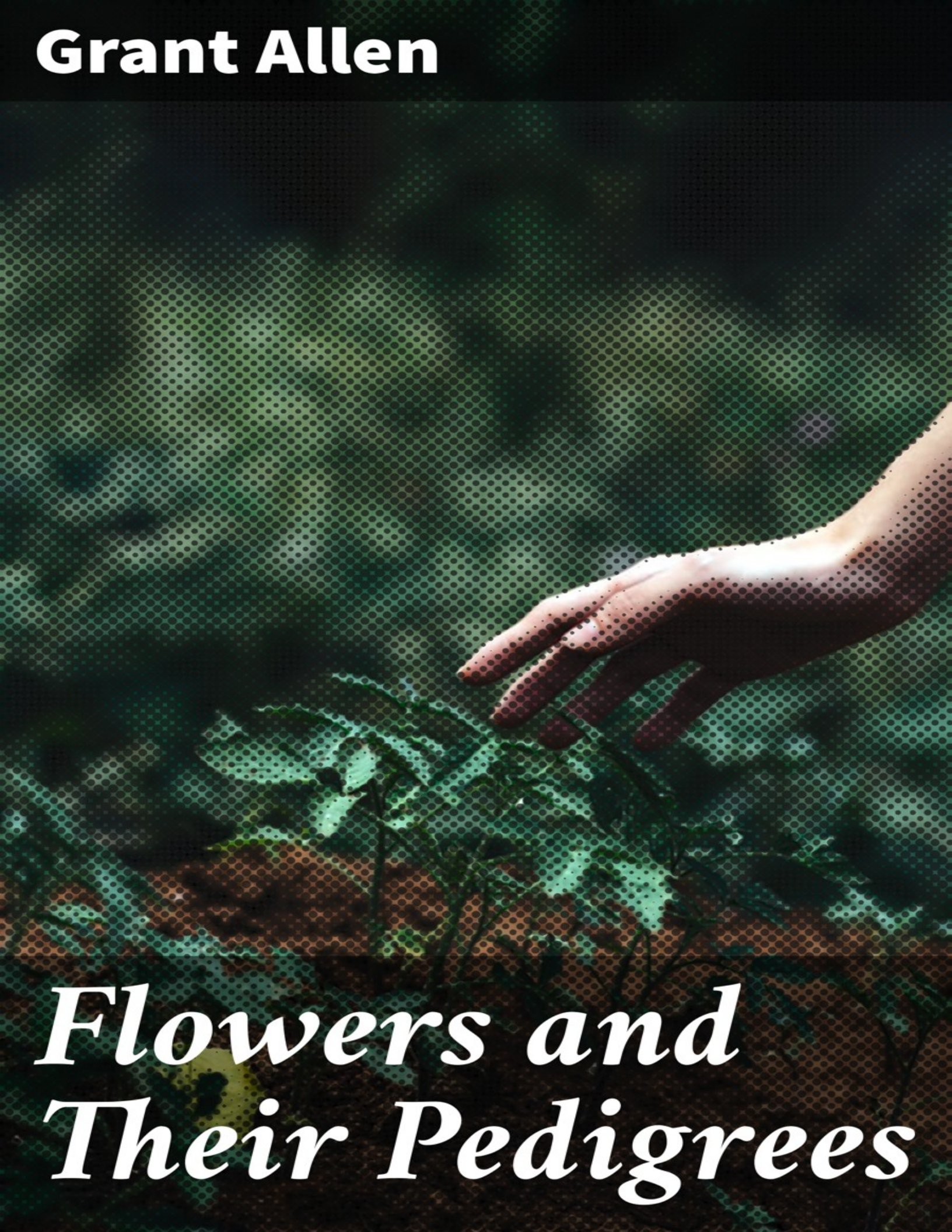
Grant Allen



Flowers and Their Pedigrees

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Published by Good Press, 2022

goodpress@okpublishing.info

EAN 4064066363574

Table of Contents

NEW YORK:
D. APPLETON AND COMPANY,
1902.

Table of Contents

PREFACE.

Table of Contents

These little essays originally appeared as articles in ‘Longman’s Magazine,’ the ‘Cornhill Magazine,’ ‘Macmillan’s Magazine,’ the ‘Gentleman’s Magazine,’ and ‘Belgravia,’ and I have to thank the editors and proprietors of those periodicals for kind permission to reprint them here. They are now offered to the public as a first instalment of a work which I hope some day more fully to carry out—a Functional Companion to the British Flora. We know by this time pretty well what our English wild flowers are like: we want to know next why they are just what they are, and how they came to be so.

G. A.

Lyme, Dorset:
July 1883.

FLOWERS AND THEIR PEDIGREES.

INTRODUCTORY.

Table of Contents

Our beautiful green England is carpeted, more than any other country in the world, perhaps, save only Switzerland and a few other mountain lands, with a perpetual sward of vivid verdure, interspersed with innumerable colours of daisies, and buttercups, and meadow-sweet, and harebells, and broader patches of purple heather. It is usual to speak of tropical vegetation, indeed, with a certain forced ecstasy of language; but those who know the tropics best, know that, though you may find a few exceptionally large and brilliant blossoms here and there under the breadth and shade of equatorial forests, the prevailing tone is one of monotonous dry greenery; and there is nothing anywhere in very southern climes to compare, as to mass of colour, with our Scotch hill-sides, our English gorse-clad commons, or our beautiful dappled meadows and cornfields, all aglow with the infinite wealth of poppies, bluebottles, foxgloves, ox-eye daisies, and purple fritillaries. The Alps alone can equal the brilliant colouring of our own native British flora. Poor as it is in number of species—a mere isolated fragment of the wider European groups—it can fearlessly challenge the rest of the whole world in general mingled effect of gaiety and luxuriance.

Now, every one of these English plants and weeds has a long and eventful story of its own. In the days before the illuminating doctrine of evolution had been preached, all we could say about them was that they possessed such and such a shape, and size, and colour: and if we had been

asked why they were not rounder or bigger or bluer than they actually are, we could have given no sufficient reason, except that they were made so. But since the great principle of descent with modification has reduced the science of life from chaos to rational order, we are able to do much more than that. We can now answer confidently: Such and such a plant is what it is in virtue of such and such ancestral conditions, and it has been altered thus and thus by these and those variations in habit or environment. Every plant or animal, therefore, becomes for us a puzzle to be explained, a problem to be solved, a hieroglyphic inscription to be carefully deciphered. In the following pages, I have taken some half-dozen of familiar English weeds or flowers, and tried thus to make them yield up the secret of their own origin. Each of them is ultimately descended from the common central ancestor of the entire flowering group of plants; and each of them has acquired every new diversity of structure or appearance for some definite and useful purpose. As a rule, traces of all the various stages through which every species has passed are still visibly imprinted upon the very face of the existing forms: and one only requires a little care and ingenuity, a little use of comparison and analogy, to unravel by their own aid the story of their own remoter pedigree. This is the method which I have here followed in the papers that deal with the various modifications of the daisy, of the grasses, of the lilies, of the strawberry, and of the whole rose family.

Again, not only has each English plant a general history as a species, but it has also a separate history as a member of the British flora. Besides the question how any particular

flower or fruit came to exist at all, we have to account for the question how it came to exist here and now in this, that, or the other part of the British Islands. For, of course, all plants are not to be found in all parts of the world alike, and their distribution over its surface has to be explained on historical grounds just as a future ethnologist would have to explain the occurrence of isolated French communities in Lower Canada and Mauritius, of African negroes in Jamaica and Brazil, or of Chinese coolies in San Francisco and the Australian colonies. In this respect, our English plants open out a series of interesting problems for the botanical researcher; because we happen to possess a very mixed and fragmentary flora, made up to a great extent of waifs and strays from at least three large distinct continental groups, besides several casual colonists. Thus while at Killarney we get a few rare Spanish or Portuguese types, in Caithness and the Highlands we get a few rare Alpine or Arctic types: and while in Norfolk and Suffolk we find some central European stragglers, the ponds of the Hebrides are actually occupied by at least one American pond-weed, its seeds having been wafted over by westerly breezes, or carried unconsciously by water-birds in the mud and ooze which clung accidentally to their webbed feet. Moreover, we know that at no very remote period, geologically speaking, Britain was covered by a single great sheet of glaciers, like that which now covers almost all Greenland: and we may therefore conclude with certainty that every plant at present in the country has entered it from one quarter and another at a date posterior to that great lifeless epoch. This, then, gives rise to a second set of problems, the problems

connected with the presence in England of certain stray local types, Alpine or Arctic, Southern or Transatlantic, European or Asiatic. Questions of this sort I have raised and endeavoured to answer with regard to two rare English plants in the papers on the hairy spurge and the mountain tulip.

In short, these little essays deal, first with the evolution of certain plant types in general; and secondly with their presence as naturalised citizens of our own restricted petty insular floral commonwealth.

I.

Table of Contents

THE DAISY'S PEDIGREE.

Table of Contents

Fig. 1.—The Common Daisy.

Have you ever paused for a moment to consider how much man loses for want of that microscopic eye upon whose absence complacent little Mr. Pope, after his optimistic fashion, was apparently inclined rather to congratulate his fellow-beings than otherwise? What a wonderful world we should all live in if only we could see it

as this little beetle here sees it, half buried as he is in a mighty forest of luxuriant tall green moss! Just fancy how grand and straight and majestic those slender sprays must look to him, with their waving, feathery branches spreading on every side, a thousand times more gracefully than the long boughs of the loveliest tropical palm trees on some wild Jamaican hill-side. How quaint the tall capsules must appear in his eyes—great yellow seed-vessels nearly as big as himself, with a conical, pink-edged hood, which pops off suddenly with a bang, and showers down monstrous nuts upon his head when he passes beneath. Gaze closely into the moss forest, as it grows here beside this smooth round stone where we are sitting, and imagine you can view it as the beetle views it. Put yourself in his place, and look up at it towering three hundred feet above your head, while you vainly strive to find your way among its matted underbrush and dense labyrinths of close-grown trunks. Then just look at the mighty monsters that people it. The little red spider, magnified to the size of a sheep, must be a gorgeous and strange-looking creature indeed, with his vivid crimson body and his mailed and jointed legs. Yonder neighbour beetle, regarded as an elephant, would seem a terrible wild beast in all seriousness, with his solid coat of bronze-burnished armour, his huge hook-ringed antennæ, and his fearful branched horn, ten times more terrible than that of a furious rhinoceros charging madly through the African jungle. Why, if you will only throw yourself honestly into the situation, and realise that awful life-and-death struggle now going on between an ant and a May-fly before our very eyes, you will see that Livingstone, and Serpa Pinto, and Gordon Cumming

are simply nowhere beside you: that even Jules Verne's wildest story is comparatively tame and commonplace in the light of that marvellous miniature forest. Such a jumble of puzzle-monkeys, and bamboos, and palms, and banyan trees, and crags, and roots, and rivers, and precipices was never seen; inhabited by such a terrible and beautiful phantasmagoria of dragons, hippogriffs, unicorns, rocs, chimæras, serpents, and wyverns as no mediæval fancy ever invented, no Greek mythologist ever dreamt of, and no Arabian story-teller ever fabled. And yet, after all, to our clumsy big eyes, it is but a little patch of familiar English grass and mosses, crawled over by half a dozen sleepy slugs and long-legged spiders, and slimy earthworms.

Still, if you so throw yourself into the scene, you cannot avoid carrying your own individuality with you into the beetle's body. You fancy him admiring that fairy landscape as you would admire it were you in his place, provided always you felt yourself quite secure from the murderous jaws and hooked feet of some gigantic insect tiger lurking in the bristly thicket behind your back. But, as a matter of fact, I greatly doubt whether the beetle has much feeling for beauty of scenery. For a good many years past I have devoted a fair share of my time to studying, from such meagre hints as we possess, the psychology of insects: and on the whole I am inclined to think that, though their æsthetic tastes are comparatively high and well-developed, they are, as a rule, decidedly restricted in range. Beetles and butterflies only seem to admire two classes of visible objects—their own mates, and the flowers in which they find their food. They never show much sign of deliberate love for

scenery generally or beautiful things in the abstract outside the limits of their own practical life. If this seems a narrow æsthetic platform for an intelligent butterfly, one must remember that our own country bumpkin has perhaps a still narrower one; for the only matter in which he seems to indulge in any distinct æsthetic preference, to exercise any active taste for beauty, is in the choice of his sweetheart, and even there he is not always conspicuous for the refinement of his judgment. But there is a way in which one can really to some extent throw oneself into the mental attitude of a human being reduced in size so as to look at the moss-forest with the eye of a beetle, while retaining all the distinctive psychological traits of his advanced humanity: and that is by making himself a microscopic eye with the aid of a little pocket-lens. Even for those who do not want to use one scientifically, it opens a whole universe of new and delightful scenery in every tuft of grass and every tussock of wayside weeds; and by its aid I hope to show you this morning how far the eyes and æsthetic tastes of insects help us to account for the pedigree of our familiar childish friend, the daisy. No fairy tale was ever more marvellous, and yet certainly no fairy tale was ever half so true.

I propose then, to-day, to dissect one of these daisies with my little knife and glass, and unravel, if I can, the tangled skein of causes which have given it its present shape, and size, and colour, and arrangement. If you choose, you can each pick a daisy for yourselves, and pull it to pieces as I go along, to check off what I tell you; but if you are too lazy, or can’t find one within reach, it doesn’t

much matter; for you can at least carry the picture of so common a flower well enough in your mind’s eye to follow what I have to say without one: and that is all that is at all necessary for my present purpose.

The question as to how the daisy came to be what it is, is comparatively a new one. Until a short time ago everybody took it for granted that daisies had always been daisies, cowslips always cowslips, and primroses always primroses. But those new and truer views of nature which we owe to Mr. Darwin and Mr. Herbert Spencer have lately taught us that every plant and every animal has a long history of its own, and that this history leads us on through a wonderful series of continuous metamorphoses compared with which Daphne’s or Arethusa’s were mere single episodes. The new biology shows us that every living thing has been slowly moulded into its existing shape by surrounding circumstances, and that it bears upon its very face a thousand traces of its earlier stages. It thus invests the veriest weed or the tiniest insect with a fresh and endless interest: it elevates them at once into complex puzzles for our ingenuity—problems quite as amusing and ten times as instructive as those for whose solution the weekly papers offer such attractive and unattainable prizes. What is the meaning of this little spur? How did it get that queer little point? Why has it developed those fluffy little hairs? These are the questions which now crop up about every part of its form or structure. And just as surely as in surveying England we can set down Stonehenge and Avebury to its prehistoric inhabitants, Watling Street and the Roman Wall to its southern conquerors, Salisbury and Warwick to mediæval

priests and soldiers, Liverpool and Manchester to modern coal and cotton—just so surely in surveying a flower or an insect can we set down each particular point to some special epoch in its ancestral development. This new view of nature invests every part of it with a charm and hidden meaning which very few among us have ever suspected before.

Pull your daisy to pieces carefully, and you will see that, instead of being a single flower, as we generally suppose at a rough glance, it is in reality a whole head of closely packed and very tiny flowers seated together upon a soft fleshy disk. Of these there are two kinds. The outer florets consist each of a single, long, white, pink-tipped ray, looking very much like a solitary petal: the inner ones consist each of a small, golden, bell-shaped blossom, with stamens and pistil in the centre, surrounded by a yellow corolla much like that of a Canterbury bell in shape, though differing greatly from it in size and colour. The daisy, in fact, is one of the great family of Composites, all of which have their flowers clustered into similar dense heads simulating a single blossom, and of which the sunflower forms perhaps the best example, because its florets are quite large enough to be separately observed even by the most careless eye.

Fig. 2.—Ray floret of Daisy.

Fig. 3.—Central floret of Daisy.

Now, if you look closely at one of the central yellow florets in the daisy, you will see that its edge is vandyked into four or five separate pointed teeth exactly like those of the Canterbury bell. These teeth clearly point back to a time when the ancestors of the daisy had five separate petals on each flower, as a dog-rose or a May-blossom still has. Again, before the flowers of the daisy had these five separate petals, they must have passed through a still earlier stage when they had no coloured petals at all. And as it is always simpler and easier to recount history in its natural order, from the first stages to the last, rather than to trace it backward from the last to the first, I shall make no apology for beginning the history of the daisy at the beginning, and pointing out as we go along the marks which each stage has

left upon its present shape or its existing arrangement and colour.

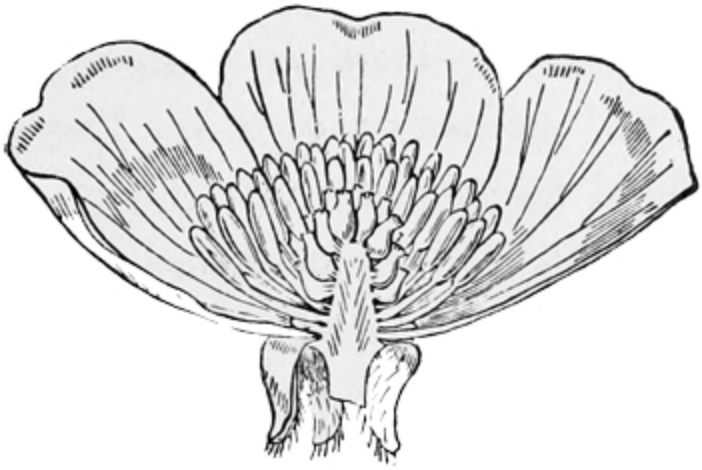

Fig. 4.—Longitudinal section of Common Buttercup.

The very earliest ancestor of the daisy, then, with which we need deal to-day, was an extremely simple and ancient flower, hardly recognisable as such to any save a botanical eye. And here I must begin, I fear, with a single paragraph of rather dull and technical matter, lest you should miss the meaning of some things I shall have to tell you in the sequel. If you look into the middle of a buttercup or a lily you know that you will see certain little yellow spikes and knobs within the petals, which form a sort of central rosette, and look as if they were put there merely to give finish and completeness to the whole blossom. But in reality these seemingly unimportant spikes and knobs are the most important parts, and the only indispensable parts, of the entire flower. The bright petals, which alone are what we generally have in our minds when we think of flowers, are comparatively useless and inessential organs: a vast

number of flowers have not got them at all, and, in those which have got them, their purpose is merely subsidiary and supplementary to that of the little central spikes and knobs. For the small yellow rosette consists of the stamens and pistils—the ‘essential floral organs,’ as botanists call them. A flower may be complete with only a single stamen or a single pistil, apart from any petals or other bright and conspicuous surroundings; and some of the simplest flowers do actually consist of such separate parts alone: but without stamens and pistils there can be no flower at all. The object of the flower, indeed, is to produce fruit and seed, and the pistil is the seed-vessel in its earliest form; while the stamen manufactures the pollen without which the seeds cannot possibly be matured within the capsules. In some species the stamens and pistils occur in separate flowers, or even on separate plants; in others, the stamens and pistils occur on the same plant or in the same flower, and this last is the case in almost all the blossoms with which we are most familiar. But the fundamental fact to bear in mind is this—that the stamens and pistils are the real and essential parts of the flower, and that all the rest is leather and prunella—mere outer decoration of these invariable and necessary organs. The petals and other coloured adjuncts are, as I hope to show you, nothing more than the ornamental clothing of the true floral parts; the stamens and pistils are the living things which they clothe and adorn. Now probably you know all this already, exactly as the readers of the weekly reviews know by this time all about the personage whom we must not describe as Charlemagne, or the beings whom it is a mortal sin to designate as Anglo-Saxons. But

then, just as there are possibly people in the worst part of the East End who still go hopelessly wrong about Karl and the Holy Roman Empire, and just as there are possibly people in remote country parishes who are still the miserable victims of the great Anglo-Saxon heresy, so, doubtless, there may yet be persons—say in the western parts of Cornwall or the Isle of Skye—who do not know the real nature of flowers; and these persons must not be wholly contemned because they happen not to be so wise as we ourselves and the *Saturday Review*. An eminent statistician calculates that Mr. Freeman has demolished the truculent Anglo-Saxon in 970 several passages, and yet there are even now persons who go on firmly believing in that mythical being's historical existence. And the moral of that is this, as the Duchess would say, that you should never blame any one for telling you something that you knew before; for it is better that ninety-nine wise men should be bored with a twice-told tale, than that one innocent person should be left in mortal error for lack of a short and not wholly unnecessary elementary explanation.

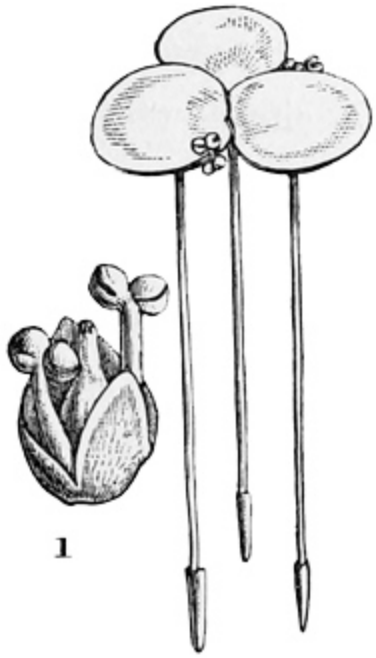

Fig. 5.—Frond and flower of Duckweed.

The simplest and earliest blossoms, then—to return from this didactic digression—were very small and inconspicuous flowers, consisting, probably, of a single stamen and a single pistil each. Of these simplest and earliest forms a few still luckily survive at the present day; for it is one of the rare happy chances in this queerly ordered universe of ours that evolution has almost always left all its footmarks behind it, visibly imprinted upon the earth through all its ages. When any one form develops slowly into another, it does not generally happen that the parent form dies out altogether: on the contrary, it usually lingers on somewhere, in some obscure and unnoticed corner, till science at last comes upon it unawares, and fits it into its proper place in the scale of development. We have still several fish in the very act of changing into amphibians left in a few muddy tropical streams; and several oviparous creatures in the