NEWS AND NOTES

FIELD NOTES

by K. A. ARMSON¹

SOME THOUGHTS ON FOREST RESEARCH

"It has become fashionable to ornament science with statistical embellishments."²

In forest research the use of statistics has become a *sine qua non*, and the more elaborate and intricate, the weightier (often quite literally) and sounder the study is often considered to be. The writer is concerned with the fact that a large number of both practicing and research foresters presently hold the opinion that if the statistical mathematics are correct then it is only the results of statistical significance which matter!

Any type of investigation, formal or otherwise, must always be preceded by a question. The question will obviously have to be based on previous experience, knowledge and reasoning. This is of prime importance, because unless the proper question is asked the right answer will not be forthcoming—no matter how elaborate the experimental design and analysis. Surprisingly, studies are still begun without even a question being asked. Foresters still go out into the field, measuring all that can be measured and trusting that with the aid of punched cards and a super computing machine, answers will tumble forth much in the same fashion that sidewalk machines dispense horoscopes and weight.

A professor of forestry in Great Britain has been attributed with the remark that "statistics is often used as a substitute for common sense". Unfortunately this is often too true. Experiments are still performed to demonstrate that if two-thirds of a seedling's root system is cut off and it is planted with only its terminal bud above the ground it does not survive or grow as well as a seedling butchered and buried to a lesser degree (at the 5 per cent level of significance anyway!).

Statistics is a powerful tool which has been and can be used well. It is not the method but its misapplication which must be criticized.

In much of the experimental work that a forester is likely to do a knowledge of experimental design and elementary statistics is virtually obligatory. In the initial stages of a problem however, the first and most important thing is to find out what factors are involved. For example, if from observation and knowledge the poor growth of a particular stand of trees is deduced to be due to a deficiency of one or more nutrients, then by a series of simple *sore thumb* trials the particular nature of the deficiency should be capable of definition. A precise hypothesis may then be adopted and a full scale experiment set up to test it.

¹ Assistant Professor of Forestry, University of Toronto, Toronto, Ont. Notes were submitted at the request of Dr. I. C. M. Place who usually writes this column.

² Lurie, W. 1958. The impertinent questioner: The scientist's guide to the statistician's mind. Amer. Scientist, 45 : 1 : 57-61.

It has become increasingly popular for forest research workers to rely on instruments, gadgets and various mechanical and electrical contrivances to carry on their work. In the eyes of many an administrator, the number and complexity of gadgets used by a research worker has become one criterion of that worker's ability. Instruments may be invaluable both in the laboratory and the field but simply because the scale of an instrument reads to the nearest tenth of a unit does not mean that readings of this order have any significance. Soil reaction (pH), for example, can be measured in various ways ranging from the use of coloured dyes to a very elaborate electric meter with a corresponding precision from one half of a unit to one hundredth of a unit. For most soils a reading of 6.38 obtained electrometrically has no more significance than a reading of 6.5 obtained by using a dye.

During the past two or three years the writer has observed a number of experiments dealing with young trees, and it has been apparent that the trees themselves were unhealthy—a condition in no way related to the experimental treatments. It would seem obvious that the results of experiments performed with *invalid stock* are not applicable to healthy normal trees. For example, the results of an experiment concerned with the effect of light on the growth of jack pine are of little consequence if the trees suffer from a nitrogen deficiency.

Lastly, a number of research workers in forestry apparently have the notion that their work is of primary interest to botanists, soil scientists, etc., rather than to foresters. Perhaps, they are merely looking for recognition from what they deem to be more august disciplines. In any event there is a trend amongst Canadian forest research workers to neglect their colleagues in general practice and to consider that problems of a *fundamental* nature are more important than *practical* ones. The result is often an unfortunate gap between forest research and current practice.

This does not mean that forestry cannot benefit from the findings of other sciences. Communications between scientists in all fields are to be encouraged. What should be realized is that apart from an obligation to his employer the research worker in forestry has a further special responsibility to that profession and all those working in it.

DEVELOPMENTS IN FEDERAL FORESTRY ORGANIZATION

Recognition by the Federal Government of the importance of forestry to Canada was quite recently foreshadowed by the appearance of two items in the 1959 September and December issues of *The Forestry Chronicle*. The first was a brief by Prof. D. V. Love of the University of Toronto to the House of Commons Standing Committee on Mines, Forests and Waters, and the second was an extract from the final report of the above Commons Committee recommending among other things the establishment of a new federal department responsible for forestry.

Representations were made by eighteen forest industry leaders and other important forest authorities to the House of Commons Committee during its 1958-59 sittings. The biggest delegation, headed by T. N. Beaupré, President of Columbia Cellulose Corp., came from British Columbia.

The sequence of major events in the Federal Government's actions in