

## PLANT ANATOMY AS A SCIENTIFIC AID TO APPLIED DESIGN

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The systematic study of plant morphology is based on three fundamental kinds of structural parts of any tree or other seed-bearing plants, namely, roots, stems and leaves. Each of these parts is composed of little structural units called cells, so small that in order to study them it is necessary to use a microscope that will magnify them many times their natural size.

Difference in function is the reason for difference in quality. These patterns differ greatly in different kinds of plants, but they are always the same in any one kind of plant. The different kinds of cells are grouped and arranged in such a way that they form very definite patterns. It is because of these beautiful forms found in the interior of plants that the author conceived the idea involved in scientific botanical design, a new application of the botanist's knowledge of plants.

In the same way in which plants have fundamental structural parts, pure design is also based on fundamental pleasing arrangements and composition, namely, Proportion, Balance, Sequence, Harmony, and Unity, elements which are at the base of all design, as in all normal plants. Some of the fundamental facts which are always true in nature have aided me in arrangement and composition and led me to establish a few rules for myself to follow. This gives me a logical reason for locating each unit in the proper place, with assurance that the design is scientifically correct and complies with the accepted principles of good design.

In using natural patterns one should be consistent and competent to distinguish quality and to classify each structure according to its own value and purpose. It is reasonable to expect the cell structure to have individuality in the same degree in which we find individuality in the respective plants. They may be equal in quality but not alike, although each may have a decidedly uniform plan which is of logical significance. This has taught me that any careless disarrangement or misplacement of what I observed would be to destroy harmony. Each kind of plant specimen is separate and singular in style, beauty, and charm. Compare the

patterns derived from the maple with those of the pine and birch, independent and impossible to mingle with its neighbor. Each one is complementary to the other, yet so different, as they may be arranged or exhibited side by side and as the trees stand in the forest in all their grandeur and dignity.

It is of great significance where the patterns are obtained in nature, as this in a large degree must determine their quality and value, and govern the orderly arrangement of motives. Fundamental laws will guide the artist, whereby he may test his work, and an understanding of these laws can be gained only by a systematic training and a workable knowledge of his subject and material as a basis for the arrangement of motives discovered inside of plants. I have learned from botanical experimentation and independent research of internal plant morphology that definite and workable plans may be carried out according to the accepted rules of good design.

The question is often asked, "Where does the designer get his ideas, where does he find his patterns?" Old ideas, old motives, changed and worked over—that is his usual source. Why not try to discover something original, rather than conform to blind imitations? Why copy something from afar, only to present it so changed and mutilated that it has lost its original meaning? The replica of existing symbolic forms is not art, neither is the copy of a masterpiece a work of art, and yet the average designer resorts to copying and making over. This is his privilege to "pick up an idea anywhere" and conventionalize it, to reduce it to elements of simple line and form because he knows no other way. This can no longer be his excuse, for now we have discovered where to find patterns from the internal parts of plants.

Moreover, a representative knowledge of this subject in all its many forms and branches is possibly beyond the reach of any one individual. This does not mean that any student of this subject should be disheartened, for there shall be no single chapter of scientific botanical design that cannot be amended and extended for future work, but he must choose his special subject within the general field, and if he decides to throw in his lot with the experimentalists of the laboratory and studio, he may be assured that he could not join the experimenters at a more favorable time, inasmuch as the experimental method is pressing forward to the reaches of research, and it needs no gift of prophecy to foretell the future of plant anatomy as a scientific aid to applied art and design.