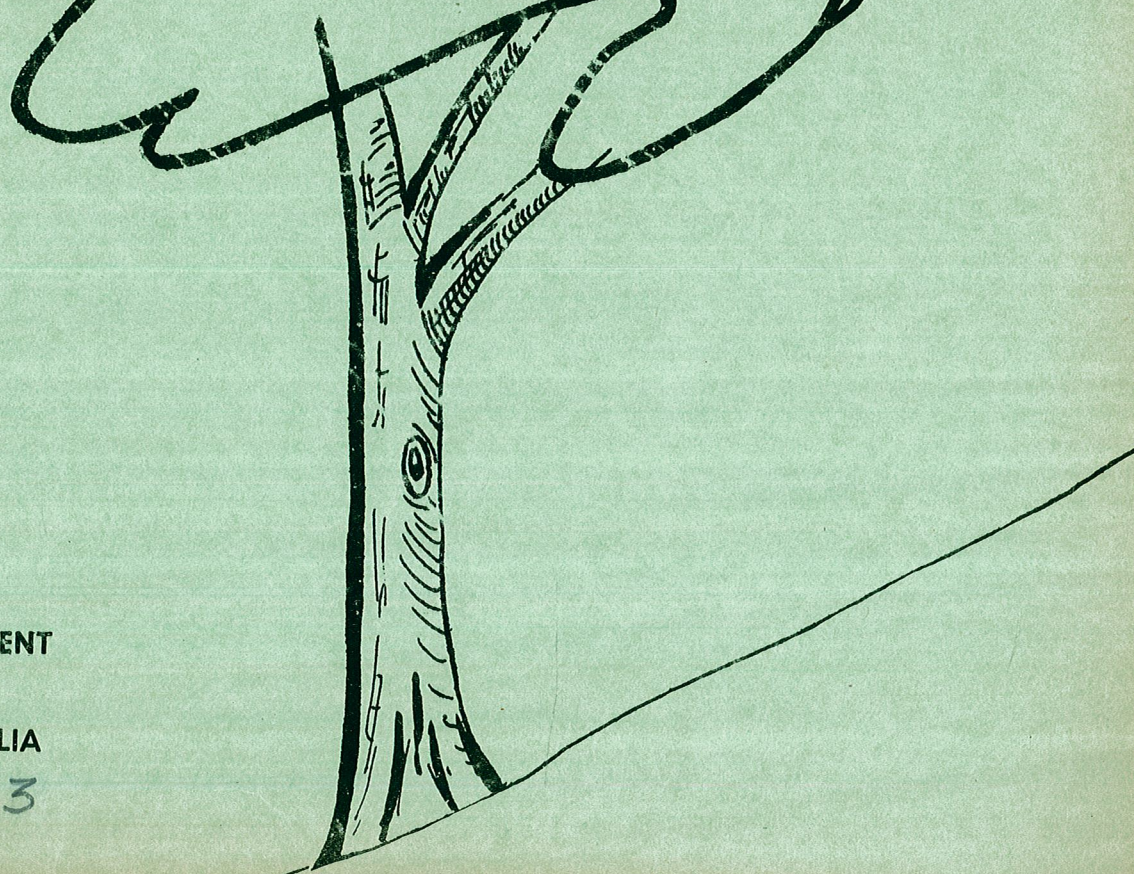
FOREST NOTES



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FOREST NOTES

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ASSOCIATION OF Macrophomina phaeseoli WITH A DISEASE OF Pinus pinaster IN A DIEBACK SITE.

By F. Batini.

Introduction.

Since 1950, Pinus pinaster has been planted extensively on dieback areas and has generally grown well. During the summer of 1967 however, officers of the Mundaring Division observed patch dying of P. pinaster in a trial planting known as "The Dell".

The planting site is in the head of a shallow gully and is surrounded by jarrah forest affected by dieback. The P. pinaster was planted in 1956 on a shallow sandy gravel over massive ironstone. Two years later, P. radiata was planted on a lateritic silt in the moister portion of the gully. The site was ploughed but not fertilised.

At age 11 years, the P. pinaster ranged in height from 3' to over 25'. The stocking was variable, suggesting considerable losses during establishment. Canopy closure had not been attained. In contrast, the P. radiata had closed canopy on account of its better stocking and growth rates.

Mortality occurred during mid to late summer and approximately 50 P. pinaster and 6 P. radiata had died. The roots of dying trees were noticeably darkened (lesioned), including the larger roots of $\frac{1}{4}$" to $\frac{1}{2}$" in diameter. P. cinnamomi was recovered from soil samples. Though a considerable number of lesioned roots were plated, P. cinnamomi was not recovered.

Inspection of diseased roots revealed black fungal structures (pycnidia and sclerotia) embedded in the wood and bark tissues. These structures were plated and a fungus tentatively identified as Macrophomina phaeseoli was recovered.

This culture was compared with known isolates of M. phaeseoli and was similar to these in all respects.

Macrophomina phaeseoli.

This fungus is classified in the group Deuteromycetes (the imperfect fungi). This constitutes a group of fungi that reproduce by asexual means and whose sexual stage has either not been discovered or else no longer exists.

Small (approximately 1/32"), black pycnidia and sclerotia are usually formed in abundance on diseased tissues. The former contain colourless spores, the latter are made up of hard rounded masses of hyphae.

This pathogen can cause root and stem rot in a variety of woody hosts. Damage may be severe, particularly under hot and dry conditions. Fungal development is best at high soil temperatures (around 86 ^{o}F).

The pathogen has been recovered from dying P. pinaster seedlings at the Wanneroo Research Nursery and from P. pinaster and P. radiata nursery stock in South Australia. The disease is commonly known as "charcoal or black root rot".

Control.

M. phaeseoli is generally regarded as a "weak" pathogen which requires the plant to be predisposed before it can gain entry. Control measures should therefore aim at improving the conditions for plant growth.

With nursery stock, the level of damage may be reduced by adequate watering, shading or fertilisation (particularly with minor elements). Fungicidal drenches and fumigation could also be used.

Under field conditions, adequate site selection, site preparation and fertilisation will reduce the incidence of this disease. These measures should result in improved growth, early canopy closure and a depression of soil temperatures.

Conclusion.

The possibility that P. cinnamomi is contributing to this disease cannot be excluded. However, it is unlikely that P. cinnamomi is the major cause and it is probably just one of a number of predisposing factors.

It is considered that M. phaeseoli is unlikely to become a serious pathogen under West Australian conditions unless the host species is planted "off site" or is subjected to some predisposing factor.

When unexplained mortalities occur, roots less than $\frac{1}{2}$" should be excavated and examined for the presence of pycnidia and sclerotia (a 10X lens is quite suitable).

Appendix.

Known Hosts of M. phaeseoli.

Eucalyptus globulus
Eucalyptus robusta
Cupressus macrocarpa
Pinus echinata
Pinus muricata
Pinus pinaster
Pinus radiata
Pinus halepensis.

PROGRESS PLAN AREAS.

By J. Williamson.

A test of the accuracy of area measurement using dot grids was made recently at one of the Working Plans Offices. The area of a straight-sided polygon was measured using:

1. A dot grid with 40 dots/square inch
2. A dot grid with 100 dots/square inch
3. Two different measurers
4. Measurements repeated on two days
5. Geometry - to give the absolutely correct area.

The results show that a variation of less than $\pm$ 2% can be expected between all these factors. A slightly greater variation would probably occur when curved and irregular-sided areas are measured, as on progressive plans.

However, it is only when Working Plans finds differences of 10% or more between areas measured on progress plans and those stated in the divisional report, that queries are sent out. This is far greater than the likely error or variation due to the dot grid method, so you can be fairly sure that a query from Working Plans means a mistake in area measurement has been found.

ADENANTHOS APICULATA
A FIRE RETARDANT NATIVE

By A. B. Selkirk.

Several years ago when investigating the origin of an uncontrolled fire, I mentally recorded a most unusual retarding effect produced by a procumbent shrub which carpeted the particular spot at the source of the fire.

The fire commenced at the scene of a woodcutter's chain saw operation. In his work of cutting foot blocks from a dry Jarrah log, the cutter had produced a continuous covering of saw chips. These had been ignited from the exhaust and smouldered for several hours until contacting more inflammable leaf litter and bursting away into a fierce 25 acre forest fire. It was very noticeable that where the sawdust and chips had been partly covered, or come into contact with the procumbent shrub, the fire had ceased to burn. The shrub had in fact delayed the break-away for possibly an hour or two, since there was no other scrub on the immediate verge, occupied by the prostrate form.

In recent months I was seeking a low shrub with fire retardant qualities for roadside protection, and preferably a native capable of surviving on lateritic gravel; so I revisited the site of the uncontrolled fire after a spring control burn. Here I found the same thing as I had observed before. In all instances where this shrub grew, the mild spring burn had ceased to run, even though in many cases the shrub was heavily covered with Jarrah leaf litter.

Each shrub appeared to give the same protection that one would expect from a shallow pool of water. Small Bossia and Dryandra floribunda specimens growing within the matted runners were protected. The short lateral shoots seemed to have the power of growing vertically and eventually enveloping all litter that fell in summer, as the plant made vigorous summer growth. There appears to be no layering of roots from the lengthy runners and some attain a length of eight feet on the radius. The runners can be rolled back in a swathe, revealing the decomposed litter in the form of fine duff, overlaying a rather infertile laterite gravel. In doing this I realised I was looking at a plant that had survived at least 15 years of rotational burning, and was covering approximately 50 square feet with a basal stem as thick as a man's wrist. I tried dropping fusee matches on the litter covered runners, but they spluttered, popped and went out. I put some in a blow flame; it glowed red after spluttering, gave a short flame and went cold and black when the blow flame was removed.

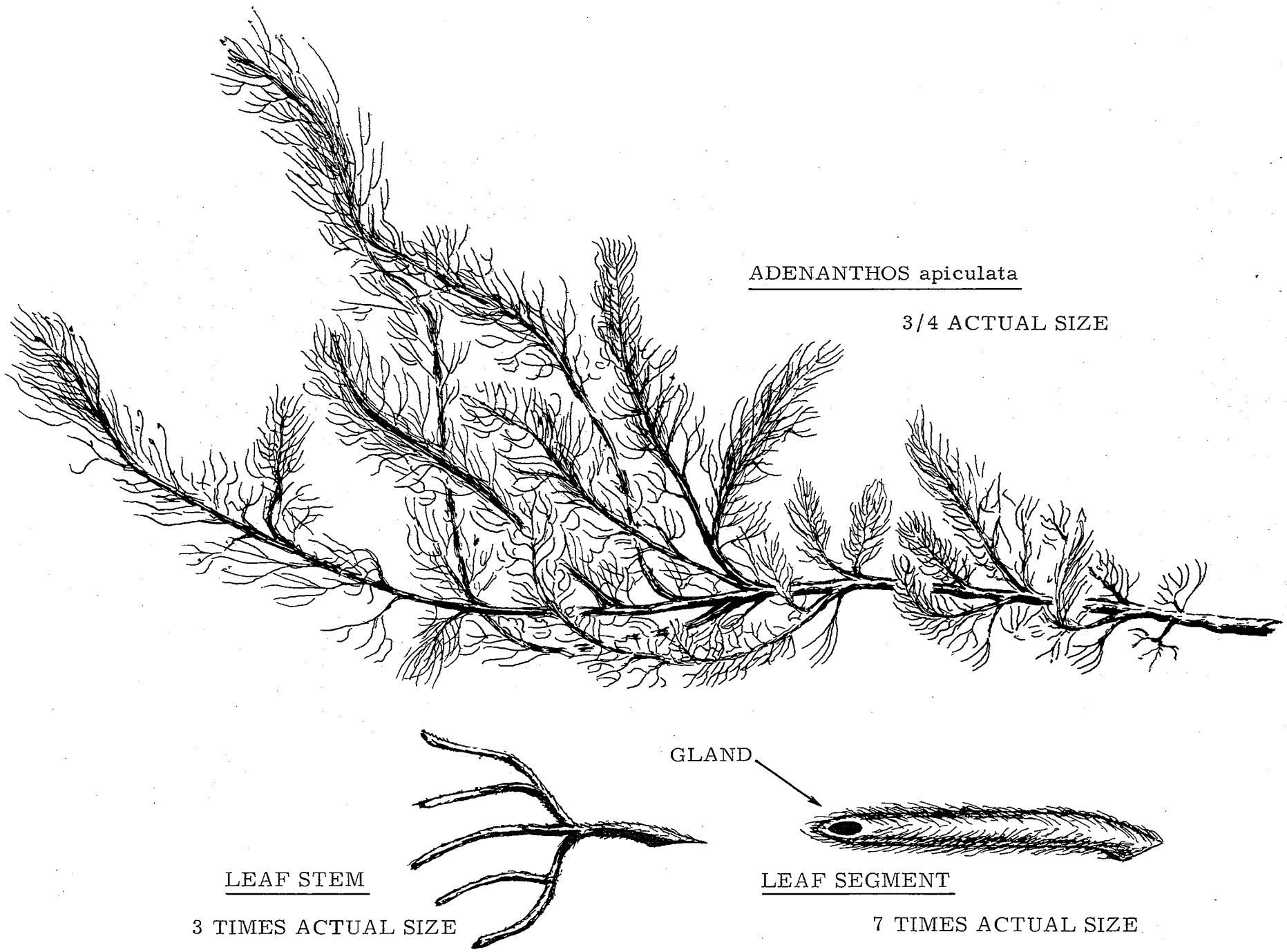
The correct identification is difficult; the closest so far is Adenanthos apiculata, and it seems very restricted in its habitat in the Mundaring District. In fact, it covers only about 40 acres.

With the transfer of small wildlings to roadside observation plots and experiments with fertiliser, it is hoped to find out what use this native may be in fire control.

At present, it appears it could be useful in:

A. High risk roadside areas;
B. Bowl and stem protection of fire tender species in parkland sections, as it seems to thrive under a canopy;
C. As a decorative procumbent in native garden landscaping;
D. It may be even more useful if grown in conjunction with the other very similar erect form, Adenanthos drummondii.

A small sketch of the plant is appended.


ADENANTHOS apiculata
3/4 ACTUAL SIZE
GLAND
LEAF STEM
3 TIMES ACTUAL SIZE
LEAF SEGMENT
7 TIMES ACTUAL SIZE

Armillaria mellea - A DANGEROUS PATHOGEN?

By F. Batini.

Introduction.

A report of an unexplained mortality in Karri from an area of virgin bush in Warren Block, Pemberton, was received from the D. F. O. and the area inspected by Officers of the Research Branch. A number of dead and dying Karri trees were observed and it appears that the disease is localised at the present time. Representatives of all age classes from pole to veteran were affected.

Examination of the lower bole and roots revealed white sheets of mycelium (a mass of thread-like strands) between the bark and the wood. In some cases the wood was reduced to a white pulpy mass filled with mycelium. Infected samples were plated and a Basidiomycete recovered. (A wide variety of fungi are classified in this group. It includes the rusts, smuts, mushrooms, toadstools and bracket fungi.) The area was also baited for P. cinnamomi with negative results.

Basidiomycetes are difficult to identify on mycelial characteristics and the local D. F. O. was advised to inspect the area regularly for the development of fruiting bodies. In June, masses of fruiting bodies developed on the diseased trees. These were identified as belonging to the plant pathogenus fungus Armillaria mellea.

Description.

A. mellea is a Basidiomycete in the family Agaricaceae (the gilled fungi). The fruiting body is that of a typical toadstool. The young fruiting body is always umbrella shaped, but in older specimens the edges are often turned outwards. A distinct annulus (ring) is present on the stalk. The fruiting body is variable in colour ranging from orange-yellow to dark brown. The gills are yellowish and the spores are white.

Fruiting bodies are usually produced in clusters from the collars, roots and stems of diseased trees. They normally appear in autumn prior to the first frosts.

When the fungus is well established, it forms sheets of creamy white mycelium with dark streaks between the bark and the wood, especially on the lower trunk, collar and major roots. Eventually the wood is reduced to a stringy sodden mass which is normally white in hardwoods and brown in conifers. The fungus can cause heart rot as well as root and collar rots.

A. mellea is also known to produce black boot-lace like strands (rhizomorphs) which grow either through the soil or between the bark and wood. Rhizomorphs were not observed on the samples inspected.

The Disease.

The ability to infect healthy trees depends on the volume of food source (substrate) available. Group attack in forests is almost invariably associated with the presence of large infected stumps. It may attack any age class but trees less than ten years old are usually more susceptible. The attack is normally restricted to trees which have been weakened by other environmental factors, e.g. waterlogging or drought. Any treatment which will increase the vigour of attacked trees should enable these to cope with infection by A. mellea. The host range is very large and an abbreviated list is shown in the Appendix.

The pathogen is troublesome in exotic plantings of P. radiata in New Zealand. The overall loss is small but severe localised mortality can occur. After the age of ten years, P. radiata appears to become more resistant but may still suffer from butt rot and windthrow at a later age.

In Western Australia, severe loss of orchard trees, particularly apples and citrus, have occurred. In one case the loss of 100 apple trees in a season has been reported.

Methods of Control.

(1) Salvage of merchantable timber.

(2) All unmerchantable timber should be pushed and an attempt made to remove the stumps and at least some of the major roots. These should be windrowed and burnt.

(3) All stumps which are too large could be split with dynamite and then excavated. An alternative is to poison these with sodium arsenite, 2-4-5 T or tordon so as to speed up their colonisation by saprophytic fungi and their eventual decay.

(4) A ditch should be dug around the affected area to a depth of $2\frac{1}{2}$ to 3 feet.

(5) The affected area should not be replanted for a considerable time (probably not less than ten years).

(6) A five chain strip around the affected area should not be logged for at least 5 to 10 years. If logging of the surround is essential, all cut stumps and damaged boles and roots should be painted with creosote to inhibit the germination

of the pathogen's air borne spores.

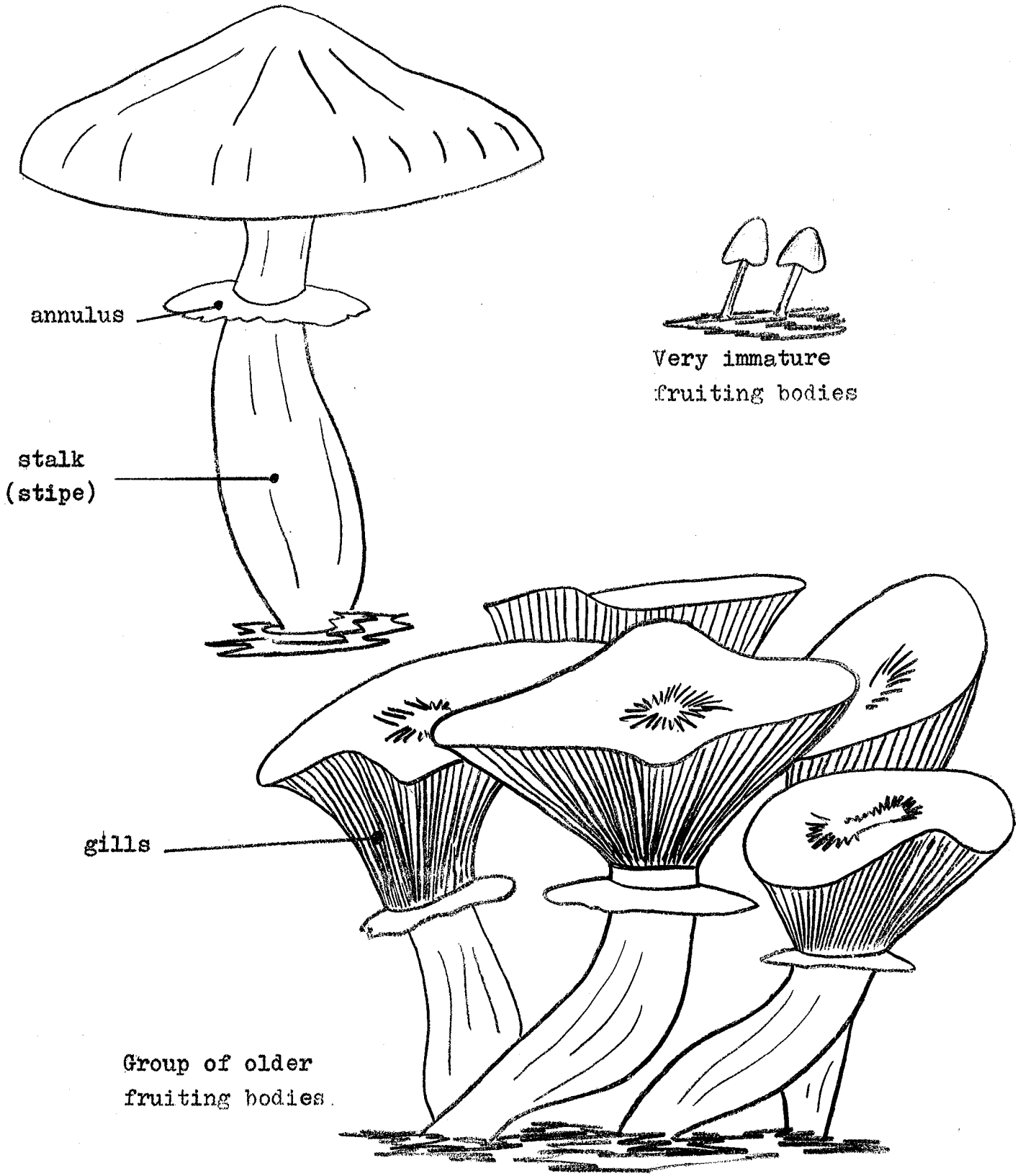
Conclusion.

It is considered unlikely that A. mellea will become a major cause of tree diseases in West Australian forests. However this pathogen could cause severe damage in localised areas. When unexplained deaths in conifers or hardwoods are observed, a search for mycelial mats and fruiting bodies of A. mellea is warranted.

Hosts of Armillaria mellea.

Acacia melanoxylon
Acacia decurrens
Acacia pycnantha
Araucaria cunninghamii
Callitris species
Cupressus macrocarpa
Cupressus lusitanica
Eucalyptus calophylla
Eucalyptus citriodora
Eucalyptus globulus
Eucalyptus delegatensis
Hevea brazilliensis
Larix decidua
Larix leptolepsis
Pinus contorta
Pinus caribaea
Pinus elliottii
Pinus halepensis
Pinus jeffreyi
Pinus muricata
Pinus patula
Pinus pinaster
Pinus ponderosa
Pinus radiata
Pinus taeda
Populus species
Quercus species
Salix species

FRUITING BODIES OF A. mellea



Very immature fruiting bodies

Group of older fruiting bodies

PLANTING KARRI WILDINGS.

By P. Christensen.

In Karri forest management these are times when artificial regeneration of an area with seedlings might be considered. i. e. when natural regeneration is either very poor or fails completely in an area. Wildings are often in abundance elsewhere and constitute a readily available source of cheap planting stock. From experiments which have been carried out at various times in the past, it appears that:-

1. Small seedlings do not do too well.

2. There appears to be little difference in survival whether the plants are pulled up, lifted carefully or lifted and balled.

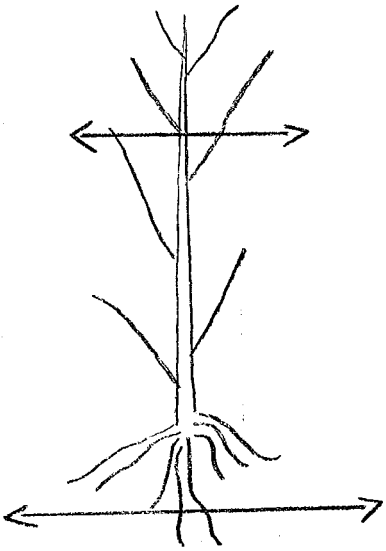
3. Scrub competition is an important factor.

Last year in June further trial plots were put in to determine the best size of seedlings to use and the best pre-planting treatment to give them. The trials were located on Spring burn sites on Wallace Road; the seedlings were obtained from Pine Creek. (1 year old.)

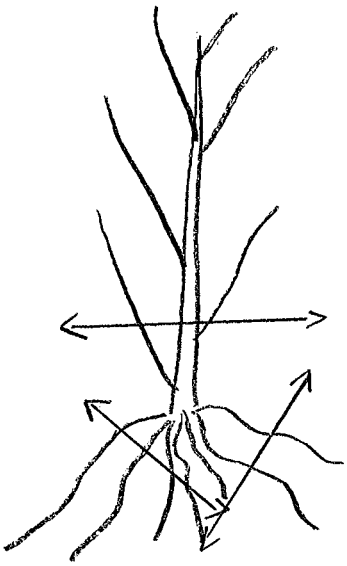
Treatment No.	Size of Transplant.	Treatment.
1	6"	Lifted carefully, roots and shoot not touched
2	12"	" " " " " "
3	24"	" " " " " "
4	12"	Pulled up, roots and shoot trimmed
5	24"	" " " " " "
6	36"	" " " " " "
7	12"	" " " " " + hormone
8	24"	" " " " " "
9	36"	" " " " " "
10	12"	Pulled up, both roots and shoot cut back heavily.
11	24"	" " " " " "
12	36"	" " " " " "
13	12"	" " " " " + hormone
14	24"	" " " " " "
15	36"	" " " " " "

Pictorial explanation of cutting treatments.

Roots and shoot trimmed.



Roots and shoot cut heavily.



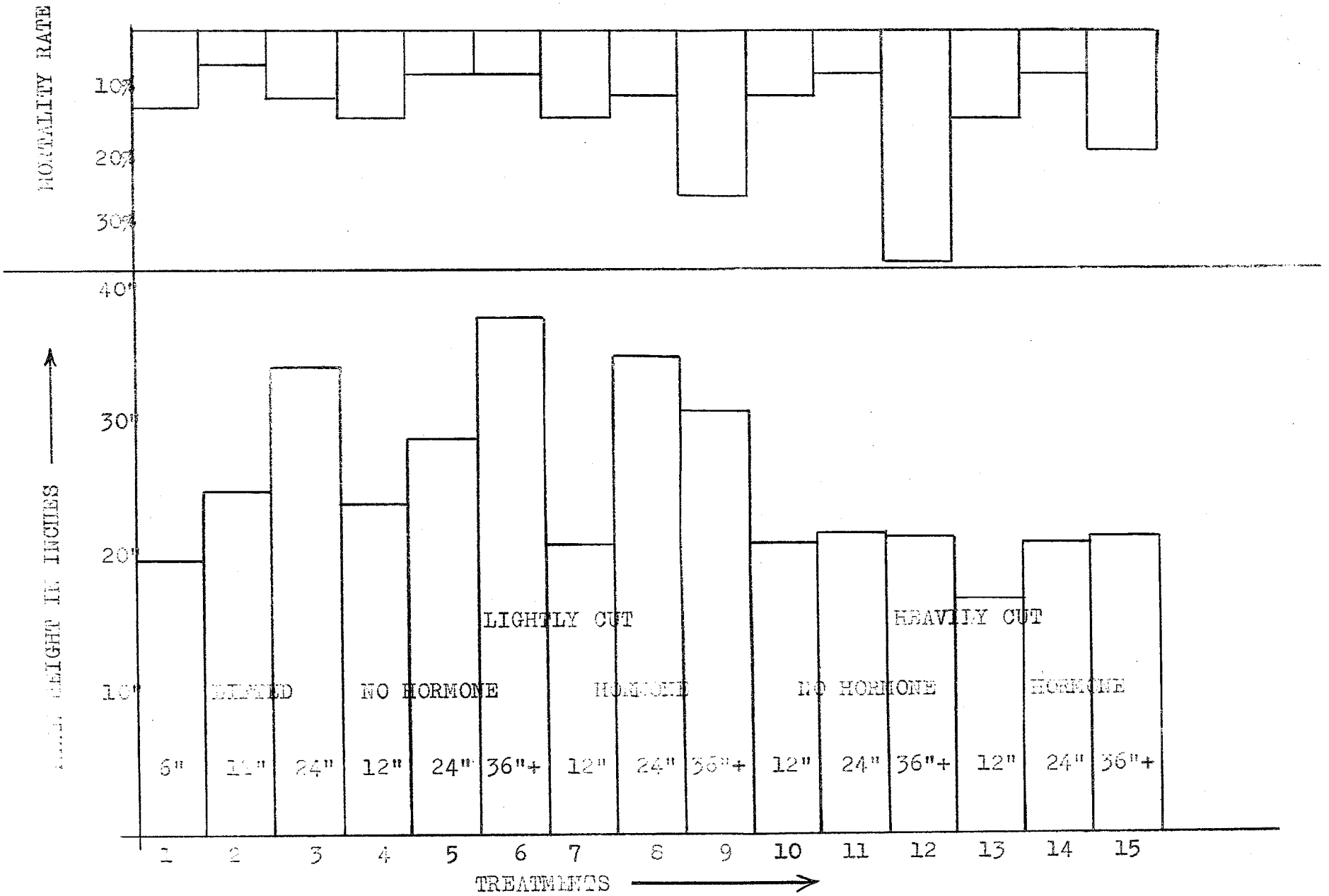
The hormone used was a root growth promoting hormone and the plants were treated by dipping their roots into a bucket containing a solution of the hormone. Each of the 15 treatments were represented by a row of 10 plants, this unit was repeated twice on each of three different sites, i. e. 60 plants per treatment, giving a total of 900 plants. Location of each treatment unit of 10 plants within each site was entirely random. The plants were transported to the site in plastic bags and planted in the normal manner. All plants were given 2oz. of Nutrifert in October. This was applied by sprinkling it onto the soil surface round the base of the plant.

The plots were inspected in mid-March, the heights of the transplants and the number of deaths being recorded for a preliminary analysis. Figure 1 is a summary of the results.

It appears that the Hormone treatment had no effect, therefore this treatment has been disregarded in the following table and the Non-hormone treatments combined as one.

WILDING EXPERIMENT

HISTOGRAM SHOWING THE MEAN HEIGHT AND PERCENTAGE MORTALITY OF SEEDLINGS UNDER THE VARIOUS TREATMENT



SUMMARY OF PERCENTAGE SURVIVALS.

Treatment / Height Class	6"	12"	24"	36"+
Lifted plants	88.3	95	90	No treatment
Lightly cut plants	No treatment	86.7	91.7	89.6
Heavily cut plants	No treatment	88.3	93.3	77.4

SUMMARY OF MEAN HEIGHTS OF SEEDLINGS (IN INCHES).

Treatment / Height Class	6"	12"	24"	36"+
Lifted plants	20.2	23.6	34.6	No treatment
Lightly cut plants	No treatment	22.8	32.2	34.7
Heavily cut plants	No treatment	19.4	21.8	22.3

The percentage survival is good in all cases except perhaps the heavily cut back 36"+ plants. As this is the case, we can do a straight comparison of mean heights. The figures are self-evident; the best treatments are 24" lifted, 24" and 36"+ lightly cut back. This is confirmed by Statistical Analysis which shows that these treatments differ significantly from all the rest at the .001 level of significance. None of the other treatments differs significantly from each other.

It seems unlikely that lifting the plants had any beneficial effect; this is illustrated by the % survivals. Lifted 24" 90%, lightly cut 91.7%. Thus the important factor is the size of the plants.

In conclusion, therefore, it seems that Wildings of 24"-36"+, pulled from the ground, with their foliage and longest roots lightly trimmed, gave the best results. The percentage survival amongst plants of this size varied between 78.8% on the worst site and 93.8% on the best site. Most of the deaths in the experiment occurred amongst the 36"+ plants. Some of these were 4'-5' high before trimming, and it is amongst these that most of the deaths have occurred. i.e. the ideal transplant size is probably somewhere between 24"-42"; these also appear the healthiest plants in the plot.

In the analysis of this experiment total heights rather than percentage gain in height was used. This was done because although the survival amongst 24" stumped plants was good, (93.3%), it is total height

we are interested in. The reason for this, as mentioned earlier, is scrub competition. Wildings are often planted into 1 year-old scrub and the taller the plant starts off, the better its chance of survival.

STUDY OF DOUBLE LEADERS - P. PINASTER AT GNANGARA.

By D. R. Lejeune.

Foresters are often involved in arguments whether or not it is wise to retain any trees with double leaders. This argument can only be resolved satisfactorily by observing what happens to double leaders which are retained in any locality. It is assumed that a conclusion reached for one locality does not necessarily apply to others.

A study was made recently after gale force winds during Easter, by taking a selection of compartments which had been thinned for some years and running random samples to ascertain:

(1) The proportion of double leaders or multiple leaders should they occur.

(2) The number of double leader trees which have lost one or more leaders.

Summary of Results:

Compt. No.	Thinned to stems per acre.	Date of last thinning.	Total No. of Trees.	Multiple leader trees Above 15'	Below 15'	Occurrence at Broken Leaders.
71	300	1960 (1st)	146	5	1	-
74	200	1964 (2nd)	118	5	-	-
76	300-400	1960 (1st)	188	2	-	-
76A pt.	300-400	1960 (1st)	161	1	1	-
76A pt.	200	1968 (1st)	45	1	-	-
			658	14	2	Nil

Conclusion.

Despite the retention of 2.4% double leaders these stems have not suffered from the increased exposure of a thinning which had generally reduced the stocking from about 1100 to 300 per acre.

It is not suggested from this that it is desirable to retain double leaders. However, they are often the most vigorous trees and it does seem unwarranted to remove them at the 1st thinning and possibly later thinnings due to an unfounded fear that they will lose a leader.

PROFILE - EMIL DZUBIEL

By J. S. Evans.

With the retirement of veteran bushman Emil Dzubiel in March 1969, the bush has lost another of its old-timers. Emil has spent over 40 years in the Jarrah forest around Collie, mainly employed on splitting timber for the Collie deep coal mines.

Emil arrived in Collie in 1929 after spending his early years at sea, including a voyage from America in the three-masted sailing ship "William Mitchell" of London, which was 240' long and 240' high (30' higher than the Gloucester tree). He arrived in Melbourne, walked to Sydney, then worked his way across Australia with his lifelong friend Bill Henneburg.

From 1929 he worked mainly for farmers clearing blocks, and in 1934 he began cutting mining timber with contractor Charlie McCamish. The first mine that he cut for was the Proprietary (commonly called the Bullfinch) which was located where Bunnings new sawmill now stands. At that time there were 32 cutters and carters, compared with 9 now. Some other well-known cutters with whom Emil worked were Fred Buckle, Alec McCamish, Clem Spencer, Clidham Hargreaves, Bill Stone, Tom Martin and Jack Fisher.

Since 1934 Emil has cut an average of the following per day:-

50 props (6 to 10 feet in length, 5"x 5" square)
200 lids (roof supports, 24" long x 6"x 2")
25 slabs (" " " 8 to 10 feet in length 8"x 4")
plus about 10 sleepers (4'x6"x 4"), since discontinued in later years, although there is an occasional order for them.

This means that in 35 years of cutting mine timber (with 2 weeks holiday per year) Emil has cut approximately:-

437,500 props (13,672 loads)
1,750,000 lids (5,833 loads)
and 218,750 slabs (8,414 loads) (50 cubic feet/load).
Total 27,919 loads.

A staggering figure indeed! Another interesting note is that if all props and slabs that Emil had cut were laid end to end, they would extend for more than 1,033 miles!

Conditions have changed a lot since 1934. There was no sick pay or paid holidays and wages were around $7 per week.

Emil has cut timber for nearly every mine around Collie, most of which have long since closed down, including the Proprietary, Western 1, 3, 4, Stockton, Co-operative and Black Diamond Mines. All mine timber at present is used in the Western Collieries No. 2 deep mine, 10 miles east of Collie.

One record which Emil must have created in his long employment was the fact that he had not been on compensation for over 20 years, which is certainly an outstanding achievement in an occupation where falling limbs and trees, flying wedges and sharp jagged splinters from split timber are a daily hazard. As a matter of interest, Emil has had only 5 days sick leave in the past 8 years, which is something exceptional in itself, considering that work is carried out all year, rain, hail or shine, commencing at first light each day.

Married with 7 children, 4 of them married, and with 16 grandchildren, Emil intends to enjoy his retirement in Collie, with possibly a trip to Germany at a later stage.

THE TEN COMMANDMENTS.

By D. J. Keene.

1. Safety first.

2. When all else fails, read the instructions.
(If you are a conservative, read the instructions first)

3. When in doubt, don't.
(Variation on theme: press on regardless)

4. Never burn on a North West wind.
(You may increase the area, and the cost.)

5. Don't be obsolete.
If you still follow the same practice as you did 3 years ago, chances are it's out of date (or should be).

6. If you know you are right, speak up; if not, shut up.

7. Consult your fellows.
His idea may be better than yours.

8. Your wife is important.
Spend one whole day per week doing what she wants to do. The rest is your own.

9. Read the Manual.
Then you won't always be told to read the Manual.

10. Do you know who knows how many beans make 10?

(With Apologies)

AERIAL SUPERING OF PINES, 1968.

By K. Haunold.

For the first time in pine plantations in W.A., aerial application of superphosphate was attempted in October, 1968.

The operation involved the application of 260 tons of superphosphate to 1295 acres (net) of plantation in the Neaves and Amarante sections of the Gnangara plantation, consisting of 6 - 7 year old stands. The application was carried out by Agricultural and General Aviation Pty. Ltd. at contract rate of $5.45 per ton for spreading only.

Total cost per acre by Aerial methods - $4.48
Total cost per acre by ground methods 1966 - $5.21, a saving of 73 cents per acre.

Advantages of Aerial Supering are:

1. Direct costs reduced.
2. Man hours for both staff and wages men reduced.
3. Labour costs are rising faster than plant costs and we must find ways of keeping the labour content of any job to a minimum.
4. Distribution of super more even.
5. Capitalization in plant for ground supering would not be necessary.
6. Obstructions in the way of unpruned stands, slash or stumps, would be no further obstacle requiring preliminary work.
7. It is possible to use bulk super which is cheaper and the operation can be confined to the month when super is cheapest.

Two landing strips were used, one at the Northern end of Silver Road which was approximately 30 chains in length, and landings and take-offs were all made on the N.W. side of the super dump, so that it was necessary for the plant to turn at the dump. The strip at Amarante Block was 65 chains in length, and it was possible for operations to be speeded up by planes landing and taking off in the same direction, stopping at the dump for a few seconds to fill up with super. If future landing strips could be established in the direction of planted rows, then the contract price should be accordingly lower. Planning for this should be completed well in advance so that work can be carried out in time for the strips to consolidate.

The strip width for supering was calculated by the pilot, and also the load to be carried, which was a maximum of 13 cwt.

Runs were made along the planting rows, and the strip width varied from 25' to 30' depending on length of run and strength and direction of wind.

The quantity of super is thinner on the edges of a run and the spacing allows for overlap to compensate for this.

For a marker, a jeep was placed at one end of the block a short distance away from the pines, so that the pilot could detect his run and line himself up with the planting rows, and the jeep was then shifted further to the next flight run.

The unit used for loading the super was a combined fuel truck and rear end loader 7 ton Bedford truck. On the end of the chassis a cabin was fitted with all the driving and loading controls available. A two-way radio was fitted to the combined unit so communication between the pilot and loader driver was possible, also if any complications arose, the pilot could be notified immediately or vice versa.

The application was monitored by Research Branch in order to ascertain the uniformity of the application and to suggest improvements that may be desirable. Shallow metal trays were used and these were spread both across and along the flight lines.

This sampling method indicated an average amount of fertiliser deposited per tray as equivalent to 2, 72 cwt/acre. The considerable discrepancy between this and the planned application rate of 4 cwt/acre is presumably due to one or more of the following reasons:

(a) A certain amount of large granules bounced out of the trays.
(b) The area to which the fertiliser was applied included both internal firebreaks and margins of external firebreaks, whereas the amount obtained was calculated on the basis of net area.
(c) A small amount of super was left over.

Patterns of application evident from deposits in trays were:

(1) Along the flight line - higher rates near the beginning and end of the line. This could be due to mechanical and/or human factors.
(2) Across the line of flight higher rates near the edges of blocks being supered. This is apparently due to a human factor.
(3) On any block, a high rate on the leeward side. This would be due to drift of the lighter particles.
(4) Some deposition of super on breaks at the beginning and end of a flight and on the leeward side of an area being supered.

Conclusion.

Although no sampling was done of the previously used ground methods of supering, observers who have seen the results of both agree that the result of the aerial method is a far more even spread. In unpruned stands it is hard to imagine an even spread by ground means. However,

wastage on breaks at the beginning and end of runs could be reduced by deliberately missing say, the first and last chain of runs and subsequently making several runs across the ends to cover this section.

THE OLYMPIC GAMES AND CONTROLLED BURNING

By J. McCormick.

Our distant ancestors, so we are told, were a wretched lot being little better than the beasts that stalked around them; in fact, by some freak of nature, they were not even suitably clad against the elements and were therefore obliged to remove the hide from other animals and wear it themselves so as to maintain any degree of comfort at all. Even then the situation could not be borne out indefinitely, so it was by a stroke of good fortune that one, Prometheus, looked down from the heavens and took pity on those wretched 'creatures of a day'.

Prometheus conceived a plan whereby he might improve their lot. He stole the heavenly fire from the gods and gave it to mankind - for this action he was severely punished .... but that is another story. From the day in which man received the sacred flame, so his life on earth improved; art and industry had begun. Man learned to cook his food, melt iron, use ash to make paint with which to paint his abode and himself - to make swords and war which demanded strategy. Mankind worshipped fire and even to this day in religious ceremony men light fire, let off firecrackers, burn candles, etc., whilst the Olympic torch must go unquenched throughout the Games.

Over the centuries man's attitude to fire has changed from one of worship to one of dread, and whilst this attitude may be appreciated in an urban society, it should be frowned on in a rural one. To protect grassland, bush and forest by the complete expulsion of fire has, in many cases, proved fatal to man, beast and forest alike, and no doubt it can be proved that complete protection from fire disrupts the process of natural selection and is thus detrimental to the life of native flora and fauna.

One often hears the lament "Ah, the wildflowers aren't what they were in my young day", and one might give credulence to this tale of woe, for the countryside becomes more and more unnatural with protection and cultivation. Again the cry arises, "Save our wildlife from those incendiarists" yet complete protection allows the weak to survive with the strong; the weak bring down the strong and there's an end to it.

Many of us, whether we are interested in athletics or not, have a confirmed belief that the Olympic torch must never be allowed to die out; then why not so the 'natural' fire - Prometheus instigated both.

REGIONAL NOTES.

BUSSELTON REGION.

Oil drilling: preparations are well advanced for drilling a third hole in the Busselton River (GR25) and termed Blackwood No. 1. The first hole drilled, Sue's No. 1, went down to 10,000 feet, while the second, Whicher No. 1 went to 15,256 feet. Local information suggests the dome structure to be 30 miles in diameter.

Lilly's Mill: a small mill owned by Millars Timber and Trading Company in Busselton which has operated under a lease agreement by E. W. Lilly since 1951, ceased operations on June 27th. The site is now being cleaned up prior to subdivision into building blocks.

Plantation and Tree Services: the Forestry Consulting firm of which Charles Peaty is a Principal has completed planting a property in the Bridgetown area, named "The Peninsular". 800 acres were planted with P. radiata on behalf of a number of clients. The firm raised their own stock in a nursery run by the previous owner of the property, Tony Wheatley.

Forest guard Kokir, was transferred from Walpole to Lewana on 22nd July.

Forest Officer Richmond was nominated by the Nannup Shire to attend the Civil Defence School at Macedon for a one week course in August. He will take the opportunity to study the APM nursery practice in the Traralgon area following the Civil Defence.

Nannup nursery successfully raised Pinus taeda, elliottii, canariensis, muricata and Eucalyptus diversicolor in open beds this year with some variable results. It is considered that with earlier sowings and improved mycorrhiza the results will be further improved. They are keen to try a more comprehensive range of Eucalyptus by this method.

Trial plots amounting to 50 acres of P. pinaster and some Eucalyptus species were planted in the sunklands to the west of Nannup this winter. Non forested, dieback and other non-productive sites were selected.

SOUTHERN REGION.

Staff.

Appointments:

R. J. Kitt	T/A Research, Manjimup	12.5.69
Miss Diane Fornari	Research Assistant, Manjimup	17.6.69

Resignations:

W. J. Prien	T/A Research, Manjimup	3.7.69

Transfers:

F/G C. N. Broadbent	Shannon River to Carinyah	8.5.69

Mr. J. A. Thomson commenced work with the Department on 1. 7. 69. He will carry out a survey of Boronia areas and assess the possibility of creating a Flora Reserve along the Denmark-Mt. Barker Road.

Forty-two professional and field staff representatives from Southern Divisions attended a dinner at the Manjimup Hotel on 25. 6. 69 to farewell the retiring Conservator of Forests, Mr. A. C. Harris.

Karri Distribution.

The distribution of karri is generally recognized as being in the lower South-West around a high rainfall tract of country in the Manjimup, Pemberton, Walpole, Denmark area. The species is generally found on better class soils derived from Gniessic Granites. There are two main outliers from this region, one on limestone sands at Boranup, and the other in the Porongorups which are granitic outcrops.

A recent article by Churchill in the Australian Journal of Botany in relation to the past and present distribution of Eucalyptus in the lower South-West, among them karri, enlightened many foresters. The reference to karri at Rocky Gully and Mt. Manypeaks raised the obvious question "why?" in such areas of comparatively low rainfall.

A closer look at the distribution of small patches of karri indicates an almost continuous line of karri close to the coast from Denmark to Albany.

In recent years Working Plans have recorded a stand of karri of some hundreds of acres just back from the coast near Black Point.

A check is being made to see if the Mt. Manypeaks karri, which unlike the Porongorups is associated in low-lying areas, is connected with the karri on the west side of Princess Royal Harbour by further isolated patches.

A brief inspection of small patches of karri around Mt. Manypeaks showed that the karri was associated with limestone sink holes and the patches were generally only 5-10 acres in extent. The karri was of good size, up to 17' G. B. H. O. B. and 130' high. One patch had recently been logged by an Albany mill.

All patches located were in private property and an investigation is proceeding to locate some in a reserve, of which there are quite a number between Albany and Mt. Manypeaks.

The intention is to plot the occurrence of karri outliers and to attempt to explain the occurrences by studying the soils and climate of each.

Eucalyptus microcorys v. s. the Boorara Fire.

Foresters busily planting Tallowood (Euc. microcorys) throughout

the south-west may be interested to hear of a hitherto unsuspected fire resistance in this species.

The Boorara fire of March this year burnt through a 2-year-old plantation of mixed Eucalypts on a repurchased farm about 1 mile east of Boorara tree. Most species were about 4'-5' tall and growing amidst dense, dry bracken fern. Among ten other species was a small plot (about 180 plants) of Euc. microcorys. This plot was on the western edge of the plantation, and took the full brunt of the fire as it came out of the neighbouring bush.

When first inspected about a fortnight after the fire, I considered every tallowood to be completely dead. They were fully defoliated and the wood dry to the ground. Plans were made to replant.

However, a further inspection in July brought a pleasing surprise. Over 90% of the plants were coppicing vigorously from the root collar. Others were already developing an epicormic crown. It is now intended to leave the plot as an area in which to closely follow the recovery of these plants from a very hot autumn fire.

METRO REGION.

Staff:

Two new Forest Assistants have been appointed in the Region. Ted de Jong, formerly of Collie, is at Gnangara and John Butts is at Mundaring. Forest Guard Bob Burns has transferred to Dwellingup and his place at Carinyah has been taken by Charlie Broadbent.

The Como Fire Control and Research Institute now has a Xerox photo-copy machine, and its principal operator is the section's new Forest Assistant, Lyall Younson.

Publicity:

An interesting television coverage of the 1969 planting at Wanneroo was screened on S.T.W. 9 on July 20th, and showed some excellent film of nursery and planting techniques.

Recreation:

Two developments in the Kelmscott Division may be of interest in other centres.

The first is the development of two picnic areas along the Albany Highway using a split-post combination seat and table. Further details of this will be produced at a later date.

The second is a "Forest Visitor Survey". A detailed questionnaire has been produced and members of the staff at Mundaring and Kelmscott are interviewing visitors to the forest to complete these questionnaires. It is hoped to obtain a better understanding of the motivations and the needs of picnic parties and other forest visitors.

There are large numbers using forest areas near Perth for recreational purposes and this survey is the first stage in a study of this form of forest use. Some idea of the level of visitors can perhaps be gauged from the fact that in the four months between mid-October 1968 and Feb. 22nd. 1969 over 300 people signed the visitors' book at Mt. Dale Tower, and 250 at Gungin Tower.

Quadruple Furrow Liner.

As a result of trials at Gnangara in late summer a quadruple furrow-lining machine was successfully put into operation for preparation of planting furrows in the Wanneroo Division this season. This has made it possible to almost halve the cost of this operation.

SAFETY NEWSLETTER.

DEPARTMENTAL SAFETY.

On the completion of this, our second year of intense accident prevention activities, it is pleasing to record that we have been successful in further reducing our accident frequency rate.

Disabling injury accidents sustained during the period under review totalled 96, as compared with 124 during 1967-68.

This reduction of 28 accidents has resulted in a drop of our frequency rate from 65 to 48. Although results this year are not as spectacular as those achieved last year, it is heartening to find that the incidence of disabling injury accidents is continuing to decline.

A number of divisions have achieved spectacular safety success, which is revealed in the divisional safety summary which appears on page 33.

Congratulations are extended to Narrogin and the Trainee group who have worked the entire year without a disabling injury accident, and to the four divisions - namely Harvey, Shannon River, Pemberton and Dwellingup, who have achieved a 50,000 hour accident-free period during the current year.

Frequency rate graphs for these divisions have been included to show the progress that has been made.

Although the overall progress we have made during the current year indicates that we are gradually combating the accident problem, a study of the causes of accidents sustained during the year reveals that some divisions have yet to achieve the control of men, machines and materials which is essential in reducing work injuries to a minimum.

Accident prevention is not a passive or negative thing. It is a positive outlook requiring constant alertness and vigilance.

Just as accidents don't happen, but are caused, so improved safety records don't happen, but are caused. They are caused by attention to hazards in work areas, by elimination of unsafe acts in the work method, and by training the worker in his job.

DIVISIONAL FIGURES.

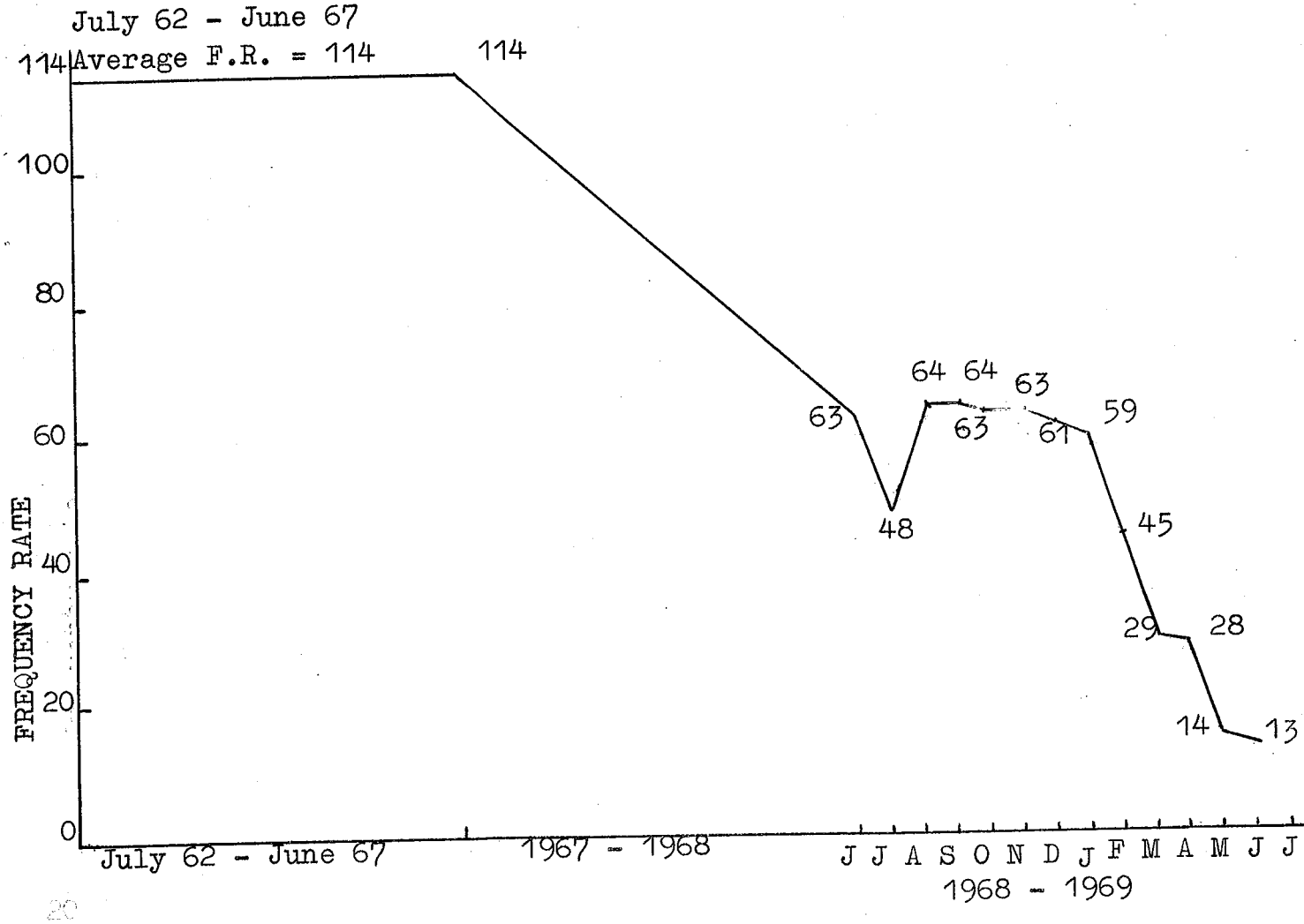
	1967-1968.			1968-1969		
	M.H.W.	D.I.A.	F.R.	M.H.W.	D.I.A.	F.R.
Busselton	177,146	13	73	166,782	8	47
Mundaring	99,632	12	120	94,405	4	42
Dwellingup	143,196	5	35	128,028	6	46
Collie	135,434	2	15	144,609	7	48
Kirup	117,320	21	179	138,846	9	64
Manjimup	196,113	8	41	174,938	13	74
Narrogin	22,126	1	45	20,618	Nil	Nil
Kelmscott	76,319	2	26	70,287	5	71
Collier-Somerville	32,065	4	125	79,933	5	62
Wanneroo	132,554	10	75	128,604	12	93
Harvey	212,274	20	94	216,380	12	55
Pemberton	104,205	5	48	108,187	1	9
Nannup	139,868	15	108	138,369	5	46
Shannon River	61,665	4	63	73,289	1	13
Trainees	26,235	2	76	24,854	Nil	Nil
W/Plans	)	No information Available		41,420	3	72
Research	219,448)		"	81,868	3	36
Head Office	)		"	180,159	1	5
Kalgoorlie	)		"	7,992	1	160
TOTAL	1,895,600	124		2,019,568	96	

DEPARTMENTAL FREQUENCY RATE.

1967-1968	1968-1969
65	48

SHANNON RIVER SAFETY STATISTICS

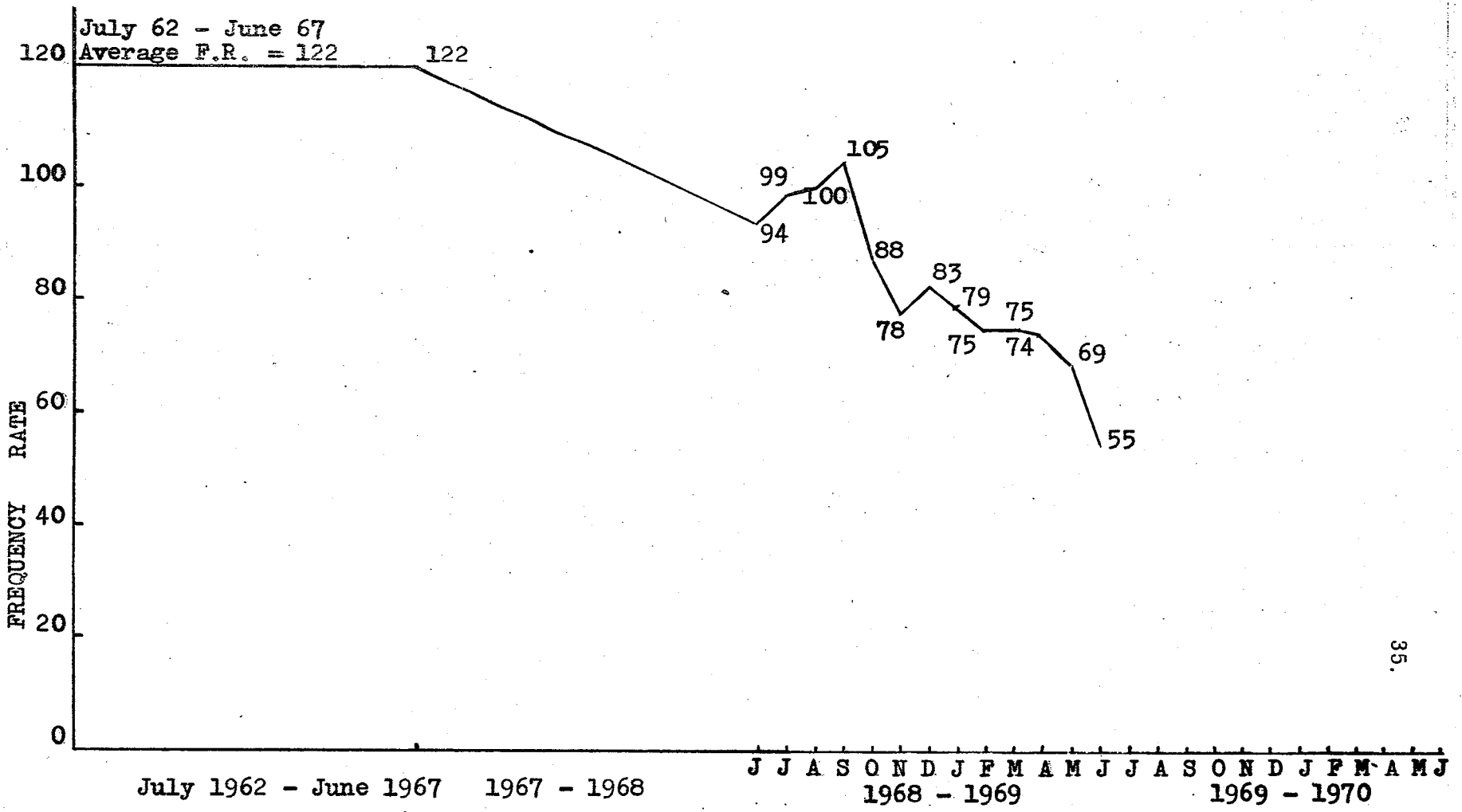
During the period July 1962 - June 1967 the Average Frequency Rate based on annual M.H.W. and D.l.A sustained = 114.
From July 1967 - June 1968 the frequency rate was reduced to 63.
From July 1968 each progression of the graph represents the F.R. for the previous 12 months, based on 1967 - 1968 monthly figures.
e.g. 1st July 1968 - 30th June 1969 = 13.



HARVEY SAFETY STATISTICS

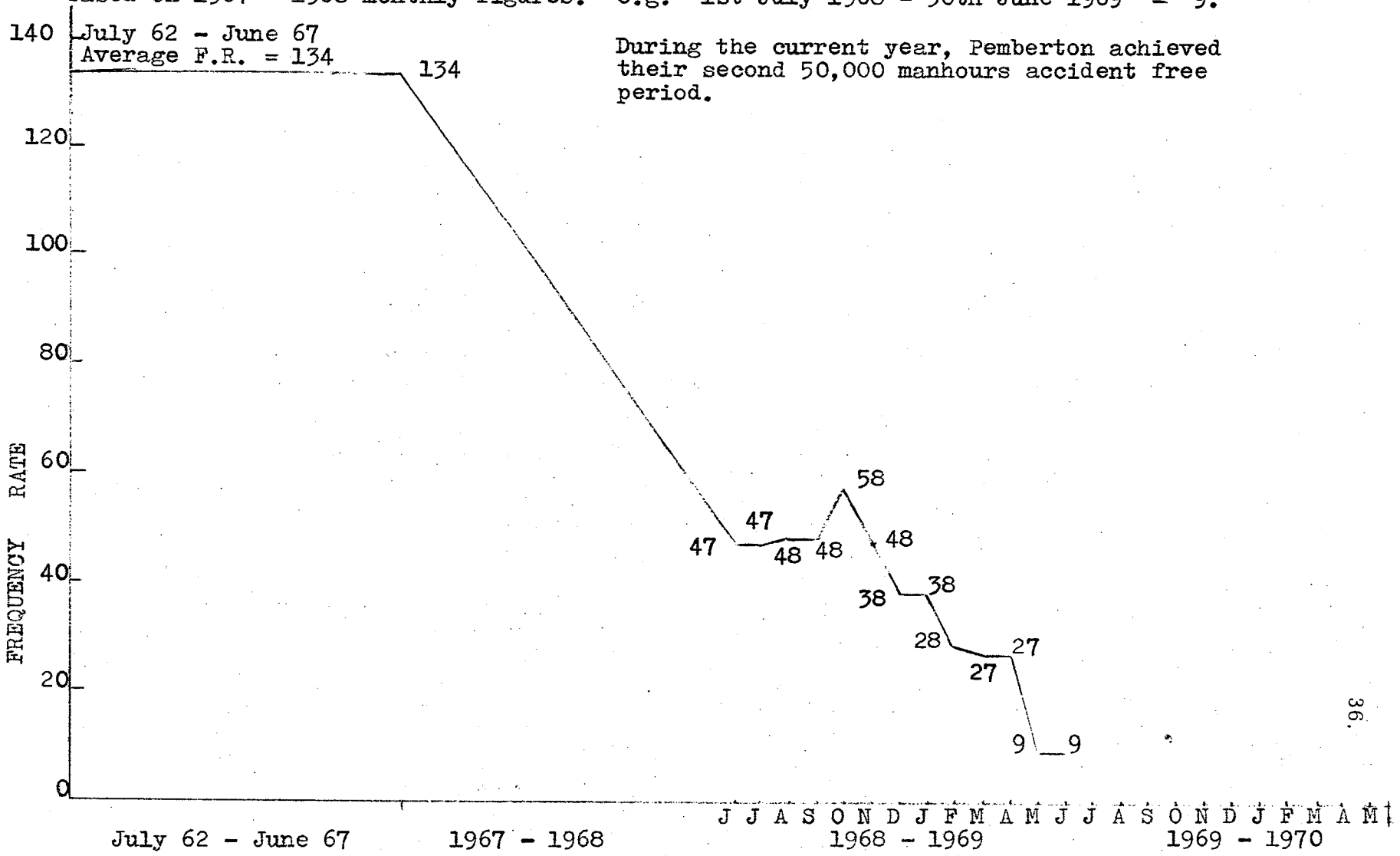
During the period July 1962 - June 1967 Harvey Division's frequency rate based on M.H.W. and D.1 A sustained = 122.
From July 1967 - June 1968 the F.R. was reduced to 94.
From July 1968 each progression of the graph represents the F.R. for the previous 12 months based on 1967 - 1968 monthly figures. e.g. 1st July 1968 - 30th June 1969 = 55.

During 1968 - 69 Harvey achieved their first 50,000 manhours accident free period.



PEMBERTON SAFETY STATISTICS

During the period July 1962 - June 1967 the average frequency rate based on annual M.H.W. and D.I. sustained = 134.
From July 1967 - June 1968 the frequency rate was reduced to 47.
From July 1968 each progression of the graph represents the F.R. for the previous 12 months based on 1967 - 1968 monthly figures. e.g. 1st July 1968 - 30th June 1969 = 9.



During the current year, Pemberton achieved their second 50,000 manhours accident free period.

SAFETY INDUCTION.

Safety training begins at the time of employment, before the employee starts work. An effective safety training programme should include a carefully prepared and presented introduction to the Department.

So that the new employee may learn the things he needs to know and may form a good attitude, it is desirable for a responsible officer to give him the right kind of start.

The following pages are an example of how this extremely important phase of safety training is conducted in Harvey Division.

BE SAFE.

You are a new employee of the Forests Department, Harvey. We hope you will stay and enjoy working with us. Maybe your previous employer was SAFETY conscious. If so, you are lucky and will have begun to appreciate the importance and benefits of Industrial Safety. However, should your previous employer not have been SAFETY orientated, then we would like you to read this hand-out even more diligently.

SAFETY should be a natural part of your life, not something that starts at 8a. m. and ends at 5p. m. It is something to be practised at work, in the house and on the road.

There are many hazards in the forests. You will be exposed to these dangers, but if you are alert and think about what you are doing, then you will be safe. Your Overseer is a man of wide experience and will point out the hazards on different jobs. Listen to him and heed his instructions. If you do not know or if you are unsure,ASK. Some SAFETY equipment is available; use it, and look after it.

If you see anyhting that is dangerous, do something about it immediately; should you be unable to remove the hazard, inform your Overseer or an Officer. Inform your workmates so that they are not imperilled. Apathy has not killed anyone here, it has done so elsewhere.

Monthly meeting of employees representing their fellow workmates discuss SAFETY problems and present ideas from the workforce to increase SAFETY in the working conditions and methods.

All accidents have to be reported immediately. No matter how small or trivial they seem, fill in the Accident Report Form. Failure to do so may lead to your employer refusing to confirm your eligibility for Workers' Compensation. Injuries are painful, and if you are on compensation your income will be smaller than that which you normally enjoy. This obviously will cause hardships to your family or dependants. Think about your work; THINK SAFETY, ACT SAFETY always.

INDUSTRIAL SAFETY.

Accidents do not happen; they are caused. Some of the causes are listed, together with notes. It is hoped that you will read these notes and you will think and talk more about SAFETY.

SAFETY is a combination of qualities. Firstly, it is an attitude of mind, a determination not to get hurt and not to hurt others. Secondly, alertness - watch for hazards. Thirdly, knowledge - recognizing by experience of others what is likely to lead to an accident.

Within these notes there are rules. Rules are the product of experience and they are devised to protect you, your workmates and equipment. Remember a lost time accident hurts twice - physically and financially; ask anyone who has been off work on workmen's compensation.

Walking: Watch your step. Loose logs and stones can cause you to lose your balance; this is especially dangerous if you are carrying a heavy load. Spilt liquids, oil on the workshop floor, grease in the servicing area: clean them up even if you did not make the mess - your thoughtfulness may save someone from having a serious accident.

Falls: Stack material so that it is stable. Put tools and equipment where they cannot fall on you or your workmates. If you have to climb, get a ladder, and make sure the ladder is in good condition.

Clothing: Wear good boots, preferably safety boots. Remember the rules for clothing during controlled burning and fire-fighting operations. If you are working with machinery, button up - loose clothing is dangerous. Smooth shafting is just as dangerous as belting and unguarded gear trains. Think before approaching machinery. Think when leaving it.

Tools: Keep tools in good repair. Warped, cracked, splintered or split handles are dangerous. Check axes, hammers, shovels and rakes before you use them. An axe head is not a football and it might even be a boomerang; people bleed. Cutting tools have sharp edges, or they should have if they are in good order. Remember sharp tools are cutting tools and people cut quite easily. Keep the cutting edges covered. Tools are only as dangerous as the people who use them.

Handling Goods: It is the way goods are handled that leads to accidents. Look out for sharp edges, splinters and nails. Pull out or knock down projecting nails before you pass materials or throw them out for scrap.

Don't carry loads you cannot see over. Be careful with drums and other liquid containers. Some of the materials we handle are inflammable, corrosive or poisonous. Even apparently empty drums may have dangerous vapours in them.

When lifting heavy objects keep a straight back; use your leg muscles to lift - they are far more powerful than your back muscles. Get help with heavy and awkward loads. Be sure to think - don't be sorry.

Tidiness: Keep your work areas tidy. Waste and rubbish have proper places - use them. An apple core or a piece of orange skin on a concrete floor is a dangerous hazard - find a rubbish bin for your waste.

Protective Devices: Welding screens, goggles, aprons and gloves are available - use them. If they are broken get them repaired or ask for new ones. It is your eyesight, etc. that depends on the efficiency of the equipment.

Hard hats are supplied to everyone; their use is obligatory on some jobs. Their shape is designed to take shock; if they are distorted or cracked they afford little or no protection. Inspect yours - do not get caught out.

Fires: Keep access to fire-fighting equipment clear. Keep access to doors and exits clear of obstructions.

Electricity: Do not interfere with equipment. Amateurs are dangerous. Examine electrical tools for obvious faults before you use them.

Machinery: You are not allowed to use machinery without permission. Before starting machinery ensure your workmates are out of the way. If you are servicing machinery switch it off and isolate. NEVER use a machine without its guards. NEVER distract a mechanic operator. One the operator's concentration is broken you have created a dangerous situation. Swith off machinery after use and park it properly.

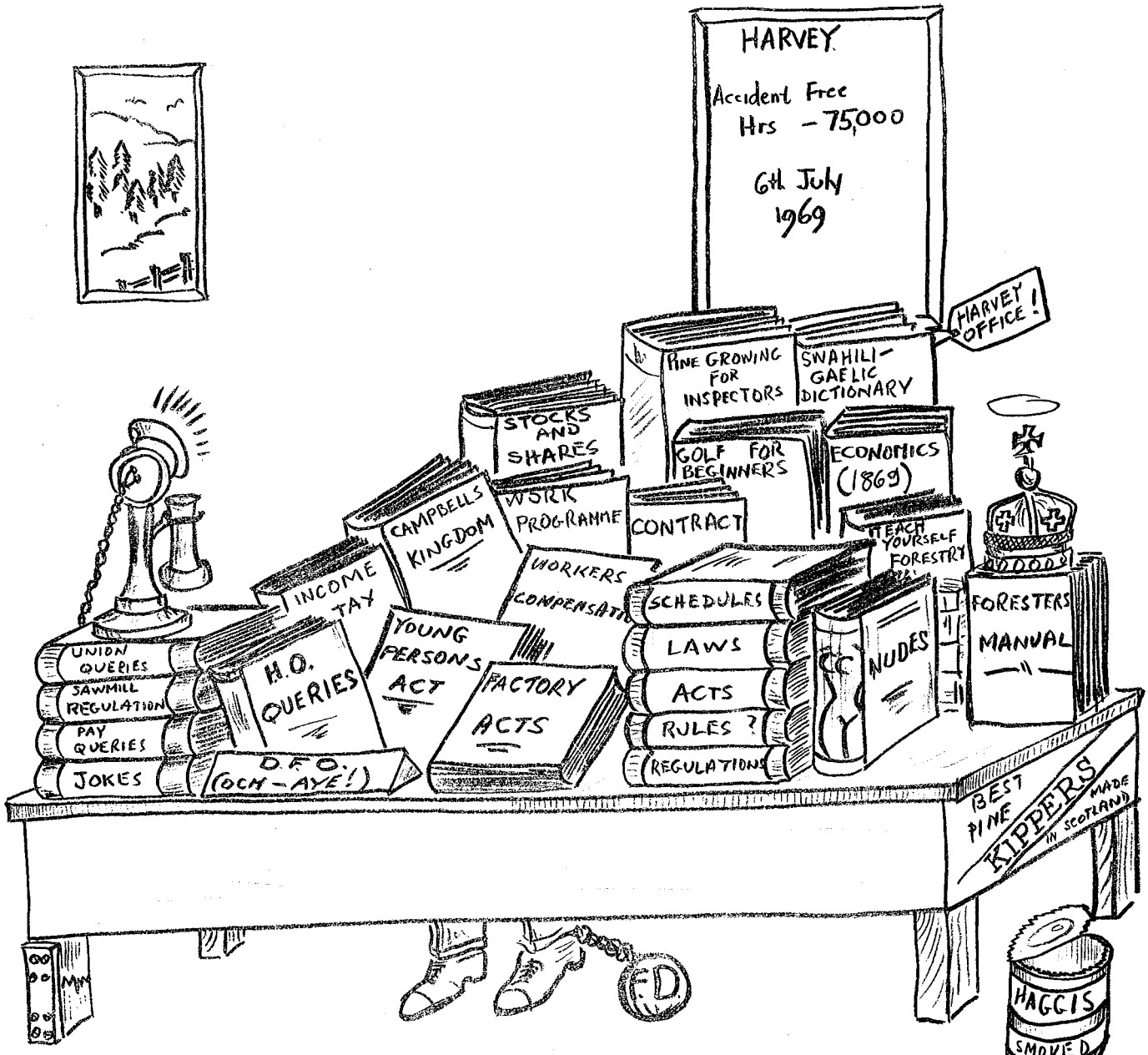
Skylarking: Fun at parties - but you are at work. Practical jokes can lead to tragic endings.

First Aid: If you feel ill tell your Overseer. Your full attention is needed on your work.

Should you be involved in an accident, however small or trivial it may seem, fill in the Accident Report. The smallest scratch can become infected and lead to blood poisoning.

Eye injuries must be examined and treated by qualified medical aid. See the attached sheet on Eye Injuries.

First Aid Kits are available on all vehicles. It is encumbent on Overseers and Drivers to see that they are complete and clean.



HE'S UNDER THAT LOT TRYING TO HELP YOU

HELP HIM - THINK SAFETY - WORK SAFELY

Support Stand Not Used.

A mechanic was removing a hydraulic ram from a D4 Bulldozer. These rams regulate a quadrant-shaped bell crank, whose function is to lift or lower the dozer blade. When the ram is removed from its mountings, the bell crank is free to fall with a pendulum motion.

The mechanic removed the ram which allowed the crank to fall, and in so doing it crushed his leg between its end and a fixed trunion mounting.

Although minor injury only resulted, far more serious injury could well have resulted.

This accident could have been prevented if the mechanic had placed a support stand in position or secured the bell crank to prevent it falling.

Eye Injury from "Blackboy" Spike.

An employee with sight in only one eye, was employed on blazing a survey line.

After blazing a tree he turned and was struck in his good eye by a blackboy spike, which caused traumatic conjunctivitis, necessitating medical treatment and loss of time.

The use of safety glasses could well have prevented this accident. This is a classic example of overall failure.

Let's face it; how would we, and the employee also, feel, if this accident had resulted in the loss of his remaining eye?

If it is necessary to employ workers suffering with infirmities such as this, on jobs of this nature, we must exercise extreme measures to ensure that everything possible has been done to protect them from injury.

There's always a cause.

Bill Tame from Nannup recently suffered painful injuries to his left hand and arm when he tangled with a "Pine plant sorting machine" in the nursery.

Observing that mud was building up on one of the conveyor belt rollers thus causing the belt to run off, Bill proceeded to remove the mud with a screwdriver.

The machine, although designed for sorting pine plants, is evidently capable of sorting other things as well, for it grabbed the screwdriver, Bill's hand and arm, and but for the timely action of an employee in stopping the machine, could well have sorted Bill's arm from his body.

Bill's unsafe act in attempting to rectify the fault without first stopping the machine could have resulted in serious injury - a fact of which he is now well aware.

The lesson here, of course, is that machinery in motion is a trap for young and old. Never attempt maintenance or repairs without first stopping the machine.

Incidentally, Bill did not cease work. Although the injuries sustained were severe, necessitating numerous stitches and the carrying of his arm in a sling for some time, he convinced the doctor that this did not prevent him from doing his office work or performing other essential supervisory functions.

That the occurrence had its humorous side is evidenced by the following article which was written by one of Bill's female nursery workers.

~~WILLIAM the CONQUEROR~~
WILLIAM the TAME

There was a young man named Tame
Who thought he was very game
He took to a planter
OH BOY! What a CLATTER
He never did come out the same....