

Among the many specific problems of great economic value which should be concentrated on during the next five years through the Forest Experiment Station are—

- (1.) The wood-borer—means of combatant control.
- (2.) The fixation of sand-dunes, and the economic utilization of the 500 square miles of sand-dunes in this country. This is a very important matter, and one that should be immediately dealt with. A definite appropriation of, say, £1,000 per year for five years should enable this Service to solve this problem.
- (3.) The development of farm forestry—what species to use, and study of methods of extraction, and of the best procedure for the farmer to use in developing his 5-acre or 10-acre woodlot.
- (4.) Investigation into the incidence and burden of taxation on timber land and plantations.
- (5.) Investigations into the lumber industry—logging, milling, and marketing, development of cultural regulations such as brush-disposal, fire protection, seed-trees, &c.
- (6.) Nursery practice, planting experiments, &c.
- (7.) Tree-seed selection, testing, &c.
- (8.) Determination of the mortality of residual trees after cutting by selection; under-planting value, &c.
- (9.) Cost of exploitation in the woods and the mill of various-sized logs.
- (10.) Life of woods and mill tools and equipment, considering wear and obsolescence.
- (11.) Influence of natural and other conditions on construction costs of major logging improvements, such as tramways, &c.
- (12.) The formation and observation of experimental logging-areas under various systems of extraction and silvicultural treatment.
- (13.) The location and observation of demonstration forests.
- (14.) Location, observation, and record of sample forest areas for statistical purposes.
- (15.) Forest mensuration, management, and forestation.
- (16.) Quantitative and qualitative forest increments in mature forests and on cut-over lands.
- (17.) Standardization of silvicultural practice.
- (18.) Correlation of biological factors with physical, chemical, and structural qualities of timber.
- (19.) Effects of forests climatically on various parts of New Zealand.

The Forest Products Laboratory.

The purpose of the Forest Products Laboratory is to promote the most profitable and economical utilization of forest products for the benefit of timber operators and users of wood, and to aid in the administration of the forests. In dealing with wood problems, preference, of course, should be given to those investigations relating directly to improved utilization and current business on the State forests.

The laboratory should be concerned with the conduction of technical studies and experiments designed primarily to add to existing technical knowledge of the properties and constituents of wood, and to develop by commercial tests new processes or methods of utilization having economic value, such as—

- (a.) Market studies.
- (b.) Market prejudices against certain grades and species.
- (c.) General questions of timber supply and demand.
- (d.) Industrial investigations such as—(1) Collection and compilation of statistics of production and consumption of forest products; prevailing market and stumpage prices; imports and exports; freight rates: (2) use and demand and prices of our exported timbers in other countries: (3) compilation and study of specific specifications of rough and manufactured forest products: (4) studies of lumber-manufacturing and wood-using industries as to methods, forms of material, wastes, costs, equipment, substitution of one species for another, and the improvements of more conservative use of raw material: (5) advice and assistance, through co-operative agreements and otherwise, to other Government Departments, counties, industries, and individuals.

Among the many problems of prime importance that the Forest Products Laboratory should be concerned with in the next few years are—

- (1.) Investigation and study of the relative pulping-values of our native woods. There are many thousands of tons of waste wood accumulating as a consequence of exploitation that might be utilized for the manufacture of wood-pulp, paper, and composition-board. The solving of this problem would be of great practical value to the paper-consumers of New Zealand. Every effort should be made to establish the pulp and paper industry in New Zealand. (A pulp and paper mill uses its raw material to a much finer degree than does any other wood-using industry.)
- (2.) The possibilities of securing a cheap motor-fuel by distillation of waste wood. The high price of petrol, together with early exhaustion of the big oilfields, will soon make possible the development of the wood-distillation industry having for its main objective the production of alcohol. This problem is now being aggressively investigated in the United States, and it is hoped in a very short time that an economical method may be worked to utilize at the mill the waste in all the great timber-producing centres for this purpose.