There are many figures, tables, photographs, and maps, and over 200 references.

Chapter 2 deals with the influence of shelter on factors of wind, temperature, humidity, water loss, and soil moisture, and needs careful reading to follow the meaning. A small but annoying defect is that figures relating to the text are not presented on the same page, while many of them are unnecessarily complicated and confusing. The practical man will find Chapter 4 most useful, summarising clearly the important points such as height, length, orientation, profile, and penetrability. It is interesting to read that on a small plains farm of 165 acres a mere 5% of the area devoted to shelterbelts will give adequate shelter. On the other hand, many people will disagree on the degree of penetrability. In this mild climate, draughts through even moderately open belts can be serious enough to cause stock ills; this must be true to an even greater extent in Britain. By trial and error, many New Zealand farmers have come to advocate dense hedges, up to 25 ft high, of clipped pine or cypress, and these approach the Danish ideal on a grand scale.

Anyone investigating problems connected with shelterbelts will find much that he needs to know in part 2, and with part 3 the author brings together useful information about equipment and techniques. The results of comprehensive wind-tunnel studies based on models indicate, as previously shown by Woodruff and Zing, how complicated the problem is. The model approach can only go so far in representing all the variables and results merely serve as a guide to further field studies.

Chapters 11 to 14 interpret and summarise a comprehensive work clearly and competently. Throughout, the author has maintained the high technical standard we have come to expect of the commission's bulletins and his handling of a difficult subject is creditable.

—W.J.W.

CONIFERS. SOUTH AFRICAN METHODS OF CULTIVATION.


This is a pleasant, informative, and very readable book. One can go further than this and state that it will bear re-reading and that certain of its pages will act as reference material for information that is not readily available outside of South Africa and adjoining British protectorates. Such, for example, are the notes on the plantations in Swaziland and the forest enterprises sponsored by the Colonial Development Corporation. The reviewer, for one, learned with some surprise that American investors are putting money into enterprises such as these. The author is a very well known forester in Britain whose work in private forests in the south of England has been noteworthy for many years past. He visited South Africa in 1947 and states that on that visit the then young plantations were "the best he had ever seen".
They were, however, very young, and the system of formation and early attention applied to them was then new and almost untried in its application to the unusual species that were being used. He therefore revisited the country in 1957 under the sponsorship of the Trust Directors of his British forests and, it would appear, as a guest partly of the South African Forestry Department and partly of the Corporation and their officers in Swaziland. He therefore had free and ready access both to plantations and to records that could not be available to the usual traveller in a strange country. He states frankly that during this 1957 tour “it would be an understatement to say that he was reassured” (pp. 18-19) on matters that had remained doubtful in 1947. This is no faint or equivocal praise; and no one can lightly dismiss such a statement from a forest economist of Hiley’s standing.

Having thus made it quite clear from the early pages that his overall impression of the results secured to date by the application of the unusual methods used was favourable, the author proceeds to give a well arranged impartial record of his own notes and field observations, and of the information proffered by his conducting hosts. His style is lucid, easy, and very readable. His notes are unbiased and his comments are unblemished by any of those fervent partisan superlatives that mar so many travellers’ descriptions of forests. He is not averse to the occasional doubting comment or query where there appears to be occasion for such, but such potential criticisms are never petulant and are ever tolerant of his hosts’ local viewpoints. In part, the reviewer is left at times with the impression that even the seeming adverse comment may have in it something of collusion or connivance with his hosts. How else indeed can one explain such seeming blunt comment as “There is something a bit frightening, a bit totalitarian, about a Department controlled in this way . . . deviationists are discouraged” (p. 19)? Or again “South Africans might learn much from Europe in acquiring etc.” (p. 23) or, perhaps best of all, when the author tested in the field the density of thinned plantations and found considerable deviations from written prescriptions, “The Department is not a martinet for accuracy”? Could this have been written except by an understanding forester with the faintest of winks to an understanding host Director? The reviewer ventures to read it as a subtle eulogy of a highly tolerant Department, which is not devoid of the “fluid biological attitude” (p. 23) to the problems of forestry.

The author is careful to make his initial chapter a discussion on the “Agricultural Approach to Forestry” favoured by South Africa, and to point out that what in Britain is called a “forest” is in South Africa called a “plantation” (p. 28). There is more in this than a mere difference of local name and idiom; and one may be sure that Hiley in pointing this out early in his book is doing more than making a random record of differing semantics between the countries. He is drawing reader attention to the fact that a whole national attitude of mind is involved, and that, unless this is clearly recognised, there is
much national danger to the forest problem in any country. The plantation concept is a special one quite distinct from and much narrower than the larger concept of a forest; and it can be presented with such stresses on rapidity of early growth in chosen species and such glossing over of accompanying exacting demands and restrictions that the wider forestry becomes lost in the narrow agricultural approach. "In South Africa the first duty of a forester is to make and cultivate plantations of exotic trees" (p. 28). It is a danger that besets the forester and his administrative controls in other lands also.

Having thus made it clear that the book deals with an agricultural rather than a silvicultural approach to conifer cultivation, the author quite logically gives his next chapter a numerical title. The agricultural approach always fascinates statistician, economist, farmer, and administrator, on his first encounter with extensive afforestation. It is so fatally easy to set trees out in regimented ranks and rectangular areas, to count them and measure their heights, to use simple multiplication, to extrapolate and interpolate figures, to strike averages, and to cast out seeming exceptions. To the reviewer it would seem that the author is well aware of this and has deliberately and logically followed his first "agricultural" chapter with a second "numerical" chapter as a warning. He adheres faithfully to his rule of impartiality and records what he saw (mostly with an approving eye) and what he was told. He states, however, almost casually that "the Department is not a martinet for accuracy" (p. 33) and the reviewer ventures to believe, as already stated, that this is not intended to be read as a disapproving, critical remark. The forester in the author peeps out for a moment behind the impartial reporter; and the concrete evidence in the field of "considerable deviations from the prescribed numbers" as shown in reports elicits an understanding, conniving approval, which is distinctly more than a condonation.

The next chapter in sequence is entitled "Dr Craib's Prescriptions" and it is probably the most interesting and revealing chapter of the book. It can perhaps be fully appreciated only by those who have watched for 30 years the development of the particular method of plantation treatment that the author is describing. It is a chapter of the history of a particular line of forest thought and of the almost fortuitous chain of circumstances that made its local adoption possible in South Africa, if indeed not formally mandatory. The story related by Hiley begins as early as 1929, a period which older forester-readers will remember as one of technical controversy in the U.S. journals about "root competition". The controversy about this factor as such was not particularly heated. It was not so much a controversy on the existence of root competition, as a difference of opinion about its universal significance. The theory had its exponents and its opponents. In the main, everyone accepted root competition as an ecological forest factor, as indeed all good ecologists had already done almost implicitly. As is usually the case with such doctrines, it would have
settled down to a general acceptance as nothing particularly new, if some few had not picked on it as the crucial factor that was going to explain most, if not all, forest ills. It became a fashionable subject for expositional research, and it proved that South Africa was a then topical field for pursuing research on that particular subject. The declining success of wattle culture at the time in the once celebrated Australian wattle plantations of Natal had a good deal to do with the opportunity. Any line of research that promised to the wattle industry restoration of earlier prosperity was sure to find supporters. Then almost overnight the new methods and principles enunciated for wattle culture (an orchard type of cultivation) were transferred to pine culture. The South African Forestry Department quite suddenly adopted at a departmental conference in 1938 a new set of prescriptions presented by Dr Craib for its pine forests. Hiley is careful to record that some of the older forest officers were unhappy about this new treatment even as late as 1947. This is certainly another of his modest understatements; and he admits (p. 39) that the "sudden conversion may have been due in part to Craib's personality". Hiley further concedes that he was told "that very few of those who were present (at the conference) understood the paper". However that may be, world events soon after 1938 overshadowed local foresters' technical differences of opinion, and since then normal passage of time has undoubtedly removed many, if not all, of the objectors from the field of official differences. In any case, the author states that "no undue pressure seems to have been put on them to operate" the new 1938 treatment during the remainder of their careers.

The victory to the younger exponents of the new pine prescriptions thus appears to have gone almost by default. The reviewer has not recent information about the wattle industry which gave rise to it all; but the general impression seems to be that it has dwindled probably in spite of, but not necessarily because of, the new methods.

The post-war period, has, one understands, seen the growth of much private investment in afforestation on a large commercial scale on land in the north-eastern districts of South Africa and in Rhodesia. It seems that commercial faith there has been pinned in the main to two fast-growing species of Central American pines and to the agricultural approach to cultural methods for them described by Hiley. The staff foresters of these enterprises have naturally been selected from men who undertake to direct this type of afforestation system and the picture presented to any accredited and enquiring visitor is of course coloured accordingly. The ensuing chapters of the book require careful reading to make quite sure which statements and opinions are derived from foresters who are officers of such enterprises (which it would seem have no interests in any other type of forest cultivation and harvesting) and which from departmental officers who have a much more varied range of coniferous species to care for and a much wider range of climates and soils to cope with. Examples and illus-
trations are quoted freely by the author from both sources. It is only to be expected that in details some would appear to contradict others, and in nearly every case the contradiction can plausibly be explained by differing local circumstances. The question always is "Are the hypothetical differences the complete explanation?" This query of course faces almost every writer on forest economics and finances, especially when he ventures to write as a visitor. It is many years since a very well known American writer on technical forest subjects explained to the reviewer that no such writer could ever hope to get his facts either complete or all correct to fit the strange point of view. Ask questions carefully and exhaustively as he may, the writer in a foreign forest (or even plantation) would always find that he had omitted to find out some peculiarity of species growth or use that altered the whole picture. It is this feature of the incomprehensibility of forests that drives non-foresters to demand figures, tables, graphs, and alignment charts in lieu of the more helpful verbal descriptions with all their provisos which the author in this case provides. With notes taken on the spot from at least three different sources, it is not surprising that differences and even contradictions occur. What it all boils down to is that everyone outside of departmental employ is plainly trying to provide for optimum site conditions, and that land prices (an economic factor not mentioned throughout the book) must be such that there is a wide choice of high-quality land available for plantation acquisition. This is evident from the scattered references to forest site quality, e.g. "Very few plantations are now made on Quality III sites" (p. 67) and "the sites planted in South Africa are nearly all high-quality sites" (p. 72). The principal adverse factor feared by the private-enterprise forests would appear to be the planting weather. "There are seldom more than 30 suitable days (for planting) in a year, and often fewer. When the weather is thought to be propitious, all available labour helps with the work, etc." This presupposes a very large available pool of casual labour on call. No mention is anywhere made of extensive drought losses amongst young trees in seasons after the initial planting or for that matter of losses from unseasonable frosts (although it is true that one does not think of those in South Africa). Mention is made of violent hail damage to conifer leaders with resulting epidemic outbreaks of Diplodia which seem to prove fatal or at least very deforming. It appears that these are being combated by using P. caribaea as the substitute species in lieu of the very susceptible P. radiata and P. patula (pp. 56 and 57), which sounds to New Zealanders a peculiar replacement to meet that catastrophe.

It would be perhaps unfair reviewing to endeavour to point out this matter of locality and regional differences in detail. Anyone with a small knowledge of species and climatic differences can make great play with such anecdotes. The important point for general forestry is that in too many cases belief in any new local method is apt to be contagious and to overstep its local boundaries. Its limitations are often (perhaps even usually) overlooked because of its local successes.
Hiley appears to the reviewer to mention dutifully the obvious limitations of the tree-cultivation methods that he describes, without sufficiently stressing them. He does, however, in his concluding paragraph (p. 116) state clearly that in his view it is almost a certainty that the adoption of similar methods in Britain would "greatly cheapen the growing of timber trees" there; and concludes on a note which appears to the reviewer to be the only unfair comment in the whole book, viz. that "the Commissioners (in Great Britain) are not as anxious as they should be to manage their plantations with professional competence". Hiley as a forest economist (his own description) must be well aware of how close economics run with politics and how difficult if not impossible it is at times to separate economic from political causes. He has naturally avoided, as we all do if possible, all reference to South African politics and to those of adjacent territories. But he also no more than mentions the economic factors that are at the base of the success of this particular type of forestry, viz. good land and cheap labour (p. 27). Land taxation and land tenures are not even mentioned throughout the book. It is on these that the success of the forest investment and the continuity of the forest enterprise must depend, and South Africa's position in these matters is so special that the economics of its "plantations" are scarcely worth considering for countries with other bases. They are as much part of the "special case" as are the species chosen (P. patula and P. caribaea) and the land quality used. "Very little land is now planted that will not support growth at a rate equivalent to the middle of Class II, or better" (p. 27). Few Commonwealth countries could in present times afford to neglect all forest lands of lower than Class II for timber growth, and few could find investors able to afford prices for land of Quality Class II and better, or to pay taxes and upkeep outgoings for such land devoted to forest "cropping".

He is also undoubtedly conversant with the extensive research and analysis of the procedure which is being undertaken by the South African Forestry Department, because he mentions Marsh's bulletin of 1955 prepared for the Commonwealth Forestry Conference. He refrains, as is just and natural, from quoting or using its findings, as they were put forward only as interim results and were not deemed to be yet conclusive. One finding amongst many was, however, proffered as definite, viz. that root competition for older planting densities was not a significant limiting factor at early ages. The original argument on which the whole theory was based is therefore discredited.

The British Commissioners must be aware of this clear South African finding and of the very extensive other investigations there current; and there seems to be no call for accusing them of neglect merely because they refrain from duplicating such costly research.

—C.M.S.

NOTE: P. caribaea, the name used above, is now known as P. elliotti.—Ed.