

**THE FLOWERING
PLANTS AND FERNS
OF GREAT BRITAIN**

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The flowering plants and ferns of Great Britain by John Gilbert Baker

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JOHN GILBERT BAKER

**THE FLOWERING
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THE
FLOWERING PLANTS AND FERNS
OF
GREAT BRITAIN:

AN ATTEMPT TO CLASSIFY THEM ACCORDING TO THEIR
GEOGNOSTIC RELATIONS.

A PAPER READ BEFORE THE BRITISH ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE, AT THE TWENTY-FIFTH
ANNUAL MEETING, GLASGOW, 1855.

WITH ADDITIONS.

By JOHN GILBERT BAKER.

"Objectum scientiæ est, constans et æternum in infinita varietate querere."—*Pries.*

"Mais quelle que soit la formule ou la loi générale de dispersion dont l'avenir réserve la connaissance à la science, il devra d'une manière ou d'une autre, tenir compte des propriétés des roches sous-jacentes."—*Thurmann (Essai de Phytogéologie, vol. II. p. 323).*

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FLOWERING PLANTS AND FERNS OF BRITAIN.

I.—FUNDAMENTAL GENERALITIES.

1. IN regulating the distribution of species and modifying specific types, the subjacent geological formations, principally by reason of their mechanical properties, exercise an influence which, taken as a whole, is secondary only to that of climate, which it modifies and by which it is modified perpetually.

2. With reference to the facility with which they yield to disintegration and to their hygroscopicity and porosity (*i. e.* lithologically) strata are essentially separable into two principal classes, *dysgeogenous* and *eugeogenous*.

3. *Dysgeogenous* formations are those which are disintegrated with difficulty, and yield only a feeble detritus. On a grand scale, they absorb moisture readily, and furnish stations characterized by their comparative dryness. Rocks of this class mostly contain a large proportion of carbonate of lime in their composition.

4. *Eugeogenous* formations are those which abrade easily, and yield an abundant superficial detritus, which may be either of a sandy or clayey nature. They are comparatively impermeable, and consequently hygroscopic upon a grand scale, furnishing damper stations than the rocks of the opposite category, especially when the detritus is clayey.

5. Every species possesses essentially its characteristic special range of lithological adaptability, in the same way that each possesses its characteristic special range of climatic adaptability. Under equal climatic conditions, some species are restricted to more or less distinctly marked *dysgeogenous* situations, and others to more or less distinctly marked *eugeogenous* situations: but a greater number can adapt themselves, more or less decidedly, to stations of either class.

6. In proportion as we advance from an austral to a boreal, and from a continental to an insular climate, the proportion in number which the *restricted* (*i. e.* *dysgeogenous* and *eugeogenous*) bear to the *ubiquitous* species, lessens, principally through reason of many of the *eugeogenous* species being able, under more humid conditions of climate, to adapt themselves also to *dysgeogenous* situations.

II.—THE FIELD OF STUDY, LITHOLOGICALLY VIEWED.

For phytostatic purposes, the surface of Britain may be conveniently considered as subdivided into six lithological zones.*

1. A zone of moderately *eugeogenous* formations, for the most part metamorphic or endogenous as regards their geological character (granite, gneiss, and mica-schist), furnishing a sandy detritus, repulsing some of the *eugeogenous* plants of clayey situations, but admitting to a considerable extent several of the less decidedly characterized *dysgeogenous* species. It includes the surrounding islands, and the whole of the mainland of Scotland north of a line drawn from the estuary of the Clyde to

* These may be readily traced out upon any of the geological maps of the island. That of Forbes and Johnston, recently published by Blackwood and Sons, is the most complete. A map coloured lithologically was shown when the paper was read, but it does not seem needful to reproduce it here.

the opposite coast, through the centre of the shires of Perth, Forfar, and Kincardine. The Orkneys and northern parts of the coasts of the mainland furnish sedimentary deposits (Silurian and Devonian) still eugeogenous, but the igneous rocks of the Inner Hebrides and Shetland, and more particularly the sparing oolites of Mull, Skye, Argyle, and Sutherland, must rather be referred to the opposite category.

2. A zone of mixed formations, belonging in greater part to the Silurian and Devonian systems of geologists, in which the eugeogenous character on the whole decidedly predominates, but which enclose in several places typically dysgeogenous portions. It includes nearly the whole of the remainder of Scotland, and passes southward through Cumberland, Westmorland, and Lake Lancashire. Still further south, the eastern boundary is for a space nearly coincident with the line of limit between England and Wales, but diverges so as to comprise the south of Shropshire with Herefordshire and Monmouthshire; and afterwards crosses to the English Channel so as to cut off Cornwall, Devonshire, and a small part of the west of Somersetshire. The most striking dysgeogenous portions are the carboniferous limestones of the Lake district, with those of the north and south coasts of Wales, and the fine-grained compact limestones of North Devonshire and Somersetshire; also, but admitting more readily many eugeogenous species, the igneous strata between the firths of Clyde, Tay, and Forth, and the similar rocks of Cumberland and South Cornwall. In addition to these many of the deposits of the Silurian system on the borders of Wales are more or less calcareo-dysgeogenous, as the Woolhope, Wenlock, Aymestry, and Dudley sets of beds.

3. A zone of formations of scarcely exceptional dysgeogenous character. It comprises the greater part of the Cheviot Hills,

the older carboniferous strata of the Pennine chain as far south as Staffordshire and Derbyshire, and the parallel narrow terrace of magnesian limestone that runs between the Wear and the Trent, enclosing the coal-fields of Durham and West Yorkshire. Of its formations, the Mountain and Permian limestones are the most distinctly dysgeogenous: the Millstone grits and basalts appear to manifest the same lithological character in a less typical degree, but the coal measures partake more of a eugeogenous stamp.

4. The new red sandstone strata which follow next furnish a well marked eugeogenous zone, extending from the Tees to the Channel, narrowed between the succeeding and two preceding zones at its northern and southern extremities, but expanding in the centre so as to include several of the Midland counties, from the Cheshire coast eastward to Leicestershire and Warwickshire. This zone also includes the Midland coal-fields.

5. The south-eastern half of England, with the exception of the districts afterwards to be mentioned, is occupied by secondary formations of a more or less distinctly marked dysgeogenous type, belonging to the liassic, oolitic, wealden, and cretaceous groups. Of these the middle and upper (Oxford and Portland) oolites are the most characteristic: the strata of the chalk series more readily disintegrable, but generally tolerably permeable: whilst the liassic, lower oolitic, and wealden deposits furnish a third stage of gradation. The dry sandy tracts of the centre of Norfolk and Suffolk supply a neutral ground on which many distinctly dysgeogenous and distinctly eugeogenous species meet and mingle together. - On the west, this zone is bounded by a line drawn obliquely from the mouth of the Tees to the western margin of Dorsetshire.

6. The marsh lands that margin the coasts of South-east Yorkshire, Lincolnshire, and the estuary of the Wash, including the whole of what is usually called the "fen country," furnish well-marked clayey eugeogenous stations. The tertiary strata of the London and Hampshire basins are very varied in character, clearly of the same character taken as a whole, but admitting occasionally some of the less typically dysgeogenous species. Some of the districts of the later part of the cretaceous series would range as naturally under this zone as under the preceding.

These zones may be conveniently designated either according to their geognostic characteristics :—

- | | |
|--------------------------|----------------------------|
| 1. Psammo-eugeogenous. | 4. Eugeogenous. |
| 2. Mixed. | 5. Secondary dysgeogenous. |
| 3. Primary dysgeogenous. | 6. Subeugeogenous. |

Or according to the adjacent parts of the Continent, to which they appear lithologically and climatically to bear the greatest analogy :—

- | | |
|----------------------|------------------------|
| 1. Scandinavian. | 4. Belgic. |
| 2. Subscandinavian. | 5. Secondary Jurassic. |
| 3. Primary Jurassic. | 6. Gallic. |

The eighteen provinces into which Britain is subdivided in Watson's "Cybele" are distributed amongst these lithological zones, as below :—

1. *Psammo-eugeogenous or Scandinavian zone.*—North Isles, North Highlands; nearly the whole of East Highlands and West Highlands.

2. *Mixed or Subscandinavian zone.*—The Lakes, North Wales, South Wales; the greater part of East Lowlands, West