Acta Botanica Neerlandica **13** (1964) 159–160

BOOK REVIEWS

OF PUBLICATIONS RELATED TO BOTANICAL WORK IN THE NETHERLANDS

P. C. HEIJLIGERS, Vegetation and soil of a white-sand savanna in Suriname. Kon. Ned. Akad. Wet. Afd. Natuurk. 2e reeks, 54 (3): 1–148, 31 text fig., 5 tables, 16 pl. 1963; also distributed as: Vegetation of Suriname III, and: Mededel. Bot. Museum & Herb. Utrecht no. 191. 16 guilders.

The manuscript of this work, largely in Dutch, was submitted as doctor's thesis in Oct., 1961; after having been translated it has now been published as an attractive book containing the results of detailed field studies. These were carried out in a small area in the central part of the savanna belt for about 15 months, from April, 1956 to June, 1957. In the first two chapters the scope of the investigation and the methods used in it are expounded and a review of the relevant literature is given. From this we learn that the work is not only a description of savanna vegetation in the strict sense and of the white sand on which it grows, but a sample-treatment of a landscape including morphological, hydrological, and developmental aspects. Therefore it should receive attention of physical geographers and geologists as well as of ecologists.

After reconnaissance in the field and on aerial photographs two sample areas were selected, one of 2 by 4 km adjacent to an Amerindian village, the other of 3 by 5 km at a distance of 4 km. Here transects were cut, measured, and leveled to permit correlations of the various aspects studied in space and time. Of these areas maps and stereograms are given side by side.

In chapter III a picture of the soils is drawn from 10 several metres deep profile pits and about 650 auger borings where possible going down to hard or impermeable layers. Besides the prevailing white sands also red sands and heavier soils were encountered. From the pits samples were taken to determine pore space and water content in different seasons; in a number of bore holes tubes were inserted to allow periodical readings of the water table. For selected samples granulometric, chemical, and heavy mineral analyses are presented. Also translocation of fine fractions, sesquioxides, and organic matter was investigated.

The finding that hardpans have a limited extent, together with a study about the morphogenesis of the area led to the conclusion that the white-sand soils are no true or groundwater podzols, but merely leached sands. Another important conclusion was gained from the theory of drainage in areas with a flat topography. When estimated values for all variables are used, the observed complete waterlogging in the wet savannas around watersheds after periods of heavy rainfall can be accounted for without the requirement of an impermeable layer in the subsoil.

Chapter IV deals with the vegetation which in the savanna was investigated with the methods of the French-Swiss school of phyto-sociology. On account of the local character of this study, however, the author wisely refrained from naming associations and other hierarchical units according to the rules of this school. Instead he distinguished physiognomic types designated after one or two dominant

species with variants and sometimes facies as subdivisions. The composition of each type and variant compiled from 150 relevees in one-layered vegetations and 125 in shrub vegetations is presented in 2 tables with for each species graphic notation of presence, combined abundance-cover estimate, and vitality.

In the xeromorphic or savanna forests surrounding the savannas and in adjacent creek and secondary forests in 110 sample plots of 800 sq. metres all tree species were recorded with rough estimates of abundance. For the upper-storey trees the height was also noted. The data of the 6 recognized forest types have been condensed in a table.

Besides, several profile diagrams and detailed maps of vegetation samples illustrate the topographic relations between various vegetation types.

Special attention is payed to the effects of fires and groundwater fluctuations upon the types of savanna vegetation.

26 illustrative photographs conclude the book which deserves a wide circle of readers.

J. C. LINDEMAN