quality and application of wood preservatives to building timber has met on several occasions, and it is hoped that a standard specification will soon be issued. Pentachlorphenol continues to rank as the most toxic preservative generally available for such work.

Unfortunately, it is not yet appreciated that, irrespective of the preservative employed and whether pressure or non-pressure application is used, timber must be adequately seasoned before treatment. The reason for this is twofold. Firstly, removal of free water from the cells of the wood is necessary in order to enable adequate absorption and uniformly deep penetration of the preservative to be achieved—with green timber difficulty is likely to be encountered in obtaining the necessary absorption and the penetration is almost certain to be erratic; and, secondly, it is important that the checking and splitting, however minute, which invariably accompanies the shrinkage during seasoning should occur before treatment, so that the preservative can enter such crevices and give protection against the subsequent entry of decay or insects at such points. Failure to observe this fundamental precaution of drying timber before treatment can completely nullify the value of any treatment or preservative.

Neither are the natural limitations of the various classes of preservatives well recognized. Creosotes and carbolineums which may be grouped as coal-tar derivatives are outstanding in that over the last century they have been used for the treatment of twenty times as much wood as all the other known preservatives combined and currently are still used ten times as much. Their value lies in the fact that they are highly toxic and relatively permanent, resisting leaching by rain, ground or sea water, and also improve the mechanical surface properties of the wood and its dimensional stability. The only serious disadvantages to the use of creosotes, &c., are their lasting odour and their ability to penetrate all ordinary paint films (with the possible exception of aluminium primer) and so discolour any light paints applied over the treated wood. For these reasons the creosotes find their principal usage in poles, sleepers, piles, and all outdoor or exposed construction and are confined in building work to piles and subfloor structures. No other preservatives, advertisements and propaganda to the contrary notwithstanding, are their equal, especially in such a country as New Zealand with a high and well distributed rainfall.

Ranking next in value and wide utility are the oil-solvent preservatives, of which pentachlorphenol is the most important. These have much the same properties as the creosotes in being highly toxic, relatively permanent, and not affecting the dimensional stability of the wood. On the other hand, they do not improve the mechanical surface properties of the wood, but leave no lasting odour and do not discolour paint films or varnishes. Their natural field of usefulness is accordingly the treatment of wood *in situ*, assembled wooden articles, and particularly of finished furniture or joinery parts prior to final assembly and of precut building members for prefabrication or house site usage.

The water-soluble salts, of which zinc chloride has been the most widely used, include a much greater range of proprietary preservatives than either of the other groups. Many of the claims made for such preservatives should be accepted only with caution. That some of them are quite toxic is certain—some even dangerously so, such as the arsenical and mercurial salts—but, aside from the advantage that they do not discolour paints and varnishes, the disadvantages attached to their use severely restrict their utility. Applied as they must be to dried timber, the wood swells again as the preservative penetrates the timber. Moreover, after treatment the wood must be dried again (a further expense), but, unfortunately, it does not shrink back to its original dimensions, so that this class of preservative cannot be used either for assembled wood products or for accurately finished furniture or joinery parts, but only for precut building members or parts not requiring great accuracy of fit. If good penetration can be secured, this class of preservative, like both other groups, may be applied before machining, working, or finishing, and any untreated wood exposed by subsequent working, &c., retreated. Water-soluble preservatives, however, do not resist leaching—their name implying this—to the same extent as the other groups, though some such preservatives are reported to be relatively good as compared with others and have their claims supported to a certain degree by laboratory and service tests. Nevertheless, until further service data are available, particularly from countries of high, well-distributed rainfall, extreme caution should be used in employing any water-soluble salts except for the treatment of timber entirely protected from rain and ground water, &c. They are therefore not recommended for posts, poles, sleepers, piles, &c.

Attention is drawn to a demonstration of the effectiveness of creosote as a preservative for rimu poles. In 1931–32, sixty-five poles treated with creosote by the hot-and-cold bath process and with varying absorptions were installed by the Post and Telegraph Department in the Christchurch, Timaru, and Greymouth districts. Since installation, annual inspections have been made, the result of the last being that, after twelve to thirteen years' service, sixty-three of the poles are still sound and free from decay. In only two of the poles, which are still serviceable, was any decay discernible, and this occurred in poles which had received only a light treatment. Untreated rimu poles installed at the same time required renewal or strengthening with pole butts after only two to four years. An average life of not less than twenty years is confidently expected from these treated poles, and the results so far obtained are a valuable indication, not unexpected, of the feasibility of substituting locally grown timber, properly creosoted, for at least a portion of the country's imported Australian hardwood requirements.

In 1943 a test was initiated in co-operation with the Auckland Harbour Board to determine the resistance to marine borer attack of creosoted exotic timbers and untreated indigenous timbers. A recent inspection indicated that nearly all of the creosoted specimens are free from attack, although slight damage had occurred in a few which had received only a light treatment with shallow penetration of creosote. Untreated control specimens of the same species all showed heavy attack. Of the indigenous untreated timbers under test, totara is the only species which has exhibited any marked resistance, attack being only slight. Specimens of taraire, tawa, miro, and kauri all showed heavy attack, with taraire appearing to have suffered the least.