

awards to 71 meritorious students totalled £2,965, mostly in science and medicine; and the second year's working confirmed the promise of this new development. It is clear that while under the Welfare State the scope of Class B, so far as it is concerned with the payment of fees, is greatly diminished, there is still a restricted field

within which the intentions of the Trust can be properly and effectively implemented. Besides lists of research grants, fellowships and scholarships awarded and of publications since September 30, 1961, by Fellows, scholars and recipients of grants, the report includes a brief report on the work of Fellows and scholars during the year.

## ASSESSMENT OF SITE FACTORS IN FORESTRY

THIS subject is dealt with in an able manner in Bulletin 16 of Duke University School of Forestry, under the title *Parameters of Site for Certain Growth Components of Slash Pine—Pinus elliottii* Engelm, by Dr. D. S. Jackson\*. It is a subject which is extremely important in forestry because a great amount of planting of exotic trees is taking place in many parts of the world. If bad mistakes are to be avoided, and mistakes in the choice of tree species are not always readily apparent, some practical means of assessing site factors within the natural distribution of the species and outside it are almost essential. Compared with the agriculturist, the forester has to contend with many more factors, especially the whole seasonal cycle, wind, insect persistence and so on.

Numerous attempts have been made to produce climatic classifications and most of these have been concerned essentially with maximum and minimum temperatures, duration of drought, number of rainy days, the effective amount and time distribution of rainfall, and so on. Dr Jackson gives a very good review of some of these classifications and he points out their failings from the practical point of view. Many of the factors on which the classifications were based were often too arbitrarily selected and they gave too much consideration to those factors limiting natural distribution and not to those controlling growth. This is a very important point because it is now well known that an exotic tree may give a better productivity in an alien climate where it may have a longer growing season and may be more tolerant of its new site. An outstanding example is *Pinus radiata* in New Zealand.

Dr. Jackson set himself the task to determine the inter-relationship of climatic and edaphic factors affecting

\* Duke University: School of Forestry. Bulletin No. 16: *Parameters of Site for Certain Growth Components of Slash Pine—Pinus elliottii* Engelm. By Dr. D. S. Jackson. Pp. vii+118. (Durham, N. Carolina: Duke University, 1962.) 2 dollars.

productivity. Such a task is now possible because long-term data are available on growth and statistical methods enable site factors to be quantitatively defined. He used slash pine inside and outside its natural distribution and his investigations were directed to ascertain whether soil variables known to affect production in one climatic region were significant elsewhere, to determine the correlation between climatic factors and productivity, and to develop an empirical equation relating productivity to the most important factors of the physical environment. As a result of statistical analysis, a high correlation was found to exist between mean annual height increment and mean annual precipitation, average diurnal range of temperature through March to the end of June as well as the mean temperature of the coldest month, and also certain soil conditions. In addition, other significant correlations were established. Therefore, Dr. Jackson has concluded that "homoclimal comparisons should be based on: (a) the continuous quantitative relationships between physical factors and specific productivity; as well as (b) the discrete factors which limit survival, and of their relative incidence and control in both native habitat and the area of introduction".

Dr. Jackson has carried out a very important piece of work. His critical survey of the various methods of attempting to correlate site characteristics with growth requirements of plants make one realize all the more how systematic he has been in trying to establish the relationship of the physical factors of the environment which affect the productivity of a species. The lay-out of the publication is excellent but the literary style does not always make for easy reading. This Bulletin will be welcomed by the many who are concerned with exotic trees and with further introductions.

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## X-RAY DIFFRACTION AND MOLECULAR MODEL BUILDING STUDIES OF THE INTERACTION OF ACTINOMYCIN WITH NUCLEIC ACIDS

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ACTINOMYCIN  $C_1$  (AMC) inhibits nucleic acid syntheses dependent on deoxyribonucleic acid (DNA)<sup>1,2</sup>; ribonucleic acid (RNA) synthesis is especially sensitive. RNA-dependent RNA synthesis is unaffected<sup>2</sup>. Elucidation of this inhibition may lead to a better understanding of how genetic information is replicated and how it is transmitted from DNA to RNA. Biological activity of AMC is correlated with its ability to bind to DNA<sup>3-5</sup>, probably by complexing specifically to guanine<sup>6-8</sup>; no description of the stereochemistry of the interaction has

been published. The amount of AMC bound to DNA increases with the guanine content of the DNA and is greatest when the DNA is in the native helical conformation. Single-strand DNA from the bacteriophage  $\phi X$  174 binds less AMC than 2-stranded DNA having a similar guanine content<sup>8</sup>.

The formula of AMC is shown in Fig. 1. There is a whole family of actinomycins differing in the amino-acid composition of the cyclic peptides<sup>9</sup>. Derivatives of the various actinomycins have been prepared in which the