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THE VEGETABLE NGDOM

OR, THE STRUCTURE, CLASSIFICATION,
AND USES OF PLANTS ILLUSTRATED
UPON THE NATURAL SYSTEM

JOHN LINDLEY



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The Vegetable Kingdom

*Or, The Structure, Classification, and Uses of Plants
Illustrated upon the Natural System*

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Until the nineteenth century, the investigation of natural phenomena, plants and animals was considered either the preserve of elite scholars or a pastime for the leisured upper classes. As increasing academic rigour and systematisation was brought to the study of 'natural history', its subdisciplines were adopted into university curricula, and learned societies (such as the Royal Horticultural Society, founded in 1804) were established to support research in these areas. A related development was strong enthusiasm for exotic garden plants, which resulted in plant collecting expeditions to every corner of the globe, sometimes with tragic consequences. This series includes accounts of some of those expeditions, detailed reference works on the flora of different regions, and practical advice for amateur and professional gardeners.

The Vegetable Kingdom

Employed early in his career by Sir Joseph Banks, the botanist John Lindley (1799–1865) is best known for his recommendation that Kew Gardens should become a national botanical institution, and for saving the Royal Horticultural Society from financial disaster. As an author, he is best remembered for his works on taxonomy and classification. This work, one of his most famous, was first published in 1846: reissued here is the revised third edition of 1847. Lindley describes his motive as being 'to make his countrymen acquainted with the progress of Systematic Botany abroad' given that the 'superficial and useless system of Linnaeus' was now consigned to history. The work, nonetheless an important milestone in the development of plant taxonomy, gives an overview of the various classification systems used since that of John Ray, and goes on to define the vegetable kingdom in terms of classes and 'alliances' of plants.

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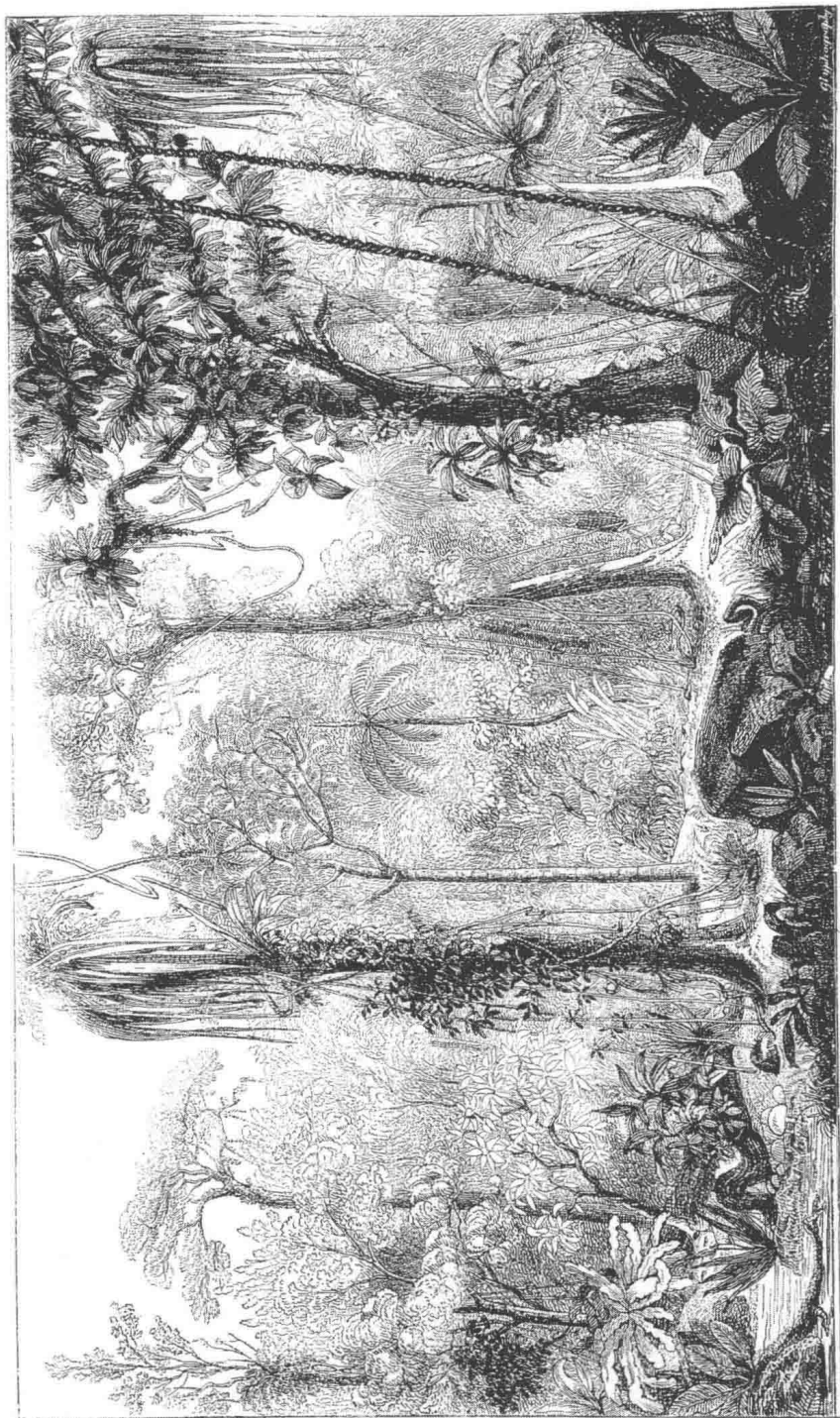
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INTERIOR OF A BRAZILIAN FOREST ON THE ORGAN MOUNTAINS.

THE VEGETABLE KINGDOM;

OR,

The Structure, Classification, and Uses of Plants,

ILLUSTRATED UPON THE NATURAL SYSTEM.

BY

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OF GREAT BRITAIN.

"Methodum intelligo naturæ convenientem quæ nec alienas species conjungit, nec cognatas
separat."—*Raii Sylloge, præf.*, p. 15.

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PREFACE.

THIS work originated in a desire, on the part of the Author, to make his countrymen acquainted with the progress of Systematical Botany abroad, during the previous quarter of a century. When it first appeared, the science was so little studied that the very names of some of the best writers on the subject were unfamiliar to English ears. In our own language there was nothing whatever; and the Natural System of arranging plants, although occasionally mentioned as a something extremely interesting, was currently regarded as the fond speculation of a few men with more enthusiasm than sound judgment; and this, too, was the opinion expressed by persons who stood at the head of English Botany, in the estimation of many British Naturalists. The Author had himself severely experienced the want of some guide to this branch of Natural History, and he felt anxious to relieve others from the inconvenience which he had encountered; the more especially after he had undertaken the responsibility of filling the Botanical Chair in the then London University. At that time, too, there was nothing of foreign origin which could be advantageously consulted; for Bartling's *Ordines* had not reached England, Perleb's *Lehrbuch* was unknown, and both it and Agardh's *Classes* were of too slight a texture to be generally useful to any except Botanists themselves.

The importance of the Natural System in a practical country like Great Britain was too manifest to leave any doubt in the mind of the Author that the good sense of his countrymen would lead to its universal reception when once placed within their reach. Nor has he been disappointed. Fifteen years have sufficed to render the once popular, but superficial and useless, system of Linnæus a mere matter of history. *Fuit Ilum.*

The Natural System of Botany being founded on these principles, that all points of resemblance between the various parts, properties, and qualities of plants shall be taken into consideration; that thence an arrangement shall be deduced in which plants must be placed next each other which have the greatest degree of similarity in those respects; and that consequently the quality of an imperfectly known plant may be judged of by that of another which is well known, it must be obvious that such a method possesses great superiority over artificial systems, like that of Linnæus, in which there is no combination of ideas, but which are mere collections of isolated facts, having no distinct relation to each other. The advantages of the Natural System, in applying Botany to useful purposes, are immense, especially to medical men, who depend so much upon the vegetable kingdom for their remedial agents. A knowledge of the properties of one plant enables the practitioner to judge scientifically of the qualities of other plants naturally allied to it; and therefore, the physician acquainted with the Natural System of Botany, may direct his inquiries, when on foreign stations, not empirically, but upon fixed principles, into the qualities of the medicinal plants which have been provided in every region for the alleviation of the maladies peculiar to it. He is thus enabled to read the hidden characters with which Nature has labelled all the hosts of species that spring from her teeming bosom. Every one of these bears inscribed upon it the uses to which it may be applied, the dangers to be apprehended from it, or the virtues with which it has been endowed. The language in which they are written is not indeed human; it is in the living hieroglyphics of the Almighty, which the skill of man is permitted to interpret. The key to their meaning lies enveloped in the folds of the Natural System, and is to be found in no other place.

The great obstacle to the adoption of the Natural System of Botany in this country was the supposed difficulty of mastering its details; but of that difficulty it may be observed, in the first place, that it is only such as it is always necessary to encounter in all branches of human knowledge; and secondly, that it has been much exaggerated by persons who have written upon the subject without understanding it.

It has been pretended that the characters of the Natural classes of plants are not to be ascertained without much laborious research; and that not a step can be taken until this preliminary difficulty

is overcome. But it is hardly necessary to say, that in natural history many facts which have been originally discovered by minute and laborious research, are subsequently ascertained to be connected with other facts of a more obvious nature; and of this Botany offers perhaps the most striking proof that can be adduced. One of the first questions to be determined by a student of Botany, who wishes to inform himself of the name, affinities, and uses of a plant, seems to be, whether it contains spiral vessels or not, because some of the great divisions of the vegetable kingdom are characterised by the presence or absence of those minute organs. It is true that careful observation, and multiplied microscopical analyses, have taught Botanists that certain plants have spiral vessels, and others have none; but it is not true, that in practice so minute and difficult an inquiry needs to be instituted, because it has also been ascertained that plants which bear flowers have spiral vessels, and that such as have no flowers are usually destitute of spiral vessels, properly so called; so that the inquiry of the student, instead of being directed in the first instance to an obscure but highly curious microscopical fact, is at once arrested by the two most obvious peculiarities of the vegetable kingdom.

Then, again, among flowering plants two great divisions have been formed, the names of which, Monocotyledons and Dicotyledons, are derived from the former having usually but one lobe to the seed, and the latter two,—a structure much more difficult to ascertain than the presence or absence of spiral vessels. But no Botanist would proceed to dissect the seeds of a plant for the purpose of determining to which of those divisions it belongs, except in some very special case. He knows from experience that the minute organisation of the seed corresponds with a peculiar structure of the stem, leaves, and flowers, the most highly developed, and most easily examined parts of vegetation; a Botanist, therefore, prefers to examine the stem, the flower, or the leaf of a plant, in order to determine whether it is a Monocotyledon or a Dicotyledon, and rarely finds it necessary to anatomise the seed.

The presence or absence of albumen, the structure of the embryo, the position of the seeds or ovules, the nature of the fruit, the modifications of the flower, are not to be brought forward as other difficult points peculiar to the study of the Natural System, because, whatever system is followed, the student must make himself acquainted with such facts, for the purpose of determining genera. The common Toad-flax cannot be discovered by its

characters in any book of Botany, without the greater part of this kind of inquiry being gone through.

In the determination of genera, however, facility is entirely on the side of the Natural System. Jussieu has well remarked "that whatever trouble is experienced in remembering, or applying the characters of Natural Orders, is more than compensated for by the facility of determining genera, the characters of which are simple in proportion as those of Orders are complicated. The reverse takes place in arbitrary arrangements, where the distinctions of classes and sections are extremely simple and easy to remember, while those of genera are in proportion numerous and complicated."

But really all considerations of difficulty ought to be put aside when it is remembered how much more satisfactory are the results to which we are brought by the study of Nature philosophically, than those which can possibly be derived from the most ingenious empirical mode of investigation.

Such were the motives which led to the publication, in 1830, of the first edition of the present work, under the name of an *Introduction to the Natural System of Botany*. No one would have more readily than the Author transferred the labour to another hand, if any other had been found. Indeed, he confesses that it was because the most capable of those whom he knew belonged to the class of men described by Lord Bacon, who "object too much, consult too long, adventure too little, repent too soon, and *seldom drive business home*," that he undertook a task for which no man's abilities are in reality high enough. He could not but feel that: "To think nothing done while anything remains to be done is a good rule for perseverance, but to think that nothing should be done while a main thing remains undone, would be a most idle and thriftless maxim. If there be a good presently practicable, it may be done without any desertion of another good not so immediately attainable. And in effecting all secondary amendments, we have the satisfaction of feeling assured that there is a link between all real improvements, and that every sound reform is a step to others, though the connexion may not be broadly distinguishable."

The *Introduction to the Natural System* was originally written in illustration of the popular system of De Candolle; but daily experience showed the insufficiency of that system, and the necessity of forming sub-divisions of the primary groups of plants higher than their so-called Natural Orders became so apparent, as

to lead to serious attempts to carry out a plan of Alliances, in imitation of a few continental writers. These attempts were embodied in the second edition of the present work, which appeared in 1836, under the name of *A Natural System of Botany*. Notwithstanding some glaring defects in the method then proposed, and a host of errors of a less manifest description, the views of the Author were favourably received by those best able to judge of their value. On the other hand, they have been severely criticised by writers who show a singular want of knowledge of the true bearing of such works. Those persons have imagined that a natural classification of plants is something which is suddenly to start into existence, perfect in all its parts, and their criticisms betray a total ignorance of the difficulties by which such a subject is surrounded. The Natural System of Botany may be likened to the plan of a vast edifice, at the construction of which many are labouring. Certain courts and quadrangles are easily set out; a particular style of architecture is agreed upon, and it may be even settled irrevocably in what places the state apartments and cellars are to be stationed. But when further details are to be discussed, many unsatisfactory attempts must be made by the architects, and many an awkward arrangement of the rooms proposed, before a final plan can be produced. If perfection in such small matters is impracticable, if it is impossible so to arrange all the details of even an edifice as to satisfy all critics, how much more hopeless must be the task of classifying the infinite works of the creation! To demand perfection in a work of that nature is little less than impious; for perfection is the attribute, not of man, but of his Maker.

The Author may now be equally charged with inconsistency in not adhering to his former plan of classification after having promulgated it. But he is not conscious of having ever pretended that it even approached permanency.—See *Natural System*, p. xiii. In fact, there is no such thing as stability in these matters. Consistency is but another name for obstinacy. All things are undergoing incessant change. Every science is in a state of progression, and of all others the sciences of observation most so. Since 1836 the views of the Author have, of course, been altered in some respects, although they have experienced but little modification in others. This is inevitable in such a science as that of Systematic Botany, where the discovery of a few new facts or half a dozen fresh genera may instantly change the point of view from which a given object is observed. The Author cannot

regard perseverance in error commendable, for the sake of what is idly called consistency; he would rather see false views corrected as the proof of their error arises. His object, and, he thinks he may say that of every one else who has turned his attention to this question of late, has not been to establish a system of his own, which shall be immutable, but to contribute to the extent of his ability towards that end. He indeed must be a very presumptuous person, having a microscopically small acquaintance with his subject, who should even dream of being able to accomplish such a purpose. All that we can do is to throw our pebbles upon the heap, which shall hereafter, when they have sufficiently accumulated, become the landmark of Systematical Botany.

Having stated thus much by way of preface, it only now remains to explain the plan of the work in its new form. Its object is to give a concise view of the state of Systematical Botany at the present day, to show the relation or supposed relation of one group of plants to another, to explain their geographical distribution, and to point out the various uses to which the species are applied in different countries. The names of all known genera, with their synonyms, are given under each Natural Order, the numbers of the genera and species are in every case computed from what seems to be the best authority, and complete Indices of the multitudes of names embodied in the work are added, so as to enable a Botanist to know immediately under what Natural Order a given genus is stationed, or what the uses are to which any species has been applied. Finally, the work is copiously illustrated by wood and glyphographic cuts, and for the convenience of Students, an artificial analysis of the system is placed at the end. Some of these points demand a few words of comment.

In offering to the public a view of the present state of Systematical Botany, the Author has pursued the plan developed in the succeeding pages, of first taking certain characters common to very extensive assemblages of plants, by means of which Classes have been constituted; and, secondly, of breaking up those Classes into minor groups called Alliances, whose common characters are also more extensive than those of Natural Orders, and under which the Natural Orders are themselves assembled. Very short characters have been proposed, under the name of Diagnoses, for both Alliances and Orders; these are intended to express the prevailing tendency observable in each group, but do not include casual exceptions, for which the reader is referred to the descriptions immediately