Schieving, F.: **Plato's Plant. On the Mathematical Structure of Simple Plants and Canopies**. - Backhuys Publisher, Leiden 1998. 360 pp. USD 93.50. ISBN 90-5782-003-X.

Mathematical models are now widely used in biology and ecology to get a better understanding of complex interactions at various organisation levels from cell to the whole ecosystem. In most cases, they are constructed by biologists, and used for analysis of real situations which are of particular importance from a biological point of view. This is why we have now a lot of non-compatible and very complex models with rather obscure intrinsic formal structure. The reviewed book, unique in many respects, stresses the need of unifying formal structure of models from quite different research fields. Instead of presenting a variety of case-specific models with discrete submodels and summation steps, the author is trying to show another approach to mathematical modelling: elegant functional solutions using advanced mathematics, including systems of differential equations. Naturally, such approach cannot be realized without a lot of simplifications, so the results are valid only for ideal (or "Plato´s") plants and their populations.

The book is divided into six parts. The chapter 1 and 2 deals with optimization of canopy leaf area and nitrogen distribution within plants and plant stands as static structures. In chapters 3, 4, and 5 the plant functioning is described from a dynamic point of view, including control mechanisms of interactions between plants and their environment, and optimal allocation of biomass into shoots and roots. The final chapter is devoted to to construction of a population growth model in which the interaction between plant growth and environmental factors is explicitly taken into account. The difficult problem of plant acclimation to local environment is also solved in this context.

The modelling approach presented may be viewed by some biologist as too simplificated, and thus not much helpful in solving particular problems of their interest. But it is quite sure, that the new generation of mathematical models should be based on simple unifying principles, transparent intrinsic structure which could be brought forward by further mathematical analysis. The reviewed book will be much helpful for all interested in this perspective way of development of mathematical models in biology and ecology.

J. GLOSER (*Brno*)