The Botany of Shakespeare

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THE BOTANY OF SHAKESPEARE

THE universality of Shakespeare is the common remark of critics. Other great men have been versatile; Shakespeare alone is universal. He alone of all great men seems to have been able to follow his own advice, "to hold as it were the mirror up to Nature." On the clear surface of his thought, as on a deep Alpine lake, the whole shore lies reflected—not alone the clouds, the sky, the woods, the castles, the rocks, the mountain path by which the shepherd strolls; not alone the broad highway by which may march the king in splendor, the peasant with his wain; but even the humbler objects by the still water's edge, the trodden grass, the fluttering sedge, the broken reed, the tiniest flower, all things, all Nature in action or repose finds counterpart within the glassy depths.

Hence it is that no man, at least no English-speaking man, reads Shakespeare wrong. Everybody understands him. Here is a sort of Anglo-Saxon Bible in which, so far as the world goes, every soul finds himself, with all his hopes, his doubts, his whims, depicted. We are therefore not surprised that everybody claims a share in Shakespeare; rather claims the poet as his own. The Protestant is sure that Shakespeare despised the hierachy; the Romanist is quite as certain that he loved the Church. There exists an essay to prove him a Presbyterian; another to show that the great dramatist was a Universalist. A volume has been written to prove the man a soldier; another that he was a lawyer, a printer, a fisher-

man, a freemason, and here are five or six articles to show that Shakespeare was a gardener.*

All this simply means that the poet had a marvelous faculty for close observing; that his vision was accurate, his instinct wonderfully true. It may be therefore worth our while to study for a little this remarkable man from the standpoint of a naturalist, to see how he who so vividly paints a passion can paint a flower; how the man who limns a character, till beyond the phonograph it starts to actuality, will catch the essential feature of some natural truth.

We shall nowhere lack for material. The plays are full of references to plants and flowers of every sort. England in Shakespeare's day, as now, was a land of bloom, and the poet but reflects the loveliness of beauty and color spread about him. But he does something more. He is not content with flashes of color and breathings of odor, he goes into detail and gives us the individual plant unmistakably. In his description he shows an exactitude, a discriminating perception that, had it been turned to Nature's problems seriously at all, must at once have transformed the science of its age. But Shakespeare was not a man of science; he was a poet. In his views of Nature he resembles the great poets of the world, notably Goethe; and, like Goethe, he not infrequently outruns the science of his time, uses his imagination, divining things invisible. Moreover, Shakespeare's plants are living things; they form a garden, not a herbarium. They stand before us in multitudes, so that it is difficult for the present purpose to know what to select. We must be content with a few specimen forms brought out in quotations no more extensive that seems necessary to the argument. Of course,

*In preparation of this article, the author has consulted chiefly the following: John Gerarde, The Herball or General Historie of Plants, 1597; Shakespeare, Edward Dowden, 1872; William Shakespeare, Works, Globe edition, 1867; Natural History of Shakespeare, Bessie Mayou, 1877; Shakespeare's England, William Winter, 1894; The Plant-lore and Garden-craft of Shakespeare, H. F. Ellacombe, 1896; The Gardener's Chronicle; sundry pamphlets, and shorter articles.

there are many plants today discussed of which Shakespeare never heard. He does not speak of many sorts of fungi, of slime moulds, microbes; he knew nothing about these. The microscope had hardly been invented, and the unseen world was as yet largely personified. And yet Shakespeare has not failed to note the visible signs of some of our microscopic forms. Critics have wasted their time and the patience of mankind in an effort to identify Hebona, the "leperous distilment" poured into the porches of the royal ear. Almost profitless are such discussions. Yet we may note that we have here to do with an effect; the means of producing it need not be too closely questioned. Before the rush of action, the weird setting, the voice of an apparition, the excited audience cares not what the mysterious vial may contain—ebony, henbane, yew, or whether it were entirely empty. What is called for is a speedy and mysterious taking off. Had the scene been laid in Italy, the effect had been reached by the fateful prick of a jeweled pin, some ring upon a Borgian finger whose pressure was the paralysis of death. But the king died of no such curari. Note the symptoms (Hamlet, i, 5, 64-73):

> "The leperous distilment; whose effect
> Holds such enmity with blood of man
> That swift as quicksilver it courses through
> The natural gates and alleys of the body,
> And with a sudden vigour it doth posset
> And curd, like eager droppings into milk,
> The thin and wholesome blood; so did it mine;
> And a most instant tetter barked about,
> Most lazar like, with vile and loathsome crust,
> All my smooth body."

These are the symptoms of blood-poisoning, vividly portrayed; of some contagion, communicable by infection. In foul old London Shakespeare had doubtless seen endemic, zymotic diseases of every description, and drew his picture from the life. Royal blood is notoriously unsound, royal habit leaves the porches of royal ears especially exposed. On our suppo-

sition the vial need not have contained very much, not even ebony. The dramatist had plenty of mystery ready to his hand, and the Hebona is perhaps intentionally ambiguous. Bacterial diseases were of old called plagues; they fell from heaven. Listen to King Lear:

> "Now all the plagues that in the pendulous air
> Hang fated o'er men's faults, light on my daughters!"

or Caliban:

> "All the infections that the sun sucks up
> From bogs, fens, flats, on Prosper fall and make him
> By inch-meal a disease!"

Or they were attributed, as already intimated, to unseen personal agencies:

> "This is the foul fiend Flibbertigibbet: he begins at curfew, and walks till the first cock; he gives the web and the pin, squints the eye, and makes the hare-lip; mildews the white wheat, and hurts the poor creature of earth."

I quote this latter rather also to show the accuracy and compass of Shakespeare's vision. How many people, not farmers, have seen wheat whitened by the blight! And that is exactly the description, white not "to the harvest," but whiter still to sterility and death.

But leaving aside all microscopic forms which may or may not be incidentally touched upon everywhere, we may turn our attention next to cryptogamic plants which are positively defined. The sudden springing of mushrooms, for instance, especially at night, so unreal and yet withal so realistic, made their creation a suitable trick for Prospero:

> "You demi-puppets that
> By moonshine do the green sour ringlets make,
> Whereof the ewe not bites, and you whose pastime
> Is to make midnight mushrooms, that rejoice
> To hear the solemn curfew."

The green sour ringlets on the fields "whereof the ewe not bites" are fairy rings. The same thing appears in the speech of Dame Quickly:

"And nightly, meadow-fairies, look you sing,
Like to the Garter's compass, in a ring;
The expressure that it bears, green let it be,
More fertile-fresh than all the fields to see."

Fungi, toadstools, mushrooms, and so forth, are fructifications only; the vegetative part of the plants permeates the soil, feeds on its organic matter, and spreads almost equally, we may assume, in all directions from the point of starting. When now this vegetative growth has accumulated energy to form fruit, the sporocarps or mushrooms rise all around at the limits of activity: hence, in a circle.

The fungi cut a small figure in Shakespeare—i. e., considering their numbers and almost omnipresence. But we must remember that they were at this time studied by few, their significance and interest little suspected. They formed part of the realm of the world unseen; they came and went at the instance of powers unknown, mostly personified, imaginary, a misty population, the thought of which kept for long ages the childhood of our race in terror. Shakespeare saw the forms of unstudied plants, everything visible to the naked eye, and really omitted very little. He speaks of mosses—the lichens were included with them—chiefly as indicative of age in the object in which they rest:

"Under an oak, whose boughs were mossed with age
And high top bald with dry antiquity."

Then again he simply touches them, but in such a way as to reveal his full appreciation of their beauty, as in Cymbeline, iv, 2. For the decoration of Imogen's grave the ruddock would bring flowers—

". . . bring thee all this;
Yea, and furr'd moss besides, when flowers are none,
To winter-ground thy corse."

The "furred moss" to "winter-ground thy corse" is exquisite.

Ferns, though so much larger, so handsome, and in our day so all-attractive, failed generally to impress our fathers.

Butler, writing in 1670, has this to say:

> "They spring like fern, that infant weed,
> Equivocally without a seed,
> And have no possible foundation
> But merely in th' imagination."

Now, as far as Shakespeare was concerned, ferns answered his purpose without seed just as well as with such visible means of perpetuity. His only reference is I Henry, iv, where Gadshill says:

> "We have the receipt of fern-seed, we walk invisible;"

and Chamberlain replies:

> "Nay, by my faith, I think you are more belonging to the Night than to fern-seed for your walking invisible."

In this connection Ellacombe suggests the doctrine of signatures. The God of Nature had written for us his human children prescriptions all over the leafy world. The remedy indicated by its form its own application. Thus a heart-shaped leaf was good medicine for cardiac troubles, a lung-like leaf was good for consumption, a lungwort in fact, and so a liverwort, a spleenwort, and the like. Gerarde, and, in fact, all the old medical writers throughout the centuries, are full of this. Now, what more natural than a plant which could thus perpetuate itself age after age by means invisible should be able to confer the much-sought gift of invisibility, the power to disappear and reappear at pleasure? Many people so believed. Shakesperae appears to have been skeptical.

Turn we now to the flowering plants; the amount of material at our disposal, as already indicated, is immense. Shakespeare was evidently a great lover of flowers simply as such. His pages from first to last are ornate with color, almost redolent of roses, lilies, eglantine, with every conceivable metaphor and trope—"the bud of love," the "nettle of danger," "the flower of safety." Their lovely shapes are ever before him; he is spell-bound with their beauty. England

itself is a "sea-walled garden." Grammatical forms may vanish, if only the flower may live. Compare Cymbeline, ii, 3:

"Hark, hark! the lark at heaven's gate sings,
And Phœbus 'gins arise,
His steeds to water at those springs
On chaliced flowers that *lies*."

the image of the morning flowers, the fiery steeds that drink them dry, shall fascinate us so that we forget the grammar. It will not do to say lie; the word must rhyme with "arise" and further on with "eyes;"

"And winking Mary-buds begin
To ope their golden eyes:
With everything that pretty is,
My lady sweet, arise."

For the Queen of the Faries he spreads this sort of a couch:

"I know a bank where the wild thyme blows,
Where oxlips and the nodding violet grows,
Quite over-canopied with luscious woodbine,
With sweet musk-roses and with eglantine;
There sleeps Titania sometime of the night,
Lulled in these flowers with dances and delight," etc.

Such cases reveal the impress, the healthy happy impress which Nature could exercise on this the foremost man of all the world, the harmony between Nature and Nature's child. All the plants in the last quotation are wild flowers, except the musk-roses, and these are so common in England as to be almost wild. The eglantine was the sweetbrier, said to be wild in all the southern part of the island and popular in the literature of all recorded centuries. Gerarde describes as follows: "The leaves are glittering, of beautiful green color, of smell most pleasant. . . . The fruit when it is ripe maketh most pleasant meats, and banqueting dishes, as tarts and such like, the making whereof I commit to the cunning cook, and teeth to eat them in the rich man's mouth."

The sweetness of the leaf of the eglantine is referred to by Shakespeare in another passage which I venture to quote now

for another purpose, to show the accuracy of his description as applied to simple flowers. The lines are from the scene quoted before. Arviragus and Guiderius would bury the swooning Imogen. They think her dead (Cymbeline, iv, 2):

> "I'll sweeten thy sad grave: thou shalt not lack
> The flower that's like thy face, pale primrose; nor
> The azured harebell, like thy veins; no, nor
> The leaf of eglantine, whom not to slander,
> Out-sweetened not thy breath."

Primroses when pale are the palest of all withering plants. The flowers change color with maturity, especially after fertilization. The paleness of the primrose is the pallor of decay. But the azure harebell—behold it waving on its slender stipe beneath the shade of some great rock—who can look into its delicate cerulean cup again and not bethink him of the blue-veined eyelid sleep that falls upon our human flowers!

The same accuracy of detail is evinced in many other places. Take, for instance, Shakespeare's description of the violet all the way through. It moves him chiefly by its odor (King John, iv, 2):

> "To gild refined gold, to paint the lily,
> To throw a perfume on the violet,
> To smooth the ice, to add another hue
> Unto the rainbow, or with taper-light
> To seek the beauteous eye of heaven to garnish,
> Is wasteful and rediculous excess."

Nevertheless, we have violets dim, and violets blue, and purple violets, and more particularly "blue-veined" violets, as if the poet looked with a lens into the very throat of the flower which Frenchmen call a thought. "And there is pansies—that's for thoughts." His description of the elm is equally exact (Midsummer-Night's Dream, iv, 1, 47–49):

> "So doth the woodbine the sweet honeysuckle
> Gently entwist; the female ivy so
> Enrings the barky fingers of the elm."

There is nothing better than that, as you may prove by examining the twigs of even some of our American species; the cork elm, for instance. The hawthorn, the cedar, and the pine and the oak especially, are most naturally treated. These are Shakespeare's favorite trees. The cedar of Shakespeare is the cedar of Lebanon, commonly planted throughout Europe since the time of the crusades. Shakespeare had probably seen specimens in England. He uses it as the type of all that is great and fine. One author thinks he copies Ezekiel, chapter xxxi. The pine was beside him all the while. He knew the secret of the pine knot, and well described it (Troilus and Cressida, i, 3):

> " . . checks and disasters
> Grow in the veins of actions highest reared,
> As knots, by the conflux of meeting sap,
> Deflect the sound pine and divert his grain
> Tortive and errant from his course of growth."

Any one who has ever examined the case, or even one who has handled knotty lumber, has seen the wood fiber run around the persistent base of some dead limb, and can appreciate these lines.

All these quotations show that Shakespeare used his own eyes and used them well. He saw the real distinctions of things, the hoariness on the willow leaf. He found character in the oak as in the king, and beauty in both. In many of his notices of natural objects, however, the poet is not the original observer. He often uses current opinions, fancies, dreams, for these also were the realities of his day, quite as much sometimes as oaks and forests. There is concerning plants a sort of orthodox mythology, and thousands of years have sometimes contributed to the reputation borne by a single species. A curious illustration is found in what Shakespeare has to say about the mandrake (Antony and Cleopatra, i, 5):

> "Give me to drink mandragora.
> Why, madam?
> That I might sleep out this great gap of time."

Othello, iii, 3:

> "Not poppy, nor mandragora,
> Nor all the drowsy syrups of the world,
> Shall ever medicine thee to that sweet sleep
> Which thou owedst yesterday."

Juliet, reflecting on her proposed entombment in the dark grave of the Capulets, exclaims (Romeo and Juliet, iv, 3):

> "Alack, alack! is it not like that I,
> So early waking, what with loathsome smells,
> And shrieks like mandrake's torn out of the earth,
> That living mortals, hearing them, run mad;
> Or, if I wake, shall I not be distraught,
> Environed with all these hideous fears?"

The mandrake *Atropa officinalis* belongs to the *Solanaceæ*, and, like others of the family, has narcotic properties. This was doubtless known to Shakespeare, as in the passage cited he compares the mandrake with the poppy. The groaning and shrieking are, of course, the purest superstition. The root of the mandrake was supposed to resemble the human form. The favorite habitat assigned to the plant was the foot of the gallows, and men believed that in some way the bodies of criminals were reproduced in the growing plant; their very pains and cries renewed, especially for him who profanely dared to pull the mandrake from the earth. The curious may consult Gerarde.

These ideas, it is needless to say, are very old; Pliny refers to them, and, if I recollect well, Vergil has his hero pull up some plant amid the strangest of sights and sounds. With these old myths are tied up, perchance, the mandrakes of King James's version. Nay, the superstition still survives; look at the wood cut in Webster's Unabridged, and you will discover that the artist who set out to illustrate the word mandrake for that somewhat venerable authority was by no means able to free himself from the ancient spell. Credulity is evermore a factor in the compound called human nature. Men love to be fooled, or to find some support for belief in

manifest absurdity. There is nothing so silly but has its advocates among men who ought to know better.

A year or two since, a man brought from Ohio to the University of Iowa an innocent five-parted, digitate, black fungus. It was treasured in alcohol. Why? Because of its origin. An honest mechanic meeting with accident lost his fingers under the surgeon's knife. The amputated members were neglected, but presently discovered and duly buried in the garden. The following spring from the "identical spot" uprose a swarthy hand, black without, white within. The hand was a perfect *main-de-gloire* for that sensation-loving community. The matter was discussed in newspapers. A long and careful account of the wonder was prepared, put in print and circulated among the friends of the deceased—fingers! "What fools we mortals be!" For sheer superstition and crass stupidity who may say that the nineteenth century may not yet discount the days of the Virgin Queen?

But I said at the outset that Shakespeare had in some instances anticipated modern scientific teaching. To illustrate this in its most striking instance, I am compelled to offer a somewhat long quotation. (Winter's Tale, iv, 4, 76–106):

"POLIXENES. Shepherdess,
A fair one are you, well you fit our ages
With flowers of winter.
PERDITA. Sir, the year growing ancient
Not yet on summer's death, nor on the birth
Of trembling winter, the fairest flowers o' the season
Are our carnation and streaked gillyvors,
Which some call nature's bastards: of that kind
Our rustic Garden's barren; and I care not
To get slips of them.
POLIXENES. Wherefore, gentle maiden,
Do you neglect them?
PERDITA. For I have heard it said
There is an art which in their piedness shares
With great creating nature.
POLIXENES. Say there be;
Yet nature is made better by no mean,
But nature makes that mean; so, over that art
Which you say adds to nature, is an art

That nature makes. You see, sweet maid, we marry
A gentle scion to the wildest stock,
And make conceive a bark of baser kind
By bud of nobler race: this is an art
Which does mend nature, change it rather, but
The art itself is nature.
PERDITA. So it is.
POLYXENES. Then make your garden rich in gillyvors,
And do not call them bastards."

Here we have brought out very distinctly the effect of cross-fertilization in flowers, the result of grafting and the development of varieties. Better than that, we have here the recognition of that tendency in organisms to vary that lies at the very root of the development of the species. Natural selection, survival of the fittest, were impossible were it not true that "Nature is made better by no mean but Nature makes that mean;" or, as it is more broadly stated a few lines further on, "This is an art which does mend Nature, change it rather, but the art itself is Nature." I consider these very remarkable statements when we reflect on the time in which they were written. Darwin, in 1860 does but unfold the thought. The selection which Shakespeare notes as practiced by gardeners, and a similar selection seen in the world of domestic animals, gave Darwin his cue of natural selection. The beauty of Darwin's thesis lies in the fact that the process is natural, and such is Shakespeare's dictum. Later on, lines 112–128, Perdita brings out another remarkable observation that has only lately been confirmed by the conclusions of science:

". . . Now my fairest friend,
I would I had some flowers o' the spring that might
Become your time of day; and yours; and yours;
That wear upon your virgin branches yet
Your maidenheads growing: O Proserpina,
For the flowers now, that frighted thou let'st fall
From Dis's wagon! daffodils,
That come before the swallow dares, and take
The winds of March with beauty; violets dim,
But sweeter than the lids of Juno's eyes
Or Cytherea's breath; pale primroses,

That die unmarried, ere they can behold
Bright Phœbus in his strength—a malady
Most incident to maids; bold oxlips and
The crown imperial; lilies of all kinds;
The flower-de-luce being one!"

Primroses are dimorphic—i. e., on the same species we find flowers of different sorts. These are complete, but in any particular flower the essential organs fail of adaptation to each other—the style in one too long, in another too short, to receive pollen from the stamens of its own flower. For fertilization such flowers are absolutely dependent upon the assistance brought by insect visitors. Perdita's primrose is *Primula veris*, the early primrose, "that takes the winds of March with beauty," and dies ere it beholds "bright Phoebus in his strength," and it is precisely this species that forms the basis of one of Darwin's earliest and most fruitful studies in the cross-fertilization of flowers. The styles in one form of the early primrose are three times as long as in the other, the stigmas differ and the coadaption of the parts of the different flowers extends even to the grains of pollen. Such flowers in the absence of insects are entirely unproductive. Insects are rare so early in the year, and accordingly many of the primroses die, as Perdita says, "unmarried."

Of course, it is not pretended that Shakespeare knew anything of this; but that he should have discovered the fact that the early primrose bears little or no seed, and that he should have been impressed by the truth that this is due to lack of fertilization, is wonderful. This circumstance might well lead to the suspicion that the poet was a gardener.

We must not forget to notice, too, in this connection that carnations—i. e., pinks—are remarkable for the great number of their varieties. We have, if I may so say, pinks of every color, from crimson to white, even brown it is said. This was true in Shakespeare's time if one may trust Gerarde again; he says, "A great and large volume would not suffice to write of every one at large considering how infinite they are, and how every year the climate and country

bringeth forth new sorts and such as have not heretofore been written of."

Another passage in which the poet has instinctively hit upon a scientific truth is found in Sonnet V, the last ten lines. The beauty of the passage as a whole is so remarkable that the delicate touches in particular lines are apt to be overlooked:

> "For never resting-time leads summer on
> To hideous winter and confounds him there;
> Sap checked with frost and lusty leaves quite gone,
> Beauty o'ersnowed and bareness everywhere:
> Then, were not summer's distillation left,
> A liquid prisoner pent in walls of glass,
> Beauty's effect with beauty were bereft,
> Nor it nor no remembrance what it was:
> But flowers distill'd though they with winter meet,
> Leese but their show; their substance still lives sweet."

No botanist can read the line "A liquid prisoner pent in walls of glass" and not recognize the exact portrayal of the living vegetable cell. The living protoplasm is a liquid prisoner sure enough, hemmed in by walls transparent. There could be no more striking image. And when in herb and tree, in every living plant, the summer's work is ended and hideous winter falls, the new cells, summer's distillation left, do in all perennials actually survive, lest of the effect of beauty, beauty be bereft. There is no more marvelous picture in all the vegetable world than that of a great tree with all its myriad cells, in summer so filled with the rush of life's activity and change that we might hear its music, in autumn sinking to quiescence, and the winter's silent chill where liquid prisoners sleep 'neath walls of glass. The poet did not understand it; he simply prophesied better than he knew. He makes us think of Goethe, of Lucretius. These men made happy guesses. Lucretius especially surprises us by his views on the constitution of matter—unverified; so far as we can know. Goethe lived in the age of science and went on laboriously to verify his surmises. The only natural science

which Shakespeare knew was gardening—if that may be called a science. His Sonnets are supposed to have been written about 1590, and the first scientific glimpse of the "prisoner pent in walls of glass" came about 1670, through the lenses of Nehemiah Grew, a Puritan physicist and botanist.

I am aware that it is said by some that in a critique like this we are apt to read much into the writings of our author. The quotations I have submitted show, it seems to me that this is unnecessary in the present case at least. The words are generally unequivocal. Of course, the language is poetical, metaphoric, but the metaphor has reference to something else; the description is not the metaphor. But, in fact, ought we to expect in Shakespeare very exact or complete description? His whole art lies in the power of suggestion. The deep impressions a man of genius makes upon our minds lie often, if not always, in what he does not say. A word or two and the vision rises, whether in Nature or in life, a passion or a landscape. Take the broken phrases of Ophelia depicting her broken heart, her "no more but so;" or the picture of the winter woods in Sonnet LXXIII:

> "That time of the year thou mayest in me behold
> When yellow leaves, or none, or few, do hang
> Upon those boughs with shake against the cold,
> Bare ruin'd choirs, where late the sweet birds sang."

Does any one pretend that we are reading into the lines when we appreciate the marvelous sorrow of the one picture or the exquisite truthfulness and splendor of the other?

Shakespeare's natural eye was clear indeed, but none the less he seems to have seen everything with the eye of his mind. Faraday so saw the world of force, Newton of mathematical law, and Tyndall's "scientific use of the imagination" lies in the same direction.

And so the man of science and the poet have much in common. Both use the natural world, and the imagination is for each an instrument of effort. The poet's generalization

is a splendid vision in a world ideal, suggested, no doubt, by what is actual and liable here and there to coincide with truth; the generalization of the scientific man is likewise a vision, but it rests upon the actual, upon the ascertained fact at the greatest number of points possible, and disappoints us only that it is not everywhere coincident. The poet dreams of Atlantis, the lost continents, the islands of the blest, and builds us pictures that vanish with his song; the man of science too beholds the continents rise; scene after scene he likewise makes to pass across our startled vision; but his are history; his tapestries are wrought in the loom of time.

The poet writes the book of Genesis, with the herbs bringing forth fruit after their kind; the man of science figures fossil leaves and cones and fruit. Only at the last do poetry and science possibly again agree;

> "The cloud-capped towers, the gorgeous palaces,
> The solemn temples, the great globe itself—
> Yea, all which it inherit shall dissolve,
> And like this insubstantial pageant faded, leave not a rack behind!"

And when the man of science gathers all his data, and collates fact with fact, and builds the superstructure of his vision, with him, too, all things fade and vanish in the infinity of the future.