

is certain to find something, if not much, that is new. The more usual average of readers will find new material on every page. The reviewer, for example, had long wondered what any *Olearia* could possibly have had to do with frogs. Without this booklet, he would probably have continued to wonder to his dying day. The explanation is that the specific name *Rani* is a mutilation of the Maori word *Wharangi*, although admittedly the capital R should give more careful students a clue to the fact that a native vernacular name might be involved. The mutilation, however, is so extravagant that the connection could hardly be guessed, specially in view of the fact that modern Maori lexicons show no authority for calling this particular *Olearia* "Wharangi." So too with the generic *Mida* from the Maori *Maire*.

Despite the scholarship and care of the authors, an occasional error seems to have crept in. The reviewer, somewhat mistrustful of his own temerity, ventures to suggest that the note on *Scutellaria* needs revision. The classical Latin diminutive of *scutum* is *scutulum*; the modernised Latin diminutive (according to the Oxford Dictionary) is *scutellum*. The word *scutella* which is quoted as the origin of this generic name is a diminutive of *scutra*=a platter, not of *scutum*=a shield. He would similarly venture to question the derivation given for *sanguinolentus*. In his opinion, Linnaeus, in condemning this word as a specific name (see p. 5), would have raised a colour bar only, not a scent bar.

Nor is it easy to agree that the name *Pteris comans* seems "singularly inapplicable" (p.25). On the contrary, the specific epithet seems to the reviewer to be beautifully appropriate to this particular bracken, if the Vergilian meaning of "leafy" or "luxuriant" is remembered.

These critical remarks are made principally with the hope that these small points will be amended in the second edition, to which the work will surely run in a very short period; and one may at the same time express the further hope that the second edition will be enlarged to give even more philological detail. Meantime, the first edition should be in the reference library of every N.Z. forester.

C.M.S.

Forest Tree Breeding and Genetics.—By R. H. Richens, M.A. Imperial Agricultural Bureaux, Joint Publication No. 8. pp. 79, paper covers. Nov., 1945. 5/-.

As its preface explains, the aim of this bulletin is to collate the literature on forest tree breeding that has appeared since 1930, much of which has been published in comparatively inaccessible German, Russian and Swedish forestry journals, so that it has become increasingly difficult for research workers to keep abreast with modern developments. An extensive bibliography is given, and also a glossary of technical terms; this latter feature is essential for any non-

specialist reader, owing to the considerable technical vocabulary which geneticists have found it necessary to invent. General principles of tree breeding are described, and the methods employed, including those aimed at reducing the time period necessary to secure results with forest trees, are outlined. The selection criteria used by tree breeders, including timber yield, reproductive capacity, tree shape, wood quality, competitive ability, resistance to fungi, insects, frost and other unfavourable conditions are considered, first in general and then with special reference to a number of tree genera.

The importance of normal sound silvicultural methods, such as the use of good seed, of local provenance, and the competent performance of thinning, is recognised, but it is urged that to secure the best results silviculture needs to be complemented by breeding. Thinning for example, though the best way of obtaining individual trees adapted to the local environment, is only eliminative and negative and places undue emphasis upon competitive vigour; such features as disease resistance and timber quality may not be correlated with vegetative vigour, and so may not be improved by selection based solely or principally upon juvenile growth rate.

Striking results have been achieved by selective breeding and hybridisation with fruit trees and field crops, and it is claimed that similar success may be expected with forest species. The time, area and expense involved are admitted difficulties to forest tree breeding, which can hardly be an economic proposition unless it is placed on a national or even an international basis; to reject forest genetics on those grounds however would be a short term view. Biological systems are essentially dynamic and it is seldom that a static equilibrium is attained; this is particularly true in forestry, where unfortunately the direction of movement is towards racial deterioration. Seed production is often greatest in low yielding or misshapen trees; uncontrolled commercial exploitation and the North American system of selective felling both result in a steady racial impoverishment, through the removal of the best trees and regeneration from the residual less valuable types. Breeding methods are thus necessary not only to improve the quality of trees but even to maintain their quality at its present level.

The bulletin is intended primarily for the research worker, and a considerable number of the genera dealt with in detail are practically unknown in New Zealand forestry, but it contains much of value and interest for those engaged in afforestation or reafforestation. Regeneration, whether natural or artificial, with inferior or ill adapted seed or stock is bound to result eventually in serious economic loss, so that, especially at a time such as this when forest areas are being felled and re-established on a hitherto unprecedented scale, all measures which can maintain or improve the quality of future stands deserve careful study.

O.J.