

## SUMMARY OF THE SYMPOSIUM

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In treating engineering in forestry, the Institute has tackled a very timely subject. I am very pleased to see that we have had with us members of the engineering fraternity and also some of the people who actually do the work—contractors and operators.

Engineering is obviously important in all phases of forestry, particularly prominent at present in development and production but also, as Ash Cunningham pointed out, necessary in other phases such as protection. The costs of engineering are so significant that all foresters must sit up and take notice. The implication is that the forester should become involved in engineering and develop wider horizons than he has hitherto had. If he concentrates exclusively on biological, ecological and silvicultural problems, his influence on the forest industry will be minor.

With this theme in mind, your Council arranged a series of topics, which unfortunately were not able to cover all aspects of engineering in forestry. We selected some of the more prominent ones with which the forester, as a land manager, must inevitably be involved.

Briefly summarizing the papers:

Mr Cunningham pointed out that, in protection forestry, engineering must play a part. However, its techniques are still in their infancy, and the primary problem is access. Until we get better access to our mountain lands, we cannot achieve a high degree of protection.

Mr Revington's very apt paper was, I felt, notably competent, and his illustrations in particular helped to bring home to us some of the points that we should not forget. To my mind his prime concept that foresters should contemplate is "that in high rainfall areas vegetation on its own is not enough". Engineering structures, etc., are required for flood and river control. He emphasized that in catchment control the talents of the engineer, the hydrologist, the agriculturist and the forester must be combined to get the best answer in management of a major resource—water.

Mr Crequer illustrated how the planning of logging operations is virtually production engineering. He postulated that planning is based on the measurement of the elements involved in production and assessment of the influence of variations within these elements. To plan any specific job, one must first define the elements involved, and the restrictions or parameters that limit what one can or cannot do.

Mr Chavasse covered an important and expensive part of forestry in talking about roading. He carried out extensive research into findings both in this country and overseas, and I would commend his paper to you as a very valuable record. It was a difficult subject to present, but the paper contains a wealth of information. The tables featuring the timing of roading emphasize the losses that could be incurred through concentration on the short-term view.

We were very pleased to have Mr Goudie with us, because this is the first time that the Institute has initiated a move to get an overseas visitor imported to speak to us. Mr Goudie was a valued contributor, not only through presenting his paper, but by taking part, at short notice, in both the panels. I think that the feature of his talk and his illustrations was the application of mechanization to forestry. He concentrated here on nursery and establishment, and I am sure he surprised us with the production rates that his company is achieving through mechanization. Obviously, of course, this mechanization was very well planned. It must make us think of the benefits we could achieve through increased mechanization in our own fields. In any developed country, the emphasis must be on mechanization, particularly in a rural industry where labour is scarce and manpower will continue to decrease. Because of this, it is mandatory that we raise the man-hour productivity in every phase of forestry. We can do this primarily through mechanization.

The panels embraced the topical subjects of land clearing and thinning and gave a wide range of participants opportunity to present their views.

Land clearing is currently important, embracing, as was shown, elements of mechanical, chemical and aeronautical engineering, as well as an appreciation of the role of controlled burning. Obviously, one must keep pace with developments in all these fields to apply the optimum combination for his own particular circumstances.

Thinning problems become increasingly important as our wood resource becomes more completely utilized. Techniques are at present in a development stage and the lessons from experimental units in New Zealand, Australia and overseas must be evaluated. Probably the outstanding concept discussed was the need to modify silviculture to fit the restrictions implied by mechanical units. These must be operated at high productivity to achieve satisfactory returns.

Last, but not means least, a feature at this conference was the presence of Professor McKelvey, Dean of the new forestry school to be set up at Canterbury. We have noted that, in establishing this forestry school in Canterbury, the university selected has an Engineering School. I hope that this feature is not lost on Professor McKelvey and that the points debated here will influence him in the curriculum he will be developing for this new forestry school.