FOREST EDUCATION

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THE ARTICLE by the three senior students, Henderson, Brown and Mackay, in the September 1945 Chronicle is to be highly commended. All too frequently such articles pass without comment. In fact I have yet to see any criticism of Chronicle articles. I have written many but have looked in vain for comments favourable or otherwise. Such apathy does not show a healthy condition. One has the distinct feeling that the veriest drivel could be published and draw no comment. So when a timely article such as this appears, especially as it is written by coming foresters, it should at least be noticed.

The writer has thought for a long time that there is something lacking in forestry education. Usually the student is taken along in his mensuration course to the level of the estimate in cubic or board feet and then given only a minor "top-dressing" of regulation. All the methods of calculating yield, all the formulae, etc., in text-books are based on normal growing stock, normal increment and normal distribution of age-classes. Therefore, the senior student is left with the idea that since most of the forests he will encounter in his work, either in private or government employment, are the exact opposite of normal in all respects, he cannot use any of the text-book methods. How then is he to make an effort to place the forest with which he is concerned under sustained yield management. Everyone writing on the subject uses this term "sustained yield" often without much idea of how it is to be accomplished, either for small or large areas. This attempt, therefore, at determining the yield and budget for the university forest is an exercise which may serve these men well in their future work.

This leads to the problem of what should be the order of the courses in forest management, regulation and mensuration. Having in mind that this question of the budget and yield is coming more to the fore every day it would seem advisable to revise our methods and teach the student the "Forest Business". Why wait to give him some "top-dressing" of regulation in his final year? All the data necessary for the preparation of working plans for several different areas should be assembled in a booklet which could be used throughout the course. The student would then be required to prepare several working plans, and these could be discussed and criticised in the class-room. What matter if he does not know how to measure a tree, make a volume curve, or run an estimation survey? He will get an over-all picture of the forest business. When he has mastered the principles involved in running the business on a sustaining basis he can then be taught the ordinary methods of forest mensuration.

It is not necessary to teach the student first how to measure a tree, make a volume curve, or calculate increment. Some time ago, Bruce and Schumacher published a forest mensuration based on the principles that if the stu-

dent knows how to use the tools of forest mensuration, "he can work on any type of structure". This, while logical as far as mensuration itself is concerned, is not so logical when the application of forest mensuration in forest business is the chief consideration. The student should be taught how the forest business is run, or should be run, so that he will have a better background and know the reasons for studying methods of forest mensuration. These latter methods, when the sections on increment and yield are reached, are so complicated and confusing that, unless the student has a clear picture of how they are to be used in running the business, he may get lost and lose sight of the main objective.

The article written by the students could, of course, be criticised on many grounds, mostly on the assumptions which are made. A few comments may be of interest.

Evidently this was a practice cruise of the 3,640 acre forest, and while the whole plan is not given, the mechanics of the method of yield determination are presented. My first comment is, as would be expected, on the 20 per cent *standard error* allowed. This seems very high. Since the standard error is either plus or minus it would mean that the estimate may be either 20 per cent too high or too low. If it should be 20 per cent too low, to subtract another 20 per cent means that the estimate would be 40 per cent too low, which is a large amount. Surely even a 10 per cent cruise, if well done, should not be subject to such large errors.

With such heavy cutting as proposed every 30 years, the mortality from what is often termed decimation would actually be very small. Windthrow after cutting can, of course, be expected. But if a stand containing 2,239 board feet is to be left at each cutting out of one containing 4,800 board feet, it should be sufficient to prevent much windfall; especially if the larger trees are cut. It should not result in anything like 10 per cent of the volume of the stand being blown down.

Again, it seems to be the main object of management to grow saw timber. Why, then, is the forest capital reduced so much? Two thousand two hundred and thirty-nine board feet cannot be considered anywhere near normal stocking even after cutting. However, the policy may be chiefly to supply hardwood fuelwood to the university and the growing of softwood saw timber may be more or less a side-line.

Even if we assume that the forest capital is the average of 2,239 board feet (residual stand) and 4,800 board feet (final stand less 20 per cent) this is a volume of 3,520 board feet which is not a very high capital for maximum board-foot production. Taking the production in 30 years as $4,800 - 2,239 = 2,561$, we have a yearly production of about 85 board feet per acre per year, or about 2.4 per cent (Pressler's per cent). Of course, if the large amount of 20 per cent is not allowed for mortality and estimate error and 6,000 board feet are realized, the yearly increment is 125 board feet and the interest rate is 3 per cent (Pressler's). Even this amount is not high when calculations are made in board feet.

The important feature here is the acceptance of the residual stand as left

after thinning, or at least the volume concerned, as the most desirable one. This, with a 30-year cutting cycle, keeps the diameter limits down. Moreover, the species-volume relation is kept the same as in the original stand, which may or may not be desirable. Since white pine grows so well, even if there are only 10 trees per acre on the average, it would be well to try to increase the proportion of this species in the stand by leaving it to grow and cutting more heavily other species such as balsam fir.

These comments are made not so much as criticism as to show that an interest has been taken in the article. Some of them may not be pertinent, since the whole working plan with its silvicultural features is not given. It is hoped that the Chronicle will publish more articles of such a nature, bringing the discussion of sustained yield down to actual facts and figures.