

# Editorial

## *The Dominion School of Forestry*

The most important event of the year, so far as the Editorial Committee of "Te Kura Ngahere" is concerned, is the announcement by the Minister of Education, made while this issue was already passing through the press, that the Dominion School of Forestry is to be located at Canterbury College.

All concerned with forestry in New Zealand have been agreed as to the futility of attempting to maintain two University professional schools of forestry in this country. The announcement that in future but one School will be maintained, whereat all the forestry educational activities of the nation will be developed, will therefore meet with general approval.

The Canterbury College School of Forestry is naturally deeply gratified that its work, and its opportunities should be recognised by the Minister of Education, by the education committee of the Empire Forestry Conference, and by other impartial investigators, as entitling this School to be made the national institution. It is with great relief that the staff of the School has learned that the six years of financial starvation, overloading of teaching work, duplication and dispersion of effort are now ended, and that in future better conditions leading to greater teaching efficiency will provide the incentive to further endeavour.

While no details of the necessary reorganisation have yet been announced, it is understood that the change will take place prior to the opening of the 1931 session. The new year, therefore, will see the School with additional provision for equipment, and with an increased teaching staff, while the status of the present staff will be greatly improved. In an optimistic anticipation of the decision, plans for the improved conditions have been under consideration by the Staff for some time. There will be a few changes in the

teaching method. The Associate course, having fulfilled its purpose in the formative days of forestry in this country, will now probably be discontinued. A distinct separation of the work of the Degree and the Ranger courses has long been recognised as necessary. The increased staff will allow this to be done. Minor changes in the Degree prescriptions will probably be recommended to the University.

It is in the fields of research and co-operation, however, that it is hoped to make the greatest advance. These two lines of activity, both vitally necessary to the development of a University professional school, have in the past been badly starved. A larger staff, and a greater number of senior students, together with more equipment, will make possible the advancement of pure research, while the relief of the heavy burden of over-much teaching will make possible a greater degree of specialisation, and greater freedom to devote to problems of applied forestry in co-operation with all forms of forest industry, and to the field of extension of teaching work along technical lines in the form of special courses, etc.

For "Te Kura Ngahere," this issue, Vol. II., No. 5, completes our second volume. Next year's issue will be Vol. III., No. 1. It is hoped that the improved conditions at the School will be reflected in a journal more nearly fulfilling the aims of its founders than has heretofore been the case. It is our aim to make "Te Kura Ngahere" an organ of forestry expression in New Zealand comparable with that of the "Journal of Forestry" in North America, and "Forestry" in Great Britain, and the Empire generally. To this end it is hoped to enter into closer contact with the Institute of Foresters, and in other ways to broaden the control and support of the journal. The editorial committee trust that they may prove equal to the enlarged field of opportunity now confronting them.

## A Question of Economy

In perusing the annual reports of State, commercial and private forestry organisations in the Dominion, one cannot but be struck with the fact that New Zealand, once 90 per cent. forested, still 20 per cent. forested, and 8½ per cent. covered with commercial forest, is devoting the whole of her energies, not to developing her original forests, but to creating artificially new forests of exotic species to take the place of her native forests, still being steadily destroyed without any reasoned attempt at perpetuation.

State and private money is being invested in exotic plantations in New Zealand to a total of approximately £500,000 annually, and the area of such plantations is added to by about 100,000 acres each year. Already the capital valuation of these plantations stands at the huge figure of three and a half million pounds, with plans laid for an even greater rate of increase for the next few years.

The question must inevitably arise, is our forestry policy such that we are going to secure the greatest returns from the lowest expenditure? Is it really necessary that all this money should be poured out so freely from the pockets of taxpayers and bondholders?

The necessity, advisability, and profitability of forestry in New Zealand are undoubted, but it is certainly open to question whether our present line of action is likely to prove truly profitable in the long run—that is, whether it is the cheapest means of attaining our end.

There are in every forest three essential elements of value—the mature timber ready for immediate realisation, the growing stock, and the land. Given the land, and young plants established on it, natural forces will, with the passage of time, evolve both growing stock and mature timber, but in forestry, unlike engineering, no amount of capital poured into an enterprise can hasten the completion of the enterprise. That awaits the action of sun, air and soil. The growing stock cannot be manufactured overnight.

In our native forests all three elements, land, growing stock and mature timber, are present. The forest is complete. It can yield its crop to-day, and provided only that adequate reproduction is established, it can con-

tinue producing indefinitely. The cost of establishing that reproduction over the cost of wastefully destroying all hope of perpetuation by reckless logging and burning is the only outlay or foregone profit entailed. Most countries have found that outlay a small one.

In our exotic forests the land only has existed as a natural resource. Tree growth is being established artificially over extensive areas—most of the vast sum quoted above represents planting costs alone. That sum expended, and growth established, it is a matter of waiting until, with the passage of time, mature timber is produced. It is true that the land is cheap, that the planting costs are low, and that the rotation will probably be comparatively short. Nevertheless, a large amount of capital has gone into afforestation, where it will remain frozen for a generation.

Is it necessary so to lock up several million sterling for such a time? Can our forest resources not be perpetuated without such tying up of liquid assets? Is it not possible at least to keep our six million acres of commercial native forest permanently producing for little to no outlay, instead of destroying it, and then having to pay to restore to forest artificially a similar area?

Alone of all countries having extensive natural forests, New Zealand has put all her eggs in the basket of artificial planting. All other important forestry countries have, after a period of reckless devastation even greater than ours in some cases, set themselves to restoring their resources from their own native forests. The conversion of the native forest from its virgin state to a normal fully stocked producing unit has been the object of management. In Europe this task was done successfully so long ago that the manner in which it was done has been forgotten. The U.S.A. is now wrestling with the same problem, and is achieving marked success. Canada somewhat later, is following in the same path. In India, Malaya, and Nigeria, notable success has been achieved. In all these cases it has been found that once the silvical problem of securing adequate regeneration has been solved, the cost, or foregone profit, is small, while as the forest responds to treatment, yields increase, rotations shorten, administrative costs shrink, and utilisation costs, carried

by a permanent yield and absorbed by a stable market, are greatly reduced. The problem has been successfully faced in so many countries, with so many different types of forest, that it can be accepted that it can be solved equally successfully for New Zealand's important forest types, of which, with the almost total extinction of the kauri, the rimu type is far and away the most valuable. The one essential is the solving of the silvical equation which will give the necessary regeneration. This equation is different for every type of forest, and must be worked out on the ground. It cannot be borrowed ready-made from elsewhere. The working out of the equation is an intricate task calling for the highest technical knowledge and application, and much patient experiment. Once it is solved, however, the conversion of the virgin forest to a normal fully-producing unit is straight-forward forest management.

Why has this problem not been attempted in New Zealand? Why is our native forest still steadily destroyed when all the experience of other countries indicates that we are carelessly throwing away a natural resource that cannot be duplicated without the expenditure of capital, and abstinence from returns for a long period of time? Why is it, when our first Forests Act was passed in 1874 that it is only within the past few years that even the first steps have been taken toward solving the problem? The responsibility in New Zealand rests upon the people as a whole, since the native bush is almost all State owned. Its attitude may be judged from the fact that last year the country, controlling  $7\frac{1}{2}$  million acres of native forest and 250,000 acres of plantations, spent £250,000 on its plantations, and £30,000 on the development and management of its native forests (surveys, cruising, wild life control, and administrative). Silvical re-

search saw less than £1,000 spent upon it. This is the keynote to the whole thing, for until this has been tackled wholeheartedly no progress toward reasoned management of our native forests can be made. Yet the State Forest Service has received little public support in its constant appeal to be allowed to do more along these lines. It is only after much perseverance under discouraging circumstances that it has recently managed to establish an officered Experimental Station in the North.

Frankly, the general public is not interested in the perpetuation of the native forests. It rests upon the professional foresters of New Zealand to show the public the true economics of the case. New Zealand has always grudged paying for any form of scientific research, and it has been our habit always to shirk the problem. It was so much easier to drift along, destroying the forest, and then, when the end was in sight, still so much easier to go in for large scale planting. But it is quite likely that such policy will prove vastly more costly than its alternative. Our native forest area is now too small for our national needs, so some afforestation has been essential. That price must be paid for our national shortsightedness, but let us not thoughtlessly destroy the asset which is left, and increase the cost that must be paid.

The profession must, in the interests of true national economy, and in justification of its own training and ability set the facts of the case before the public, showing that it is not mere sentiment but thoroughly sound business to explore fully the silvical nature of our forests so that our remaining native forest may become a permanently producing unit at a cost well below that of wrecking it, and then replacing it artificially.

### *A Quarantine on Imported Timber*

Recent cases of imported timber arriving at New Zealand ports in a badly insect-infested condition have brought to general attention a matter to which foresters in New Zealand have been giving considerable thought for some time. That is, the danger of bringing into this country in all shipments of timber products wood-boring insects that might prove

a menace to our own forest industries. Our own native forest insects were at the time of European settlement on an endemic basis, so far as can be judged, and the native bush itself is probably still largely so. A few of our native insects have been enlarging their scope at the expense of some exotic trees, but practically all our present insect pests have arrived

in this country unnoticed, carried on the cargoes of vessels trading to these shores. We have by no means imported yet all the noxious insects found in other lands, and have no wish to do so. It is desired to formulate some means by which the danger of bringing in these insects may be obviated. We import annually large quantities of timber, practically all rough sawn green, and most of it in baulk. We also import a considerable quantity of natural round poles and piling from Australia. Finally, we run a risk of importing some insects at least in the wooden boxes, cases, etc., in which manufactured goods of all kinds are brought here from practically any country on earth. The problem is to find some certain way of eliminating the chance of bringing in insects, without incurring any undue expense, and without interfering with the normal course of trade.

There are certain measures that may be taken which offer a considerable degree of protection. When so many of the wood-destroying insects may be found at some stage in or under the bark, the rigid insistence that all natural round poles be absolutely free of bark, and that no waney-edged timber or baulks be admitted unless the bark is stripped clean is a measure that seems obvious, as it entails little expense or difficulty, and in no way interferes with the utility of the pieces.

The demanding that all timber be kiln-dried before leaving the country of export has also been suggested. Kilning will certainly kill all insect adults and larvæ that may be present in the piece at the time. It offers little protection, however, against subsequent re-infection between the time of kilning and the date of leaving the shores of the exporting country. It has the further disadvantage in that the process leaves no visible sign of its being performed on the timber. No person in New Zealand inspecting the timber on its arrival here could definitely state that it had or had not been kilned. It would be necessary, therefore, to demand a certificate to accompany each shipment. Where the shipments were made in bulk ex mill direct on to ocean-going steamer, this would be feasible, though the possibility of false certificates is always present and difficult to detect. Where the trade is, as is New Zealand's, largely a "parcel" trade, working through brokers who place orders for small lots in any of a number of

mills and assemble cargoes in the exporting ports over a period of some length, the requirement for a certificate of kilning would prove difficult to fulfill, irksome to the trade, certain to be evaded, and of doubtful value, due to risk of re-infection prior to final shipment.

Fumigation of the cargo seems impracticable, either in transit or on arrival. It could be done only by gases, and would be dangerous to the operators, while penetration of all galleries in the timber would be very slow, or almost impossible.

The only safe method seems to be that of actual inspection of the timber by persons qualified to detect the evidence of insect infestation. Inspection has the great drawback of being expensive. Also, if not complete, it is futile. There is one thing above all others that must be avoided—the raising of the cost of timber unnecessarily by an inspectorate unable to give a reasonable measure of protection because inadequate in either men, equipment, or knowledge and ability. The need is to devise an inspectorate adequate enough to guarantee effectiveness at the lowest possible cost, and applied in a manner that will cause least interference to the trade. Inspection could be applied either abroad or here in the country of destination. If done abroad, it could be done either by our own agents stationed at the exporting ports, or by agents of the country of export on our behalf. Our total import is but 60 million feet, coming from many ports, mainly Australian, Canadian, American, and English, but from others as well, so that the first suggestion, that of stationing men abroad, is obviously unpractical.

To have it done for us by agents of other countries has been seriously suggested. It has been put forward that it be required that every shipment of timber be accompanied by a certificate from some official of the exporting country that the timber is, to the best of his knowledge, free from noxious insects. Such a service might be arranged for rather cheaply. That is doubtful, but at least is its only advantage. On the other hand, it contains disadvantages nothing short of dangerous. Were the exporting all done from ports which are also important importing centres for the countries concerned, where a trained inspectorate might be stationed, whose services could be availed of, the scheme might

be of value. But that is not the case. It would inevitably mean that in most cases the certifying would be done by a post office or harbour official, having no expert knowledge of the subject, nor any real interest in preventing the insects from leaving the country. The inspection would be regarded as an interference with regular duties, and would become the meaningless filling in of a form. We have had experience here in New Zealand of cases where postal officers, police, and others have been given such extraneous duties requiring for adequate performance certain special knowledge. We know the intense irritation that can arise in such cases. The official who takes his work seriously and holds a doubtful shipment until he can get an expert to the scene is an officious meddling bureaucrat. It is easier to sign and say nothing, especially when the country concerned is not affected, and no responsibility can be fixed upon the official in event of infested timber passing under him without detection.

It is to our own interests only to keep the insects out, and we must take full responsibility in the matter. An inspectorate in New Zealand seems the only feasible solution of the problem. We already have a forest entomological organization with the expert knowledge needed to do this work thoroughly and expeditiously. It should be possible to arrange for an officer of this section to pass all cargoes of timber at the port of entry. Shipping advices are usually received in New Zealand some time in advance of arrival of cargoes. The Customs Department could with little trouble notify the entomological inspector of time and port of discharge, and could be empowered to hold all consignments until passed by the inspector. With the inspector on the wharf during unloading, the time taken for a trained man to go through the parcel would not be great.

The cost of the system would therefore be almost entirely represented by the salaries and expenses of the inspectors. How many of these would be needed would be governed by the number of shipments arriving monthly and the ports of discharge. Were it not for our great number of ports of entry in New Zealand, one full time man should be ample. With small parcels to be unloaded from a single vessel at any of a dozen points of discharge up and down the New Zealand coast, the matter is less simple. It is not known how much hardship would be involved by requiring all timber imports to be centralized in, say, five ports, but such measure would certainly simplify the inspection. But in any case it seems that inspection by trained men at the point of discharge is the only feasible means of getting a quarantine service that would be effective enough to justify its existence.

The system sketched above can be considered adequate for the handling of sawn timber, logs and poles. It could hardly be effectively applied to the risk represented by casing and boxing timber. That is a more difficult matter to handle. Being farther from the forest than sawn or round material, the risk of bringing in forest insects is lessened, though having been in use for a longer time the chance of having become infected with low-moisture-content insects is greater, particularly as boxing and casing is made of the poorer grades of timber. The matter needs further investigation to see how great in reality is the menace represented by this class of material.

But in the meantime, since the imports of sawn and round timber form the overwhelming proportion of wood material entering the country, and since these may be comparatively simply dealt with as outlined above, there is no reason why a system of inspection should not be applied at once.

## *The University and Industry*

Considerable attention has been devoted by economists, educationalists, and others prominent in the social development of this country to the functions and duties of the University as a national institution. The opinions of these men have naturally received con-

sideration from our own viewpoint of national forestry education.

The University has as its prime aims the development of a cultural or broad outlook, and the development of the powers of reasoning, rather than the imparting of definite

items of information, of either practical or cultural value in themselves. The University professional schools, to fulfill their function adequately must not lose sight of this prime object, even though their courses deal with concrete or applied subjects, and their avowed aim is to turn out men professionally competent. Professional competence must mean a sound understanding of scientific method, a good grounding in basic science, and a well-developed quantitative or mathematical comprehension. On that foundation the professional courses aim to build a faculty for appreciation of essential factors, a true recognition of cause and effect, and a sense of application of scientific method to the problem in hand. This last can be obtained only through practical experience. The hand must teach the head to weigh accurately the physical factors of time and space, so that field and laboratory work are indispensably connected with the lectures and reading. Forestry, as an applied science, can have tangible expression only in quantitative terms. It is the aim of the field and laboratory work to provide the quantitative units in terms of which the effects of the various underlying principles of pure science may be weighed and compared.

In developing a teaching institution with these aims in view, two things are essential, if the teaching work is to be on a sound basis, and in touch with the realities of life, that is, interpreting truly the quantitative values involved. These two things are research, and a definite connection with industrial organisation. The value of the first is obvious, since by research alone can our understanding of the relation of cause and effect be extended.

The second is a matter whose value has not been recognised by the University itself until rather recently, with the result that in many instances there exists a gulf of lack of sympathy and understanding between the professional schools and the related industries. There are in all applied sciences two sets of factors to be weighed,—those factors of physical science governing the operation, which in forestry is the growing of trees, and those economic factors of value which govern the profitability of the operation. Our scale of values is continually changing in the second set of factors, as our economic position

evolves, so that unless the orientation of the professional schools is constantly checked, their outlook becomes anachronistic. This orientation can be kept only by actual contact with the living industry of the practising profession.

The old idea that it was beneath the dignity of the University to have any dealing with commerce is rapidly disappearing, and in almost every case the gulf is being bridged to the benefit both of the University and the industries concerned.

In laying the policy for the School of Forestry the importance of developing every possible contact with the forest industries of New Zealand was recognised. Limited staff and equipment, and the fact that the School was new, small, and insufficiently nourished financially, made progress toward this aim difficult. At the same time the past six years have seen a respectable body of co-operative projects completed by the School in conjunction with a wide variety of forestry organisations. These include, in addition to such routine matters as appraisals of plantations, etc., and identification of timber specimens, projects such as an investigation of non-pressure penetration by creosote of native and exotic timbers in co-operation with a gas company marketing a creosote by-product; studies of cask materials, and of decay in cool store construction for a meat export company; investigation of certain properties in proprietary building boards for an interested firm, etc. In the broader fields, close and harmonious relations exist between the School and the Sawmillers' Federation, the local Timber Merchants' Association, Builders' Association, architects and industrial wood-using plants.

In such ways the School attempts to keep always in a position to appreciate truly the economic factors which govern the field of forest use, and therefore forest development. The founders of the School are convinced by the results of the past six years that their policy has been amply justified. The expansion of activity now opening to the School with its recognition as the Dominion centre for forestry education is expected to enable this aspect of the work to be considerably enlarged.

## Research in Forest Biology

In our last number we referred to the establishment of a Forest Biological Research Station in Nelson. We stated: "The initial work of this station will be the handling of problems in forest entomology and later on mycological problems will be attacked. When in time the whole scope of animal and plant life of the New Zealand forest is under investigation the value of this station will be inestimable."

It is most gratifying to observe that the research station is now in being. A controlling body has been set up, known as the Forest Biological Research Committee, composed of representatives of the Department of Scientific and Industrial Research, the State Forest Service, the New Zealand Timber Growers' Association, and the Cawthron Institute. The Chairman is Mr. C. E. Foweraker, Lecturer in Charge of the Canterbury School of Forestry. The Director of the Station is Dr. David Miller, Chief Entomologist to the Cawthron Institute, and his chief of staff is Mr. A. F. Clark, A.C.S.F., an ex-student of the Canterbury School of Forestry.

The Station is housed in a new and commodious ferro-concrete building adjacent to the entomological buildings of the Cawthron Institute, Nelson. The building comprises

several laboratories, library, and committee room, and the structure has been so arranged that a second storey can be added when necessary. Ample ground is allowed at the back of the building for field experiments and the construction of insectaries.

Much work has already been accomplished, and the general policy is to pursue three main lines of endeavour; first, forest entomological survey; second, studies of individual pests and general investigations; and third, the work of an information bureau and the formation of collections. The mycological work of the station will be carried out in the meantime at Palmerston North, under the direction of Dr. Cunningham, Government Mycologist. Arrangements have already been made for laboratory accommodation, and for the general work of research into problems relating to New Zealand forest mycology.

The establishment and functioning of this research station is a fact whose value is thoroughly appreciated by the various forestry interests in New Zealand. It is an endeavour in co-operative research which should be far-reaching in its results, and we wish the new station every success.

