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Our outward life requires them not,â€” Then wherefore had they birth? To minister delight to man, To beautify the earth. Some are stout and fleshy, others are delicate and even filmy, but most are herbaceous, resembling ordinary flowering plants in the texture of their foliage. While most would be recognized as ferns by even a novice, a few differ so widely from the ordinary typical forms that to an unskilled observer they would scarcely be considered as bearing any resemblance to ferns whatever. The fronds of one of our Florida species resemble narrow blades of grass, and the fertile spikes of another from New Jersey might be mistaken for a diminutive species of sedge. When we add to these peculiar forms of our own country those of foreign lands, and include the immense tree-ferns of tropical regions, we find our early conception of a fern inadequate to cover this diversity of forms. Without attempting an accurate definition of a fern, let it be regarded for present purposes as a flowerless plant, producing spores instead of seeds, possessing more or less woody tissue, and having its leaves coiled in the bud from apex to base. After the necessary study of the structure of some of our common ferns, we will be able to comprehend the more technical definition found later in the work. Some, like the common brake, have their fronds rising from more or less distant portions of the creeping rootstock. Others, like *Asplenium trichomanes*, are tufted, many fronds rising irregularly in a cluster; while still others, like the ostrich-fern *Matteuccia*, and many shieldferns *Dryopteris*, grow in crowns or circles, the later fronds continually rising within the older ones. In the grape-ferns *Botrychium* the rootstocks usually produce a single frond each season, the bud for the succeeding year growing within the base of the common stalk. In many there is a tendency to dimorphism, the fertile or fruit-bearing fronds differing to a greater or less extent from the sterile ones. In a few species, like the sensitive-fern *Onoclea* and some others, this is carried so far that the sterile and fertile fronds bear no resemblance to each other, and in one instance have been mistaken for different species, and so described. *Osmunda cinnamomea*, *Woodwardia areolata*, our two species of *Cryptogramma*, and *Struthiopteris* offer further examples of this principle of growth. This depends to some extent on the character of the soil and the ordinary climatic conditions. For example, the lady-fern *Asplenium filix-femina*, which in ordinary locations grows from two to four feet high, in mountainous regions is sometimes reduced to from three to six inches, when it forms the var. In like manner the marginal shield-fern *Dryopteris marginalis*, usually two or three feet high, is reduced to five inches when growing on rocky cliffs, and yet regularly produces fruit. In some cases there is a tendency to variation in size that cannot be referred to soil or climatic influences. The common grape-fern *Botrychium Virginianum* will be found in some localities to vary from six inches to two feet in height, all well fruited and matured, and with the extreme sizes growing within a pace of each other in the same soil and with the same environment. The other species of the same genus present similar variations, and judging from size and external appearance alone, a regular gradation of forms might be arranged from the most diminutive undivided forms of *B.* Another tendency to variation is noticed in the forking of fronds either at the summit or at the ends of the branches. Some of the species of *Botrychium* show the same tendency, especially in their fertile segments. It is probable that all our species will be found to fork under certain conditions. More definite information is desirable with regard to many species that show this tendency, as it doubtless involves the question of ancestry of existing ferns. In those species whose sterile and fertile fronds are unlike, forms often appear that are intermediate between the sterile and fertile fronds, and sometimes even form a graded series from one to the other. This is especially true of the sensitive fern *Onoclea* and the cinnamon-fern *Osmunda cinnamomea*, and has frequently been the source of so-called "varieties. One of the varieties of *Botrychium obliquum* seems to have been founded on a condition which is intermediate in structure between the sterile and fertile segments. In a few forms there is an apparent mimicry, one species imitating another in foliage or method of fruiting. In the cinnamon-fern just alluded to, which has a cinnamon-colored sterile frond totally unlike the fertile, sterile

fronds will sometimes be found which are fertile at the apex the normal method of fruiting in the royal flowering-fern *Osmunda regalis* ; and in turn the royal flowering-fern is sometimes fertile in the middle, in imitation of *Osmunda Claytontana*. The time of maturing fruit is different among different species, and also varies with geographical location and proximity to tropical climates. In the Northern States some species produce their fruit as early as May *Osmunda cinnamomea* , and others as late as September *Lygodium* , but the greater number are best studied in July and August. In the Northeastern States, where the two species of *Filix* abound on limestone rocks, *F.* In semi-tropical climates, like Southern California and the Gulf States, the time of fruiting is often earlier, sometimes occurring in February or March. Some fronds are killed by the early frosts, while others, like the Christmas-fern, are evergreen, and may be gathered in midwinter. Ferns are largely dependent for successful growth on the amount of warmth, moisture, and shade to which they are subjected, and we would naturally expect to find them reaching a maximum in size and abundance in warm swamps or shady marshes. While this is in general true, we nevertheless find many species thriving only in rocky places, thrusting their roots into the crevices of the rocks with little earth for their nourishment, and many times exposed to the scorching rays of the sun. Of necessity, such species are of comparatively small size, and likely to be protected in some way against the heat of the sun, and provided with means to retain their moisture in times of drought. Others still are found in wet, rocky ravines, often where moistened by the spray of cascades or waterfalls, and consequently have no such provision against the heat of an extended summer. Certain others thrive in open fields that are comparatively dry and unshaded. One species of Southern Florida is aquatic, having the sterile fronds floating in shallow water. A few species are epiphytic, or grow on other plants, some being found on tree-trunks to the height of or feet! So, while moisture, warmth, and shade in abundance are the climatic conditions essential to promote luxuriant fern growth, it can and does continue when any or all these conditions are reduced to a minimum. Ferns may then be sought in any of the following situations, and it will be seen that each situation has its characteristic species: Wet swamps or marshes with or without abundant shade. Rich woods, more or less moist. Uncultivated open places and dry hillsides. Moist, rocky ravines or rocky places not subject to summer drought. Growing on other plants. In the first location mentioned above, we may find the chain-ferns *Woodwardia* , many of the spleen worts *Asplenium* , a few of the shield-ferns *Dryopteris* , the flowering-ferns *Osmunda* , as well as the genera *Acrostichum*, *Onoclea*, etc. These include some of our largest and coarsest ferns. A few more delicate in structure are also found here, notably the dainty *Phegopteris dryopteris*. In the second we find a few spleenworts, most of the shield-ferns, the beech-ferns *Phegopteris* , most of the grapeferns *Botrychium* , the maidenhair *Adiantum* , *Dennstaedtia*, and some others. In this situation we find the finest development of foliage and the greatest artistic finish among all the ferns. In uncultivated places and on rocky hillsides we often find the common bracken or brake *Pteridium* , and also the lady-fern *Asplenium filix-foemina* , though these are by no means confined to these locations, the latter growing quite frequently in moist woods, and even in cold, wet swamps. Many other ferns are found occasionally in openings of the forest or recent clearings, where they maintain a sickly existence, sometimes for a series of years. In such locations ferns often become contracted and abnormal in growth, and take on a faded yellow hue from their exposure to the open sunshine. The long, pendent fronds of our *Filix bulbifera* add greatly to the beauty of our natural ravines, and often serve to conceal the uncouth rocks, or at least draw the attention to that which is more delicate and artistic. On dripping rocks, or where the sides of ravines are kept continually moist by the spray of waterfalls, such delicate pellucid ferns as the filmy-fern *Trichomanes* and one *Cryptogramma* may be sought. There seems to be a direct connection between the environment and the texture of the fern. The last two mentioned grow in very damp situations, and are pellucid and almost membranous. The *Filix* in somewhat drier situations is thinly herbaceous, while *Asplenium trichomanes* and *Camptosorus*, requiring less moisture, are more firm, and form the transition to the next group. I believe a thorough search for this fern along the outcrops of the formation in Central New York and elsewhere would show a wider distribution than is at present attributed to this species. On dry cliffs we may look for the various species of *Woodsia*, the cloak-ferns *Notholcena* , the lip-ferns *Chetlanthes* , and the cliff-brakes *Pellaea*. Many of these are firm and even leathery in texture, and others are thickly covered on one or both sides with tangled hair or scales, fitting them to survive long periods of drought. Only one of our

OUR NATIVE FERNS AND THEIR ALIES pdf

native species is strictly aquatic, the anomalous *Ceratopteris thalictroides* found in Southern Florida, though *Acrostichum aureum* is often found with its rhizoma rising from the water of salt marshes. *Osmunda regalis* is occasionally found in standing water several inches deep, though this is not usual. Among the epiphytic ferns are several species of *Polypodium*, *P. Scouleri*, and *Phlebodium*, the last always being associated with the cabbage-palmetto *Sabal palmetto*. *Vittaria*, *Cheilogramma*, and *Nephrolepis* are also of this class, and are frequently pendent from the same plant, though occasionally found on other tree-trunks. *Cheiroglossa palmata*, another peculiar tropical fern-ally, belongs to the same list. Even in the streets of Southern cities, *Polypodium polypodioides* is often seen growing with various mosses well up on the trunks of shade-trees. It is only in tropical regions, however, that epiphytes are seen in profusion. These principles of climatic distribution are necessarily modified by the geographic range of species, which must be considered in this connection. For example, *Dryopteris spinulosa* or its varieties form the leading foliage ferns of Northern New England and New York, and *Dennstaedtia*, less common in those localities, largely replaces them from Connecticut southward. This subject will be more fully discussed in a later chapter. *A Bit of Fern History*. In *Botanical Gazette*, vii, May, *Cultivation of Native Ferns*. In *Garden and Forest*, i, , , ; ; Aug. *Ferns in their Homes and Ours*. A valuable outline of fern cultivation, indispensable to those desiring to undertake the cultivation of ferns either in conservatories or Wardian cases. *Ferns, British and Foreign*, 8vo.

2: Catalog Record: Our native ferns and how to study them : with | Hathi Trust Digital Library

When the writer issued this little book in as the honest effort of a novice to provide for the study of our ferns a convenient handbook by means of which they might be identified, he had no idea that the first edition would be exhausted within a year, and much less that a sixth edition would.

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