Modern forest management is largely concerned with obtaining optimum productivity from site, capital and labour. To date, a great deal of attention has been concentrated on increasing the productivity of the site but the growing requirement for skilled forest labour, together with the increasing cost of this important element in our labour-intensive forest industry, both emphasize the need to increase labour productivity. Most present-day foresters will agree that a permanent, well-trained labour complement is an absolute essential to sound forest development.

On surveying the articles in *Te Kura Ngahere* from 1925 to 1936 and latterly in the *N.Z. Journal of Forestry*, I could find only four articles which had any bearing on forest labour: an editorial dealing with immigration published in 1949; an historical survey by Kennedy in 1951; one by Miller on piece-work payments; and an editorial in the most recent issue — this in 46 years of publication by our profession. From this dearth of written information and comment, apart from the recent, timely editorial, one could well assume that, of the three elements of productivity, land, capital and labour, the labour element in forest management to date has been of least consequence. It is high time then for our Institute and the forest industry at large to be having a good look at the sort of men seeking forestry work and to be giving careful thought to the skills they require, their training and motivation.

Let me recapitulate what has been written about forest labour. The 1949 editorial on "Forestry and Immigration" surveys the postwar scene, noting the small influx of ex-service-men into forestry ranks because of the buoyant economy and more attractive working conditions in other industrial spheres. During 1947 and 1948 some 200 immigrants from the United Kingdom found work in forestry but wastage was both high and rapid. Many of the U.K. workers were tradesmen who defected to other occupations where conditions were less isolated than in some of our forests. Later, there was further immigration by families from Baltic countries displaced by the Second World War, and later again, by Dutch families from Indonesia. These families settled remarkably well and proved to be very satisfactory workers. Very few have remained in forestry work. In an article entitled "New Zealand Forest Practice — Review and Preview" (1951), Kennedy reviewed some 30 years of forestry progress in this country. Reference was made to the fairly rapid forest development of the 1920s when the Forest Service alone planted some

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200,000 acres, largely using seasonal workers. The economic depression of the 1930s saw an increase in the tempo of forest establishment owing to the plentiful supply of otherwise unemployed manpower and the availability of suitable land. As economic conditions improved towards the end of the decade, the great bulk of men previously engaged on relief works, including forestry, were rapidly reabsorbed into old trades and professions. The commencement of hostilities gave further impetus to the exodus of labour from forestry and the manpower shortage continued on well into the postwar years.

Today we can look back and salute the men who organized and controlled the tremendous planting feats of the 1930s. We acknowledge also the accomplishments of the relief workers and others by whose efforts an exotic forest estate of nearly one million acres became a reality. We are not well acquainted, however, with the living and working conditions under which most of the forest labour force worked. Little has been written of the massive tent and hut camps of Kaingaroa and Whaka Forests; of long hours of strenuous work in all weather conditions; of inadequate clothing and little pay. This is an era which is past — a slice of New Zealand’s forest history which will never be repeated. For all that, today’s forest managers may well envy their earlier counterparts who were able to establish vast tracts of forest on prime forest topography at such little cost. The last 20 years has seen a reinvigorated industry, especially in terms of forest expansion and silviculture. The forest labour growth rate over the ten years to 1968 was 47.9% — a rate of growth more than twice that of the whole of the forest industry; and again, more than twice the rate for the whole labour force in all industries. (Forestry Development Conference Manpower Report, 1969.) Over the five-year period 1968 to 1973, the Forestry Development Conference predicts forest labour requirements will increase at a rate of over 8.5% per annum in order to sustain the planned planting rate of 52,000 acres per annum. Thereafter, an annual growth rate of 1% per annum is estimated. In the Labour and Employment Gazette of February 1971, a labour decrease of 6.5% is recorded over the period October 1969-October 1970. This decrease may in fact be accelerating owing to present fiscal policies of Government. Unless this trend is soon reversed, the Forestry Development Conference targets will become meaningless.

What kind of person are we going to recruit to the forest industry in the next decade or two? From present experience, we should be able to detail a specification for what we believe is an adequate forest worker. As we have seen in the past, all kinds of people have contributed to the forestry work force — the prisoner, the unemployed, the immigrant, the ex-serviceman, the seasonal worker, as well as a permanent cadre of workmen. We in the industry have helped to write down the image of the forest worker by providing monotonous and often unsafe work conditions; by poor awards in relation to other sections of industry, and by lack of adequate incentives, financial and social, which have contributed in the
past to poor morale, absenteeism and to high labour turnover.

Following the planting boom of the 1920s and 1930s, it was understandable that many people regarded tree planting and forestry as synonymous terms. There was no tending and no utilization. The forest industry can no longer afford to believe that the example of the past can be repeated. In an address to the Forestry Development Conference in 1969, our present Minister of Forests acknowledged that the forest industry needs more technically skilled men. But then he went on to say: “Establishing forests can use otherwise redundant labour productively to create an asset from which major industrial growth can be spawned. The forest establishment gamble in the years 1925 to 1934 is a magnificent example of this.” Further on in his address, the Minister suggests that “Our future forest labour requirements can include labour that is seasonally unemployed or caught up in the restructuring of the economy.” Reference was then made to 35% of the total unemployed used by the Government in 1968 in State forests. For me, these statements suggest that the Minister still equates tree planting and forestry as synonyms and that the industry can still look to the unemployed and the seasonal worker for its unskilled labour force. I wonder just what the true cost to the Forest Service was, of the 1,872 unemployed or winter workers as they are now called, which the service employed in 1968? I suggest it was significantly in excess of the costs of the work accomplished on the same forests by the trained and highly skilled, permanent labour force. We must remember that these State-owned, exotic forests represent commercial enterprises where excessive costs in the establishment stages will be carried throughout the rotation at interest rates of 7% or greater.

With some exceptions, gone are the days when vast tracts of easy topography with little impeding scrub cover were available for forest establishment. Today’s forest managers are having to face the establishment of new forests on much more difficult country where cutover native forest is common. The clearing, burning and planting of such country, and the subsequent tending of the crops thereon, require that our present and future labour must comprise the most highly skilled individuals that we can find. We must train and house them adequately and plan to retain them throughout their working life. We hear the phrase that “forestry has come of age” but we have got a long way to go yet. We must realize that our workmen must learn to work safely in what is naturally an unsafe environment. The manager of a factory can generally modify the work environment. This can rarely be accomplished in our “forest factories”. Mechanization of forestry work is increasing — in nurseries, in land clearing, in planting, in the use of aircraft for applying herbicides, for fertilizing and air seeding, and especially in harvesting. Increasing labour costs will be a continuing spur to further mechanization but there are obvious limits as to how far we can replace labour with mechanical systems. Training will become increasingly necessary in forestry as mechanization in-
creases, and New Zealand is far from being a leader in this field. We can look to those countries such as Scandinavia, Europe and North America where, of all rural jobs, forestry is a key one and the skill requirements are high, made necessary by the high level of technology and by the environment itself. We in New Zealand must also set about upgrading the public image of forest operations by providing formal training programmes and stressing skill requirements; and by publicity aimed at showing improved living and working conditions in this sector of industry.

With the increasing forestry programme planned for the next decade or two, the time is ripe, I believe, for forest managers to give greater consideration to the level of job characteristic requirements in the future. These job elements can be classified into such groups as skill, effort, responsibility and work conditions. In the productivity formula of land/capital/labour, the latter is of equal importance to the other two. We should be aware of the motivational factors which can prevent people from becoming unhappy with their jobs and unco-operative workmen; for example, adequate levels of earnings and fringe benefits, quality of supervision and good work conditions. We should also be aware of those factors which make people happy to contribute their best; for example, interest and challenge in work, recognition and feeling of achievement. There is obviously a very strong relationship between the characteristics of a job and the factors which motivate men.

In New Zealand we have a limited labour pool from which the primary and secondary industries must draw. There is already plenty of competition for skilled labour. The financial rewards in industry, including basic wage rates, shift work allowances and overtime, generally overshadow those offered by forestry. There should be adequate rewards for men who are prepared to work in all weathers at jobs which are often dangerous, often very tedious, boring and mundane. The provision of an adequate wage structure — i.e., one which compares favourably with the levels of financial returns in other sectors of industry — and the provision of other adequate incentives are important considerations.

Equally, or even more important, however, are the environmental factors that must be endured by the employee in the performance of his duties. As examples pertinent to forestry operations there are such items as temperature extremes, exposure to dust, fumes, chemicals, water, noise, and safety hazards to the worker himself. Managements should provide for the safest working conditions possible. An alarming statistic concerns chainsaw accidents in New Zealand during the last two years. There were 72 accidents to personnel working in exotic forests in the Rotorua labour district in 1969. In 1970 the total was 45. Throughout the whole of both indigenous and exotic forest work in New Zealand in 1970, the chainsaw toll was 500. Chainsaws are becoming as lethal as firearms. Of the 19 fatal accidents in forestry recorded for New Zealand in 1970, 7 occurred in the Rotorua region and 3 of these were due to hangups caused by vines. Several
of these accidents related to land clearing operations, a function which is becoming increasingly important in forest establishment operations today, and one wherein there is little prospect of mechanical tools replacing the forest labourer with his chainsaw. To eliminate these accidents there must by first-class, on-the-job training and complementary training such as is now available in the short courses at the Forestry Training Centre and the Timber Industry Training Centre in Rotorua. Personnel safety is the concern of everyone in the forestry business — management and employee alike. First-line supervision should remind the men constantly of the hazards associated with their jobs. Safety meetings held at regular intervals, safety schemes to heighten interest, non-routine publicity and the provision of safe equipment, and clothing should all be part of the everyday business of forestry. Chainsaws with bow and paddle bars can be more effectively protected than can the more conventional straight bar. Available protective clothing should include ballistic-nylon leg pads and hand protectors for chainsaw operators, wet-weather clothing, protective hats and safety boots. Ear muffs for both chainsaw operators and tractor drivers are required, as are goggles and respirators for use by personnel on chemical spraying, burning-off and firefighting. Tractors need to be equipped with weatherproof safety cabs. These items used in the appropriate situations will help in enhancing worker productivity.

The field of worker health is equally important. A significant environmental factor is that of noise levels generated by the powered equipment which workmen are required to handle — e.g., tractors, powersaws. Authorities differ on the exact level where sound becomes injurious to hearing but, for long-term exposure to sound in the range of 90 to 95 decibels, ear protectors are recommended to prevent hearing loss. However, ear muffs or plugs should only be used if it is not possible to control noise at its source. Continuous excessive noise can not only result in permanent injury, but also impairs the efficiency of the operator to an increasing degree. Excessive noise causes distraction and fatigue, resulting in less alertness, slower reactions and reduced output. It can hinder communication between workers and may be a cause of accidents by masking warning signals. The Agricultural Engineering Institute at Lincoln College, in a report released recently dealing with noise in 65 hp tractors, indicated that permanent damage to hearing may result from exposure to levels of 98 decibels in “A” range, for regular periods in excess of 8 hours. Enclosed cabs increase noise and it was recommended that acoustic pads be incorporated in the covered frame. The problem with chainsaws may be overcome by improved design, by the use of mufflers, etc. Managers should be aware of this problem and should plan to accommodate improved equipment as soon as possible.

More insidious than the effects of high noise levels on hearing are the possible effects of vibration tools on the human body. The Raynaud phenomenon, of occupational origin, is a vascular disease of the hands which is known to affect people subject to the vibrations of tools such as pneumatic...
hammers, grining tools and the like. The phenomenon is not unknown in forestry and thus the new generation of chainsaws, specially designed to prevent excessive vibration to the operator, and now on the market, may be regarded as a "stitch in time". In this wide field of worker health and safety, I believe that the forestry industry is moving in the right direction. Some of the protective devices previously mentioned are already required by our legislation. Where a need exists, management should take the initiative and not wait until pressure from the unions makes us meet the situation.

I made mention earlier of routine and mundane forest work. How does management find the means of instilling a sense of skill, variety, responsibility and achievement into a work force faced with the release-cutting of thousands of acres of new plantings, the pruning of thousands of acres of young pine stands and the clearfelling of cutover native forest? It is said that where a man has a narrow job outlook as does a worker on an assembly line handling only one small component in a complex technical product, then only about 5% of that man's potential is being used. Much forest work is like the assembly line. We should plan to rotate forest personnel from job to job in order to provide change and to give each man as wide an experience and training as possible.

Finally, the job of work being done is the great common interest between the forest manager and his labour. By directing our attention to the issues I have discussed; by remembering that men are one of the most important assets required by industry; by emphasizing that our industry does not want the school "dropout" nor the casual labourer, we can set about improving the quality of life for forestry workers and at the same time improve the image of forestry in New Zealand.