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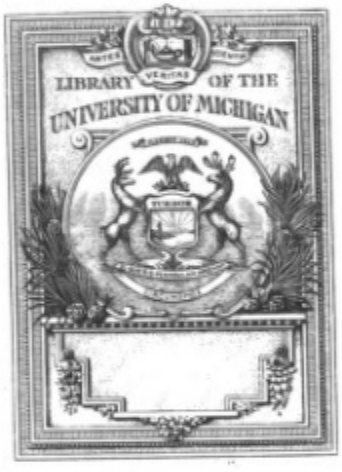

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PLANTS

THEIR NATURAL GROWTH

AND

Ornamental Treatment

BY

F. Edward Hulme, F.L.S., F.S.A., &c.

"Now pray I to hem that harkene this tretyse or rede, that yf ther be onything that liketh him, that thereof they thank Him of whom proceedeth al wit and goodnes, and yf ther be onything that displease hem, I praye hem also that they arrete it to the defaulte of myn unkonnyng and not to my will, that would have seyde better if I had knowing."—Chaucer.

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PLANTS:

Their Natural Growth and Ornamental Treatment.

INTRODUCTION.

"Every rational creature has all Nature for his dowry and estate; it is his if he will."—EMERSON.

THE application of vegetable forms to the creations of ornamental art has been in the past so universal, that we need scarcely dwell at length upon the value of a knowledge of such forms to the ornamentist, in order that he may either study, with due appreciation, the labours of his predecessors, or himself follow in their footsteps.

In almost all periods of art, Nature has been largely drawn upon, the only marked exceptions being in Celtic ornament, where, though vegetable forms are met with in MSS., the greater bulk of the ornament is zoomorphic, consisting of entwining monsters, or, at other times, composed of very curious and complicated arrangements of interlacing bands; or in those styles where a religious prohibition of the representation of any living thing deterred the designer. Under this head we may include all art under Mahomedan influence; for, though the Persians to some extent disregard the law, the forms are generally very conventional, and in this respect, as in several others, they place themselves under the ban of those who deem themselves true followers of the prophet. How far we may ourselves regard such use as opposed to religious obligations, may be readily tested by a consideration of the directions so carefully given to Solomon for his guidance in building a house meet for the Deity, where the lily, the pomegranate, the palm, and other plants, are frequently mentioned as parts of the general scheme of decoration; while, in our own beautiful cathedrals, we may study how little our forefathers felt such subjects unfit for highest use, since many of them have their capitals, stringcourses, spandrils, &c., masses of beautiful plant form—the sturdy oak, the graceful maple or bryony, the lowly buttercup, the still lowlier fungus, being introduced in their work: all creations of the one great Father of all, and, as testifying to His all-wise care and protection, not unworthy, humble and common-place as some might think them, of honoured place in His house.

Ornamentists too commonly overlook the treasures that Nature scatters around them, and, by a slavish adherence to a few set forms, deprive themselves of a valuable means of imparting enhanced interest to their work. No remedy for this can be so effectual as personal study and familiar acquaintance with rural scenes; but as, unfortunately, such opportunity of quiet study is frequently out of the power of the designer, either from press of work or other restraining cause, he must be content, at some loss of both pleasure and profit to himself, to derive his material from the labours of others. We have said at some loss of pleasure—for there is an enjoyment in the actual study of Natural beauty—

> "In the sweet Spring days,
> With whitening hedges and uncrumpling fern,
> And blue-bells trembling by the forest ways,
> And scent of hay new mown"—

that no attention to its merely pictured charms can compensate; and we have said, also, at some loss of profit—for there is no comparison between referring merely to the work of another and actually handling the natural plant, and noting its characteristic features in all their living beauty.

Many are, no doubt, deterred from a study of plants from an idea that Botany is too technical a thing to be of any benefit to them. They exclaim, with Wordsworth—

> "Let Nature be your teacher—
> Sweet is the lore which Nature brings; our meddling intellect
> Mis-shapes the beauteous forms of things, we murder to dissect.
> Enough of Science and of Art: close up those barren leaves;
> Come forth, and bring with you a heart that watches and receives"—

as they recall some such passage as this—"Leaves ovate-oblong, subserrate, pulverulento-tomentose." Without for a moment undervaluing the technicalities of botanical science, for they

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are most valuable, I would yet say that, at a very slight expenditure of time and trouble, the designer might acquire a sufficient knowledge of the commoner botanical terms to enable him on finding any plant to consult with ease some standard work, if he desired full information respecting it. The enjoyment and profit derived from direct study of Nature would be greatly increased by this, and the sweetness of "the lore which Nature brings" would be enhanced by the greater appreciation that would thus be brought to bear on it.

We had at first proposed, in writing the present work, to carefully eschew all technicalities of language, but on fuller consideration it has seemed desirable rather to use such terms, being careful, as we proceed, to explain their meaning, since the botanical term, merely one word, will often convey a significance that the substituted round-about description may, after all, not so effectually compass. The leading terms, once acquired, are easily retained, and it is better to master them once for all, as they are common to all writers on the subject (being found in all the books the designer may have occasion, or wish, to refer to for either naming a plant or gathering further information about it), than to forego numerous opportunities of acquiring useful knowledge for want of a little study to begin with.

After the wonderful richness of natural form, perhaps the most striking feature is its infinite variety. There is no stint, no repetition. Some leaves are long and tapering—some round—some triangular. Some blossoms are so minute as to be almost or quite microscopic; others, like the *Rafflesia Arnoldi*, of Sumatra, nine feet in circumference. In some plants the leaves are placed singly on the stem, as in the water-cress; in others in pairs, as we see in the privet or hop; in some cases in threes, as in the new American water-weed, that has now taken possession of so many of our streams; in other plants, as the crosswort, in fours; and in some cases in rings of eight or ten, all springing from the same level, as in the goose-grass. We need not, however, dwell at any further length on this point: the present illustrations will tend to indicate it, and a very slight study of Nature will much more amply and effectually confirm it.

A very pleasing ornamental feature is found in the variation of form or colour often met with in individual plants: thus, the first leaves are frequently of a different form to all the others that succeed them. We see this very well exemplified in the Sunflower (fig. 27) and the Radish (fig. 64). Many plants have their lower leaves richer in form than those that occur higher on the plant; the Hedge Mustard (see figs. 33, 34) and the Shepherd's Purse (figs. 62, 63) are illustrations of this—the richer form in each case being the lower one. Other examples may be seen in the bulbous Crowfoot (plate 15), the Water Avens (plate 21), the Agrimony (plate 31), and the Columbine (plate 37). In other plants this is reversed, the lower leaves being comparatively simple in form, the upper ones richly cut, as in the Sowthistle, or Marsh Mallow (plate 7). Figs. 69, 70, 71, 72, on plate 6, are further good examples of this; the whole series being from one plant —the ivy-leaved Speedwell, a not uncommon plant on arable land. These four examples show a very delicate gradation of form from fig. 69, one of the lower leaves, through figs. 70 and 71, to fig. 72, one of the higher leaves. In some instances the only difference perceptible is in the larger size of the lower leaves, all throughout the plant being of very similar form; the Bush Vetch (plate 14) and the Ground Ivy (plate 18) are examples of this. In some plants a valuable ornamental feature is seen in the forms of the opening bud. In the Sycamore (figs. 48, 59) the transition is abrupt and immediate, from the scaly external forms to the true leaves within; while in the Lilac, the gradation from the smallest scale to the fully developed leaf is very delicate. Figs. 51, 52, 53, 54, 55, are examples of this development of form in the Lilac.

Variation of colour in a plant, though not so commonly to be noted as variation of form, may also be studied with advantage. Thus we see what greatly increased richness it gives to the flower of the Sweet William (fig. 39), where the deeper band forms a ring of enhanced colour; or, again, in variegated Ivy, and the leaves (fig. 37) of many species of Pelargonium.

We might in the same way indicate many other points of study, but we refrain, preferring rather to appeal to our illustrations; and the more especially as we can, in our remarks upon each plate, better point out many little features than we are here, in a general introduction, able to do. Without further preface, then, we pass to a consideration of the various points thus suggested, endeavouring to make our remarks as practical as possible, in the hope that thus our pleasant labours may prove of real utility to the follower of ornamental art.

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DESCRIPTION OF THE PLATES.

PLATE 1.

"I shall be well pleased if I can say what is right, though it may not be of my own invention."—QUINTILIAN.

IN ornamental art, plants may be employed from various motives; thus, in some cases, their beauty has evidently been the sole consideration in their selection, while, in others, they have been chosen on account of an inner meaning involved. In the first case, the art is æsthetic—beauty, for its own sake, as the end and aim; in the second, it is symbolic—the outward and visible form conveying to the spectator a deeper meaning than it inherently possesses. The second is the nobler aim, as the pleasure to be derived from any work of art will be in direct proportion to the thought embodied in it. Many plants have thus in past art been used with this inner meaning; the Egyptians, for instance, largely employed the Lotus, the beautiful lily of their sacred Nile, in their ornament, as a symbol of plenty, since it was one of the most striking plants of that river, whose annual overflow caused the fertility of the land, and made Egypt the granary of the ancient world. The Vine is very commonly used throughout Christian art, and more especially during the Byzantine period, in allusion to such passages as—"I am the true Vine." The Palm branch of victory, the Lily, emblem of spotlessness of life, are other examples; and to those we may add the Snow-drop (of which we have a drawing in fig. 9), since, in Roman Catholic countries, it is, together with the white garden Lily *(Lilium Candidum)*, accepted as a symbol of the Virgin Mary, and hence is frequently found in ecclesiastical decoration. In some countries it is customary, on the day kept by that Church as that of her ascension, to remove her images from their altars, and to strew the spot with this flower. Apart from this religious significance, the plant is well worthy of the ornamentist's regard from its delicacy of form and colour; and as the first sign of the awakening of Nature after the storms of winter, hence the name Snow-drop, or, as the French term it, *Perceneige*—both names testifying to its early appearance, while the generic name *(Galanthus)* is derived from two Greek words signifying milk flower.

"Earliest bud that decks the garden,
Fairest of the fragrant race,
First-born child of vernal Flora,
Seeking wild thy lowly place."—LONGTHORNE.

Double flowers are frequently met with, even in its wild state; the transition in these from the normal forms of the stamen to the petal, and then on to the sepal, is very interesting. A floral leaf, as large as a sepal, sometimes only shows its petaloid character by its notched apex, and by a slight line or two of green on it, while others, more heart-shaped, smaller in size, and more regularly striped with lines of green, approximate more nearly to the normal form of petal. In others again, the rudiments of an anther are seen—the form thus produced being transitional from stamen to petal, while more nearly in the centre of the flower the forms become truly staminoid. Figs. 2, 3, 4, 5, 6, 7, show this gradation very well, the lower figure being the normal form of the stamen; the upper, the normal form of sepal; the others, the intermediate forms, merging from the one to the other. Fig. 12 is a detached sepal, fig. 13, a petal, while figs. 10 and 11 are the interior and exterior views of the natural single flower, as a whole.

The sepals in the Snow-drop are pure white; the petals white, having on the exterior a spot of brilliant green, and the interior striped with the same colour, while the anthers are brilliant orange. Where the plant is met with at all it is generally abundant, growing in clumps, the roots of several plants all matted together, and requiring some little force to separate them. In most flowers the calyx is green, and of smaller size than the corolla, as in the rose, buttercup, borage; but there are numerous exceptions, thus in the present plant it is white, and the segments longer than those of the inner ring; in the *Anemone pulsatilla*, light purple; in the *Delphinium Ajacis*, intensely deep and pure blue; in the *Caltha palustris*, brilliant yellow.

Where the petals and sepals are similar in colour and form, the term perianth is applied to them collectively, though, as there is generally some slight difference perceptible, the term is not always employed—one botanist describing the parts as a perianth, another recognising corolla and calyx. The flower of the Snow-drop is generally described as a perianth, but the Tulip flower (fig. 14) is a still better example. In some flowers, as for instance Orchids, some one or more of the segments, though the same in colour, differ in form from the others; such form of perianth is,

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botanically, called irregular. In the Snow-drop, as the outer and inner rings of parts, though different in size and form as compared with each other, are similar in themselves, the perianth is termed regular. The Snow-drop may be found throughout Britain, in pastures and woods, as, though not really indigenous it has become thoroughly naturalized. The cross section of the ovary, like that of many other flowers, is very ornamental in form. The ovary is the enlarged base of the pistil or central organ of the flower, and contains the ovules or future seeds. The ovary of the Snow-drop, like that of the Yellow Iris and Hyacinth, is technically called trilocular, as it is divided into three cells: it is shown in fig. 17. In fig. 8 we have another graceful form, the trilocular ovary of the *Vellozia elegans*, a native of Natal. A very beautiful ovary section is also seen in fig. 15, that of the common Primrose *(Primula vulgaris)*.

Geometry enters so largely into ornamental art that it is interesting to see how freely, too, it may be met with in natural forms; not only the ovaries, but many other parts of plants being frequently geometric in form. A very good example of this is seen in fig. 1—a section of the stem of the *Stapelia Hystrix*—the bristly-flowered Stapelia, a native of South-East Africa. At fig. 16 we have what we may term an architectural stem-section, being that of a shaft from Dorchester, Oxfordshire; but as we shall have occasion to refer at greater length to stem sections, in considering plate 5, we shall defer further comment until then.

PLATE 2.

"I meditate on all Thy works; I muse on the work of Thy hands."—PSALM cxliii. 5.

The central illustration (fig. 22) represents a flowering stem of the great Mullein *(Verbascum Thapsus)*. The whole plant grows to a height of about five feet, and is somewhat similar to the more familiar Foxglove in its mode of growth. The lower leaves, while similar in general form to those shown, are much larger than any we have been able to represent in the limited space at our disposal. The Mullein is subject to considerable variation, in some plants the spike of flowers being much denser than here shown. The leaves are thick, and very woolly in texture. The plant is not uncommonly found on banks, and in the hedgerows, on sandy, gravelly, or calcareous soil. It is a characteristic of the order to which the Mullein belongs, that all the plants have their flowers bi-symmetrical: in some species, as in Snapdragon, Rattle, Foxglove, this is very marked, and in the present example it must be noted that, though the blossoms are almost multi-symmetrical, they, nevertheless, are bi-symmetrical, as a closer observation of the plant shows. The *V. Thapsus* is beautifully introduced in a picture—"The Legend of St. Giles and the wounded Hart," by Lucas Van Leyden. The familiar name is derived from *mollio*, to soften, in allusion to the texture of the foliage. The remaining illustrations on the plate are given as affording good examples of natural multi-symmetrical or bi-symmetrical forms.

Symmetry is one of the most beautiful in its results of any of the principles of ornament; for, however simple or poor a form may be in itself, if it but forms part of a symmetrical arrangement, it at once becomes more pleasing than when viewed alone. We see this very well illustrated in the kaleidoscope, wherein very rich and beautiful forms are produced by the reflection and symmetrical arrangement of rough, irregular pieces of glass that, in themselves, are worthless, and powerless to please.

Symmetry shows itself in a general beauty of proportion, and balance of masses in a composition, or, in a more limited sense of the word—the sense in which we here use it—in the likeness of one half or part to another in a design; thus we speak of an ornamental composition being bi-symmetrical or tri-symmetrical, if it can be reduced into two or three similar parts; or multi-symmetrical, if it goes beyond this, as in many designs based on a circle. There may be symmetry of the grand divisions of a design, whether architectural or ornamental, with continuous variation as a principle in the details, and this is the nobler form of symmetry; where a general harmony and balance are felt in the composition, and yet a constantly recurring variation in the filling in of the details, entailing more thought, careful labour, and ingenuity in the designer than any mere repetition of parts.

The higher the order of the work, the less must the mechanical symmetry become obtrusive; for instance, in a church window moulding, the cusps on one side should just agree in position and be identical in form with those on the other; but in the stained glass, occupying the field of the window itself, the apostles or martyrs must, while maintaining due unity of grouping, show also variety of position and action. You can put two similar leaves back to back, and the effect may be good; but if you try and put two figures—angelic or human, or even of the lowlier animals—back to back in exact symmetry, you will find in the result that you have only degraded

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them. Bi-symmetrical arrangements will be found most appropriate in the decoration of upright surfaces, such as wall papers or curtains, which will always be seen one way, while multi-symmetrical star-like forms become more suitable for floorcloth and carpet patterns, because a star-like pattern on the floor looks equally well from all parts of the room, while a design, having only its halves alike, must, in such a position, to some of our visitors seem upside down, while others will see it sideways, or at various angles with its central line, and only in one position will it be viewed to proper advantage.

We find our own views amply confirmed by the dicta of recognised authorities. Thus Ruskin, in his remarks on symmetry, in the second volume of "Modern Painters," says—"I only assert, respecting it, that it is necessary to the dignity of every form, and that by the removal of it, we shall render the other elements of beauty comparatively ineffectual; though, on the other hand, it is to be observed that it is rather a mode of arrangement of qualities than a quality itself; hence symmetry has little power over the mind, unless all the other constituents of beauty be found together with it. A form may be symmetrical and ugly, as many Elizabethan ornaments, yet not so ugly as it would have been if unsymmetrical, but better always by increasing degrees of symmetry." While Wornum, in his "Analysis of Ornament," remarks—"It seems to be a law of Nature that every individual thing shall be composed of similar parts in its outward appearance, and, as the internal arrangement is often different, as in the animal creation, this similarity of externals would appear an evidence of the design of beauty." It is curious to observe, in Nature, that not only are symmetrical units combined, as in the case of the *Potentilla anserina* (fig. 24), or the *Sambucus nigra* (fig. 26), to form one symmetrical whole; but that this general symmetry of effect may also be produced, as in the *Vinca major* (fig. 18), by the aggregation of parts in themselves unsymmetrical. Flowers having their disc (using the word in its ornamental, not botanical sense,) in a horizontal plane, and, therefore, those that, like the Daisy, Dandelion, Celandine, and most others, we look directly down upon, are generally stellate or multi-symmetrical in character; while those which, like the Pansy (fig. 25), have their disc in a more or less vertical plane, are ordinarily bi-symmetrical. Flowers that are multi-symmetrical in plan are, however, generally bi-symmetrical in the side views, as shown in the Potato blossom (*Solanum tuberosum*, fig. 21). The student, on consulting plate 18, may see the two principles—fig. 157 being a plan view of the plant selected, and fig. 161 an elevational view. Many other such examples will be found scattered throughout our illustrations, and more especially at the close.

Repetition, the aggregation of similar units, is very commonly met with in ornamental art, and it is no less common in Nature, while a slight variation, produced by the continuous repetition of two dis-similar units, in alternation with each other, is also very freely to be met with. We see it, for example, in most of the Greek anthemion patterns, and in the almost equally characteristic so-called egg-and-tongue moulding of that people, where two very different forms are brought side by side, each by contrast and juxtaposition assisting the effect of the other. We see very good natural examples in the common Avens, the *Geum urbanum* of systematic botany (fig. 23), where we have alternation both of form and colour, the rounded yellow petals contrasting well with the acutely-pointed green segments of the calyx; and, again, in fig. 26 (the *Sambucus nigra*, or Elderflower) where the petaloid curves alternate with the more decided forms of the stamens: the colours, in this instance, being clear yellow or creamy white. For ornamental examples, plate 34 may be consulted: in the upper band of fig. 283, alternation of forms is seen, and in the lower part, repetition; while, in the leading forms of fig. 284, we see continuous repetition, the variation being produced by alternation of colour alone.

Repetition commends itself, apart from the pleasing art effect often produced, on the ground of economy, both in the price paid in the first place by the manufacturer to the designer, and, in the second place, in the facility of reproduction afterwards; we see it, therefore, largely employed in paper-hangings, muslins, designs of all kinds produced by the agency of machinery in any form.

The *Vinca major*, or Periwinkle, is not uncommonly met with in our hedgerows, where its long trailing stems, glossy leaves, and large lilac flowers render it a rather conspicuous plant. It flowers throughout the summer. Both the Latin, *Vinca*, and the English name, Periwinkle, are derived from *Vincio*, to bind, in allusion to its growth, as the thin straggling stems trail all over the other herbage of the bank, and mat it together by their pressure. By old writers it is termed Pervinke; Chaucer, for instance, thus terms it. It is very doubtful, however, if the plant be a true native. In ornamental art it appears to have been very sparingly employed, the only instance we have met with is in a MS. of the 16th century, where, in accordance with the practice of that period, it is represented naturally, having cast shadows, &c., on a golden ground. A plant very similar to this, but smaller in all its parts, is known, botanically, as *V. minor*, the smaller Periwinkle; but it is not so ordinarily met with as the present species.

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No. 19, the *Pelargonium tomentosum*, is, like No. 25, one of the numerous varieties cultivated by florists.

The *Convallaria majalis* (Lily of the Valley, or May Lily, fig. 20) may, from time to time, be met with in woods, but it is as a garden flower that our readers will, no doubt, be most familiar with it. Some of the older herbalists record the plentiful growth of this plant on Hampstead Heath, and other equally well known localities near London; but we need scarcely say that it has long since been rooted out from all these spots. It flowers during May and June, and, later on in the year, the blossoms are followed by bright, red berries. From its mode of growth, it is a plant well worthy of the ornamentist's regard, though it has comparatively rarely been employed by our designers.

The Potato (fig. 21), like many another lowly plant, has been overlooked and despised, its very utility in another direction, like that of the beautiful-leaved Parsnep or Carrot, having been against it; and there are few, we fear, who would risk the ridicule their nosegay would encounter if this beautiful flower had a place in it. It is, nevertheless, a very ornamental plant; the leaf, flower, and fruit that succeeds the blossoms being all very suggestive and beautiful forms. It was given by the Department of Science and Art, one year, as the plant upon which all designs from the various Schools of Art, competing for medals in a certain stage, were to be based.

Of the *Geum urbanum* (fig. 23) we shall have occasion to speak in dwelling upon plate 21, we, therefore, now defer our remarks on it, and pass to figs. 24 and 26—the flowers of the *Potentilla anserina*, or Silverweed, and of the *Sambucus nigra*, or Elder. The Silverweed is so called from the whitish grey of its feathery leaves; hence also in old works the plant is called Argentina. It is a very common wayside plant, the flower bright yellow, and the leaf somewhat similar to that of the Agrimony.—(See fig. 258.) The Elder is almost equally familiar, as there are few country hedge-rows where it may not be found. Its botanical name, *Sambucus*, is derived from the Greek, and refers to a musical instrument made from those hollow stems so familiar to the rustic intent on pop-gun making. The flowers are subject to a considerable amount of variation. Out of one hundred flowers, indiscriminately picked, we found that sixty-eight had the corolla five-lobed, and with five stamens, while the remaining thirty-two had those parts in fours. All the flowers were perfect, those having the corolla four-cleft being as free from all appearance of distortion as those having the normal growth. Some plants are much more subject to this irregularity of the floral parts than others; thus, in the Blackthorn (*Prunus spinosa*), ninety-three per cent. had the flowers of normal form; in one hundred flowers of Cinquefoil (*Potentilla reptans*) eighty had the divisions of the calyx and corolla in fives, the remaining twenty being in sixes; while in the lesser Celandine (*Ranunculus Ficaria*)—a plant in which this variation is greatly marked—out of one hundred flowers ninety-seven had three sepals, two had ten petals, nine had seven petals, eighteen had nine petals, sixty-eight had eight petals; while one had five sepals and fourteen petals, one had four sepals and seven petals, and one had four sepals and nine petals.

This variation is a matter well worthy of the study of the ornamentist, for though to the scientific botanist the calyx and corolla hold a subordinate place to the stamens and pistils, those inner organs which to him are the essential features; to the ornamentist, on the contrary, these outer rings of parts are the features of greatest interest and art value.

PLATE 8.

"The standing objection to Botany has always been that it is a pursuit that amuses the fancy and exercises the memory without improving the mind, or advancing any real knowledge; and when the science is carried no further than a mere systematic classification, the charge is but too true; but the botanist who is desirous of wiping off this aspersion should be by no means content with a list of names: he should study plants philosophically: should investigate the laws of vegetation."—WHITE OF SELBORNE.

In many plants, as we pointed out in our introductory remarks, the leaves that first rise from the ground are different in form to those we accept as characteristic of the plant that may be in question. They are termed seminal leaves (Lat. *Semen*, a seed) when they are developed from the seed lobes, as in the Lupin; they are ordinarily very simple in form, and fleshy in texture. In some cases the leaves succeeding these, though different in form to the seminal leaves, are not like the normal leaves of the plant. In this case they are known as the primordial or root leaves (Lat. *primus* first, and *ordo* order). We see examples of these in the Sycamore, large garden Convolvulus, Sunflower (fig. 27), and the Radish (fig. 64). The variation thus afforded in the foliation of a design is a point not without value.

The illustrations 33 and 34 we have also referred to in our introduction, when speaking of the great diversity of form that may be found in the various leaves of one plant, according to

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their position on the stem. The Hedge Mustard is a very common plant on waste ground by the wayside; the flower is very small, and unsuited to designing purposes; but the leaves are very good in form, and might well be introduced into an ornamental composition. In the lower leaves the terminal lobe is very large.

Fig. 32 is the stem section of the *Aspidospermum excelsum*, a native of British Guiana, As we shall have occasion, in plate 5, to refer to it again, we shall for the present defer further remark.

The remaining illustrations are given as useful examples of flower forms. The Daffodil (*Narcissus pseudo-narcissus*, fig. 28) is frequently to be met with in the early spring in moist woods and thickets, and when found at all is generally in great profusion; this, added to its brilliancy of colour, makes it, when thus seen, a very striking and beautiful plant. Wordsworth, with his usual fidelity to Nature, and his delicate perception of her beauties, has, in these lines—

"A host of golden Daffodils
Beside the lake, beneath the trees,
Fluttering and dancing in the breeze"—

very well indicated these salient points. Though admirably adapted to the requirements of ornamental art, and a plant very characteristic of the spring, it has been but sparingly used. The only example we are able to quote is on a plate of Wedgwood cream-coloured ware, in the ceramic collection at the South Kensington Museum, where the plant, though in shades of purple colour, is very naturalistic in form and general treatment.

The Corn-cockle (*Agrostemma Githago*) affords the very striking looking rosette seen in fig. 29. It owes its beauty to the very elongated and decided forms of the calyx segments, alternating with the petals of the corolla. Though now frequently to be met with in corn fields it is not a true native. It is one of the enemies of the agriculturist; but it has become so thoroughly naturalised that its extirpation is now impossible. We have seen it introduced very effectively in a Missal of the 16th century, one of the MSS. of the valuable collection in our National Museum. The treatment, in accordance with the spirit of that period, is very naturalistic, being pictorial rather than truly ornamental, the flower, with moths and dragon-flies, being painted in its natural colours, on a ground of gold, upon which it throws its shadow, a mode of treatment not altogether in harmony with the practice of the best periods of decorative art.

The flowers of the various species of *Hypericum*, or St. John's Wort, like the flower of the Periwinkle, that we have already noticed, are good examples of a regular, symmetrical form, produced by units in themselves unsymmetrical. The flower of the *H. Hirsutum* (fig. 31) is an illustration of this.

It will ordinarily be found that the various parts of a flower stand in a certain numerical relation to each other; thus we frequently meet with plants in which some of the parts are in threes, while others are in multiples of three; thus in the *Iridaceæ*, or Iris Family, the perianth is composed of six parts, while there are three stamens, either three stigmas or one stigma, with three divisions, and a three-celled ovary. In other plants the parts are in fours, or multiples of that number; thus, for example, the Holly (*Ilex aquifolium*) has four sepals, four petals, four stamens, and four stigmas, while the Evening Primrose (*Œnothera biennis*) has the calyx four-cleft, the petals in fours, and the stamens eight in number. A very common arrangement is that based on the figure five; the *Dianthus Armeria*, for instance, has a five-toothed calyx, five petals, and ten stamens. Arrangements in twos are not nearly so commonly met with as any of the foregoing; still, as we occasionally meet with such, it will be well not quite to ignore them. The Enchanter's Nightshade (*Circæa Lutetiana*) is an example, as its calyx is two-cleft, the corolla has two petals, there are two stamens, a two-lobed stigma, and a two-celled ovary.

The Corn-cockle is an illustration of the observance of this law of numerical relationship, as it has a five-toothed calyx, a corolla of five petals, five styles, and ten stamens; while the St. John's Wort is an exception to it, as, though it has a calyx and corolla each composed of five parts, there are only three styles, you will notice, in the centre of the flower.

Some of the exceptions to this law are very curious, when contrasted with the strict adherence to it that may be traced in the vast majority of plants; thus the *Claytonia perfoliata*, a native of Northern America, though now getting so commonly distributed over England that it is claiming a place as of right in our Flora, has a three-cleft style, five stamens, five petals, and a calyx of only two segments. So universal is the law, however, that exceptions as striking as this are rarely to be met with.

Many natural floral forms are very striking, and, while interesting as variations from what we ordinarily accept as the normal type of a flower, are also frequently of great beauty and ornamental value. Such an one is shown in fig. 30—the flower of the *Dielytra spectabilis*, or

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Chinese-lantern plant; a plant which, whether we consider the general growth, or the beauty of the individual parts, is admirably adapted to art purposes.

Whatever the number or arrangement of the inner parts of a flower, the outer ring is always known, botanically, as the calyx; though, from the occasional brilliancy of its colouring, as in the *Fuchsia*, it may be mistaken by beginners for the corolla. Notwithstanding this, the large and pink part of the *Dielytra* is the true corolla, hence care is necessary before a decision is arrived at as to the real nature of the floral parts. In some plants the calyx is what is termed caducous—a term derived from the Latin word *cado*, I fall; when it falls away either before the expansion of the flower, or when it has received its full development. The calyx of the *Dielytra* is an illustration of this; and we see others in the Scarlet Poppy *(Papaver Rhœas)*, so commonly to be met with in our corn fields; and in the *Eschscholtzia Californica*, a garden flower of a brilliant golden yellow colour; where the scarlet or yellow parts respectively are, though external, petaloid; the calyx, that in most flowers is more prominent than the corolla, having, in these cases, dropped off on the opening of the blossom. The corolla of the *Dielytra* is termed gibbous (Lat. *gibbus*, a hump), on account of its distended appearance; in the Columbine flower (fig. 300) this is carried still further, and the flower becomes calcarate (Lat. *calcar*, a spur). Many other names are given to various modifications of the form of the flower; thus the flower of the White Dead Nettle *(Lamium album*, fig. 35*)* is termed bilabiate, literally two-lipped; others are termed campanulate, from their resemblance to a bell, as in fig. 144; others, again, like the Bindweed blossom, are called infundibuliform, from the Latin word *infundibulum*, a funnel. We shall in passing through our illustrations find instances of many other such terms.

PLATE 4.

"Il me semble qu'un des plus grands charmes de la Botanique est, apres celui de voir par soi-même, celui de verifier ce qu'ont vu les autres: donner sur le temoignage de mes propres yeux mon assentiment aux observations fines et justes d'un auteur me paroit une veritable jouissance: au lieu que quand je ne trouve pas ce qu'il dit je suis toujours en inquietude si ce n'est pas moi qui voit mal."—ROUSSEAU.

In many of the old illuminations great richness of effect is produced by having either the central portion of a leaf of a deeper colour than the rest, or sometimes by merely a band of colour, as, for instance, deep blue on light blue, crossing the leaf at about midway from the apex and the insertion of the stalk. Natural illustrations of this are seen in the foliage of several of the cultivated species of *Pelargonium*. Fig. 37 is a representation of one of these leaves, wherein a form, already rich in its contour, is still further enriched by the band of darker colour crossing it: the flower of the Sweet William *(Dianthus barbatus*, fig. 39*)* is another good example. All spotted, blotched, striped or otherwise variegated leaves, as those of the Cuckoo Pint *(Arum maculatum)*, or spotted Persicaria *(Polygonum Persicaria)*, are worthy of the study of the ornamentist, and will often be found to have a suggestive value that will bear its fruit in his work.

The remaining figures are given as illustrative of the great variety of forms seen amongst leaves; other examples will be found on the various plates; even had we devoted the whole of our sheets to leaf forms alone, we could have given but faint idea of the enormous variety to be met with: some being long and narrow, like those of the Firs, needle-shaped or acicular (Lat. *acus*, a needle); others, like the Evening Primrose *(Œnothera biennis*, fig. 40*)*, broader in proportion to their length, and termed lanceolate, from their resemblance to a lance-head. Some, like the Snowberry *(Symphoricarpus vulgaris)*, are oval in outline; others, as the Daisy *(Bellis perennis*, fig. 75*)*, or the London Pride *(Saxifraga umbrosa)*, are spatulate or battledore-shaped. Such leaves as those of the Corn Convolvulus *(Convolvulus arvensis*, fig. 38*)*, are termed hastate, from the resemblance of the form to a dart (Lat. *hasta*). When the leaf is of the character shown in fig. 43, that of the Black Bryony *(Tamus communis)*, it is termed cordate or heart-like, and if resembling fig. 42, the leaf of the Coltsfoot *(Tussilago farfara)*, it is angular. When the lobes that we see in fig. 38 are considerably longer, and thrown more backward, the leaf becomes sagittate, or arrowhead-shaped—the leaf of the Arrowhead *(Sagittaria sagittifolia)* is an excellent example. When the leaf is broader than long, and with its basal lobes rounded, it becomes reniform or kidney-shaped. When the stem, as in the Nasturtium or Indian Cress *(Tropæolum majus)*, or in the Marsh Pennywort *(Hydrocotyle vulgaris)*, is attached to the leaf at some distance from the margin, a peltate or shield-like leaf is produced—(Lat. *pelta*, a shield). Peltate leaves are ordinarily very simple in form, but those of the Castor Oil Plant *(Ricinus communis)* are a marked exception, being very rich in character.

Though ordinarily the central line of the leaf terminates in a more or less distinctly-marked point, it has not always this feature, as there may even be in its stead a depression, more or less

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marked; we see this in the Box *(Buxus sempervirens)*, and notably in the leaf of the Ginkgo *(Salisburia adiantifolia*, fig. 41), where the foliage has the appearance of being cleft down the centre—a form botanically known as bifid. You will see that, ornamentally, this gives quite a new character. There is, perhaps, no more beautiful kind of leaf form for designing purposes than such as the Sycamore *(Acer pseudoplatanus*, fig. 36*)* affords a type of, where we get a central prominent mass, and other similar forms given off laterally. The radiating character, and the subordination of the various masses to each other, are very valuable points (if the reader covers up the two apparently insignificant basal lobes, he will see at once how the whole form suffers), while the toothed edge imparts further pleasant variety to the outline.

Botanically and physiologically the leaf is full of interest; but the points of greatest practical value to the designer, and therefore those that alone now concern us, are the following:—1—Its position on the stem. 2—Its general form as a mass. 3—The character of the outline. 4—The venation. 5—The texture. We propose, then, to take up briefly these points for consideration.

A leaf may be either stalked, as that of the Apple *(Pyrus Malus)*; or stalkless, as in the Pimpernel *(Anagallis arvensis)*. The leaf may entirely surround the stem, as in the perfoliate Honeysuckle *(Lonicera Caprifolium)*, or its basal lobes, instead of thus uniting, may be continued down the sides of the stem. In this case the leaf is decurrent; we see instances of it in the Comfrey *(Symphytum officinale)*, and in several of the thistles.

Leaves may occur singly at intervals on the stalk, when they will ordinarily be found to grow in a spiral. In the Oak *(Quercus robur)*, for instance, only one leaf is given off at one level; and if any one of these leaves be brought immediately opposite to the eye, the next one above it will be found to be at an angle with us, while the next still further recedes, and it is not until we get to the sixth leaf that we find it exactly over number one; we shall find that seven will be over two, eight over three, and so on—five leaves thus completing one cycle. We see this special arrangement also in the Pear *(Pyrus communis)*. In some cases the spiral is much more elaborate; while, on the contrary, in the Meadow Saffron *(Colchicum autumnale)* three leaves suffice to complete one revolution—number four then coming over number one, number five coming over two, &c.; the simplest form of all is that termed alternate, as in the Ivy *(Hedera Helix)*, where the third leaf comes over the first, the fourth over the second, and so on. Sometimes leaves grow in pairs, as in the Ground Ivy *(Nepeta glechoma*, fig. 155). In this case the pairs of leaves ordinarily alternate in their direction, the second pair being at right angles to the first, and number three returning to the direction taken by number one; a cross-like form is thus given to the foliage when seen in plan. In some plants, however, all the pairs are placed in the same direction, so that instead of being a cross form, when looking down on the growth, the top pair will conceal all those beneath it. We see a good instance of this in the opposite-leaved Pond-weed *(Potamogeton densus)*. In the *Globulea obvallata* the successive pairs of opposite leaves are arranged in a spiral, the second pair not being in a parallel line with the first, nor at right angles with it, as we see it in the great majority of plants, but at a slight angle, so that it is not until we arrive at the seventh pair that we find any of its leaves coming directly over those from whence we started in our investigation. When leaves are not opposite or alternate, they are said to be verticillate or whorled, except in the Pines and Firs, where the leaves, being gathered together in small bundles, are said to be fascicled (Lat. *fasciculus*, a little bundle). The number of leaves in a whorl varies considerably, thus in the *Anacharis alsinastrum*, or American Water Weed, now so rapidly spreading throughout our English water-courses, the leaves are in threes: in the cross-leaved Heath *(Erica Tetralix)* in fours; while in the Goose-grass *(Galium aparine)* the whorl is composed of many more parts. It is a law of universal force in vegetable organography that the greater the number of parts the less regular they are; thus the opposite or two-leaved arrangements are most constant; but, when three leaves compose the ring, a variation from the normal number is occasionally met with, while the fluctuation is most marked when the normal number is greater. In one hundred whorls of the Goose-grass that we counted to test this, thirteen were composed of six leaves, thirty-eight had seven, forty-one had eight, while the remaining eight had nine. In one hundred whorls of the great Hedge Hedstraw *(Galium Mullugo)* the variation was equally striking. Fourteen examples had six leaves to the whorl, eighteen of the whorls had seven leaves, fifty had eight leaves, seventeen had rings of nine leaves, while one whorl had ten.

The general form of the leaf, as it would tell as a mass in the design, is artistically a very important feature. We have already described some of the simpler forms. Leaves are either simple (figs. 55, 67, 91, 123, 169), or compound (figs. 125, 152, 173, 181); simple, when the divisions do not pass down to the central line: compound, when they do. Compound leaves are of two very marked types, either, in the first case, where the parts all radiate from one centre—the Horse Chestnut leaf (figs. 311, 326) is a good example of this; or, secondly, where these

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parts are thrown off at intervals along the central line : of this type the Ash is a good example ; we see it also very well shown in fig. 217. Such leaves are termed pinnate, from the Latin word *pinna*, a feather. The leaflets composing them may be all of very similar size, or the difference amongst them may be very marked, as we see in the Agrimony leaf, fig. 258. When the divisions into which a leaf is cut up become very numerous and complex in their arrangement, the leaf is said to be decompound ; while a still greater cutting up of the parts, as in the Hemlock *(Conium maculatum)*, renders it supradecompound.

The character of the outline of the leaf is a point of considerable importance to the ornamentist. If bounded by one continuous and unbroken line, as in the Lilac *(Syringa vulgaris*, fig. 55), and in the design fig. 323, the leaf is said to be entire. If the outline appears like a series of teeth, as we see it in the Violet leaf, or that of the Sycamore (fig. 36), it is said to be serrate (Lat. *serra*, a saw). We have this feature introduced in the design marked 320. It is capable of giving great richness of form and effect in an ornamental composition. When similarly-shaped teeth—instead of all being directed, as in the serrate form, towards the apex of the leaf or lobe—are directed outwards merely from the centre of the leaf, and approximately perpendicular to its general outline, they are said to be dentate (Lat. *dens*, a tooth). If these teeth are rounded, as in fig. 222, they are called crenate. When these three forms of teeth are very small the leaf is serrulate, dentulate, or crenulate. The term erose (Lat. *erodo*, to gnaw off), is applied to leaves in which the margin is irregularly cut, as in the Ragwort *(Senecio Jacobæa)*. Other terms are occasionally given in works, and used in botanical descriptions, but they are of less importance, both in themselves and to the special purpose of the ornamentist, than those given above.

The venation of the leaf becomes another ornamental feature : we need, however, dwell but a short time upon it. Leaves have their veins parallel (not in a mathematical sense) when they run, as in the leaves of the Iris or Yellow Flag *(Iris pseud-acorus)*, from one extremity of the leaf to the other. They have their veins reticulated (Lat. *rete*, a net) when they branch and form a net work, as in the Apple *(Pyrus malus)*, and most other trees and herbs. They are said to be bifurcated when the veins, as in Ferns, regularly branch off into pairs (Lat. *bis*, twice, and *furca*, a fork). In reticular venation the leading veins may be either penninerved or palminerved ; there are other smaller divisions, but this general and broad classification will suffice for the purposes of the ornamentist : penninerved, when approximately parallel lines are given off in succession, at intervals, upon the central line ; and palminerved, when the principal ribs all start in a radiate form from the base of the central line, like a hand with the fingers extended. The Oak *(Quercus robur)* is an example of the first form : the Vine leaf *(Vitis vinifera)* of the second.

The texture of the leaf is not a matter of much importance in surface decoration, but in relief work it is not unworthy of consideration. Some leaves are very thin and dry ; others, though thin, are pliable; others again, soft and flexible. Some, like the House-leek *(Sempervivum tectorum)*, are thick and fleshy. Others again, like the Mistletoe *(Viscum album)*, are dense and leathery. In most leaves a certain flatness of surface is a characteristic ; but in some, as the Weld *(Reseda Luteola)*, the margin is waved—a valuable feature frequently in relief work. In some cases, as, for instance, the Wood-sage *(Teucrium scorodonia)*, and the Coltsfoot (fig. 42), the whole surface of the leaf is wrinkled into convex masses between all the principal veins.

As it would be impossible, while keeping our volume of a reasonable bulk, to give plates of the entire growth of each plant we mention, or even of those of which at present some single detail—a flower or leaf—is given, we desire, while making some few and brief remarks respecting each, to also indicate where the student may turn for fuller information. To this end we are careful, in mentioning any plant, to give with its familiar name, that also by which it is known botanically , not that it will, in this place, be of much value, but expressly as a means of finding it in other works to which it may seem desirable to refer. All the books to which we now desire to call attention will, we believe, be found, together with many others quite as valuable, in the Art Library of the Department of Science and Art, South Kensington Museum, where they can be consulted at a fee so small as to become almost nominal, in comparison with the advantage to be derived—a payment of sixpence entitling any person to avail themselves of the full advantages of the fine collection of art-works there accumulated, for one week, and at a rate even lower for a longer period ; while those who, from their residence away from London, are unable to profit in the full advantage, can, by joining the classes of any provincial School of Art, of which there is one in every town of any size throughout the Kingdom, have almost equal privilege, as the masters of such schools have the power of borrowing, at will, from the central collection. The books to which we would more especially desire to refer our readers are as follows :—The *Flora Londinensis*, of Curtis : this, though published many years ago, is an excellent work for the designer. The plates are very large, and in almost all cases the whole plant is represented. The illustratrations are very carefully drawn and coloured. Though limited to the plants found

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round London at the time of its publication, it contains some hundreds of plates in the six volumes of which it consists. From its rarity and great costliness, it is one of those books that the designer will scarcely be able to secure for his own library: it is well, therefore, to know where it may be consulted. To this we may add the *Medical Botany* of Woodville, and a book with a similar title, by Stephenson and Churchill; though, like the *Flora Londinensis*, books of a considerable age, they are not the less excellent. The plants selected are such as have medicinal value, and include both British and foreign species. The illustrations have clearly been drawn and coloured from Nature. In these three works, the plants are arranged according to the Linnæan system—a classification of plants now given up in favour of what is termed the Natural system; but this in no way impairs the value of the illustrations to the art-student. The third edition of Sowerby's *English Botany*, recently completed, is an invaluable work for consultation. It contains a carefully-drawn and coloured figure of every British plant; but, like the others we have mentioned, it is naturally a book rather for library reference than for individual possession, as a work so comprehensive and elaborate must, of necessity, be high in price. The student may also refer to Owen Jones's *Grammar of Ornament*, where he will find some few plates, towards the end of the book, devoted to natural forms; and to the large volumes of illustrations of the *Natural Orders of Plants*, by Elizabeth Twining. Figuier's *Vegetable World*, and Coleman's *Woodlands, Heaths, and Hedges*, are valuable; and so, too, are the two volumes of the illustrated edition of Bentham's *British Flora*, wherein wood cuts of every British plant are given, though to a rather small scale. To these we may, perhaps, be pardoned, if we add a work on *Plant Form*, by the author of the present pages, in which numerous plants, adapted to ornamental purposes, are drawn to a large size, and analysed with a special view to art-treatment.

A few details, in conclusion, before passing to plate 5, concerning the plants partially illustrated on the present plate.

The Sycamore (*Acer pseudo platanus*, fig. 36)—so called from a slight resemblance the tree bears to the true Sycamore (*Ficus Sycamorus*) of the East—though not indigenous, is sufficiently common for most of our readers to have frequently seen it. It is one of the very few trees in which the leaves are arranged in pairs—the Ash, Maple, and Horse Chestnut being the other examples. The leaves of the Sycamore are often, during the autumnal months, found covered with purplish, black, irregular blotches: a feature that the ornamentist will make a note of as it comes under his observation. These stains are caused by *Xyloma acerinum*, a fungoid growth. The flowers, green in colour, and in long, drooping clusters, appear in May; they are, however, too small, both in their details, and even in the aggregate, to be of practical service to the designer, though the winged fruit that succeeds them is a very suggestive and beautiful ornamental form. We are not aware of any existing instance of the use of the Sycamore in decorative art, though the Maple (*Acer campestre*), an allied species, is, as we shall see in speaking of that plant, one of the greatest favourites of the carvers, during the Decorated period of Gothic.

The Pelargonium, or Geranium leaf (fig. 37), is one of the numerous forms produced by cultivation: a form so familiar to all, that we need not—having already referred to it—dwell further upon it.

Fig. 38 is the leaf of the Corn Convolvulus (*Convolvulus arvensis*), a very beautiful and common plant, strewing the bank with its profusion of pink and white flowers, or twining in a graceful spiral up the stems of the growing corn. An exceedingly beautiful plant for any light class of design, as, for instance, muslins, damasks, or lace. An instance of its use in the art-work of the past may be seen at the end of one of the stalls in Wells Cathedral; the leaves, however, alone being represented. It is sometimes called the Small Bindweed, in contradistinction to an ally, the *Calystegia sepium*, or Great Bindweed, the large, white Convolvulus of our hedges.

The Sweet-William (*Dianthus barbatus*, fig. 39), a native of Southern Europe, is a very favourite flower in cottage gardens. The heads of blossoms show a very considerable variety of tint; but in almost, if not quite, all, the characteristic ring of colour, either darker or lighter than the ground, is present. Many of the pinks and carnations in cultivation also show this feature very clearly. The familiar name of the present plant does not, as one might suppose, commemorate some rustic hero, but is a good illustration of the curious modifications that plant names are sometimes found to undergo. Its name in France is *Oeillet*, a little eye, in allusion to the pupil-like central spot seen in many of the flowers, and, the original significance being lost in crossing the Channel, the transition to Willy, and thence to Sweet-William, was easy; as the illiterate will always modify a word that is meaningless to them into something that, however wide of the mark, seems more familiar; thus the word Asparagus, originally derived from a Greek word, signifying to tear (many of the species being armed with sharp spines), being thus without

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meaning to the costermonger, is perverted by him into Sparrowgrass, a name that is in reality and entirely meaningless.

The Evening Primrose, or Evening Star (*Œnothera biennis*, fig. 40), though really a North American plant, appears to be fully establishing itself in many parts of England. Its only title to the name of Primrose consists in the delicate yellow of the large and fragrant flowers: it is, in all other respects, very different to the true Primrose (*Primula vulgaris*). It flowers throughout the summer and autumn, the blossoms opening in the evening. It has long been cultivated in gardens, but it is not known at what period precisely it was introduced into England. Parkinson, in his *Garden of Pleasant Flowers*, published in 1679, is the first author who refers to it. In that book it is called the Tree Primrose of Virginia. It first reached Europe in 1619, plants in that year being sent from Virginia to Padua. The poet Barton (1784-1849) thus alludes to it—

"Fair flower, that shunn'st the glare of day,
Yet lov'st to open, meekly bold,
To evening's hues of sober grey
Thy cup of paly gold."

It is a highly ornamental plant, and one well worthy the regard of the ornamentist.

The Ginkgo (*Salisburia adiantifolia*, fig. 41) is a native of China; there is a great variety of form in the foliage, though all the forms agree in general character. It is sufficiently hardy to stand our climate—the flourishing tree from whence this leaf was taken being in the open border at Kew. The leaf is very similar in form to that so characteristic of the *Adiantum* Ferns, of which the *Adiantum Capillus-Veneris*, or Maiden-hair, is a familiar species, hence the specific name *adiantifolia*.

The Coltsfoot (*Tussilago farfara*, fig. 42) is very conspicuous from its large leaves on most waste ground of a gravelly or clayey nature. The flowers, large and of a golden yellow, appear in early spring before the leaves are developed. It has many synonyms in rural districts, as, for instance, Cough-wort, from its supposed medicinal qualities; Foal's-foot, Horse-hoof, Bull's-foot, from the shape of the leaf. A plant admirably adapted for stone-carving, though we are unable to cite any instance of its application to decorative art.

Black Bryony (*Tamus communis*, fig. 43). This striking plant is not uncommon in our hedge-rows and thickets, though it does not occur in either Scotland or Ireland. It is a doubtful native. The flowers are greenish white: the berries that succeed them, a brilliant red. Its long trailing stems and masses of large glossy leaves make it one of the most ornamental plants of the hedge-row, and one every way worthy of the ornamentist's regard. It must not be confused, from similarity of name, with the White Bryony (*Bryonia dioica*, fig. 90), another equally beautiful hedge-climber, but of very different form in all its parts to the Black Bryony, our present plant.

PLATE 5.

"The Lord is good to all; and His tender mercies are over all His works."—PSALM cxlv 9.

"Consider the lilies of the field, how they grow; they toil not, neither do they spin: and yet I say unto you, that even Solomon in all his glory was not arrayed like one of these."—MATT. VI 28, 29.

The opening buds of spring frequently present very beautiful and suggestive forms: of these the Sycamore is a very good example. Two views of the same bud are shown in figs. 48 and 59. The imbricated arrangement (Lat. *imbrex*, a tile, overlapping like the tiles of a roof) of the scales, and their gradual increase in size, are note-worthy points, as also the abrupt transition from scaly to true foliate form. The Horse Chestnut bud (*Æsculus Hippocastanum*) affords another very beautiful study of form and development of growth. The arrangements of young leaves within their buds, or as it is technically termed, vernation, are often very curious. Several very distinct varieties of arrangement are to be found; thus in the Sycamore, our present plant, the vernation is plicate—from the Lat. *plica*, a fold—the parts being folded together, like a closed fan. The Vine is another instance of this plicate arrangement. In Ferns, the vernation is a very characteristic feature: it is termed circinate (Lat. *circinatus*, rounded), the whole leaf, from apex to base, being tightly rolled into a spiral and rounded mass. Many other such distinctive forms of growth are recognised; but a due consideration of the space at our disposal compels us to abstain from any further comment, lest haply, in endeavouring to exhaust our subject, we may still more effectually succeed in exhausting our readers. Scales are rudimentary leaves: we may, therefore, in the Sycamore, as in most other plants, meet with transitional forms. The function of the scales is to protect the tender bud during the cold of winter, hence the plants of cold

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regions are generally thus provided for, while in tropical plants the development of scales is altogether exceptional. Upon the evolution of the bud, the protective work of the scale is at an end; it is, therefore, thrown off, leaving a scar upon the stem, a memorial of its former existence.

In the Lilac *(Syringa vulgaris)* the transition from rudimentary scale to normal leaf form is more gradually marked: fig. 50 is the natural growth of a young Lilac shoot: figs. 51, 52, 53, 54, 55, showing the forms detached, as the gradation is thus more readily traced.

We have already, in referring to plate 3, pointed out the difference in form that may frequently be traced between the earliest leaves of a seedling, and all those that succeed them. Of this the Sunflower (fig. 27) afforded an example; while, in the present plate, we see the same ornamental feature again illustrated in the Radish *(Raphanus sativus)*. We also, in our remarks on that plate, pointed out the great variety of form that in some plants is seen in their normal leaves, according to their position on the plant, illustrating our observations by a reference to the forms seen in the Hedge Mustard. The Shepherd's Purse, an equally common plant (figs. 62, 63), is an equally good example, the larger and more richly-cut leaf being one of the lower leaves, while the form of simpler character is one of the higher leaves of the flowering stem.

Throughout the whole range of ornamental art the use of geometry is a principle of continuous recurrence. In many periods of art, as in the English and Italian Gothic of the 13th century, its use is eminently characteristic. One of our great authorities on matters connected with design has laid down this law,—"All ornament should be based on a geometrical construction;" and, though at first sight we feel inclined to doubt whether all should be thus bound by so rigid a law, we shall, nevertheless, on consideration and investigation of various examples of ornamental art, be quite prepared to admit the charm that a geometric basis is able to impart to an even otherwise poor design, and to recognise the enhanced beauty that it gives in all cases.

Nature affords us many examples of geometrical forms, more especially in the open blossoms of most plants, and perhaps no less so—though it is not at first sight so obvious—in the sections of stems. The circle, the simplest geometrical form, is that most commonly found; we see it in the stems of grasses, the Elder *(Sambucus nigra)*, the Ash *(Fraxinus Excelsior)*, and many others. The triangle is the typical sectional form of the stems of water plants, as, one angle being presented to the direct action of the flowing stream, it is the form most suited to ensure the necessary stability, acting, as it does, like the prow of a boat, or the triangular pier of a bridge, in diverting the direct force of the current. We see the triangular section very well shown in the Sedges *(Carex vulpina*, fig. 56), for example: plants that, growing in the bed of the stream, are exposed to the full power of the water; and again in the *Alisma plantago*, or Water Plantain (fig. 57), where the forms are much rounder, as this plant does not grow in the open stream, but fringes its banks, and has not, therefore, so great a pressure to sustain. The contrast between the two triangular forms, each so admirably adapted to the special circumstances of the plant's existence, is, we think, a very striking illustration of that great law of adaptation so frequently to be traced in the works of Nature. The form of the cross section of the stem of the Papyrus *(Papyrus antiquorum)* is identical with that of the *Alisma*. Several of the Labiate family have stems based on a square: such a form is seen in the *Lamium album*—the White Archangel, or White Dead-nettle—fig. 61. We see another modification of it in the stem of the Stinging Nettle *(Urtica dioica)*, and of the square-stalked St. John's Wort *(Hypericum quadrangulum)*; while more complex polygonal forms are met with in the pentagonal stems of the Meadow Sweet *(Spiræa Ulmaria*, fig. 53), or the *Stapelia hystrix* (fig. 1), and in the hexagonal stems of the Balsam *(Impatiens noli-me-tangere*, fig. 49), or the Hop *(Humulus lupulus)*. A still greater richness of form is seen on cutting across the deeply-furrowed and fluted stems of many of the *Umbelliferæ*, as the Wild Carrot *(Daucus Carota)*, or the Fool's Parsley *(Æthusa Cynapium)*. A very curious stem section is figured on plate 3—that of the *Aspidospermum excelsum*, a native of British Guiana. Several very remarkable sections of this may be seen in the botanical collection of the British Museum. Though so extraordinary in form, a parallel on a smaller scale might almost be found in the stem of the common Maple *(Acer campestre)*, the bark being exceedingly rough, and full of deep and irregular fissures. Fig. 16, and the remaining illustrations on plate 5, are geometric shaft sections of varying degrees of richness, from the Cathedrals or other buildings named beneath each example.

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PLATE 6.

"The great business of study is to form a mind adapted, and adequate, to all times and all occasions; to which all Nature is then laid open, and which may be said to possess the key to her inexhaustible riches."—SIR JOSHUA REYNOLDS, Discourse XI.

The first figure on this plate is the highly ornamental leaf of the greater Knapweed (*Centaurea scabiosa*). As the plant is represented in its natural growth at fig. 247, we shall defer further comment until then; the leaf is merely detached from want of space for it on plate 30, as it is one of the large lower leaves of that plant.

Fig. 67, the leaf of the Corn Marigold (*Chrysanthemum segetum*), is very ornamental in character; the whole plant is well worthy of the ornamentist's consideration. Its large yellow flowers render it a conspicuous object; it is found, together with the Blue Cornflower (*Centaurea Cyanus*) and the Scarlet Poppy (*Papaver Rhœas*), in the ripening wheat, and is, like those, one of the characteristic plants of autumn.

Figs. 69, 70, 71, 72, the leaves of the Ivy-leaved Speedwell (*Veronica hederifolia*), have been already referred to in our remarks on the variation of form often seen in the leaves of the same plant.

Though the great majority of leaves are bi-symmetrical in form, we occasionally meet with examples wanting in this symmetrical character; the leaf of the Elm (*Ulmus campestris*) is a familiar example of this. We see it still more clearly in the various species of *Begonia*—as in fig. 68, the leaf of the *B. suffruticosa*, and in fig. 76, that of *B. Wetoniensis*. In this family the difference of size between the portions on either side of the main rib is very marked indeed. In speaking botanically of leaves being bi-symmetrical, we disregard any minor variations, or slight deviation in the dimensions, the word being used in a general sense, and not as implying geometrical accuracy: since, in almost every leaf, though practically it may be said to be bi-symmetrical, small differences of form will be easily detected in comparing one half with the other. Where leaves are unsymmetrical, it will always be found that they are arranged alternately on the stem: no instance is know of inequilateral leaves being arranged in an opposite manner on the stem; hence this would seem to prove, in the words of De Candolle, "That this inequality ought to be referred to the position of the leaf upon the plant favouring the development of one of its sides more than the other, and in this case it is always the lowest which is developed most." This law is still more evident in the leaflets of pinnate leaves; when they are unequal, as is ordinarily the case, the lower part is always that most developed. We see this in the leaflets of the Knapweed, on the present plate. Figs. 152, 173, 258, are also good examples. In palmate leaves, leaves of a radiate character, like those of the Horse Chestnut, when the lateral leaflets, though forming part of a symmetrical whole, are not, in themselves, symmetrical, the larger portion will always be on the external side—that part furthest removed from the general central line of the leaf. Not only do leaves, when viewed individually, present ordinarily a general symmetry of form, but also a due symmetry in regard to their position on the stem in connection with other leaves; thus, with scarcely an exception, all leaves that spring from the same level are of equal size: they are, at least, normally so, though accidents of growth may have disturbed this natural symmetry. We see this very clearly in the Ground Ivy (*Nepeta glechoma*, fig. 153), or the Meadow Crane's-bill (*Geranium pratense*, fig. 184). A very curious instance of this law of symmetry and the due balance of parts is seen in the *Ruellia anisophylla*, where the leaves, though growing in pairs, are not equal, one being very small and narrow as compared with the other; yet, on comparing successive pairs, the small leaf of the pair is found to occur alternately, first on the left side, then on the right. In the Deadly Nightshade or Dwale (*Atropa Belladona*) the leaves, though in pairs, are of very unequal size, one of each two being always much larger than the other, as may be seen by reference to fig. 271. In fig. 339 we have a design based on this curious and abnormal growth. When leaves are in whorls, or verticillate in arrangement, all the leaves composing a whorl are ordinarily of the same size: occasionally, however, they vary from large to small, placed alternately.

The leaf of the Daisy (*Bellis perennis*, fig. 74) has already been referred to in speaking of the various foliate forms, as an example of the spatulate type; while the Harebell leaf (*Campanula rotundifolia*, fig. 75) is a type of the rounded leaf. We may also cite it as a further instance of the variety of leaf form to be sometimes found on one plant, as the lower leaves alone are of this character, the upper ones being thin and strap-shaped. The plant as a whole is admirably adapted for employment in design, its delicate growth and graceful bell-shaped flowers being features of great beauty and adaptability to art-work.

The leaves of the various species of *Sarracenia* are curious examples of the very abnormal forms sometimes assumed. The variation of colour in these is very striking In the *S. Drummondii* the lower portion is light green, gradually merging into pure white, and on this, as a ground,

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the veins are represented by interlacing lines of pale green and brilliant crimson. In *S. Flava* the general colour is yellowish green. The Sarracenias are all natives of North America, the present plant (fig. 73) being found abundantly in the swamps of Florida and Carolina. Some of the species are found as far north as Canada; in fact, the plants derive their name from a Dr. Sarrazin, a French physician residing in Quebec, who first discovered in Canada this remarkable genus. Our illustration is necessarily on a very small scale: the natural leaves are between two and three feet high.

There are three families of plants which, though very different in many respects, are all familiarly called "pitcher" plants. Of these the Sarracenias are one, the pitcher being the long funnel-like form made by the rolling together of the sides of the leaf; while the others are *Nepenthes*, a group of shrubs, natives of South-Eastern Asia, having pendant goblet-shaped pitchers; and lastly, *Cephalotus*, a family of small herbs, growing in the bogs of Southern Australia, with small cups of globular form. In all these the vessel has a natural lid, tightly closed at first, but gradually expanding as the pitchers become more developed. The flowers of the various species of *Sarracenia* are large, and very curious in form: in some cases deep red in colour, in the present a pale green. The whole plant is very quaint and striking in effect.

Our space is far too limited to justify our alluding, however briefly, to many other very curious and abnormal leaf forms: nor indeed do we care to do such scant justice to them. We regret this the less, however, since—however interesting and curious the subject—it would not be of much practical value to the designer.

The variegation of colour sometimes seen in leaves is, as we have pointed out in referring to the Pelargonium leaf (fig. 37), a matter of study quite within the scope of the designer's aim. Many beautiful examples are to be met with; in some plants the variation is normal and characteristic, in others exceptional—the result of cultivation, or of some special circumstance peculiar to the particular plant in which it is found; thus, in this latter category we find, for example, the leaves of the following plants which, normally green, are occasionally variegated in colour:—Daisy, Lily of the Valley, Yew, Strawberry, Ivy, Hop, Plantain, Periwinkle, Coltsfoot, and Violet. Where the variation of colour is thus exceptional—the result of some disturbing circumstance, the abnormal colour is generally met with in blotches and irregular streaks. In plants, on the contrary, where this variety of colour is a natural feature, the forms assumed are frequently, though by no means invariably, of definite outline, as in the markings on the leaf of the *Maranta pardina* (fig. 77), a native of New Granada.

It is in leaves of this class that the designer will most probably find suggestive material: the black, quadrangular spots on the Maranta leaf, for instance, impart great additional richness to it, and form a valuable ornamental feature. Other good examples may be seen in the *Calathea Zebrina*, a native of Brazil, where the green ground-colour of the foliage is barred across on either side of the mid-rib with parallel lines of a darker green; or in the *Aphelandria Leopoldii*, also a South American plant, where the deep green of the leaf has the parallel veins sharply defined by a series of clear white lines.

Many valuable colour suggestions may be derived from a study of autumnal foliage; the Blackberry is only one example out of many that afford great richness and variety of colour in their decay. We mention the Bramble especially, partly because it is so common, partly because, while many plants show great richness of colour of a green tint—the Maple, for instance, turning a brilliant yellow, the Guelder Rose deep crimson, the Oak a rich brown—the Bramble has a great variety of tint, some leaves being as yellow as the Maple, or as crimson as the Guelder Rose: while others are of a delicate lemon yellow, a brilliant orange, or a beautiful purple.

PLATE 7.

"All Thy works shall praise Thee, O God; and Thy saints shall bless Thee. They shall speak of the glory of Thy kingdom, and talk of Thy power; to make known to the sons of men His mighty acts, and the glorious majesty of His kingdom."
—PSALM CXLV 10, 11, 12.

The Musk Mallow *(Malva Moschata)*, like the Meadow Crane's-bill *(Geranium pratense*, plate 22), the Bulbous Crow-foot *(Ranunculus bulbosus*, plate 15), and many other plants, possesses one feature of great advantage to the ornamentist; its leaves and flowers, while alike beautiful in form, have in addition a due proportion, the one with the other, that renders them in an especial degree of service. A further recommendation to the designer will be found in the pleasing variety of form in the leaves, the upper ones being deeply cut, while the lower are of a much simpler character. The bud, with its involucre of pendant bracts (fig. 81), and the beautiful plan views, back and front, made by the flower, are additional features of value. We have, in fig.

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83, given a plan view of the expanded flower of the *Malva Sylvestris*, an allied species, and one more commonly met with; the flowers are of a reddish purple, and the leaves very similar to the lower ones (fig. 85) of the Musk Mallow: it has not, however, as a whole, the richness of form and ornamental detail that we find in our present plant. The Musk Mallow is not unfrequently met with on hedge-banks, in pastures, and by road-sides, and more especially where the soil is of gravel or chalk; it will be found in flower during July, August, and September. It derives its name of musk in allusion to a slight musky odour that is perceptible when the plant is drawn through the hand. The various species of Mallow have long been held in repute for their medicinal qualities, being emollient in their nature, a feature not peculiar to our English species alone, but to the whole family, some six hundred in number. The *Malvaceæ* form a considerable proportion in tropical vegetation, and all the species are thus mucilaginous in their nature, and entirely without deleterious properties. They have also valuable economic use, the various species of *Gossypium* (the cotton plants) being members, amongst many others of less conspicuous commercial utility, of this family. The Holyhock *(Althea rosea)* a familiar garden plant, is also a Mallow. The ring of bracts, three in number, beneath the true calyx, is characteristic of the whole of our British species of *Malva*. It is clearly shown in fig. 79. The Musk Mallow yields an excellent fibre after maceration, and several attempts have been made to introduce it in the manufacture of paper, cordage, &c. Good as it is however, other plants, as the Hemp and Flax, are still better, and it has consequently never come into practical use. The technical name, ***Malva***, like the familiar English name, Mallow, refers to the soothing nature of the plant, being derived from a Greek word signifying to make soft.

We are unable to give any instances of the use of the plant in the ornament of the past; possibly the fact of its not being so very common as many other plants may, in part at least, account for this, as it seems to us that, its beauties once perceived, it should be gladly hailed by the follower of ornamental art. We have, in fig. 80, a patera form, based on a flower of five petals: but the resemblance to our Mallow is not sufficiently close to justify us in claiming it as an art-adaptation of that flower. Fig. 84, though more like it, has the unit six times repeated, instead of five times, as we see it in the petals of the natural flower. Though unable to cite either of these ornamental forms as being actually derived from the Mallow, they are at least suggestive, and on this ground we feel justified in introducing them. Both examples are from tiles dug up in the ruins of Chertsey Abbey, Surrey: the originals may be seen in the South Kensington Museum. Many of the Chertsey tiles are very interesting, and give very excellent renderings of our native plants, as in fig. 157; the Maple, Ground Ivy, and other plants being shown with sufficient truth to render them pleasing, and yet in due subordination to ornamental requirements. Besides the collection at South Kensington, other examples may be seen at the British Museum.

PLATE 8.

"Do not depreciate any pursuit which leads men to contemplate the works of their Creator! The Linnean traveller who, when you look over the pages of his journal, seems to you a mere botanist, has in his pursuit an object that occupies his time, and fills his mind, and satisfies his heart. Nor is the pleasure which he partakes in investigating the structure of a plant less pure, or less worthy, than what you derive from perusing the noblest productions of human genius."—SOUTHEY.

The White Bryony, or White Hedge-Vine *(Bryonia dioica)*, is one of our commoner English plants, though it is but sparingly met with in the northern counties and in Wales, and not at all in Scotland or Ireland. It must be sought in the hedge-row or copse, where it may be found covering large expanses of hedge and bush with its long trailing stems and masses of large leaves. The flowers, from their small size and green colour, are not conspicuous features; but the bright berries that succeed them—first orange, then of deep scarlet—attract the eye more readily, as the plant hangs in graceful festoons from point to point. The generic name, *Bryonia*, is derived from a Greek word signifying to shoot or grow rapidly, in allusion to the rapid growth of the plant; while the specific name, *dioica*, refers to its dicœcious nature. In most plants we find the male, or staminoid parts, and the female, or pistilloid parts, placed together in each blossom; but in some cases some of the flowers on a plant are wholly pistilliferous, while others are exclusively staminiferous; while a further modification is seen in such plants as the present, where all the blossoms of one plant are pistil-bearing, and all the blossoms of another plant stamen-bearing. These plants are called dicœcious. It is only on the plants bearing fertile or pistillate flowers that the fruit is formed. The leaves, ordinarily with five lobes but occasionally with seven, are very rough in texture. The whole plant possesses dangerous properties, and, though long classed amongst medicinal herbs, is, from the violence and uncertainty of its action, now discarded.

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The plant is, from the freedom of its growth, its large and handsome leaves, and long waving tendrils, one eminently adapted to art purposes. In fig. 92 we have a conventional treatment of it from an early 14th century MS., in the British Museum—"Le live de la Chasse," by Gaston Phébus, Comte de Foix. The berries, tendrils, and leaves are all well introduced in a carving, filling a hollow moulding, Rouen Cathedral. We find it again in the carving beneath a bracket (14th century period) in Hawton Church, Nottinghamshire: this is an especially beautiful example; also round a small capital in the same church. A very good treatment of it again in a capital (decorated period) at Guisborough Abbey, Yorkshire. Holbein has introduced the plant in two of his pictures—one a portrait of Sir Henry Dudley; the other, of John Reskinner: both pictures are in the Royal collection at Windsor. We have ourselves endeavoured to embody something of the spirit of the plant in the two designs marked 94 and 95 respectively—the first being for flat decoration, the second for work in relief.; while, in the lower figure on plate 39 (fig. 319), we have a very beautiful mediæval rendering of it from Southwell Minster.

It will be understood that figs. 87, 88, and 93, are enlarged views of the parts represented; their natural size is shown in fig. 89.

The inflorescence of plants is a feature not to be neglected by the ornamentist. Inflorescence is a term used to express the arrangement of the flowers (from the Lat. *infloresco*, I begin to blossom), and is equivalent in meaning to the term *modus florendi*, or manner of flowering, used by the earlier botanists. If we examine such flowers as the Dwale (*Atropa Belladonna*, fig. 274), the trailing Periwinkle (*Vinca major*), the large Hedge Convolvulus (*Calystegia sepium*), or the Broom (*Sarothamnus scoparius*, fig. 97), we find single flowers given off at more or less regular intervals from the axils of the leaves, and the shoot continuing its length indefinitely. Plants having this growth are said to have their flowers solitary or axillary. Single flowers are said to be terminal when at the summit of a stem, as in fig. 9, the Snowdrop (*Galanthus nivalis*), or the Coltsfoot (*Tussilago Farfara*). In some plants, especially in those having erect stems, the central axis terminates with the inflorescence; the intervals between the flowers are small, and the floral leaves (bracts), by their rapid diminution in size, give to the whole a tapering form. If the individual blossoms have no stalks (pedicels), but are attached at once to the central stem, this form of flowering is called a spike; but if the blossoms thrown off from the central axis have stalks, it is called a raceme. The flowers of the spike may be very close together, as in the Plantain (*Plantago major*), or at some considerable interval, as in the *Agrimonia Eupatorium*, or Herb Agrimony (fig. 249), or again in the *Plantago sparsifolia;* very frequently the lower ones are much further apart than the upper, as in the Yellow Rattle (*Rhinanthus crista-galli*, fig. 233). The flowers composing the spike may be in pairs: or whorls, as in *Myriophyllum verticillatum*, the Whorled Water Milfoil; singly, in a line, one over the other, all being thus on one side only of the floral axis, as in *Spartina stricta;* or singly, with a spiral arrangement, as in the Vervain (*Verbena officinalis*). All these features, though found in one form of inflorescence, the spicate, are worthy of consideration, as, ornamentally, these modifications each give a different character and effect.

A raceme, as we have seen, resembles a spike, except that the flowers are on pedicels, and these pedicels, to make the inflorescence truly racemose, must be all of nearly equal length; *Vicia sepium*, the Bush Vetch (fig. 129), the Mignonette (*Reseda odorata*), or the Red Currant (*Ribes rubrum*) are examples. If, instead of being of nearly equal length, the lower pedicels are very much longer than the others, so as to bring the flowers approximately to one level, thus forming a more or less flat-topped mass of blossoms, the resulting form is called a corymb; the inflorescence of the Bryony (fig. 89) is corymbose. We see it also in the Goldilocks (*Linosyris vulgaris*), the Ploughman's Spikenard (*Inula Conyza*), the Groundsel (*Senecio vulgaris*), and many other plants. Another modification of racemose flowering is seen in what is termed the panicle—it is practically a compound raceme—where the pedicels are themselves again branched, instead of each supporting but one blossom. The paniculate form is very characteristic of grasses: the Oat (*Avena sativa*), is a good and easily accessible example of it. We see it, too, in the Yellow Bedstraw (*Galium verum*), the Sycamore (*Acer pseudo-platanus*), the Butterbur (*Tussilago Petasites*), and numerous other plants. When this paniculate form presents a very dense head of flowers, it is sometimes called a thyrsus, as in the Privet (*Ligustrum vulgare*), or Horse Chestnut (*Æsulus Hippocastanum*).

The umbel is a very characteristic form of inflorescence: it is produced by all the pedicels springing from one point, whence they radiate like a fan, or the ribs of an umbrella. Umbellate inflorescence is seen in the Cherry (*Cerasus communis*), the Celandine (*Chelidonium majus*, fig. 148), or the Flowering Rush (*Butomus umbellatus*). The umbel is called compound when each ray of the primary umbel itself terminates in an umbel, as in the Fennel (*Fœniculum vulgare*), the Hemlock (*Conium maculatum*), and many other plants.

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In some cases the upright growth of the central axis is suddenly terminated, when a flat (Marigold, *Chrysanthemum segetum*), concave (Fig, *Ficus carica*), or convex (Teasel, *Dipsacus sylvestris*), cushion-like head is formed, and on this a number of sessile flowers are congregated, as in the plants just mentioned; or, as in the Leopard's Bane (*Doronicum pardalianches*, fig. 193), the *Aster Alpinum* (fig. 296), the Daisy (*Bellis perennis*), or the Dandelion (*Taraxacum dens-leonis*). It will be noticed, therefore, that what we should, as ornamentists, term the flower of the Daisy, is really an aggregation of very many flowers into one head. This form of inflorescence is termed the capitulum.

There are several other forms, as the cyme, amentum, spadix, and fascicle, and also modifications of those already described; thus it is not uncommon to find a floral axis racemose at the base, and spicate above: or, in other cases, spicate in the early part of its existence, and becoming racemose as it becomes more developed; but however interesting physiologically, we need not now, for our present purpose, dwell upon them, since the type forms of inflorescence mentioned are those that will most readily lend themselves to the requirements of ornamental art. Any of our readers desirous of further information on these points can at once acquire it by turning to any manual of descriptive botany.

The tendrils of the Bryony are a beautiful feature, though, from their lightness of form, they become features of greater beauty in surface decoration (see fig. 131) than it is possible to make them in relief work.

Tendrils (Lat. *teneo*, to hold) are, botanically, and with a view to ornamental treatment, of various kinds; thus the Bryony and the Passion Flower throw them out from the stem, while in the Everlasting Pea (fig. 163) they spring from the end of the leaf petiole: they are sometimes single, at other times branched. The upper leaflets of a pinnate leaf are sometimes converted into tendrils: we see this very well exemplified in the Pea already referred to. In the *Strophanthus hispidus*, of Sierra Leone, each lobe of the five divisions of the corolla is prolonged into a filament of some seven inches in length, serving all the purposes of a true tendril. Tendrils are only met with in a fully-developed form in plants of a soft and flexible nature; thus those plants —belonging to the *Viciæ*, *Passifloreæ*, and many other groups—that have weak stems have well-developed tendrils: while in other and stronger plants in the same orders, we find that they are rudimentary or altogether absent. Tendril-bearing plants, being dependent upon others for their support, are naturally found either in forests, as in many fine tropical examples; or amongst thickets and hedges, as in the case of the Meadow Vetchling (*Lathyrus pratensis*); or the Bush Vetch (*Vicia sepium*, fig. 124).

The twisting of tendrils or twining stems is based on a rigid law, and always has the same direction in the same species. In the French Bean (*Phaseolus vulgaris*), or large Garden Convolvulus (*Ipomœa purpurea*), for example, the spiral always ascends to the left; while in the Hop (*Humulus Lupulus*) it is always from left to right. It may, at first sight, seem difficult to verify this, but if the reader will imagine the plant in question to be turning round his own body he will at once be able to determine whether the plant, in ascending, would cross in front of him from right to left, or the reverse. The Bryony presents a peculiarity which, so far as we are aware, is exclusively its own; the tendrils suddenly, in the middle of their course, change their direction, the upper half twining in a contrary direction to the lower.

The means of support employed by climbing plants are very varied. In many cases the main stem twines and gives the needed support—the Corn Convolvulus (*Convolvulus arvensis*) is an illustration of this mode of growth; at other times, as in the Ivy (*Hedera Helix*), root-like processes are thrown out from the stems, and by their grasp and powers of penetration into the hollows of brick or stone-work, or the rugged tree-bark, amply suffice to sustain the plant. The Goose-grass (*Galium Aparine*) clings by means of the small hook-like appendages with which the stems and undersides of the leaves are furnished. In the *Plectocomia elongata*, one of the tallest species of Palms, the stem is so slender that it needs the support of others stronger than itself; to obtain this, the long pinnate leaves terminate in a series of recurved hooks or spines, of complex form and immense strength; and by these the plant, thrusting its leaves upwards (each leaf being some thirty feet long) amongst the branches of the surrounding trees, secures itself perfectly. In some plants the leaf-stems twine round any suitable object—the Garden Canariensis (*Tropæolum peregrinum*) is a very beautiful illustration of this; while in other instances, as in the Dodder (*Cuscuta Europæa*), little tubercles are developed, which, becoming hollow underneath, act as suckers by the vacuum produced. So great then is the diversity of means for attaining the same end, so marked the variety of operation in working out the same problem—a good illustration of the wealth of resource to be seen in the works of Nature, and a lesson not without value to those who would endeavour to base their art on natural beauty.

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PLATE 9.

"Am I not
In truth a favoured flower?
On me such bounty Summer showers,
That I am covered o'er with flowers;
And when the frost is in the sky,
My branches are so fresh and gay,
That you might look on me and say,—
'This plant can never die.'"—WORDSWORTH.

The Broom *(Sarothamnus Scoparius)*, the subject of the present plate, is one of our characteristic heath plants, being commonly met with on dry, hilly wastes throughout England and Ireland, and in many localities in Scotland. Like the Furze *(Ulex Europæus)*, its companion, its large and brilliant blossoms render it a very conspicuous plant. Its generic name is derived from two Greek words signifying shrub, and to sweep; having a meaning equivalent to that conveyed in its familiar English name, an allusion to its domestic use in former times by careful housewives. In the early part of the summer the plant, some four or five feet high, presents a profusion of blossom, so that at a little distance the whole shrub tells only on the eye as a mass of golden yellow. As the blossoms die away they are succeeded by the black pods: these, as they ripen, burst open, as shown in our plate, fig. 96. The flower-stems are very long, of a bright green colour, and very angular in form: fig. 100, a cross section, indicates this latter characteristic very clearly. The pods are very flat, hairy along the edges, and contain numerous seeds. It is at all times a striking plant—whether seen during its summer time of flowering, when covered in the autumn with its dark pods, or verdant during the winter's gloom. It is the badge of the Scottish clan Forbes.

The Broom, like the Rose of England or the Scottish Thistle, is one of our historic plants, having, under its mediæval name of *Planta genista*, given a name to the Plantagenet line of monarchs. It was, from a very remote period, the badge of Bretagne. It was assumed as a personal device by Fulke of Anjou, and afterwards adopted by his grandson, Henry II. of England, on account of his claim to that province: it was subsequently borne by the remaining Plantagenet kings. It first appears heraldically on the great seal of Richard I. Amongst the various devices on the glass quarries in the Chapel of the Tudor king, Henry VII., at Westminster, is a good one, based on the Broom plant. We have endeavoured, in our own designs (figs. 98, 101), to embody something of the nature of the plant—the first one being adapted to a running pattern, and based on the profusion of yellow blossom that we have seen is so characteristic of the Broom; while the second is a diaper, giving both the flowers and pods: an artistic license that is quite permissible.

The various forms assumed by fruits are not without interest to the designer. We, therefore, propose to briefly enumerate the more striking modifications that possess any ornamental value, as, though not so largely employed as foliate or floral forms, they are, nevertheless, frequently used. In Egyptian art, for instance, we see a great use made of the Lotus fruit; while the Vine, with its clusters of grapes, has in all ages been a favourite plant, partly, doubtless, from its symbolic meaning, but frequently also from its beauty, without afterthought or a consideration of any religious bearing. The Gothic carvers delighted in the Oak, with its accompanying acorns; the Hop, the Maple, or the Hazel, with their various characteristic fruit forms; while in the various styles of the Renaissance the introduction of fruit was a very conspicuous feature in the ornamentation. A familiar illustration of this is seen in the border running round the celebrated Ghiberti gates at Florence, wherein clusters of grapes, pears, beans, wheat, pomegranates, the fruit of the egg plant, and many others, are introduced.

In speaking of the fruit we apply the term ornamentally, and in its widest sense, to that form which succeeds the flowers, whatever its fashion, and regardless of any strict botanical limitation. Fruits are either dehiscent (Lat. *dehisco*, I split asunder) or indehiscent. The fruit of the Broom is dehiscent, that is to say, splits open on ripening, : a natural arrangement to aid the dispersion of the seeds. The seeds of indehiscent fruit cannot perform their functions until the ripened fruit has fallen from the plant to the ground, and its exterior parts become decomposed. The dehiscence of fruits into regular parts is an ornamental feature of considerable value, as our readers will not fail to remark, should they submit our observations to the test of experience, and observe the natural forms for themselves. In the Broom it is effected by two valves; in the Meadow Saffron *(Colchicum autumnale)* there are three equal divisions; in the Thorn-apple *(Datura stramonium)*, four; in Rhododendrons, five.

A fruit is termed follicular when it is made up, as in the Columbine *(Aquilegia vulgaris*, fig. 301), of a series of little husk-like parts (Lat. *folliculus*, a little bag). A fruit is leguminous

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when it is what would ordinarily be called a pod, as in the Broom (fig. 96), Bush Vetch *(Vicia sepium*, fig. 130), or the Everlasting Pea *(Lathyrus latifolius*, fig. 166). The legume, instead of being straight, as in the preceding examples, may be twisted in a spiral form, as in the pod of the Spotted Medick *(Medicago maculata)*, or very much inflated, as in the Bladder Senna *(Colutea arborescens)*. The drupe is the form assumed by the Peach *(Amygdalus Persica)*, or the Date *(Phœnix dactylifera)*, a succulent fruit, with central seed enclosed in a hard shell: what is familiarly termed a stone-fruit. The nut is a hard and dry fruit, as in the Acorn *(Quercus robur)* or the Filbert *(Corylus Avellana)*. The berry, or bacca, is soft and fleshy, and contains numerous seeds, as in the Currant *(Ribes rubrum)*. The beautiful ornamental form known as the Samara (see fig. 333) is a winged nut; examples of it may be seen in the Maple *(Acer campestre)*, or the Ash *(Fraxinus excelsior)*. The Pome, an apple-like fruit; the Etærio of the Raspberry *(Rubus idæus)*, an aggregation of several small drupes; the Capsule, a dry fruit, opening by valves or pores, as in the Poppy *(Papaver Rhœas*, fig. 324), or the Foxglove *(Digitalis purpurea*, fig. 294); and the Siliqua of the Wallflower *(Cheiranthus Cheiri)*, are other forms; but, as examples of all of them may so freely be met with, we need not enter into any lengthened descriptions of them. Fruits may be either simple, as in the Blackberry *(Rubus fruticosus)*, resulting from one flower; or multiple, as in the Cone, the result of an aggregation of flowers.

A further point for the consideration of the ornamentist, when employing fruit forms in relief work, arises from the various surfaces and textures found in Nature; thus some fruits, as the Cherry, are smooth; some, as the Peach, velvet-like; others papery and crisp, as in the Columbine; some downy, as the Peony; others like Horse Chestnut or Thorn-apple (figs. 311, 321), spiny. Ornamental treatments, introducing some of the varied forms of fruit, may be seen in figs. 131, 310, 311, 316, 319, 321, 327, 329, 330, 331, 333.

PLATE 10.

"The world was made to be inhabited by beasts, but studied and contemplated by man; 'tis the debt of reason we owe to God, and the homage we pay for not being beasts. The wisdom of God receives small honour from those vulgar heads that rudely stare about, and with gross rusticity admire His works; those highly magnify Him, whose judicious enquiry into His acts, and deliberate research into His creatures, return the duty of a devout and learned admiration."—RELIGIO MEDICI, A.D. 1686.

The Milk Thistle *(Carduus Marianus)*. This, one of our most ornamental wild plants, has been little used, if at all, in design—a fact that will, no doubt, be fully accounted for by its comparative rarity. It is a very conspicuous plant, attaining to a height of about five feet, and having a profusion of large leaves; one of the lower leaves, if drawn to the natural size, would have required a greater width of space than our whole plate affords, and a length equal to some four of these sheets joined together; we have, therefore, been obliged to choose our leaf from some distance up the plant. The most striking and distinctive characteristics of the plant are the large recurved subfoliaceous scales round the flower head, and the beautiful variegation and richness of effect produced by the white veinings and blotches on the upper surface of the leaf. The spiny involucral scales—seen in elevation in figs. 102, 103, and in plan in fig. 104—are very suggestive features for the designer. In old botanical books the plant is often called our Lady's Thistle, or Holy Thistle, a relic of monkish superstition, as the white markings of the veins were said to have been first produced by the milk of the Virgin Mary falling upon them; hence, too, the specific name *Marianus* in further allusion to this old legend. The plant, though rare in England, has by some accidental means been introduced into Australia, and has spread so abundantly that special legislation, with a view to its destruction, has been necessary.

Thorns, spines, or prickles, though associated in the minds of most persons with the curse pronounced in Eden, cannot but be features of interest to the designer, as by their introduction a far greater richness of effect is produced than would often be possible in their absence; as a proof of this the reader may turn to figs. 311, 321. Though ordinarily met with on the stems or leaves, all the organs of plants are capable of a degree of induration that may transform them into spiny points. The most frequent cause of thorns or spines arises from the retarded development of branches: thus in the Blackthorn *(Prunus spinosa)* the spines spring like true branches from the axils of the leaves, and frequently bear leaves themselves. A further proof that these spinous processes must be regarded as defective branch developments is seen in the fact that a plant growing in dry, poor soil is much more spiny than one under more favourable circumstances; in the first case many of the branches are abortive, in the second they are fully developed; thus it is that many plants, as the Plum and Pear, spiny in their natural wild growth, lose their thorny points by cultivation. The ramal origin of these spines will also enable us to see how it is that, while as a rule thorns are simple forms, they are in some cases branched, as in the Christ's-thorn *(Gleditschia*

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triacanthos), where not only does the central spine throw out lateral points, but these in turn have smaller spines on them. In some foreign plants the petioles, on the fall of the leaves, harden and become true spines: they are, from their original nature and function, always of simple form. In some few cases leaflets are entirely or partially abortive, and a spine with lateral branches takes their place. The leaf may be spinescent by the hardening of the central nerve, as in the *Yucca gloriosa;* or by the prolongation into spines of the nerves of the lateral lobes, as in the Thistles. The sharp points of the Holly *(Ilex Aquifolium)* are also good examples of these foliary spines. The rudimentary leaf-forms, botanically termed bracts or scales, may, as we see in fig. 102, present similar features. In the *Alyssum Spinosum* the flower stems, on the fall of the blossoms, become hardened into veritable spines: while even the parts of the flower themselves, fugacious as they ordinarily are, are in some examples found to present spinous forms; thus in some species of *Stachys* the calyx is spiny: while in *Cuviera* the petals develop a thorn-like point. As all the organs of plants, with the exception of the root and seed, are thus capable of being transformed into spinous processes, these spines must be considered rather as a particular development of vegetable growth, than as true organs themselves.

Though the terms thorn, spine, or prickle are frequently used synonymously, it is more correct to limit the use of the first two to the developments above mentioned, reserving the term prickle for those forms which do not result from the induration of any of the organs of the plant, but are rather of the nature of hairs, differing from them only in being stronger, harder, and of modified form; prickles, therefore, are usually found upon stems or leaves. A prickle being, as we have seen, but a modified hair, is superficial, and can easily be removed, leaving but a surface scar, as in the Dog Rose *(Rosa canina);* while a thorn, being a modification of some organic body, is intimately connected with the internal structure, and can only be removed by actual force and rupture of the parts.

PLATE 11.

"God made the flowers to beautify
The earth, and cheer man's careful mood,
And he is happier who has power
To gather wisdom from a flower,
And wake his heart in every hour
To pleasant gratitude."—WORDSWORTH.

The brilliant *Crocus luteus* is one of our favourite cultivated species of *Crocus*, its brilliant perianth rendering it a very valuable acquisition at a time when there are but few flowers, and those of but pale tint—the delicate white of the Snowdrop—the sulphur yellow of the Primrose. Either the present flower, or an allied and very similar species, was introduced into our gardens during the reign of Elizabeth; for we find in the description of a Crocus, in the writings of Gerarde, a famous herbalist of that period, that he says—"That pleasant plant, that bringeth forth yellow flowers, was sent unto me from Robinus of Paris." Gerarde was a great lover of rare plants, and had exceptionally good opportunity of acquiring them, as he was the curator of the very fine botanical garden of Lord Burlegh. He wrote a "Catalogue of Trees, Fruits, and Plants," dedicating the first edition (A.D. 1596) to his patron Burlegh, and a second, in 1599, to Sir Walter Raleigh. His prefatory remarks, though quaint in expression, are also so full of genuine appreciation of Nature, that we make no apology for making a quotation from them. He commences as follows:—"Any the manifold creatures of God (right honourable, and my singular good lord) that have all in all ages diuersly entertained many excellent wits, and drawn them to the contemplation of the Diuine wisdome, none have prouoked men's studies more, or satisfied their desires so much as plants haue done, and that upon just and worthy causes; for, if delight may prouoke men's labour, what greater delight is there than to behold the earth apparelled with plants as with a robe of embroidered worke, set with Orient pearles, and garnished with great diuersitie of rare and costly jewels? If this varietie and perfection of colours may effect the eie, it is such in herbes and flowers, that no Apelles, no Zeuxis ever could, by any art, expresse the like; if odours or if taste may worke satisfaction, they are both so soueraigne in plants, and so comfortable, that no confection of the Apothecaries can equall their excellent vertue. But these delights are in the outward senses: the principal delight is in the mind, singularly enriched with the knowledge of these uisible thïngs, setting forth to vs the inuisible wisdome and admirable workmanship of almighty God. The delight is great, but the vse greater, and ioyned often with necessitie. In the first ages of the world they were the ordinary meate of men, and have continued euer since of necessary vse, both for meates to maintaine life, and for medicine to recover health."

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The generic name *Crocus* was bestowed upon these plants by Linnæus. Its significance seems not quite clear, as by one writer it is derived from the Greek word for filament or thread, an allusion to the appearance of the stigmas of one of the species *(C. Sativus)*, when dried to form the saffron of commerce; another finds in mythical story an explanation of the name in the ardent passion of Crocus for the fair Smilax, an ardency that consumed him, and led to his metamorphosis into the plant that still bears his name; while a third derives it from Coriscus, a mountain of Cilicia. This suggestion bears a certain amount of probability, from the facts that, in the first place, the Crocus really is a native of the South-Eastern Mediterranean region: and, secondly, that Pliny, in his writings, expressly informs us that the best saffron was the Cilician. Of the three suggested derivations, however—the commercial, the mythological, and the geographical—the first seems most probable, as the Crocus has, from the earliest times, been cultivated for its commercial value. Saffron is mentioned by the earliest Greek writers; while in the East it has been held in great esteem from time immemorial for its supposed medicinal virtues. Its Arabic name *zahaferan*, is the parent of our English name saffron, of the French, Danish, and Swedish *saffran*, the Italian *safferano*, the Spanish *azafran*, the German *safran-planze*, the Russian *shafrann*, the Dutch *saffraan*, the Hindostanee *zaifran*, and the Malay *safaron*. This remarkable similarity of name clearly points to its importation into Europe from the East: while the Arabic name itself is derived from the adjective *ssafra*, yellow. The bulbs were introduced into England in the reign of Edward III. Throughout the middle ages, saffron was held in great favour as a cordial; the old writers, to mark their sense of its value, called it Aurum Philosophorum, Sanguis Herculis, Aurum Vegetabile, Rex Vegetabilium, and Panacea Vegetabilis; but its use in more modern times has been very limited, and it is now but little employed, except for its aromatic qualities and power of imparting a rich colouring—properties that render it useful sometimes for disguising unpalatable medicinal preparations.

In the preparation of saffron the stigmas and a small portion of the style are the parts employed. After being carefully gathered, they are dried by artificial heat, and then form narrow shreds of about an inch in length, and of a reddish brown colour: this is technically called hay saffron. The space and labour required to produce even a small quantity render it very costly, as the stigmata of about seventy thousand flowers must be carefully picked by hand for each pound weight of saffron produced.

Besides the very numerous garden Crocuses, we have two or three English species. The Purple Spring Crocus *(C. Vernus)*, though not truly indigenous, has so completely naturalised itself in various localities in England and Ireland that it now occupies a recognised place in our Flora. The Naked Crocus *(C. Nudiflorus)*, though a native of Southern Europe, has naturalised itself in the neighbourhood of Nottingham, Derby, Warwick, and Halifax, and, like the Spring Crocus, may justly claim a place amongst our British plants. The purple flowers appear in the Autumn, after its leaves have withered away: a curious feature that the ornamentist may at some time find of value; other such examples may be seen in the Coltsfoot *(Tussilago Farfara)* and the Almond *(Amygdalus communis)*; but in these instances matters are reversed, the flowers preceding, not succeeding, the leaves. In addition to these, the following are occasionally met with, though, as in every case they have been outcasts from gardens, they have as yet failed to make good their claim to recognition as truly wild plants. The *C. Minimus*: this species, cultivated in gardens under the name of the Scotch Crocus, has, for more than half a century, sprung up in Barton Park, near Bury St. Edmunds. The *C. Aureus*, a rich golden-yellow flowered species, and a very similar plant to that of our plate, may at times be found; it was at one time cultivated for saffron, hence its occasional occurrence. It is dedicated by the Roman Catholic Church to St. Valentine, a saint whose name at least is better known than those of many of his comrades of the calendar. Homer, in the fourth book of the Iliad—struck by the brilliancy of its tint, as it spread over the hills one mass of colour, like the beautiful expanse of purple heath clothing our own mountains and moors—thus refers to it in his description of the couch of Jove and his consort Juno:—

> "And sudden Hyacinths the turf bestrew,
> While flowering Crocus made the mountain glow."

The true Saffron Crocus is still cultivated in the neighbourhood of Saffron Walden, in Essex; but it has no claim to be considered a British plant.

It is, we feel, superfluous to point out the beauty of the plant we have selected as a representative Crocus, its strikingly ornamental forms are too apparent to need any eulogy of ours: it is itself its own ample commendation. We may, however, mention, by way of bare elucidation, that, while in fig. 108 we have the natural growth of the plant as a whole, the remaining detached figures give us details of what are ornamentally the more important parts. These

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details are as follows:—Figs. 105, 106, side views of the flower: in the first case the sepaloid segment of the perianth being the central mass: in the second, the petaloid. It will be noticed that the outer or sepaloid segments have a conspicuous series of striped markings upon them, the inner segments being nearly, but not quite, free from them: this is seen more clearly in fig. 111. Fig. 107 is the graceful form of the bud. Fig. 112, the bulb. The remaining views are plans, fig. 109, showing the opening bud; fig. 110, the form taken by the flower when incipient decay causes the curling over of the parts; while in fig. 111 we have an exterior or underneath view of the flower at its fullest expansion.

PLATE 12.

"The rough burr-thistle, spreading wide
Among the bearded bear,
I turn'd the weeder-chips aside,
And spared the symbol dear."—BURNS.

"Then cullet she all flowers that on field,
Discerning all their fashions and effeirs;
Upon the awful Thistle she beheld
And saw him kippit with a bush of spears;
Considering him so able with the weirs,
A radius crown of rubies she him gave,
And said,—'In field go forth, and fend the lave.'"
—DUNBAR: *the "Thrissill and the Rois."*

The Spear Plum Thistle *(Carduus lanceolatus)* is one of our most ornamental species. It grows abundantly in Britain, and may be met with ordinarily by our hedge-sides, where its height and numerous heads of large purple flowers render it a very conspicuous plant. The stem is winged, as it is botanically termed, by the prolongation of the leaf forms down the stem; and the leaves have numerous lobes, each being terminated by a sharp prickle. The bracts surrounding the flower-head are simple in form, not branched, as in the *C. Marianus*, with a lateral fringing of points. The plant is found in flower throughout the whole Summer. The Thistle has been largely employed in ornamental art: in some cases clearly for its own inherent beauty: in others as clearly from its historic and heraldic associations. A very beautiful example of it may be seen in a square panel in the Cathedral of Bruges, and again in a moulding on the tomb of Don Juan II., in that building; a good crocket at Evreux; a bracket at Sens; an especially beautiful running moulding at Miraflores; numerous wooden panels (Gothic carving) in the South Kensington Museum; on the monument of Mary Queen of Scots, in Westminster Abbey; examples at Stirling Castle, Linlithgow, and Holyrood. The Thistle, we need scarcely say, has been adopted as the badge of Scotland; but great uncertainty seems to exist, both as to what species may be considered the true heraldic Thistle, or on what ground it was originally chosen as the national emblem. The Thistles found sculptured on monuments are too conventional in character to afford any clue to the natural species from which we may assume they were originally derived; hence a wide field has been opened for antiquarian speculation. Some authorities are prepared to accept the present species as most deserving of the honour; others prefer to advocate the claims of the Milk Thistle, or of the *Onopordum acanthium*. Neither of these latter, it appears to us, can however be accepted, as there is so much doubt of their being indigenous species; while they share with the present plant the disadvantage of being much too large, as, if any value can be attached to the legendary history of the subject, it must be some low-growing species like the *C. Acaulis* that has most claim. In one chronicle we are told that Queen Scota, a mythical sovereign, whose name is not to be found in any chronological record, after a grand review of her troops, while resting on the turf was pricked by a Thistle, and from this circumstance she adopted it, with the motto, "*Nemo me impune lacessit*"—no one with impunity injures me—as the badge of her country. Another historian says that during a night attack of the Danes, one of the enemy treading on a Thistle cried out, and thus gave timely warning to the Scots of their near approach, and that, in gratitude for this, the Thistle was chosen as the national emblem. If either of these legends be accepted, it is clear that the *C. Acaulis* has most right to our recognition; but Sir Harris Nicholas, in his "History of the Orders of Knighthood," shows that so far from the Thistle being assumed as a badge at any such early period as either of these legends would infer, it is not alluded to in any way as an emblematic object until the reign of James III., when we find it referred to in an inventory of the property of that monarch at his death, in 1458—"a covering of variand purpir tarter browdin, with thrissils and a unicorn," the unicorn being another emblem of Scotland. It was, beyond doubt, a national badge in 1503, as in that year Dunbar wrote a poetic

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allegory, entitled the "Thrissill and the Rois," on the union of James IV. and the Princess Margaret of England. The expressive motto was not added until 1579; it first appears on the coinage of James VI., where it surrounds the Thistle that occupies the centre of the coin. It was not, however, altogether an original idea, though the application of it was so admirable, as Francis Sforza, at an earlier date, on taking possession, amidst considerable contention, of the State of Milan, assumed as his bearing a greyhound, and the motto, "*Quietum nemo impune lacessit.*" The Thistle gives its name to an order of knighthood. Enthusiastic antiquarians ascribe a fabulous antiquity to the Order of the Thistle; but its real institution, or, as some would say, revival, took place in the year 1657, during the reign of James II. of Great Britain. James I. of England, but VI. of Scotland, on his accession to the throne of the United Kingdom, took as a badge a compound form, half Rose half Thistle, a central upright line dividing them. The stalk supporting this curious flower has on the one side a Rose leaf, on the other that of a Thistle. This impalement, as it would be termed heraldically, of the Rose and Thistle is borne on the arms of the Earls of Kinnoull. The Thistle occurs too in the arms of the Aberdeens; while, in the reign of Henry VIII., Sir William Finch bore as a badge a greenfinch standing on a Thistle flower. The Stuarts adopted as a badge the Cotton Thistle *(Onopordum acanthium)*; it is a scarce plant in Scotland, and, though sometimes cultivated as the veritable Scottish Thistle, can have but little claim on our recognition as the badge of the nation.

PLATE 13.

"That which proves
Strong poison unto me, another loves,
And eats, and lives: thus Hemlock juice prevails,
And kills a man, but fattens goats and quails."—CREECH'S LUCRETIUS.

The plant we have chosen for representation, the Henbane *(Hyoscyamus niger)*, though not often to be met with, and therefore of unfamiliar appearance, is one that we are persuaded will prove a valuable addition to the designer's store, the leaves, blossoms, and fruit being alike striking in form, and of that due proportion to each other that is so important an element for the consideration of the ornamentist. The plant must be sought for on rubbish heaps and waste land about villages and ruins. It is distributed sparingly over the whole of England and Ireland and the South of Scotland, and may be found in flower during most of the Summer months. The flowers are in one-sided and leafy spikes, rolled up in a circinate manner during the early stages of flowering, but which gradually elongate until they present a line of some ten to twenty blossoms. The early stage is that which, owing to our limited space, we have here represented. The calyx during the flowering is small and foliaceous (fig. 120) in texture and appearance; but becomes larger as the fruit ripens (fig. 117), and is much more solid and rigid to the touch, the five terminal points becoming prickly. The whole plant is very hairy and viscid, and has an extremely nauseous smell.

The Henbane is one of our most powerful narcotic plants: it is a dangerous poison, but, under certain circumstances, and with due caution, becomes a valuable remedial agent from its sedative properties. The natural supply not being sufficient for the requirements of the pharmacopœia, it is raised in considerable quantities, as a field crop, in the neighbourhood of Mitcham, in Surrey, a place long famous for its herb gardens. Cases of accidental poisoning are not common, as the plant is at once too scarce and too unpleasant when found to afford much temptation to children, while it does not at all resemble any culinary vegetable; these are the two ordinary causes of such mistakes—either a plant (like the Deadly Nightshade, with its cherry-like fruit) tempts little fingers to gather it, from its resemblance to some fruit they know, or from its own tempting appearance; or it is taken in mistake by older persons (as in the case of the *Æthusa Cynapium*, having leaves somewhat like those of the Garden Parsley) for some esculent. Children have, however, with serious consequences, eaten the fruit in mistake for filberts. Sir Hans Sloane relates a case where a child, after such a mistake, though it ultimately recovered, remained for fifty hours in a profound sleep. The roots have been eaten in error with the most terrible results. Woodville mentions an instance where the leaves were boiled in a soup; all who partook of it became delirious, catching wildly at things about them, and in all ways exhibiting the symptoms of acute mania; while Gerarde, in his quaint English, says—"The leaves, seed, and juice taken inwardly, cause an unquiet sleepe, like unto the sleepe of drunkennesse, which continueth long, and is deadly to the party." The Henbane belongs to the same order of plants as the Deadly Nightshade (fig. 271) and the dangerous Thorn-apple (fig. 321): an order containing many other acrid and narcotic species. Linnæus called the plants comprising this order *Luridæ*,

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from a fancy that the lurid appearance of many of them indicated the dangerous properties that they possessed. It is very singular to notice in so many of our poisonous plants the curious limitation of their ill effects; thus, though the present plant is deadly to man, and no less so to dogs and many birds (hen-bane, *i.e.* a bane to poultry), yet horses, goats, and swine seem able to feed on it with impunity, and the same thing is seen in many other plants. The generic name *Hyoscyamus*, is derived from two Greek words signifying hog and bean, in allusion to the ripening fruit being eaten by swine. Linnæus, as the result of many experiments, tells us that the horse eats two hundred and sixty-two plants, and rejects one hundred and twelve; the cow eats two hundred and seventy-six, and declines two hundred and eighteen; the goat devours four hundred and forty-nine, and refuses one hundred and twenty-six; the sheep takes three hundred and eighty-seven, and rejects one hundred and forty-one; while the hog, despite the not over-niceness that appears to control its appetite, is more fastidious than any of the preceding, eating only seventy-two plants, and rejecting one hundred and seventy-one. These experiments were conducted with the Flora of Sweden, and the figures would doubtless require a little modification if we tested the matter on our own soil, but they are at least approximations to the truth, and not, we think, without interest.

PLATE 14.

"Without system the field of Nature would be a pathless wilderness; but system should be subordinate to, and not the main object of our pursuits."—WHITE OF SELBORNE.

The Bush Vetch *(Vicia sepium)*. We have in the first two figures of the present plate a couple of sketches of the natural growth of this pleasing plant, the remaining illustrations, with the exception of fig. 131—an attempt to give some idea of the lightness and grace of the plant in a design—being various useful details, as the forms of the bud, flower, and fruit. The Bush Vetch is very commonly to be met with, and ordinarily in the hedge-row, as both the English and Latin names imply, *sepium* being derived from the word *sepe*, a hedge; the plant may also be met with in woods and shady copses, flowering during June, July, and August. The flowers spring, as will be seen from our illustrations, in a racemose manner from the axils of the upper leaves, and both flower and fruit may be met with simultaneously: a very valuable ornamental feature, and one capable of imparting greatly increased interest and variety to the labours of the designer. The whole plant, from its graceful delicacy of growth, is eminently qualified for employment in the decoration of light fabrics, and should on this ground, we think, be its own amply sufficient commendation.

The pea flowers, as an order, present many excellent subjects for the art of the ornamentist, and deserve an attentive consideration, since, though on a casual glance all are apparently very similar, a beautiful variety of form and colour makes itself felt on a closer survey. In the *Trifolium incarnatum*, or Crimson Clover, a species extensively grown as fodder, the inflorescence is densely spicate; in the *T. arvense*, or Hare's-foot Trefoil, the flower head is cylindrical; while it is spherical in *T. resupinatum*, the reversed Trefoil. In the *Vicia lutea*, or Rough-Podded Yellow Vetch, the flowers are sessile, and occur singly at intervals up the stem; in the *Lathyrus Aphaca*, the Yellow Vetchling, the flowers, though occurring singly, as in the last example, are on stalks; while in the Melilot *(Melilotus alba)* the flowers are in long racemes, containing from twenty to thirty blossoms. In some of the species the leaves are pinnate—ex. *Hippocrepis comosa*, Horse-shoe Vetch, and the present plant (fig. 124); in others trifoliate—ex. *Medicago lupulina*, the Black Medick; in others again unifoliate, as in the Dyer's Green-Weed *(Genista tinctoria)*; while in the *Lathyrus Nissolia*, the Crimson Grass-Vetch, they are very acute in form, and much resembling the grassy Turf, amidst which the plant is often found. The leaves are often entire in outline—ex. *Trifolium pratense*, the common Purple Clover; but sometimes toothed—ex. *Melilotus officinalis*, the common Yellow Melilot. In *Ononis campestris*, the Rest-harrow, the lower leaves are trifoliate, while the upper are frequently unifoliate. In the Furze *(Ulex Europæus)* the trefoil leaves are only present immediately after germination, all the succeeding forms being of the spiny growth so characteristic of the plant. In some of the pea plants the leaves are opposite in growth—ex. *Lathyrus Aphaca*; in others alternate—ex. *Lotus diffusus*. Many of the plants, as in the *Vicia Cracca*, or Tufted Vetch, and the present instance (fig. 125—see also fig. 163) have tendrils; while others, as the *Astragalus Alpinus*, or Alpine Milk-Vetch, and the Broom (fig. 97) are without them. In some species—ex, *Vicia sativa*, the Common Vetch—the pods are long and conspicuous; in others—ex. *Lotus hispidus*, but short, and, therefore, features ornamentally of but secondary value. We might thus point out many other interesting varieties of form apparent on

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an analysis of this one tribe of plants, but we must now leave all further consideration of them, and, in conclusion, briefly refer to the colours of the various flowers. The great majority are deep yellow, as in the Broom or Furze; or white, as in the *Trifolium repens*, the Dutch Clover; but in some species—ex. *Lathyrus latifolius* (fig. 168)—they are pink; in others crimson—ex. *L. Tuberosus*, the Tuberous Bitter Vetch; in some lilac—ex. *Medicago sativa*, the Lucerne; or purple—ex. *Astralagus hypoglottis*, the Purple Mountain Milk Vetch. In *Vicia lutea* the flowers are of a pale yellow. All the pea flowers belong to the natural order *Leguminosæ*, an order that, with the exception of the *Compositæ*, contains more British plants than any other. All the British genera are papilionaceous, a term applied to the form of their flowers, as seen in figs. 99, 128, 167, 168, from a supposed resemblance to a butterfly (Lat. *papilio*), with expanded wings, a resemblance more fanciful perhaps than obvious.

PLATE 15.

God first planted a garden, and indeed it is the purest of human pleasures.—BACON: *Essay on Gardens.*

The *Ranunculus bulbosus*, or Bulbous Crowfoot, is one of our commonest species of Crowfoots, or Buttercups, as they are often termed, and from being the plant that ordinarily in the Spring covers the meadows with its brilliant flowers, and transforms them for a time into a mass of golden yellow, must be familiar to even those who commonly are but little observant. The individual plant is no less beautiful, and amply repays a closer attention. The designer will find in it rich store of material, the flowers being large and good in form, the leaves having great richness and variety of contour, and the general growth of the plant free and flowing in its lines, while the swelling expansion at the base of the stem, and the radiating fibrous roots beneath it, form an admirable terminal form. In rich soils the flowers are occasionally double; it will be seen that one of the flowers in fig. 132 is of this character, the others on the same plant being of normal form. Front and back veins of the normal arrangement of parts—*i.e.*, five petals and five sepals, are shown in figs. 134 and 135: while, in figs. 133, 139, the plan and side views are given of a flower having a greater number of petals, the sepals being generally, even when the petals are very numerous, only five in number. The *R. bulbosus* is one of the favourite plants of the carvers of the 14th century gothic, and examples of its introduction into their ornament are very numerous—so numerous that we need scarcely pause to enumerate any special instances, as any of our finer remains of that period, such as Lincoln or Southwell, will afford illustrations. The species of *Ranunculus* are somewhat numerous, and many of them possess features that render them of value to the art student; thus the *R. aquatilis*, or Water Crowfoot, a plant very commonly to be met with in ponds and streams, has large white flowers, and two very distinct forms of leaves—the upper ones rich in form, and floating on the surface: the lower ones submerged, and deeply cut into fine linear segments, a feature of the greatest value ornamentally. The *R. lingua*, or Spearwort, is another plant of great utility to the designer, its stems being erect, and two to three feet high: the leaves long and simple in outline: the flowers very large. We need not further particularise the remaining species; but the designer will do well to consult any good illustrated work for *R. Ficaria* (see fig. 315, in present work), *R. acris*, *R. repens*, and *R. parviflorus*—as all these possess valuable features at the service of the designer. The *R. arvensis*, or Corn Crowfoot, another good species, forms the subject of plate XXV. The brilliant Garden Ranunculus is a species from the Levant; it is known botanically as the *R. Asiaticus*. The name Buttercup clearly arises from a belief very prevalent in country districts that the rich yellow of the Spring butter is caused by the presence of these plants in the herbage; so far is this, however, from being the case, that cattle scrupulously avoid them on account of their acrid nature. The name Crowfoot can as clearly be traced to the fancied resemblance between the leaves—see figs. 137, 138—and the feet of a bird. From the extreme commonness of the present plant it naturally bears many names in various parts of the country, as, for instance, Frog's-foot, Gold-knobs, Gold-cup, Baffiner, Bassinet, Troil-flower, Butter-flower, and Polt. Some of these names have a significance too obvious to need any attempt at explanation, while others, we confess, are too recondite to permit us to render it. Goldknob is a not inexpressive name when we see the opening buds, while Goldcup is no less expressive when the flowers are fully expanded. Baffiner, inexplicable in itself, is possibly a corruption of Bassinet, as such names undergo strange mutations amongst those who do not comprehend their import. Bassinet is derived from the French word *bassinet*, a small basin or skull cap, in allusion to the shape of the fully open blossom. Troil-flower is derived from the old German word *trol*, a globe or ball.

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The specific name, *bulbosus*, alludes to the bulb-like expansion of the base of the stem, the part that is ordinarily called the root; the term is, however, scarcely correct, as the true root is seen in the mass of little fibres beneath the bulbous mass. It is not a true bulb.

As the roots of plants are, under skilful treatment, capable of being made characteristic and beautiful features in a design, we will just glance at a few points concerning the modifications they undergo for the benefit of the more inexperienced of our readers. The root may be defined briefly as the descending portion of a plant—it is ordinarily that portion of a plant that develops beneath the soil; some plants, however, have their roots developed in the open air. These are termed epiphytes: they grow upon other plants, but merely derive support from them; they do not, like the parasite, penetrate their substance or draw any nourishment from the plants they cling to. A true root does not develop leaf buds on its surface, nor scales, the rudimentary leaf form; hence any body, as, for example, the bulb of the White Garden Lily (*Lilium candidum*), that has a clothing of scales, is not a root: the root proper will be found springing from beneath it. Where the root is not simply a mass of fibres, as in grasses, it ordinarily develops a central portion, a prolongation of the line of the stem: this is termed a tap root; from this central body lateral portions may be given off, while these in turn may branch again. The root derives from the soil those chemical constituents that are necessary for the well-being of the plant, and stores them away for future service, as well as for immediate need; it also gives the needful mechanical support to the plant, and ensures its stability. The simplest form of root is the conical—the common Carrot is a familiar example of this; at times, the greatest diameter of such a root may, instead of being near the top, be some little distance down. This modification renders it fusiform, or spindle-shaped, and of this the Radish affords a good illustration; while, at other times, the form becomes more globular, when it is termed napiform, from *Napus*, a turnip—a plant that very well exemplifies this mode of growth. A great richness of form is seen in the fasciculate root, where, as in the Asphodel, a series of conical roots all spring from the base of the stem. A very similar form of root is seen in the Dahlia; but in this case the component parts are not conical, they are rather elliptical, as the greatest bulk of the stored-up matter is deposited near the centre of each of the lateral members. Other characteristic forms are the nodose, testiculate, moniliform, and annulated; but having now called the attention of the designer to the point by the few examples mentioned, we do not propose to go at any greater length into descriptive details, as these may be found in any work on structural botany. Roots are not always thus regularly developed: abnormal requirements produce adventitous or abnormal results, and, under these circumstances, roots are given off from various parts of plants, as when a cutting is "struck." In the Ivy the root-like members thrown out from the stems assist to support the plant by inserting themselves in the crevices of the brickwork or bark, and in Sea-weeds what appears to be the root is but a collection of suckers or fibres, and merely gives mechanical attachment. In the Banyan tree these members develop from the branches; on entering the soil they become true roots, and aid in the support, the nourishment, and the extension of the tree. In the same way the aerial roots thrown out by the Mangrove and Screw-pine become ultimately rooted in the soil beneath. These filaments may attain to great dimensions—the aerial roots of some species of *Clusia* are from eighty to a hundred feet long. Occasionally, even while in mid-air, ramifications are produced and lateral bodies developed: this may be well seen in the *Rhus radicans*. In some plants, as in many grasses, underground stems are developed; but, from their scaly nature, they can be easily distinguished from the true roots. On a piece of Roman earthenware, a rude form of vase, in the Museum of Economic Geology, London, the only decoration is a series of forms in black, so identical in character with root forms, that there can be but little doubt that some natural root afforded the suggestion. John, Duke of Bedford, brother of Henry V., bore as one of his badges a golden root.

PLATE 16.

"He prayeth best who loveth best
All things both great and small;
For the dear God who loveth us,
He made and loveth all."—COLERIDGE.

Out of the seven species of *Campanula* found wild in Britain, six have their blossoms on long footstalks, the seventh only, the *C. glomerata*, the subject of the plate, having them sessile; this, therefore, affords an easy means of identification of the present species, and it is well that such a means exists, as there are few plants more changeable in appearance than this. In one

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situation it may be found attaining a height of eighteen inches or so, generally when in rather damp meadows: while, on our open, breezy downs, it rarely reaches a height the third of that, and is dwarfed in every way, the flowers being at once individually smaller and collectively less numerous. Like many other purple flowers its blossoms are occasionally of a pure white; but a greater peculiarity, and one almost its own, is that on the same plant both purple and white bells may at times be found. The plant represented in our plate is an exceptionally fine specimen, the blossoms are ordinarily about three quarters of an inch long, in a fairly good example. The upper leaves are sessile, the lower ones stalked.

All the species of *Campanula* are well adapted to art work, and will repay attention. The Hairbell, or Harebell, known botanically as the *C. rotundifolia*, from the roundness of its lower leaves, is a very graceful plant. It is in Catholic countries dedicated to St. Dominic; it is also claimed as the "Blue-bell" of Scotland, though its claims to this poetic distinction have been disputed, apparently without much justice, in favour of the wild Hyacinth. It is a plant eminently adapted for light and delicate work. Of the other species, the *C. rapunculoides*, *C. Rapunculus*, and *C. hederacea* are especially worthy of the ornamentist's regard.

The generic name, *Campanula*, is derived from the Latin, and signifies a little bell; it has, therefore, the same force of meaning as the familiar English name, while the specific name, *glomerata*, signifies rolled together in a mass like a ball, and is applied botanically to this plant from the dense terminal head of flowers so distinctive of this species; the common name of the plant, the Clustered Bell-flower, is, therefore, almost a literal translation of the botanical appellation. The two designs, figs, 146, 147, are attempts on our part to emphasise this clustering together of the bells of this beautiful wild-flower.

The significance of plant names will be found a matter not altogether without interest, as there is often a very considerable depth of meaning, on analysis, in a word that from constant use has grown too familiar to us to lead to any thought on the matter. Into the many sections into which this subject may be divided—names given from poetical association, ex. Pansy; names given from the locality the plant is found in, ex. Cheddar Pink; names given in allusion to the situation in which the plant is found, ex. Stonecrop; names given from season of flowering, ex. Lent Lily; names derived from religious or legendary association, ex. St. John's Wort; names based on economic uses, ex. Broom; names given from the medicinal service, ex. Wormwood—it is not here desirable to enter upon at any length; but the class of names given to plants in recognition of their resemblance to some other objects is suggested to us by the example afforded by the subject of our plate. This class, appealing, as it does, both to the faculty of observation and the influence of the superstitious, no less than to the love of the marvellous and strange, is in every country largely developed; and the same turn of mind which, in the Middle Ages, found so many objects of Nature to justify the doctrine of signatures, was no less alive to these accidental resemblances. Many, therefore, are obvious enough to justify their names, while others do not so fully bear out the somewhat forced analysis which has been sought out. In these cases, as in the other examples derived from the various sources that we have indicated above, many of the names yet preserve their meaning intact, and are as clearly to be understood now as at any past time: while others, from change of dialect or custom, do not so readily commend themselves to our understanding. In this latter subdivision we would merely instance the Oak, Hazel, Columbine, and Garlic; for, though a list ten times as long might easily be added to these, our desire is rather to make the subject suggestive than exhaustive. The Oak was by the Anglo-Saxon called *ac*, by the Sweeds *ek*, and by the Danes *eg*; all these names are etymologically identical with egg, and refer to the egg-shaped acorns. The Oak, like many other objects, derived its name from its product of greatest value, and though now we should certainly point to the timber as being the most commercially valuable, we must bear in mind that the Oak, being a common indigenous tree, received a name when wealth lay rather in the possession of numerous herds of swine, and when the fruit of the Oak, rather than the wood, rendered the greater service. The Hazel-nut derives its name from the Anglo-Saxon word *hasel*, a cap, and *knutu*, a nut: the reference being to the large scales of the involucre, the green and somewhat leaf-like cap within which we see the nut itself. Columbine is derived from the Latin word *columba*, a dove: another English word for the plant being Culver-wort, from the Anglo-Saxon *culfre*, a pigeon; and both these names indicating the strong resemblance of the ring of spurred petals to a group of little pigeons—(see fig. 300). Garlic, from the Anglo-Saxon words *gar*, a spear, and *leac*, a plant, is so called from its acute and spear-like leaves; though it is only right to mention that another derivation, which has been suggested, is based on the Gaelic word *garg*, pungent, and *luigh*, a plant. More familiar examples may be seen in the Lantern plant (fig. 30), the Buttercup (fig. 139), the Tulip tree (fig. 170), the Rattle (fig. 233), the Foxglove (fig. 286), and in the scientific names of the *Aster*, from its star-like form (fig. 296), and the *Violet cornuta*, from its spur resembling a

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horn (fig. 221). If we should have awakened the interest of our readers by these remarks, they will speedily be able to find out many other illustrations; but if we have unfortunately failed we shall have the greater reason for drawing our observations to a close. In any case, therefore, we forbear to trespass at any greater length on the patience of any before whom these lines may fall.

PLATE 17.

"Herbs, too, she knew, and well of each could speak
That in her garden sipp'd the silvery dew,
Where no vain flower disclos'd a gaudy streak,
But herbs for use and physic, not a few
Of grey renown, within those borders grew;
The tufted basil, pun-provoking Thyme,
Fresh Baum, and Marygold of cheerful hue."—SHENSTONE.

A certain amount of confusion has arisen from the name Celandine being applied to two very dissimilar plants—one a species of Ranunculus, the *R. Ficaria* of botanists: the other the *Chelidonium majus*, the subject of the present plate. There is little or nothing in common between the two plants; the first named has a stellate flower of some eight or ten brilliant yellow petals, and small but very glossy kidney-shaped leaves. It is one of the earliest plants of Spring, and is found abundantly in damp and shady places, covering the brown earth for many feet with its carpet of glossy green and deep yellow; this, from its never growing above six or eight inches high, is generally called the lesser Celandine. It was the favourite flower of Wordsworth, and, as such, has been enshrined in his poetry. An ornamental arrangement, based on it, may be seen in fig. 315. The larger Celandine has a cruciform flower, and a very deeply-cut and ornamental leaf: the inflorescence is umbellate, the flowers being succeeded by small pods. The plant attains a height of about two feet, is somewhat brittle, and, wherever broken across, a considerable quantity of yellow juice, of an extremely bitter taste, exudes. Though often found in hedge-banks, it is one of a numerous series of plants that seem more especially to delight in the neighbourhood of towns and villages. It is ordinarily found in flower during May, June, July, and August; and, being a perennial plant, it will, when once established, be found year after year. Though a plant eminently adapted to art work, we are not aware of its introduction into any work of a decorative character; it may, however, be seen very beautifully and truthfully introduced as a foreground plant in the picture by Lucas Van Leyden, known as the "Legend of St. Giles and the Wounded Hart."

Both the generic name *Chelidonium*, and the familiar name Celandine, are derived from the Greek word *chelidon*, a swallow. According to some old writers the swallows make use of its juice to give eyesight to their young; while others, with greater appearance of probability, give, as an explanation of the name, the circumstance of the plant flowering at a time when these birds first make their appearance, and perishing on their departure. One of the old herbalists, adhering to the first opinion, says—"They say that if you put out the eyes of young swallows, when they are in the nest, the old ones will recover them again with this herb; this I am confident, for I have tried it, that if we mar the very apple of their eyes with a needle, she will recover them again." A very cruel experiment: a very dubious fact. Applying his knowledge to a practical end, he goes on to say that if only the plant be gathered when the sun is in Leo, and the moon in Aries, an ointment of wonderful efficacy for all diseases of the eyes may be prepared. The juice was also highly commended as a remedy for jaundice, and other diseases of the liver, as, according to the doctrine of signatures so firmly held during the Middle Ages, the deep yellow of the juice was considered an indication of its value for such complaints. The juice has decidedly poisonous qualities, and the remedy, like so many others of that period, was quite of the kill-or-cure order. Orfila, to test its nature, inserted a small quantity, at three o'clock in the afternoon, in an incision in the thigh of a dog; the poor brute was found dead next morning. The doctrine of signatures alluded to was based on the faith that each plant possessed some healing virtue, and that every disease might thus be cured; for that for each an antidote had been provided by the goodness and wisdom of the Creator of all, and that He had in most cases stamped visibly upon the plants sufficient proof of their fitness for the alleviation of the varying ailments of mankind; or, to quote the words of an old writer—"Though Sin and Sathan have plunged mankind into an Ocean of Infirmities, yet the mercy of God, which is over all His workes, maketh Grasse to grow upon the Mountains, and Herbes for the use of man, and hath not only stamped upon them a distincte forme, but also given them particular signatures, whereby a

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man may read even in legible characters the use of them." As examples of this we may mention the Herb Robert *(Geranium Robertianum)*, and the Foxglove *(Digitalis purpurea)*. The first was held, from the brilliant crimson of its leaves during the Autumn, to be in an especial degree serviceable as a vulnerary to arrest the flow of blood; the second, from the form and colour of the interior of the flower, was termed Throat-wort, and was held in great repute for its remedial efficacy in all relaxation or soreness of the throat.

In mediæval times there were few plants that were not held to possess healing powers—some, no doubt, justly; though foreign drugs of greater potency, as Quinine or Ipecacuanha have in these later days supplanted them; while others—we may, with little lack of charity say—were of no more value than the faith or imagination of the patient were able to impart. Amongst the manifold uses of plants, as detected by Gerarde, the following are but a few :—"To comfort the cold, weake, and feeble brains—to keep dogs from growing greate—to refresh a wearied horse, and make him travell the better—to waken one out of a deep sleepe—to cause a traveller to feel no wearisomnesse." Every old herbal abounds with recipes—the same plant having often the most contradictory appplications.

PLATE 18.

"Our artists are so generally convinced of the truth of the Darwinian theory, that they do not always think it necessary to show any difference between the foliage of an Elm or an Oak; and the gift books of Christmas have every page surrounded with laboriously engraved garlands of Rose, Shamrock, Thistle, and Forget-me-not, without its being thought proper by the draughtsmen, or desirable by the public, even in the case of these uncommon flowers, to observe the real shape of the petals of any one of them."—RUSKIN.

Amongst the less conspicuous flowers of the hedge-side, few are more worthy of the ornamentist's regard than the Ground Ivy *(Nepeta Glachoma)*, the subject of our plate. It is so commonly to be found that any lengthened description of it seems useless. The leaves, it will be noticed, grow in pairs, each succeeding pair being at right angles with the last, so that, on looking down on the plant, as in fig. 155, a cross-like form is observed. This is very well shown in the ornamental adaptation (fig. 157) taken from one of the tiles from Chertsey Abbey. The excellence of the design shown in these tiles, we have already had opportunity of dwelling upon in our remarks on the Musk Mallow. When the plant is trailing on the ground, the leaves, in their desire to come towards the light, do not adhere to this cruciform arrangement, but are all in one direction; though, on tracing them down to the stem, it will be found that the successive pairs are given off at right angles to each other, as in the upright shoots. We have endeavoured in our design (fig. 162) to give a conventional treatment of this turning upwards of the leaves to the light; while in our sketch (fig. 161) we have selected as the basis of our design the upright growth. The flowers, it will be observed, grow in whorls from the axils of the leaves. These whorls, it will be noticed too, are unilateral (fig. 158, 159); they grow on one or other side of the stem, but do not, as in the White Dead Nettle *(Lamium Album)*, surround it by a ring of blossoms. The central stem is square—a feature delicately suggested in fig. 157 : while fig. 160 gives the true, natural form. The Ground Ivy is so called from its trailing habit : it has no botanical relationship whatever to the true Ivy, and we cannot but think that the name, though sanctioned by long usage, is an unfortunate one. The plant was held in high favour as a medicinal herb, and is still employed in country districts, being slightly tonic and stimulating. During the Middle Ages, its virtues were considered far greater than later investigations have appeared to justify, and one fanciful belief—its supposed power to heal the sting made by a scorpion—gives it its generic name, *Nepeta*, that being derived from *Nepa*, a scorpion. Besides the name given, it has many others, though they are generally of more local application; while Ground Ivy is the name by which it may be found, by all who desire to learn more regarding it, in all botanical works. Other names are Cat's-foot—a not inappropriate name, its soft leaves, clothed with silk-like hairs, being in texture and shape not unlike the foot of the cat—Gill-go-by-ground, Turn-hoof, Hay-maids, and Ale-hoof. The name Gill-go-by-ground is obscure, owing to change both of language and custom. It arose from the old practice of gilling, or, as we now term it, fermenting during brewing, by the addition of a few of these leaves. It was supposed to improve the flavour too, and to render the liquor clearer; for we read in an old herbal that—"It is good to turn up with new drink, for it will clarify it in a night; or, if any be thick with removing, or any other accident, it will do the like in a few hours." The country name, Ale-hoof, is, no doubt, also derived from this old economic use of the plant. The Ground Ivy has not been so freely used in decorative art as its abundance would lead one to suppose probable. The only other good example with which we are familiar, in addition to the one given on the Chertsey tile, is in a small spandril in one of the doorways of the Cathedral at Rheims.

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PLATE 19.

"Nature never did betray
The heart that loved her: 'tis her privilege,
Through all the years of this our life, to lead
From joy to joy; for she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thoughts, that neither evil tongues,
Rash judgments, nor the sneers of selfish men,
Nor greetings where no kindness is, nor all
The dreary intercourse of daily life
Shall e'er prevail against us or disturb
Our cheerful faith, that all that we behold
Is full of blessings."—WORDSWORTH.

The broad-leaved Everlasting Pea, the *Lathyrus latifolius* of botanists, the subject of the present plate, is, strictly speaking, a garden flower; for though it is occasionally found in what may be considered a wild state, it is in all cases only as an escape from cultivation. It is very rarely to be met with in this semi-wild state, though it has been found in woods in Cumberland, Bedfordshire, Gloucestershire, and one or two other English counties, and on the Salisbury Craigs, Edinburgh; as a cultivated plant it is by no means uncommon; its hardiness, climbing properties, perennial nature, and profusion of beautiful bloom, rendering it a general favourite. It will be found in flower during July and August. The plant is a native of Southern Europe, though some botanists are unwilling to admit its claim to be considered a species, regarding it only as a variety of the *L. sylvestris*, or narrow-leaved Everlasting Pea, a somewhat common plant. The main points of distinction are—that in *L. latifolius* the flowers are larger, and richer in colour, and the leaves are much broader in proportion to their length. The winging of the stem is a very conspicuous and striking feature in both species. The semi-sagittate stipulate forms of the present plant are a very ornamental characteristic. In introducing the plant with any ornamental composition, a great variety of form is possible without violation of natural truth, as, at the same time, the bud, the opening and fully expanded flower, and the ripened pod, may be found on one plant. All these stages of the plant's history are represented on the plate.

As we have already had occasion to refer to the stipules of plants, and shall, doubtless, still further require to do so, the present seems a convenient opportunity to make some few and brief observations concerning them.

Stipules are scaly or foliaceous appendages, occurring at the base of the leaf-stalk in some plants. They are generally two in number, one on either side of the stem. They are exceedingly varied in form and size—in some cases being very similar in form to the true leaves; while, at other times, the modification of structure is so great that they become tendrils—ex. *Smilax*, or thorns—ex. *Pictatia*. The young student must, therefore, regard their position more than their appearance: the one being fixed, the other exceedingly variable. Stipulary forms are sometimes found to embrace the stem in a sheath-like form; this modification of the type form is called an ochrea, and may be very well seen in the garden Rhubarb; a very similar form is seen in many grasses. It is very curious that while, in many families of plants, as the *Rosaceæ* and *Leguminosæ*, the species are stipulate, in others, as the *Caryophylleæ*, they are in every case wanting—the plants being what is botanically termed exstipulate. Stipules, as we have said, are extremely variable in size, and in the proportion they bear to the true leaves; in some cases they are actually larger, and very notably so in an allied species of the Everlasting Pea, the *L. aphaca*, where the real leaves are almost abortive, and the large stipules found in their place perform the physiological functions that normally fall to the office of the leaf. Stipules are very variable in their duration; in some cases they fall with the leaves at the approach of Autumn; in others, as in the Oak, they fall very early, the leaf then appearing exstipulate; while in some cases they outlive the foliage, remaining *in situ*, when the true leaves have disappeared. Occasionally the two stipules unite on the side of the stem opposite to the leaf, and thus present the appearance of one large stem-encircling stipule; but the union is rarely ever complete, and, on close investigation, the line of junction is perceptible. In opposite stipulate leaves it frequently happens that those of each side of the leaf are united with those of the opposite leaf, and in this case it appears as though there were but two stipules, one on each side, common to the two leaves. The leaflets of compound leaves at times present, at their bases, little organs, bearing the same relationship to the leaflet that the stipule does to a leaf. These are termed stipels; they may be very well seen in the Scarlet Runner.

Turning now to our plates for illustrations, we find examples of exstipulate plants in the *Atropa Belladonna* (fig. 271), and the Mistletoe (*Viscum album*, fig. 331); while in the Musk

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Mallow (*Malva moschata*, fig. 85)—a stipulate plant—the stipules are very small and linear, altogether unlike the leaves of the plant. In the Water Avens (*Geum rivale*, fig. 179), the stipules are small, but of very similar character to the foliage; while in the *Viola cornuta*, the stipules are very large and foliaceous. In the Red-berried or White Bryony (fig. 90) the tendrils are considered to be stipulary in character. Other very good examples of stipulate leaves, though not herein illustrated, will be seen in those of the Hawthorn or Wild-rose, the former especially being particularly rich in form. Stipules, though but features of secondary value to the ornamentist, will often be found of service, as, by their judicious introduction, the point where a leaf is thrown off from the stalk can be considerably enriched: a very desirable result very frequently, the mere divergence of two lines if the point of departure be unclothed, having often a bald and poor effect; thus, in our design based on the Thistle (fig. 115), it will be noticed that we have been careful to clothe the various junctions with foliage. This principle will be observed in the best Greek and mediæval work; but it must not be carried to excess, the eye must feel that the continuity of the lines is duly provided for, and the main curves must receive due emphasis: overloading them is as much an error of judgment as the exhibition of meagreness.

PLATE 20.

"No tree in all the grove but has its charms,
Though each its hue peculiar: paler some
And of a warmish grey; the Willow such,
And Poplar, that with silver lines his leaf,
And Ash, far-stretching his umbrageous arm;
Of deeper green the Elm; and deeper still,
Lord of the woods, the long-surviving Oak.
Some glossy-leaved and shining in the sun,
Now green, now tawny, and ere Autumn yet
Has changed the woods, in scarlet honours bright."—COWPER.

In the introduction of any plant into a design, care must be taken, not only that it is a plant appropriate in scale to the space to be filled, but also that the parts of the plant that are introduced bear a due proportion to each other, so as to ensure a due balance of colour and form. Hence many plants, while presenting numerous features of interest, cannot, as a whole, be introduced into any decorative scheme with just ornamental effect; some, like the Comfrey (*Symphytum officinale*), having the flowers too small for the large masses of foliage: while in others the reverse is seen. At other times, owing to the studied simplicity of a design, the leaf forms, or those of the flowers, are alone introduced; while, again, the same result may follow from a desire to lessen expense by the introduction of as few colours as possible. It is in all these cases quite legitimate to avail ourselves to the full of any portions of a plant that thus seem best fitted for our purpose, or to discard those that, for some sufficient reason, are not suited to our requirements. Examples of designs based on leaf forms alone will be seen in figs. 157, 161, 162, 180, 188, 206, 207, 220, 232, 240, 257, 264, 284, 304, 309, 318, 319, 320, 322, 324, 337, 340, 346, 348; while other examples, based on floral forms alone, will be found in figs. 80, 84, 218, 269, 298, 313, and the centre of 344. The patera-form, so characteristic of classic art, in most cases is evidently suggested by a fully opened flower, though in some few cases it appears to be rather a rosette of leaves. A delicate powdering of stellate forms will often produce a very rich effect. Very suggestive star-like forms will be found scattered throughout the plates—figs. 23, 26, 29, 39, 79, 111, 134, 150, 186, 193, 276, and 305, being especially good; in many cases it is the only way that a beautiful natural form can be employed: an isolated flower of the Elder, for example (fig. 26), would be admirably adapted as the unit of repetition in such a design, while it would be impossible to produce any satisfactory result if an attempt were made to express any idea of the dense head of blossom produced naturally by the plant. In the present plate we have collected a number of leaves, the parts that, in all the plants from whence they are taken, are of most value to the ornamentist.

The leaf of the common Fig (*Ficus Carica*) shown in our 169th illustration, is of a very bold and suggestive form. Figs. 325 and 326, based on somewhat similar forms, indicate how it might be advantageously employed. The Fig, though originally a native of Asia, now flourishes in Southern Europe, and even at times ripens its fruit in the open air in England. It was first introduced into this country by Cardinal Pole, in the year 1525, and the two trees which he had brought over from Italy are still to be seen, or at least were very recently, in the Archiepiscopal garden at Lambeth, one having a stem of twenty-one inches, and the second of twenty-eight inches circumference. Figs have been employed as food and medicine from the earliest time.

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The wife of Nabal appeased the wrath of the fugitive David, we read, by a present that included some cakes of figs; while we also read of its use medicinally in the Old Testament history, by King Hezekiah, some 2,500 years ago. The Athenians attached such value to it that the export of its fruit was forbidden; while at Rome, in the Bacchic rites, it was carried next to the vine as a symbol of plenty and joy. The stems of the Fig exude, when broken, a milky, tenacious, and very strong-smelling juice. About 900 tons of the dried fruit are annually imported into Britain, chiefly from Greece and Turkey; those from the neighbourhood of Smyrna are considered the best. Botanically, the fruit of the Fig is very curious and interesting; but space presses, and we must refer our readers for full information to any good work on structural botany. Other interesting species are the *F. Indica*, *F. elastica*, *F. religiosa*, and *F. sycomorus*. The first of these is the celebrated Banyan tree of India—its singular aerial roots have been already referred to; by means of these the tree spreads to an almost incredible extent, many of the trees being more than five hundred yards round the circumference of the branches: the tenacious juice that exudes from the tree is used as bird-lime. Though many of the trunks are nine to ten feet in diameter, the wood is soft and porous, and of no economic value. The viscid milky fluid that flows from excisions made in the wood of *F. elastica* furnishes one of the commercial varieties of caoutchouc, though it is inferior to that produced from the Brazilian *Siphonia elastica*. The *F. religiosa*, or Peepul Tree, is one of the common trees of India, being very extensively planted near houses, for the sake of the welcome shade thrown by its huge mass of foliage. It derives its specific name, *religiosa*, from the veneration in which it is held by the Hindoos, one of their great deities, Vishnu, having, according to their mythological teaching, been born beneath its branches. The *F. sycomorus* is an Egyptian species, and, like the last, is extensively planted for its grateful shade. It is the Sycamore or Sycamore-fig, of the Biblical narrative.

Fig. 170 is the form, and a very curious one, of the leaf of the Tulip Tree *(Liriodendron tulipifera)*, a native of North America. It was introduced into England in 1663. It flowers here freely during June and July, but in this country rarely ripens its seeds; though, in other respects, the climate seems to suit it, as it grows freely in the open air, often attaining a height of upwards of one hundred feet. Its English name Tulip Tree, and the botanical *tulipifera*, are both given from the resemblance of its yellow and orange flowers, both in size and colour, to the flowers of the Tulip. Many of the leaves are larger than the one here shown; but all alike are of the curiously four-lobed and truncated form of the present example.

Figs. 171 and 172 are the leaves of the *Sida hastata*, and of the *Phelloderma cuneato-ovata*, respectively. The plants have no English names: the first is a native of Mexico, the second, of Chili. The *Kolreuteria paniculata*, a Chinese tree, affords us the very graceful leaf shown in fig. 173. The plant has been introduced into England since 1763; specimens of it may be seen growing in the open air in Kensington Gardens, near London. The delicate gradation and variation of form in the different members comprising the leaf are very beautiful features: points well deserving attentive study.

The leaf of the Jute *(Corchorus capsularis)* is the subject of our next illustration (fig. 174). Though similar in general form to many leaves that we are familiar with, the two elongated forms at the base of the leaf give it a quaint individuality of its own. The plant has, within the last few years, been very largely grown in India for the fibre it produces—a fibre a good deal used in the manufacture of bales and sacks for the export of rice, sugar, cotton, &c., and less legitimately as a means of lowering the quality of silk, as the fibre is very fine, and of a satiny lustre, so that the fraud is not easily detected. Jute is an annual, attaining a height of from four to fourteen feet. The flowers are small, and have five rather finely-cut yellow petals. It is estimated that about 120,000 tons of fibre are manufactured in India, while about 80,000 tons of the raw material are each year exported to Great Britain. Almost the whole of the jute that reaches our shores finds its way to Dundee. The cost of the fibre, on its arrival at the factory, is about £20 per ton, though, owing to scarcity at a given time, or the quality of the sample, this price is sometimes considerably exceeded. Many thousands of persons are now employed in the various processes of manufacture; though, in 1822, a Mr. Neish, a merchant of Dundee, having received a small quantity of jute, was glad, after keeping it some years, to sell it off at a nominal price to get it out of the way. At the present date it is estimated that capital amounting to over five millions sterling is invested in the jute factories of Dundee and its vicinity.

The leaf of the Maple *(Acer campestre)* is that chosen for the last illustration on the plate. The Maple is a common hedge-row tree throughout England, though it is somewhat scarcer both in Scotland and Ireland. The leaves and fruit were largely employed, during the 14th century, in the wood and stone carving of our Cathedrals, and also in the stained glass and illuminated MSS. of that period. It is, in fact, like the Oak or Buttercup, one of the most characteristic forms seen in the ornament of that time. Very good examples of it may be seen at Southwell, Lincoln, and

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Winchester. The winged fruit, botanically termed a *Samara*, is represented, together with the leaves, in our design numbered 333: while the leaves alone are introduced in the suggestions, figured 345 and 347.

PLATE 21.

"Flowers, as the changing seasons roll along
Still wait on earth, and added beauties lend,
Around the smiling Spring a lovely throng
With eager rivalry her steps attend;
Others with Summer's brighter glories blend;
Some grace wild Autumn's more majestic mien;
While some few lingering blooms the brow befriend
Of hoary Winter, and with grace serene
Enwreath the king of storms with Mercy's tender sheen."—BARTON.

The Water Avens *(Geum rivale)*, though not, by any means, an uncommon plant, is not so familiar to us as many, partly from the marshy and moorland ground it thrives best on: partly, too, from the general sombreness of colour of the flower-stalks thrown up. The plant is found in congenial situations throughout Northern Europe, Siberia, and North America, extending to the Arctic regions. It is common throughout Scotland, Ireland, and the North of England: less so in the Southern and Midland counties. The leaves are mostly radical, each having one very large terminal segment, and a few much smaller ones below it, on the leaf-stalk. The flowers are few in number, drooping, having a dull purplish calyx, and petals of a dusky orange. The petals, five in number, are of the form shown in fig. 177. The calyx is of the character shown in fig. 182; but it is never seen in Nature thus expanded. The five large and five minute segments, alternating with each other, are also to be met with in the *G. urbanum*, and in the calyx-forms of the *Fragaria vesca*, *Potentilla reptans*, *Comarum palustre*, and some few other plants. In the first of our designs (fig. 180) we have a diaper, based on the single leaf (fig. 179): while, in the second suggestion (fig. 183), the whole plant is employed.

The allied species *(Geum urbanum)* is an equally ornamental plant; but as it is much commoner, and as, too, we have already represented it in another of our works, we prefer to figure the Water Avens. The flowers of the common Avens are much smaller, of a brilliant yellow, and have not the drooping habit of the subject of the present plate. The whole plant is larger and, instead of the damp situations chosen by the *G. rivale*, it thrives best by the hedgeside. The generic name, *Geum*, is derived from a Greek word signifying to yield an agreeable flavour. Both species have been held in esteem medicinally, and their roots, from their aromatic qualities, are still in some parts of England dug up in the Spring, and added as a flavouring to ale and other liquors. The common Avens is the Herb Bennet, or *Herba Benedicta*, of monkish herbalists, names given on account of its supposed value, both as a healer of a long list of bodily ailments, and also as a charm against the greater ills with which gross superstition clothed a circumambient spirit-world. The belief in its power of averting demoniac possession, and nullifying the power of evil spirits, seems to have died out by Gerarde's time, though its medicinal credit was unimpaired, for, while "commended against the biting of venomous beasts, the same is likewise a remedy for stiches and griefes in the sides; if it be boiled with pottage or broth it is of great efficacie, and of all other pot-herbes is the chief, not only in physicall brothes, but commonly to be used in all;" while Culpeper, a later writer, extols it for its virtues in the cure of diseases of the chest, the healing of wounds internal or external; as a decoction to comfort the heart and strengthen a "cold brain," or, more important still, as a preservative against the plague or any other poison, as an aid to digestion, and as a defence against so many other ills of the flesh, that, assuming its efficacy in this direction, we feel that, even if its influence on evils of a spiritual nature be contested and denied, it richly deserves its mediæval name—the "blessed herb."

A very curious plant is not uncommonly to be met with, which, though in some old botanical works styled the *Geum intermedium*, is now recognized as a hybrid between the two plants referred to above, the *G. urbanum* and the *G. rivale*; in it the flowers are sometimes erect, at others drooping, the calyx and corolla intermediate in form and colour, inclining in general character sometimes towards one parent, sometimes towards the other.

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PLATE 22.

"What we specially need at present for educational purposes is to know, not the anatomy of plants, but their biography—how and where they live and die, their tempers, benevolences, malignities, distresses, and virtues. We want them drawn from their youth to their age—from bud to fruit. We ought to see the various forms of their diminished but hardy growth in cold climates or poor soils; and their rank or wild luxuriances when full fed and warmly nursed; and all this we ought to have drawn so accurately that we might at once compare any given part of a plant with the same part of any other drawn on the like conditions."—RUSKIN.

The *Crane's-bills*, or wild geraniums, are all plants well adapted to art work. Bentham, in his British Flora, recognises twelve species; other writers twelve to fourteen, the discrepancy arising from the fact, that some of the species are doubtful natives, and each writer at his discretion excludes or includes these as he sees best, according to the evidence accessible to him. There is a strong family likeness seen in the midst of the distinct individuality of each species, so that any one who was familiar with some four or five species would have little difficulty in identifying the others as belonging to the same genus. One marked feature is, that the flowers all grow on long peduncles, each of these, except in one species, forking off into two pedicels bearing a single blossom. This may be seen in the upper part of fig. 184, where the flower, seen in side view, is evidently one of the two that will ultimately surmount the peduncle when the bud on the companion pedicel has opened. It is very clearly seen in fig. 282. The only exception to this growth is seen in the *Geranium sanguineum*; in this the flowers are always found singly on the peduncle. As we have had occasion, once or twice, to use the very similar terms, peduncle and pedicel, it will be well just to give a few words to them before passing on. The peduncle is the stalk supporting the flowers that are given off from it laterally or terminally. The little stalks that branch off from the peduncle, and each support one blossom, are the pedicels. Another very curious feature, and one confined to the *Geraniceæ*, is seen in the arrangement for the dispersion of the ripened seeds; but as this is a matter of interest to the botanist rather than to the designer, we need not here dwell upon it.

The *Geranium pratense*, or blue Meadow Crane's-bill (the subject of our Plate), is one of the largest of the genus, being frequently over two feet high. It grows, as the specific and familiar English names imply, on pasture land, though it may also be found in moist thickets and country lanes. Though local, it is generally distributed throughout England, while it is scarce in Scotland, and not known at all in Ireland. The plant is found in flower from May to August, the size of its blossoms rendering it very conspicuous. The colour of the blossoms is sufficient in itself to distinguish it from all our other species, most of which have flowers more or less tinged with pink, though in the dusky Crane's-bill (*C. phæum*) the flowers are of a dark brownish-purple—a very unusual colour, and one that attracts attention from its singularity rather than from its beauty. The leaves of the present species are very large, and are more deeply cut than in any other members of the genus. From their slight resemblance to the lower leaves of the *Ranunculus acris*, the plant is sometimes known as the Crowfoot Crane's-bill. On the approach of autumn the leaves of several of the geraniums turn a vivid crimson, as, for example, those of the herb Robert, or *G. Robertianum*, the shining Crane's-bill (*G. lucidum*, fig. 282), and the present species, and, under these circumstances, have a beautiful effect in the midst of other vegetation. The twisting and overlapping of the petals in the bud is a point ornamentally valuable: indications of it are seen in the opening flower (fig. 185). Other species of our wild Crane's-bill, that the designer will do well to familiarise himself with, are the herb Robert (*G. Robertianum*), a plant beautiful both in foliage and flower, and one of our commonest kinds; the *G. sanguineum*, a plant with very large flowers and richly-cut leaves; the wood-geranium (*G. sylvaticum*); the shining Crane's-bill (*G. lucidum*), figured on plate 34; the Dove's-foot geranium (*G. molle*), a particularly ornamental plant, and one especially suited to the decoration of light fabrics, where delicacy and refinement are desired; the cut-leaved geranium (*G. dissectum*), a species with small purple flowers, but having very richly-cut leaves, and the long-stalked geranium (*G. columbinum*). It scarcely seems desirable, having due regard to our space, to enter at any great length into the special peculiarities of each of these plants. Our readers will, however, have no difficulty in finding them out by referring, by the names given, to any good illustrated work.

Plant-colour may often prove as suggestive to the designer as plant-form. We do not here refer so particularly to the tints of flowers, so beautiful in themselves and so infinite in variety, since these we may naturally assume have received the loving attention of the true follower of decorative art; we are thinking now rather of the field for study open in the consideration of the tints of the foliage, and more especially when the Autumnal influences have begun to make themselves felt. The Elm, before losing its leaves, shows us a mass of rich yellow brown; in the Maple, the leaves are one mass of tawny yellow; in the Guelder Rose, the whole tree becomes brilliant crimson; while in the Brambles, unlike the other examples, a whole host of

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lovely contrasts and harmonies are found—crimson, deep yellow, pale green, clear brown, varying shades of purple and grey. Seaweeds too, as materials for design, have never received a tithe of the attention they deserve—

"The deep's untrampled floor,
With green and purple seaweeds strewn,"

seems a veritable *terra incognita* to our designers, yet every beach is strewn with forms of surpassing beauty, in form and colour alike excellent. About 380 species are found on the British coasts. Fungi, or toadstools, though repellent to many persons, are often very beautiful in colour, sometimes, as in the scarlet fly Agaric *(Agaricus muscarius)*, of an intense red, or, as in the *Clavaria fusiformis*, a deep orange yellow; lilac in the *Agaricus personatus*; brown in the *Boletus edulis*; white as snow in *Clavaria rugosa*; lemon yellow in *C. Amethystina*; or black, as in the *Tuber Cibarium*.

As it has been necessary, in speaking of the various Crane's-bills, to repeatedly use the generic term *Geranium*, adding to it some distinctive term, as *Robertianum*, *molle*, or *pratense*, to indicate the particular plant in question, the present seems a convenient opportunity of giving some explanation, in passing, as regards these purely scientific names. Botanical study subdivides itself into several very distinct sections: thus we get the physiology of plants, a study that concerns itself with the vital functions and organisms; economic botany, or a study of plants in their application to the service of man, medicinally, commercially, &c.; and the study, again, of plants with a view to their identification and classification. This is known as systematic botany. As upwards of 100,000 plants are now known, the necessity of some means of classifying them will be at once apparent, since, while each plant must have a distinctive title belonging to itself alone, it is evident that no memory, however cultivated, could retain 100,000 distinct names bearing no sort of association with each other; hence a second name that is common to several plants on account of some peculiarity they possess in common. Thus, for example, there are many plants which, from their similarity, we call roses: rose, then, is a name we give to a genus or collection of similar plants, while, to mark the slighter differences, we call one a red rose, another a white rose, a third a sweet-scented rose. The substantive is the generic name, and indicates those points in which a certain number of plants agree; the adjective is the specific name, and points out some characteristic in which that particular plant differs from all others allied with it. In ordinary conversation we put the specific before the generic name—as, for instance, white rose, while botanically the generic name precedes the other, as *Lathyrus hirsutus*, *Lathyrus sylvestris*, *Lathyrus tuberosus*, *Lathyrus maritimus*, one *Lathyrus* being hairy, another a dweller in woods, the third tuberous, the last a sea-side plant. The genera of plants being still too numerous for study without some further scheme of classification (as there are over 6,000 genera), those which, in some degree, resemble each other are aggregated into groups, called families or orders, while these natural orders (some 300 in number) are again collected into classes. The number of plants comprised in any one of these divisions is very variable—thus, in some cases, one or two species, though somewhat similar in themselves, may differ so entirely from others as to constitute the entire genus, while in others a hundred or more plants may all be included under one generic head.

PLATE 23.

"Happy is he who lives to understand,
Not human nature only, but explores
All natures—to the end that he may find
The law that governs each; and where begins
The union, the partition where, that makes
Kind and degree among all visible beings:
The constitutions, powers, and faculties
Which they inherit—cannot step beyond—
And cannot fall beneath; that do assign
To every class its station and its office,
Through all the mighty commonwealth of things;
Up from the creeping plant to sovereign man."—WORDSWORTH.

The Leopard's-bane *(Doronicum Pardalianches)*, though not truly a native of Britain, has been largely cultivated in cottage gardens, and has readily spread from thence, so that in many parts of the country the plant has become so completely naturalised as to thoroughly justify its insertion in our Flora. It is found in flower during the Spring and the earlier months of the Summer. There is a considerable variation of form in the leaves, the upper, as seen in the plate, being sessile and clasping the stem, the intermediate ones, on a short petiole with two broad lobes half surrounding the stem, while the lowermost are on long and naked petioles as shown in

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fig. 192. The plant is from one to three feet high, of a rather brilliant green, and soft in texture. It possesses rather dangerous qualities, hence the familiar name; while the derivation of the word *Doronicum*, given to the genus by Linnæus, though not quite clear, is supposed to be derived from two Greek words, *doron*, a gift, and *nike*, victory, as the plant was formerly used in some countries to destroy wild beasts, though, according to other writers, it is the Arabic name for the Leopard's-bane *(durungi)*, latinized by the earlier botanists.

The Leopard's-bane belongs to the natural order *Compositæ*, the most extensive of all the orders, the most widely spreading, and the most easily recognised. It contains more than 900 genera and almost 10,000 species. According to Humboldt, a sixth of the flowering plants of North America, one half of those of tropical America, a sixteenth of the flora of New Holland, one-eighth of that of Germany, one-seventh of that of France, belong to this important order. Though, as ornamentists, we should speak of fig. 193 as the flower in the same way that we should refer to the flower of the Buttercup, yet botanically it represents a whole bunch or head of flowers; the composite flower, or flower-head being made up of an aggregation of florets, unisexual or hermaphrodite, forming a dense head of blossom on a common receptacle, the part that we should as ornamentists term the calyx, being a ring of bracts. Each little floret is in most cases very minute, still, any careful observer will easily verify the existence of them for himself. In some of the plants all the florets are perfect, *i.e.* have both stamens and pistil, and have a ligulate or strap-like form of corolla, this may be very well seen by pulling a dandelion flower carefully to pieces. In another large division all the florets are tubular, and alike in the same head, as in the thistles, or these tubular florets, themselves regular in form, may have an outer ring of irregular and neuter ones, as in the knapweeds (Fig. 247). In some cases these outer florets form by far the most conspicuous part of the flower-head, as in the Corn Blue-bottle *(Centaurea Cyanus)*, where the florets of the disk are small and purple, and those of the outer ray few, but bright blue, and of large size.

It would be foreign to our present purpose to enlarge on the various characteristics that have aided the scientific botanist in his task of classification—a task of no small difficulty in dealing with so many species; but all who care to peruse the subject at any length will derive all the information they need on consulting any good work on systematic botany, aided by personal observation wherever it is at all possible, theoretical knowledge alone being of little value.

Our readers will find examples of the composite type of flower in figs. 104, 113, 243, 247, 296. Other very good natural and familiar illustrations will be met with in the Dandelion *(Taraxacum dens-leonis)*, the Daisy *(Bellis perennis)*, Corn Marigold *(Chrysanthemum segetum)*, Chamomile *(Anthemis nobilis)*, Yarrow *(Achillea millefolium)*, Groundsel *(Senecio vulgaris)*, Ragwort *(Senecio squalidus)*, Elecampane *(Inula Helenium)*, Colt's-foot *(Tussilago Farfara)*, Chicory *(Cichorium Intybus)*. Nipple-wort *(Lapsana communis)*, Sowthistle *(Sonchus oleraceus)*. Amongst garden flowers, the Sun-flower, Dahlia, Aster, and Chrysanthemum belong to this order. Amongst the British species, white or yellow, singly or combined, are the general colours. In turning over a British Flora to test this, we found that ninety-seven of the species figured were of various shades of yellow, and fourteen had the central part yellow, and the outer rays white; twenty-seven of different tints of pink and purple, one with a yellow centre, surrounded by rays of blue, while three were of blue alone.

Many of the composite flowers are well adapted to art purposes, the flower-heads being often large and bold in character, and the leaves very frequently richly cut up into good artistic forms. The stellate character of the flowers adapts them well for either vertical or horizontal treatment. Designs, embodying the stellate form characteristic of many of the species, will be seen in figs. 297, 298, 299, in all these cases adaptation for an upright surface being the treatment chosen.

PLATE 24.

"Where order in variety we see,
And where, though all things differ, all agree."—POPE.

"Similitude in dissimilitude."—WORDSWORTH.

The Hepatica flower, the *Hepatica triloba* of botanists, so called from the three distinct lobes of the leaf, is one of those favoured plants that, like the Primrose or the Crocus, form the ever-welcome advance-guard of the floral host, coming as it does in the early Spring, in the bleak days of March, while yet the trees are leafless, and the stern grip of Winter seems scarcely relaxed, and decking the border with its little lilac star-like blossoms. The Hepatica, like most of the flowers of the opening year, does not attain to any height, but shelters itself as best it

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may from the boisterous winds that sweep over it, by its lowly growth, the plant being found in little clumps, and rearing its delicate blossoms some four or five inches only above the surface of the ground. Each flower-stalk, as in the Daisy, springs directly from the root and bears but a single blossom on its summit; the growth of the leaves is similar, they are not thrown off from branches, as in the Buttercup, but, Primrose or Dandelion-like, radiate from the root. Throughout our descriptions it will, we trust, be understood that our desire is to give, as far as possible, the effect of the plant as it would strike an ornamentist, the minutiæ of a more rigid botanical analysis being foreign to our present aim; thus, though in the Primrose, for example, the leaves and flower do really spring from a very short central stem, yet as this stem is hidden by the bases of the leaves, and is only apparent on close observation, we speak here rather of the effect of the plant as it strikes an ornamentist, and, while inaccurate in a strictly scientific sense, best convey to a designer an idea of the plant by speaking of the leaves as radiating from the root. The Hepatica is subject to a considerable variation of form, thus, though fig. 197 gives us the normal form of the foliage, it is not uncommon to find some leaves with five lobes, as shewn in fig. 200, in the same way that the Ivy, in the midst of a mass of five-lobed leaves, occasionally develops a few with seven. A similar variation is frequently seen in the petals, for, though by far the greater number of the flowers have six of these, it is not unusual to come across examples, as in fig. 203, where those parts are eight in number. In many plants an increase of the parts is only a blemish, as the additional members are frequently distorted or dwarfed, and thus the symmetry of the whole is destroyed; but this seems rarely to be the case in the Hepatica, and the abnormal eight-petaled flower is as beautiful in itself as the ordinary form of blossom, as suitable, therefore, for introduction in any design; though, if Nature be but slightly conventionalised, it must be borne in mind that such forms must be exceptional, and only introduced for the sake of that variation that is as valuable a quality in ornamental art as in Nature. The curious form of the leaves before their full expansion, as shewn in fig. 202, is a point not without suggestiveness to the designer; while the fruit form, fig. 204, that succeeds the blossoms, is an equally ornamental feature.

Variation in the details of a design is a very legitimate means of imparting enhanced interest to any work. It is much more characteristic, however, of some periods of art than others; thus, in a Greek temple every Corinthian capital is an exact fac-simile of every other throughout the building; and the triglyphs that may be seen running round a classic building are, be they many or few in number, an exact repetition of one form. In some styles of ornament (as, for instance, Chinese) the opposite is seen; and while there is great risk of monotony in constant repetition, the other extreme is equally to be deprecated, all harmony and unity of design being destroyed by a too persistent variation. The ancient Egyptians, with that fine instinct that characterises so much of their work, avoided either extreme, and preserved similitude in dissimilitude, preserving unity as an effect in the whole mass, yet with constant variety in the details; the columns of a temple for instance, not being all alike, though similar in general proportion: thus, the two columns immediately flanking the entrance are found to be similar, the next to these on either hand being of a different design to the first, but similar in themselves; number three on each side being like each other, but unlike numbers one or two; and so on throughout the series. The same thing is noticeable in a great deal of the best Gothic work, both English and continental; a due balance and symmetry of the masses of the composition, with continuous variation of the details when examined more closely. Though the quotations with which we have headed our remarks on each plate have ordinarily been selected for their own inherent interest, rather than from any especial appropriateness to the subject-matter with which they chance to be associated, the present extracts from Pope and Wordsworth have an especial fitness for their place, expressing so clearly, as they do, the limit which may be safely reached in the use of this art-principle of variation, and the ideal attained, "where order in variety we see, and where, though all things differ, all agree."

In the three designs we have based on the Hepatica, the first (fig. 205) is bi-symmetrical, and is intended as a suggestion for relief work, the remaining two being for surface decoration. In fig. 206 we have continuous repetition in the form, with variation in the colour, while in the last example (fig. 207) the alternation is seen both in form and in colour.

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PLATE 25.

"These are Thy glorious works, Parent of good,
Almighty! Thine this universal frame,
This wondrous fair; Thyself how wondrous then!
Unspeakable, who sitt'st above these heavens
To us invisible, or divinely seen
In these Thy latest works; yet these declare
Thy goodness beyond thought, and power divine."—MILTON.

We have already, in our description of the *Ranunculus bulbosus*, or Bulbous Crow-foot, given a slight sketch of the various species of the genus, dwelling, however, but little on the *R. arvensis*, or Corn Crow-foot, as that comes more especially before our consideration now, being the subject of the present plate.

The Corn Crow-foot is, as the name implies, one of the numerous plants (like the Poppy, Cockle, and Blue-bottle) that occur in the growing corn: though ordinarily a very common plant, it is, nevertheless, much more abundant in some localities than others, the southern counties of England, rather than the colder northern parts, furnishing examples of it, and those ordinarily on farms under slovenly tillage. The specific botanical name *(arvensis)* is derived from the Lat. *arvum*, a ploughed field, and further indicates the locality most congenial to the growth of the plant.

The flowers of this species are smaller, and of a somewhat paler yellow, than those of most of the plants of this genus; the leaves are three-cleft, each lobe being either of simple form, as in the upper leaves (fig. 211), or again divided into three, as in the lower leaves (fig. 214); the carpels of the fruit few in number, but large (fig. 209), and covered on both sides with prickles, forming as a whole a fruit of a very quaint and suggestive character ornamentally. The very light effect and spreading growth of the plant fit it in a more especial degree for fabrics requiring designs of a delicate character—such as muslins or lace; and it is in this direction, though we do not remember ever to have seen it so employed, that it may prove of service to the art-student or professional designer. The plant attains a height of some eighteen inches, and flowers during May, June, and July, the flower and fruit-forms being found simultaneously on the plant—an additional recommendation to the designer as assisting to give that pleasant variety of form that is so desirable in itself, and also as in some degree interesting the spectator in the life-history of the plant chosen for representation.

The various species of Ranunculus, with the exception of the Water Crow-foot *(R. Aquatilis)*, possess a very considerable acridity, though the active principle, being of a volatile nature, is dispelled by heat and exposure to the air; so that, though animals will avoid the plants when growing, the buttercups that yellow the meadows in the early summer do not, when dried with grass, retain their deleterious qualities, nor in any way depreciate the value of the hay as fodder. Many of the species if held long in the hand will blister it; hence they have been used in country places as vesicatories: the experiment is, however, a rather dangerous one, as the wound caused is slow to heal, and may itself become a cause of trouble. The *R. Flammula*, a species very commonly found by the sides of ditches, was the plant ordinarily selected. The specific name is the diminutive form of *Flamma* (a flame), and refers to its burning or inflammatory qualities. The leaves bruised and applied to the skin, will raise a large blister in about thirty minutes. Though poisonous, the buttercups are not dangerous, since their burning acridity makes it very unlikely that anyone would take a sufficient quantity to produce serious effects, while, if taken accidentally in place of some other vegetable as a pot-herb, the boiling they would have to undergo would render them innoxious. The Corn Crow-foot is the most poisonous of the whole family: sheep have been known to eat it with very speedily fatal effect, while in an experiment that we have found recorded, where three ounces of its expressed juice were administered to a dog, the result, death in four minutes, was very conclusive as a proof of its deleterious properties.

The persistency of the attachment of particular plants for special localities is a very curious point, and one well deserving of study; indeed, to the ornamentist some slight knowledge of this becomes a necessity, that he may not fall into error in his representations of plants, nor run counter to the associations connected with them.

We can easily understand the need of seeking for acquatic plants in their special element, since in that alone are they fitted to dwell; and we can comprehend, while we wonder at, the attachment of certain plants to particular geological formations, since we can easily believe, on consideration, that that particular formation best furnishes certain chemical substances needed for the food and consequent healthy well-being of the plant in question. Thus, the *Nasturtium Pyrenaicum* thrives best on granite and gneiss, the *Polgala calcarea* on chalk, the *Lychnis viscaria* on limestone and trap; but it appears to us more curious that in any given district of one geological

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character, under the same climatic influences, and in fact under identical conditions throughout, certain plants, like the present or the Blue-bottle, should only spring up where a particular crop, in these cases cereal, is in cultivation.

The habitat chosen by plants is a matter not beneath the consideration of the ornamentist, partly since a knowledge of it may prevent incongruous grouping in his designs, partly, too, as the knowledge will greatly assist him in his search for natural plants, for, possessing it, he will not waste time in hunting, for instance, on some breezy inland common for *Spergularia*, a plant found in salt marshes, nor expect to find the Bog Pimpernel on the walls of some crumbling old ruin.

The great distribution of many species, some, like the Dandelion, being almost cosmopolitan; the narrow area of others, the *Linaria Candollei* being only met with on the littoral of Brittany, the *Scrophularia Pyrenaica* in two localities of the Pyrenees, the *Wulfenia Carinthiaca* in one place in Upper Carinthia; the abundance of particular species in some localities; the universality of plants as a whole; are all points that may very profitably engage the attention and awaken interest; we can here but indicate them, leaving others to enlarge on them at their pleasure.

It may be said that much of this is beside the mark, and by no means helpful to a man who is practically engaged in making designs, but this we are by no means willing to admit. Our present and pleasant labours are not intended as an assistance to the man whose only care is to see with how little trouble his work can be got through, but rather as supplying matter for consideration to those whose labours are a matter of interest to them apart from the pecuniary value of their toil; and we hold that the ideal designer should be not only a culler of plants as raw material for his own ends, but a lover of them from the inherent interest derived from their study; in fact, the term *designer* is but in brief the description, in theory, though perhaps too seldom in practice, of a man, who, in addition to a refined taste and sympathy with Nature, adds thereto some considerable knowledge of not merely botany, but also of many other studies, such as anatomy, zoology, and archæology, and thus possesses the knowledge that is power in this case no less than in most others, while the absence of this familiarity with these special studies is crippling, and persistently felt as a hindrance in actual work.

PLATE 26.

"There lives and works
A soul in all things, and that soul is God.
The beauties of the wilderness are His,
That make so gay the solitary place,
Where no eye sees them. And the fairer forms,
That cultivation glories in, are His.
He sets the bright procession on its way,
And marshals all the order of the year;
He makes the bounds which winter may not pass,
And blunts its pointed fury; in its case,
Russet and rude, folds up the tender germ—
Uninjured, with inimitable art:
And, ere one flowery season fades and dies,
Designs the blooming wonders of the next."—COWPER.

The *Erodium Manescavi*, the subject of the present plate, though not a native of England, may from time to time be met with in cultivation; we have, therefore, inserted it in our series, as, while it may from its beauty be of service to the designer, it is, though a foreign plant, not inacessible to him should he care on seeing our drawing of it to derive still further knowledge by consulting the living plant. As our present work has an artistic rather than a scientific purpose, we have troubled ourselves but little with any questions of botanical classification, hence exogenous and endogenous plants, indigenous species and those of foreign extraction, are found side by side, all claiming an equal right to our regard on the one broad ground of beauty and fitness for ornamental application.

In the present plant, the large and brilliantly-coloured flowers and the bold character of the foliage, are features that fit it in an especial degree, to art-work. The umbellate inflorescence is a further valuable feature, the radiation of the buds and blossoms from the one spot being a point admirably adapted for decorative treatment; we have an illustration of this radiant form in our sketch for a diaper (fig. 218). The flowering Rush, *Butomus umbellatus*, is another plant, that, though very different in many respects from the present, has the same beautiful character of inflorescence, and the same fitness on that account, for art-treatment. The great natural order, known as the *Umbelliferæ*, so termed on account of the species having the flowers in umbels, contains but few plants of a suitable character for the designer, since in many of them the flowers are exceed-

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ingly small, while the general growth is often ill-adapted for the specific requirements of ornamental art; in some cases the leaves are very large and coarse, while in others, again, they are so minutely divided that they are equally non-available.

The remaining sketches call for but slight comment; our readers will, no doubt, perceive that the design, fig. 219, is intended to be bi-symmetrical, and that only the exigencies of the space at our disposal have necessitated our giving it in its present unilateral and somewhat maimed form. Fig. 220 is a simple repeat, at regularly recurring intervals, of a single leaf. Our designs are necessarily, as we have already pointed out, somewhat simple in character, but the student reader must not imagine that the simple treatments we here, and from time to time, introduce, by any means express all that the plant is capable of affording to the designer. We content ourselves here with slight suggestions; the practical designer should find no difficulty in adapting much that is herein given to the requirements of specific work, whether calico-printing, lace, iron-work, or whatever other medium may present itself for treatment.

PLATE 27.

"Yet mark'd I where the bolt of Cupid fell—
It fell upon a little Western flower,
Before milk-white, now purple with Love's wound,
And maidens call it 'Love-in-Idleness.'"—SHAKESPEARE.

Violets and pansies have, from the associations connected with them, been favourite flowers with all our poets. Owing to these associations, poetical and legendary, no less than from the inherent beauty of the flowers, considerable use has been made of them in past art, and the designer will, therefore, do well to acquaint himself with their structure; and, to assist him in this end, we have represented two varieties, selecting them as being not so immediately accessible to him as the common hedge-row Violets or the garden Heart's-ease.

The allusions to this genus amongst the poets are too numerous to quote at any length; yet some few examples of the affection in which it has been held may not be without interest. Thus Sir Henry Wotton writes—

"Ye violets that first appear,
By your pure purple mantles known,
Like the proud virgins of the year,
As if the spring were all your own."

A reference will also be found in Chaucer's "Assemblie of Ladies." The following lines many of our readers will, no doubt recall, as occurring in the "Comus" of Milton—

"The shepherds at their festivals
Carol her good deeds loud in rustic lays,
And throw sweet garland wreaths into the stream
Of pancies, pinks, and gaudy daffodils."

Milton also mentions it in his "Lycidas" and "Paradise Lost;" while, not to weary our readers, we will content ourselves, in conclusion, by quoting the following passage from Spencer—

"Strew me the ground with Daffe-down-dillies,
And Cowslips, and Kingcups, and loved Lillies.
The pretty Paunce
And the Chevisaunce
Shall watch with the fair Fleur-de-Luce."

The name pansy is evidently a corruption from the French *pensée;* and Shakespeare alludes to this in the passage where Ophelia says, "There's pansies—that's for thoughts." The *Viola tricolor*, so commonly to be met with in cultivated fields, has many expressive provincial names, as "Three-coloured Violet," "Three Faces under a Hood," "Herb Trinity," &c. The latter name we may explain by a quotation from one of the old monkish herbals—"This flower is but one, in which be three sundrye colours, and yet but one sweete savour. So God is three distinct persons in one undivided Trinitye, united together in one eternal glory and divine majestie. It is called *Herba Trinitatis* because it has three colours." The Welsh name, *Llys y Drindod*, has the same significance. It is also called the *Mam yn gyfraith*, or Mother-in-law; the Danish name, *Stifmoder blomst* (the Step-mother) having a very similar meaning, the fancy in each case being that the two large, plain-coloured petals are the new connexions, the others, more gaily attired, being her own daughters.

The sweet-scented Purple Violet *(Viola odorata)* may be seen as a bordering in a 16th century MS. in the collection of the British Museum: it is, like most of the work of that period, painted in a somewhat too naturalistic manner. It may, also, be found very tastefully embroidered

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(temp. Henry VI.) on the hangings in the State bed-room at Haddon Hall; and, again, on a white tea-cup of Wedgwood-ware in the Ceramic Gallery of the South Kensington Museum. The Field Pansy *(Viola tricolor)* forms one of the borders of the "Hours of Henry VII." in the British Museum.

The *V. cornuta*, or Horned Violet (represented at fig. 221), is a native of Spain and Northern Africa, though, from its hardy and perennial nature, and the great ease with which it may be propagated, it is not uncommonly met with in our gardens, being often used as a bordering, as it flowers very profusely and remains in blossom during the greater part of the Summer. The distinctive term *(cornuta*, or horned) is applied to it on account of the curiously elongated spur; this member may be very well seen in the side view of the flower, fig. 227, and again in the bud represented in fig. 225.

Fig. 222 is the natural growth of one of the numerous species of Garden Pansies, the geometric elevation of the flower being seen in fig. 223. We have introduced it here as affording a pleasant variation of form. The points of difference, judging as an ornamentist, are, when comparing it with the *V. cornuta*, mainly these:—The flowers, different in colour, are also decidedly more rounded in character, and having the segments of the calyx much less conspicuously entering into the general effect of the blossom. The leaves are much larger, so that in this species the stem appears more clothed with foliage, while the stipules at the base of the leaf-stalks are very much more conspicuous than such members ordinarily are, and, from their deeply-cut segments, their size, and the general quaintness of their effect, appear admirably adapted to art treatment. The whole plant would appear to be in an especial degree suggestive to the designer.

PLATE 28.

"Let the earth bring forth grass, the herb yielding seed, and the fruit-tree yielding fruit after his kind, whose seed is in itself, upon the earth; and it was so. And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good."—GENESIS i. 11, 12.

The *Aconitum napellus* (Monk's-hood or Wolf's-bane), though apparently really naturalised in some few localities, is ordinarily to be met with only as a cultivated flower in Britain. It is a true native of the wooded and mountainous parts of Western Europe, but appears not to have been known in England until about the reign of Queen Elizabeth. As a garden plant, it possesses, in addition to its striking character, one great recommendation, as it will grow under the drip of trees, and in shady spots where most other plants refuse to thrive.

The whole plant is exceedingly poisonous in its nature; every part of it possesses very virulent properties, though in the root these properties are intensified. The ancients had so great a dread of it that many superstitious cautions were observed in gathering the herb, that the gatherer might escape scot-free from the peril involved in the undertaking. The Greeks ascribed its discovery to Hecate, and its first origin to the foam dropping from the jaws of Cerberus, the janitor of Hades—points in its mythical history that at least serve to prove their recognition of its deadly power.

The Monk's-hood is still retained in use as a medicinal plant, though, from its strength, great care is needed in its employment: it is occasionally used externally as a sedative in neuralgia and diseases of the heart. It is cultivated, together with its allies, *A. paniculatum* and *A. decorum*, in the botanical gardens at Mitcham, in Surrey, for use in medicine.

Fatal accidents have from time to time arisen from the roots having been eaten in mistake for horse-radish. Turner, one of the old Herbalists, cites a case as a warning at the time of its introduction into England, and as it still remains no less a warning to all those who at the present day cultivate the plant in their gardens, we will quote his remarks. "About twenty yeare ago," he writes, "certeyne Frenchmen at Antwerp, willing to make a sallet, gathered the rotes of blew Wolf's-bayne and eat them, but as many as eat of them, died all within two dayes, wherefore if they had been better learned in the knowledge of herbes, they mighte have avoyded the hasty death that they come to. Let oure Londiners, which of late have receyved this blew Wolf's-bayne, otherwise called Monke's-coule, take hede that the poyson of the rote of this herbe one daye do not more harme, than the freshnesse of the flower have done pleasure in seven years; let them not saye but they are warned." When once established in the ground it is very difficult to eradicate it. The most potent form of the drug is found in the alkaloid, Aconitina, that by skilful preparation is procured from the roots; in the case of a man who had eaten some Monk's-hood root, it was found on analysis that the amount of this alkaloid contained in the bulk he had with fatal results taken, could not have exceeded five one-hundreths of a grain in weight; the

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active principle of this plant is the most deadly known, not even excepting hydrocyanic acid. All chance of accidental poisoning can be at once removed if the roots of supposed horse-radish are, after scraping, allowed to have free exposure to the air for a short time; if they are really horse-radish, little or no change of colour is seen, while, if Monk's-hood, they will speedily turn of a pinkish-brown colour.

During our Indian wars, the wells and tanks have been repeatedly poisoned on the advance of our army, by throwing bruised aconite root into them; the natives of India also use a preparation of the plant to poison arrows with, when hunting the tiger and other wild beasts;—an application of its powers that has been in vogue since very ancient times, hence the name Wolf's-bane, and the generic term *Aconitum*, derived from the Greek word for a dart, in allusion to its use in rendering still more deadly the weapons of war or of the chase.

The Monk's-hood has a firm and erect stem, from eighteen inches to three feet high; the leaves are stalked, though those on the upper part of the plant are so slightly so as to appear almost sessile; all the leaves are of a dark bluish-green, and very glossy in appearance, divided into three, five, or seven deeply-cut segments, the upper ones being of much simpler outline than the lower. The inflorescence is racemose, the flowers being large, and of a dark and sombre purple hue. The calyx, by far the most conspicuous part of the blossom, is composed of five petaloid sepals; the upper one is semicircular, and from its form, and the way it closes over the others, resembles a helmet or a monk's cowl; the petals are two to five in number—two, of very abnormal petaloid form, being contained beneath the hood of the upper sepal, the remaining petals, when present (which is not always the case), being very small and narrow. The fruit (fig. 230), composed of three to five carpels, is a quaint and not unornamental feature.

The calyx, though in most cases resembling a little green cup (as in figs. 35, 81, 122, 144, 154, 165, 237, 275, and many other examples), is at times considerably altered both in form and colour, and may thus prove more difficult of recognition, especially to the beginner. The sepals, as we have seen already in some earlier remarks, sometimes fall away at the commencement of flowering, the Corn Poppy is a good example of this; sometimes at the conclusion, as in the Buttercup, while at other times they are what is botanically termed persistent, and do not drop off. In this case they either wither up after flowering, as in the Broom (fig. 97), become fleshy, or, remaining foliaceous, grow larger, and are then said to be accrescent—*ex.* Winter Cherry *(Physalis Alkekengi)*. When the calyx is not green it is said to be coloured, since, botanically, green in such a relationship is not held to be a colour. In all plants in which the calyx and the corolla are so similar as to be unitedly termed the perianth, the sepaloid parts are generally as brilliant in colour as the petaloid—*ex.* Crocus (fig. 111), the White and Orange Lilies, the Tulip, Crown-imperial, Daffodil, Snowdrop, and many others. In the Wolf's-bane, the calyx, it may be seen, is purple, while in other plants it is white, crimson, yellow, orange, or blue.

The forms assumed by the calyx are at times as varied as the colours, and as great a deviation from the typical character; thus, in the Wolf's-bane, the irregular form of the calyx is surmounted by a very large and cap-like sepal; this form, from its resemblance to a helmet, is called galeate: in the Primrose or Fuchsia, the calyx is tubular; in the Chickweed, stellate; and numerous other examples might be added. In some plants the calyx is obviously composed of an aggregation of distinct parts; in others, from the growing together of these parts, the whole form seems composed of one piece, as in the Soapwort *(Saponaria officinalis)*.

PLATE 29.

"The soul and nature are attuned together. Something within answers to all we witness without. When I look on the ocean in its might and tumult, my spirit is stirred, swelled. When it spreads out in peaceful blue waves, under a bright sky, it is dilated, yet composed. I enter into the spirit of the earth, and this is always good. Nature breathes nothing unkind. It expands, or calms, or softens us. Let us open our souls to its influences."—CHANNING.

The Yellow Rattle *(Rhinanthus crista-galli)* is one of our common plants, being found, at times, in such abundance in pasture-land as to be really a nuisance to the farmer. It attains to a height of one to two feet, the stem being sometimes simple, as in fig. 234, but more generally branched (fig. 233); it is sometimes spotted with purple. The leaves are in pairs on the stem, lanceolate in form, and coarsely toothed. The blossoms are arranged in a loosely spicate manner, springing from the axils of the floral leaves, calyx inflated and four-toothed, as shown in figs. 237, 238, enlarged views of the flower as seen from the side and from above. After the flower has fallen, and during the ripening of the seeds, the calyx continues to increase in size; the lower forms, as will be seen in our plate, being much larger than the upper and more recently developed

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When the fruit is ripe, the seeds rattle within their husky capsule; hence the familiar English name. It is in some districts known as Cock's-crest; in France, *Creste du Coq*. The Rattle is a very variable plant, both in the form of the leaves and the size and number of the blossoms; on these accounts, the earlier botanists distinguished three or four supposed species; but further observation of these variations of form does not confirm the ideas of our predecessors, as these peculiarities are neither constant in themselves nor sufficiently marked to justify the creation of additional species; and, as the plant is parasitic, adhering to the living roots of the grasses, and other plants of the meadow, by means of little suckers, there is but little doubt that these trifling variations arise from greater or less nourishment, and what we may here term accidental or external circumstances, and do not point to any specific differences in the various plants observed. The plant flowers during May, June, and July.

The Red Rattle *(Pedicularis palustris)*, an allied species, is another plant well deserving of the ornamentist's regard, its crimson flowers and very richly cut pinnate leaves rendering it a very handsome plant. It will be found figured in Curtis and several of the other books we ventured in our opening remarks to direct the attention of the student to (see pp. 12, 13); or better still, in all its natural beauty, in marshy land and watery ditches from May to September.

Both the plants named are to be met with over a very large area of country, being found throughout Russian Asia and Europe, from the Mediterranean Sea to the Arctic regions. In Sweden, the farmer judges that the fit time for gathering in his hay has arrived when the seeds of the Yellow Rattle are heard in their capsules. In looking through a Flora of Iceland for another purpose, we found the *Rhinanthus* mentioned, and being at the same time struck with the great number of other familiar English plants, that enter into the nosegays of the little Icelanders in their chilly northern home, we make but slight apology for mentioning a few of those that will be familiar to our readers, viz.—Dog-Violet, Marsh-Marigold, Shepherd's Purse, four kinds of Buttercups, Water-Cress, Blue Meadow Crane's-bill, Bird's-foot Trefoil, Silverweed, Tormentil, Wild Strawberry, Water-Avens, Stone-crop, Ivy, Goose-grass, Yellow Bed-straw, Daisy, Dandelion, Milfoil, Groundsel, Harebell, Forget-me-not, Foxglove, White Dead-nettle, Purple Dead-nettle, Stinging-nettle; to these, did our space seem to justify it, we might add many others.

In figs. 235, 239, 240, 241, 242, we have suggestions of the use of the plant in design. The ornamental treatments that we have from time to time introduced are not by any means the best of which the plants are capable, as we are here of necessity placed under limitations of space and simplicity of colour that narrow the scope afforded; still, in the hope that these simple treatments may at least prove suggestive to the designer, we insert them. No. 240, for instance, would produce a richer effect, if, while preserving the two greens, the ground were made a deep maroon, the outlines and veins of the leaves being given in gold. Figs. 235, 239, are intended as simple forms for stencilling; the reader will easily perceive that, in the first of these, the limited space has prevented our making it bi-symmetrical. Stencilling affords a simple and effective means of decorating surfaces where great delicacy is not imperative, and where the forms are removed at some little distance from the eye. The *modus operandi* is as follows: the design selected is cut out in a sheet of thin metal, the parts cut away being those that enter into the ornamental form, so that, on placing the plate on the surface to be decorated, the perforations are brushed over with a stiff brush, primed with the required colour, and the design is thus transferred at once to the wall or other flat surface. Copper is the metal ordinarily employed, as it lies more flatly than brass (which being cheaper is sometimes used), as closeness of contact is an essential point, or the hairs of the brush will get beneath the edges of the plate, and destroy the sharpness that is so indispensable in this kind of work. The design is either cut out by the graver, or etched with acid; very frequently both processes are employed, as the pressure necessarily used with the graver has a tendency to warp and stretch the plate, while, on the other hand, the acid leaves a ragged edge: by first etching the forms, however, and afterwards sharpening them by the graver, the maximum of advantage is gained.

In the designs figured 240, 241, the natural arrangement of the leaves in pairs is the feature introduced. In fig. 240, the cross-like arrangement of the foliage, as seen in plan, each pair of leaves being at right angles to the pair above it, is the point utilised, while, in fig. 241, single pairs are worked up into a diaper, the central spots representing the section of the stem, and the sessile leaves being seen thrown off on either side. In works on ornament a certain amount of confusion seems to exist as to what constitutes a diaper, that term and powdering being often used as synonyms. It appears to us, however, that there is a marked distinction between typical examples of these two treatments, though undoubtedly there are debatable instances that, partaking of some of the characteristics of both, are hard to assign rigidly to either: thus, Pugin says that the term "diaper" signifies a continuous pattern of varied colour, in contradistinction to a detached or

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scattered pattern; yet some of the examples he gives as diapers are composed of an aggregation of detached forms; while Parker defines it as an ornament of flowers applied to a plain surface, whether carved or painted; if carved, the flowers are entirely sunk into the work below the general surface—and adds that diapers are usually square and placed close to each other. The true solution of such a question may often be found by a little study of the etymology of the word under consideration, but in the present case it is but little help to us, as there is a division of opinion, one derivation being suggested by the small ornaments of this character so freely found on the fabrics made during the middle ages at *Ypres*, in Flanders, while another and more probable one is based on the old French word, *diapré*, variegated, or *diaspre*, a jasper stone. Chaucer speaks of a meadow diapered with flowers. A diaper, as it appears to us, is the repetition at regular intervals of a form, such form, though generally floral or foliated, having a geometric basis; the forms may be either in contact, as in fig. 232, united into one composition by bands or lines of colour, as in figs. 161, 180, 182, 314, 325, or detached, as in figs. 217, 240, so long as the geometric arrangement is felt. It does not appear to us necessary that the pattern should be of varied colour, nor that it should be of necessity composed of floral forms; grotesque animal forms, monograms, and arbitrary conventionalisms, have all from time to time been employed in forming what we think are entitled to be considered true diaperings. It is by no means needful that the general bordering lines should throw the composition into squares, as in fig. 334; hexagons, fig. 323; the rhombus, or diamond, figs. 183, 241, 299, 314, 324; the equilateral triangle; the semicircle, fig. 347; the vesica, figs. 101, 325; the circle, figs. 232, 269, or curved forms of a compound character, figs. 147, 284, 326, are as legitimate in employment, and frequently more beautiful in effect. A powdering we conceive to be the repetition of a given form at irregular intervals; thus, the grounds of figs. 345, 349, are illustrations of it, one being powdered in white, the other in blue and gold. Golden stars in a ceiling are often seen powdered on a ground of blue. The forms employed in diapering and powdering may be varied, they are not of necessity fac-similes of each other throughout a given composition; thus, in the stellate powdering we have alluded to, some of the star-like forms may be larger than others; some may have four points, others five, six, or eight, while, in the more rigid composition of the diaper, though it is essential that the masses harmonise, the details may be varied. A diaper, for instance, may be composed of the heraldic rose, thistle, and shamrock, or the symbolic monogram, chalice, and thorny crown.

Where so vast a field is open to the designer, no rigid line can be drawn—no definition so carefully worded as to satisfy every case. Hence, while we have given our ideas on the subject, we feel bound to confess that the student will, no doubt, from time to time, come across examples that can with difficulty be assigned to either class. We have, however, in the foregoing remarks, defined what we think to be the true meaning of the terms diapering and powdering, when used most legitimately in the description of art-work of an ornamental character.

PLATE 30.

"And as for me, though that I konne but lyte,
On bokes for to rede I me delyte,
And to hem give I feyth and ful credence,
And in myn herte have hem in reverence
So hertely that there is game noon,
That fro my bokes maketh me to goon,
But yt be seldom on the holy day,
Save, certynly, when that the monethe of May
Is comen, and that I here the foules synge,
And that the flowres gynnen for to sprynge."—

CHAUCER—"*Legende of Goode Women.*"

The genus *Centaurea* includes several plants of highly ornamental form, and rich in suggestiveness to the designer. We have in the present plate represented two of these (the *C. nigra* and the *C. Scabiosa*), while the others more especially worthy of attention are the *C. Cyanus*, the brilliant blue flower found so commonly in the growing corn, and introduced very beautifully in a 16th century MS. in the British Museum, the *C. Calcitrapa* and the *C. solstitialis*. The Black Knapweed (*C. nigra*) is very abundantly met with throughout Britain in meadows, pasture-lands, and by the roadsides, and as it flowers throughout the summer, it can easily be procured at almost any time by any one desirous of studying its natural growth, not from illustrations, but by the far preferable way—direct appeal to Nature. It presents two very distinctly marked typical forms, varieties, however, of the same species, as so many intermediate forms are found between these two that, though the differences are marked enough

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in the two extremes, one passes by these gradations of form so imperceptibly into the other as to forbid the idea of any specific difference. The following are the leading characteristics, such features as would strike the ordinarily careful observer, ignoring as foreign to our present aim more refined differences of structure :—In the *C. nigra, var. genuina*, the branches are short and much thickened beneath the flower heads, the florets all equal and in a compact head ; in the *C. nigra, var. decipiens*, the branches are slender and thicken but very slightly beneath the flower heads, and are less clothed with leaves than in the preceding, while the most marked difference is seen in the flower heads, the latter variety having an outer row of large and radiant florets. The first form is found throughout Britain, and becomes the typical plant in the north, the second variety, though as abundant in many localities as the other, being confined almost entirely to the more southern counties. The upper leaves in both varieties are of very simple form, linear or lanceolate in outline, the lower ones being often (figs. 244, 245) slightly lobed, though in other cases (fig. 246) the leaves merely broaden, and do not throw out any lateral lobes. The *Centaurea* genus derives its name from a belief in its medicinal effects that was firmly held throughout the middle ages, it being fabled that the Centaur Chiron cured himself, by means of one of these plants, of a wound inflicted by Hercules. Country people give them many expressive names, as in some places they are called Hurt-sickles, from their tough and wiry nature, while in other localities they are known as Hard-heads or Iron-weeds, in allusion to the very solid mass on which the florets are set.

The *C. Scabiosa*, or greater Knapweed (fig. 247), though more local than the Black Knapweed, is not unfrequently found in pastures, hedgerows, and waste ground, though it is rare in Scotland. It is one of the numerous plants that appear to thrive best on the chalk, and in such a district it is generally very commonly to be met with. The whole plant is stouter than the preceding ; the stems attain to a height of some three feet, and are considerably branched. The leaves are firm in texture, and deeply pinnatifid, giving a very rich effect to the plant. The lower leaves are very large, so large that press of space has necessitated our representing one of them away from the present plate ; it will be found on plate VI., fig. 66, though even there we have been obliged to considerably reduce it from the natural size. The involucral bracts (fig. 248) are very large, and with a sharply defined black fringe, that gives a markedly ornamental character to the flower-head. It will be noticed that in this species the stem does not thicken beneath the flower-head, nor has it the agroupment of small leaves characteristic of that part in the *C. nigra*.

The overlapping or imbrication (Lat. *imbrex*, a roofing tile) of the bracts of the involucre, bears a strong likeness to what, from its resemblance to fish scales, is known ornamentally as the scale-form. The scale-form is composed of a series of semi-circles, arranged as shewn in figs. 218, 347 ; the decorative effect being produced, either, as in those examples, by the filling in of foliate forms, or by variation of colour in the scales themselves. It is one of the earliest ornamental forms and one of the most universal, being found abundantly in every style of decorative design, in the Egyptian paintings some three thousand years old, throughout the Ninevite or Assyrian, Persian, and Chinese styles in Eastern art, and in the Norman, Gothic, and Renaissance periods of Western art, the natural fish scale being doubtless the proto-type.

PLATE 31.

"For many years it has been one of my constant regrets that no schoolmaster of mine had a knowledge of natural history, so far, at least, as to have taught me the grasses that grow by the wayside, and the little winged and wingless neighbours that are continually meeting me with a salutation which I cannot answer, as things are. Why didn't somebody teach me the constellations too, and make me at home in the starry heavens that are always overhead, and which I don't half know to this day? I love to prophesy that there will come a time when, not in Edinburgh only, but in all Scottish and European towns and villages, the schoolmaster will be strictly required to possess these two capabilities (neither Greek nor Latin more strict), and that no ingenuous little denizen of this universe be thenceforward debarred from his right of liberty in those two departments, and doomed to look on them as if across grated fences all his life."—CARLYLE.

The Agrimony (*Agrimonia Eupatoria*), the subject of the present plate, is very commonly distributed throughout England and Ireland, and more sparingly met with in Scotland. It flowers throughout the Summer months. From the smallness of the blossoms, it is a plant that may easily be overlooked in the masses of undergrowth found in the hedgerows, its favourite habitat. Though subject to much variation, both in size and form, it is ordinarily from eighteen inches to two feet high. The plants vary in the hairiness of the foliage and stem, in the form of the calyx and the size of the flowers, hence some botanists have been prepared to divide the present into one or more sub-species, or even to give to some a distinct specific claim, but the differences do not appear sufficiently marked nor constant enough to justify their being considered more than accidental variations from the typical form. The yellow

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blossoms are loosely and spirally arranged in long, terminal spikes. The petals, five in number, alternating very pleasingly in form (fig. 250), with the sepaloid masses of the calyx. The spikes, unlike those of many other plants, are not clothed at all with leaves, but each flower springs from the axil of a small bract, three or five-cleft, and flanked by two smaller bracteoles; these bracts may be seen indistinctly in fig. 249, and much more clearly in the enlarged views, figs. 254, 255, 256. The lower leaves of the plant (fig. 258) are large, and have on each side from seven to nine large lateral leaflets, intermixed with numerous smaller ones, these and the large terminal leaflet being very coarsely serrated, while the upper leaves, though similar in general character, have a smaller number of leaflets (fig. 251), and the leaf as a whole is not so large. The calyx during flowering points upwards, but on the death of the blossom turns downwards, as shewn in our illustration, rapidly enlarges, and becomes covered at its summit (fig. 253) with a number of hooked bristles.

Chaucer speaks of the plant as the "Agremoine," but many old writers term it *Philanthropos*, on account, as some say, of its beneficent medicinal properties, or, according to others, from its calyces clinging to the clothes of the wayfarer, as if desirous of being his companions in travel. The generic name, *Agrimonia*, is a corruption of *Argemone*, a name given by Greek writers to a plant supposed to cure cataract.

The Agrimony is one of the most favourite remedies of the old herb doctors, being used not only in cases where its tonic and febrifugal qualities would really be of service, but also, on the principle of a good thing never being out of place, in many remedies where its benefits could only spring from a strong faith in its power: thus, for the relief of hæmorrhage a sovereign cure was compounded of human blood, pounded frogs, and agrimony—a remedy that, were such diseases at all under the influence of the will, would certainly, from its nastiness, effectually cure any one, and prevent a repetition of the attack. Another writer, in spreading its fame, explains to what causes its potency must be attributed; for he tells us that "it is an herb under Jupiter and the sign Cancer, and strengthens those parts under the planet and sign, and removes diseases in them by sympathy; and those under Saturn, Mercury, and Mars by antipathy, if they happen in any part of the body governed by Jupiter, or under the signs Cancer, Sagittary, or Pisces." In some astrological way, of which the secret would appear to be now lost, he finds it a vermifuge, a remedy for gout, liver complaints, inward wounds, the biting of serpents, colic, cough, ague, cancer, deafness, and many other of the ills of mortality, extracting thorns, strengthening the joints, cleansing, opening, and binding; in fact, it would appear, so varied are its healing powers, to be as potent as some, at least, of the patent medicines of the present day, and a possession as valuable to the 15th century as those are to the 19th.

As we have had occasion to refer at some little length to the bracts of the Agrimony, we will take the opportunity of explaining the nature of bracteal forms, since, under various modifications, they are frequently met with, and are frequently features of sufficient importance to become an element in the treatment of a plant in design. Some little knowledge of their nature will, therefore, be an advantage to the student.

The term bract is applied to the leaves of the floral stem when they differ from the other leaves in size, shape, colour, or arrangement: they are ordinarily much smaller than the leaves (as in present example) and sessile. Bracts, though generally green, are not invariably so; thus, in the *Astrantia major*, they are white, or tinged with pink; when coloured they ordinarily partake of the colour of the blossom. The one or two last forms beneath the flower, when differing in some marked degree in size, or form, or colour from the other bracts, are sometimes termed bracteoles. Bracteal forms often insensibly merge into the ordinary foliate forms of the plant; the intermediate forms that, from their position, may be either lower bracts or upper leaves, and can scarcely be satisfactorily assigned to either class, are often termed leafy bracts or floral leaves. Bracts are true leaves modified by their position: this may be easily known, not only by a study of the scarcely perceptible gradation between the two noted above, but also from the fact, that in many plants the bracts develop into true leaf forms. In some foreign species the floral leaf, in its transformation into a bract, instead of retaining its foliaceous character, becomes a spine, a tubercle, or a tendril.

When the floral stems, as in the umbel of the Carrot (*Daucus Carota*), and the capitulum or flower head of the Daisy (*Bellis perennis*), rise from nearly the same point, the ring of bracts thus formed is called an involucre or *involucrum*; where, as in many of the umbellate plants, the umbel is compound—that is to say, where each ray, instead of bearing one flower, has at its summit a smaller umbel of flowers—the bracts of the lesser umbel form an involucel. In capitulate growth, as in the Daisy, Dandelion, and other composite flowers, the bracts of the involucrum form an envelope of several imbricating rows, so that many beginners, thinking of the Dandelion as one flower, instead of an aggregation of flowers into one head. mistake the involucral bracts

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for a calyx. A very abnormal form of bract is seen in the Cuckoo-pint *(Arum maculatum)*: it is shown in fig. 328, the large sheathing and enveloping body protecting the enclosed organs of the true flower: this development is known as a spathe.

Referring to our sheets for illustrative examples, we notice, in figs. 79, 81, the curious involucre of three bracts forming a sort of outer calyx to the Musk Mallow, and the spiny development of the involucral bracts of the Milk-thistle, fig. 103. Other examples of bracteal forms are seen in the Everlasting Pea, fig. 163, and the blue Meadow Crane's-bill, fig. 184. When the bracts are very small, they are sometimes called scales; the Monk's-hood (fig. 228) is a good illustration. The involucrum, so characteristic of capitulate flowers, is exceedingly well shown in the *Aster alpinus* (fig. 296); while the *Linum flavum* (fig. 279) and the Foxglove (fig. 286) exemplify the gradual transition from foliate to bracteal form.

PLATE 32.

"The mountains old and hoar,
The chainless winds, the streams so pure and free,
The God-enamel'd flowers,
The waving forest, the eternal sea,
The eagle floating o'er the mountain's brow,
Are teachers all."—NICOLL.

Lamium maculatum, Spotted Nettle. This species, though occasionally found in a wild state, will be more ordinarily met with in gardens, as, from its striking foliage and the profusion of blossom, it is a favourite of the cottager. It is perennial and an early flowerer—two further recommendations. The lower leaves have a white streak or a series of blotches, more or less confluent, running down the centre, the upper leaves being sometimes as freely marked, at other times green throughout, or blotched with purple. The general growth of the plant is very similar to the common White Nettle *(L. album)*, but the flowers, besides being purple in this species, are only about half as numerous in each ring or whorl. Throughout Southern Europe the *L. maculatum* takes the place of the *L. album*, being generally as common as the latter is with us. By some old botanists the present plant was called the *Urtica lactea*, or Milk Nettle; by others the *Lamium albâ lineâ*, or White-lined Nettle, both names being based on the characteristic marking of the leaves.

Figs. 259, 260, give the natural growth of the plant, fig. 261 the cordate form of one of the lower leaves, fig. 262 the more acute character of the upper leaves. Fig. 263 shews that the stem of this species, like that of the *Labiates* generally, is quadrangular in section, a feature that, as we see in the drawings of the general growth, gives a strongly marked character. Figs. 265, 266, and 267, are enlarged views of the flower, the first two giving its appearance in profile, with and without the calyx; the last, the front view of the blossom. Fig. 268 is the bud immediately before expansion.

The remaining illustrations are suggestions of ornamental treatment; the first, fig. 264, being based on the foliage alone, while in figs. 269, 270, the inflorescence enters into the composition. In fig. 269, the diaper is composed of a series of plan views of the whorls of buds, the square being the central axis or stem-form; in fig. 270, the lateral or elevation growth is suggested, the whole springing, as in Nature, from the point whence the leaves issue, and the leaves, as in the natural growth of the plant, being alternately presented in front and side-view, the plant, like the Ground-Ivy and many others, having its pairs of leaves at right angles, with those that immediately precede or succeed them.

The *Lamium maculatum*, from its general lightness of growth, the large size and pleasing colour of its flowers and its striking foliage, beautiful alike in form and colour, will be found full of suggestion, where design of a light and graceful character, as in lace, chintz, &c., is required.

The leaves of the Wild Arum, or Lords and Ladies (fig. 328), are sometimes blotched with white, though more ordinarily the spots are of a dull purple. Several of our plants have additional interest, speaking now as ornamentists, thus imparted to them; we may merely mention here the spots found on the leaflets of the various species of Trefoil, and the large single purple spot in the centre of the leaf of the Persicaria; the spotted stem of the Hemlock is a somewhat analogous feature, and our readers will, doubtless, on but slight investigation, detect many other such examples in Nature. The Milk Thistle, already figured and described, is a peculiarly fine illustration. At Kew and other fine botanical collections, many tropical plants may be seen, that owe all their interest and beauty to the brilliantly variegated colours of their foliage. The *Maranta* leaf, already referred to, is a somewhat simple illustration; many of the plants being considerably richer in colour, some being blotched or streaked with crimson or purple; others with yellow, white, or black.

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PLATE 33.

"I have been plucking (plants among)
Hemlock, henbane, adder's-tongue,
Nightshade, moonwort, libbard's-bane."
—JONSON's *Masque of Queenes.*

The Deadly Nightshade *(Atropa Belladonna)*, is one of our most striking plants, and possesses so distinct a character of its own that it cannot by any possibility, when once seen, be mistaken for any other plant. It is not at all a common plant however, and its familiar name is often erroneously applied to another plant, the *Solanum Dulcamara*, or Bitter-sweet; though, as our readers will see on comparing the leaf, flower, and fruit of this last (figs. 276, 277, 278) with those of the Deadly Nightshade, there is no shadow of resemblance. The Deadly Nightshade is found on waste land, and more especially amongst ruins; it attains to a height of from three to four feet. The stem is thickly clothed with leaves, these being in pairs, and one always very much larger than the other. The flowers are solitary, tubular in form, of a lurid purple colour, and spring from the axils of the leaves. The blossoms are succeeded by berries that are at first green, but ultimately turn black, and are not unlike a cherry in size and colour; hence many fatal accidents, as, while the whole plant is poisonous, the berries are especially deleterious. The generic name, *Atropa*, is derived from *Atropos*, one of the evil destinies or Fates in classic mythology. The Nightshade is also often called Dwale, and especially by the older writers,* being derived from the Anglo-Saxon *dwal* (foolish), in allusion to its stupifying properties, or, as some say, from the French, *deuil*, mourning. The Danes call the plant *Dwale-bær*, literally, torpor-berry; in Germany, it is the *Tollkraut*—the *toll*, frantic or raving, *kraut*, herb; while the specific name, *Belladonna*, is derived from the Italian language, the meaning being "beautiful woman." The name originated in the practice of using the plant as a cosmetic, though we should have imagined that any added beauty thus derived would have been dearly bought. In Spain the plant is known as the *Bella dama*.

The Dwale is used medicinally. It is narcotico-acrid, and when applied externally to the eyes, causes great dilation of the pupil—a curious property that has rendered it valuable to oculists in treating various diseases of the eye: the effect follows in a few minutes after the application, and remains for some little time. It is a very dangerous plant where it grows within reach of young children, as the blossoms are somewhat tempting in appearance, and, being sweet to the taste, have frequently proved the source of much mischief; hence, no doubt, its scarcity, as, when found, it is often destroyed as a dangerous plant, and the advice of the old herbalist, Gerarde, is scrupulously followed—"If you will follow my counsell, deale not with the same in any case, and banish it from your gardens, being a plant so furious and deadly. Banish, therefore these pernitious plants out of your gardens, and all places neere to your houses, where children do resort, which do oftentimes long and lust after things most vile and filthie, and, much more, a berry of a bright shining black coloure, and of such great beautie."

The Scottish historian, Buchanan, states that the Danes were defeated, or rather destroyed, by the Scottish troops, under Macbeth, through an act of treachery, ale and bread poisoned by the juice of the Dwale being sent as a present, during a truce, to the Danish army under Sweno. The whole story, however, is too dubious in itself, and relates to too mythical a period in Scottish history to possess much value.

The Woody Nightshade, or Bitter-sweet *(Solanum Dulcamara)* is a very common hedge-row plant, its size and trailing habit, the brilliant purple of the blossoms, and the bright crimson of the mature fruit, rendering it very conspicuous. The stalks, when tasted, have a slightly bitter flavour, followed by a curious sweetness—a peculiarity pointed out in the specific name *Dulcamara* and the familiar English name Bitter-sweet, the French *Douce-amere*, the Spanish *Amaradulcis*, the Italian *Dulcamara*, the German *Bittersusstangel*. Though a poisonous plant, it is far less so than the true Deadly Nightshade. The trailing habit, the clustering flowers, the stellate form of the individual blossoms, the smallness and brilliant colour of the fruit, and the lobed and halberd-shaped leaves, are all features that distinguish it very completely from the *Atropa Belladonna*.

* "There needeth him no dwale"—CHAUCER; *i.e.*, no need of any narcotic to provoke sleep.

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PLATE 84.

"To mark His presence in the mighty bow
That spans the clouds, as in the tints minute
Of tiniest flower: to hear His awful voice
In thunder speak, and whisper in the gale:
To know and feel His care for all that lives:—
'Tis this that makes the barren waste appear
A fruitful field, each grove a paradise."—GRAHAME.

The first of our illustrations, fig. 279, is devoted to a representation of the natural growth of the *Linum flavum*, or Yellow Flax; figs. 280 and 281 being side views of the opening bud and fully expanded flower, while, in fig. 285, we have an ornamental adaptation of the plant.

The Yellow Flax, though not indigenous to England, being one of our garden flowers exclusively, has a claim on our attention, we think, from its admirable features as an ornamentist's plant, the leaves being simple and good in form, the general growth pleasing in itself and well defined, and the flowers simple and bold in character. The plant is a hardy perennial: it was first introduced into England from Germany, where it is indigenous, in the year 1792. In its native country it is one of the plants found amongst the undergrowth in coppices and hedgerows on mountainous ground. The Yellow Flax flowers freely during June, July, and August; the whole plant is ordinarily from nine to twelve inches high. A very similar plant to this, though more delicate in form and constitution, may, from time to time, be met with in green-houses; it is a native of the Levant, and is known botanically as the *L. arboreum*.

The English species of Flax are all of a very ornamental character, and very similar in general form to the plant here figured. The *L. catharticum* throws up a mass of very small flowers of a pure white, the flowers of the *L. augustifolium* being of a delicate shade of blue, and those of the remaining species, the *L. perenne* and the *L. usitatissimum*, of a rich purple blue. The latter is an especially ornamental plant, and is not uncommonly met with in corn-fields. It furnishes the flax and linseed of commerce. The word *linum* is derived from the Celtic *lin* (a thread), and obviously refers to the value of its fibre in manufacture, the stem, after maceration, furnishing the strong thread used in the fabrication of linen. This allusion to its commercial value is seen, too, in its familiar English name, flax being derived from the old German *flechten*, to plait or weave together; hence the modern German name for the plant is *Flachs*. Other languages curiously agree on the same point: thus, the plant in France and Sweden is *lin;* in Portugal, *linho;* in Spain and Italy, *lino;* in Russia, *leonn;* in Holland, *vlas*. Flax is interesting as being probably the first material used in textile fabrics, mention of it being made at a very early period in the Bible. Amongst the ancient Egyptians it furnished the mummy-wrappings, and was largely exported to other countries. The various processes of manufacture, the preparatory steeping in water, the after-beating of the stems, spinning of twine, and the ultimate weaving of it into cloth, are all graphically represented in the tomb paintings of Thebes.

The remaining figures, Nos. 282, 283, 284, illustrate the natural growth of the *Geranium lucidum*, or shining Crane's-bill, and its adaptation to art-work. The present plant is one of the commoner species of *Geranium*, growing, as it does, very freely on hedge-banks, rocks and walls, though it is not found in the northern counties of Scotland. It flowers during May, June, July, and August. The stems are very brittle, swollen at the joints, and spreading in growth. Both leaves and stems are very glossy, hence the appropriate familiar English name. The whole plant, when in exposed situations, frequently turns a brilliant crimson, and then presents a very beautiful appearance, as the colour is not, like most changes of tint, the forerunner of speedy decay, but remains for many weeks, the plant blossoming, and being in all ways apparently as healthy as in its earlier and verdant days. The same peculiarity is seen in the Herb-Robert *(G. Robertianum)*, an allied species. This rich brilliancy of colour renders these two plants very conspicuous amongst the surrounding herbage, and will greatly assist in their identification by any of our readers to whom they are at present unknown. The leaves and flowers of the shining Crane's-bill, it will be noticed, both grow in pairs.

Even in so apparently simple a matter as the stem, the eye, on cultivating habits of observation, soon learns to discriminate several marked varieties of texture and consistency; thus, while in the present plant it is very brittle, in others it is exceedingly rigid; in some, as in the *Cacti*, the stem is very soft and succulent; in others, again, woody and hard. In many plants the stem is smooth, in others downy, hairy, or prickly; or the surface may be covered with a kind of bloom, as in several kinds of cabbage, or spotted, as in the Hemlock *(Conium maculatum)*, or the *Chærophyllum temulentum*. In some instances plants have their stems fluted, so as to give a striped or chanelled effect; the Fool's-parsley *(Æthusa cynapium)* is a very good illustration; while in some plants the ridges are much more conspicuous, and the stem appears deeply grooved, as in the Parsnip *(Pastinaca sativa)*.

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PLATE 35.

"Herkeneth these blisful briddes how they synge,
And seth the freissche flowers how they springe,
Ful is myn hert of revel and solaas."—CHAUCER. "*Canterbury Tales.*"

The Foxglove *(Digitalis purpurea).* This plant, one of the most striking and beautiful of our native flowers, is very commonly to be met with in woods and by the hedge-banks in most localities, though it is but seldom seen in chalk or limestone districts, or in the more eastern counties, as Norfolk or Suffolk. It is very abundant in mountain districts, the Welsh hills, for example, being profusely clothed with it. The stately flowering stems thrown up attain to a height of six feet, or even more, under exceptionally favourable circumstances, the upper part being clothed with the numerous large flowers. The blossoms, normally purple, are occasionally met with of a pure white; this variety, from its being frequently cultivated in gardens, will, no doubt, be familiar to many of our readers. The corolla is campanulate and unequally lobed. The calyx is composed of five segments, four of them being broad and bold in character, the fifth, the upper one, being much narrower and more acutely pointed, as may easily be seen in figs. 293, 295, the front and back views. The main stem frequently throws out small lateral stems from the lower part, and it is one of these smaller pieces that we have selected, since it is necessary for our purpose that as much as possible of the varying character of the plant should be represented. Had we taken the central stem, we must either have reduced the whole very considerably (a course not altogether advisable), or, preserving the natural size, have given but a portion of the long line of flowers, frequently forty or fifty in number; by taking the lateral shoot we are able to introduce both the bud, the flower, and the ripening fruit, and thus get an insight into the whole history of the plant.

The Foxglove is one of our medicinal plants, and has considerable value in certain disorders of the heart, as it possesses the power of diminishing its action. It is, however, a rather dangerous medicine, as its action is frequently cumulative, so that after several small doses may have been given with little or no apparent effect, the whole will suddenly affect the system, giving rise to the most alarming symptoms. It is sometimes administered in acute febrile diseases, its power of reducing the action of the circulation giving it a certain beneficial value, bringing down the pulse from over one hundred and twenty to about forty beats per minute. During the middle ages it was known as the Throatwort, and employed, according to the doctrine of Signatures, already referred to, in cases of ulcerated throat, from a supposed resemblance between that part when thus suffering and the blotched interior (fig. 287) of the flower.

The generic name, *Digitalis*, means the finger of a glove, and the English name similarly alludes to the peculiar form of the flower; the first syllable does not refer to the fox, but to the fairies, the little "good folks," whose favourite haunts were believed to be in the sylvan shades where the Foxglove rears its tall spikes so beautifully. Many of the local names of the plant illustrate still more clearly this belief in the association of the Foxglove with the fairy wardrobe; thus it is called Fairy-Cap, Fairies' Petticoat, Fairies' Thimble, and Puck's-glove. It is also known as Finger-flower and Witches' Fingers, while, in France, it is *Doigts de la Vierge*, or *Gants de Notre Dame;* in Germany, *Fingerhut;* in Holland, *Vingerhoed;* in Wales, *Manyg Ellyllyn* (Fairies'-glove). In the "Flora Veronensis" of Pollinius it is called *Cornucopia*, a by no means inappropriate name, as we may see on consulting fig. 290, the side view of the flower.

PLATE 36.

"He whose name we first find upon record (though, doubtlesse, some had treated thereof before), that largely writ of plants was the wisest of men, even King Solomon, who certainly would not have medled with this subject if he, in his wisdome, had not known it worthie himselfe and exceeding fitting: First, for the honour of his Creator, whose gifts and blessings these are. Secondly, for the good of his Subjects, whereof in this work he had no doubt a speciall regard for the curing of their diseases and infirmities."—JOHNSON, A.D. 1636.

Amongst the varied forms of flowers none, perhaps, have a greater ornamental value in design than those of a stellate or radiant character, the central and convex boss contrasting, as it does, so admirably with the exterior and concave ring composed of numerous similar units. In most flowers of this character, colour heightens the beauty of effect already produced by the form, as in the subject of our plate (the *Aster Alpinus*, or Alpine Daisy), where the central mass is of a rich golden yellow, the outer ring a pure and delicate purple. In the *A. alwartensis* the central portion is yellow, and the rays that surround it a rich pink, while in our Daisy, the *Bellis perennis*, a plant familiar to every one, the centre is yellow, and its radiant fringe pure white.

The *Aster Alpinus* is only to be met with in this country as a garden flower, being a native

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of the mountainous regions of Central Europe, and having no claim whatever to a place in our indigenous flora. In its wild state the plant is rarely more than four inches high, though, when cultivated, it often attains to a height of some eight or nine inches. The plant represented is an especially fine specimen, the elongation of the stem being, however, the main point of difference between wild and cultivated specimens, as those growing naturally, though smaller plants, have their leaves and flowers as large as those shown in the example selected for our plate. The plant blossoms during the latter part of May and throughout June.

The generic name of the plant is based on its stellate character, *aster* being the Greek word for a star. In figs. 297, 298, 299, we have endeavoured to embody the main features of the plant in a series of ornamental compositions. No. 297, though based on the Alpine Daisy, is considerably conventionalised, though not to a greater extent than falls strictly within the province of decorative design. In fig. 298 the plant is introduced as a patera in relief work. On looking at the growing plant, the part that at once strikes us is the large and brilliantly-coloured flower, the leaves occupying a very subordinate place in our regard; the flower, therefore, in the present instance, forms the bulk of the design, the leaves being kept in the background, and strictly subordinate to the floral mass.

The term *patera* was originally applied to a broad flat dish, used by the Romans in their sacrificial rites, to receive the blood of the offering, and to pour out libations to the gods. The materials used in its construction were very various, *pateræ* having been formed of gold, silver, bronze, glass, stone or marble, and clay. The word *patera* was applied to these vessels from their peculiar form, the word being derived from *pateo*, to lie open. The term is used in ornamental art to describe a painted or carved and rosette-like ornament, of circular form, like an expanded flower, though in some few cases leaf-forms (as the Acanthus) are employed. The *patera*, though occasionally seen in Gothic art, is more especially a classic and *renaissance* form; it is also one of the characteristic features of the ornament of the ancient Assyrians.

PLATE 37.

"Bring Corn-flag, Tulip, and Adonis-flower,
Fair Ox-eye, Goldylocks, and Columbine,
Pinks, Goulans, King-cups, and sweet Sops-in-Wine;
Blue Hare-bells, Paigles, Pansies, Calaminth,
Flower-gentle, and the fair-haired Hyacinth:
Bring rich Carnations, Flour-de-luces, Lilies."—BEN JONSON.

Amongst our wild flowers, numerous as they are, and so varied in their charms, there are few more beautiful than the subject of our thirty-seventh plate, the Columbine, the *Aquilegia vulgaris* of the botanist. The Columbine is met with in open woodland scenery throughout Europe, and, though frequently cultivated in our gardens, and often, when found, being clearly but an escape from cultivation, is believed to be truly indigenous in several districts in England, Ireland, and the more southern counties of Scotland. When cultivated, it frequently exhibits curious variations, both in form and colour, from the typical plant, in some cases the petals being greatly increased in number; in others, losing the very characteristic spur; sometimes, again, having the blossoms pink, at others varying in colour from pure white to a very deep and sombre purple. The leaves are chiefly radical on a long stalk (fig. 306), and divided into three very distinct segments, though a few leaves of much simpler character (fig. 300) are thrown off at intervals from the flowering stem. The flowering stems are ordinarily from one to three feet high, and bear numerous blossoms. The sepals, five in number, are of the same colour as the petals, but differ in form, being more acutely pointed, and not having the spurred character of the petaloid forms with which they alternate. The difference of the shape is very clearly seen in the enlarged plan (fig. 305) of the interior aspect of the flower, the rounded forms of the petals contrasting very happily with the more angular character of calyx segments. The curious aggregation of carpels (five in number) forming the fruit (fig. 301), has a quaint character, not without ornamental value. The Columbine has been from time to time employed in decorative art: we have seen it used as a bordering in a 15th century MS.; it was also a badge of the House of Lancaster. It appears in the spandrils of a brass in Exeter Cathedral, to the memory of Sir Peter Courtenay, who died during the reign of the Lancastrian monarch, Henry IV. The Derby family have, in past times, borne as one of their badges a Columbine sprig. The red rose is the best-known Lancastrian badge, owing to its historic connexion with the desolating civil war between the two great factions, but many other badges were employed: thus, the king already named, besides the red Rose and the Columbine flower, adopted as badges a white swan, a crowned eagle, a fox's brush, a crescent moon, a

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crowned panther. Fig. 303 is a representation of the Columbine; it is taken from Sherbourne, Dorsetshire: a piece of 14th century work, and an admirable illustration of the due conventionalism required by reason of the nature of the material in which the design is worked, all the characteristic effect of the flower being produced without that painful elaboration and sense of labour lost that must have ensued had a more literal rendering of Nature been attempted. The design, fig. 304, is a simple repeat, based on the leaf-form represented in fig. 306.

The generic name, *Aquilegia*, is bestowed upon this plant from a fancied resemblance of the spur-like member to the claws of an eagle, Lat. *Aquila*, while the familiar English name, Columbine, is derived from *Columba*, a dove, the petals clustering together, and presenting very much the appearance of a group of doves or pigeons, as may be very well seen in the flower shown at fig. 300, or in the enlarged buds marked 307, 308. An old name, now fallen into disuse, is the Culverwort, which, though very different in sound to Columbine, is very similar in sense, being derived from the Anglo-Saxon *Culfre*, a pigeon.

PLATES 38, 39, 40, 41, 42, 43, 44.

"Surely these are points not wholly uninteresting or uninstructive; they are historical details which many persons may rationally desire to know, and such as no man ever needs to feel himself ashamed of knowing. If I do not here give him the most full and satisfactory intelligence on each particular, let it be remembered that at least I neither cut off nor obstruct his way to more copious sources; on the contrary, I studiously direct the enquirer to further information, wheresoever the opportunity is afforded me."—COTTON'S *Typographical Gazetteer, 1831.*

The remaining plates are more especially devoted to the application of plants to the purposes of design, and from the general sameness of purpose that runs through them, may very conveniently be treated as a whole, dealing with them in the order to which our title refers, first giving some slight description of the natural growth, and secondly, of the ornamental treatment to which it most readily lends itself, adding to these any subordinate points that nevertheless it would be well to take the opportunity of mentioning, if they can in any way be shewn to be helpful to the practical designer.

In fig. 309, the plant selected is the *Crataegus oxycantha*, known familiarly as the Hawthorn, Whitethorn, or May, a tree that at almost all periods has been regarded with affection and interest. By the ancient Greeks and Romans it was adopted as the emblem of Hope. In France it is called *L'épine noble*, from a legendary belief that it supplied the thorny crown of our Saviour; hence it is affirmed that sounds of sighing are heard proceeding from it on the eve of each Good Friday. Another legend relates that on the coming to England of St. Joseph of Arimathea as a missionary, he planted his hawthorn staff in the earth one Christmas day, when it immediately budded and blossomed; a manifest and miraculous proof to the doubting heathen of his sacred mission. It has also heraldic and antiquarian interest, for after the defeat and death of Richard III. at Bosworth, the royal crown was hidden by one of his adherents in a hawthorn bush; it was however soon found, and being carried to Lord Stanley, he placed it on the brow of his son-in-law, crowning him amidst the exultation of the victorious army, Henry VII., hence the House of Tudor bore as a badge, a crown and hawthorn bush. It is also one of the earliest plants of Summer, and Cowley, Pope, Dryden, Chaucer, Milton, Shakespeare, Kirke White, Thomson, and Moore, amongst other poets, sing its praises. In Scotland it is the badge of Clan Ogilvie. The plant is subject to considerable variation, both in the form of the leaves and the colours of the blossoms and fruit. The Hawthorn is one of the favourite plants of the carvers of the Decorated period; good examples of it may be seen at Southwell, Exeter, Winchester, Ely, and Hereford. The present example, fig. 309, is a spandrel from Lincoln Cathedral; though so simple in composition the effect is decidedly good, and the overlapping arrangement herein introduced may prove a suggestive feature capable of pleasing introduction in work of more ambitious character.

The Ivy *(Hedera Helix)*, figs. 310, 316, is so familiar a plant that any attempt at describing it is palpably superfluous; we prefer rather, therefore, to dwell on other features connected with it. It is, like the preceding plant, a great favourite with the Mediæval carvers, and examples of its introduction into wood and stone carving of Decorated work are very numerous. Fig. 310 is a design of our own, while fig. 316 is, like fig. 309, a spandrel from Lincoln. The Ivy is in classic art dedicated to Bacchus, and an Ivy crown was the reward of the successful poet, while the priests at marriage festivals presented the newly-wedded pair with a wreath of Ivy, as a symbol of the closeness of the tie that should bind them to each other. The characteristic features distinguishing the Ivy at various periods of its growth can scarcely be legitimately ignored, if anything approaching a naturalistic treatment is attempted. Ivy, when climbing, throws up numerous long stems, furnished with more or less acutely five-pointed leaves, but when it has arrived at the

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summit of its support, a marked alteration takes place; it develops a rounded and dense mass of foliage, no longer divided, but of simple heart-shaped character, it then throws out flowering stems, and these, after bearing their bunches of pale yellow blossoms, are crowned by the succeeding clusters of dark brown berries, hence we see that we cannot consistently introduce the very beautiful five-pointed leaves and the equally decorative clusters of fruit in one design, without a violation of the natural facts of the case; we have, therefore, with all respect to the beautiful character of the Mediæval design, fig. 316, sketched, in fig. 310, a panel, that, if not so beautiful a composition in itself is truer in its details. It may be said that this in an ornamental design is a matter of little consideration, but we cannot ourselves feel this, as it appears to us that the right principle is this—either to so far conventionalise the plant as to render any such modification no longer an evident violation of natural fact, or, on the other hand, if naturalness of detail be aimed at, to make it thorough-going and complete throughout the work.

The Horse Chestnut furnishes the material for our 311th illustration. It is a native of Northern India, being first introduced into Europe by Clusius, about the middle of the sixteenth century: the scientific name is *Æsculus hippocastanum*. The English name, according to some writers, points to the value of its nuts as provender for horses, a value that is by no means ascertained, while others affirm that it derives its name from the large and conspicuous scar that is seen when a leaf falls from the stem, the mark being very similar in form to a horse-shoe. From the large size and striking character of its heads of flowers, it is sometimes called Giants' Nosegay, or Lupin Tree. Chestnut is a corruption of Castana, a city of Pontus, whence the first specimens were derived. Most of the foreign names of the plant indicate its Eastern origin; thus in France it is the *Marronier d'Inde;* in Italy, the *Castagno d'India;* in Portugal, the *Castanheiro da India*. The flowers, though beautiful objects in form and colour when viewed in their natural growth, are too small in their details to permit of successful introduction into ornament, but the large palmate leaves and prickly fruit are admirable features, and it is these that we have endeavoured to treat in our design.

The Stone-Crop *(Sedum acre)* is represented in its natural growth in fig. 312, while figs. 313, 314, 317, are illustrations of its use in design, the latter (fig. 317) being from some old English embroidery, *temp.* Henry VI.; the others, designs of our own. In fig. 313, the plan view is selected, in fig. 314, the elevation view; in both cases the object proposed being to convey an idea of the masses of yellow stars that are so beautiful a feature in the natural growth, and that give it one of its familiar names, the Golden Moss. It is also called Wall-Pepper from its biting flavour, a property that in some parts of the Continent leads to its cultivation as an ingredient in salads.

The Lesser Celandine *(Ranunculus Ficaria)* apart from its inherent beauty, derives great interest from its early appearance, its profusion of star-like blossoms, imbedded in the dark green glossy leaves, being one of the earliest indications of coming Spring, as damp hedge-banks and coppices are often brilliant with its yellow stellate flowers at the beginning of March. It was an especial favourite with the poet Wordsworth, and is often referred to in his writings, while it is sculptured with folded petals on the white marble stone that marks his resting-place at Grassmere. The flower is subject to considerable variation in the number of its parts, though the petals are the most subject to this, as in one hundred test blossoms we picked at random as an experiment, ninety-seven had three sepals, of these, two had ten petals, nine had seven petals, eighteen had nine petals, the number ordinarily given in books as normal; sixty-eight had eight petals; while one had five sepals and fourteen petals, one had four sepals and seven petals, and the last had four sepals and nine petals. Our design shows the more ordinary form found in the leaves, though these, like the blossoms, are subject to a certain amount of modification, and are at times spotted or blotched with irregular masses of a lighter green.

Figs. 318, 319, are from old examples, the first from a tomb in Chichester Cathedral, the second from Southwell Minster. The monument at Chichester is of the form known as an altar tomb; running round its four sides is a series of quatrefoil panels with figure subjects, the form shewn in our drawing being the filling in between the quatrefoils. It is difficult to say what the exact leaf is that suggested the form filling the space, as there are several leaves nearly resembling it, our object in introducing it is as an illustration of the great adaptability of this palmate character of leaf to the purposes of design. The Christmas Rose, Cinquefoil, Horse-Chestnut, Shining Crane's-bill, Tormentil, Bane-berry, Maple, Vine, and many other plants have foliage more or less resembling the form here introduced. The lower example is based on the white Bryony; an illustration of the natural growth will be found at fig. 90. As we have already dealt with the plant, describing its habitat, &c., we need not now do more than refer our readers back to the description of plate VIII., the plate devoted to the plant.

The design, fig. 320, has the Cinquefoil, *Potentilla reptans*, as its basis, the leaf only being

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employed. This plant is one of our commoner species, being generally abundant throughout the country in meadows and on hedge-banks. It flowers from June to September, its brilliant yellow blossoms rendering it then rather conspicuous. The flowers are somewhat variable; out of one hundred blossoms, picked as a test of this, eighty had the divisions of corolla and calyx in fives, the remaining twenty in sixes.

The central design upon plate XL. is derived from the Thorn Apple, *Datura Stramonium*, a rather scarce plant. It is not truly indigenous, having been introduced in the reign of Elizabeth. It has, however, become quite acclimatised, and may be found from time to time growing on rubbish heaps, its favourite place, or by the roadside. The flowers, large, white, and very ornamental in appearance, are succeeded by the prickly fruit, an equally suitable feature for art-treatment. The plant is a powerful narcotic.

The design, fig. 322, has been suggested by the graceful pinnate leaves of the common Scarlet Poppy, or Corn Rose, *Papavar Rhœas*. The brilliant scarlet of the flowers as they grow amongst the ripening corn must have struck all our readers, so that we need not pause to describe a plant so familiar. The flowers are very fragile, withering and shattering their petals very soon after being gathered :—

"Pleasures are like Poppies spread,
You seize the flower, its bloom is shed,"

The specific name, *Rhœas*, alludes to this characteristic, being derived from the Greek word *rheo*, I fall or pass away; the generic name being from *papa*, thick milk, in allusion to the juice that exudes from the plant when the stems are broken across.

It may very possibly happen that some special necessity for a design from a given plant may arise at a time when the natural plant cannot be procured, or on the other hand, some plant may strike the eye on account of some suggestive feature in it, though no immediate opportunity for its utilisation in an ornamental composition may present itself. To meet either case, the habit of sketching is a good one; it impresses the characteristic features of the plant on the mind in a way that nothing else can do, and the sketch, when finished, may, after being stored away months or years, prove some day the very thing required. Book illustrations, even when perfectly reliable, are often not altogether suited to the designer's requirements, as the details of growth are not sufficiently defined, nor given with that geometric exactitude that is generally desirable. It will be well on completing the drawing to wash the parts over with flat tints of the local colour, while, if time permits, a small piece may be more carefully painted with due regard to light and shade. Some plants dry fairly well, sufficiently well to render them of service for consultation, and very accurate representations of some details of plants may be obtained by various processes of nature printing.

In drying plants for reference, the following points must be observed :—The specimens must be as complete as possible; the root, stem, the various forms of leaves and bracts, the blossoms and fruit, should all be preserved. On bringing them home they must be laid between sheets of coarse, stout, and absorbent paper (common blotting paper is scarcely stout enough), and then pressed by a heavy weight. The drying paper must be frequently changed, as the more rapidly the drying is accomplished, the greater the likelihood of a successful result; if the paper is well heated it is an advantage, as the drying is more speedily effected, there is less likelihood of mould developing, and the colours are better preserved. When the drying has been satisfactorily performed the specimens must be mounted, or they will speedily, from their dry and fragile nature, suffer injury. Good white cartridge-paper is the most suitable material, as it is sufficiently substantial to bear a good deal of the handling and turning over that are inevitable if the plants are referred to at all. It is well, as affording greater facility in reference, to have all the sheets of uniform size; that known as quarter-imperial is very convenient. Ordinary gum or paste may be used in mounting; gum has an unpleasant shininess; paste, if a little corrosive sublimate (a dangerous poison) be added to it, is perhaps the best to use. Paste, thus medicated, does not get mouldy, while it also largely aids in preserving the specimens from the attacks of insects. Ferns, grasses, mosses, and plants of a firm and rigid nature, are best suited for the student's herbarium, as they lose but little of their natural appearance and dry readily. Plants of a succulent nature, like the Stone-crop, suffer a good deal. We have not gone into many minor details that a botanist in forming such a collection would require to attend to, but the art-student, being less exacting in his requirements, will, we trust, find that, after a little personal experience of his own, our explanation of the course to be adopted will suffice.

Impressions of plants may be obtained, as we have said, by various methods of nature printing. Numerous recipes are given for accomplishing this; some we have succeeded in gaining good results by; others, owing to the blundering of the originator or of his disciple, we have

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failed in; we shall, therefore, here only describe two processes that have stood the test of repeated experience, and by which we have obtained perfectly satisfactory impressions.

For the first of these the reader must procure a solution of nitrate of silver in the proportion of one part of nitrate to fifteen parts of distilled water. With this solution, by artificial light, a piece of smooth paper must be covered, to be, as soon as dry, carefully put away from the influence of daylight. When a botanical specimen has been procured of which a record is desirable, it must be placed upon the prepared paper, and, over all, a large sheet of glass, free from spottiness, and heavily weighted at the corners, as to ensure close contact of the plant and prepared paper; the whole must then be placed at the window; if the sun's rays fall on it the paper will rapidly turn a rich chocolate brown; if the sun be not shining the same result will follow, but not so speedily. On this result being attained, the glass must be lifted off and the plant shaken aside, when its image will be seen in delicate fac-simile in a pale creamy white on the ground of deep brown, the sun's ray or the daylight not having been able to more than very slightly influence that part of the paper protected by the plant. As, however, that part where the specimen is impressed is as sensitive to the light as the rest of the sheet it will rapidly darken unless preserved from its influence; this may be readily achieved by putting the paper within a large book. On the approach of evening and gas-light, the impression may be freely examined, as any artificial light will not affect it, but as a specimen that can only be referred to by lamp-light would prove of but little practical value, it must be what is technically termed fixed. To effect this, it is only necessary to dip it in a strong solution of hyposulphate of soda; when a chemical action takes place that at once and for ever after preserves it from being further affected by daylight, and it can be as freely consulted as any ordinary drawing. By this process, the richest and most beautiful results may be obtained. It is especially suited to light and delicate forms, such as ferns and grasses, or finely-cut leaves of any kind. It is very important to ensure close contact, as if the specimen be in any place raised above the general surface of the paper, the rays of light will there penetrate beneath it, and at that point produce an unpleasant blurring that will effectually destroy the sharpness and clearness of the impression, and thus far render it useless. The more richly cut the leaves are the better, as this process only gives the general effect of the mass; it does not give the veining of the leaflets; to secure this, our next process, as follows, must be employed.

Having procured a tube of oil-colour, such as artists use, black, brown, or dark green being the best, a certain amount of the colour must be squeezed (this quantity can be only determined by practice) over a sheet of smooth paper, so as, by means of a dabber made of cotton wool enclosed in fine muslin, to cover the surface with a light and even layer. On this the leaf of which an impression is desired must be placed and, having loaded the dabber with colour, the surface of the leaf is then gone over until all the prominent veins have received a light covering of the pigment. The leaf should now be carefully lifted off and placed between two surfaces of clean and smooth white paper, and a gentle pressure of the hand will suffice to imprint the leaf, one of the papers having an impression of the front, and the other of the back. When the colour is dry a wash of green may be laid over it in water-colour, the result being an absolute transcript of Nature, the veining, texture, and even minute hairs of the surface being given with the most beautiful fidelity. Leaves with prominent veins, as the Hop, Nasturtium, Plane, Horse-chestnut, or Foxglove, are most suitable.

In fig. 323, we have a design based on the smaller Celandine, *Ranunculus Ficaria*. The treatment is conventional, the points worked out being the multiplicity of blossoms starring the ground, and the carpeting of leaves so characteristic of the natural plant, the details of leaf and flower form being much more freely rendered than in fig. 315, a design also based on the same plant.

The White Trefoil or Dutch Clover, *Trifolium repens*, is the plant employed in our design, fig. 324, for a diaper for wall decoration. The leaf alone is employed, as the head of flowers, though pleasing in itself, scarcely, from the minuteness of the parts, lends itself happily to art treatment. The plant is so commonly met with in pasture land, being sown for its excellent qualities as fodder, that it must be familiar to all those who, from love of plants or appreciation of beautiful form, will be induced to turn over these pages. In Ireland, it is of comparatively recent introduction, though now it is often accepted as the national emblem, in place of the Wood-Sorrel (*Oxalis Acetosella*), the original *Seamrog* or Shamrock.

The design, fig. 325, is based on the foliage of the Oriental Plane, *Platanus orientalis*. The Plane, though now commonly to be met with, is not an indigenous tree, being, as its name implies, a native of the East. It may be easily identified, not only by the size and characteristic shape of its foliage, but by a curious shedding of its ashy grey bark in long thin flakes, exposing large masses of the yellow wood beneath, a feature that at all times renders it conspicuous. It is one of the few trees that seem unaffected by a smoky atmosphere, hence it is often planted in the

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neighbourhood of our large cities; a fine specimen may be seen in Cheapside, in the heart of London. The Plane was a great favourite amongst the ancient Greeks, who celebrated many of their festivities beneath its spreading shade; many virtues were ascribed to it, medicinal and protective, against venomous serpents and scorpions; and the Persians to the present day believe it protects them from evil, dissipating the plague and other epidemics. It was first introduced into England by Sir Nicholas Bacon, father of the more celebrated Sir Francis Bacon, being planted by him in his garden at Verulam, about the middle of the sixteenth century. The Occidental Plane *(Platanus occidentalis)*, a very common tree in North America, is very similar to the present, but its leaves are larger and much less deeply cut into lobes, while the fruit, a winged nut, a very ornamental feature in both, is much larger in the American species than in the Eastern Plane.

The design shewn in fig. 326, like fig. 311, is based on the Horse-chestnut, though in the present case the handsome palmate or radiate foliage is alone employed. There are several species of the Horse-chestnut, one of the American species, a native of Brazil, Carolina, &c., has brilliant crimson blossoms. The common Horse-chestnut was first introduced into England in 1550, thence it was taken to Vienna in 1576, while the first mention of it in France dates from 1615.

The treatment seen in fig. 327 is so pleasing in itself, and so suggestive in its character, that we need make but slight apology for introducing it, though, from its very conventional character, it is perhaps scarcely within the scope we have in the present work proposed to ourselves. It is, in some respects, not unlike the Field Artemesia *(Artemesia campestris)*, though that plant, from its extreme rarity, being only found in the north-west of Suffolk, the contiguous part of Norfolk, and near Belfast, in Ireland, is scarcely likely to have really suggested the form. The *A. vulgaris* is very commonly distributed throughout the whole of Britain, but in some respects does not so clearly suggest the plant seen in the panel as the former species. The carving is Mediæval, of the Decorated period.

Fig. 328, the central design on plate XLII., is derived from the Common Arum, Cuckow-pint, or Lords-and-Ladies *(Arum maculatum)*, a plant very generally distributed throughout England, but one of the rarer plants of Scotland and Ireland. It ordinarily grows in copses and shaded hedge-banks, the curious form of inflorescence being met with during April and May. During the Summer the leaves die away, and the only memorial of the plant is the long spike of scarlet berries that may often be seen gleaming during the Autumn months in the leaf-stripped hedge-rows, and that no one without previous knowledge would associate with the plant, so different is its appearance in Spring and Autumn. The root, though extremely acrid, giving rise to an almost intolerable sensation of burning and pricking in the throat if tasted in its raw state, contains a large amount of amylaceous matter, that, when dried so as to dissipate the acrimonious juice, forms a bland farinaceous substance, an excellent substitute for bread-flour. It is also a good and innocent cosmetic, being sold at times for that purpose, at a highly remunerative price, as cypress powder. We are not aware of the use of the plant in any example of decorative art.

In the remaining examples on plate XLII. (figs. 329, 330, 331), we have filled our panels with designs based on fruit forms, those chosen being the capsule of the Red Poppy, the hips of the Dog-Rose, and the viscid berries of the Mistletoe. The Poppy we have already referred to in our remarks on fig. 322; we will, therefore, pass at once to a brief consideration of the other two plants.

The Dog-Rose *(Rosa canina)*, so commonly to be met with throughout the country, decking the hedges in June and July with a profusion of pink blossoms, to be in turn succeeded by its mass of scarlet fruit, was one of the favourite flowers of the Mediæval carvers, and may frequently be found in 14th century work. Wherever the flower appears, however, it is always of the conventional form known afterwards as the Tudor Rose. The plant is employed both with heraldic significance as the badge of the Lancasterians, Yorkists, and Tudors, and also as a religious symbol, being dedicated to the Virgin Mary. The names of plants are often very curious in their origin: it would be foreign to our subject to go into the point here, but we may mention that the prefix "dog," as in Dog-Violet, Dog's-Mercury, Dog's-Orach, implies worthlessness, an opprobrium that our beautiful wild Rose hardly deserves, as, apart from its striking beauty, a thing that in itself should give it value, it is of direct utilitarian service, conserve of Roses being of medicinal value, while its stocks are used by gardeners in grafting.

The Mistletoe is our most conspicuous British example of parasitic growth, and its name alludes to this characteristic, being, in Anglo-Saxon, *Mistiltan*, from *Mistl*, different, and *tan*, a twig, from its being so unlike the tree from which it springs, while its Celtic name, *Gwiâ*, the shrub, points out its eminent position; the plant, *par excellence*, from its sacred character. It is not found in either Scotland or Ireland. As it cannot be generally known, we may mention that

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in the garden of one of our friends in Dean's Yard, beneath the shadow of Westminster Abbey, a remarkably fine plant of it has been growing for a long time, and as healthy, apparently, in spite of its curious habitat, as if it grew in the midst of the purest country air. It is quite unknown how it originally got there, but having made good its footing, it is now scrupulously preserved. Herefordshire and Worcestershire supply the greater amount, between 300 and 400 tons weight being transported thence annually to London and other large towns. The supply would appear to be almost inexhaustible, as in the cider districts it is calculated that from thirty to ninety per cent. of the apple trees yield it. Its presence in an orchard is an indication of approaching decay, and also the not remote cause of a rapid acceleration of it, as it speedily exhausts the branch from which it springs, and the tree ultimately perishes, overcome in the unequal struggle, and becomes, to quote Shakespeare—

"Forlorn and lean,
O'ercome with moss and baleful mistletoe."

Besides being found on its favourite tree, the Apple, it occasionally is met with on the white and black Poplars, Willow, Hawthorn, Lime, Aspen, Alder, Crab, Maple, Mountain Ash, Hazel, common Ash, and some few other trees; never on the Holly, Cherry, Walnut, or Beech, and so rarely on the Oak, only some six or seven authentic cases being recorded, that that no doubt greatly increased the reverence the ancient Britons felt for it, great rejoicings and sacrifices taking place when the sacred Oak bore this symbolic plant growing in mystical vigour, without taint or contact of the earth. From this early association with the solemn Druidic rites, the plant has been excluded from Church decoration; to compensate however for this, it is one of the most welcome plants that deck the dwelling at Christmas, having a wealth of meaning that its compeers, the ruddy Holly, the Ivy, and gloomy Yew, cannot emulate. In some parts of the country it is customary for the people, who have sufficient faith in it, to go out on New Year's Eve, and gather a bough to be hung up at the midnight hour, to ensure good fortune in the opening year. Fortunately the commonest, that found on the Apple, is held to be most efficacious, though that from the Poplar is almost equal to it in virtue.

The remaining designs, based on various foliate and floral forms, call for but little comment. Figs. 332, 334, are repeating diapers founded on the square, and filled with Trefoil and Ivy-like leaves; the design between them, fig. 333, complete in itself, is suggested by the Maple leaf and fruit. Fig. 335 is founded on the alternate growth seen in many leaves, *ex.* Water Cress *(Nasturtium officinale)*; Hedge Mustard *(Sisymbrium officinale)*; Mignonette *(Reseda lutea)*; Wood Vetch *(Vicia sylvatica)*. Fig. 336 is suggested by the form of leaf-growth termed verticillate, as in the Goose-grass *(Galium aparine)*, or the Woodruff *(Asperula odorata)*; while the remaining illustrations on plate XLIII. are derived from various treatments of opposite leaf growth. Fig. 337, with its variation in the size of the segments, has its natural type in such leaves as the Agrimony *(Agrimonia Eupatorium)*; the Meadow-Sweet *(Spiræa Ulmaria)*; or the Silverweed *(Potentilla anserina)*. The feature seen in fig. 339, the pairing of leaves of different sizes, is seen naturally in the Dwale *(Atropa Belladonna)*; while the opposite growth of leaves alike in each pair, as shown in figs. 338, 340, is the commonest form of all in Nature; the Pimpernel *(Anagallis arvensis)*; Red Dead-Nettle *(Lamium purpureum)*; the Ragged Robin *(Lychnis flos-cuculi)*; the Privet *(Ligustrum vulgare)*; Moneywort *(Lysimachia nummularia)*; and Germander Speedwell *(Veronica Chamædrys)*, are but a few examples.

The illustrative designs on plate XLIV. are based on various forms of leaves, lobed, as in figs. 341, 346; radiate, as in figs. 345, 347; sagittate, as in fig. 342; palmate, as in figs. 348, 350; cordate, as in fig. 349.

In the introduction of any vegetable form into ornament, the leading lines should (fig. 345) be clearly represented. It is often a good feature to let the ornament spring from the bounding form, as in figs. 341, 350, hence Early English stonecarving is superior in effect to Decorated; as, in the first, all the forms introduced can be traced to their origin, and spring from one of the enclosing mouldings, while, in the second period, the foliage is wreathed around the capitals in a way that suggests accidental adhesion, rather than vigorous offshoots of growth. All good treatment of natural forms is to a certain extent conventional, and influenced by the position the design is to occupy. Nature must not be merely applied. In all good periods of ornamental art it will be found that certain modifications have become necessary to fit the natural forms for their new purpose, the nearer the approach to the pictorial the less are they fitted to enter into a decorative scheme. The distinction drawn between fine and decorative art is a very just one, though we are not prepared to admit the necessary inferiority of the latter, a point too commonly assumed as proved. Each has its legitimate function and its independent sphere. We need not here dwell at any length on the principles of ornamental art, as we have already done so in other works, and it does not seem advisable to repeat here matters already dwelt upon; besides, the

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student will find in such authors as Owen Jones, Dresser, and others, these matters very fully handled; we have, therefore, in the present work, striven rather to occupy ground not so fully pre-occupied. Such a work as this should, however, if rightly viewed, be regarded only as a means to an end, and that end the individual study of Nature itself. It has been our desire to produce a book that should prove sufficiently suggestive to the reader to lead him to study farther for himself, and certainly not to rest wholly on our labours. It is too much the custom with many manufacturers to recklessly appropriate the ideas of others; too much the fashion with many designers to tread closely in the footsteps of those who, by a successful idea, have diverted thought in that direction. It has not been our aim to produce a series of designs that might be, at slight expenditure of thought or labour, adapted to various commercial purposes, but rather to refer manufacturers and designers alike to that wealth of fancy that may be so readily developed and utilised by a consideration of the beauty and wealth of Nature, and by an adaptation to ornamental purposes of those general principles of plant growth, and those varied details that repay a closer study, that would render the work produced at once more novel in conception and more beautiful in effect than would probably be the result of a merely modified treatment of some idea that, once novel and possibly good, has long since got too well-worn to be able to claim any credit on the first score, while even its recurring goodness, assuming that it possesses it, is, after all, not wholly desirable, since it usurps the place that some other equally beautiful and fresher form might have taken, and imposes a narrowness of scope that the abundant wealth of floral beauty does not justify.

In presenting to our readers a series of drawings of natural plants, and endeavouring to aid them by suggestions of their use in design, we have, we trust, in some measure supplied a want, since, though there are many excellent standard works on Botanical Science, many equally excellent standard works on Ornamental Art, there are but few, so far as we are aware, that endeavour to show the relationship existing between them. Should our work, by its utility, prove that we have in some measure reached our ideal, our labours, pleasant as they have been in themselves, will have that pleasure greatly enhanced by the knowledge that others besides ourselves have found them of interest and profit; that we have thus been in some small way instrumental both in inculcating a greater taste for natural beauty, and in aiding incidentally the spread of the beautiful in art. With all its failings—and in no mock modesty do we exaggerate them—our work has been throughout a labour of love, and with a feeling of real regret do we find it drawing to its close. If we have failed in causing this feeling to be shared at all by our readers, it will, we trust, be considered no disparagement to our subject, it will only shew that fair Nature has been unfortunate in her self-appointed spokesman, in that we have failed to convey to others the sense of delight that her study is nevertheless able so richly to afford.

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LIST OF ILLUSTRATIONS.

The Drawings here marked (*) have been designed by the Author as Illustrations of Ornamental treatment of the respective Plants. Decorative treatments that are not so marked are from Mediæval and other sources.

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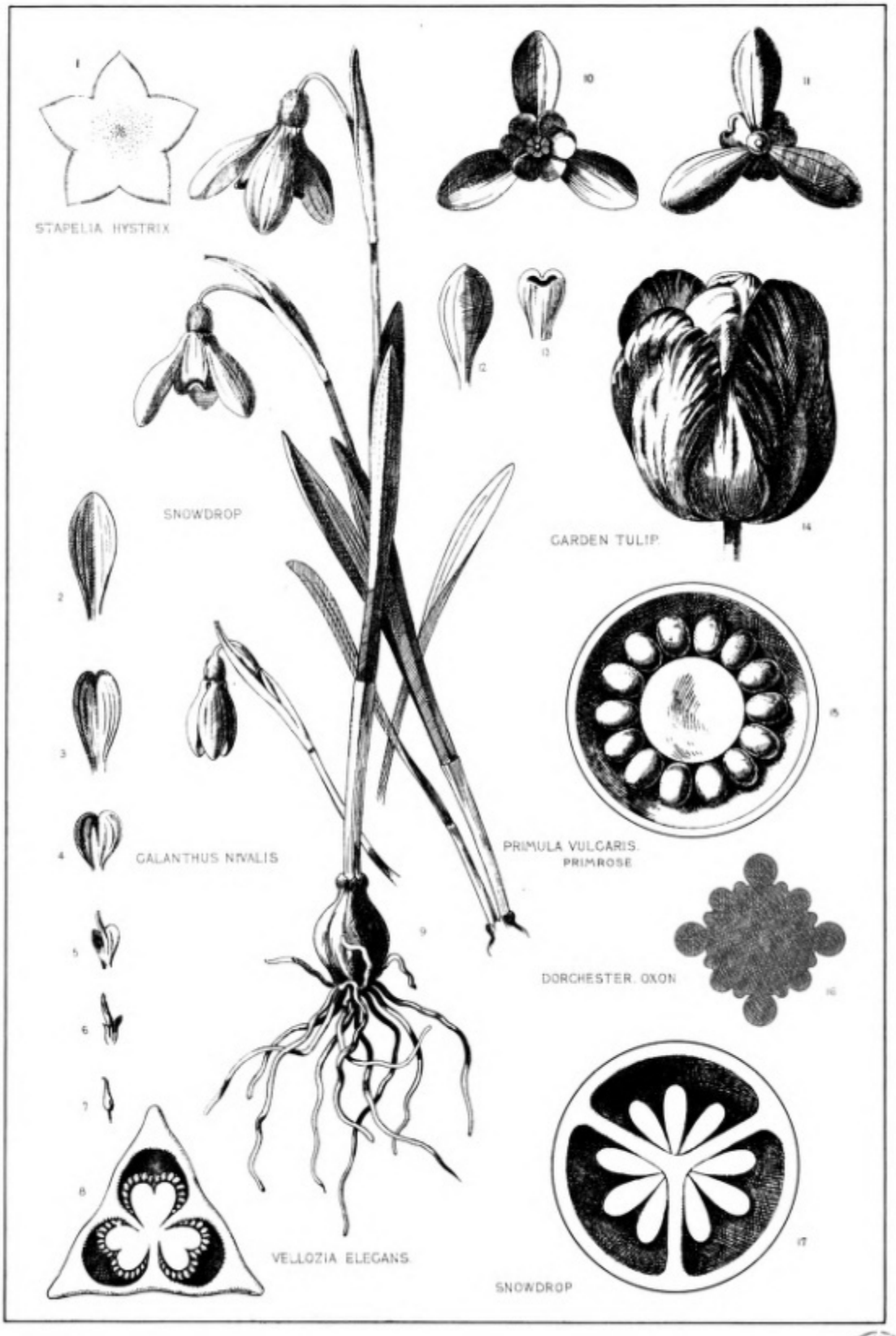

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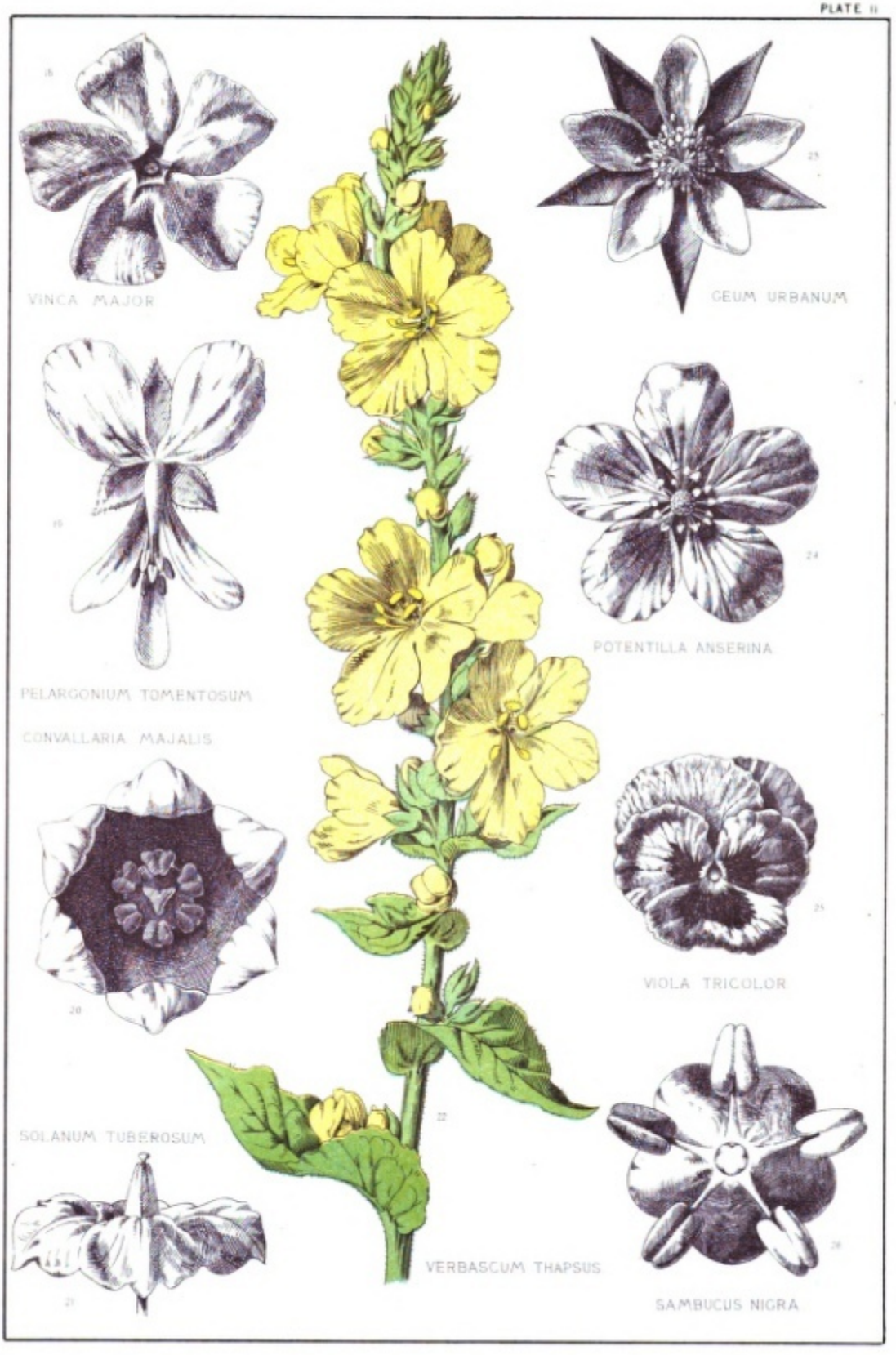

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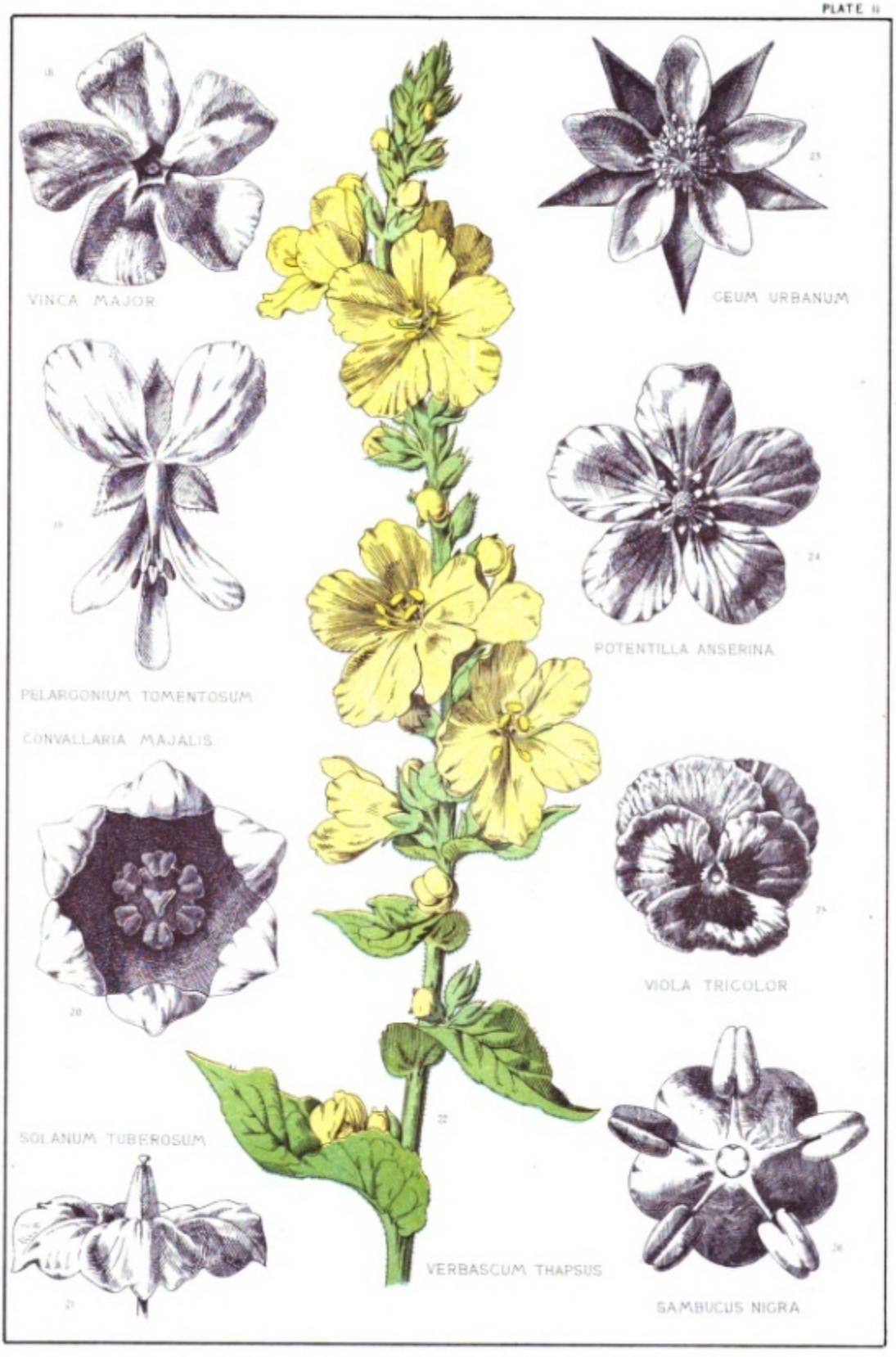

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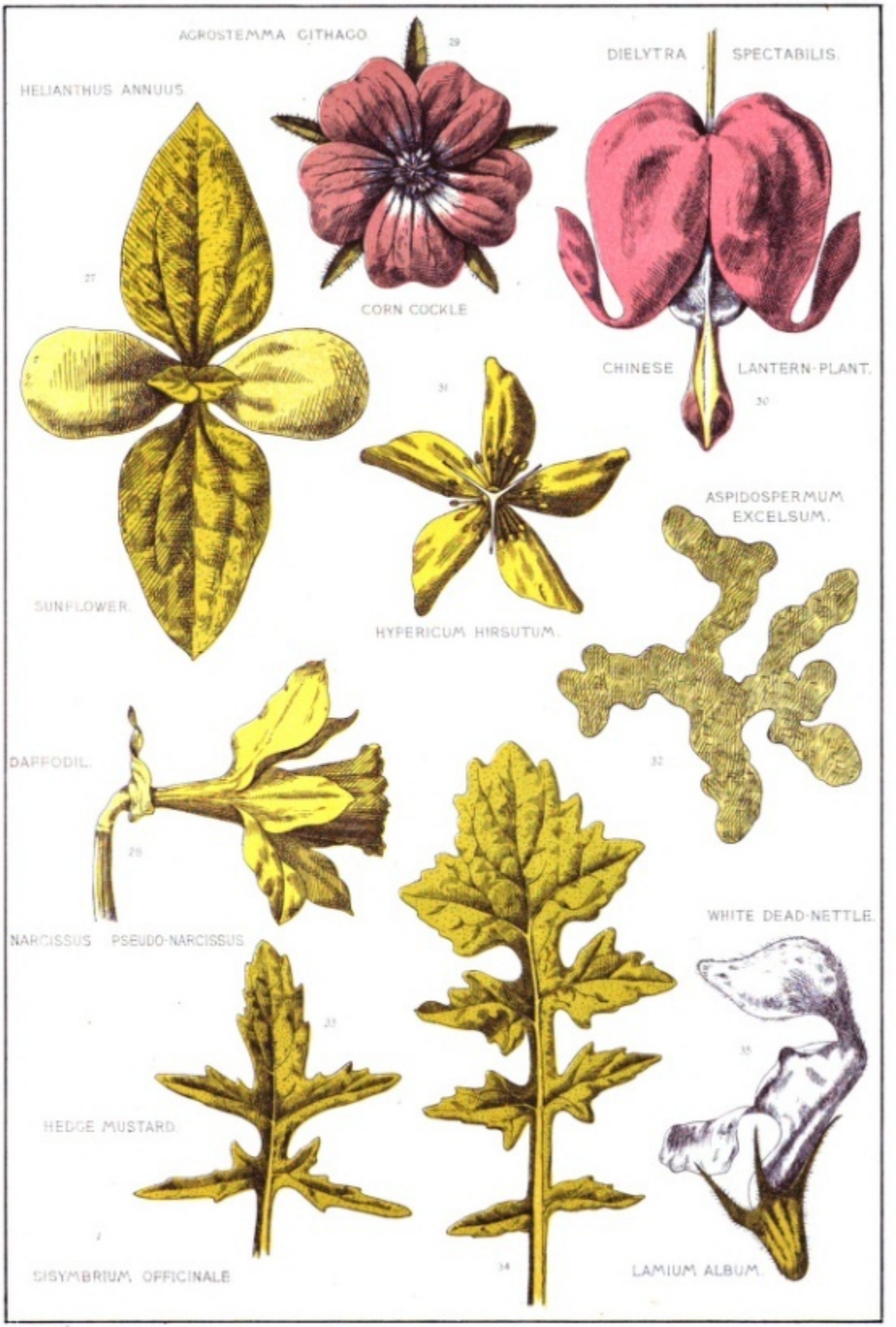

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EVENING PRIMROSE.

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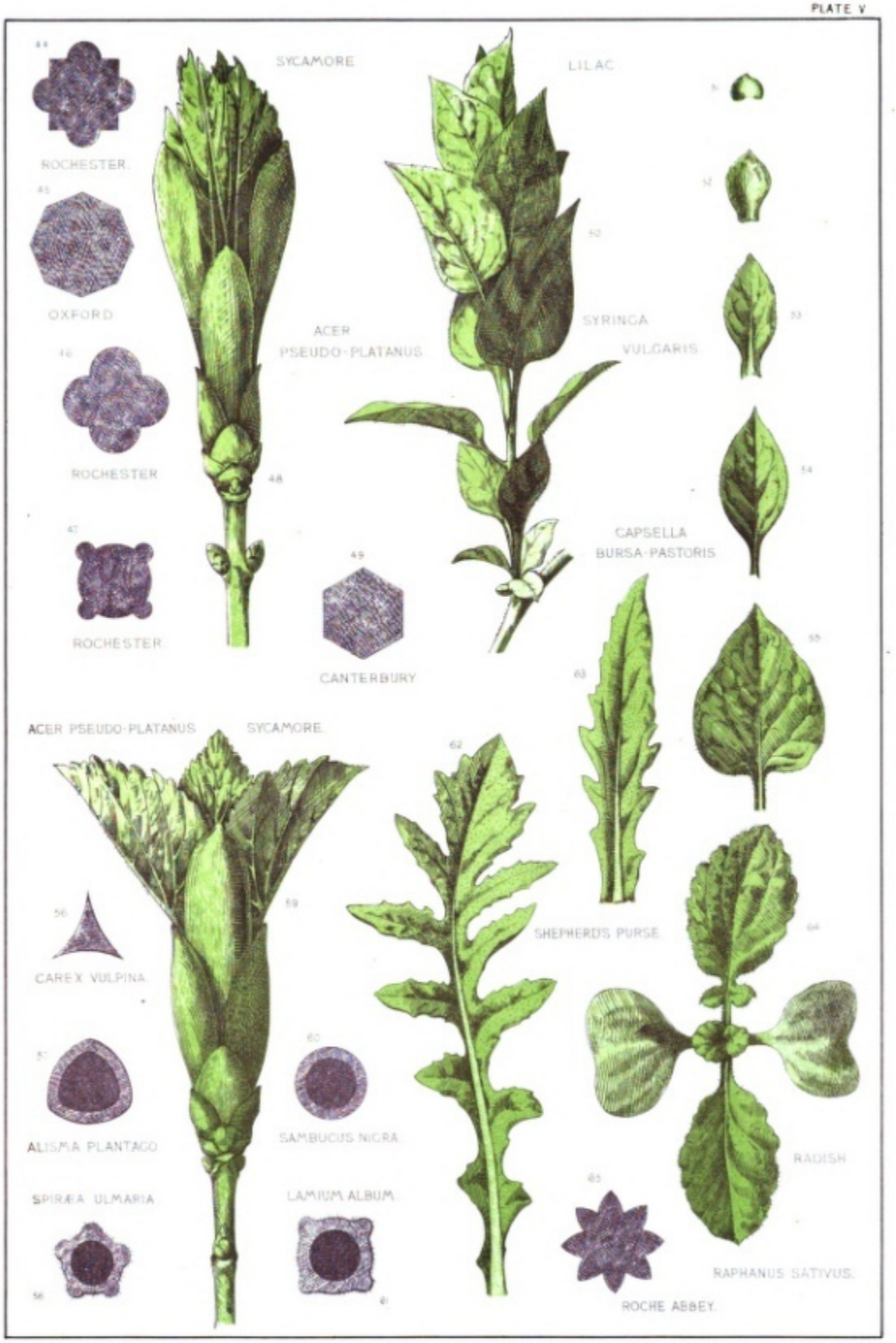

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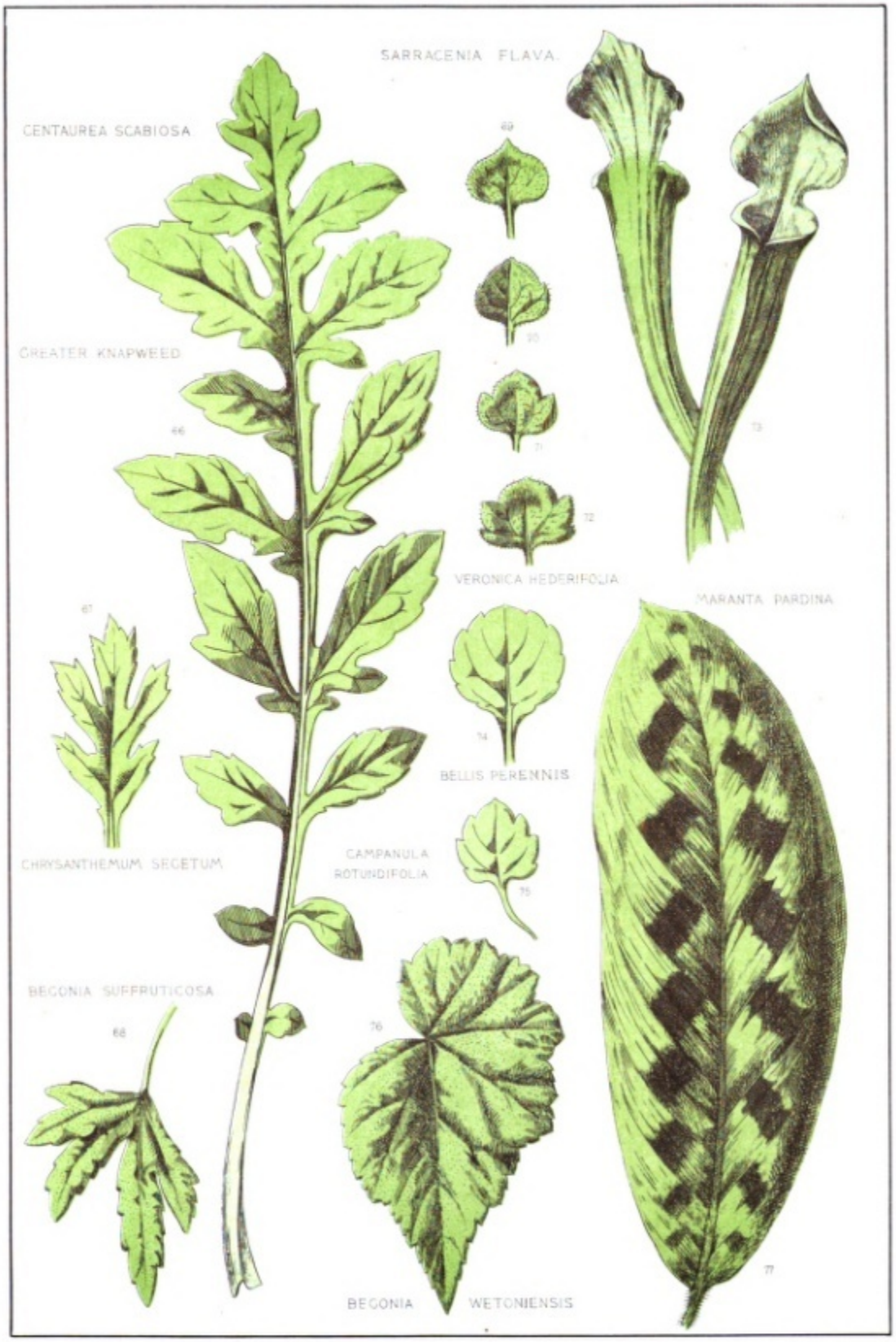

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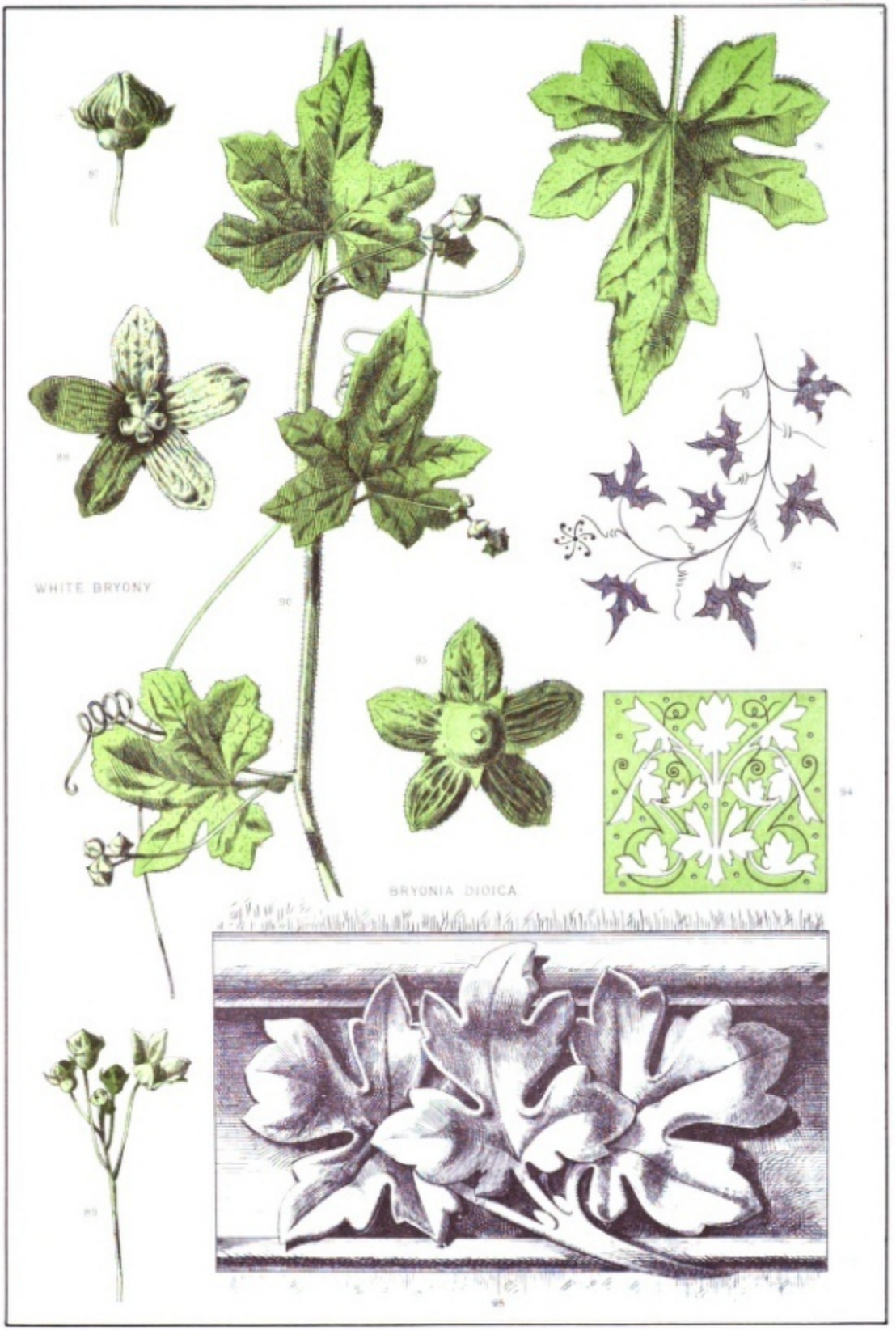

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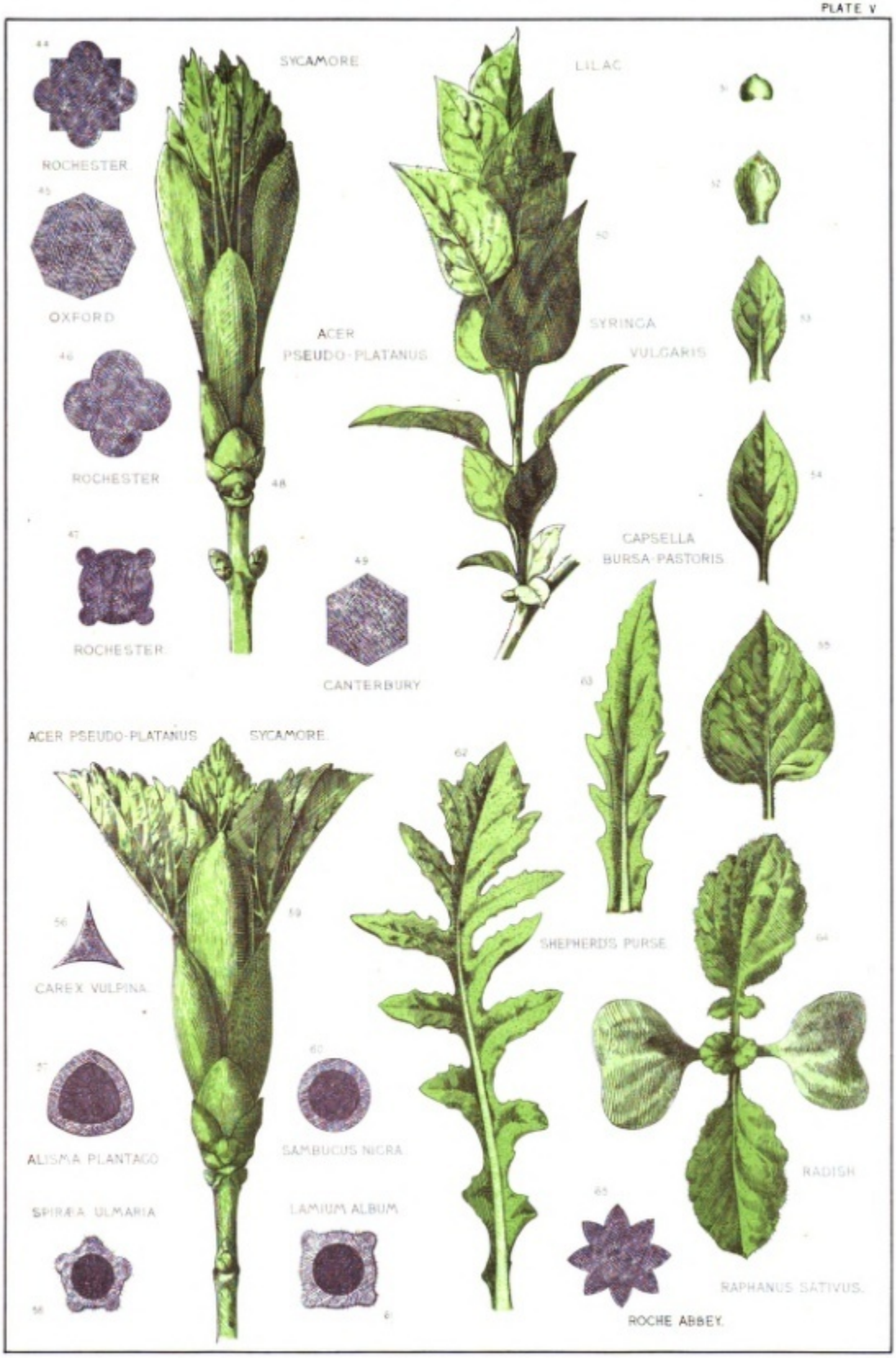

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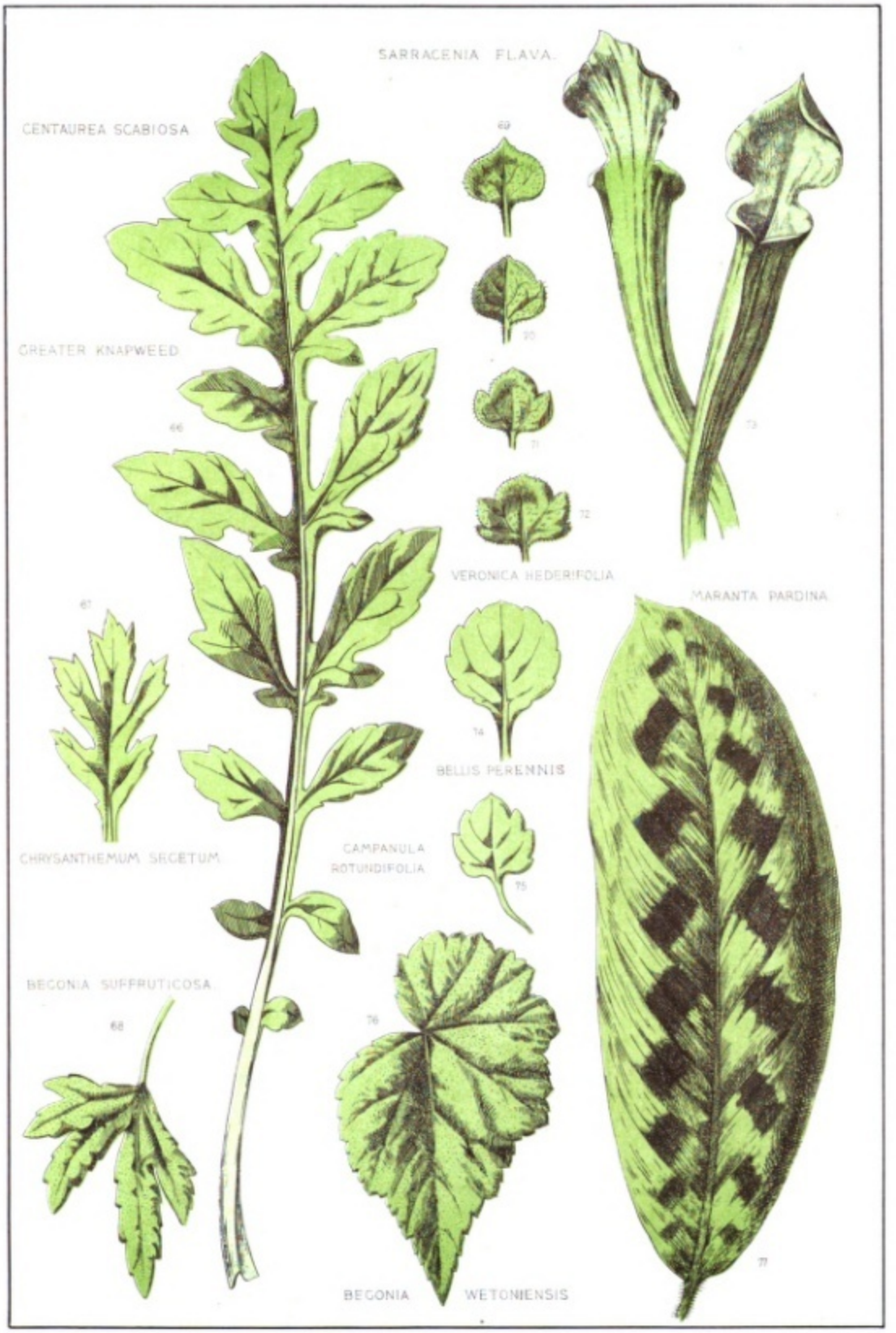

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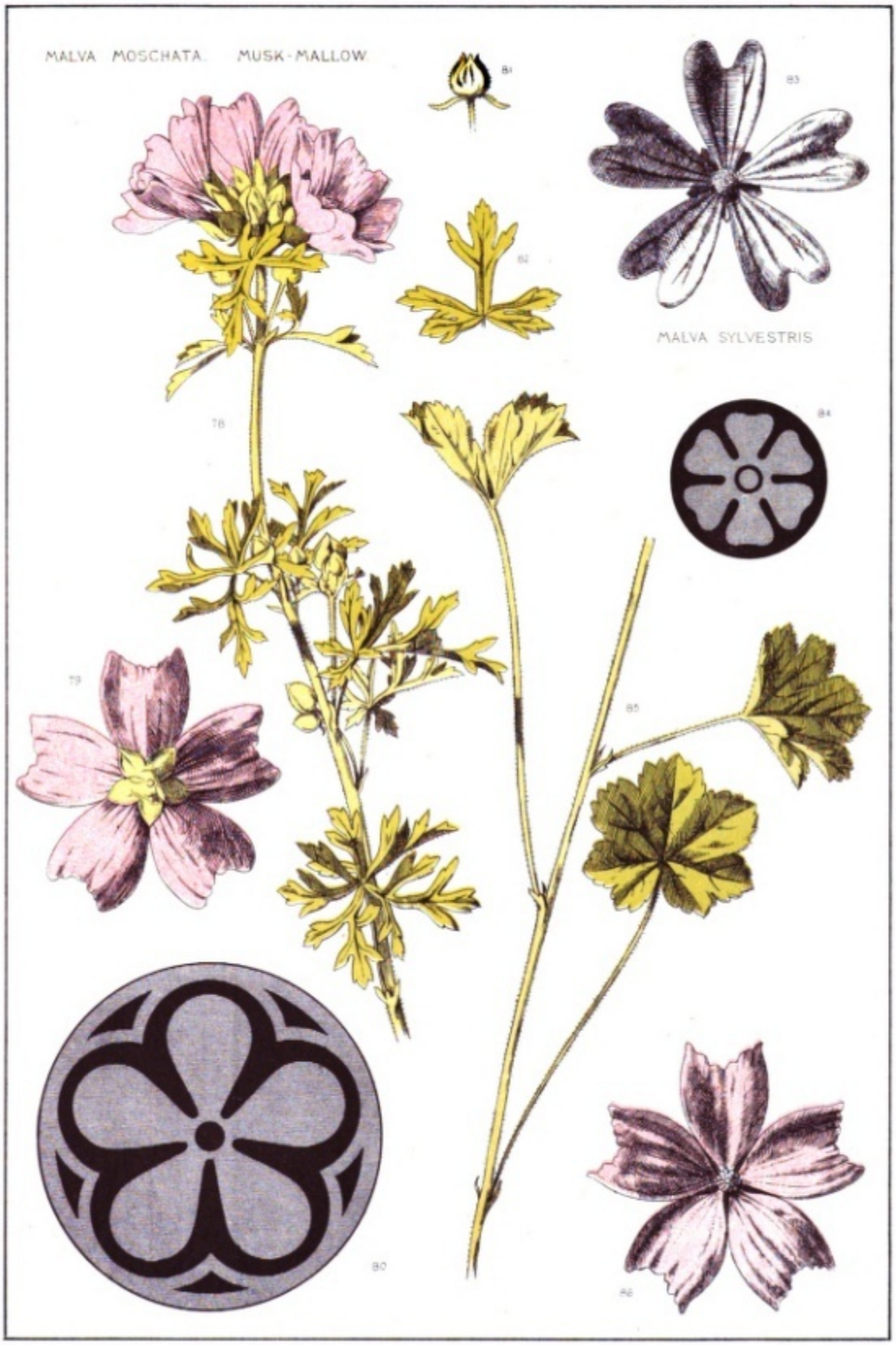

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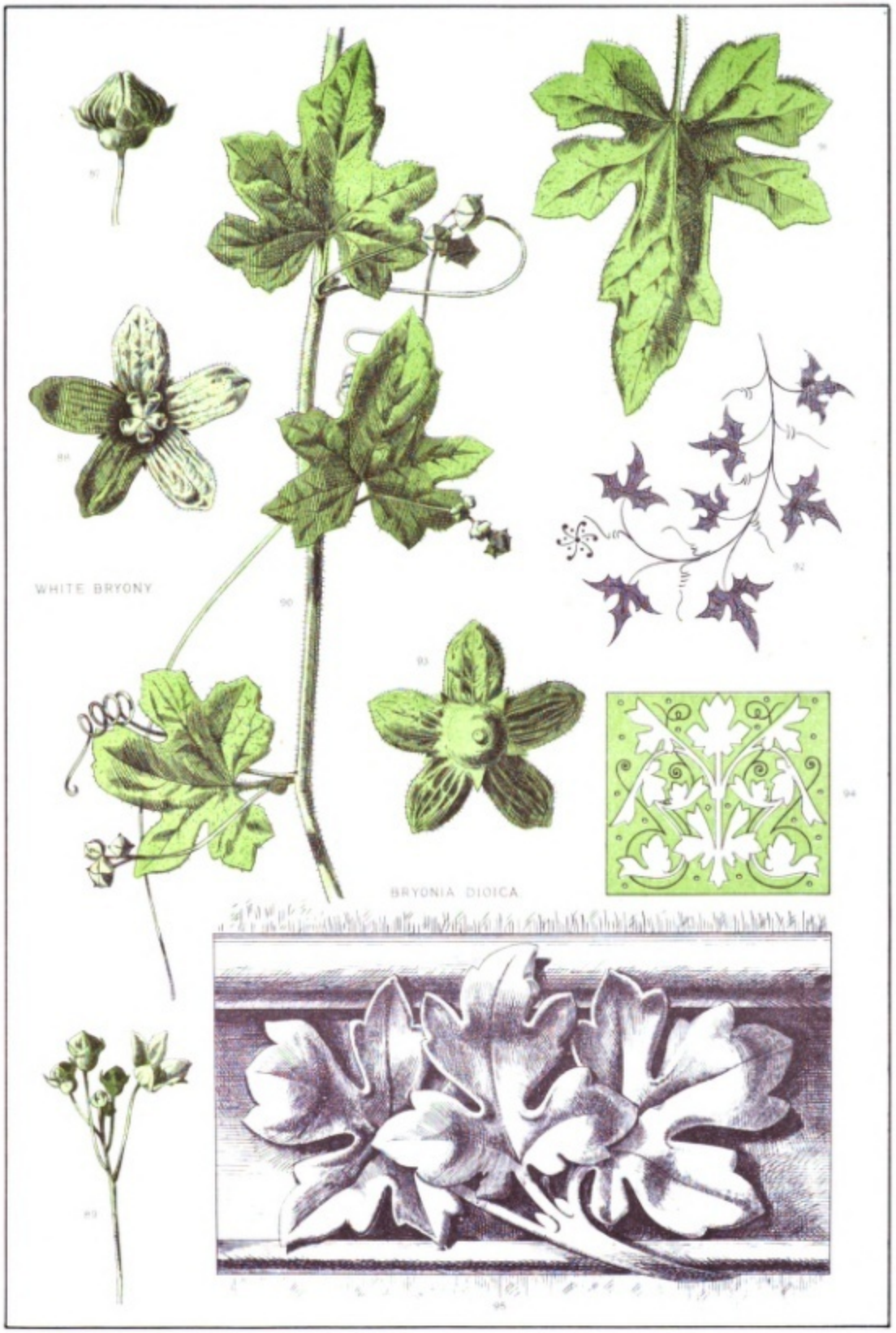

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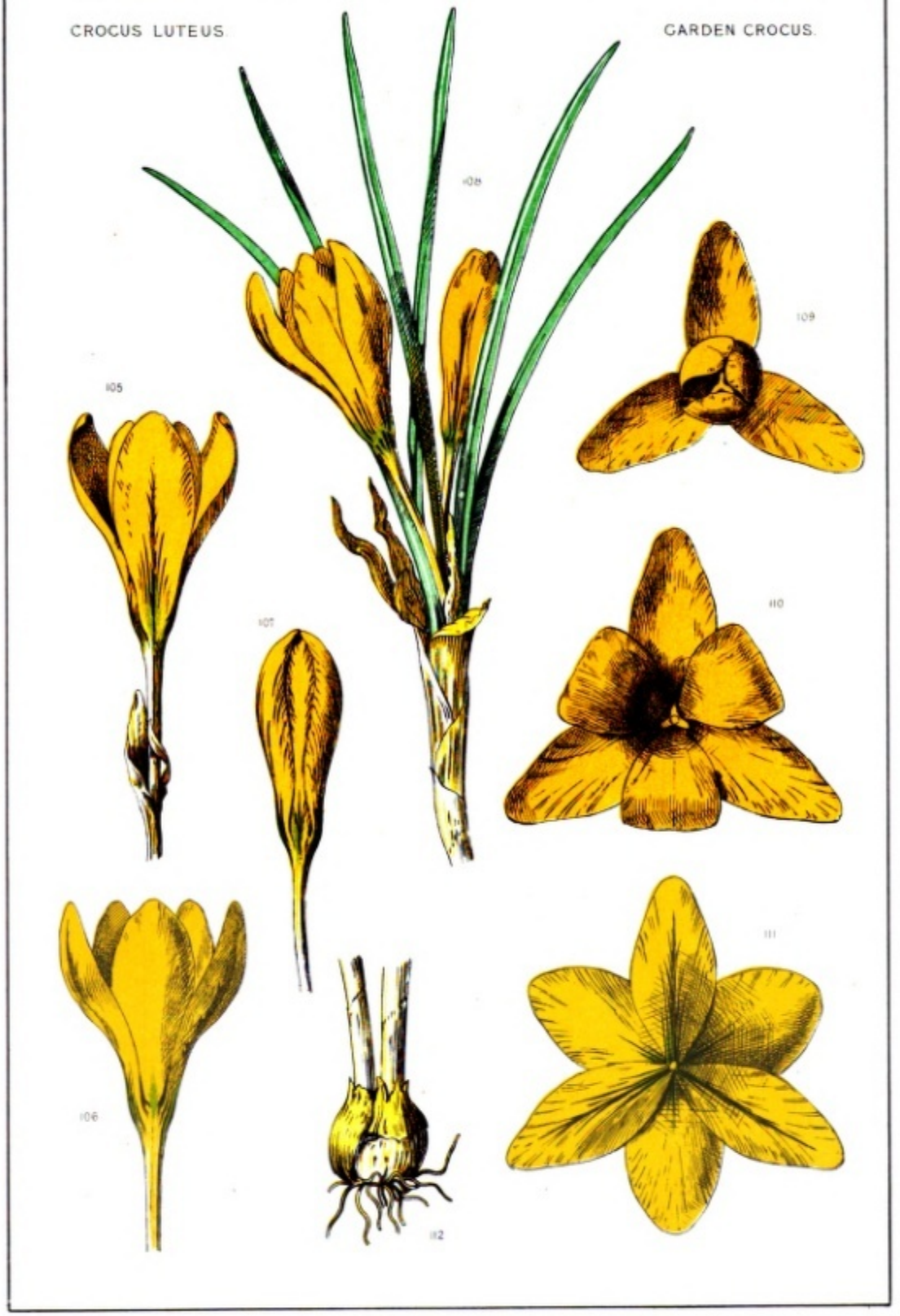
CROCUS LUTEUS.

GARDEN CROCUS.



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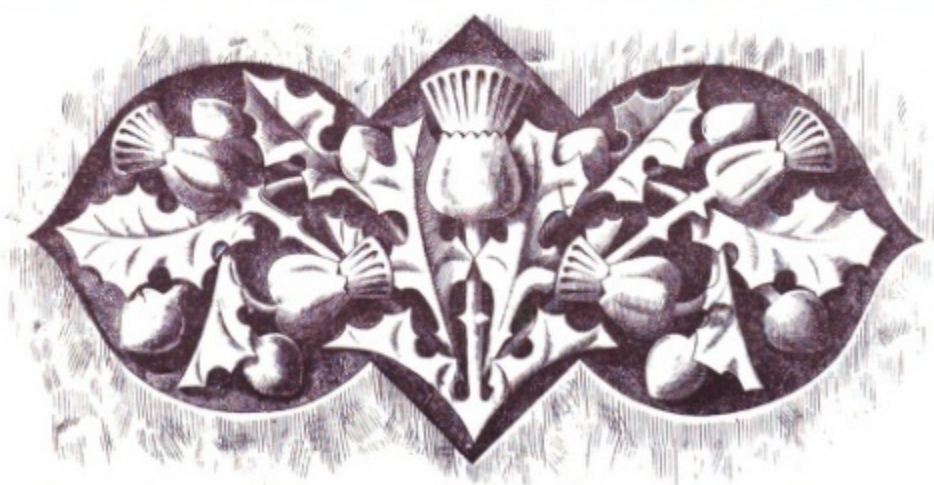
CARDUUS LANCEOLATUS. SPEAR PLUME THISTLE.



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VICIA SEPIUM.

BUSH VETCH.

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RANUNCULUS BULBOSUS.

BULBOUS CROWFOOT

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CAMPANULA GLOMERATA CLUSTERED BELL FLOWER

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CHELIDONIUM MAJUS.

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CELANDINE.

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NEPETA GLECHOMA

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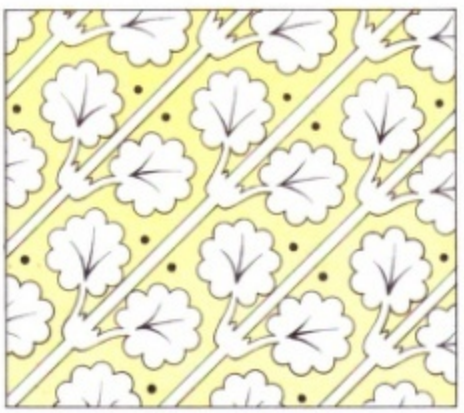
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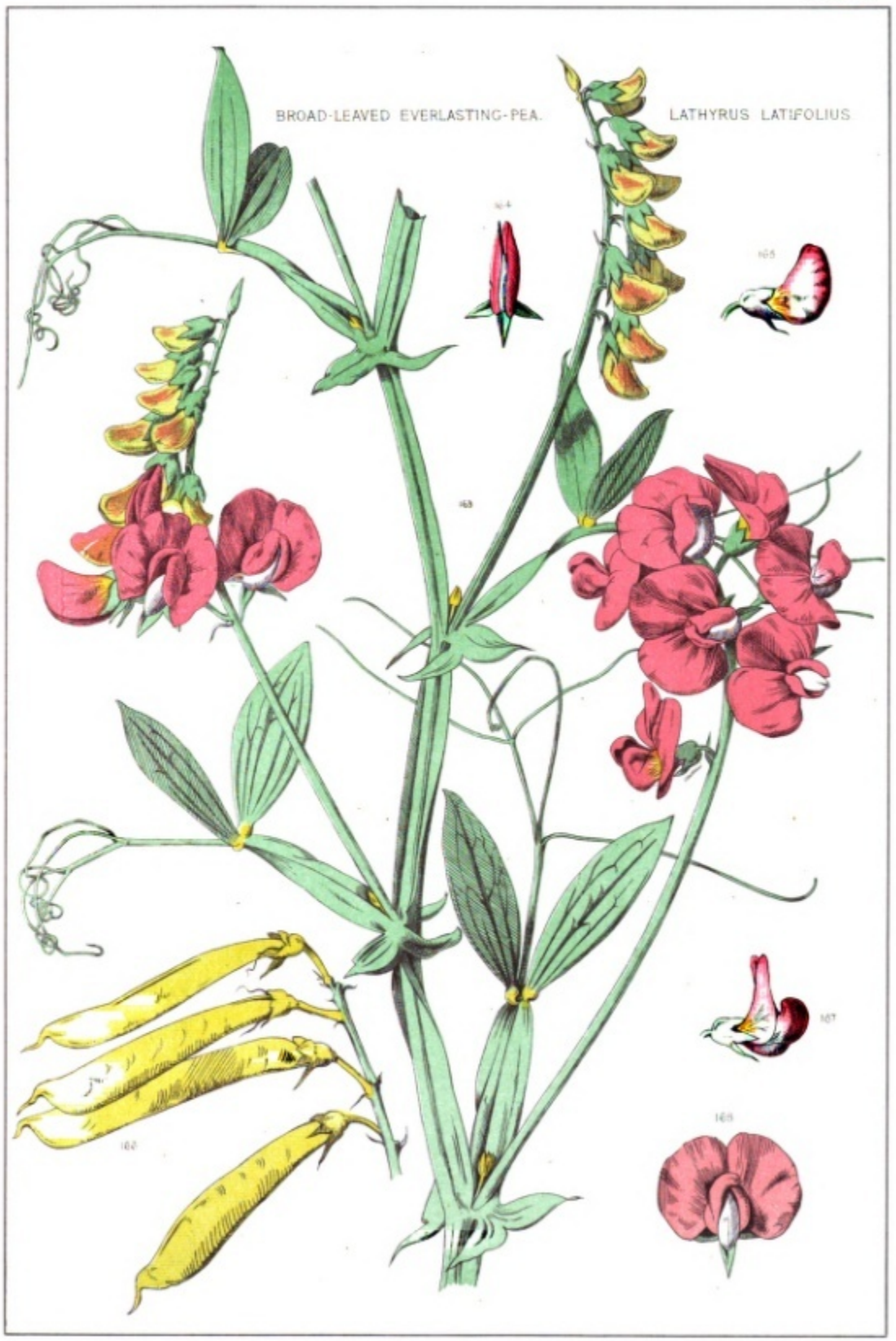

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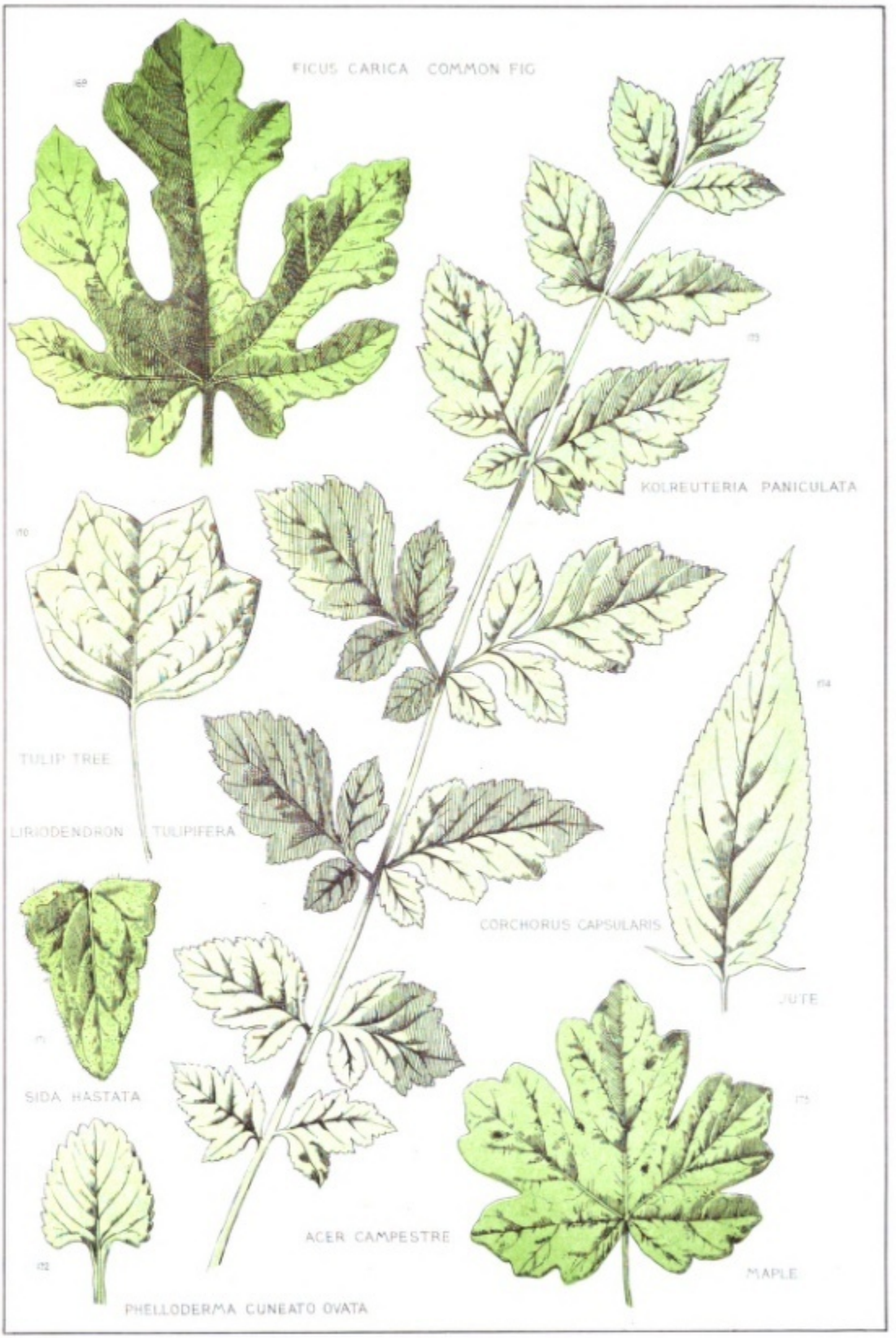

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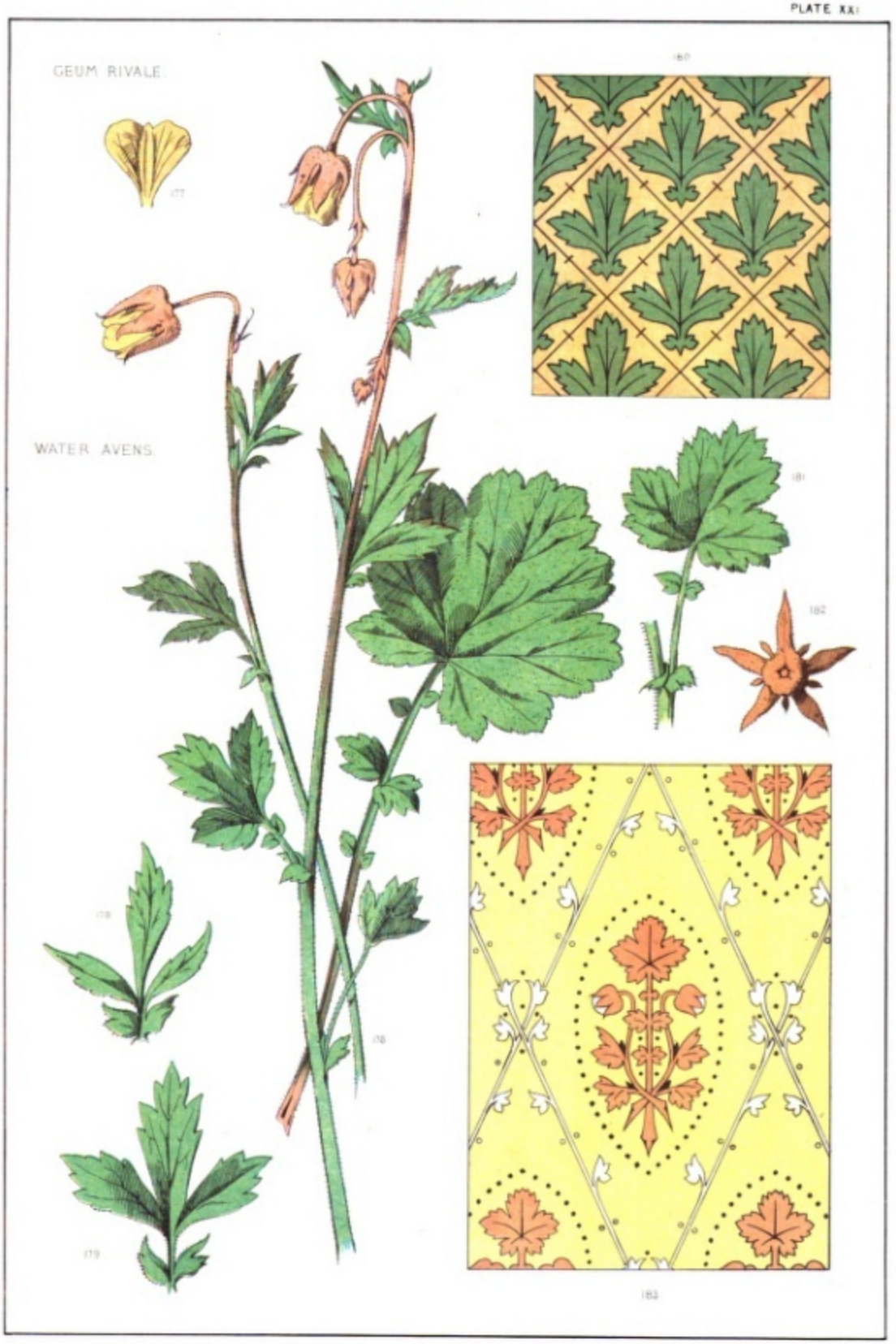

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BLUE MEADOW CRANE'S-BILL.

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LEOPARD'S BANE.

DORONICUM PARDALIANCHES.

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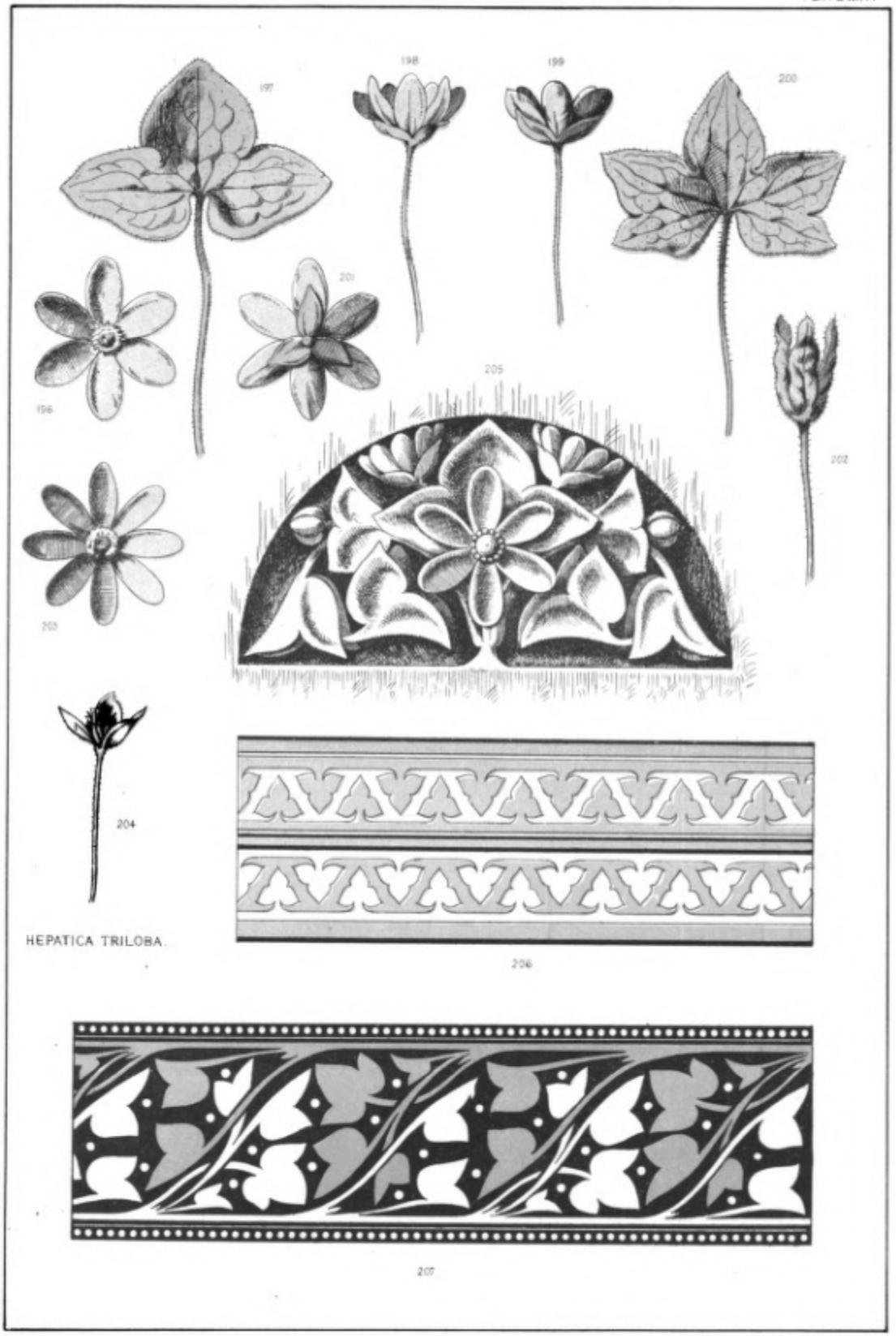

HEPATICA TRILOBA.

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ERODIUM MANESCAVI.

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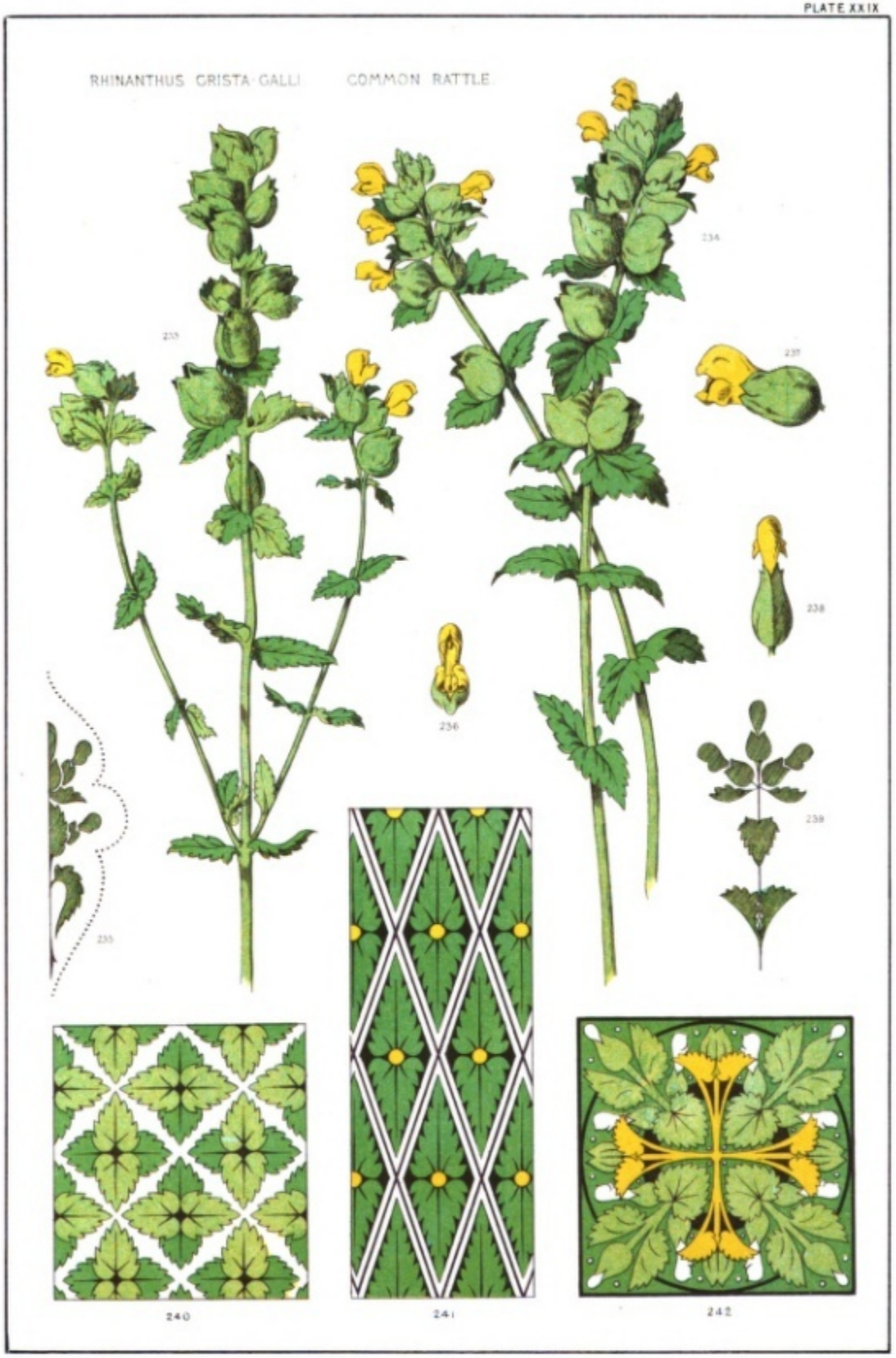

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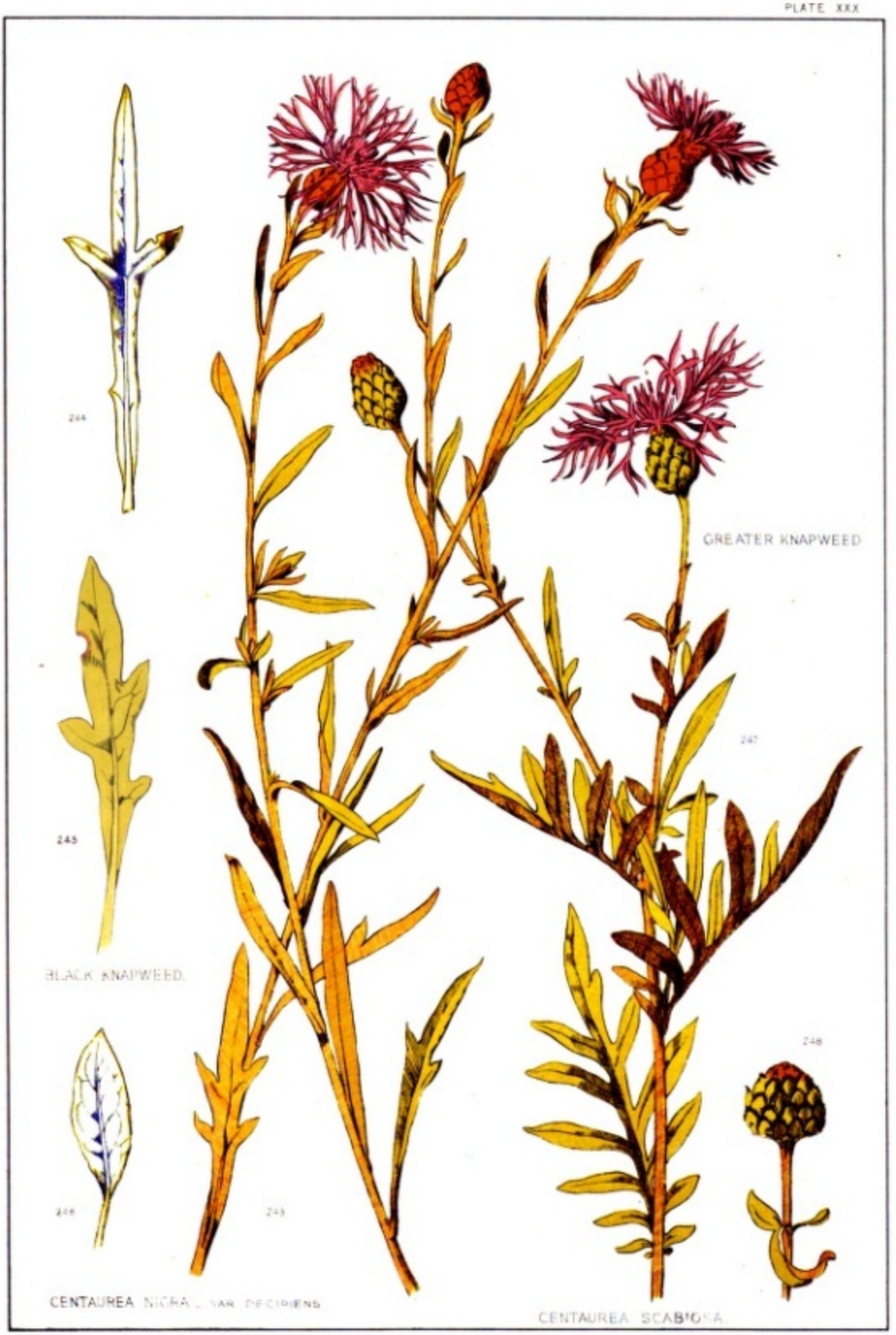

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AGRIMONIA EUPATORIUM. HERB-AGRIMONY.

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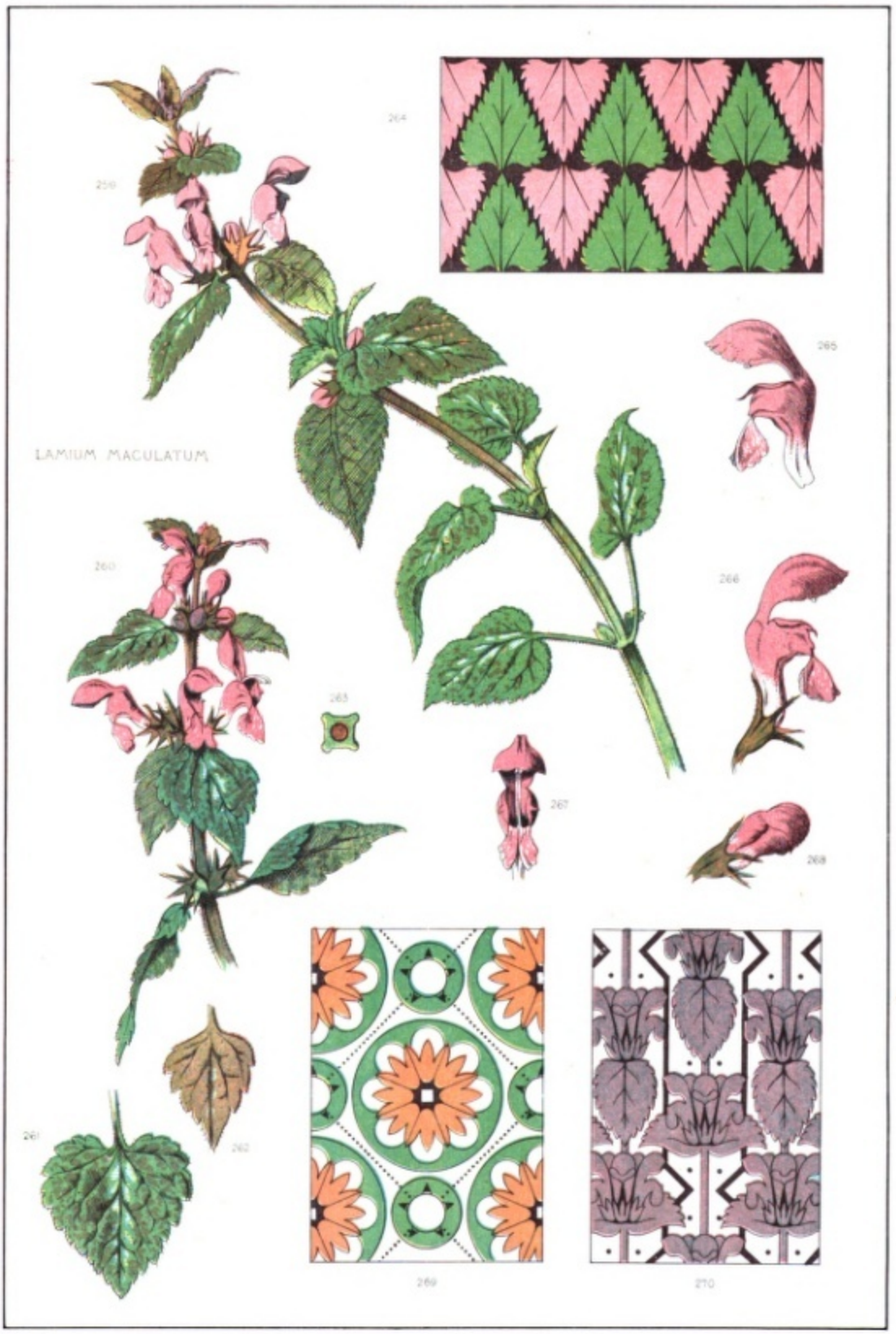

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PLATE XXXIII

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LINUM FLAVUM.

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GERANIUM LUCIDUM.

SHINING CRANE'S BILL.

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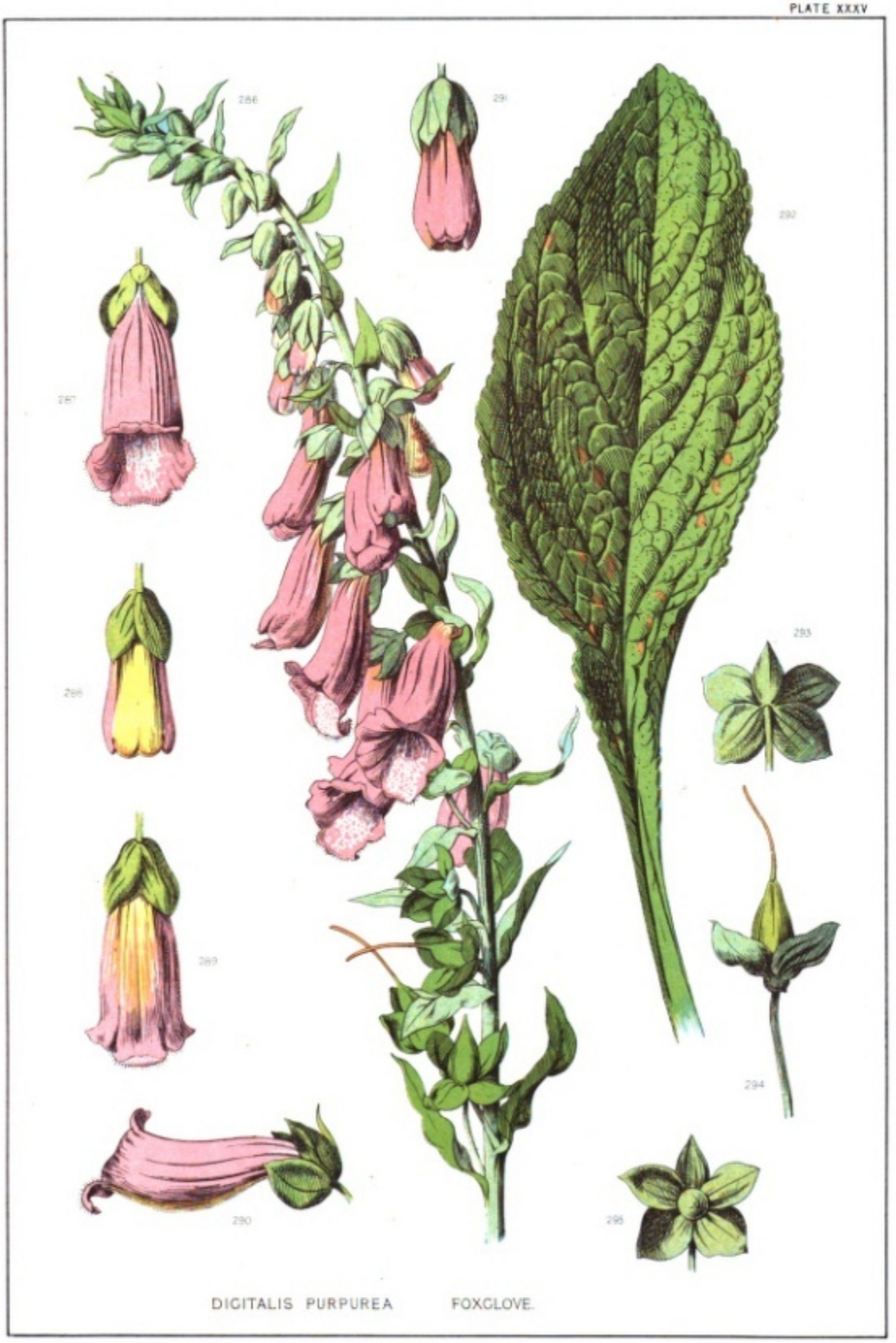

DIGITALIS PURPUREA FOXGLOVE.

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ASTER ALPINUS

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AQUILEGIA VULGARIS

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COLUMBINE

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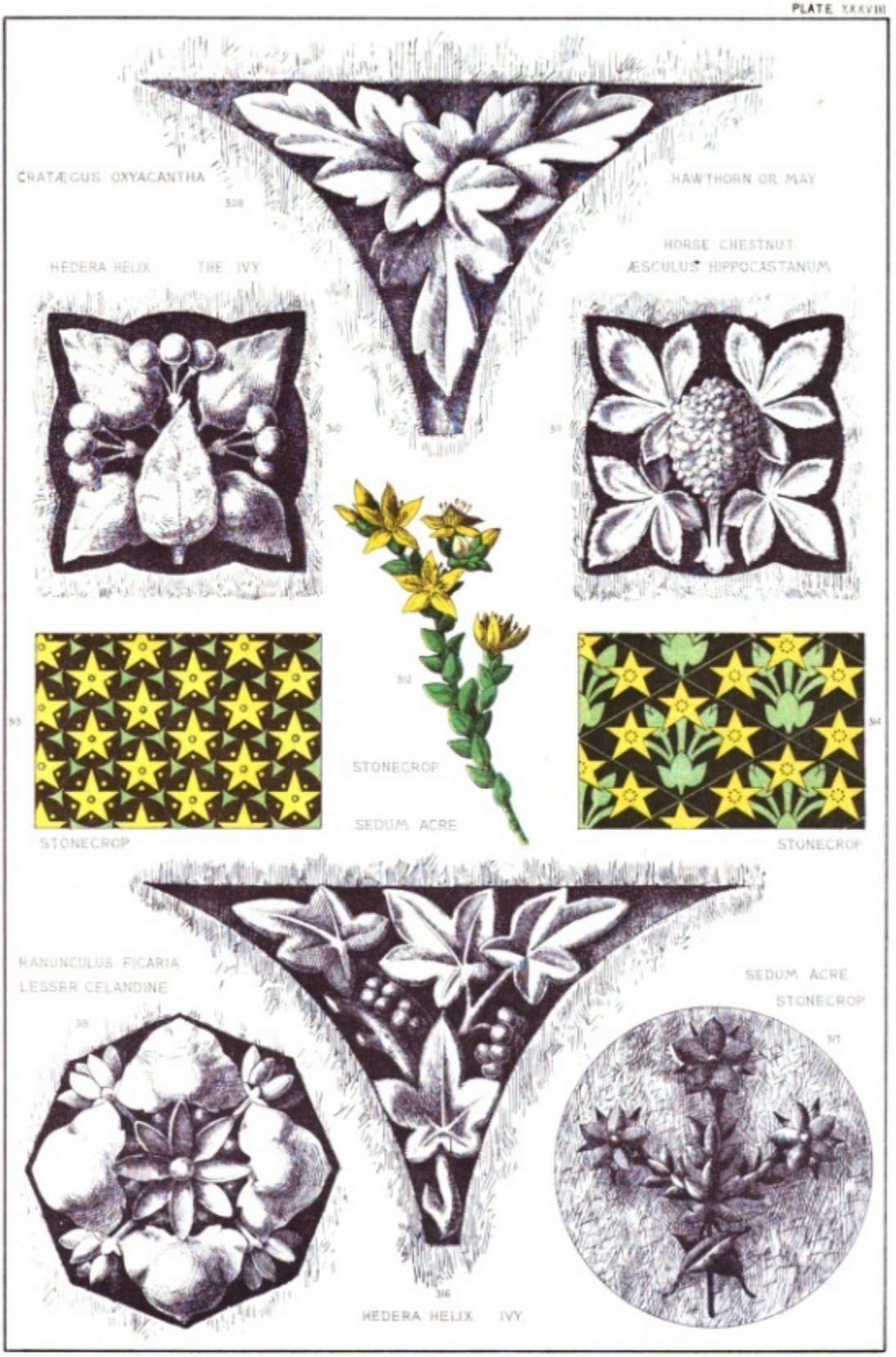

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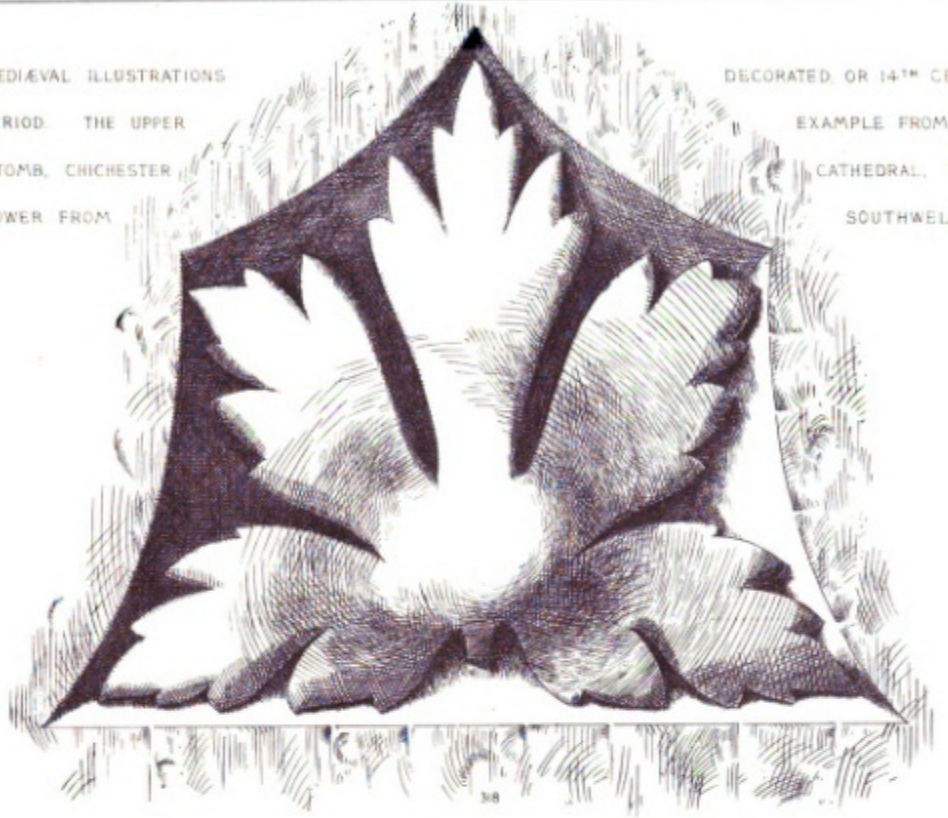
MEDIÆVAL ILLUSTRATIONS

PERIOD. THE UPPER

A TOMB, CHICHESTER

LOWER FROM



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DECORATED, OR 14TH CENTY

EXAMPLE FROM

CATHEDRAL, THE

SOUTHWELL.

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POTENTILLA REPTANS CINQUEFOIL 320

DATURA STRAMONIUM THORNAPPLE 321

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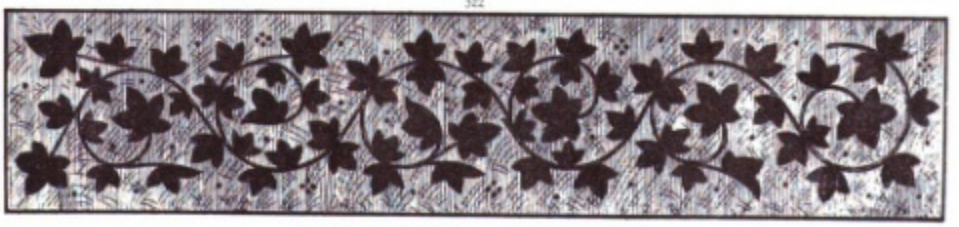

PAPAVER RHŒAS COMMON POPPY

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ARUM MACULATUM. CUCKOW-PINT

CORN-POPPY, DOG-ROSE AND MISTLETOE.

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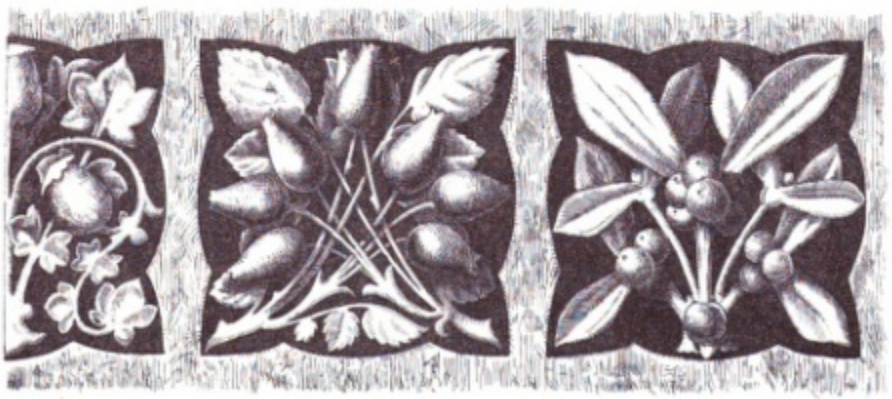

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PAPAVER RHÆAS. ROSA CANINA. 330 VISCUM ALBUM.

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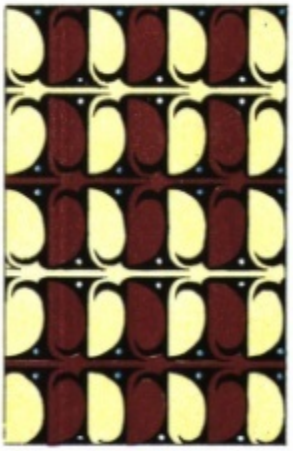

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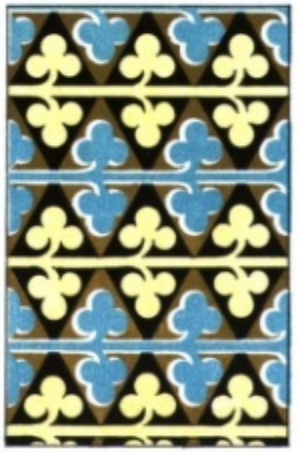

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