingly high.

••••••• •••••••

•••••••

With the fire season half over for most of us the quotation below may be of interest. It is from "A Discussion of Australian Forestry, with a special reference to forests in Western Australia", by D.E.Hutchins, 1916.

"Fire-protection must be part of a general scheme for dealing with virgin forests or burnt out areas".

The fire-protection of the forests is a matter, not so much of cost, as of organization and practical knowledge of the subject. It is essential that the Forests Department in each State be properly organized; and with a Chief Forest Officer who has a practical acquaintance with fire-work, either from training or travel. As regards the cost of forests completely organized against fire, it must be remembered that often the complete fire-protection of the outer forest most exposed to fires will ensure a sufficient measure of protection to the inner, less accessible and less frequented forest where no irresponsible persons should be allowed during the fire season."

NOTES ON DYELINE PLAN PRINTING

by G.Wheeler and A.Rice

Printing materials.

Anyone who has not visited the Head Office Drafting Branch may not be aware of the new materials which have become available for the plan printing machines, nor of the improved processes and techniques they have made possible. The following is a list of the materials used by the Drafting Branch, together with brief notes on their characteristics and main uses.

(1) 81A Special. This is the medium-weight printing paper familiar to everyone. The cost per print is the lowest of all printing media and it is consequently used for the bulk of printing work, including maps and plans which are not expected to receive a lot of handling or field use, or are only of a temporary nature.

(2) Aquarel. This is a special heavy-weight paper particularly resistant to fading and used mainly for wall plans etc. on permanent display. It is not suitable for field plans, being stiff and unwieldy to handle.

(3) Linen 40A. This is the medium-weight opaque printing linen in general use for field plans, or maps and records which receive much handling or are of a permanent nature.

Much use has been made recently of printing materials having a transparent base. Using such material, any number of additional transparencies can be printed from an original; and in turn, any of these secondary transparencies can produce paper prints in the normal way. Consider the use of this process in, say, the field of plantation establishment. From an original topo base plan, three or four additional transparencies can be printed. One can then be used for a soil survey base plan, one for subdivision proposals, another for planning access roads and firebreaks, burning proposals, etc., and from each as many prints as required can be taken.

The transparent printing materials held by Drafting include:

(1) Ammopermatrace. This was the first of these media to be used, and consists of a "Permatrace" base plan developed with the aid of ammonia gas. It is available in both a single and double-sided matt finish; using the latter, additions or corrections can be made upon either side with pen and ink. The material is thin and relatively fragile and is very little used at present.

(2) Acute. This is a plastic-coated transparent paper, cheaper than 35M film and so used for temporary transparencies or those for sale to the public. To cut material costs, Acute is also used for intermediate transparencies. For example, when the tracings of two adjoining mapsheets have to be joined to produce a composite plan, what is done about the printed matter appearing on the overlapping margins? The original cannot of course be mutilated, and so Acute transparencies are made of the portions to be printed and then trimmed and joined with transparent tape.

(3) 35M film. This polyester-based film is .002-3" thicker than Permatrace, and is much more durable. It will neither shrink nor stretch and therefore is used for all permanent records and special plans needed for accurate plotting. However, the sensitized chemical surface has a tendency to "creep" in wave-like patterns and, for this reason it can only be used by experienced Drafting Branch staff on suitable machines.

(4) Stripfilm. This material is fairly unstable, having a tendency to shrink, but it is invaluable for making a transparency from an ordinary paper plan when the original tracing is unavailable. For example, we may wish to reproduce a plan received from sources outside the Department. It can be printed onto Stripfilm as an intermediate transparency and then transferred to 35M film or Acute.

(5) Durafilm. This is a plastic-based material, matt finished on both sides. There is one insuperable obstacle to its general use however; any contact with moisture (water, perspiration etc.) will immediately and completely remove the plan detail. It is no longer used in the Drafting Branch.

Preparation of transparencies for dyeline printing.

With so many specialized materials available, it might be thought that the production of high grade prints is automatic. This is not so. The dyeline print operator can only produce as good a print as the quality of the original transparency allows. The points he looks for in the original is a uniformly transparent base material, clean, flat, and with a dense sharply-defined line.

When preparing a tracing for printing, a first-rate result will be ensured if it is remembered to:

(1) Keep the material free of grease, wax, water, etc. Tracing linen in particular is rendered opaque by contact with moisture.

(2) Use a dense black ink, or pencil if soft enough to give a dense line and hard enough not to smudge e.g. 2B.

(3) Avoid erasures, as they lead to smudged and discoloured prints.

(4) If using tracing linen, it will be found easier to work on the dull side, first rubbing it thoroughly with pounce to size the surface.

(5) The use of coloured inks and pencils for line-work makes the transparency itself clearer to read, but unless they are quite dense the print will be poor. The printer must underexpose in order to bring out the lightest colour, and this results in a dark-toned "background" with a very poor contrast. It must be emphasised that solid "blocks" of colour (washes or pencil shading) should on no account be used for transparencies as a legible print cannot be obtained from them.

(6) Finally, refrain from folding or creasing a tracing. It causes permanent marks that transfer to the print; and more important, because the transparency will not be completely flat in the machine, there will be a more or less serious distortion in the scale of the print. Tracings should be stored flat and transported rolled around a cardboard cylinder.