

# Nature Study

## A Chat about Flowers

By A. Logan Miller

From *The Parents' Review*

*Cotyledons.* This may sound dry, but it is in fact full of interest. In flowering plants there are *two* embryos or only *one*. The former are called dicotyledons, the latter monocotyledons. The lower group of non-flowering plants have *no* cotyledons, but are produced from spores or cellular embryos; these are called acotyledons. If we plant one bean and one grain of barley, side by side, the difference in the form of germination will be seen very clearly. Now, what appears first above the soil when we plant a bean? A pair of green fairy roundish wings peep above ground to survey the great unknown world: these fairy wings are not true leaves, inasmuch as they are not of the same shape as those which will come by-and-by. Note in passing that the pea and the oak have fairy wings-*but not above the ground*-they decay below the surface. Notice too some important points. If we put a bean into water, wipe it and then gently squeeze it, a drop of water appears at a little point or hole. This is called the "*micropyle*" or "little gate"; you will see this "little gate" also in a pea or in the yellow lupine. Then notice a little sort of peg, the "*radicle*," pointing the way as it were to the micropyle, and lying between them we find a little curved line of a yellowish colour. This is the "*plumule*"; it is very tiny in some plants, so tiny that we might say "it is wanting," but bide your time, do not be in a hurry, wait till the seed has *come up*. It is the rudimentary stem; the word means "little feather," and is the ascending axis of the plant, and it is equally present in the dicotyledonous and monocotyledonous plants-

1. The micropyle- "little gate"
2. The plumule- "little feather"
3. The radicle- "future root"

In a former paper, I spoke of the violet as an alchemist; so now I say note the cotyledons and see whether or no they contain starch (albumen). How shall we decide? Drop a drop of iodine solution on the cotyledon and if you see it become a vivid *blue*, then you are sure starch or albumen is there. Is it of value? Aye it is, even as

bread is the staff of life. It is the nourishing matter stored up between the embryo and the integuments of the seed. It is the floury part of wheat, the fleshy part of a coconut, the oily part of a poppy. Those plants which do not contain albumen, as peas and beans, we call exalbuminous. The buttercup has an exalbuminous seed.

There are some wonderful exceptions to the great fundamental laws of botany which are not only interesting, but which fix, I think, the laws more firmly in our minds. For instance, ordinarily in dicotyledons the first *two* leaves, having fulfilled their duty, drop off; but there are instances –notably a wonderful South African plant, the *welwitschia*, discovered in 1860-of which the dicotyledons *never* fall off; it has in fact no others, and they attain to the wonderful size of six feet by two! Again, to take an example nearer home and of ordinary observation, the balsam has cotyledon leaves repeated a long way up the stem-but these exceptions only prove the rule. The class, *dicotyledons*, has *four* well-marked characteristics-

1. The seed contains *two* cotyledons or lobes.
2. The stems show circles of wood, if perennial.
3. The flowers have sepals or petals in four or fivefold sets, or curiously enough, in multiples of four or five.
4. Last but not least, the leaves are all, except in very few cases, *branch-veined*.

If therefore the seeds themselves are too small to allow of dissection, the leaves will, to a casual observer, be sufficient indication that they belong to the class dicotyledons. And now let one exception be carefully noted-herb paris-which we may find down in some moist wood, and once seen will never be forgotten. Winchester folk may find it in Chilcomb Wood. This is our “true love-knot.” How did it get its name? Not from the abductor of fair but false Helen, but from the more prosaic fact, that the leaves grow (*par paris*) *equal*. See its branch-veined leaves, but remember it is *monocotyledonous* for all that; the seeds and the leaves not being jointed to the stem prove them monocotyledonous. Again, the leaves of the black bryony might deceive us; but once more the veins may resemble the reticulated veins of the dicotyledons, but the leaves are not jointed to the stem, so again we recognize that they are monocotyledons.

Dicotyledons embrace a family of vast dimensions; nearly all British timber and fruit trees and nearly all our flowering plants. Monocotyledons generally inhabit warm or tropical climates, but *we* can find plenty of examples-orchis, blue-bell, crocus, arum,

snowdrop, lily, rush, palm, asparagus, wheat, barley-which have but one embryo, one cotyledon.

On entering the domains of “leafy June” we will try to seek for illustrations of some other great sub-divisions of plants; we will begin with umbels. By an umbel we mean a plant where the flowers grow at the end of stalks, stalks which all start from one point like the ribs of an umbrella.

Here is an umbel! a hemlock (conium). See the red spots on the smooth stem, and specially note, the bracts at the base of the umbels. All umbellate plants should be used with caution. Hemlock is a most valuable medicine, but it is necessary to apply the red label, “Poison,” to the bottle in which it is kept. Wild celery is another umbel, harmful and poisonous, but when cultivated and kept in the dark by being “banked up” it becomes harmless and edible. Umbels may be simple or compound, the compound showing great varieties-especially as regards the fruit, which may be egg-shaped and prickly or egg-shaped and *not* prickly, beaked or *not* beaked. Here is another umbelliferae, though it seems most unlike all the rest of the family. We must pick our steps in trying to secure it, for the bog is wet and treacherous. See! the curious little platter-like leaves, and the wee reddish-white flowers! It is the marsh-pennywort (*Hydrocotyle vulgaris*). You may find it in May or June in bogs or marshes. Here is another beautiful example, the rough chervil (*Cherophyllum temulentum*). See the deeply lobed and cut leaves, notice how the buds *droop*, observe how few general bracts there are. By-and-by the leaves will be a rich purple. All hemlocks, drop-worts, carrots and parsnips are umbels and most of the species are white in flower, but occasionally yellow (as parsnip), pink (hedge parsley), blue (sea holly). These we may hope to see by-and-by, but scarcely in June. And now, what is this gloriously blue flower by the way-side with here and there a red-tinged blossom, with curious hairy spotted leaves like the surface of the human lung? It is a borage-*Pulmonaria* or lung-wort-a borage beloved of bees and beautiful in colouring. Its cotyledonous leaves are very decidedly different to those which follow. We *must* gather it, though we detect it is *not* an umbelliferae. The calyx is five and often six-cleft. In the specimens I gathered at Lyndhurst, more than two-thirds have the calyx six-cleft. It is a cousin to the viper’s bugloss, but in this latter the stamens are longer than the corolla. In the pulmonaria they are enclosed within the corolla and as the corolla falls off fall with it, leaving behind the pistil and four-seeded ovary clearly to be seen. If we tear open the fallen corolla, we can see the four beautiful stamens, like minute hammers, within. The calyx

is wonderfully beautiful in form and colour, the minute hairs shining in the sun. If we get a really good specimen, root and all, we shall see that the leaves at the base are rounder and stalked, while the upper ones are sessile, sitting, so to speak, on the main stalk, as do the leaves of the speedwell. In Hampshire and the Isle of Wight we may hope for still more beautiful borage, the *Pulmonaria angustifolia*. The whole plant is taller, and the leaves much narrower. Bugloss of many kinds may enrich our collection. The common viper's bugloss has rough leaves, reminding us of the huge tongue of an ox. A year or so ago I came upon a wide expanse of otherwise unprofitable ground, near Ringwood, ablaze with viper's bugloss. In vain I tried to procure a specimen with full length of root, for the soil though loose was hard, and the roots seemed to descend to unknown depths. I could almost have fancied myself in the steppes of the Caspian during the two months when beauty, many-coloured, reigns in that unusually sterile land.

But our time is exhausted, our box fairly full. Let us return home to experiment by planting some dicotyledons and monocotyledons. To see by actual experiment the *microphyle*, the *plumule*, the *radicle*. To find out the reason of the starchy food stored in the embryos. For clear experiment take a sycamore seed, a broad bean and a mustard seed, the last mentioned if not in actual fact "the smallest of all seeds," still sufficiently strikingly small. Six hundred mustard seeds will often be needed to make the scales equal should we put a broad bean in one scale, mustard seeds in the other.

(The little error in my last list, "Greater Stitchwort" instead of "Lesser Celandine," I hope deceived no one. It was scarcely the printer's fault, as in my endeavours to make the delayed paper more "up-to-date," the confusion arose.)

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