

1. Record Nr.	UNINA9910711539703321
Autore	Langbein Walter B (Walter Basil), <1907-1982, >
Titolo	Annual runoff in the United States / / by Walter B. Langbein and others
Pubbl/distr/stampa	Washington, D.C. : , : United States Department of the Interior, Geological Survey, , 1949
Descrizione fisica	1 online resource (14 pages) : illustrations + + 1 plate
Collana	Geological Survey circular ; ; 52
Soggetti	Runoff - United States Water-supply - United States Runoff Water-supply United States
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"June 1949."
Nota di bibliografia	Includes bibliographical references (pages 13-14).

2. Record Nr.	UNINA9910783136103321
Titolo	The algorithmic beauty of plants // Przemyslaw Pruskinkiewicz [et al.]
Pubbl/distr/stampa	New York : , : Springer, , 1990 ©1990
ISBN	1-4613-8476-1
Descrizione fisica	1 online resource (XII, 228 pages) : 14 illustrations
Collana	The Virtual Laboratory
Disciplina	004
Soggetti	Plants - Development - Mathematical models Plants - Development - Computer simulation L systems Computer graphics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Graphical modeling using L-systems -- 1.1 Rewriting systems -- 1.2 DOL-systems -- 1.3 Turtle interpretation of strings -- 1.4 Synthesis of DOL-systems -- 1.5 Modeling in three dimensions -- 1.6 Branching structures -- 1.7 Stochastic L-systems -- 1.8 Context-sensitive L-systems -- 1.9 Growth functions -- 2 Modeling of trees -- 3 Developmental models of herbaceous plants -- 3.1 Levels of model specification -- 3.2 Branching patterns -- 3.3 Models of inflorescences -- 4 Phyllotaxis -- 4.1 The planar model -- 4.2 The cylindrical model -- 5 Models of plant organs -- 5.1 Predefined surfaces -- 5.2 Developmental surface models -- 5.3 Models of compound leaves -- 6 Animation of plant development -- 6.1 Timed DOL-systems -- 6.2 Selection of growth functions -- 7 Modeling of cellular layers -- 7.1 Map L-systems -- 7.2 Graphical interpretation of maps -- 7.3 Microsorium linguaeforme -- 7.4 Dryopteris thelypteris -- 7.5 Modeling spherical cell layers -- 7.6 Modeling 3D cellular structures -- 8 Fractal properties of plants -- 8.1 Symmetry and self-similarity -- 8.2 Plant models and iterated function systems -- Epilogue -- Appendix A Software environment for plant modeling -- A.1 A virtual laboratory in botany -- A.2 List of laboratory programs -- Appendix B About the figures -- Turtle interpretation of symbols.

The beauty of plants has attracted the attention of mathematicians for Mathematics centuries. Conspicuous geometric features such as the bilateral sym- and beauty metry of leaves, the rotational symmetry of flowers, and the helical arrangements of scales in pine cones have been studied most exten- sively. This focus is reflected in a quotation from Weyl [159, page 3], "Beauty is bound up with symmetry. " This book explores two other factors that organize plant structures and therefore contribute to their beauty. The first is the elegance and relative simplicity of developmental algorithms, that is, the rules which describe plant development in time. The second is self-similarity, characterized by Mandelbrot [95, page 34] as follows: When each piece of a shape is geometrically similar to the whole, both the shape and the cascade that generate it are called self-similar. This corresponds with the biological phenomenon described by Herman, Lindenmayer and Rozenberg [61]: In many growth processes of living organisms, especially of plants, regularly repeated appearances of certain multicellular structures are readily noticeable. . . . In the case of a compound leaf, for instance, some of the lobes (or leaflets), which are parts of a leaf at an advanced stage, have the same shape as the whole leaf has at an earlier stage. Thus, self-similarity in plants is a result of developmental processes. Growth and By emphasizing the relationship between growth and form, this book form follows a long tradition in biology.
