TRANSCRIPT OF EVIDENCE.

Given before

THE ROYAL COMMISSION APPOINTED TO INQUIRE INTO THE CAUSES AND ORIGINS AND OTHER MATTERS ARISING OUT OF BUSH FIRES IN VICTORIA DURING THE MONTH OF JANUARY, 1939.

held at

THE EXHIBITION BUILDING, MELBOURNE.

on

TUESDAY, 14th MARCH, 1939.

PRESENT:

HIS HONOUR, JUDGE STRETTON, Royal Commissioner.

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MR. GREGORY CONNAGH, assisting the Commission.

MR. E. H. E. BARBER, on behalf of the Forests Commission.

MR. A. E. KEILSO, on behalf of the Melbourne and Metropolitan Board of Works.

MR. A. D. HADY, on behalf of the Victorian Branch of the Australian Forests League.

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THE COMMISSIONER: I think it appropriate to announce now that, owing to certain difficulties that have arisen in the preparation of cases — and I use the term "case" in the convenient sense in which I used it yesterday — and because of inconvenience it would cause certain witnesses to be called on certain days this week, the Commission will adjourn at the conclusion of tomorrow’s business until the following Tuesday morning, Monday being a public holiday. That adjournment will give most people time to consider their position and to prepare whatever they wish to prepare.

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As to the Forests Commission — it has playfully been referred to as Public Enemy No. 1 — the Commission evidence will be given last, as some criticism has been made against it, and the short adjournment I have just mentioned will not apply to the Forests Commission. If Mr. Barber so desires, at the conclusion of the evidence he can seek a short adjournment.

MR. BARBER: I do not know that it will be necessary, but I cannot tell until the whole of the evidence has been heard. We will prepare our evidence as far as possible, but, should it become necessary I may apply for a short adjournment.

THE COMMISSIONER: You should adopt the confident attitude — "we have nothing to fear; we are ready to go on"!

MR. GOWANS: Before leading evidence to day, I ask for the production of certain documents by the Forests Commission. Yesterday I asked for the production of correspondence between the Forests Commission and the Timber Workers' Union in connection with safety precautions at the mills. I now ask for the production of the following documents:—

1. Correspondence since 1930 between the Forests Commission and sawmillers relating to safety precautions at mills — including (a) the file of general or circular correspondence, and (b) files of correspondence with individual sawmillers, all relating to the subject matter mentioned;

2. Reports of District Officers or Divisional Inspectors as to the necessity for the provision of dug-outs at mills in their areas;

3. The minutes of the deputation to the Minister of Forests and the Forest Commissioners in February, 1932. The last mentioned deputation is the one to which reference was made yesterday and about which a certain undertaking was given.

MR. BARBER: Is that identical with the conference mentioned yesterday?
THE COMMISSIONER: There was a conference as well as a deputation.

MR. GOVAN: One was the Bush Fire Fighting Conference and the other a deputation to the Minister of Forests and the Forests Commissioners. I should like the documents produced as soon as possible, preferably before the adjournment tomorrow night.

MR. BARBER: A search is being made at present for the documents asked for yesterday, and it will be continued in connection with the other matters now sought. We will give the documents to Mr. Govan as soon as we have them; some are now available.

THE COMMISSIONER: You cannot do better than your best.

MR. GOVAN: I do not know whether, it would be onerous to ask the Forests Commission to take out of the general files the particular letters and reports. Certainly the Commission has at its disposal more labour than I have at my disposal to take out documents. If it were possible for the Commission to do that, I would be grateful, rather than simply have all the files dealing with the sawmills handed over to me.

THE COMMISSIONER: That is frequently done at inquiries of this description, and then you have to start burrowing.

MR. BARBER: We will do our best to assist the Commission.

HERBERT WILLIAM GEPP, Sworn and Examined:

MR. GOVAN: Your name is Herbert William Gepp, where do you live?

I live at 29 Hampden Road, Armadale. I am the Managing Director of the Australian Paper Manufactures, Ltd., but I hold several other positions.

I understand you have certain observations to make with regard to the phenomena accompanying eucalyptus fires in Victoria.

I take it you would like to do so. My evidence will be divided into two major parts -
(1) Certain special observations regarding the mechanism of "conflagration" fires in Australian eucalypt forests;
(2) Comments and suggestions dealing with the national aspect of the conservation of natural resources.

(1) The historical review which Your Honor has doubtless had placed before you during the hearing of this Royal Commission shows clearly that at irregular intervals the eucalypt forests of the State of Victoria are in danger of serious damage amounting, as in 1938/1939, to almost total destruction of the most valuable portion of these national assets. Unavoidably associated with these types of fires is the tragedy of the loss of human life, unless ever-ready organisation provides means of rapid exit when ample warnings are given. During discussions with experienced people, and whilst thinking over the evidence that has been given before this Royal Commission, it has occurred to me that there has been no detailed study given to one outstanding phenomenon of these "conflagration" fires, namely, the enormous rate of advance of the fire under certain circumstances. I believe that people have stated that from observation they knew that the fire was several miles away, and yet suddenly they were enveloped in flame.

My early training was as a chemical engineer engaged in the manufacture of explosives. Later I had much experience in coal mines, including some eight months of work as a member of the Royal Commission on the Coal Mining Industry during 1930/1. The information which I gathered has led me to believe that a very probable explanation of the phenomenon to which I have referred is that the sudden burst of flame is due to the almost instantaneous ignition of huge volumes of inflammable gas which, admixed with air, is being driven ahead of the fire by the strong hot north winds.

It is, I think, easy to visualise the development of the necessary
conditions. The fire or fires which usually have been smouldering for weeks suddenly spring into activity under the conditions of some particular fire-risk day, namely, a previous long period of hot, dry weather, a hot north wind with exceedingly low humidity, and a forest with everything on the ground and right to the tops of the trees ready to burn. The fire, possibly joining with several other fires, becomes a major conflagration of the canopy type. The heat waves move ahead of the actual fire.

The oils of the eucalypt foliage are rapidly volatilized. To a certain extent, due to the extreme heat, there is a partial distillation of the actual organic matter in the leaves and bark which supplies extra quantities of inflammable gas. So long as there is a continuation of steady conditions without checks or swirls or eddies, these enormous volumes of inflammable gas mixed with air do not ignite. But any check such as would be caused by a deep valley with a transverse ridge on the southerly side, or any other such set of topographical or meteorological conditions, such as a sudden quick alteration of wind direction, will cause the air and gas stream and within a few seconds a volume of gas, perhaps several miles in length, a thousand feet in depth and several thousand feet in width, explodes. An ideal example of such conditions is at Noojee, where a number of deep forested valleys enter the valley of the Latrobe from the north, and a high transverse ridge, south of the Latrobe River, faces Noojee. If this hypothesis be correct in principle, then several conclusions seem to me unavoidable. Inter alia, they are:

1. That protection of life by clearings of any practical size is impossible, unless study shows means whereby people can be warned to take shelter, and unless such shelters of very special type can be devised, erected and maintained.

2. By far the wisest thing would be to provide all
necessary arrangements so that, on ample warning being
given, the whole of the people in the threatened area
can move to safety, thereby evacuating the area. All
sorts of dangerous possibilities can be imagined even
with the most perfect design of tunnels and necessary
ventilation, and any other special precautions.

On the question of ventilation, tied up with the question of
very highly dangerous atmosphere outside, that would give any
designer considerable headaches.

THE COMMISSIONER: Do you think that in the case of a shaft and drive
type, in flat country where you cannot tunnel into the side of
the hill, if you put the shaft down and have a drive off it, that
you would keep the bad air out, so that people going in would not
be overcome by the bad air?—Unless you take all the details
associated with such a question, you could not answer that.

There is a danger?—Undoubtedly there is a danger. For one thing,
carbon di-oxide, which is the result of combustion, is heavier
than oxygen or nitrogen and will sink. That is what they call
black damp in the coal mines. The dangers in tunnels arise if
they are not properly ventilated. A shaft is always liable to
contain carbon di-oxide, which, as I have said, is heavier than
air and will sink in the bottom. For instance, when examining
an old mine shaft or an old mine tunnel, if it is going on a down
grade, one would never think of going without a most careful test
of whether the air will support light. All these points have
to be considered. Then there is the other aspect, that in
any question of the ventilation of a tunnel or of a shaft you
must remember that outside you have atmospheric conditions which
may be dangerous to life, consequently, you are starting your
ventilation, but ventilation may be the worst possible thing you
can start.

MR. JONES: What would you suggest as a possible explanation of this
set of circumstances. At Saxton's mill at Tanjil, we were
told that in a certain dug-out, which was quite a long one, they put a curtain at the entrance to the tunnel. Subsequently when they found that the smoke was getting in, and the air was becoming bad, they hung another curtain about half way along the tunnel, intending to retreat behind it, but they found that the mere hanging of the second curtain immediately accelerated that condition. The suggestion advanced by someone who was in the tunnel was that, somehow or other, the second blanket or curtain attracted the smoke, caused it to rise and took it from other parts of the dug-out. I should state that both blankets were wet!—It would be impossible to say definitely, and one could advance all sorts of hypotheses. One would be that the increased humidity of the atmosphere might have reduced the temperature and thereby may have reduced the amount of circulation of hot air, and bad air from outside was prevented from coming through. It may be that the blanket blocked the amount of air coming into the tunnel. In all such tunnels, unless they are very long, you will have the colder air coming in at the bottom and the hot air going out of the top. You get circulation like that, as with an ordinary window. With a room in which there is one window, you will notice the cold air coming in from the bottom. For instance, in Germany, I was at a place in Upper Silesia in 1912/13, where the temperature was minus 14 degrees to minus 16 degrees Centigrade outside. There they gave you three mattresses, one on which to sleep, one which you put over your body, and one which you placed either over your feet or your neck, whichever you wished. The room was heated with steam, but I found that I could not sleep. The window in the room was a huge vertical window, swinging on a hinge. On the second night, I discovered that if I opened the window half an inch it greatly assisted. On the first night, I checked the steam, the steam heating system stopped, checked the condensed water, and by 2 o'clock
in the morning I was frozen. The next night I opened the window a few inches, and the cold atmosphere from outside came in along the floor, over to the heater, then rose and went out through the top of the window. You get exactly the same thing in a tunnel. You have the movement of air, the cold air coming along the bottom of the tunnel, and the hot air going out of the top. One explanation of the instance you quoted in the Yulin dug-out would be that the second curtain checked the circulation. You get all sorts of conditions of atmosphere of this sort. You get carbon monoxide, which is very dangerous. It is a gas that is much more dangerous than most people realise, and is due to partial combustion. You particularly experience that condition in front of a big fire. You would have a certain number of volatile oils, all toxic. The eucalyptus oil is definitely toxic. When I was a Royal Commissioner in connection with lead poisoning at Port Pirie, we found that one reason for the general malaise of a number of people was not that they were suffering from lead poisoning but from the inhalation of small quantities of carbon monoxide, regularly inhaled, with .01 per cent of carbon monoxide in the atmosphere in which they moved. After eight hours working in those conditions, the blood test showed the effect of that inhalation on the red corpuscles. When they started to allow traffic through the new Hudson tunnel in the State of New Jersey, at New York, it was found that they had not provided ventilation in sufficient quantity. The average carbon monoxide output from a motor car is in the vicinity of 6 per cent, and that discharge of carbon monoxide in the tunnel was poisoning the people in the motor cars.

THE COMMISSIONER: Was it found after that Hudson tunnel had been opened for traffic that it had not been ventilated?—The ventilation provided was not sufficient for the purpose, and the people using the tunnel were inhaling the exhaust
gases. That was a very long tunnel right under the Hudson River, and the people were being poisoned. You probably know the effect of a man starting a motor car in a closed garage. With a cold motor engine in the morning, when the engine is started the carbon monoxide discharge will rise to 8 per cent or 10 per cent. That is the explanation why people are sometimes found dead alongside their motor cars, in a closed garage on a cold morning. That is simply due to poisoning by carbon monoxide, which is very poisonous. Even one half per cent will put a man out very quickly. One tenth of one per cent will affect people, and one one-hundredth of one per cent over a period of years will have an effect on people. That is why policemen at certain intersections in London have to be removed regularly, because they are continually breathing an atmosphere impregnated with carbon monoxide all the time. The general questions of ventilation and noise are two of the great problems of civilisation.

Reverting to the question of the blanket in the tunnel, when the second curtain or blanket was erected, it may have blocked the circulation to a certain extent, and the inhabitants of the tunnel may have been breathing better air than the air that was coming in. That is one possible explanation. Then there is the question of humidity. Probably you are aware that you can breathe a very much fouler air in a cold room than you can breathe in a hot room. There are other toxic properties given off from the lungs of the human being which are not carbon dioxide but are actually toxic. They will condense on the walls at below a certain temperature. People get very much more tired in a close room with high temperature than in a close room with low temperature. I could not give a definite explanation of the position that arose in the tunnel, because one would have to study every possible point in seeking the explanation, but there are all those points of toxic properties
in particular cases, the volatile oils, the question of the circulation of air, temperature and humidity, all of which affect the breathability of a particular air.

MR. DOXARDS: I take it the construction of a dug-out that would ensure safety for human life in bush fires would not be beyond the capacity of Victorian engineers?—The point I made recently is of great importance, namely, that people cannot go on breathing the same air indefinitely. They must have a certain amount of fresh oxygen coming in.

Secondly, if they have ventilation that is going to bring in air laden with poisonous substances, it would be beyond the power of anybody to prevent the ingress of those poisonous substances unless a gas mask were placed over the entrance to the tunnel, through which the air entering the tunnel could filter. So far as carbon monoxide is concerned, that is impossible. You cannot filter carbon monoxide.

THE COMMISSIONER: If you built a tunnel or a dug-out with the floor on an inclined plane, the lowest part of the plane being at the entrance, would that have any protective effect in the prevention of the ingress of the heavy dangerous air?—I do not think so. If you have a big enough space around the mouth of the tunnel, then I should say, not being an expert in these matters, that, after ordinarily speaking, the only danger with the provision of a proper circulation system would be if that system became blocked. Suppose you have a tunnel with an upcast at the end to give ventilation, but that upcast opening was not protected against it being blocked by fallen trees or falls of earth, there would be a danger. But with the upcast opening, if it was sufficiently protected at the mouth so that it would not fall in, and if people could get away from the radiant heat, the only possible danger would be in a period of intense combustion in the vicinity where the gas was bad. In my

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opinion, that would probably be for only a short period. Therefore, in those circumstances, I should say it was absolutely certain that you could build a type of tunnel that would protect people, but you must give them ventilation. In addition, you must have protection against the swirl of gases coming in and burning. It would have to be a sufficient area in which there were no petrol drums about the mouth of the tunnel, otherwise they might explode and finish off the lot of them. You have sufficient area, and then the danger of the gas being bad enough for a long period to affect the people, I should think, would be very small.

It is worth while taking a chance on a dug-out?—I think so, absolutely, if the people cannot get out of the affected area.

(Continued on page 1468).
THE COMMISSIONER: It would save a lot of people in theory - it has saved a lot of people in practice?—There is no doubt that these facilities should be provided everywhere. The experts of the Mines Department, the Health Department, and the appropriate engineering Department should be called in to undertake experiments in order to ensure that they are properly designed. The Mines Department has officers specially skilled in ventilation problems. The Health Department has officers who know a good deal about the toxic properties of gases, and the Public Works Department could be brought into the consultation.

I understand that one of the Wonthaggi over-seers designed a dugout from practical experience?—The Inspectors of Mines are required to deal with bad air in mines almost every day of the week. Without question, every place, where there is the slightest danger, should be provided with a properly designed dugout.

MR. GOWAN: One witness went so far as to suggest that a couple of cylinders of oxygen should be placed in each dugout?—That could be considered.

THE COMMISSIONER: The misuse of oxygen would be dangerous to people?—Doctors would be able to tell you about that. I do not think there would be any great danger. The oxygen would make them a little bit lively, but I do not think it need cause very much worry. They would enjoy the bush fires then?—I should think instructions could be issued which would be quite sufficient.

What do you think of the practicability of that proposal? I would probably be almost impracticable to provide oxygen cylinders in all dugouts or to initial them for use in the event of fire; something may go wrong with them through long disuse?—We do not find that in factories. We test chemical extinguishers every month. If a regulation provides that cylinders of oxygen should be placed in dugouts, regulations could be framed for regular testing.
who should test them?—It would be a matter only of testing the valve, for the most part. The valve might stick, and that would be the only possible thing that would happen.

Does oxygen expand with heat?—Yes.

One would have to be careful in dealing with oxygen in bush fire country?—The only place where you could possibly keep cylinders of oxygen would be well away from the mouth of the tunnel. The cylinders are strong enough to stand any rise in temperature.

MR. GOWANS: How long could they be preserved in good state?—For ever so long as they are put on a cradle and provided there is no rust showing on the outside. Compressed oxygen will not change inside a steel cylinder. You would need to try the valve once a month to see that it was working. By experiment, it could be easily be set so that it would not discharge more than a certain amount of gas per minute.

THE COMMISSIONER: By the use of some sort of governor?—Yes.

MR. GOWANS: Is oxygen costly?—I cannot tell you from memory. We use many thousands of cubic feet per month in ordinary oxygen welding. You could easily get that information from a welding company or a compressed oxygen company. They could tell you the size of the cylinders and the charge per cubic foot.

I think we interrupted you in reading your statement.

THE COMMISSIONER: (To witness): You will have to be prepared to be interrupted from time to time, Sir Herbert, because we can get very interested in these explanatory statements.

THE WITNESS: Yes. I have seen this question from both sides.

Continuing my statement, I would point out that the Mt. Pelée explosion in 1902 at Martinique is an extreme example of what is always possible. What I mean by this is that if we are going to have properly designed tunnels, naturally no trees should be allowed to remain so that they can fall over the mouth of the tunnel. There should be no possibility of the mouth being knocked away or broken down.
THE COMMISSIONER: What do you think of the proposal to provide some sort of baffle at the entrance to the tunnel mouth?—If you go to the Deer Park Explosive Works—where I used to manage—you will find there that every hut where an explosion is possible is surrounded by a mound so arranged to overcome that difficulty. I have seen these mounds?—That illustrates the point. If there was an explosion in the vicinity, it would have less effect than in the case of an open mouth.

Would that assist in retarding ingress of noxious gases?—No, it would only check the impact of the explosion and stop the swirl from coming into the mouth of the tunnel. You would have to take the chance of that, which would be very small, except at the maximum period of combustion, but that would be only for a few moments, and I think a human being could stand it.

I think there is not the slightest doubt that tunnels properly designed and ventilated would save the lives of all concerned, but that is not anything like as satisfactory as getting the people out of the area.

That is so, but if they are trapped there?—Then without doubt the tunnel is the best alternative. I think the Mines Department, the Forests Commission and the Health Department should make a number of experiments in various directions. I think it is quite possible to spray water in such a tunnel with an ordinary hand spray—like the spray used for rose trees—and that would humidify the air and might have a good effect in cooling the temperature and washing out a few of the volatile oils in the atmosphere. You would have a drum of water there for use in spraying.

We thought of that in another connection: the spraying of clothing of persons sheltering there?—If you are going to do that, it would be better to spray them with a special solution such as waste liquor from salt works which renders material inflammable.
We thought that such spraying would be of advantage for refreshing purposes and to enable the people to withstand any heat that might find its way into the dugout, but I see the point of your suggestion also?---We have made a number of tests with the Forest Commission officers with the use of these bitterns, the waste liquor from the salt works, which contains large quantities of magnesium chloride and which helps to prevent combustion of any organic matter. You cannot burn foliage after spraying it with this liquid. In this connection, I suggest that it would be a good thing to make sure that the timber is absolutely safe from fire. I have always done that at Broken Hill, by cement-gunning the timber used with a dilute emulsion of cement which is shot all over the timber making it fire proof from the point of view of ignition from the ordinary flash fire, because a fire in such circumstances usually starts from the little whiskers on the timber. In effect that puts a thin layer of cement over the whole surface of the wood which will not then burn until it is absolutely red hot.

Would asbestos paint take the place of cement gunning?---Yes, but cement is much cheaper, and can be applied more simply.

MR. GOWANS: Is there a commercial product known as fire-proof timber?---I do not know, but there are all sorts of methods of rendering wood fireproof. Sodium tungstate is used for that purpose. The Forests Commission could instal a small cement gunning plant on a lorry and run it around the areas concerned in three months, making it everything fireproof.

Continuing with my statement, I would point out that any ordinary firebreaks, even with the floor of the forest as clean as possible, will not prevent "conflagration" fires from sweeping the country-side when the conditions are favourable -- such conditions including hot north wind, low humidity, and previous dry weather.

MR. GOWANS: That is an important statement, having regard to the fact
that many witnesses have advocated burning in autumn with a
view to preventing fires spreading in the following summer,
and we have had evidence placed before us that in different
parts of Victoria, where the areas have been so burnt off,
they have withstood subsequent fires?—This is based on a
certain hypothesis; if you have a condition such as I
illustrate, and if you accept the hypothesis as correct,
the fires, having been started, cannot be prevented from
jumping over long distances.

We might not have these conditions obtaining in every fire?—That is
so. I would point out that the evacuation of the people
living in the district is practicable only by an organisation,
including a complete system of lookout towers for early
fire detection by proper communication systems, with ordinary
and wireless telephones, and by a system of roads such as
are available in the jarrah forests of Western Australia.
These roads were made partly, at least, by the early timber-
gatherers in comparatively easy country. To my mind you
will never get safety unless the whole of the forest country
is properly roaded so that people can get out as well as
get in. Reverting to wireless telephones, I brought
back from America a portable wireless telephone weighing
9 lbs., which could be placed on a man’s back, for use by
lookouts in forest areas. That machine is in the possession
of the Forests Commission at the moment. The man at Wash-
ington who obtained the set for me told me that they had
proved it to be very efficient up to a radius of about 12
miles. I consider that there should be an absolute pro-
hibition of lighting of fires from October or November to
March or April in any proclaimed dangerous years. This could
be enforced by increasing the patrols, by putting all patrols
in uniform, — and I think that is very important — and with
proper authority by prohibiting campers and any extraneous
people from entering the forest areas during these periods,
and by heavy imprisonment without the option of a fine for anyone breaking the law. One interesting point in the hypothesis which I have suggested to Your Honor is provided by the statement to me by one of the Senior Officers of the Victorian Forests Commission. He tells me that in 1926 and again in 1928-39, for some days before the conflagrations occurred, when a match was lit or when a brush fire was being burned, the flame was white and not red. In my conversation with him, he suggested that this was due to an increase in the volatile gases in the atmosphere. He informed me that he saw that in 1926 and again had his attention drawn to it in 1938 just prior to the bad days. He tells me also that several of his men had asked him on different mornings whether he had noticed the white flame of the match. That is due to an increase in the volatile gases in the atmosphere.

**THE COMMISSIONER:** How do you explain the blue flame of the match on Friday, 13th January? That was noticed in the affected areas where the smoke was thick, conditions were bad, and fire was imminent?—Well, the colour of carbon monoxide is light blue, the same colour as that noticed on the top of a coke fire. That is carbon monoxide, which is due to incomplete combustion. Carbon dioxide is due to complete combustion which is not poisonous, by the way. Carbon monoxide does burn with a blue flame. It is possible that in the conditions that then existed, there was a considerable amount of low temperature carbonisation and incomplete combustion, with a considerable extent of combustion. There may have been all sorts of conditions. If you have a particular mixture of volatile phellandrene and eucalyptus oils in the atmosphere with high temperatures, that also might have an effect. The senior forest officer referred to informed me that several of the men spoke to him about the white flame.
Was that before the fires broke out?—I understand all the fires were
smouldering. All the big fires grew from smouldering
fires that were burning for months; they were fanned up.
If you have high temperatures, combined with low humidity,
you have every possibility of an extremely rapid and in-
creasing amount of volatilisation of eucalypt oils from the
leaves, without a fire at all. The smell of the bush under
such conditions will tell you that. That increases with a
terrific temperature such as was experienced during the summer.
During some of the hot days, the sun temperature was 175° to
180°F. — the shade temperature was 120°. I have seen the
temperature in the sun at 170° in South Australia. You can
get good volatilisation without a fire, but with the natural
heat. A series of fires will without doubt destroy the seed
and
trees and the chances of natural regeneration. Whatever it
may cost, the most drastic organisation to prevent the destruction
of new forests is vital to the future of the forest industry in
Victoria. It has been my privilege and responsibility at
intervals during a number of years to give consideration to
the development of the natural resources of Australia. I have
pointed out in reports to Government and in number public addresses
and newspaper articles that the Continent of Australia is a strange
old land with many unique conditions. The problems associated
with these unique conditions have to be solved before development
can proceed on sound proven lines. Australia has to develop its
own farming practice. Of recent years, much study by special
Government organisations, both Commonwealth and State, and by
interested industries has advanced the knowledge of the ways in
which these problems can be partially solved at least, but there
is yet a tremendous lot to do.

I instance the over-
growing masses of erosion. I have appealed
in several ways from time to time for co-operative efforts
between all Governments and all the people of Australia to face this problem. I desire to hand in as exhibits copies of newspaper articles and of public addresses to individual bodies in this connection. I was asked by the Australian Natives' Association to make the opening speech over the national wireless network on the dangers of erosion, to the future productivity of the Commonwealth.

Copies of newspaper articles, and addresses.

(By direction of the Commissioner the following report of the introductory speech delivered by Sir Herbert Gepp at a Conference of Scientific and Public Organisations on Soil Erosion, and broadcast through the national network on 29th July, was included in the evidence).

There is an insidious danger in our midst eating up the productivity of our natural resources and threatening the basis of our existence.

Soil erosion is a national menace, against which the nation's forces must be mobilised.

The urge to preserve life is the most fundamental of all human instincts. Man, having found means of providing for his basic needs, has erected his superstructure of material conveniences and luxuries, his arts and his culture - in fact what he is pleased to call his standard of life or civilisation.

Destroy the foundation, and the superstructure which has been so laboriously built up and on which we pride ourselves so much will vanish into thin air. I suggest to you that that foundation is at this very moment being slowly undermined!

What is this menace of soil-erosion?

The process of erosion is a natural one. Under normal circumstances it is extremely slow, and is balanced by the natural formation of new soil to replace that which is eaten away by various agencies.

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SIR H.W. GEPF.
erosion of oar fertile land*. For instance physical processes such as the action of temperature changes and of wind and water, chemical processes such as the operations of chemical solutions in rain water, break down the hard rocks. Then vegetation grows and not only binds the soil but provides the food and energy for the bacteria which aid the process of soil formation.

As vegetation increases the soil is built up both in quantity and fertility. The process of erosion, however, may be so speeded up by a utilisation of the soil which is so out of harmony with the natural processes, some of which I have just described, that the balance of destruction and replacement is tilted in favour of destruction. There are several types of erosion which are of major importance and the causes of which are various. It is not my province to deal in detail with each of these kinds of erosion - that will be done by the expert speakers who are to follow me.

Suffice it to say that highland erosion caused by the destruction of forests by fire or by man and the consequent abnormal flow of water, the erosion of plains and cultivated areas caused by overstocking and over-cultivation as well as by floods, the shifting of soils by wind and other factors are examples of the types of erosion which menace our more fertile areas. The daily press gives prominence to events which appear to affect directly and immediately the standard of well-being of the nation. You may open your paper any morning and read of tariff changes in other countries, trends towards self-sufficiency, the competition of low wage countries, changes in banking systems, the movement of prices, wars and rumours of wars. Yet the forces which work more silently and subtly may be excluded from our thoughts entirely - crowded out by the every-day hurly-burly of buying and selling.

The erosion of our fertile lands is a problem that goes deeper than the problem of economic policy. It does not merely affect the "how" of production, the methods
production, the methods of controlling our economy - it goes to the very root of our ability to produce. Do you realise that areas which were once productive, fertile, abounding with life are now nothing but vast stretches of unproductive desert? Do you realise that civilisations have faded away and passed into nothingness because of the unwillingness or inability of their people to appreciate the importance of this problem? The Sahara, Mesopotamia and Libya once supported thriving and prosperous civilisations. Do you know that in 1877 China lost one million people through the flooding of the Yellow River, and even now the decreasing productivity of large areas of that country is forcing the migration of great numbers to Manchukuo and other provinces. Do you know that the United States has in a very short number of years lost 100,000,000 acres of arable land? I should have no need to remind you of the terrible year of 1936 in North America, when the follies of the past were visited upon the helpless heads of the American population. In addition to the loss of 100 million acres already referred to, 1,000 million acres have lost much of their top soil. And as though such destruction were not enough, floods raged through the Midland river system carrying with them death and ruin.

If there is one thing that can be said about the people of the United States, it is that they are thorough in their methods. Their disregard of the principles of land culture has brought them to a sorry plight, but they are now labouring with might and main to arrest and repair the damage. The plans are now being developed represent a movement of concentrated endeavour and courage.

A friend of mine who recently travelled through the United States said to me that a large number of the farmers of the Middle West will be employed for the rest of their lives in planting areas which their fathers and grandfathers dreamed of.
trees in order to make their farms. Nor is it in the United States alone that such work is being done. In the last 10 years Italy has spent £24 million upon the conservation of her natural resources and at the moment has one million men engaged upon public works designed to conserve the soil for future generations. France has for a century and a half been husbanding her land and constantly making an effort to maintain its quality for the future.

Where does Australia stand? That will be told you in more detail by the succeeding speakers, but I want to say that the soil erosion menace has been more than a dark spot on our horizon for some years. We are now in the position in which the American people found themselves early in this century. We have yet time to save the greater part of our Continent for the people of the future. But, if we delay action much longer, we shall have a similar legacy of droughts, floods, dust-storms, and sand drift. We shall run the same grave risks as those so brilliantly yet accurately described in a progress report of the United States National Resources Committee in such words as these:

"the splendour of our bankrupt cities will become a ghastly joke."

We shall experience the reality of those deadly "black blizzards" which tear out the top-soil and hurl it through space, of those swirling floods which care neither for man nor his possessions and subside to lay bare ruin and desolation on every hand.

In Australia physical conditions and controls are remarkably similar to those of the United States of America. Both of these countries imported an agronomy from older European countries which withstood the test of centuries in those regions and which, although applicable to certain parts of the newer world, is not suitable of application to the major parts.

Methods which can be applied to areas suitable for intensive cultivation may well prove destructive to those suitable for
extensive cultivation. We must do more thinking for ourselves —
adoption, not adoption, is that is required.

Australia is fortunate in that in one generation we have seen
the sudden effects of the adoption of a wrong policy in the
United States. We have been provided with an object lesson;
if we do not turn it to our own advantage, then we shall be regard-
ed by future generations as exploiters rather than as trustees of
our great national heritage.

Nobody can live on his capital for ever! That is what we
must learn as a nation. Our soil is handed to us in trust.

If we waste our substance in riotous living, it is not only our-
selves but our children who will suffer the fate of the waster!

In these 20th century days we handy about such phrases as
"the harnessing of nature", "the triumph of mind over matter",
carelessly very often of their true meaning. The idea that
nature can be conquered and subjected seems to me to be out of
harmony with the natural order of things. Nature cannot be
conquered — she must be wooed, and if we are to obtain the best
from her, there we must be a realization of what Nature expects from
man. No one in his right mind quarrels with his best friend!

We may, for instance, replace the native scrub by wheat, but we
will find that unless we make provision we will reap not only the
profits from our wheat, but the losses from our interference with
Nature's dispensation. Interfere with Nature we must because
otherwise no development is possible; we should, however, look
for and prepare for trouble because of this unavoidable inter-
ference.

An old Spanish proverb runs: "Take whatever
you wish", said God, "take it, but pay for it". It takes
thousands of years to make an inch of soil, but it may take only
ten years to destroy all that has been so slowly built up.

Economic activities must be properly adjusted to the fundamental
controls exerted by physical and geographical conditions.

There are just as clearly laws of nature with regard to human
relations, and society cannot continue unless there is an appreciation of social responsibility. In secondary industry the idea is gaining ground that individual profit-snatching must give place to long-run stability with moderate profits— that each individual industry must have regard to the rights of other industries, to the consumers at large and to the nation as a whole. Likewise in primary industry exploitation of the land by individuals without regard to the effects of such exploitation upon neighboring properties and upon succeeding generations must be replaced by a sense of social responsibility and a regard for the future productivity of the soil. But in addition to the need for a new national conscience with regard to the land, we have to repair the damage which has been done in order that the sins of the past may not be visited upon present and future generations. There is no need for hysterical fright; admittedly the problem is both grave and urgent but it can be averted. Wild exaggeration is as stupid as careless neglect and blind indifference. The great need is for a co-operative effort on the part of all Governments and individuals to discover the extent of the damage done and being done by soil erosion in all sections of the Commonwealth, and to devise remedial measures.

I am sure that the following resolutions will be heartily endorsed by you all. In view of the grave and growing menace of soil erosion in Australia, which threatens to rob great areas of their productivity, to lower our standard of living and to undermine our national prosperity, this meeting is firmly of opinion that—

A. The Federal and States’ Governments of Australia should immediately institute surveys of the nature and extent of the erosion and soil-drift problems within the boundaries of their respective territories.

B. The surveys be conducted by competent specialists,
who shall be requested to report within six months and to submit
definite programmes of the works and measures necessary to
prevent further erosion and to restore eroded areas wherever
feasible.

C. A representative national committee should be appointed
to co-relate the aforesaid reports and programmes and to make
any alterations necessary to increase their collective value;
whereupon, the revised programmes should be adopted as the basis
of a nation-wide soil conservation plan, to be financed and in-
augurated at the earliest possible moment.

D. That, because erosion and soil drift are national dangers
affecting every Australian citizen, the Commonwealth Government
should co-ordinate the individual efforts of the States Governments;
assist them in conducting their indispensable preliminary erosion
surveys and assist them in carrying out a collective programme of
soil conservation.

E. The Commonwealth Government should forthwith invite the
States Governments to co-operate in initiating a national campaign
of soil conservation on the lines herein suggested.

I now leave it to the other speakers to support with their
expert knowledge what I have already said.

(The report of the address ends.)

THE WITNESS: I now desire to emphasise at this point that what I will
say is not intended in the least to be a criticism of past actions
of governments, government officials, leaders of industry or of
the people of this nation. What I propose to say is only with
the desire to make such contribution as I can from my knowledge
and experience to help to develop sounder and better organisation
and subsequent action. Destruction by fire, by wind, by water,
or by any other agency, natural or human, reduced the assets
of the nation and threatens the future productivity of the
country. Only a long range active policy, directed by vision and supplied with ample finance, can protect the natural resources of this country, for the present and particularly for the future generations. No such long range policy can be put into regular operation unless there is practical unanimity in the minds of the people regarding the necessity therefor, and unless the organisation is such that it carries on irrespective of the political control which naturally changes from time to time. And again, no national unanimity is possible unless the people are educated as to the inevitable results if this policy is not adopted and consistently followed. I know from experience that the people of a country cannot be educated unless facts supported by the evidence of trusted leaders are consistently and persistently placed before them. The average citizen is so busy with his daily avocation that he has little or no time to think of national measures. The average member of local government bodies and of parliaments is so busy with the details of his constituents that he cannot give the necessary time to national problems.

Ministers of the Crown in Australia and their principal advisers, the heads of government departments and statutory bodies, are so overwhelmed with detail that they have too little time to think on long range problems consistently and constructively. Anyone reading the studies of political economists will find these facts repeated and repeated as a reason for more intense organisation on long distance problems. If these facts be accepted, then let us come immediately to the problems to which this disaster to the forest wealth of Victoria has drawn insistent attention.

Water and soil are in the end source of national wealth because, without them, food and clothing cannot be provided and the nation decays in strength and in numbers.

In other countries, such as United States and Canada and again in Great Britain, and doubtless also more definitely...
in the dictatorship countries, the preservation of natural resources is being given more and more attention. These dreadful fires are without any doubt injuring the water supply of a large part of Victoria. I do not propose to enter into the controversy which has existed for a long time between the Victorian Forests Commission and the Melbourne and Metropolitan Board of Works regarding the control of certain forest areas east of Melbourne, and but without criticism of any sort I would say that this is an instance of divided responsibility. It is an example of different policies being followed by different branches of Government. If the hypothesis submitted in the earlier part of this evidence is correct, then all the regulations administered with an efficiency of 100% by the Melbourne & Metropolitan Board of Works, will not prevent the destruction of the forests on the watersheds of the rivers providing the water supply of Melbourne - because the fires will jump from forest land or marginal land or land under the control of the Lands Department, into the forests on the watersheds, and no human agency can stop these fires on fire-risk days.

(Continued on Page 1473).
There is, I suggest, a grave necessity for instituting immediately an organisation under the direction of the senior authority in Victoria, the Government and the Parliament of Victoria, to study the problems of the conservation of the natural resources of the State and their subsequent sound utilisation and development.

Co-ordination of the policies of the Forests Commission, of the Department of Lands, of the Department of Mines, of the State Rivers & Water Supply Commission, of the Melbourne & Metropolitan Board of Works, and of all other cognate authorities is obviously indicated as one studies the problem which has been partially unmasked by these fire disasters. With respect, I suggest for the consideration of the Honourable, the Premier, and the Cabinet, that a special Department of State, responsible to and reporting direct to the Premier and Treasurer, should be established and charged with the problems of surveying regularly the protection and development of our natural resources. The work of this Department would be mainly that co-ordination of policy, of submission of long range proposals, and of giving expert advice to the Premier, to the Cabinet and to Parliament. The reports of this special Department, published as Parliamentary papers for the information of all citizens, would be a powerful factor in the essential education of the people of the State concerning the protection of national assets.

From my long experience, I think I can say that few men can know better than I do the genuine service given by Ministers, by Members of Parliament, by State officials, and by officers of local government organisations for the benefit of the State. I desire to say that such comments and suggestions as I have made are not to be taken in any way as criticism. I have worked closely with the members of the Forests Commission of recent
years, and the staff of my company has co-operated with the staff of the Commission in studying the problems for the preservation and development of Victorian forests. The recent disaster seemed to us to point eloquently to the necessity for closer co-ordination between all authorities and other organisations, directly or indirectly responsible or concerned. This co-ordination cannot be achieved without a full time authority, studying and developing the policy, and taking subsequent action. The British Government has found it necessary to appoint a special Minister to co-ordinate the policies of the army, the navy, and the air force. I suggest that the parallel is complete.

**MR. GOSANS**: Can you tell us anything about scientific research undertaken to provide some form of chemical for extinguishing fires?—

In that connection, we did some work with the Forests Commission. The suggestion came from me that bitterns, which are a very cheap chemical, should be used in special circumstances to fight fire. I thought the chemical might be enclosed in cardboard bushes, which could be put on the fires. I think one of the problems is to stop the fires before the bad days arrive. Unless you do that, you are faced with a difficult and almost impossible problem. There are two great problems in this connection. First of all, there is the proper co-ordination of effort and policy, and, secondly, there is the provision of sufficient funds to do the job. My industry will co-operate to the utmost limit in any way we can in the matter of scientific research, staff, or in any other way. The subject should be regarded as a long range problem. We have had four or five instances of serious fires now, and the last has been the worst, and, if we have many more, there will be no forests left. This is our last chance, in my opinion, to save the mountain ash areas of Victoria.

I think they will be finished if we do not do something definitely.
A long range policy needs to be evolved to meet a long range problem. There is also the necessity for research work of a high class. More money needs to be available to the Forests Commission for this purpose. More money needs to be spent after discussion with the body I have suggested, which is essential to the co-ordination of the policy and efforts of all Departments of State. They should co-operate to study the whole question of the problem of silviculture of eucalyptus of Australia. These two problems are linked much more closely than you would imagine, and they involve the life history of regeneration. It is desired to regenerate areas that are eminently suitable for this kind of tree. The trees have picked out their natural habitat and have, in a sense, decided where they can grow best. The Grampians, the Bews Baws and the Strezleckies are the habitats of one of the finest timbers in the world—the eucalyptus regnans. That tree is one of the most delicate from the point of view of fire.

What is the chemical you call bitterns?—At Geelong they take salt water from the sea, put it in pans and evaporate the water. They take out the common salt or sodium chloride by crystallisation. The remaining salts—sodium sulphate, magnesium chloride and sodium bromide—remain in the concentrated liquor that is called the mother liquor or bitterns. It is one of the cheapest chemicals that could be used as something better than water. Water will not put out a very hot fire except in two ways—by hitting it so hard that it pushes the fire out, or by reducing the temperature, by using an enormous quantity of water, below the point of combustion. The whole principle of fighting fires in factories is concerned not with the volume of water but with the force of it. The other way is to put on to the fire a non-volatilisable salt which will surround the material and make it less inflammable.

That obviously has a very limited application.—That I am not able to
say. I got the committee formed, which included the Forests Commission and ourselves, and we carried out a fair number of experiments. How far the idea is practicable, I do not know. I have talked on the subject in Washington, Canada and Western Australia. Western Australia is by far the best example in Australia of the protection of forests against fire. Conditions are easier there. Roads are through the forests in many places, and it is nice, easy rolling granite country. It is possible to stop a fire within a very short time of its starting, if the lookouts are efficient. The whole principle is to hit the fire hard and quickly. At the outset, it probably covers only a few square yards, and to get on it then is merely a matter of efficient lookouts, wireless telephony and ability to get into the forests. We shall never be able to protect the asset unless we can get into it. At present I would not accept the view that it would not be better to send out trucks laden with bitters than with water to spray around the fire.

You are suggesting bitters as a substitute for water. You recognise that it would have no wider application than water?---It has a much stronger application.

But you can only apply it in the same quantities as water?---I agree.

Can you tell us anything about scientific research into the use of gases in fighting fires?---I should say it would be practically impossible.

Have you heard about it in America?---No. The reports I made when I came back, which are available if you wish to have them, give details of long conferences at Washington and Ottawa, and they emphasise that the only chance is early detection and the ability to get to the fire quickly.

THE COMMISSIONER: How are you going to get to fires quickly in some parts of our forests, in the north east, for instance?---I say that in one of the great problems. Until this country is more densely populated, and there are tracks into the
forests, I do not think there is any possibility of stopping fires. The only hope is to keep people out. I am informed that 90 per cent of fires are caused by human agency. PatROLS ought to be doubled or trebled in bad years, and anyone who lights a fire should not be fined, but put in gaol and kept there.

THE COMMISSIONER: You are getting on to the question of crime and punishment. We may have a very long discussion if you open up that subject.

MR. BARBER: As I understand it, there are times when climatic conditions are such that once a fire has started no human agency can do much to stop it.---I agree.

What do you think about the evidence we have had that the forests should be regularly burned?---I do not know. I am not an expert and I have no views at all on that. All I know is that it is a matter on which experts should be balanced against other experts, and the question should be decided according to the circumstances existing. Whatever view is adopted, it should become a policy. I cannot enter into a controversy on a matter of which I have no personal knowledge.

Apart from putting roads through the forests, do you agree that the provision of fire breaks and proper patch burning and clearing of certain strategic areas would be of advantage?---I would agree with that if the best experts on Australian forests advocated it, but personally I do not know.

I suppose you would agree that the problem in Western Australia is less difficult than the problem in Victoria?---It is nothing like so difficult.

Western Australia is an example of a comparatively easy problem?---It is easy country. It is well roaded, there are good observation points, and there are any amount of indications when bad days are approaching.

I take it that the main use of bitterns would be to stop small fires?---Where water can be used, I should use bitterns instead, so long as the cost was not prohibitive, which I do not think it
would be. The idea has not had all the attention it deserves. Any amount of the chemical is available. There are railways from Geelong right through the forest areas, and water has to be taken there. The suggestion is worthy of consideration, and I do not regard it as anything but a small contribution.

You have suggested keeping people out of the forests, at any rate in the dangerous season. You have personal knowledge of the Hume catchment area?—Yes.

What do you think of the question of allowing graziers into that area?—Personally I am not an expert, but I should say that grazing, as an industry, should not be compared with the water supply of Australia. Water is the most valuable commodity in Australia; therefore, I urge that a body should be appointed as an advisory and investigating authority to the Premier and Cabinet. It would be free of any fear of vested interests, and would decide on the policy that should be followed. The policy should be announced publicly in a Parliamentary paper and not kept for the information merely of one or two people. That is the only way to educate democracy, or what is left of democracy.

MR. KELSO: Do I glean that, from your experience overseas as well as here, you feel that it is essential that we should devise a method of attacking fires vigorously as soon as they break out?—Yes, I do. Whatever other things are done, that should be done?—That is the whole basis of the attack upon the problem in North America. The next most inflammable forests to the Australian eucalypts are the pine forests of North America. They have succeeded in certain areas in reducing the fire by about 75 per cent. They say that area patrols are all right, but that they are supplementary to lookouts. Lookouts you must have and means of communication, reading, and men.

If ten men cannot get the fire out, send one hundred, and if one hundred cannot do it, send thousands?—Yes. The principal man there said to me that the only thing we can do to save the forests is to
hit the fires, and hit them quickly.

Whatever else you do, that is essential?—It is absolutely essential.

If you can do that, and keep the human agency out, you may save the forests, but otherwise you will not.

If it is shown that burning involves some danger, would you think it worth trying?—That is a matter for consideration by all the experts available, and they should make their judgment on a logical and sound basis. It is no use for me to express views and comments about "ifs" and "andas" on a policy of that kind.

I tried to save you by expressing the "if" myself?—If, on the balance of opinion, it is disadvantageous, it should not be done.

Regarding the co-ordinating authority suggested by you, would it be an advisory or would it have power, if necessary, to over-rule all existing authorities?—It would not be a large body. It would be staffed with the highest class of men in the State and it would deal with the broad policy of protecting the national assets of the State. The chairman, or head of the Department, in reporting direct to the Premier, would have power to call together not less than once a month the heads of Departments and other advisory experts. Thus he would be able to achieve a policy. There is a noticeable absence of policy at present. He would say to the experts "Here is my programme, which I am going to submit to the Premier". It would be published as a Parliamentary paper, once the Cabinet or the Premier, with the authority of the Cabinet, had authorised it. When that had been done, it would be obligatory on the heads of Departments and others interested to see that it was carried out.

By enactment?—If necessary.

You are aiming at a centralised scientific authority to advise the Government concerning the problems of fire prevention, erosion, conservation of water, and watershed control?—I do not think the people of Victoria realise what is happening...
to the water supply of the State as a result of erosion and the destruction of the forests, combined with the absence of any real considered policy. We are throwing away the most valuable thing Australia has - water - and allowing it to rush to the sea. We are taking no care or consideration of anything connected with it. Until the people wake up and say that something must be done, the danger will increase.

We have to look forward to a population of four, five, six or ten times as many as we have today. The absence of public appreciation or the growing danger is appalling. It is an insidious menace. Everyone is so busy with business, sport or something else that they do not take any notice. The authority that I advocate will have nothing to sell. It will be able to stand up against grazing, parliamentary, social and other special interests. The chairman will have to say at long range which policy is right. He will have to decide between the different heads of Departments. With his colleagues, he will have to state a policy in a Parliamentary paper, so that it cannot be suppressed. It must be published, and the newspapers must do their job by putting it before the people. That is why I have used the phrase "Consistent and persistent education of the public".

I do not suppose that in your reference to carelessness, thoughtlessness and forgetfulness, you would suggest that the Board of Works, in its particular area, is in that category? Do you think it really does its best?——— I make no suggestions of that kind. The only point I put is that there is definitely a difference of policy, and there is need for co-ordination.

What do you consider is the difference of policy?——— One difference is that the Board of Works declines to allow timber milling in its areas. That is what you consider a difference of policy?—-Yes, but I do not say whether it is right or not.

There is not a difference of policy as to how a forest should be managed to maintain its water - that is to say, to manage it other than
as an industry?—I would suggest that there is some reason for belief that if the crop of timber was garnered regularly, it would not only better for the area but would also be of value to the people who own the area, and that it would not increase the danger of fires, if properly policed.

Have you seen a milling area after it has been milled?—I have.

Do you suggest that it would be a proper state for a watershed area?—

I do not suggest that it is the right way to mill.

How can you get timber out of a forest without introducing the danger of pollution of the water supply?—The Forests Commission maintains that you are wrong in your policy, and you maintain that you are right. The only thing I am suggesting is that there should be a senior authority representing Parliament and the people to make decisions when there are differences of policy between such organisations.

That is a function that Cabinet exercises at present?—I think at present that no one in this country has time to think about the real danger.

Do I understand that your co-ordinating authority will really be a high advisory authority?—They will be continuously there to see that their recommendations are given effect. There is a big difference between a continuing authority and a Royal Commission, which makes its report, and that is the end of it.

(Continued on Page 1468).
THE COMMISSIONER: Do you mean that that is the end of the Report?—Very often it is the end of everything. In the case of a man in an independent position, he cannot be moved except by resolution of both Houses and that would be necessary in the case of the senior officers in this Department. He could keep on saying in his first, second, and third report "I desire to reiterate so and so". Sooner or later the people of the State would wake up and insist that it be done. Everything that is wise is unpopular.

MR. KELSO: That is a very wide generalisation. In connection with dugouts, are you familiar with the system that is actually in operation in London, or is proposed to be put in operation— the dugouts have been built—for the protection of the people. Do you think that these dugouts should not be ventilated; that their capacity should be calculated to protect and maintain people for the longest expected time. In other words, do you think that the better solution is not to ventilate the dugout at all and to absolutely exclude all gases?—That may be a good thought; I would not like to say.

You said that there must be some ventilation?—I was remembering that in some cases they were in the dugout for 24 or 36 hours during the last fires.

It could be calculated if necessary?—I am afraid an enormous dugout would be necessary.

That is so if the people had to be in the dugout for 36 hours but do you think it would be necessary to construct the dugout so as to hold the people for that length of time?—If you have a fire in a certain area and the wind changes 20 or 30 points, and then creeps a bit further to the west, and then back to the north, you might easily have a long period; I do not know.

In nearly all of these areas the fire danger was over on the day itself, I believe?—I suggest that you have your experts and a
very fine body of men in the senior officers of this State Department to whom these things should be put and definitely decided on the balance of opinion as to what is the best thing to do.

It might be that no ventilation in dugouts would be the better course?---

It might be so.

THE COMMISSIONER: I can tell you, Sir Herbert, that I am not going to design the dugouts. I might suggest that they be made compulsory, but I will leave the design to wiser men, men with more knowledge of those matters?---I am putting it that there should be co-ordination between various people, all of whom have some knowledge of these matters. That would be a wise idea because you would then get the best knowledge in this State, from various points of view.

We have invited these public servants with so much wisdom to attend, but without very much response?---May I submit some maps to the Commission. They are simple but they will illustrate what I have spoken about.

Will you leave the typed script with the Commission. We will have a copy made and return it to you?---Yes. I have here another map which gives a general idea of the check and the sudden expansion of gases which occur in a coal mine.

I have heard a lot of expressions from non-scientific people along those lines; they say that a ball of fire actually precedes the fire, emitting sparks.

MR. HARDY: In regard to safety matches being dropped in the forest by accident. Do you think there is any possibility of those matches being ignited in a temperature of about 150 degrees?---I do not think so; but if the Commission is interested, I am quite sure that Bryant & May's would be able to supply that information.

I would say, no, from my own general knowledge.

The question arises from experiments carried out by myself in burning holes through both dead and green eucalyptus leaves in a shade
temperature of about 80 degrees. The ignition of the safety matches was instantaneous where it was only about 60 degrees in the shade?---It would be easy to clear up by putting the matches in an oven and then raising the temperature gradually to see the result.

THE WITNESS WITHDREW.

ARCHIBALD GEORGE CAMPBELL: Sworn and examined.

MR. GOWANS: What is your full name?---Archibald George Campbell. I live at Kilislyth, and I am a teacher in nature study at the University Extension Board.

THE COMMISSIONER: Are you the gentleman who wrote to the Commission in its early stages?---Probably.

MR. GOWANS: I understand that you have some evidence you wish to give the Commission?---Yes. Both as an agriculturist and as a naturalist I wish to make a few remarks on the practices and the condition at Wilson's Promontory, National Park, as observed by myself, the object being to show somewhat in the way of an allegory that firing for grazing represents the ordinary practice of perhaps twenty or thirty years in this locality, and may be, is the ordinary practice in Sipeland as well.

During a week's walking tour in May 1937 with a small party I was astonished to see the almost unbelievable destruction of forest and scrub in this National Park. I inquired of the ranger what was the cause and he said "They burn under control to get feed for grazing, the main source of income". I wrote to the Committee asking whether they knew of what was to me the destruction of their asset, scenery and forest, but I got no reply. On meeting the Secretary, Mr. Kershaw, one day in Russell Street, I asked him whether he had received my letter and he produced it from his pocket. He said "We burn under control for grazing". I asked "What seed do you sow".
He said "None". On the sandhills section of the Park I was sufficiently interested to make a count of the plants on the area that had been obviously burnt some time. Marking off a square rod I found that 72 per cent. was bracken ferns in that little area, and the rest dandelion, cottonwood and such like, all of which would have been blown on to the spot on the wind once it was burnt. The unspoiled section of the land not far away gave a rather interesting selection of flowering native shrubs and heath. The rich variety known as the Sandringham flora, one of the attractions to visitors, and of course, one of the pictures that nature herself puts on the unspoiled portions. I have a list of the plants and the percentages and a note at the bottom that burning has replaced all but the last named, i.e. dandelion, with bracken fern. Being an agriculturist and speaking of the matter as a business proposition, I fail to see where they had gained their objective in grazing. There is no secret about this fire — cum — grazing in the park. This year I am informed that the area has been two-thirds burnt. I produce a copy of the letter I received from the Secretary for Lands which is as follows: "End May, 1936, To the League of Youth: In respect of the reserve at Wilson’s Promontory. I am advised that the grazing lessee is permitted to burn off in specified areas at certain times during the year under the supervision of the Committee’s officers. I know of no provision where the lease is automatically cancelled where the lessee is found to be responsible for the lighting of fires, but cancellation may be the penalty decided upon by the Committee. Signed W. McIlroy."

My own plea is that this Park was given to the nation about 1908 for the health and the inspiration of the people. It is a place where unique Australian flora and fauna may be preserved.
I note also that R. H. Croll in "The Open Road in Victoria", 1928, stated that behind Oberon Bay there was a forest with a bear in almost every tree, and that the Trustees said there were 10,000 bears, i.e. koalas, on the Premontory. I submit a map showing the unique triangular position of the Premontory which suits its natural purpose.

THE COMMISSION: I have read the books which you refer to?—In the space of ten years we find there is now no forest behind Oberon Bay, and instead, long horned Gippsland cattle may be seen and a change in the face of the country.

MR. HARKER: So that I may follow you, will you tell the Commission where Oberon Bay is situated?—It is on the west side. The two areas marked in red on the map show the areas to which I refer. In the space of ten years that aspect has disappeared and I say again that from a business point of view I fail to see the gain. I also submit two pictures taken at a point marked "Saddle" about the centre in the red area, looking west and looking east.

If I can answer a statement before it is made—that all of this burning occurred before the Trustees took over 30 years ago I would like to absolutely deny that that is so. Being able to read the country, I should say that the last big fires there previous to 1939 occurred in 1932. If you will look at the picture closely, you will see where regeneration has occurred in the forest, but those places, too, have been burnt again. For what object? From what I can see, not more than to get a crop of rubbish and such crudities, referred to by the bushmen as rubbish, fireweed, bracken, etc., and all of those various things that blow in on the wind. That remark applies to the afforested lands that I have seen in other parts of the State also.

The area about Oberon Bay that I have referred
to is no longer a national park; it is a national pasturage.
I contend that in this particular area the motive is plain.
It is said that bush fires do good, that they clean up the
rubbish and bring the grass. I think that is entirely
erroneous house focus, especially in the National park. Fires
destroy not only the highly organised timber and growth, that is,
the primitive bush; they burn up the natural humus matter of the
soil, the very makings of the soil, cause violent erosion and put
back the country one thousand years. I do not know whether this
is actual evidence, but a neighbor who has been on the spot after
the big fires recently told me that two-thirds of that area had
been swept again.

THE COMMISSIONER: I know a young man who was there just before the fires,
and he found it expedient to come go home by boat. He said it
was impossible to get through in any other way when the fires broke
out?--I include in the burnt areas, the neck or isthmus. You
will notice that north of the fence there is a lot of Crown land
known as Yannakie. The fires occur quite frequently there.
Referring to my neighbour's visit to the Promontory, he said that
on going down there about January 25th there was no sign of fire
on the isthmus but by January 31st, there was fire on the side
of the road.

What would you do to prevent that?--Prohibit grazing under licence on
Crown lands. I have heard some interesting matter this morning.
My main point is in relation to the economic side. Whilst I have
a regard for the present Government and the government departments
for the way they tackle problems, I say that while they have open-
air names, they have not open-air practices. From the economic
point of view, there is what is known as security. There is a
security of tenure about these Departments that is remarkable.
John Citizen wants his money's worth and I think he should demand that he has some security for his natural and his national assets.

What do you think mean by the security about those departments?---The security of tenure in the positions in those departments which is utterly remarkable in economics. I am a bit democratic myself, but in this country I think it is remarkable that we have the security of tenure in those Departments. I say that John Citizen should demand the same security.

Do you think that security of tenure is a good or a bad thing?---It is a good thing. It is aimed at and is one of the chief objectives in economics. I maintain also that we have good men in every Department. I maintain that we have as good an opportunity as any to carry out the work and we would have the results if the work was carried out in a practical way. Further, I would be prepared to argue that we have the regulations necessary, if they were only carried out.

In some parts of Victoria, but in other parts it would not be possible to burn at all if you abide by the regulations?---In my district I see the ordinary practice as well.

Like a lot of other witnesses you suggest that the graziers should be kept out of the forests. Would you keep out other men also, such as prospectors, campers, and walkers?---Do you mean out of Crown land?

Yes?---No, not of necessity.

Do you think you could keep the graziers out?---Yes. The Victorian Walkers' Federation prepared an interesting scheme in regard to the primitive areas in at least two grades. You will see outlined in the pamphlet which I submit their views and objects, including reference to the erection of hostels and so on.
MR. GOWANS: Apparently you suggest that graziers should be kept out of forests because they have an economic interest in lighting fires?---Yes, that is the motive.

You know that prospectors light fires in order to find their way along creeks and carry out what they call "Locam operations"?---To the destruction of the forest?

Yes?---They come under the same category.

THE COMMISSIONER: What about the anglers; they burn out great lengths of creek and river frontage to get along more easily.

Would you put them out?---I would give them a little bit of education and see where we got to, so that they might come again.

You are not suggesting the severe type of education, such as going straight to gaol without the option?---No.

In other words, you suggest that men who will light fires in the forest should be prohibited from entering it at all?---I think if they were duly punished and looked on as a kind of outlaw, this quite small minority or perhaps five or ten per cent. would learn their lesson.

We will not discuss these matters of punishment or they will get us right off the track, but I doubt very much whether punishment educates anybody. Will you take the photographs and leave the other matter for the Commission?---I know it is the common practice to light fires to fight fires, but I think that is based on entirely erroneous ideas, because in the summer time when the temperature is high it raises conditions, by artificial or human means, to the explosive point.

MR. HARDY: The burnt out locality on Wilson's Promontory is where Fraser's Creek is situated?---Yes, Fraser's Creek and Growler's Creek.

That is where the initial scientific excursion of field naturalists camped—the excursion which led to the preservation of the Promontory as a National Park?---Yes.

1500.

CAMPBELL.
How far back does your knowledge of the Promontory go?—Not before May 1937.

You spoke of the original condition of the country at the back of Oberon Bay?—As I would imagine it and as I have read of it.

It would probably be the same as when the nationalists' excursion was camped there and complained of being kept awake at night by the koalas in the forest trees around the camp. You say that it is all gone now?—Being rather observant, I found two koalas.

Would you give any credence to any statement that the fires were not caused by gr zi ers, but by tourists and pedestrians?—No.

I quite recognize that it is difficult to make the connection between the leases and the fire, but I would say that wherever there is a grazing licence on Crown land, by an invariable and damming coincidence, fires occur.

The fires in the Wilson's Promontory are admitted by the Committee?—There is no secret about it.

THE WITNESS WITHDREW.

DAVID WILLIAM ROBERTS, Secre and Examined

MR. GOWANS: What is your full name?—David William Roberts; I reside at 23 Albert Street, East Malvern. By occupation I am a timber inspector employed by the State Electricity Commission of Victoria. I have been occupied in that position for 17 years.

I take it that your work takes you over the whole of Victoria, wherever there is timber?—Not over the whole of Victoria but in all timber areas.

I understand that you have prepared your evidence?—I did not know until yesterday afternoon that I was to be called on this morning. I have written down a few notes on which Counsel may be able to cross-examine me. They are not as good.
(Reading) "Fires could be minimised by a more thorough practical method of cleaning up all cut out areas such as sawmill sites where thousands of tons of waste materials are allowed to remain on the floor of the forest after sawmillers, sleeper cutters, pole and pile cutters, have been operating.

It is absolutely impossible for new fresh growth of eucalypt to survive for very many years amongst such enormous dead debris. Such areas may escape perhaps for 10 or even 20 years, but sooner or later they will be swept by fire which will destroy everything on those areas. The damage done to that area of young seedlings would be far in excess of the cost of clearing that particular area if that area were allowed to come to maturity. Now, seeing that the Forests Commission is desirous of maintaining a continuous supply of timber in perpetuity, what are the best means to adopt in order that the remaining mature timber and all young growth should be protected.

It must be admitted that it is useless growing timber if you cannot protect it against fires. By protecting your forest against fires you are also protecting the forest worker who has in the past been a sadly neglected individual.

Fires are fiercest in areas that have been milled over or cut out by other forest workers such as sleeper cutters, and various other workers, owing to the enormous amount of useless material left lying about the cut out areas.

(Page 1503 follows)
I suggest the following remedies:— The Forests Commission to be divided into three Departments. One, commercial or utilisation department; two, reclamation department; and three, reforestation department. The commercial department to deal with all matters appertaining to timber products and their utilization. The reclamation department to consist of a chief who must be practical in all matters appertaining to the reclaiming of all areas that have been cut out and are in a fit state to clean up. 75 per cent. of all moneys from loans and grants to be spent on this branch of the service for at least twenty years. This branch to be mechanically equipped with the necessary gear and material to economically operate on all cut out forests, and to be responsible for all burning in the various areas throughout the State, on which they are operating, at the most suitable time of the year. This department to consist of 100 per cent. practical men who have had as their training
ground the forest mills. After the areas have been cleaned up of all logs, dead standing timber and anything that will jeopardise the life of a young forest, such areas to be handed over to the third department who would be entrusted to utilise all their scientific training in the propagation of young forests which would have a 100 per cent. chance of surviving. In a dense forest of young eucalypts there would be a very small chance of big fires ever taking place, because there would be no heavy fuel to feed them. Ten times the amount of good would be done if the forest floor were entrusted to an independent body of experts whose sole object would be the preparation of the areas, cut out od commercial timbers, for future regeneration. Ring-barking of thousands of trees as now carried out by the Forests Commission are a potential danger to the forests, as they only become, when dead, good fuel for forest fires. Thousands of deformed growth trees from six inches to three and four feet in diameter are ring-barked by unemployed xxxxxx relief men every year, later to become a menace from a fire point of view, also a breeding ground for white ants to the detriment of young healthy trees. Forestry officers in charge of districts where large sawmilling operations are carried out should invite the co-operation of all mill owners and managers to discuss the most convenient time of the year to make the necessary safeguards to protect the employees engaged in forest operations. This is most essential as mill owners or managers are more familiar with the local conditions than a forest officer who may only have a vague knowledge of such conditions.

Forestry officers might be transferred from another district and the conditions prevailing there might be absolutely foreign to him.
"Such conferences with local landowners adjacent to forest country is also essential as their interests must be conserved as well as the interests of the forests. Crown lands which chiefly consist of a lot of poor timbered country, very often owing to its very dirty state, are always a potential source of fire danger. These areas should in summer time, be policed by Crown land rangers who should be compelled by law to keep such Crown lands reasonably clean where they adjoin private settlers or forest reserves. Private landowners in many places throughout Victoria live in dread every summer of fires from adjacent Crown lands burning them out. It should be someone's responsibility to see that these areas are burnt every year at the correct time to ensure safety. Landowners who own dirty scrub country should be compelled by law to keep it clean, and it is only a breeding ground for rabbits and noxious weeds. Bugouts at sawmills should be part and parcel of mill equipment, and should be designed to meet the requirements of all employees in or adjacent on the area. They should come under the supervision of the Factory Inspector who visits these areas periodically. Fire breaks through forest areas, in my opinion, are useless in helping to stem a forest fire, and very often serve as a sense of false security to those engaged in fire fighting. They also act as traps for tourists to visit danger spots in forest areas, where the careless individual may cause a conflagration. It should not be lawful for any man to erect a sawmill on either Crown lands, forest reserves, or private property without conforming to certain safety measures for the protection of the employees thereon. More visits of inspection by the heads of departments should be paid to the various districts throughout the State, and not only to the officer in charge of the district. Commissioners should make themselves more.
acquainted in detail with the manner in which operations are
carried out in the forests. Forestry officers in charge of
districts are in many cases very lax in their supervision of
men and a terrible lot of young timber has been destroyed in
the past through their laxity. What I mean by laxity on the
part of the Forestry officers is that they are not sufficiently
experienced in the knowledge of what a tree should be kept for,
and the results are that indiscriminate forest employees cut
thousands of young trees into sleepers which should be conserved
for other purposes. Forests as they exist in Victoria
have been ruthlessly cut over to obtain the most valuable
species, and the less important species have been left. Sooner
or later the various Government departments will be compelled
to either abandon the use of timber, or resort to the less
durable of these timbers. I say definitely that this is a
wrong policy, as it has meant that our red gum, iron bark, and
yellow stringy bark forests are sadly disappearing from the map.
With scientific treatment quite a lot of these inferior timbers
could be made suitable for service. One department that I am
acquainted with spends in the vicinity of £100,000 a year in
the purchase of timber from other States, most of which could
be retained in the State if proper scientific treatment was
provided. If our forests were worked and utilised in a
proper systematic manner they would be easier to control and
re-afforestate. Water catchment areas should always remain
under the control of the Metropolitan Board of Works and the
Water Commission, whose officers should see that such areas are
kept free from fire, by insisting on the Crown Lands or
Forests Commission the necessity of keeping all areas
surrounding catchment areas reasonable clean. All ridges
and areas containing messmate, gum, and peppermint where
they surround mountain ash areas should receive special
attention. This is where the Department with its staff of practical men would come in, as all the danger areas would be paid special attention, and the more thickly timbered areas of mountain ash protected by a surrounding burnt area. This is what might be termed patch burning. The conclusion I have arrived at is this, forest fires, no matter what penalties are imposed, will always appear at intervals of a few years, and the only thing to minimise their danger is by creating a body inside the Forests Commission jurisdiction, composed of more practical men to work in conjunction with sawmillers and graziers in the periodical burning of danger spots throughout the State."

MR. GOWANS: Those views are based upon your experience?—Yes, years of experience.

In the course of that experience did you find that any steps were taken by the Forests Commission or its officers to see that timber mills and sites within its areas were cleaned up after milling operations had ceased?—No. I do not know of any mill area that has been cleaned up in the Victorian forests at all.

What do you mean by "cleaned up"; do you mean the heads?—I mean where milling operations take place are usually in areas of valuable timbered country, and after the timber is felled there are thousands of tons of the heads of those trees left lying about on the area. The mill moves away and the scrub and young seedlings come up amongst all those logs and debris. I say a fire will eventually take place and destroy the lot.

We know that where a mill is actually operating steps are taken to see that the heads are burnt off periodically?—I do not agree with that.

Where are the worst areas, from the point of view of mill sites
being left in a dirty condition?—The mountain ash areas in the Erina and Noojee districts. Around Woodside there are only three sawmills, but in the other areas I have enumerated there are numerous sawmills.

How long is it since you have been in the Erina and Noojee districts?—I cannot say the exact date, but I usually visit those areas two or three times a year, perhaps more. Sometimes I have been up there numerous times in a year, according to what I am procuring from the mills.

Have you found that condition existing there during the last twelve months?—Yes. The condition would be hard to see now because the fire has swept through and it is clean, but it is there in the Cape Otway district. I was there only the week before last and I went out into a blue gum area about twelve miles out to a mill operated by a man named Armistead and his area had been burnt over. Of course, they burn the heads of the trees but the logs are left lying there. They were there in the original state before they were burnt.

We have had it said by Forestry officers they do in fact see the heads of trees are burnt. I think we also had the evidence from the District Officers at Erina and Noojee?—Yes, but you will find it is not carried out throughout the State as it should be. I do not think the burning of the heads is sufficient.

You mean they are not sufficiently burnt?—No. I think it is really a superficial burning, that there are millions of tons of dry logs which have remained for years. Once a bush fire takes possession of the country it becomes that hot it creates a crown fire, that is a fire through the heads of the trees because the heat is so great on the floor of the forest.

When you were talking about this dirty condition in milling areas,
were you referring to the mill heads or something else?-----

Everything not cleaned up by the use of proper systematic mechanical means. I do not mean unemployed men from Melbourne as it is impossible to clean up without mechanical aid. In the first place it is far too costly and you would want the National Bank behind you.

When you read your evidence I was not quite sure whether you were advocating the putting through of a light fire to clean up the forest periodically?---I think that light fires at the proper time of the year, in the autumn, providing they are properly controlled and under the supervision of proper men are not dangerous, and I do not think they are a menace to the forests, providing the fires are on the ridges and in clear country surrounding the more valuable timbered areas.

You would not put a fire through an ash forest?---Decidedly not.

Do you think a fire does harm to stringy bark and messmate?---No, forest fires in my experience do not. All fires destroy the forest life to a certain extent, but there is not the same amount of damage done to a stringy bark forest as to an ash forest.

It is said that once a fire goes through even a messmate or stringy bark forest, even a light fire, you see the effect of it in the timber that is cut afterwards. You should know that?—-There are traces of burnt butts and dry rot, and different fungus growths taking place in different patches of the trees; but that is infinitesimal in comparison with the enormous amount of damage done to an ash forest, which is completely destroyed.

Do you find the effects of even a light fire in the actual internal composition of a piece of messmate or stringy bark timber?—-No, a light fire does not do any harm to those forests. As I say, there are thousands of trees standing in the forests that have been grown over, have decayed and are
hollowed, the fire gets into those hollows and burns them out, but a clean tree has a chance of surviving; in fact it has every chance of surviving.

I understand there is one class of danger, that is the fire will burn through the outer bark and thus destroy the tree?—That will never occur in a mesembate forest with a light fire.

Is there any danger to the internal structure or composition of the tree itself?—No, not with a light fire; it will not hurt the mesembate at all. I have seen trees milled immediately after, or years after heavy fires, and the timber is in a good sound condition. It has been all that was desired.

MR. BARBER: I gather you agree there should be no fire in ash country?—Yes, I think that it should be the forest policy to keep fires out of ash country as far as possible.

What about burning for protective purposes, or any other purposes in ash country. Do you agree those sort of fires should be kept out too?—I agree that fires should be kept out of ash forests wherever possible. The burning should be done on the ridges adjacent to the ash forest.

Burn the cheaper timber surrounding?—Yes, decidedly so.

You realise that a number of mills are in ash country?—Yes.

What about the burning of those heads?—I say they ought to be burnt under the supervision of the Forestry Officer; but the burning of the heads is not sufficient.

You suggest that heads should be burnt even in the ash country?—Yes, they should be.

They should be raked together and burnt?—I do not know about raking them together. I think men should be put on to lock them together where they should be burnt. It is no use sticking a match in the head of a tree and leaving that to burn. Men should be put on to chop them into small lengths, heap them in a clean patch and burn them?—I think the whole of the residue should be cleaned up.
As I understand you you are putting it that not merely the heads, but all the tops, old logs and everything round the mill should be treated in this way, chopped up, heaped and burnt?—

There would be no occasion to do much chopping if you had mechanical units to pull the heads into ravines and clear the hillsides. There would be no difficulty, especially after a fire had been through.

Now you are asking all this debris should be carted away from the mill, taken down to a ravine and there burnt?—There is no occasion to cart it to the mill.

Cart it from where it is?—I suppose you would term it carting, but I would use a different term. I say that tractors should snag these things along. Half a dozen tractors would do more work in a month than one hundred men would do in a year by manual labour. By this mechanised method of handling timber on hillsides, and clearing your slopes, when the growth comes up it has a fair chance of surviving.

How much of the actual wooded volume of the tree is left behind after the good log is chopped and removed?—If you take the volume I should say there would be about ——

Over 50 per cent.?—No, I would not say that, because if it was a good tree you would get 70 per cent. in the main log, and the branches would not take up the other 30 per cent.

Previously you said something about having the National Bank behind you; are you suggesting this complete clearing of everything should be done annually or only when the mill ceases?—I think it should be the continuous policy of the Forests Commission. A branch should be established inside the Commission with practical men, operating the whole year round according to the finances at their disposal. Their duties would be the reclamation of all areas for the purpose of regeneration.
Do you want the burning and clearing round the mills to go on the whole time?---I want it to be a continuous policy on areas that are already cut out, not on areas that are being operated by a mill; I want it to be on areas that are finished with.

I take it you are not interested in the areas while the mills are operating, but only where the mills have been?---Where mills are finished. A mill may be finished on a ridge and all the ropes, winches, gear and everything shifted to another site. There is nothing to prevent the Forests Commission reclaiming that area. It is no good growing timber on that area before it is reclaimed.

That is a matter of finance, and all sorts of other things—a policy?---Yes, decidedly a matter of policy.

Your great complaint is the lack of practicality in the Forests Commission?---To a great extent.

You have met a number of them from time to time?---Yes, they are fine fellows in so far as their scientific knowledge goes.

Where are we going to get these 100 per cent. men? Men like yourself and others from outside the Forests Commission?---I think there are many men who have had their training ground in the mills and who have been providing timber. They are between 20 and 25 years of age, but they are admirably fitted for that class of work. They are not given a chance.

You know what I mean when I refer to gum veins in messmate?---Yes.

Is it your view that gum veins in messmate are caused by the effect of fire?---No, it is not.

You do not agree with that?---No, I do not.

How do you think they are caused?---I think it is a natural characteristic of the timber.

And not increased or caused by fire through the messmate country?---No, I do not think so, because I have been through messmate
country that has never been burnt, and the mesmate there has gum veins.

How do you know it has never been burnt?—There is always evidence of burning.

It is country that to you does not appear to have been burnt?—Apparently it has not been burnt, anyhow not for many years.

Turning again to the leaving of debris in the ash country, the ash country is always high?—Yes, it grows at a fair altitude.

It is always high?—Yes.

Does not this debris in most cases become damp and eventually disintegrate and help form humus?—Yes.

Do you agree with that?—What I call humus is not logs.

Do you know that the debris which is left behind at mills will rot in the course of time?—Yes. Logs will also rot if you leave them long enough.

You do agree the smaller part of the debris will rot?—Yes, decidedly so. The leaves and falls from the trees should, in my opinion, not be interfered with as they form the humus on the floor of the forest. I am not in favour of interfering with that, but I am in favour of getting rid of some of the big stuff.

Do you think the leafy parts of the tree that are left behind are a menace in ash country?—When a tree has been felled for two or three years, if there is no fire, that automatically decays and becomes humus.

Surely they decay after one winter?—I do not class them as a menace; leaves are nothing, it is the logs.

You seriously suggest that heads have not been burnt in the Noojee and Erica areas?—As a matter of fact I do not think sufficient attention is paid to any areas as far as burning is concerned.

Are you seriously suggesting that heads were not burnt during 1938 in the Erica and Noojee district?—In 1938 I say there was no systematic burning.
THE COMMISSIONER: When you say 1938, is that January twelve months ago, or December last?—January twelve months ago.

MR. BARBER: The heads were not burnt?—Not systematically.

What do you mean by systematically?—It is no good burning one head here and another a mile away, and leaving the rest.

Of course, I am not suggesting the heads were burnt immediately they were cut, because you could not do so; but in 1938 were the heads that had been left during the 1937 cutting cleaned up?—I would not say they were all cleaned up.

Would you say they were not? You are making allegations?—I say definitely it is not the practice of the Forests Commission to burn in mill areas that I have had connection with.

You are serious in that it is not the practice of the Forests Commission to burn?—No, not systematically to burn the heads of any milling areas.

This word "systematic", what do you mean by it? I put the question "burning" and you keep answering "systematic burning".

THE COMMISSIONER: Mr. Barber, which do you mean? Do you mean systematic burning or unsystematic burning?

MR. BARBER: I was asking the witness whether the heads were burnt.

THE COMMISSIONER: He is using a very well-known word quite clear in its meaning. Every time he uses it you take exception to it.

MR. BARBER: I take the exception because I asked him whether the heads are burnt—-

THE COMMISSIONER: He says they are not systematically burnt.

MR. BARBER: Exactly. I am asking him how he uses it. (To witness): In your view what is the objection to the Forestry practice?

I say definitely there is no systematic policy of burning off each year on sawmill sites, of all debris on that area.

Can you give me some instance of a mill that has not been doing it?—I could name a dozen of them if I liked.

Name a couple?—Collins's mill at Woodside, The Northern Timber Mill,
Lrica, and Morgan's, Lrica.

THE COMMISSIONER: What about Bizard's mills?---Bizard's mills have been reorganized. I have not been to the new mill that has been built.

MR. BARBER: Can you name a mill in the Hoojee district?---Gunn's mill at Hoojee, and Goodwood, which I think belongs to Flatman.

MR. KELSO: I am just wondering if you have really considered the question of messmates being resistant far enough. I accept what you say, that a well-grown messmate tree will stand a fire fairly well; it may or may not be damaged as to the timber. If you only have one fire through a messmate area you would probably get away with it; but I am going to put to you the case of persistent firing with regard to trees that are well-grown.

What is your opinion about maintaining a perpetual forest if you burn it every few years?---I am not in favour of indiscriminate burning, just setting it on fire and letting it go anywhere.

I am not talking about what you suggest as a possible way of doing it.

It has been suggested to this Commission that a messmate forest, or a thick barked forest could be regularly burnt and still maintain a forest perpetually. You do appreciate to maintain a forest you have to have young growth coming along?---Decidedly.

If you had a fire every four years do you think that you could maintain a forest perpetually under those conditions?---In that case, I think that patch burning is the ideal method.

You would not broadcast burn the messmate forest either?---No.

You would agree with me that if you burnt generally that not only the ash would be destroyed but also the thick barked species, because you destroy the seedlings?---You must not destroy the seedlings. That is my object in patch burning where seedlings are coming up. You should burn round them.
In a fairly extensive patch you will ultimately destroy the forest?---
Yes, but if you burn a patch at a time the patch adjacent will produce seedlings one year and another patch the next year.
But if you generally burn broadcast do you not agree with me that whether thick barked trees or otherwise you will ultimately destroy the forest?---I am not in agreement with indiscriminate burning every year at all.
When we say indiscriminate, it may be with discrimination but fairly broadcast over wide areas, and then even the thick barked trees will not stand that treatment?---They will not stand it year after year. There are pockets in the trees that catch alight and enable white ants to enter into the timber.
Also it destroys the young growth and you do not get perpetual forests?---
No.
MR. GOWANS: I think you would like it to be understood you did not proffer your evidence today, but that you were sent for?---Yes.
THE COMMISSIONER: You were called here by the Commission; you did not volunteer to come?---That is correct.

THE WITNESS WITHDRAW.

LUNCH ADJOURNMENT.
UPON RESUMING AT 2.20 P.M.

THE COMMISSIONER: I had better say now I have just been in conversation with Mr. Strom of the State Rivers and Water Supply Commission, and my suggestion is that we take his evidence on Tuesday next. I think it will engage us for most of the day. I would suggest we do not call any other evidence on that day, as we do not want witnesses waiting about if we can avoid it. If we devote Tuesday next to the evidence of Mr. Strom I think it would be suitable. Would that conflict with the plans of anybody else — I do not see why it would.

MR. GOWANS: No, I understand it would not. Tomorrow we will be taking the case of the Bush Fire Brigades, also the case, or part of it, of the Lands Department, and one other witness.

THE COMMISSIONER: Can you indicate the form that the Bush Fire Brigades' evidence will take?

MR. GOWANS: I have received a communication from them, with a case, which I have not had time to peruse, but I understand Mr. Swindon is proposing to give evidence and I think that he says the Treasurer, Mr. Campbell, will also follow him. Your Honour will also see there is another suggestion contained in that letter as to evidence outside Melbourne.

THE COMMISSIONER: I saw a rather ominous paragraph in the paper this morning, that I should set forth on my journeys again to watch the Bush Fire Brigades at a demonstration somewhere in the country. We will have a chat with Mr. Swindon about that.

MR. GOWANS: I think it will be convenient to have the State Rivers & Water Supply Commission case on Tuesday, followed by the Board of Works on Wednesday, and the Forests Commission case as soon possible after the Board of Works case.

MR. COMMISSIONER: We also desire to call one or two experts ourselves; do they follow on that week?
MR. GOWANS: I understand so, if the Forest Commission case is completed.

THE COMMISSIONER: You want to call them after the Forests Commission case is completed?

MR. GOWANS: If possible. It do not think it absolutely necessary that should be done. If the Forests Commission cannot go on we can fill in the time by hearing the experts; but if the Commission is ready to go on, I think, subject to what you say, we should have the experts afterwards.

THE COMMISSIONER: Except that there may be something Mr. Barber may want.

MR. BARBER: I think they should go before us.

MR. GOWANS: I understand from Mr. Kelso that he would like to have everybody else's case go before his.

THE COMMISSIONER: It does seem a fair suggestion that no expert evidence should be called before the evidence of these two Departments, if I may so describe them, is completed. There may be theories raised with which they do not agree and which they will want to combat.

MR. GOWANS: On the other hand if the Royal Commission takes the evidence of these experts first, before we hear what the case for the Forests Commission is, we will be in the position of having no experts to refer to afterwards on the question of what is thought of that case.

MR. KELSO: I think Your Honour has a fair idea of what our cases are now.

MR. GOWANS: I have not any idea at the present time as to what the case for the Forests Commission is. Mr. Kelso can speak for himself, as to the Board of Works.

THE COMMISSIONER: I think I have a fair idea of what Mr. Kelso's case may be, and also as to Mr. Barber's case.

MR. GOWANS: I would not like to guess too much at it at this stage, especially with regard to future policy. One can get some idea of the past policy from the Report; but the
future policy is a totally different thing. That is why it may be desirable to have the evidence of independent experts afterwards.

THE COMMISSIONER: I think perhaps you are right, but we might work it fairly in this way: we will call our own experts last. If they raise some theories which the other parties wish to combat, those parties will be at liberty to do so. That is only fair.

MR. GOWANS: I think that would be the best course to follow.

THE COMMISSIONER: They could answer the case, if they thought there was one to answer. We could call our experts, with the proviso that other parties may rebut, if they wish to elaborate. Would that suit the parties?

MR. KELSO: Yes.

MR. BARBER: Yes, it will suit us.

FREDERICK LACEY COLLINS, Sworn and Examined:

Mr. Gowans: What is your full name?—Frederick Lacey Collins. I live at 14 Brynmawry Road, South Camberwell.

What are you by occupation?—I am a mine manager.

I understand in the course of your experience you have seen a good deal of Victoria and the timbered areas of Victoria?—Yes.

And you want to make some suggestion with regard to the opening up of old mining tracks?—Yes.

Will you just put it in your own words?—Before the Forests Commission was created, it was the Crown Lands Department, they were all Crown Land areas, and the Mines Department opened up mining tracks. Those mining tracks have not been touched for years and years, you cannot get through on them now. I think if they were reopened it would prevent the fires. Also in connection with the grazing areas, compel them to put on more cattle to keep that ground
eaten down, and if the Government put on Angora goats to eat the scrub there would be no fires — because the more burning the more scrub there is.

THE COMMISSIONER: What is the virtue from the Angora goat?—The hair from the Angora goat would bring them in money.

But what is the virtue of putting them on this country?—They eat the blackberries. They say that in seven years Angora goats will kill the blackberries; they will not, I have seen that.

How many years do you think the blackberries will take to kill the Angoras?—I do not know; they are hardy. I have seen those goats in Victoria, Jim Williams at Broughton had them, he put them on to eat the blackberries out, but when he took them away the blackberries came again.

Angora goats will eat anything?—Yes, I think so.

Do you think they would be good to eradicate the blackberry?—Yes, you know yourself if you go in the bush you have to burn to get through. You will get through all right, but the next time the scrub comes up it is thicker than ever.

Is the Angora in the bush harmful to mankind?—No, he is harmless.

You do not think that with a diet of blackberries he would start attacking mankind?—No. Mr. Williams had 100 goats. An old Billy, if you struck him on a log, might attempt to put you off.

Are they a local product, or would they have to be imported?—I think they would have to get them imported.

They breed in captivity?—They breed out in the bush. I know they imported these goats, I do not know if there are any about Victoria now; but they are the only things that will check the fires. I have been at it all my life and I know that, because the more you burn the more scrub you get, also fires and everything else.

That suggestion is interesting, I think you might take it up with Mr. Lawrence of the Forest Commission, he may be
interested in something of that sort?—Yes.

MR. GOWANS: You have something to say about breaks?—Yes, when the Forests Commission cuts a break they cut it anywhere, at all angles. To cut a break you must cut it in a line, either east and west or north and south, so that the wind will come across the break. You do not want wide breaks, it is only a break for a check to burn back from. However, I think if you had Angora goats and plenty of cattle on the runs you would have no fires.

That is a novel suggestion?—I know McMillan's tracks, I was on them for years in the back country. You could get through with a pack horse anywhere, without any scrub, but you cannot crawl through it now.

MR. GOWANS: I understand you have certain views as to the sawmillers burning off or clearing around their areas?—Yes, I heard a witness giving evidence before lunch. He said they did not burn systematically; they do not, not one of them. I have been through all that country.

THE COMMISSIONER: Which country?—The whole of it from Warburton to Omeo. They burn their tops like a kid would light a match and see it go up; but as for putting their logs together and burning systematically, they do not. They asked the man to name different millers, but he was not going to, they would have him set. It is the whole lot, nothing is systematic.

MR. GOWANS: Do you not think the Forestry Officers make them burn their tops and rubbish?—They do not do it, anyhow - they burn the tops, the leaves, but they do not put the logs together. When the young timber comes up it comes up amongst the logs; another fire comes in and it kills the lot. When they have cut out one strip of their area they could clean it up, they cannot do it while they are felling the trees. They could use a tractor, or bullocks, to pull the logs together, like a
farmer would do in clearing land; he has bullocks.

THE COMMISSIONER: Have you been in the bush recently?—Yes.

How long ago is it since you observed this practice on the part of the millers?—Practically all my life.

But what is your latest experience of these millers who you say will not burn?—Every one I have seen.

How long ago is it since you have seen it?—About twelve months.

As late as that?—Yes, my wife is in Melbourne but I am up at Aberfeldie.

MR. GOMAS: Was that the area you were in 12 months ago?—Yes, and also at the head of the Cen River, on the other side of the Divide.

Is there anything else you desire to say that might assist the Commission?—I think if those Government breaks were opened, and more cattle kept on it would be the main thing, and also the Angora goats.

Do you think the millowners should be made to keep their boundaries clean?—Yes, make them keep a chain or half a chain clear right around their area.

Around their milling area?—Yes, and let the Crown Lands people and others do the same, let them put in a small break.

Naturally, it would be surveyed out and it would be a straight break. If they cut a little bit, half a chain, you could light the break and burn against the wind. If it burns from the south, a slow fire, you can always stop it.

I understand some people suggest that the millowners should be made responsible for all fires that start in their areas. Would you be in favour of that?—No, I would not put on a stipulation like that, that they should be burned at a certain time; it might be wet. However, the millers should be compelled to burn and to stack his timber. Let him notify the forestry officer when he wants to burn. He might want to burn in January, if it suited him.

You would leave it to the millowners?—Yes, under the supervision of the forestry officer.
MR. BARBER: This raking together and burning of logs would be a fairly costly business?—No, not if worked systematically. If you took up land you would have to stack your timber. It would increase the cost of operation?—Yes.

And that cost would be passed on to the consuming public, I have no doubt?—Yes.

You put it that it would be a cost well worth paying, in order to preserve the forest?—Yes, certainly, I think so.

It is no use going into the question of what that cost would be with you?—No.

MR. HARDY: The Commission may be interested in knowing something in regard to the Angora goat proposition. The Board of Land and Works was approached by Mr. Barton, who had an Angora goat farm, to clear the Bendemong police paddock of blackberries which overran it at the north-west corner, in return for some concession of some portion of the land. For that he undertook to clear it in three years with Angora goats. He had a goat farm on the island in the Gippsland Lakes. The Department turned down the proposition, and I think it resorted to the planting of certain kinds of vegetation, which would perhaps do the same job. The trouble about the Angora goats was that having eaten the blackberry it wanted something else. Then it eats everything else in the neighbourhood, and when the foliage is gone up to a height of eight feet it eats the bark of the trees as well.

THE COMMISSIONER: Is there anything further you desire to say?—No.

THE WITNESS WITHDRAW.

WILLIAM HENRY DOWEY, sworn and examined:

MR. GOWANS: What is your full name?—William Henry Dowey. I live at 62 Bendigo Street, Burnley.

You are retired now?—Yes.

What were you before you retired?—For many years I was splitting
palings in the Noojee country.

At one time you were a fire guard?—Later on I was a fire guard for three years.

I understand you have a suggestion to make which would do away with the fire menace?—Yes. The forest officer who was over me asked me to send any suggestions I could to the Department, so I wrote to him. I did not write to the Department, but I wrote to him to send to the Department, about a plant I have here wrapped in a piece of paper. (Producing parcel) This is the plant I wrote to him about; it is what they call *Mesembrianthemum*, there are thousands of those plants down on the Frankston line and you can see it at East Richmond.

**The Commissioner:** Is this the plant they have grown along the railway cuttings to bind the face of the cuttings?—Yes. Down at Cheltenham, at the Old Men's Homes they have a number of pine trees planted and to save those trees they have a plantation of this stuff. No fire can go in there. At the time I wrote to the officer, I had read about 30 odd years ago about a man from India who was the assistant forester in India, a Mr. M. A. Clifford. He gave evidence before a Royal Commission on vegetable products, just before this Exhibition Building was established here. He stated there that in India they used this *Mesembrianthemum* plant on fire breaks. Then there is another man, a Mr. Christy, he also recommended this for fire breaks. I wrote to this officer about the plant and the evidence is there, well, the whole of the Forests Commission could have got the evidence clearly. It is there to be found now.

Your idea would be to plant a great deal of that plant?—I gave that information to the man 26 years ago. If they had planted the breaks with that plant 26 years ago, and up to now, there would have been no fire through there.
MR. GOWANS: I understand your suggestion is not to plant the whole of Victoria with pig-face?—No, only the mountains. I am only speaking of the mountains.

And fire breaks?—Yes, fire breaks, and around the mills, too.

I understand this plant has a very high content of water and consequently is not at all inflammable?—That is so, this specimen I have here is one I have had since the first day that this Commission sat.

THE COMMISSIONER: You were the gentlemen who came inquiring that day we were here?—Yes.

Is that still the same piece that you have now?—Yes, it has been with me all the time since then. It has wilted a bit since.

It is still very moist?—Yes.

MR. GOWANS: Is that all you wanted to say about that?—No.

THE COMMISSIONER: Is there anything else you wished to tell the Commission?—I have a few notes here, but I forget them, you see.

The greater part of the forest has been destroyed now. I am talking about the mountain ash country, because I have been mostly used to that. The water supply is going to suffer through that. About 60 odd years ago, when I first camped in Gippsland, I was living at Neerim and the most part or nearly the whole of Neerim was covered by mountain ash. There have been millions of palings taken out of Neerim, that is all out of private property, you see, all that land was selected. At the time I came to Neerim, Warragul had a regular rainfall of about 70 inches a year. Now they are hard pressed to get 30 inches a year. At Neerim you could always look up at the sky at an abrupt angle; but now you can see a distance of 50 miles away, the timber is all gone.

MR. GOWANS: What is the cause of the timber going like that?—It is because the land is all under cultivation now.

That is not going to help us much in regard to bush fires?—Well, the water supply is going to suffer.
But we are concerned with bush fires?—The fires are caused by many agents. On the track from Powelltown to Neerim, a mining track, that is before the mills were in there at all at Powelltown, one morning while I was fire guard I saw where there had been cigarettes and it had burnt away about a foot all round it. The ashes were there, but the fire had gone out. There was dew and it had gradually got wet and gone out. These days nearly everyone smokes cigarettes, in the bush in Victoria.

You can assume we have heard of most of those causes. Unless there is some special cause you want to bring forward, I do not think you need to elaborate on that.

THE COMMISSIONER: I think the witness's main point is the planting of the breaks with this plant he has brought along?—That is so. I will give you something else. It is taken from Ezekiel, Chapter 20, (47-48)—"And say to the forest in the south, Hear the word of the Lord; Thus saith the Lord God; Behold, I will kindle a fire in thee, and it shall devour every green tree in thee, and every dry tree; the flaming flame shall not be quenched, and all faces from the south to the north shall be burned therein.

And all flesh shall see that I the Lord have kindled it; it shall not be quenched."

MR. GOWANS: Your view is that fires are inevitable in any case?—Yes, and there are many agents.

THE WITNESS WITHDRAW.

You are an enginedriver by occupation? — Yes.

And you were recently an enginedriver down at a mill in a forest area? — Yes.

I understand you have certain views as to the causes of fires, in connection with your occupation? — Yes.

Just tell the Commission in your own way? — I am an enginedriver, of 30 odd years and I wish to give my experience since I went to the bush in 1857. When I went there first I could see there was great danger of fires, which would occur if no proper precautions were taken, fires that would set the forest ablaze. That was by the sparks emitted from the engines that are working in the bush, with the exhaust in the smoke-box.

How could you prevent that, by a spark eliminator? — What is really required and what should be done brought into existence at all sawmills where engines have an exhaust in the smoke-box is for a spark arrester to be placed inside the smoke-box, just above the tubes, as in a portable engine the exhaust comes right along under the boiler or sometimes over the top of a boiler. It comes into the funnel of the smoke-box and if there is no arrester there the result is that with the draught sparks are emitted up through the funnel; and in weather like we had, with those north winds, the wind catches those sparks and away they go over considerable distances. At the last mill I was at I went there in August, as an enginedriver. It was, I consider, a 17-horse power portable and she was carrying 110 lb. pressure.

When I went there they had great trouble, I believe, in getting steam, because the man they had doing the work, the driver, had to file saws. I took it on. When I opened
the smoke-box door I saw there was no spark arrester in it. I shut it up, there was nothing whatever in the box. I said to the man there, a rouseabout fellow, I do not know whether he was the enginedriver or not—"No spark arrester in that box". He said "They do not put spark arresters in the boxes here". I said "Once is right enough". I shut the door. We started. There is a breaking down bench on the one side and then another bench on the other side, where they were cutting the marketable timber. They send the logs there. There was 110 lb. pressure, blowing off. While that log is going through the bench man is on it and the boiler is forced clean up to the full pressure of steam, with the full pressure rushing through into the cylinders. The result is that as fast as you throw wood into the box it is consumed, and away go the sparks. I opened it up three weeks after and there was only about a cupful of dirt in that box; all the sparks were thrown out, and it was all in the spouting around the mill. I noticed two young fellows about as far away as from where I stand in the witness box to the northern wall of this room, they were down cutting these logs about 4 feet in diameter and their backs were riddled with sparks that came off there in fine weather. There was hardly any breeze at all. The sparks flew over and fell on their backs. Sometimes a spark would go one way, the wind was in the south-west that day, but when the wind turned around it would blow the sparks the other way, I saw a spark falling down and I could see it ignite. It set fire to the rubbish around. Of course, the fellows put it out.

Do you know of many fires started in that way?—I could not say that. I have seen fires start around in the first place, and that is at Gembrook in 1930-31. I went there then to Mr. Dyer; he gave evidence before this Commission. When I went
went on his mill the sparks coming from his engine used to set fire to all the rubbish on the floor around the mill. I or someone else was continually running with a bucket to put them out. I put a spark arrester in that box - I can prove that - and I had no more trouble after that, right up to 1931-32, when on the 2nd March a fire rushed along there; but no sparks caused any fire around the mill after I put the arrester in. Then when I was at this last place, when I came in, on the 21st December - you know when the fires first started, it was in the paper, and I thought it was then my duty to notify the Forests Commission. I went up and informed them that if this mill started to stop it at once and see that that boiler, or that smoke-box, had a spark arrester put in, or else it would set fire to all that forest - there was nothing to stop it. If that north wind came along, with the funnel of the engine up over the top of the bottom roof of the building, with those sparks flying there, pieces of oh remorse of the size I indicate, goodness knows where they would go - they would go for miles.

Do you know if the Forests Commission took any action afterwards? - - I do not know. In the first place I went to the Forests Commission. There was a young chap there and I gave him the information. He took it down and he said to me "Oh, we have inspectors who go out every year and see that these smoke-boxes are provided with spark arresters". I said "Well, I must contradict you because I have been on a good few mills and I have never seen a spark arrester in either one of them, in neither one of the engines". I said "Another thing I advise you if you want to save the forest to notify the owner of that mill not to start that mill until he puts an arrester in that engine, if he is going to work that engine". He said "Right". Later on
I went with Mr. Dunstan, our Premier, and Mr. Galbraith to look at that fire around Wood's Point.

(Continued on page 1524)
WITNESS (Continued) I went there that day to see if I could see Mr. Galbraith, and there was another young man there. He told me that he was the man in charge of steam engines at the mills. I gave him my opinion and he said that he would see into it. Whether he did so I do not know. No man would be actually aware of a fire that started in that way, because you only see the sparks ignite the rubbish close to the mill, but there is no means of telling how far the sparks will travel.

Do you refer to engines that run from the cutting mills, or are you referring to stationary engines?---I refer to stationary engines. When making the winches they take the exhaust from the winch engine and put it into the smoke-box, and then it is dangerous.

If a fire started from that source it would start in close proximity to the mill, would it not?---On every warm or hot day you can see sparks falling and igniting the rubbish close to the mills. But when you experience weather such as we experienced when the big bush fires started, with northerly gales, the sparks would be carried for miles and would ignite in the forests. I consider that is one of the greatest dangers likely to be encountered by the Forests Commission. If all engines with exhausts in the smoke-boxes were fitted with spark arresters the danger would be eliminated. If that is not done the Forests Commission can look out for trouble.

MR. BARBER: Are you sure it was the Forests Commission official who told you that it had inspectors looking after these things?---Yes.
What office did you go to?---To the Head Office, in Melbourne, at the Treasury Gardens Buildings.
Somebody there told you that they had inspectors on the works?---Yes.

THE WITNESS WITHDREW.

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EDWARD JOHN DUNSTAN, Sworn and Examined:

MR. GOWANS: Your name is Edward John Dunstan and you live at No. 4 Neptun Street, Richmond?---Yes. I am a labourer by occupation at present, but at one time I was a sawmiller at Erica. I was burnt out in the 1926 fires.

1524. SKEWES, DUNSTAN.
I understand you have certain views to place before the Commission. Will you do so, in your own words?---I have had much experience with bush fires since I was a boy. The only way in which we prevented fires was by burning along the ridges. A fire will never cross a ridge more than 20 chains in any class of country. If the country has been burnt clean for a 20 chain break that stops all kinds of fires.

THE COMMISSIONER: That is on the ridges?---On the flat country, too. What about on the northern slopes—would it stop a fire then, with a north wind behind the fire?---It stopped a fire that was followed by a high wind at Erina. I had a 20 chain wide cleared paddock and the fire did not cross it, but the fire on the other side was so severe that it burnt out the rest of my property.

MR. GOWANS: We heard evidence this morning about the accumulation of rubbish around the mill areas in Erina and Moonee; what was the practice in your time as a miller?---Nobody bothered about it at all.

Neither the millowners nor the Forests Commission officials?---No.

Do you mean that you simply cut the heads and let them lie?---That is right. I was there about 20 years and during that time I was never asked to burn off the heads.

THE COMMISSIONER: When did you stop milling in that district?---In 1926. I built up the mill again after the fire but the depression came and I had to borrow so much money that I could not carry on.

For how long after 1926 did you keep going?---About two years, until well into the depression period. I could not get the money for what I cut and I practically went insolvent.

During all that time nobody troubled you about burning the heads?---I was not troubled at all.

What was the position of other mill owners around you?---It was just the same.

MR. GOWANS: Have you been in the area since 1926?---Yes, I still have a place there.

Is the position the same now as it was in your time?---I did not go out to the mills. I simply went there to see my son. DUNSTAN 1926.
Is he milling there?—He is an engineer at Fnellwood's mill.

You generally go to the mill to visit your son and you would not take careful note of what was happening there?—No.

Are you in a position to say that the position is the same now as in 1926?—No, not as regards the bush, but the last time I was out in the bush they were not burning the heads—three or four years ago.

What have you to say about thinning operations; have you had any experience of that?—I have had experience, and I know that the Forests Commission have to grub the suckers. The Commission cuts them off at the ground level, and then the suckers come up like a crop of wheat, making a tremendous danger from fires. Green leaves will dry as readily as dry leaves once the fire starts. When the Commission falls a sapling, it should clean it out, instead of thinning out and leaving the saplings lying there.

The Commissioner: Does not the Commission stack the thinnings and burn them?—They did not at that time.

Mr. Gowans: Again you are speaking of the practice before 1926?—No, since then.

Will you make it clear when it was. My friends at the table will say that all this happened long ago, before 1926?—No, it is since then. They were cutting timber down at Bairnsdale two years ago level with the ground. They were burning it, but they were not catering for the suckers at all. They were cutting down all the crooked saplings and were burning them around that part, but they were only cutting them level with the ground.

Suckers would come up afterwards?—Where previously there was one sapling, the next year there were fifty suckers, which created ten times as great a fire menace as the single sapling.

Have you been in the bush recently?—Not recently, or not in big bush, such as in Erica district, or such places. I suggest that
the Forests Commission should cut all stumps level with the
ground and pull them out with tractors. They have plenty of
cars available, and they could pull the head, stump and every-
thing out. I have also suggested a similar procedure to the
Melbourne & Metropolitan Board of Works, but that body laughed
at the idea. I suggested that they should cut out the
forest now that it has been burnt, level all the big timber to
the ground, pull the whole thing down to the gullies, and
burn the heads. The logs they could pile up separately.
I experienced that in the bush while I was there. I cut
timber, left it on the ground, after sawing it off into logs,
as, I understand, the Board of Works intends to do. The
white ants got in, and within 3 years the timber was completely
ruined. The white ants entered in the saw cuts, and
riddled the logs, making them worthless.

Are there any other matters in respect of which you suggest the practice of
the Forests Commission has had something to do with the recent
fires?—The Commission did not send experienced men to
the bush. The Commission sent out men who knew nothing
about timber, because they used to ask me what sort of trees
they were, when I saw them.

Were they supposed to be technical men?—Yes, all technical men
with no experience.

That is some time ago, and perhaps it was before the Commission got
properly staffed?—I was up in the Erika district about four
years ago, and the Commission was still sending them along;
evitably they are only there as revenue collectors, or that
is what I would put it down to.

Do you know that most of the district officers and the men assisting them
are forestry graduates?—That is what I say, they have had
no practical experience.

Do you suggest that those men would be coming along to ask what kind of
trees were growing?—They have asked me, and they do not
know mountain gum from mountain ash.

Do you think they were trying to find out whether you knew?
Naturally I put all I could in their way. They reckoned that they knew a lot more about timber than I did. Technically they do, but practically they knew nothing.

One gentleman suggested that Mr. Gowans would not know a pine forest from mulga scrub; were they as bad as that?—I could not say so. There is a lot of timber in the bush, and it takes an experienced man to pick it out. There are several grades of six different gums which all look practically the same. One witness said that fires do not affect messmate. Actually it absolutely ruins messmate. If a big fire goes through, the whole tree will die down, and it will sprout suckers from the butt to the head. When the suckers strip off, the dry patches come and the borers get into the tree and it is ruined. When a miller goes into the bush, the feller would go in and sound the trees to pick out the best trees. The tree sounded would be marked with an axe mark. That would start the thread borer, and within six months the borer would be in, while within five years the tree would be destroyed.

MR. GOWANS: Are there any other points you desire to mention relative to the causes of the recent bush fires, or factors that you think made them more intense than usual?—Fires are caused by some person or persons, undoubtedly. A person may have a set on a particular mill, or a man might be sacked from a mill. When a good burning day comes, there are fires. When it is not a good burning day, there are no fires.

We have heard a good deal about that type of causation. Are there any other factors similar to those you have mentioned about the dirty conditions of the forest which added to the intensity of the recent fires?—The 1926 fire was intense and had all the men in Melbourne been called on to fight the fire they would not have been able to stop it.

(Continued on page 1530).
Were you in the recent fires?—No. I should say the fires were a
hundred feet high in places. You could not get near them.
At a hundred yards your face would be scorchd. You could
hardly breathe. It is impossible to stop such fires.

MR. BARBER: Do you blame the Forests Commission for being burnt out in
1926?—Yes. I blame the Commission for burning me out.

Yes, I thought perhaps you did?—I also blame them for stopping me from
getting any compensation.

THE COMMISSIONER: Compensation from whom?—From the Forests Commission
or from the fund that was created.

MR. BARBER: In your view, the Forests Commission blocked you from getting
compensation out of the fund created in 1926?—Yes.

So that your feelings towards the Forests Commission are not of a pleasant
nature now?—I think the Forests Commission officers have
not been too competent in their job.

Over a period of some years you have observed them, and you are of opinion
that they are all untrained and unpractical men?—When I
started in the milling business, I asked for a rate to be
fixed, and they fixed a rate on me double that of the
sawmill rate.

When was this?—Years before that. That was because I had an argument
with Mr. Strachan about the policy of controlling the forests
from Melbourne.

May I take it then, that you have been up against the Forests Commission
all your time?—The reason for that is this—

I am not asking for reasons. Do you know what I mean by being up against
them; you have been up against them, you have opposed and
argued against them and the policy of the Department for many
years?—I have good reason to be. Would you like to hear
the reason?

No, I would not.

THE WITNESS (To The Commissioner): Would you like to hear the reason?

THE COMMISSIONER: If it has a bearing on the cause or prevention of
bush fires, I would like to hear the reason, otherwise I do

1530.
not want to hear it?—I say the best way of stopping bush fires is to clear a space of about 20 chains wide, because that will stop a fire in any country, no matter how high the wind is.

That would not have stopped the fire on the 15th of January?—Yet there was a hurricane blowing at about sixty miles an hour, and it did not carry the fire across my paddocks.

I have seen a brick more than 20 chains away from timber and undergrowth destroyed with only the chimney left; I have seen more than one such case?—I have seen in Gippsland fires in the tops 150 feet high cross paddocks, and yet the trees would be 50 or 60 yards apart in places.

The suggested breaks would not be much good with a crown fire?—That is the only way to stop them. Tracks are cut in bush areas usually a chain wide, but that only causes a draught, and the fire will rush up that lane as fast as one can run. From my experience, I should say that fires will travel in ordinary bush country under normal conditions about two miles in half an hour, and that is plenty time to enable anyone to get out, provided there is an outlet available. When the big fire occurred at O'Shea's, two men left the fire when it was within a half mile from them, and they beat it down for three miles, in spite of the fact that there was a hurricane blowing.

That is all, thank you.

THE WITNESS WITHDREW.

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MR. RUPERT DAVEY, sworn and examined:

MR. COWAN: You live at Toolern Vale and you are an apiarist by occupation?

---That is so.

You are here speaking on behalf of the Apisists Association?—Yes, that is so.

THE COMMISSIONER: That organization represents those commonly referred to as bee farmers?—That is so.

We met one of your brotherhood at Maffra—Mr. S. Stocker?—Yes.

I did not know the form in which I was expected to give
evidenc. I have made a few notes.

You may refer to your notes to refresh your memory?—Thank you. In the
first place, I should like to emphasise that there different
kinds of forests in Australia. It is a common thing to speak of
forest areas merely as forests, but there is a tremendous
difference in the classes of forests in this country. There
is also a great difference in the classes of underground
flora. The apiarists suggest that the different kinds of
forests require different treatment, and not uniform treatment.
The particular classes of forests in which apiarists are
interested are more particularly of the open forests type,
and the dwarf species, as distinct from the mountain ash
forests, where the great fires usually take place. We cannot
speak on this question entirely from the point of view of
honey production. Regarding the best burning period for
forest country, which includes Crown land, I wish to stress the
view that there should be no spring burning. I make this
suggestion for two reasons; firstly, because of the great
difficulty and danger arising from smouldering stumps. I am
a landowner as well as an apiarist, and I wish to cite an
instance which took place on my property three or four years
ago, when we were burning off a small area at the end of
September—a area not far from my house. We noticed that
a large stump had caught fire, but we took no notice of it at
the time, until about the 1st of November, when some visitors
arrived, on looking out of the window, we noticed to our utter
astonishment, that a bush fire had started from the smouldering
stump. The stump had been burning for, perhaps, six weeks,
and being of box timber, it had smouldered slowly, gradually
coming to the surface, and ignited some deposits of peat or
decomposing vegetable matter, thereby starting a bush fire on
a small scale. Needless to say we soon put that fire out.
That illustrates the danger of spring burning and the difficulty
of putting out stumps. Furthermore, we should like to stress
the importance of conserving bird life. The spring is the nesting period for birds, and we cannot afford to ignore the birds, because they are a national asset.

What about bees; is the food destroyed if the bush is burnt in the spring?

—That will depend on the locality. Even a light burning would destroy the foliage and damage it to such an extent that it would fail. Burning is detrimental not only to the birds, but also to the bees. The ground flora is vital to the reproduction of bees. I refer particularly to the small shrubs and the small flowering plants, such as ti-tree and maleleuca. In certain areas of undulating forest country, which is of interest to graziers, if burning is to be permitted, it should be done in sections and not in whole blocks at a time. Three or four years should be taken up in burning off large areas, so that there will always be a continuity of flora. As regards mountain forest and commercial forests, such as mountain ash country, I consider that no burning whatsoever should be allowed, except the burning that may be necessary, and I am not a judge of the position in that connection, so far as milling is concerned. We cannot afford to burn mountain ash country.

From a bee keeping point of view?—No, from a national point of view, because, if we remove nature’s protection which acts as a sponge, we will ultimately denude the forests of vegetation.

Mountain forests hold the water. They act as internal reservoirs, if the forests are destroyed, the mountain streams will not be supplied with water. The burning of the forest areas will result in the ground becoming dry and hard, the water will run off, and, from a national standpoint, we shall lose a great asset in a regular water supply. We cannot afford to do that. We have had an illustration of that this year. Look at what took place in regard to the water supply during the drought. Look at the tragedy that was narrowly averted in so far as the water supply is concerned.

Take the Coliban system, and the difficulty that arose in
connection with the water supply to Bendigo, and, indeed, the whole of the northern water supply system. If we do not take adequate precautions, our mountain streams will dry up and we will eventually turn the country into a desert.

(Continued on page 1536).
THE WITNESS (CONTINUING): Wherever it may be decided to burn, I would say that it should only be done in conjunction with the local fire brigade and any other organization of the kind that may exist. For instance, we have heard recently about vigilance committees acting as bush fire brigades in conjunction with bush fire brigades but functioning in a larger way than they. Bush fire brigades exist for the purpose of putting out bush fires, whereas vigilance committees are intended to prevent the fires from starting.

THE COMMISSIONER: I suppose all burning is bad for the bees?—I would not say that.

MR. GOWANS: Sectional burning would be better?—Decisely. Not all classes of country are suitable for apiculture. Certain varieties of eucalypts produce unpopular kinds of honey. In Victoria 4,000,000 lbs of honey were produced last year. Was any honey exported?—We are getting on to the export now.

THE COMMISSIONER: If you have anything to tell us from the bee keeper's point of view, we shall be glad to hear of it, but we have already heard a great deal about the questions you are touching on. As to bush fire brigades, we have heard a lot, and later a case will be presented on their behalf.

MR. GOWANS: How many hives were destroyed in the fires?—I have not any reliable data as to the number of hives burnt, but it was quite a considerable number. It was, however, only a small proportion of the total losses in the State. The losses were largely due to want of water.

Can we take it that although you are not entirely against burning off to keep the forest areas clean, you are against indiscriminate burning?—Unquestionably.

And very much against broadcast burning?—Unquestionably.

You are also against any hot burning that might destroy the trees?—Yes.

How does a fire affect the particular trees on which apiarists rely?—The effect of a burn would be to throw the forest out of action for four or possibly five years, depending on the
rainfall following.

Are they thick-bark trees?—Many of them are. The box and red gum are fairly thick, as well as the yellow gum and iron bark.

Do you rely upon those trees for honey?—Yes.

Can all of them stand against the heat of a fire?—Do you mean before the tree would be destroyed?

Yes, destroyed?—They are very hardy on the whole.

When you say that trees are thrown out of action for four years, do you mean that they would not flower in that period?—They would not flower.

You people depend upon the flowers?—Absolutely.

You would have to have a considerable burn to throw them out of action for four years, or would a light burn do it?—A light burn would be sufficient if it was severe enough to sear the terminal twigs and the foliage.

You want a great proportion of those trees preserved each year to enable you to carry on?—That is so.

If there were some kind of local organization to carry out fire preventive measures in your area, you would like to be represented on it?—I should say so.

Would not that practically protect apiarists when fire prevention measures by burning are being carried out?—I suppose that would be fair. I had not thought of it.

Other interests would have to be taken into consideration also?—Sure.

Apart from that, have you apiarists any suggestion to make which would minimise the danger from bush fires?—I would suggest the inclusion of a clause in all leases providing that in the event of an unauthorised fire the lease would automatically cease.

THE COMMISSIONER: Unauthorised by whom?—By whoever may be in control of fire burning.

Under such a provision, an innocent man might be burned out by his enemy and might lose his lease. Someone with a grudge against him might set fire to his area to get rid of him?—If he could prove that he did not cause the fire, he
should have the first opportunity of reallocation.

That is a different proposal altogether. I thought you said that if a fire broke out on a man's land, he should automatically lose his lease?—If he could prove that he did not cause the fire, he should have first preference in reallocation.

THE COMMISSIONER: People come here and advance theories about jurisprudence, crime and punishment. They should not, because they do not know what they are talking about. Do you suggest that because it is hard to convict a man we should make it easier to dispossess him? Do you say that in face of all our known canons of justice? I suggest that you witnesses ought to keep to your own department. You should talk about bees. You do not know about human nature and what can be done under the law if it gets into the wrong hands. A man might be burned out and yet be quite innocent. The fashion for heavy punishment is rather disquieting in what one considers to be a sane society, especially the indiscriminate infliction of punishment—hit where you see a head. It seems to me to be an outrageous suggestion. I do not want to get into an argument with you on that subject or about bees either, but I think it better for you to keep to the bees and bush fires.

THE WITNESS: And leave the birds out?

THE COMMISSIONER: Bring the birds in if you like and discuss what effect they have on angora goats and vice versa.

MR. GOWANS: (To witness) When you were talking about leases, were you talking about grazing leases?—Grazing leases. Are there such things as bee farming leases?—They are licences, not leases. I thought be suggesting wholesale cancellation of bee farmers' leases?—The same would apply unquestionably.

Is there any other way of preventing bush fires short of, say, patch burning? Bee farmers come and say, "Do not burn because it destroys our allotments, and we cannot operate for four..."
years afterwards. This Commission has to consider how to prevent bush fires and that cannot be done by doing nothing. If you are not ready with any suggestion, just say so, but I thought the bee farmers might have a policy. The difficulty is to get them together.

MR. HARDY: Would you make it clear to the Commission that some of the eucalypts do not bloom annually and that a fire might cause the premature opening of the capsules and the shedding of the seeds. In that case, blooming in the next year might be delayed and there might be interference with the rhythm of the blooming of those trees in that forest. That is the point. It happens over and over again where the trees have been scorched. The buds have been thrown off and that particular part of the forests is thrown out of its regular botanical stride. It takes a series of years to get back to normal. Similar conditions may be brought about by drought or excessive rains setting up rapid growth. When that happens the trees in the meantime fail to yield honey.

In the case of eucalypts that are biennial or triennial bloomers, you are in the meantime dependent on ground flora. In that case it may be necessary to transport hives long distances.

What is the longest distance you have transported hives in the case of a local failure?---200 miles.

From where to where?---Sometimes to South Australia. We transported this year a large acreage from the Western District to Orbost.

THE COMMISSIONER: How do you find out where the food is good?---By scouting by car.

I suppose there are good scouts and bad scouts?---Yes, and it is a highly technical business. At the other end something extraordinary may happen in the way of a flood or an extreme drought.

MR. HARDY: On one occasion when you were busy preparing to transport your hives from Toolern Vale to an iron bark forest near Orbost, did you receive a telegram saying, "Do not come Gray box bloom failed completely"?---Yes.
THE COMMISSIONER: I should not like to go down with the bee hives at Orbost. That would be a very trying experience?—It is common to transport on the Murray fringes.

It is a very rare branch of knowledge into which you have given us an insight today. We have not heard much of it except from a gentleman at Maffra but he did not go into detail quite as much as you have done.

THE WITNESS WITHDREW.

THE COMMISSIONER: There seems to have been a spirit of minor levity about these proceedings this afternoon. I hope I have not been responsible, but after all the long days we have had it had been a mental relief to all of us to have had introduced delightful topics such as honey, bees and angora goats. The witnesses who mentioned these subjects must not think that we were laughing at them. I think we are all much too good mannered for that. It was such a delightful change from the talk moss, misery and so on that we have heard during part of our previous trips.

The Commission will adjourn until 10.30 a.m. tomorrow, Wednesday, 15th March, 1939.

ADJOURNED.
Author/s:
Victoria. Parliament

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