Darstellung der Pflanze

Jeder einzelne Teil der Pflanze wird in seinen verschiedenen Erscheinungsformen gezeigt.

D A S B I O L O G I E M A T E R I A L

Es besteht aus verschiedenen Kartenserien, die wiederum in 5 großen Gruppen zusammengefaßt sind.
Die 5 Gruppen sind:

Die Wurzel
Der Stengel
Das Blatt
Die Blüte
Die Frucht

Jede Gruppe ist leicht kenntlich gemacht durch eine bestimmte Farbe, in der die einzelnen Serien aufbewahrt werden.
Die Umschläge für die Serien der Wurzel sind beige.
" " " " " " Stengel " hellgrün
" " " " " " Blätter " dunkelgrün
" " " " " " Blüten " rot
" " " " " " Früchte " gelb

Jede Serie gibt es in doppelter Ausführung:
a) mit Namen
b) ohne Namen und Namenskärtchen lose
Das Namenkärtchen wird zur leeren Karte geordnet.
Die Bezeichnungen für die einzelnen Formen werden gelernt und die Aufmerksamkeit der Kinder wird auf die verschiedenen Formenbildungen gelenkt. - Der Reichtum, der uns in der Natur umgibt, wird auf diese Weise in das Bewußtsein der Kinder gerückt und die Kinder fangen an, selber neue Formen zu entdecken.

Einzelne Serien gibt es auch in Buchform. Auf einer Seite ist das Bild, das die Kinder von den losen Karten her kennen. Auf der gegenüberliegenden Seite steht ein erklärender Text.

Der Text ist gleichfalls noch einmal lose vorhanden, jedoch ohne Namen. Zu diesen etwa 5 oder 6 losen Textkarten müssen wiederum die losen Namen geordnet werden.

Schließlich wird der Text jeweils in zwei oder drei Teile zerschnitten und muß dann wie ein Puzzlespiel zusammengesetzt werden.

Dies Material kann gleichzeitig als Lesestoff zum Üben des Lesens verwandt werden.

T H E P L A N T

1. T h e p l a n t ..... is a living organism which usually consists of root and stem and leaves.
(Latin: Planta - a shoot)

Root ..... is the descending axis of the plant. It takes in water which has mineral salts dissolved in it and frequently fixes the plant to the ground. It bears no leaves or flowers and grows downwards.
(Middle English - roots)

Stem ..... is the ascending axis of the plant. It bears buds, leaves, flowers and fruits and connects these with the root. It grows upwards. The apex of the stem is called the growing point.
(Anglo Saxon - Stemn - stem of a tree)

Leaves ..... are the laminae expansions, veined and us usually green in colour, which proceed from the stem.

Axis of the plant ..... is the central part or longitudinal support around which the organs are arranged.

R O O T S

1. Parts of the root ..... Roots which descend into the ground finish with a root cap. Above are placed the root hairs.

2. Types of roots
taproots or branched roots ..... a tap root is one which descends deeply into the ground and generally produces branches (oak, wallflower, bean)
..... (English: tap - to pierce)

Fasciculated roots ..... are roots which are generally fibsous (threadlike) and all alike
(Latin - fikes - thread) (grass)

They are included among the adventitious roots
(Latin - fascicle - a bunch, a cluster)

1.)

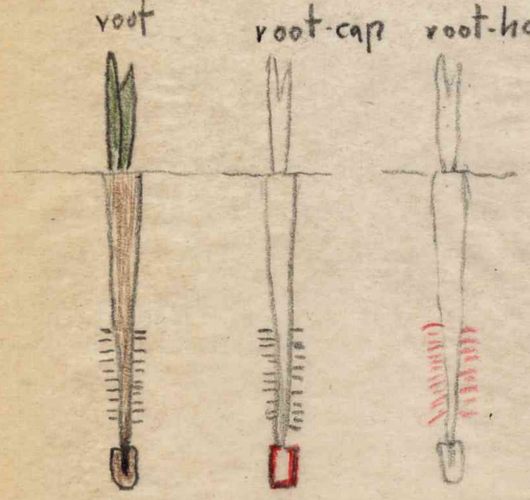
The Plant

4x

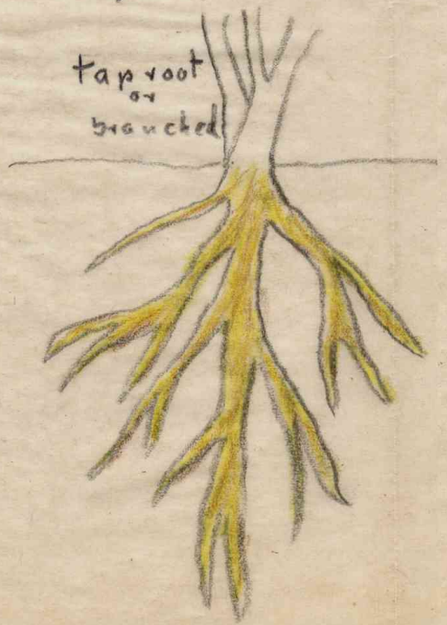
1x alles bunt
1x nur wurzel bunt
1x " Stamm "
1x " Laub "

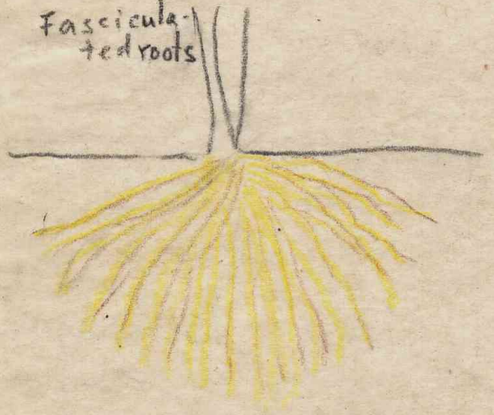
Roots

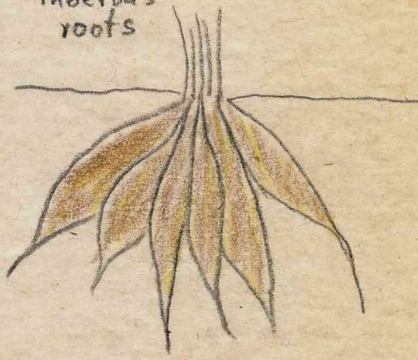
1. Part of the roots



2. Types of roots







3. The branching of roots

The primary root ..... is the main root
(Latin: primus - first)

The secondary roots ..... are the lateral branches of the primary root, which grow horizontally or somewhat obliquely from the above, parcelling out the soil between them.
(Latin: secundus - second)

The tertiary roots ..... are the roots which grow irregularly from the secondary roots. They grow in all directions and occupy the soil left free by the other roots.
(Latin: tertius - third)

4. Swollen roots ..... In some cases roots are needed for good storage. Then they present swelling in certain regions or are entirely swollen. To distinguish them one from the other they are given different names chosen from some familiar object, the shape of which they resemble . But as the names for these objects differ in different languages, the words adopted are taken from Latin or Greek andeach country then uses the same names. So,"conical"means similar to a cone; "Fusiform" similar to a spindle (the Latin word for spindle is fusus); etc.
(English: swell - to increase in volumne)

Conical roots ..... are roots which are broad at the stem and gradually taper towards the tip (carrot)
(Latin: conus - a cone)

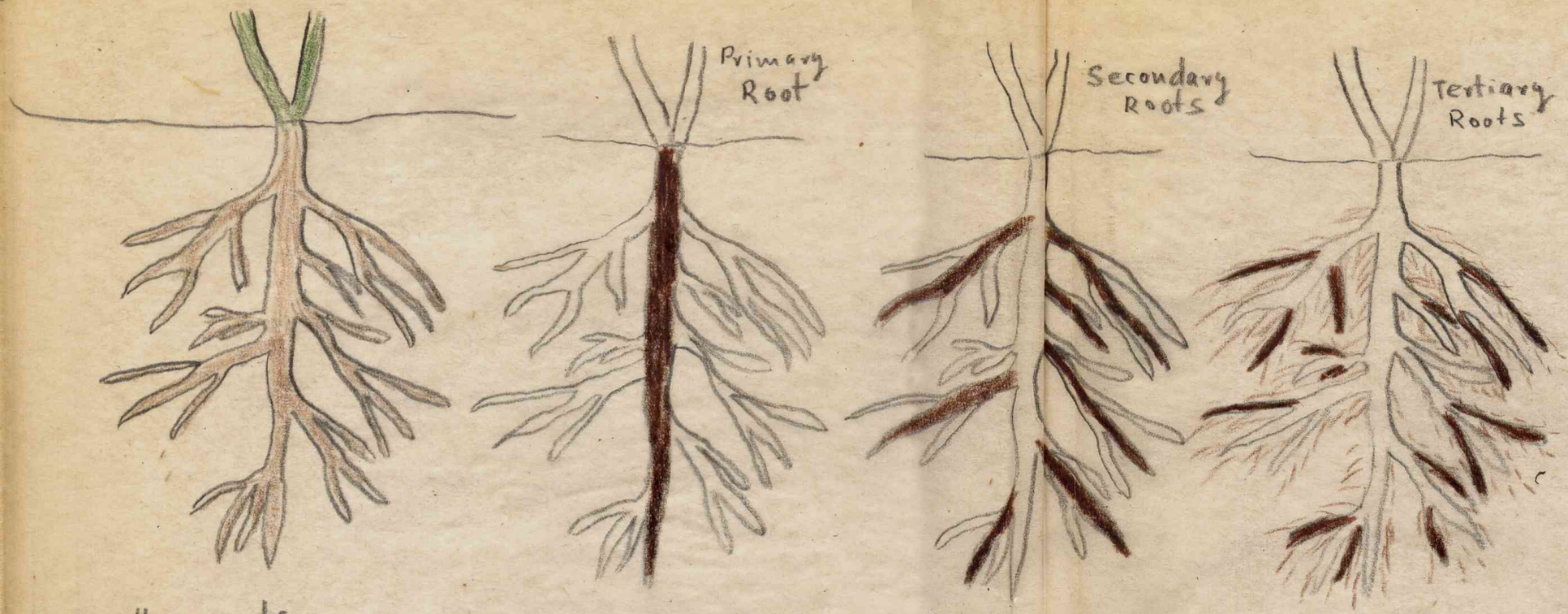
Napiform roots ..... are roots which assume the shape of a turnip, large and round in the upper part and tapering abruptly below.
(Latin: napus - a turnip)

Fusiform roots ..... are roots which appear at each end in the shape of a spindle. (Radish)
(Latin: fusus - a spindle)

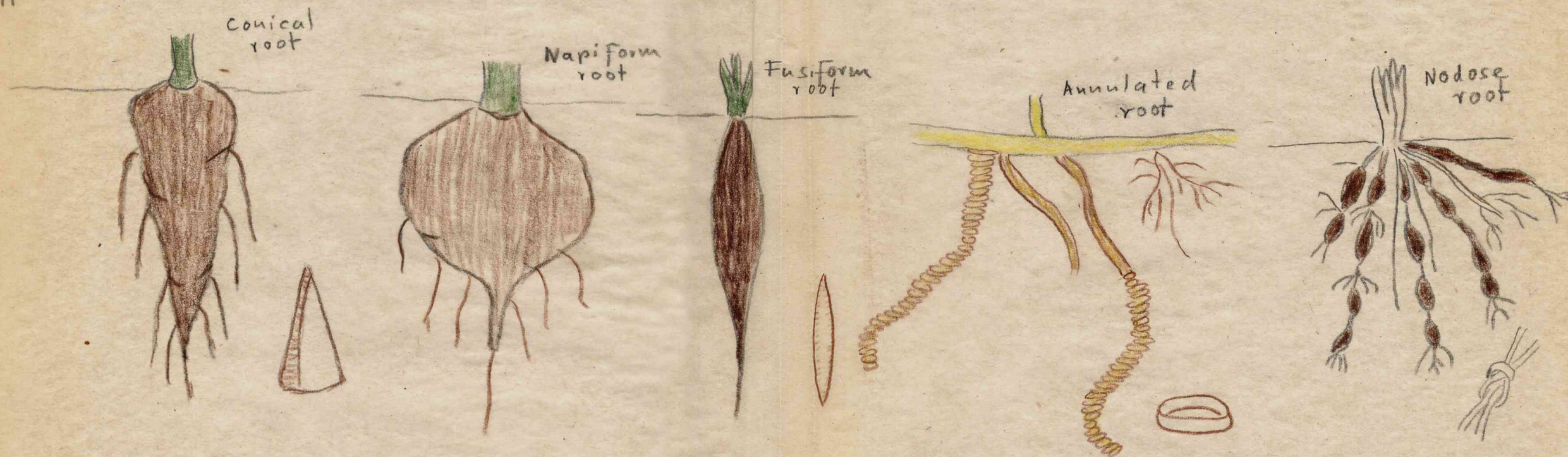
Annulated roots ..... are roots which show contractions at short intervals. (L pecacnan)
(Latin: annulus - ring)

Nodose roots: ..... are roots presenting irregular swellings on the fibrils. (spirea)
(Latin: nodus - knot)

3. The branching of roots



4. Swollen roots



Tuberous roots ..... are roots which assume the shape of a tuber (dhalia)
(Latin: tubes, from tumere - to swell)

Tuberculae roots ..... are roots which are round and swollen. (Pilewort, orchid)
(Latin: tuberculum - a small tuber)

5. Adventitious roots ..... Adventitious means out of place and therefore all roots which grow from any part of a plant other than the one resulting from the original radicle belong to this group. (For the meaning of radicle see Embryo section seeds)
(Latin: adventitious - out of the normal place)

Clinging and climbing roots ..... are roots which anable the plant to cling to walls etc. (Ivy) Most plants which push their leaves high in the air have strong thick stems. Some plants, the stems of which are very long and very thin, can not hole themselves upright, so they develop a set of roots which, by clinging to a support, a wall or another tree, are able to climb that is why some call this type of roots "clinging" and others "climbing".

Airial roots ..... belong to plants which do not live on the ground but perch on branches of other trees somewhere high up. The roots hang down in the air and take water from it. (Many and orchids)
(Latin: aer - air)

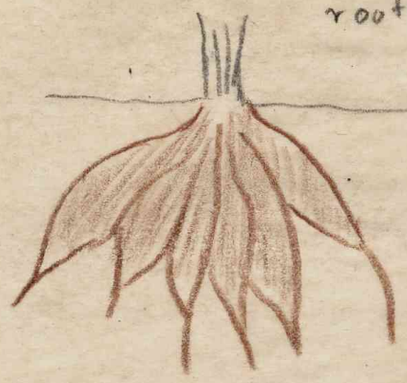
Clasping roots ..... are roots of climbing plants which clasp like two arms. (vanilla)
(Middle English: claspen - to surround and cling to)

Pillar roots ..... are airial roots which, starting from a branch, descend vertically to the ground, become imbedded in it, thicken and so support the branch. As they remain cylindrical they assume the form of pillars. (banyan tree)
(Latin: pila - a pillar)

Floating roots ..... are roots which grow in water but which never penetrate the mud at the bottom of the pond and so they float, they do not produce hairs. (water plants have thin type of roots) This name is given also to the ordinary roots of willows. Alders and Elms which growing along the banks of streams, because of the lateral extentions of their roots, often send some of them into the water.
(Middle English: flote - ship)

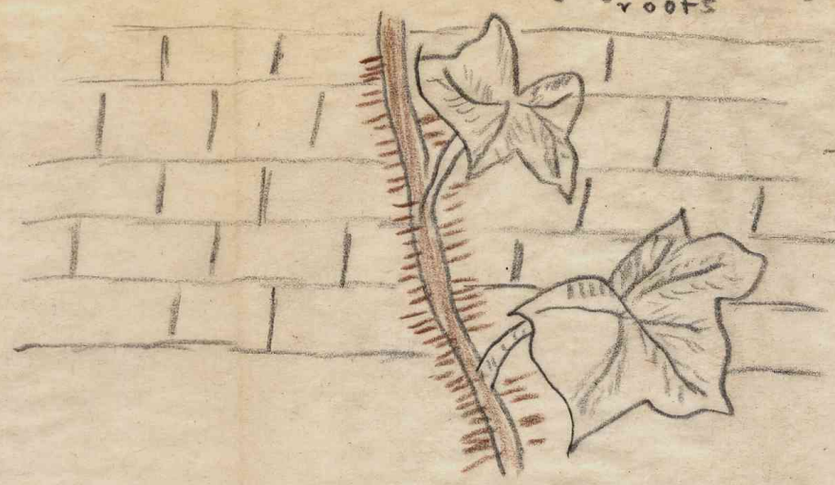
5. Adventious roots

Tuberculer roots



Tuberous roots.

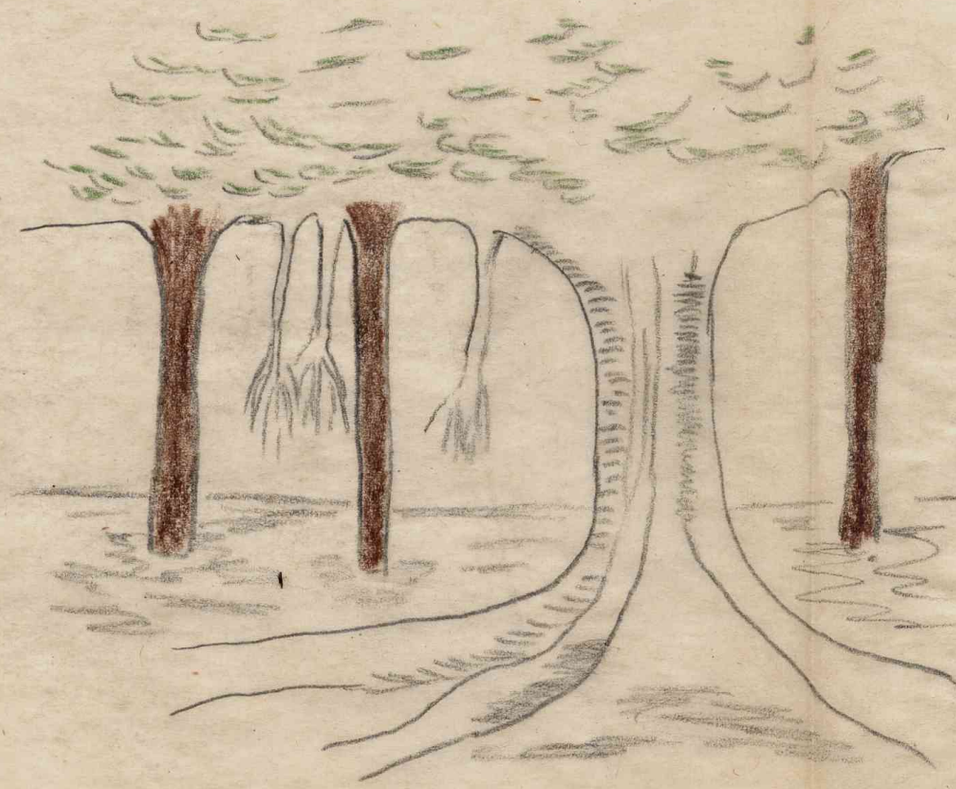
Pillar roots

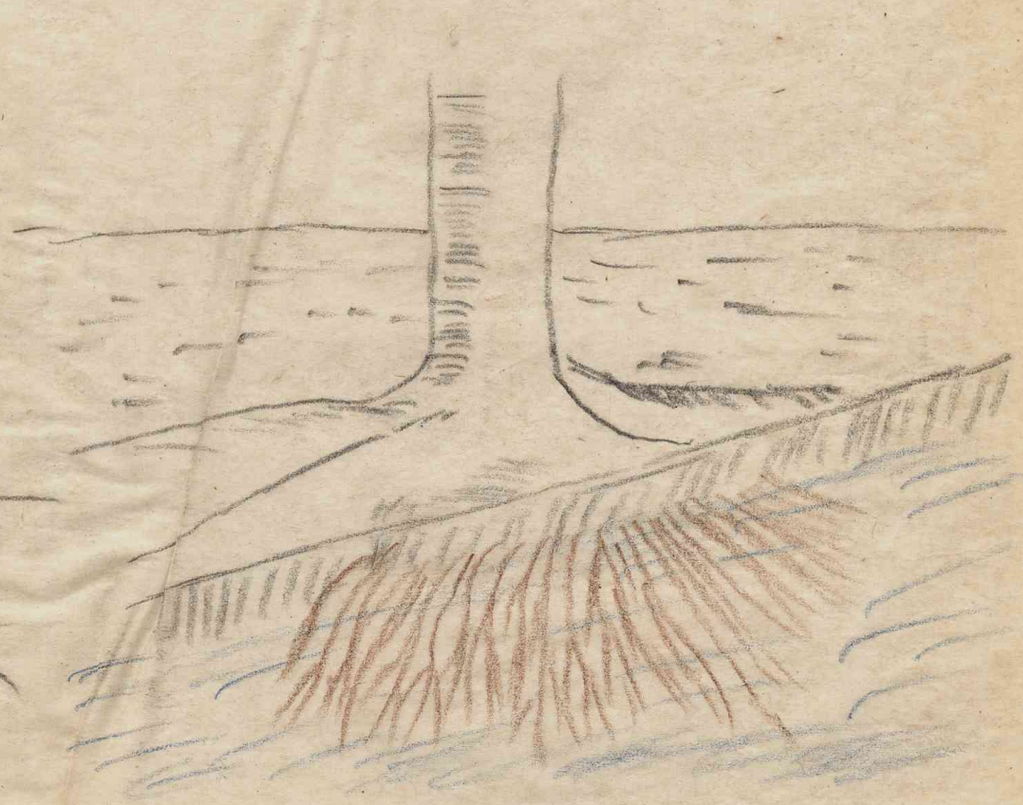


Clinging + climbing roots

Aivial roots

Clasping roots





Floating roots

Parasitic roots ..... are roots which instead of sinking into the soil penetrate into some portion of another plant and extract some of the nourishment that plant has made for itself. (mistletoe, broom rape)

Greek: parasitos - parɔa = beside - sitos = food (at the tackle o of another)

The roots of "eyesbright - broomrape " have little suckers which attach themselves to the root of grasses and extract nourishment from the them.

Breathing roots ..... Plants need air to breathe. Some tropical plants which grow in marshes send their roots into the mud where the air cannot penetrate. There they cannot breathe and the plant would d die, if it did not send some of its roots all around the stem, up instead of down. These roots dig stick out the ground above and so they are able to absorb the air. That is why they have been called breathing roots.
(Avicennia Nilida)

(Middle English: breth - breath)

Buttressing roots ..... Some larger plants, to withstand better the force of the wind, have at the base of the trunk a re-inforcement of special roots which raise out of the soil like buttressing walls.
(Rubber tree)

(French: bouter - to push)

Drop roots ..... Some plants develop from the stem at one or more points above the ground a row of roots which, reaching the ground, serve as a prop for the plant. (Screw Pine - Maize)

(English: prop - to support)

S T E M O R T R U N K

1. Aerial stems ..... are stems which grow above the ground.

(Latin: aer - air)

Subterranian or underground stems ..... are stems which grow beneath the surface of the ground.

(Latin: sub - under; terra - ground)

2. Parts and attachment of stem .....

Node ..... is the point of a attachment of leaf or leaves on the stem.

(Latin: nodus - a knot)

Internode ..... is the portion of stem between to successive nodes.

Axil ..... is the angle between a branch or leaf and the stem from which it spings.

Parasitic roots

Breathing roots

Buttressing roots

Prop root

Stem or Trunk

Aivial stems

Subterranian or underground stem.

Axil

parts and attachment of stem

Node

Internode

Bud ..... is a small axillary or terminal protuberance composed of successive layers of rudimental floral or foliage leaves. Buds are therefore undeveloped stems or inflorescences. (For inflorescence see F 34)

3. Subterranean stems

Rhisome ..... is an underground root-like stem, which sends up leafy shoots from the upper surface and produces roots from the lower side. (Solomon's seal, Iris)
(Greek: rhisoma - a mass of roots)

Tubes ..... are short, fleshy, underground stems bearing very small scale leaves at the axil of which are situated buds: the eyes in the potatoe. (Potatoes)

Bulb ..... is a short thickened stem with a large number of crowded, overlapping fleshy leaves. (Tulip, Onion)
(Latin: bulbus - a bulb)

Corm ..... is a short, fleshy, bulb-like stem surrounded by a few thin membranes or scale leaves and bearing buds at the summit. (Crocus, Gladiolus)
(Greek: kormos - trunk of a tree shorn of branches)

4. Aerial stems
Habit of growth

Erect ..... is a stem which raises upright without any supprt.
(Latin: erectus - having a vertical position)

Procumbent ..... is a stem which trails along the earth.
(Latin: pro - forward; cumbere - to bend)

Climbing ..... is a stem which needs support to go aloft.
(English: cleave - to adhere)

5. Procumbent stems

Stolon or offset ..... is a slender branch which growing at, or near, the base of the mother plant curves towards the ground, takes root, forms and upright stem, and ultimately a seperate plant. (Houseleek)
(Latin: stolo, stolonis - a stolon)

Subterranian stem

Terminal Bud

Axil Bud

Rhisome

Tubes

Bulb

4. Aerial stems
Habit of growth

Erect

Climbing

Procumbent

5. Procumbent stems

Stolon or offset

Runner ..... is a slender branch, producing roots and a bud at the nodes and at the tip. (Strawberry)

Sucker ..... is a shoot originating below ground from the lower part of the stem of a plant, it runs for a short distance beneath the surface and then strikes upwards; ecentually forming a new plant. (Rose, Mint)
(Latin: sugere - to suck)

6. Erect stems are called:

Herbaceons ..... when they are soft, green, usually annual (annual - whose life lasts only one year)
(Latin: herbaceons - grassy)

Shrubby ..... when from a short, hard and woody base several stems arise at or near the ground. Box, Heather, Gooseberry)
(Middle English: shrob - shrub)

Woody ..... when there is a single hard stem, more than ten feet high when grown. It is usually devoid of branches in the lower position, but bears a group of branches and leaves, or only a bunch of leaves at the top. (Trees)
(Middle English: wode - wood)

7. Climbing stems .

Root climbers ..... are stems which climb with the help of adventitious roots. When these come in contact with the support, they give out a fluid which, in drying up causes the stem to adhere to the support (Ivy)

Hook climbers ..... are stems which climb by means of hooks or prickles. (Bramble, rose, certain lianes etc.)
(Middle English: hok - hook)

Twining stems ..... are stems which coil spirally around either another plant or around a pole.
(Clockwise - Hop, Honey suckle)
(Anti-clockwise - convolvulus)
(Anglo-Saxon: twin - a twisted or double thread)

Leaf climbers ..... are stems which climb by means of sensitive leaf stalks or tips. These twine around or grasp the objects they touch.
(Clematis with leaf stalks; Gloriosa superba with leaf-tips)

Runners

Sucker

Erect stems

woody

Herbaceons

Climbing stems

Root-climbers

Twining stems

Shrubby

Hook-climbers

Tendril climbers

Leaf climbers

Tendril climbers (Tendril) ..... are stems which support themselves by means of their tendils which cling to various objects, or wind around them.
(Virginia Creeper - Grape vine)
(Soft tender branch or spring of a plant, from French: tendre:- tender)

Tendrils are slender leafless, spirally, coiling and sensitive organs serving as a means of attachment to a supporting body or surface. They can be a modified stem (grapes) an axillary branch (Passion flower) a stipule (greenbrier) or a modified leaf (pea). The tendrils of the Virginia creeper develop adhesive discs at the tip.

8. Internal structure
Stems are said to be:

Solid ..... when the stem is solid, as in trees.
(Latin: solidus - whole, entire, solid)

Fistular ..... when the stems form a hollow tube.
(Most graminacea)
(Latin: fistula - a pipe, a reed)

9. Outer Surface
Stems are said to be:

Glaberous ..... when the stem is without hairs.(Dhalia)
(Latin: glaber - without hairs or projections, smooth)

Hirsute ..... when the stem is hairy. (Borage)
(Latin: hirsutus - rough with hairs)

10. Shape of stem
The stem may be:

Round or cylindrical ... as in a lily, as in any tree.
(French: rond - round
Greek: kulidrons, from kulindein - to roll)

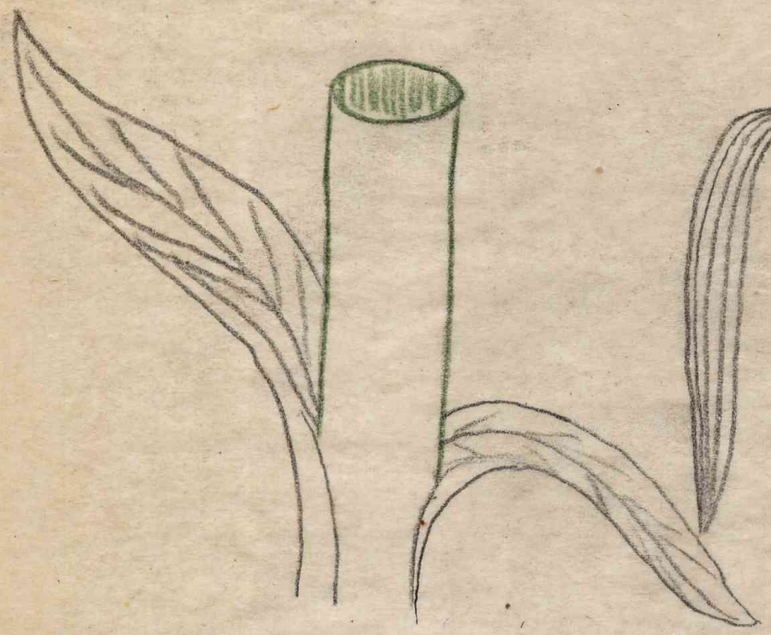
Triangular ..... as in Cyperus.
(Latin: tri - three, angulus - angle)

Square ..... as in Deadnettle.
(Latin: exquadans; from quattuor - fone)

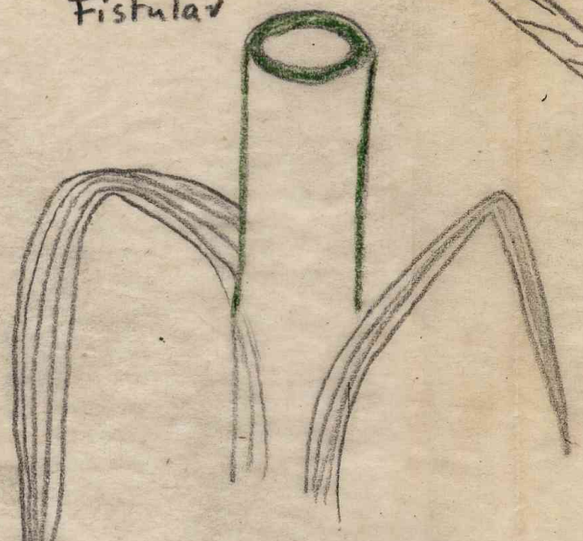
Ribbed ..... as in wallflower.
(English: rib)

8. Internal structure

Solid

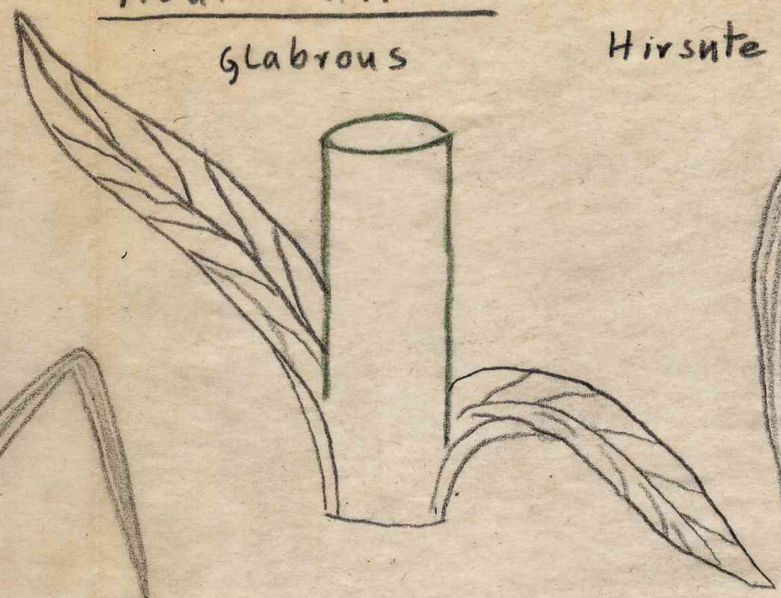


Fistular

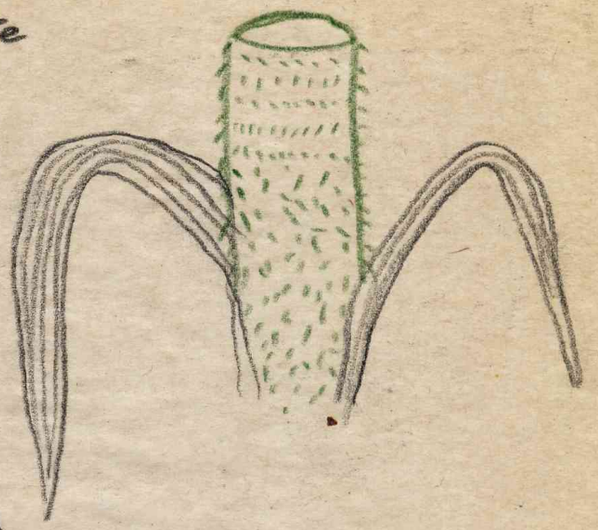


9. Outer Surface

Glabrous

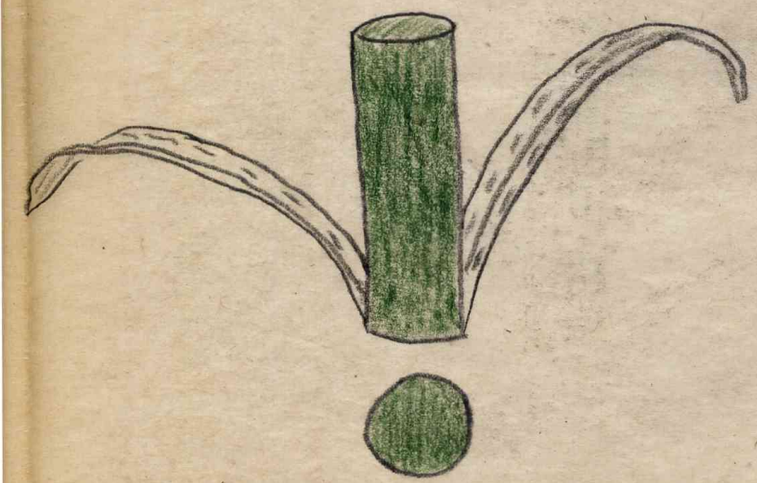


Hirsute



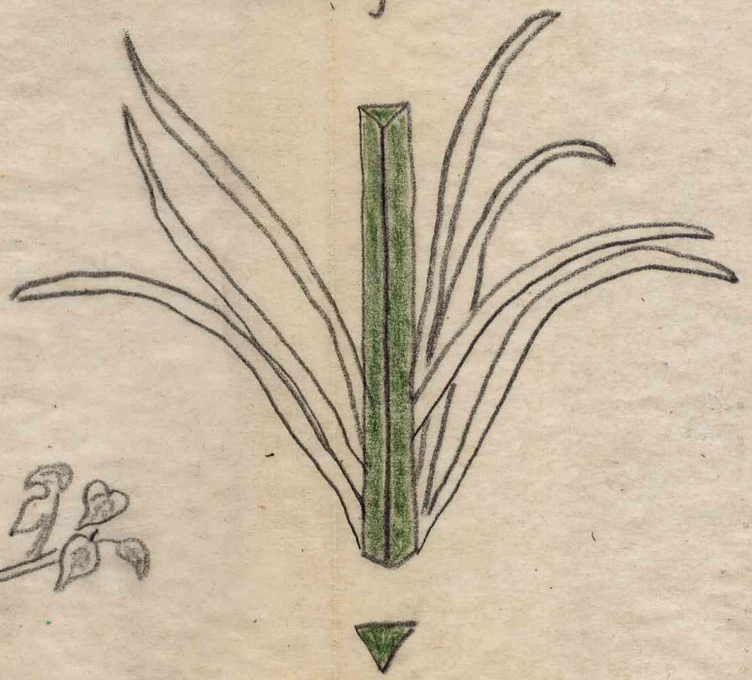
10. Shape of stem

Round or cylindrical

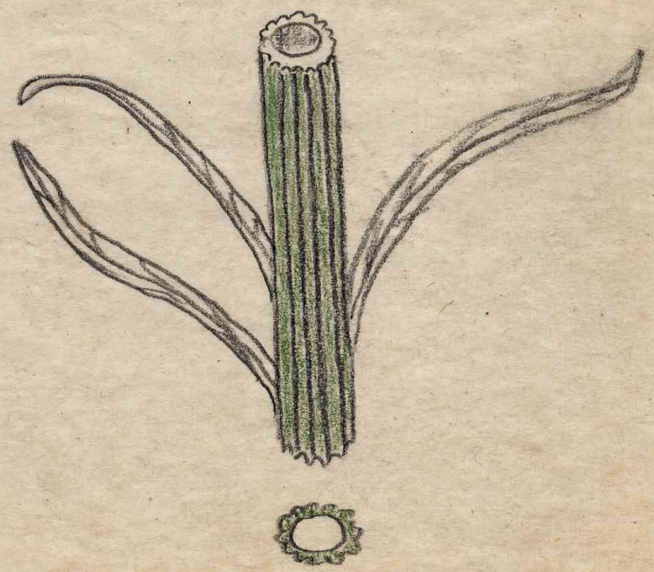


Square

Triangular



Ribbed



11. Modifications of stem

Tendrils ..... in certain plants some branches are transformed into sensitive organs called tendrils which are used for climbing. (Passion flower; Virginia creeper) (For definition see Nr. 7)

Thorns ..... are short and leafless branches which have become extremly hard and pointed. They are protective in function. (Blackthorn)

Cladode or Phylloclade ..... stems sometimes take on the general appearance and the work of green leaves, and when such is the case they often flatten out considerately. These stems may be recognized by the fact that they arise in the axil of small leaves which are extremly small and membraneous. (Butcher's broom, Smilax, many Cactaceae)
(from Greek: cladodes - having many shoots)
(from Greek: phillon - leaf - klados - sprout)

L E A V E S

1. The parts of the leaf.

Veins ..... are the portions of the leaf that function like the veins in the human body. They are made of harder material and function as the support to the softer parts of the leaf, forming a sort of skeleton. The larger veins are therefore also called ribs.
(Latin: vene - vein, also tube)
(Latin: costa - rib)

Blade ..... is the lamina or fully expanded part of the leaf.
(Middle English: klad - leaf)

Margin ..... is the outer rim of the leaf.
(Latin: margo - marginis - a border)

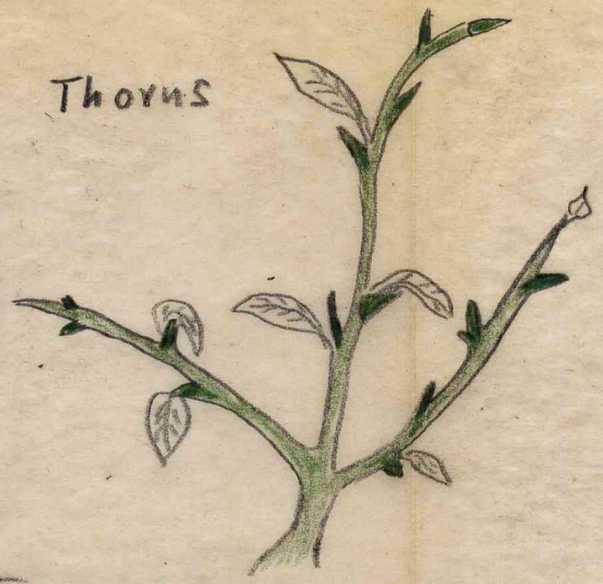
Petiole ..... is the narrow portion which joins the blade to the stem.
(Latin: petiolus - a little foot)

Stipules ..... are the leaflets sometimes found at the base of the petiole, having a lateral position. They may be free or be joined together (aduate) to the stem or petiole.
(Latin: stipula - a stalk)

II. Modification of stem

Tendrils

Thorns

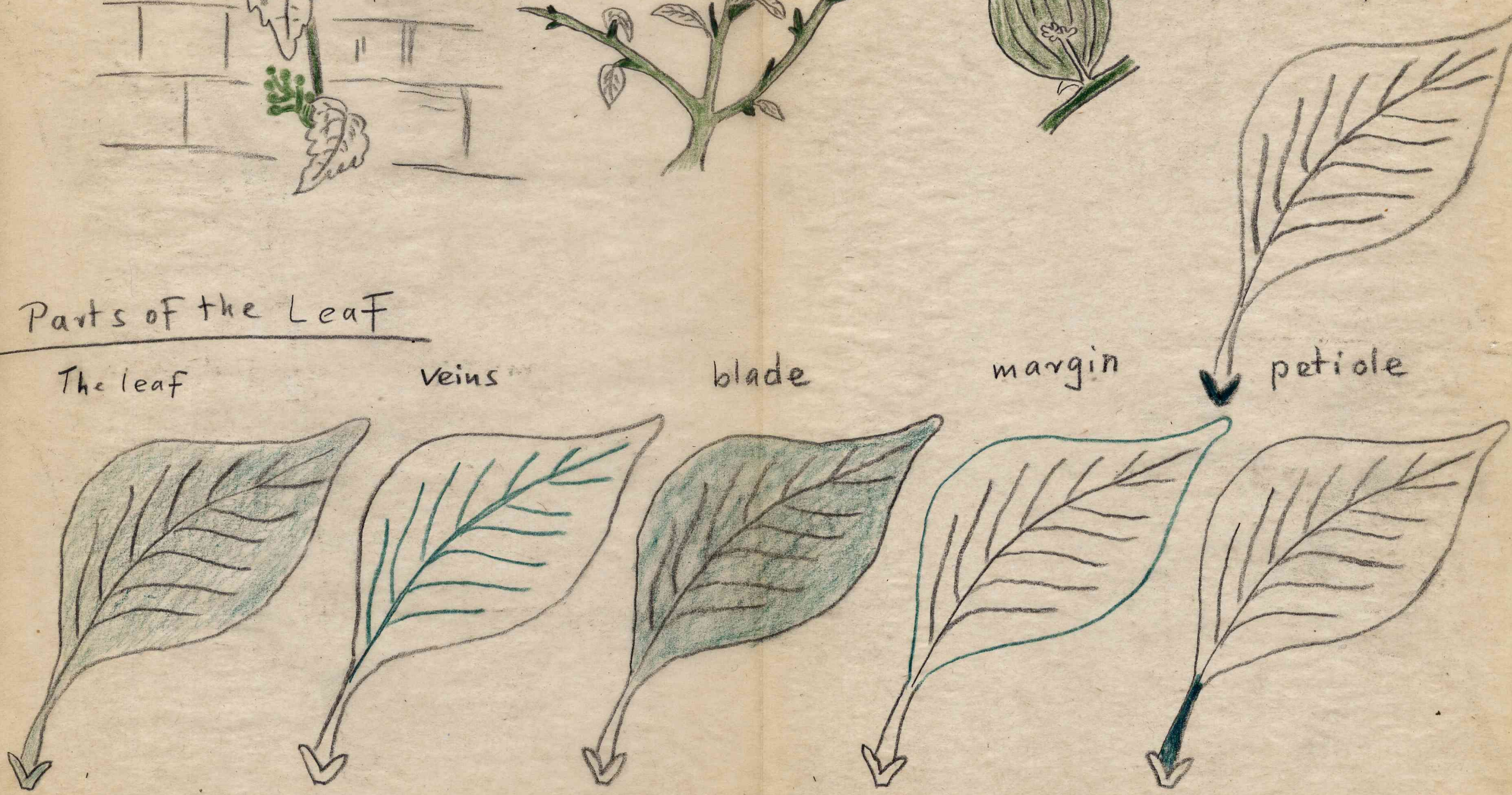


Cladode or phyllocla-de

Parts of the Leaf

Stipules

The leaf



veins

blade

margin

petiole

Apex ..... is the point of the leaf.
(Latin: apices - summit)

2. Venation of leaf
The veins are:

Reticulate ..... when on entering the leaf from the petiole they are continued in the form of one or more ribs that give off branches on either side. These in their turn, branch off and also produced thinner branches called veinlets so that the whole forms a network.
(Latin: reticulatus - resembling network)

Parallel ..... when after entering the leaf they run more or less parallel to each other and are united by simple transverse veins.
(Palms, Leeks, Grasses)
(Greek: Parallelos - para - beside)
allelon - one another

3. Reticulate veins
A leaf is said to be:

Unicostate ..... when tere is one primary midrib or vein.
(Latin: unus - one and costa - rib)

Multicostate ..... when there is more than one primary vein.
(Cinnamon, Ivy)
(Latin: multi - many)

4. Unicostate a)..... The midrib can either give off veins which proceed directly to the margin.
(Oak, Chestnut, Holly)

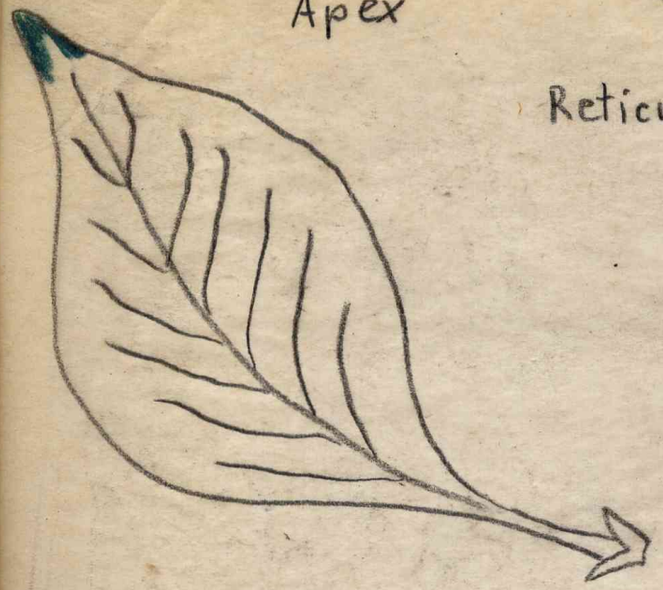
b)..... or veins which end withinthe margin in curved veins. The margin veinlets proceed from the curved veins.
(Lilac, Cherry, Deadnettle, Peepul)

5. Multicostate veins
are said to be:

Divergent ..... when the main ribs extend from a common point in different directions. They are radially or palmately distributed.
(Sycamore, Castor oil)
(Latin: dis - indicating separation
vergere - to bend)

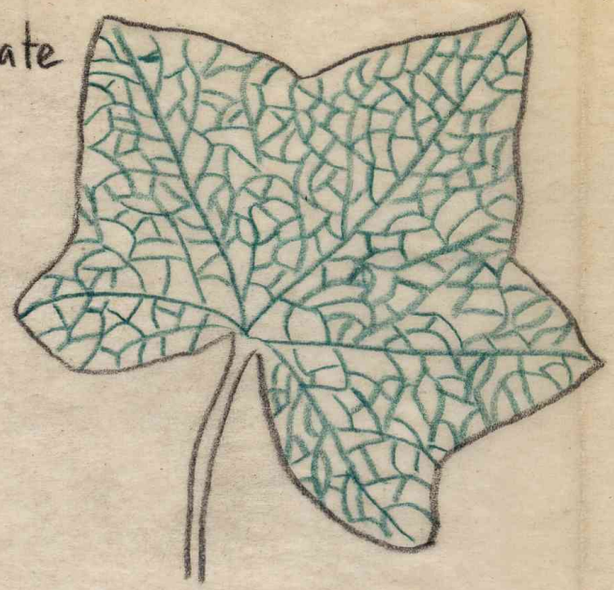
Convergent ..... when the veins incline towards each other as they run towards the apex.(Cinnamon)
(Latin: con - together)

Apex

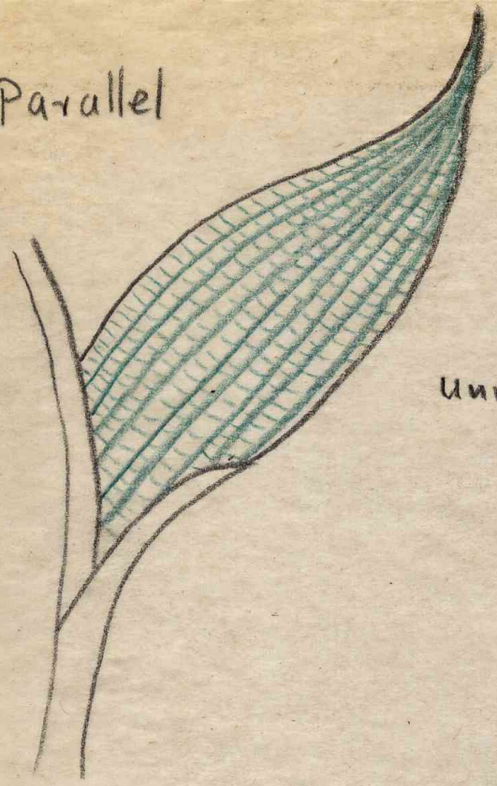


2. Venation of leaf

Reticulate

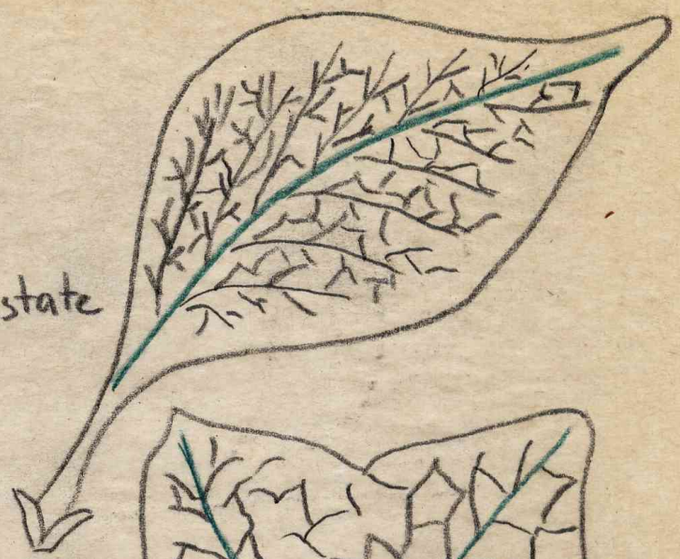


Parallel

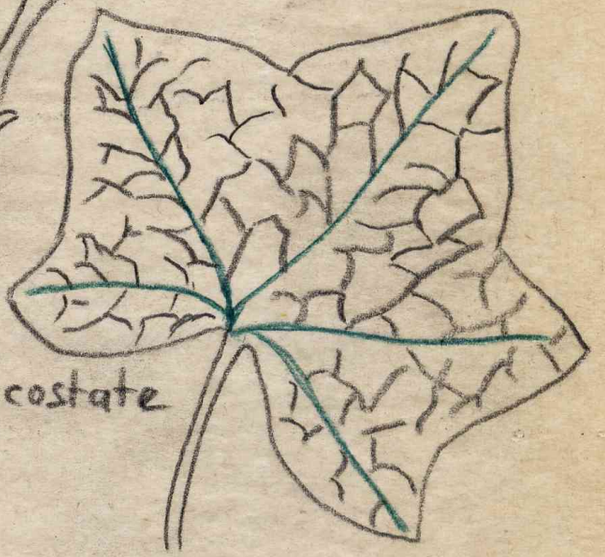


3. Reticulate veins

Unicostate



Multicostate



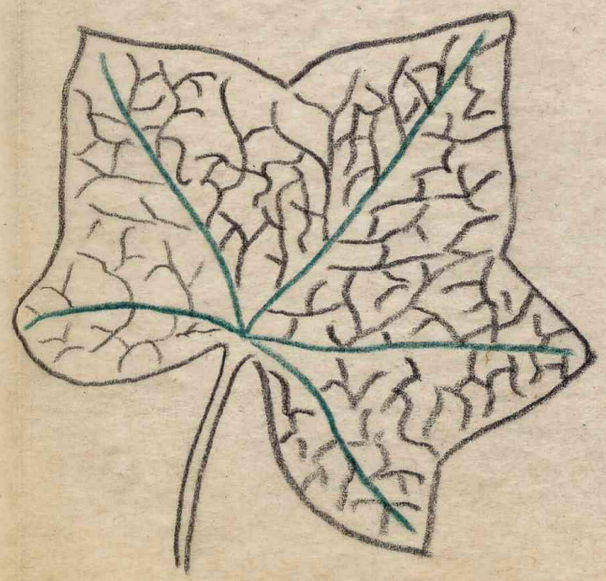
4. Unicostate

a)

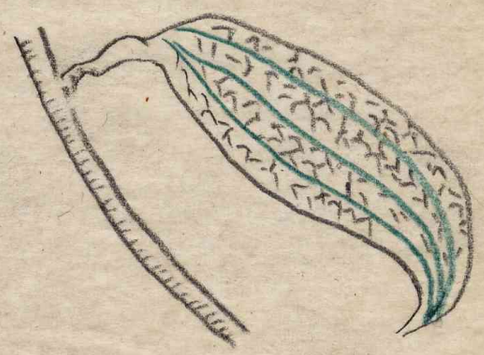
b)

5. Multicostate

Divergent



Covergent



6. Parallel veins are said to be:

Unicostate ..... when the leaves have a single midrib, from which the veinlets come off in a parallel manner, and run to the margin without forming a network. (Banana)

Multicostate ..... when the leaves have numerous veins or ribs running from the base to the apex.

7. Multicostate

Converging ..... Grasses.

Diverging ..... Certain Palms.

8. The Blade
A leaf is called:

Simple ..... when the blade consists of a single ~~petiole~~ piece. The margin may be more or less broken deeply, but the incisions never reach the central vein.
(Latin: simplex - simple)

Compound ..... when the blade is devided down to the midrib, giving the appearance of many small leaves closed together. Each devision is called a leaflet, and has a small petiole, so that each leaflet looks like a small complete leaf. That they together form one leaf is shown by the bud in the axil of the compound leaf.
(Latin: cum - together;
ponere - to put)

Surface of leaves
A leaf is called:

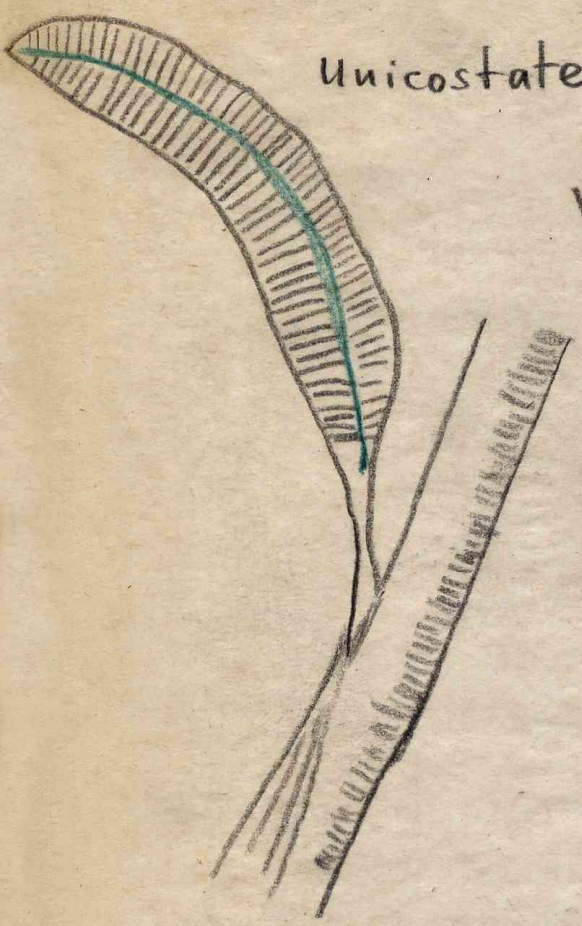
Glabrons ..... when the blade is devoid of hairs. (Grass)

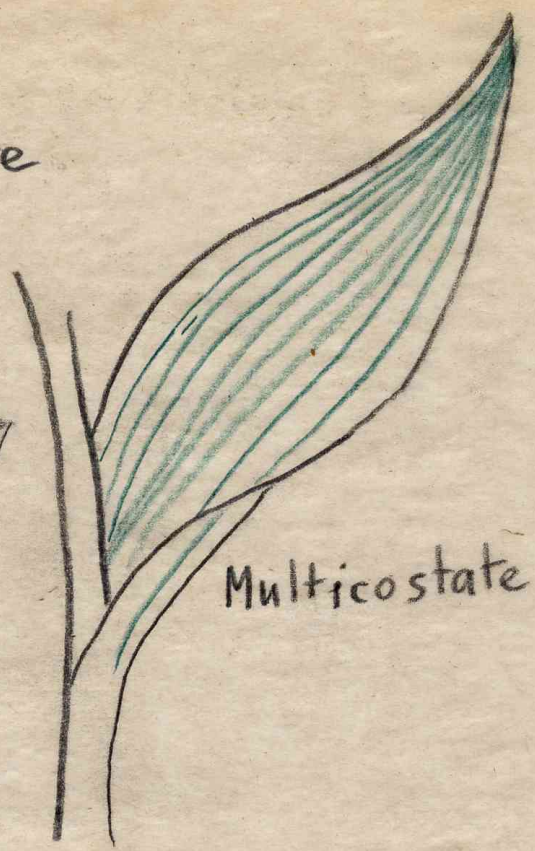
Hissute ..... when the blade is hairy.

Pubescent ..... when the hair is downy.
(Latin: pubescere - to grow hairy)

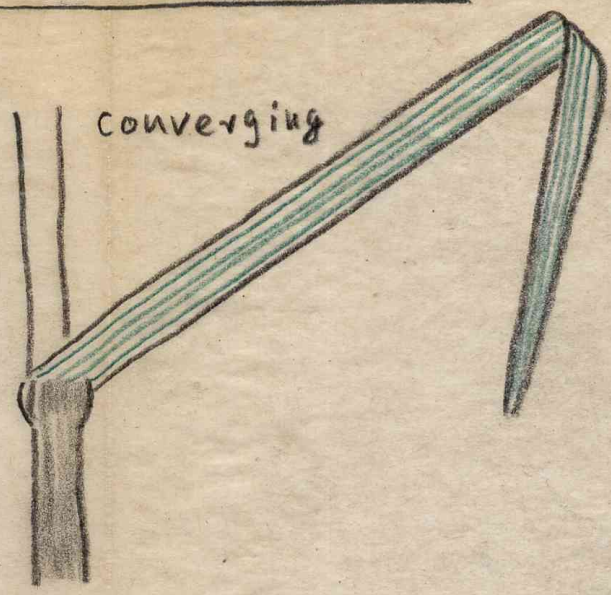
Wooly ..... when the hair is woolly.
(Middle English: wolle - wool)

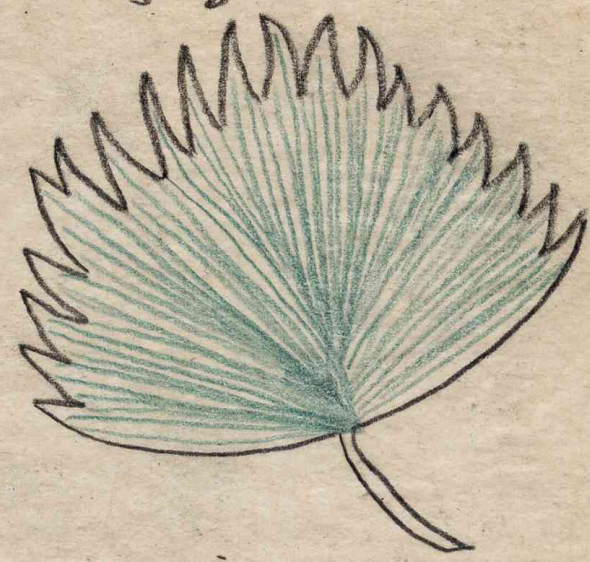
6. Parallel veins



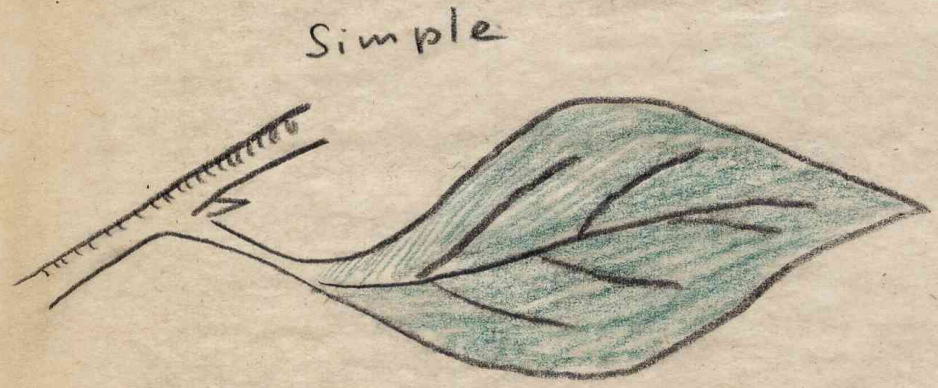


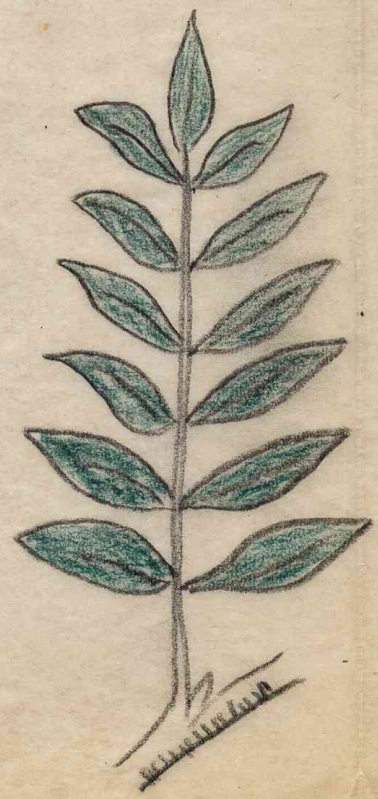
7. Multicostate





8. The Blade





9. The form of leaves

a)

Ovale ..... is a name given to a leaf, which is shaped like the longitudinal section of an egg with the wide part at the base. (Lilac)
(Latin: Ovum - egg)

Obovale ..... is the name given to a leaf which is shaped like an egg with the wide part at the top.(Woodsorrel)
(Latin: ob - inversely)

Cordate ..... is the name given to a leaf which is shaped like a heart. (Deadnettle)
(Latin: cor - cordis - heart)

Obcordate ..... is the name given to a leaf which is shaped like a heart but inverted.
(White clover)

Lanceolate ..... is the name given to a leaf which is narrow and tapers to a point, with the broadest part at the base and the point at the apex, thus assuming the shape of a lance.
(Wallflower)
(Latin: lancea - lance)

Oblanceolate ..... is a name given to a leaf which has the shape of a lance, but with the broadest part at the apex and the point at the base.

Hastate ..... is a name given to a triangular leaf with the basal angles or lokes spread out resembling the shape of a halberd.
(Arum or cuckoo pint)
(Latin: hasta - spear)

Sagittate ..... is the name given to an elongated triangular leaf, with the two basal angles prolonged downward like an arrow head.
(Convolvulus, Sagittaria)
(Latin: sagitta - arrow)

b)

Spatulate ..... is the name given to a leaf with a short broad part near the top and a long narrow tapering part below it. In form it suggests a spatula or flat ladle. (Daisy)
(Latin: spatula - a spoon)

Reniform ..... is the name given to a leaf which has the shape of a kidney. (Ground Ivy)
(Latin: ren, renis - kidney)

9. The Forms of Leaves

ovale

abovale

cordate

obcordate

b) Spatulate

Lanceolate

Oblanceolate

Hastate

Sagittate

Reniform

Elliptical ..... is the name given to a leaf which has the shape of an ellipse. (Apple)
(Greek: elleipsis - ellipse)

Lineal ..... is the name given to a leaf which is narrow comparatively long, and uniform in width it is many times longer than it is wide, somewhat like a ribbon. Sometimes it is so narrow as to suggest a line. (Grasses)
(Latin: linea - line)

Aciculate ..... is the name given to a leaf which is like a needle, slender, narrow and pointed. (Fis)
(Latin: acus - needle)

Orbiculate ..... is the name given to a leaf which is round. (Marsh penny,- wort)
(Latin: orbis - circle)

Eusiform ..... is the name given to a leaf which is sword shaped, having sharp edges and tapering to a slender point. (Iris)
(Latin: eusis - sword)

Triangular ..... is the name given to a leaf which has the shape of a triangle. (Beech)
(Latin: tres - three; angulus-angle)

10. Further forms of leaves

Lyrate ..... is the name given to an unicostate leaf with a large rounded lobe at the apex and with similar lobes towards the base.
(Latin: lyra - lyre)

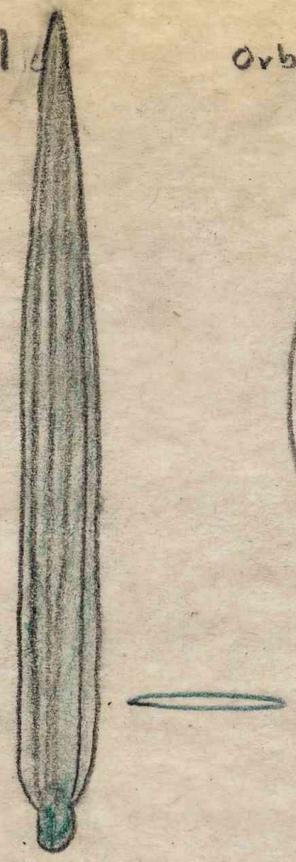
Runcinate ..... is the name given to a unicostate pinnatifid leaf in which there is a large pointed terminal lobe, the apexes of the smaller lobes below are directed backwards. (Dandelion)
(Latin: runcina - a plane)

Pedate ..... is the name given to a palmate leaf with the lateral lobes cut into two or more segments, or with each primary lobe cut on one side only. (Viola pedatum)
(Latin: pedatus - having feet)

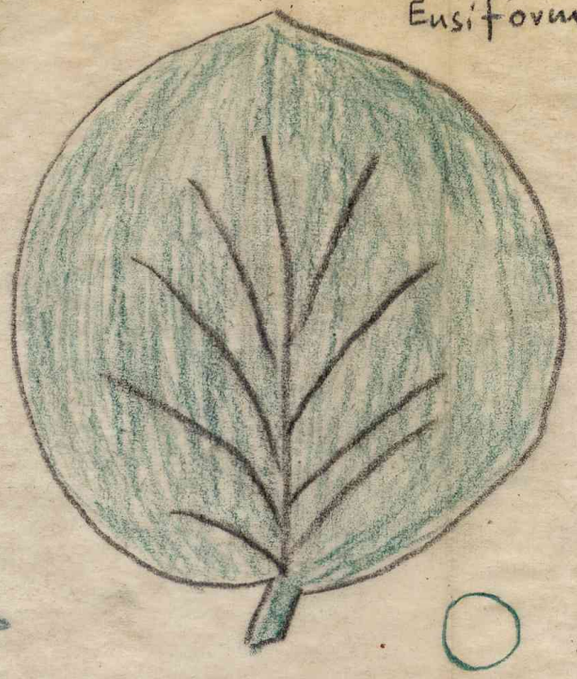
Peltate: ..... is the name given to a shield shape leaf having the petiole attached to the lower surface, instead of at the base. (Masturtium)
(Greek: pelte - shield)

Elliptical

Lineal

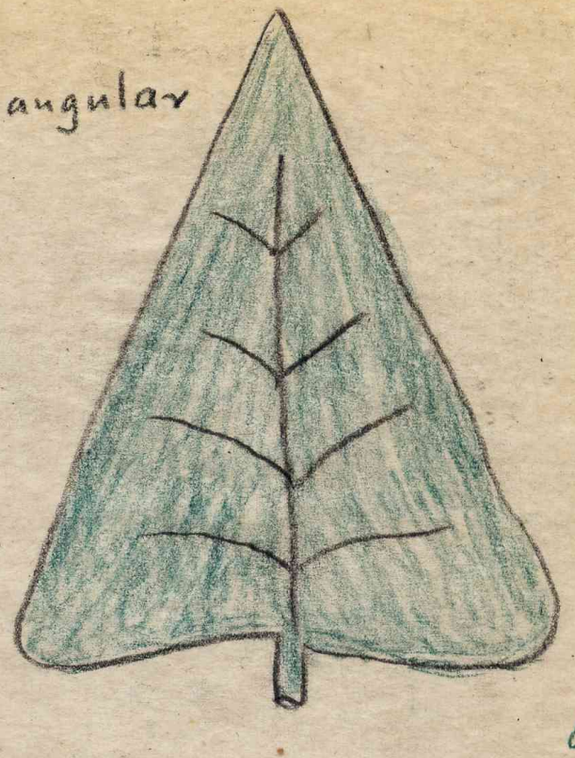


Orbiculate



Ensiform

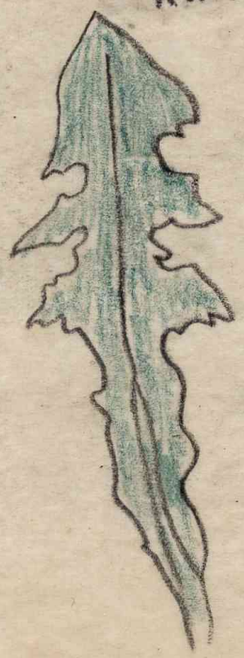
Triangular



Aciculate

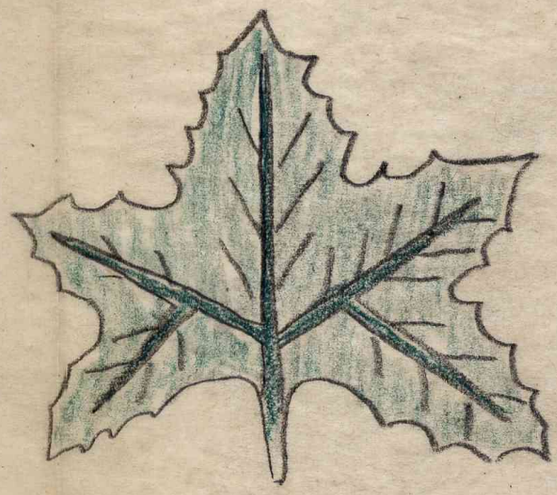
10. Further forms of Leaves

Runcinate

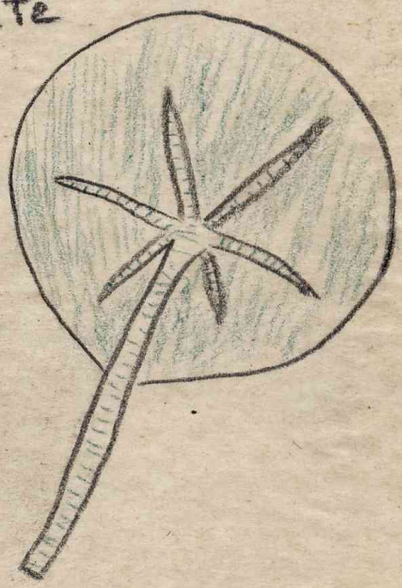


Lyrate

Pedate



Peltate



11. The margins of leaves are termed:

Entire ..... when there is no incision. (Lilac)
(Latin: integer - in-non; tangere - to touch, untouched)

Sinuate ..... when the margin is entire but wavy, with strong indentations. (Mash tree)
(Latin: sinus - a bend)

Ciliated ..... when the margin is fringed with fine hairs. (Fringed Rockcress - arabis ciliata)
(Latin: Cilium - eyelash)

Dented ..... when the incision is slight. (Birch)
(Mid-English: dint - angular incision)

12. When the margins have deeper incisions they take a double name.

The resticulate unicostate leaves incisions deeper than the ones called dented; prefix to the respective terms the word pinnate or pinnately. This is because the divisions resulting from the incisions are disposed along the midrib like the barks of a feather.

Leaves are said to be pinnately:

lobated or lobed ..... when the divisions are generally rounded and extending less than halfway to the midrib. (White Oak)
(Greek: lobos - lobe)

Fid ..... when the incisions are halfway to the midrib. (Maple, Red oak)
(Latin: Fidus - split)

Partite ..... when the incisions are more than half-way. (Shepherds purse)
(Latin: partitus - dividend)

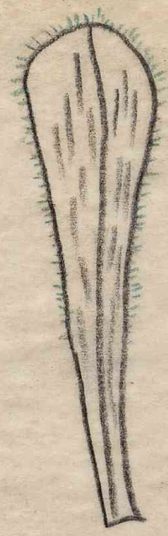
Sect ..... when the incisions are almost to the midrib. (Field poppy)
(Latin: seccare - to cut)

11. The margins of Leaves

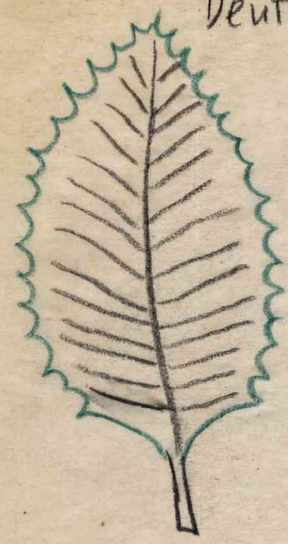
Entire

Sinuate

Ciliated

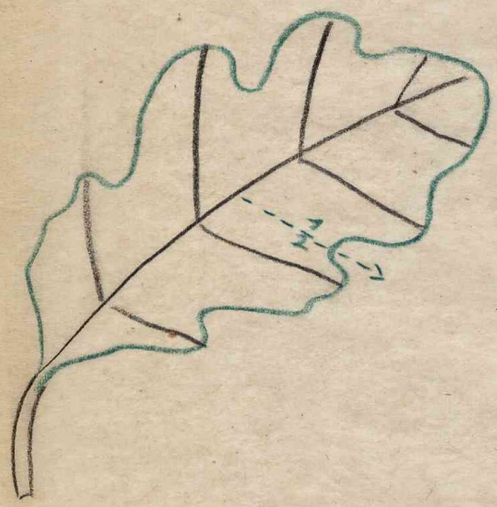


Dented

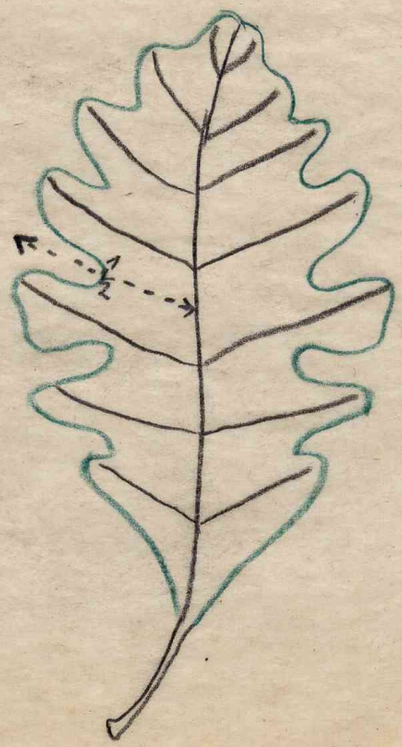


12. Leaves are said to be pinnately

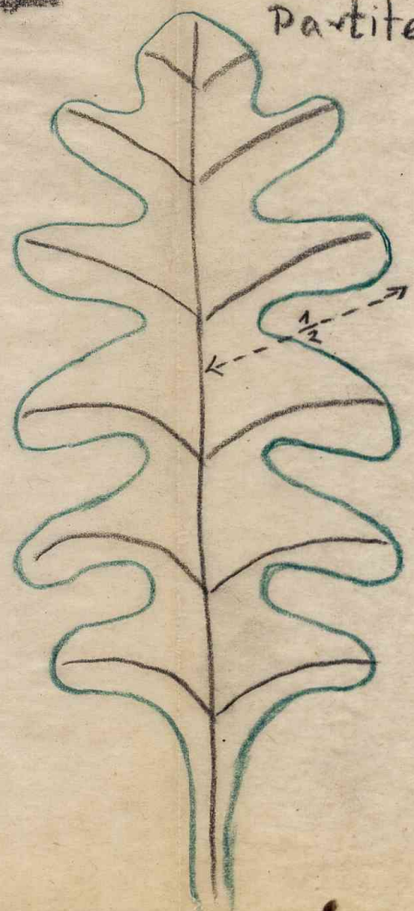
Lobated or Lobed



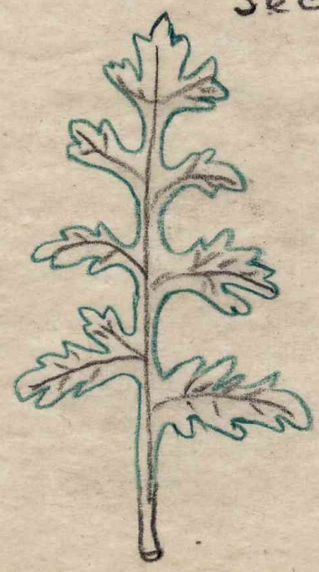
Fid



Partite



Sect



13. Palmately

For the same reason reticulate multicostate leaves prefix the word palmati or palmately to the term specifying each kind. Here the several portions of the leaf start from one point and diverge somewhat like the fingers, which start from the palm of the hand. The leaves are then said to be palmately.

Lobated or lobed ..... when the divisions are generally rounded and extending less than halfway to the midrib. (Ivy)

Fid ..... when the incisions are halfway to the midrib. (Black Currant)

Partite ..... when the incisions are more than halfway. (Hawthorn)

Sect ..... when the incisions reach almost to the midrib. (Monkshood)

14. Dentended margins of leaves are:

Serrate ..... when the divisions are pointed like the teeth of a saw and are directed towards the apex. (Deadnettle)
(Latin: serra - a saw)

Biserrate ..... when the teeth-like divisions are themselves serrated. (Elm)
(Latin: bi - two)

Crenate ..... when the incisions are rounded. (Ground Ivy)
(Latin: crena - notch)

Dentate ..... when the divisions are pointed like the teeth of a saw but are perpendicular to the margin, instead of being directed towards the apex somewhat like the teeth in the mouth. (Guelder Rose)
(Latin: dens, dentis - tooth)

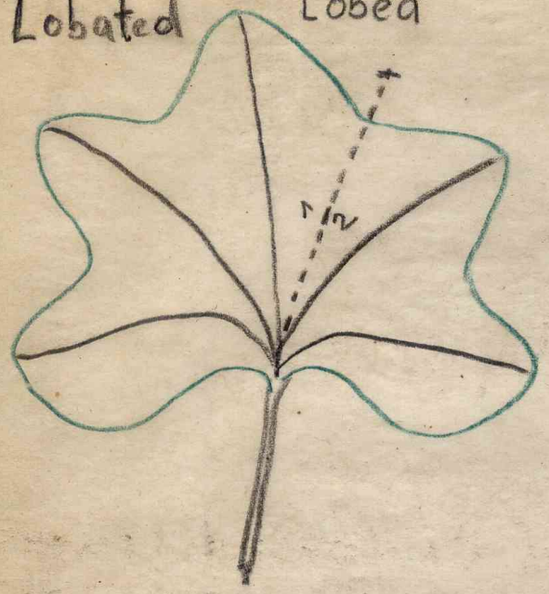
Spiny ..... when the teeth are sharp like thorns. (Holly)
(Latin: spina - thorn)

15. Compound leaves are said to be:

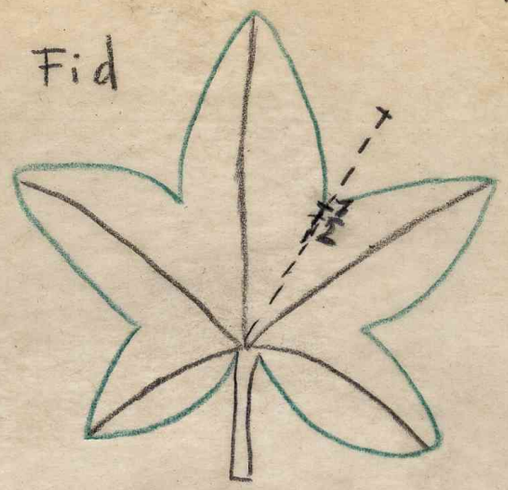
Pinnate ..... when the leaflets are disposed along the midrib. (Rose)
(Latin: pinna - feather)

13. Palmately

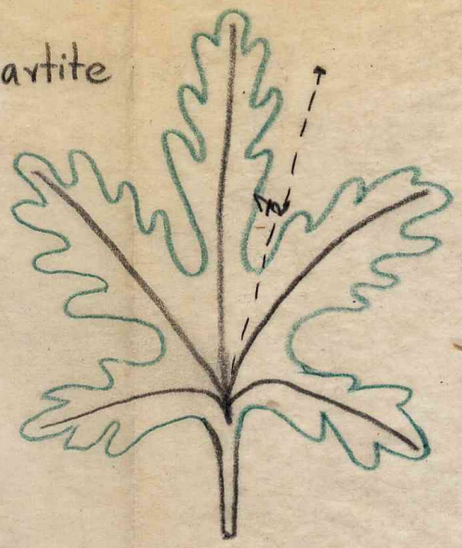
Lobated or Lobed



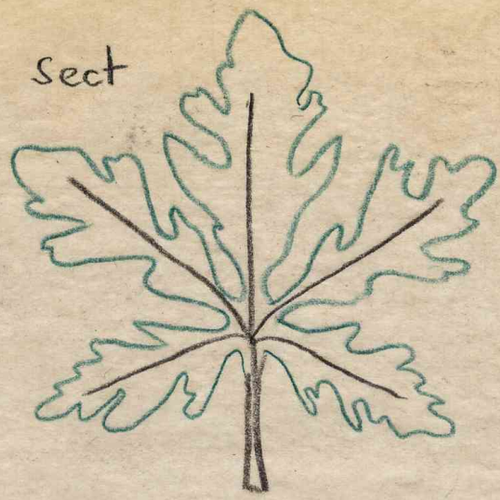
Fid



Partite

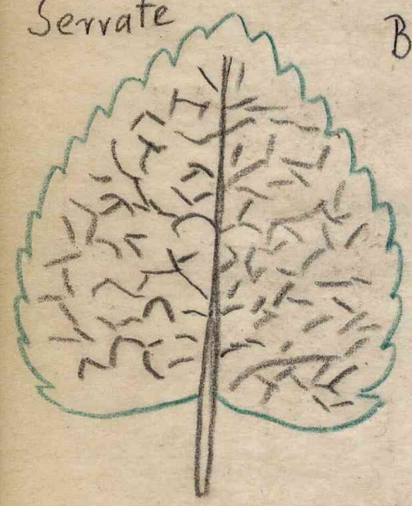


Sect



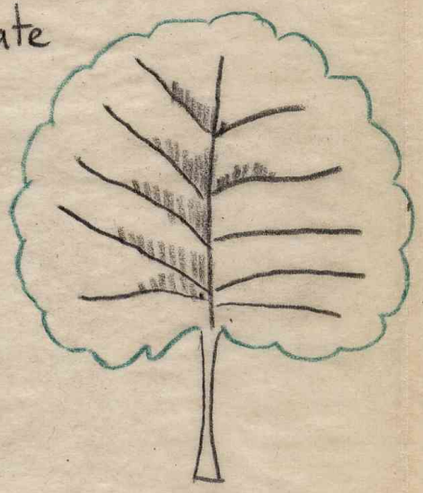
14. Dented margins of leaves are:

Serrate



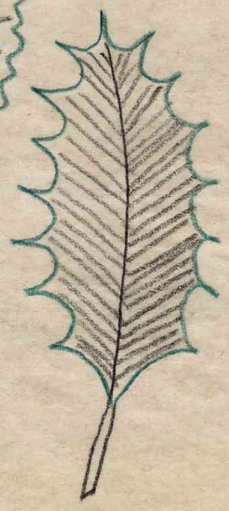
Biserrate

Crenate

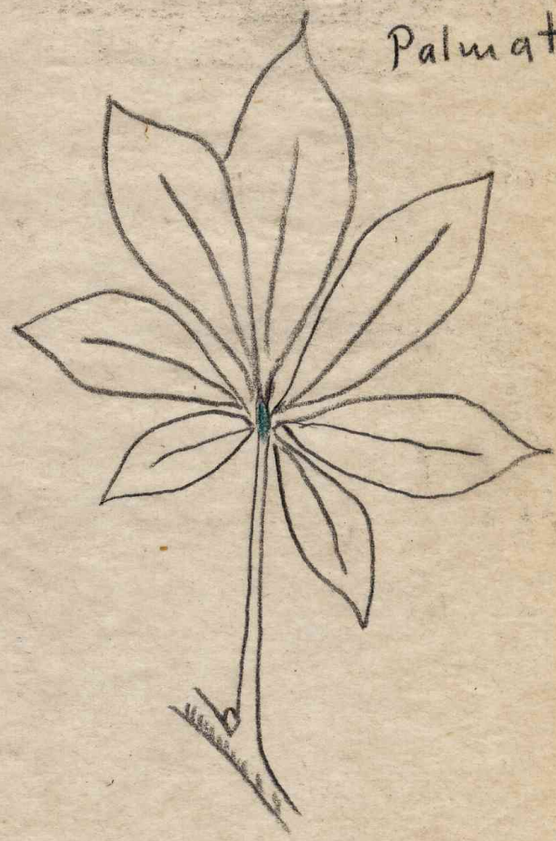


15. Compound Leaves

Dentate



Palmate



Palmate ..... when the leaflets start from the same point. (Horse chestnut)
(Latin: palma - palm of the hand)

16. Pinnate leaves are said to be:

Paripinnate ..... when they have two terminal leaflets. (Tamarind, Cassia)
(Latin: par, paris - equal)

Imparpinnate ..... when they have one terminal leaflet. (Rose, Ash)
(Latin: im - not)

17. Leaves are said to be:

Pinnate ..... when the leaflets are disposed along the midrib.

Bi-pinnate ..... when each leaflet is again divided in two leaflets or is doubly compound. (Honeylocust)
(Latin: bi - two)

Tri-pinnate ..... when the leaf is trebly compound. Many Acacias)

18. Palmate leaves are said to be:

Binate - Bifoliate..... when there are two leaflets.

Ternate - Trifoliate ... when there are three leaflets. (Clover)
(Latin: tres - three,
terni - three each)

Quinfoliate ..... when there are five leaflets, (Buck eye, Hemp)
(Latin: Quin - five)

Multifoliate ..... when there are many leaflets. (Horse chestnut, Lupin)
(Latin: multis - many foliam leaf)

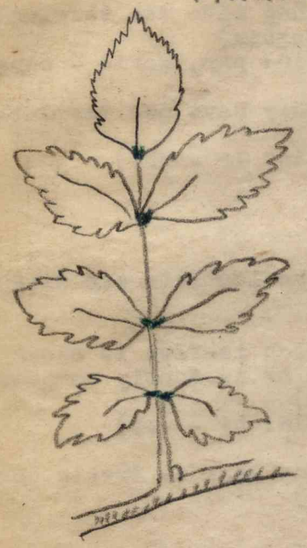
19. Ternate ..... when there are three leaflets. (Clover, some beans)

Bi-ternate when the three leaflets are again divided into three.

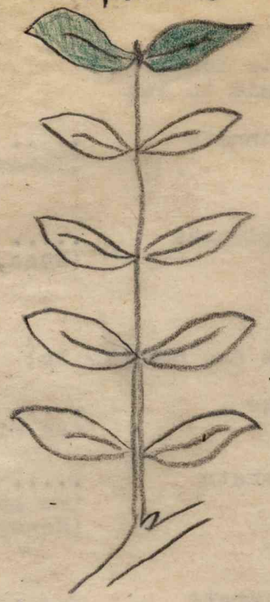
Tri-ternate ..... when the leaf is trebly compound. (Baneberry)

16. Pinnate Leaves

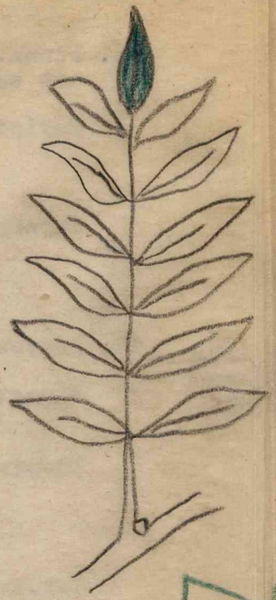
Pinnate



Paripinnate



Imparpinnate

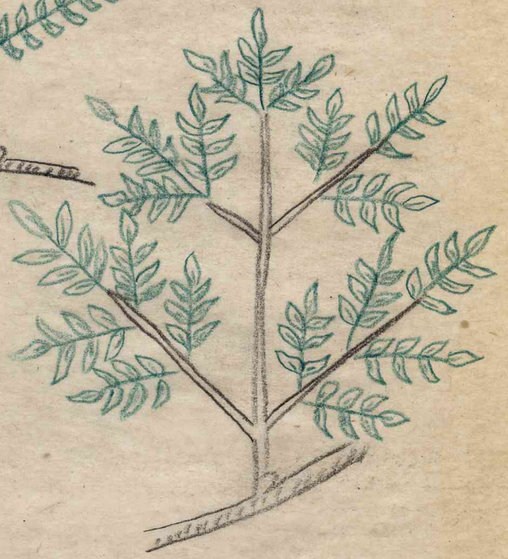


17. Leaves are said to be:

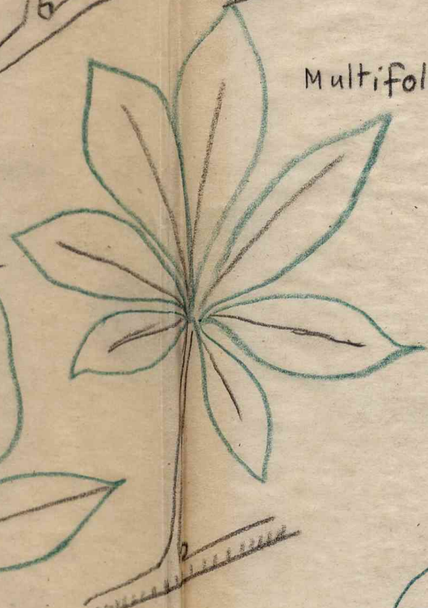
Pinnate

Bi-pinnate

Tri-pinnate

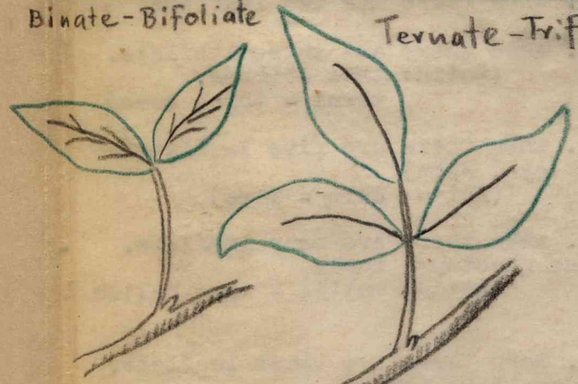


Multifoliate



18. Palmate leaves are said to be:

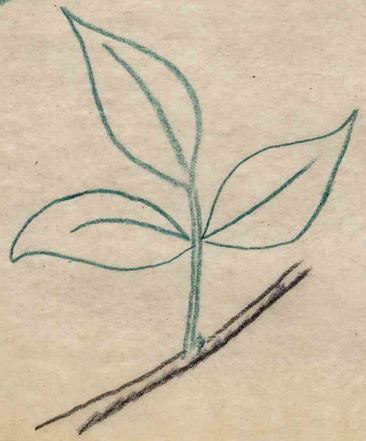
Binate-Bifoliate



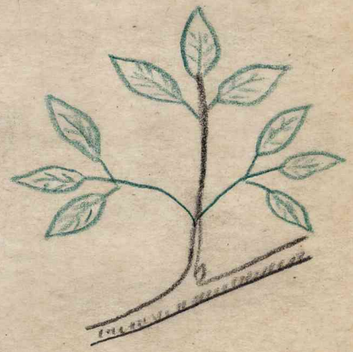
Ternate-Trifoliate

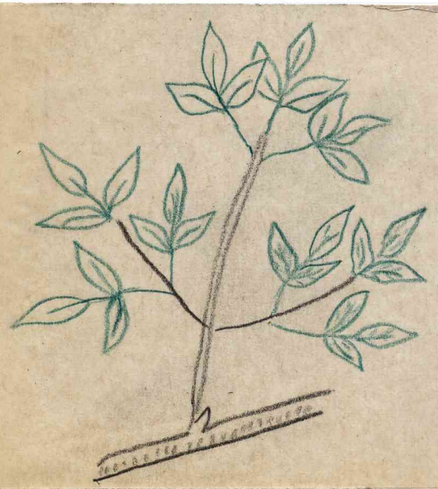
Quinfoliate

19. Ternate



Bi-ternate





The terms pinnati .... fid, partite, sect and
palmati .... fid, partite, sect
are also applied to the leaflets of compound leaves.
If the simple divisions of a simple leaf are again incised, the terms "bi-pinnatifid"etc. are used, or a pinnatipartite leaf may have divisions which are pinnatifid etc.

20. Apex of leaf is said to be:

Acute ..... when it is sharply pointed. (Nettle)
(Latin: acutud - sharp)

Obtuse ..... when it is blunted. (wood sorrel)
(Latin: obtusus - blunt)

Mucronate ..... when the midrib projects forming a stiff point or mucro. ( )
(Latin: mucronatus - sharp pointed)

Emarginate ..... when the apex is depressed
(White clover)
(Latin: - E - out; marginate - to take away the margin)

21. Attachment of leaves

Canline ..... is the name given to leaves which grow on the upper portion of a stem. (Rose)
(Latin: canlis - a stem)

Radical ..... is the name given to leaves which are produced at the base of a stem, close to the ground. (Dandelion)
(Latin: radix - root)

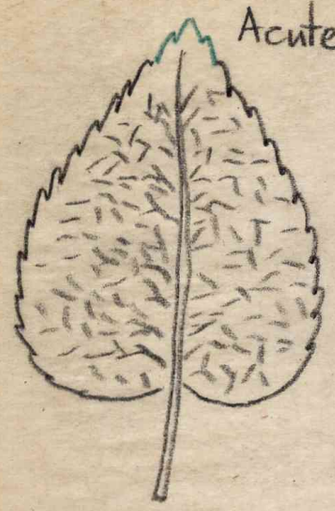
22. A leaf is said to be:

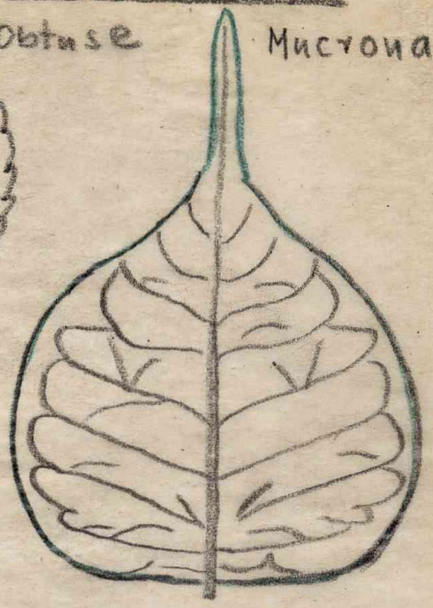
Petiolate ..... when the petiole ~~is~~ or stalk is present. (Apple)

Sessile ..... when the petiole or stalk is absent and the leaf roots directly on the stem. (Zinnia)
(Latin: sedere to site)

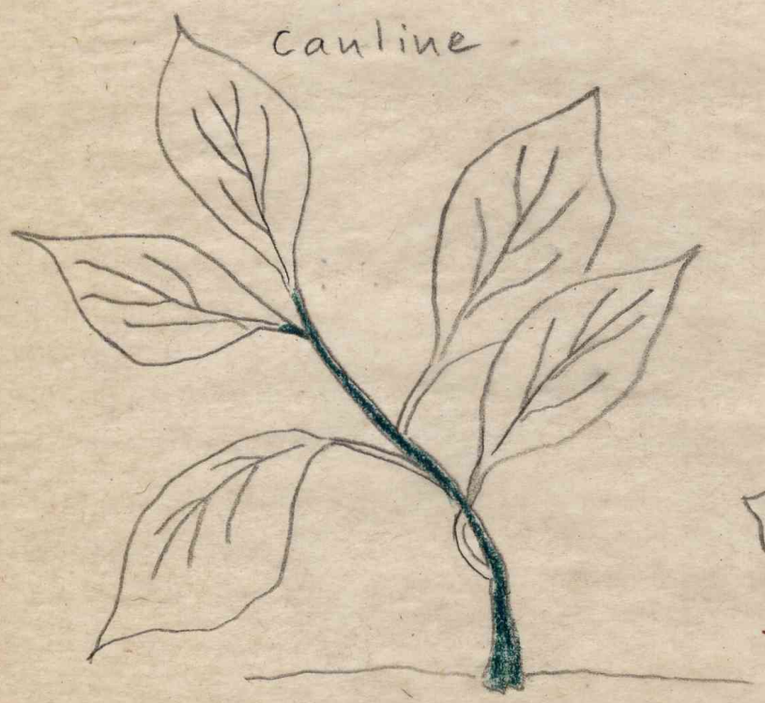
In some leaves the petioles are transformed into a sheath around the stem. In the "graminaceae" the sheath is split but has an appendace called " ligule" in the inner face just at the junc= tion with the leaf. In ather plants (as in Cyperaceae) the sheath is entire.

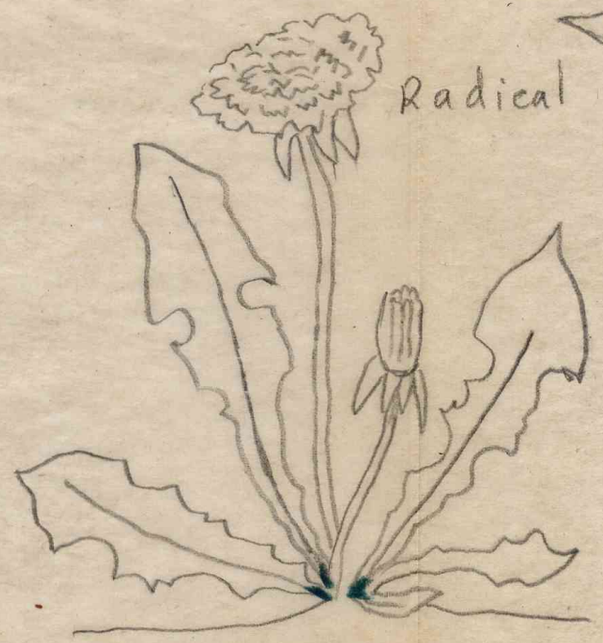
20. Apex of Leaf is said to be:



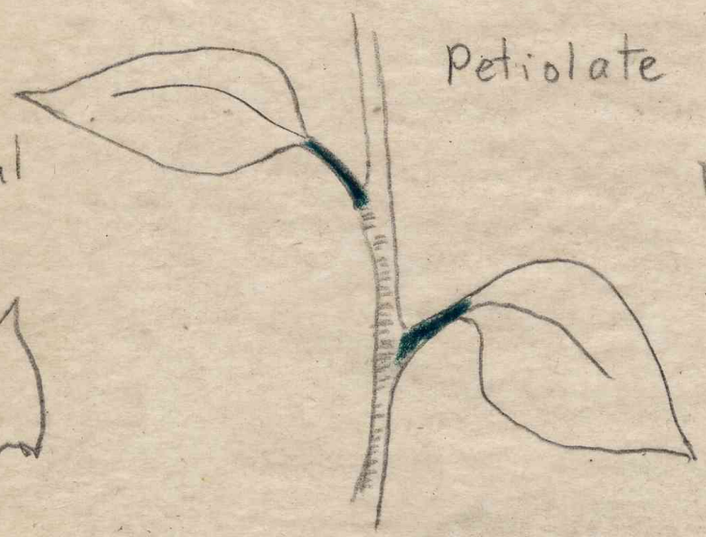


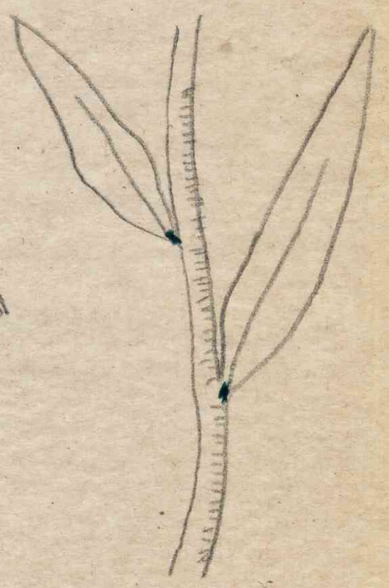
21. Attachment of leaves





22. A leaf is said to be:





23. Attachment to stem

Perfoliate leaves ..... are sessile, cordate leaves in which the lobes at the base have become united so as to surround the stem completely.
(Some kinds of Honeysuckle)
(Latin: per - through; folia - leaf)

Connate leaves ..... are two opposite sessile leaves which have become united by their bases.
(Wild Honeysuckle)
(Latin: con - together; natus-born)

Auricular leaves ..... are those which surround the stem but which are not joined. They have earlike lobes.
(Latin: auris - ear)

24. Modification of petiole .....

Phyllode ..... is the name given to the petiole when it assumes the shape and function of the leaf which is absent. (Acacia or Wettle)
(Greek: phyllon - leaf; eidos - form)

25. Stipules
A leaf is said to be:

Stipulate ..... when the stipules are present.
(Rose, Red clover)

Exstipulate ..... when the stipules are absent. (Privet)
(Latin: ex - a prefix meaning without)

26. Types of stipules
Stipules are called:

Aduate or petiolar .... when the stipules run up the base of the petiole for some distance. (Rose)
(Latin: ad - adherent and natus - born)

Axillary ..... when the stipules unite in the leaf axil. (Pea)
(Latin: axilla - armpit)

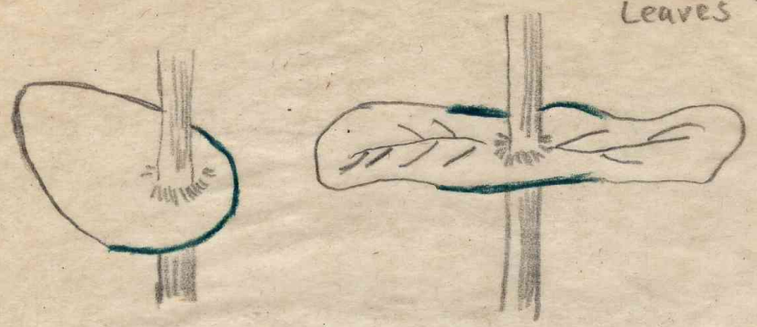
Ochreate ..... when the stipules unite to form a sheath.
(Polygonaceae, Buckwheat)
(Latin: ocreatus - booted)

27. Modification of stipule

Thorns as in the Robinia

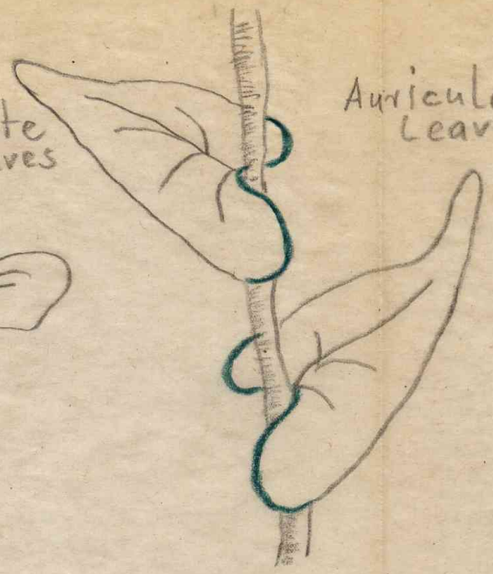
23. Attachment to stem

Perfoliate Leaves



Cornate Leaves

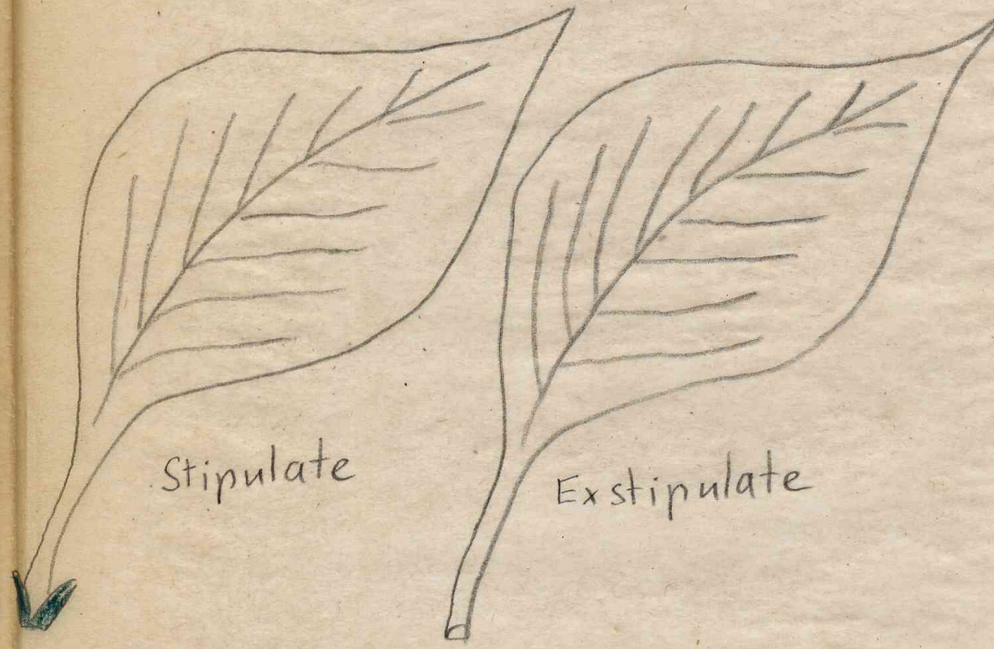
Auricular Leaves



24. Modification of petiole

Phyllode

25. Stipules



Stipulate

Exstipulate

26. Types of Stipules

Aduate or Petiolar

Axillary

Ochreate

27. Modification of Stipule

Thorns as in the Robinia

28. Phyllotaxis ..... The arrangement of the leaves on the stem.
(Greek: Phyllon - leaf ;
taxis - arrangement)

The arrangement is said to be:

Alternate ..... when one leaf is produced at each node and the leaves are not in a vertical line with each other. (Wallflower)
(Latin: alternare - to act by turns)

Opposite ..... when two leaves spring from one node and face one another. (Privet)
(Latin: opponere - to oppose,
from ob - facing;
positus - placed)

Decussate ..... when two leaves spring from node and each pair is at right angles to the next.
(Deadnettle - Scarlet Pimpernel)
(Latin decussare - to cross like a +)

Whorled ..... when more than two leaves are produced at a node. (Cross-leaved heather)
(Middle English: wharle - the whorl of a spindle; whirl - to go around)

29. Modification of Leaves

Scale leaves ..... are sessile leaves found on buds . They grow also on some underground stems and a few parasitic plants such as"broom rape".
(Middle English: scale)

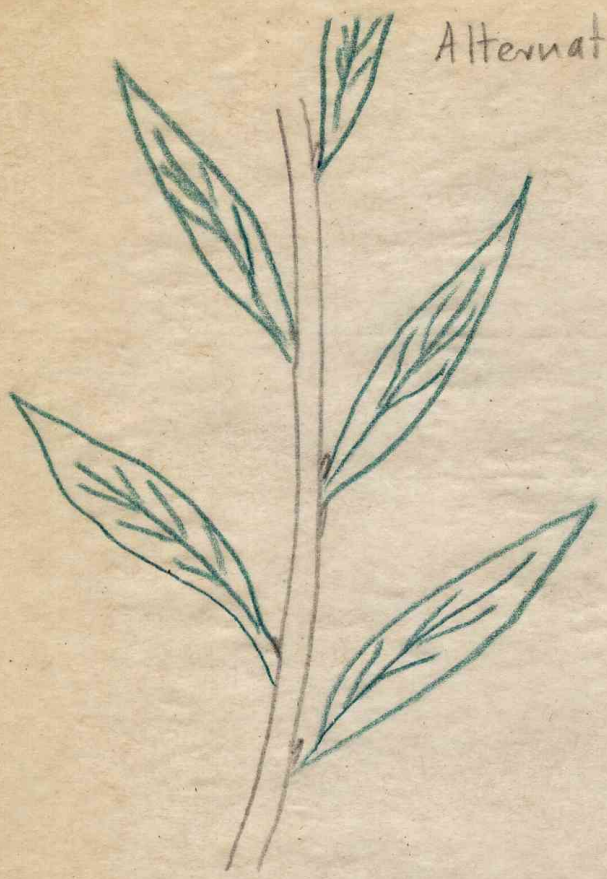
Floral leaves ..... are the modified leaves which go to build up the flower.
(Latin: flos - floria - flower)

Bract leaves ..... are those leaves which grow under the f flower or along the inflorescence. They are only called bracts when they differ either in size, shape, colour or arrangement from the stem leaves. Bracts are generally smaller and more sessile than the leaves. They may be scaly, leafy, mambreanous, woody or coloured.
(Latin: bractea - a thin plate of metal or wood)

Spines ..... are sometimes modified leaves.
(Blackberry)
(Latin: spina - a thorn)

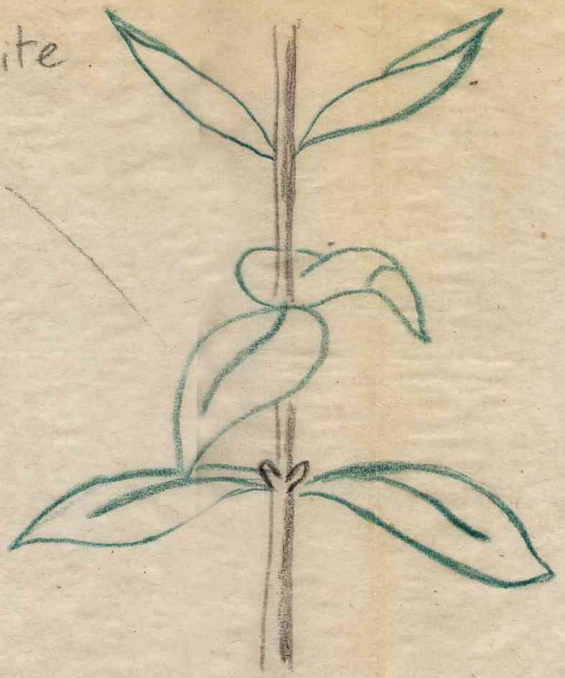
28. Phyllotaxis

Alternate

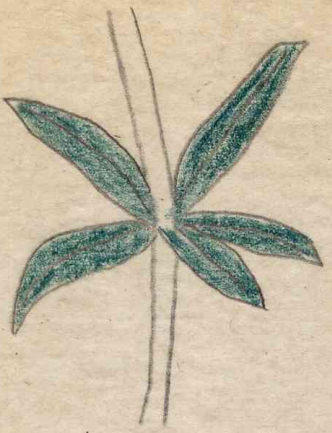


Opposite

Decussate



Whorled



29. Modification of Leaves

Scale Leaves

Floral Leaves

Bract Leaves

Spines

Tendrils ..... are sometimes modified leaves as in the pea.

Pitchers ..... are modified leaves or stipiles which trap small animals, thus supplying the plant with nitrogenous good.
(Mapenthea Sarracenia)
(Greek: bikos - wine jar)

Fly traps ..... are either leaves which finish with an expansion that opens and shuts - they have the form of a steel trap and function in the same way. (Venus Fly Trap)
Or they are leaves, covered with glandular hairs which close upon insects when they light on them. (Drosera Rotundifolia)

THE FLOWERS

1. Parts of the flower:

The flower ..... consists of four groups of modified leaves as follows:

The Calyx ..... is the outer - most covering of the flower. It is normally a green envelop made up of sepals.
(Latin: calyx - husk, shell cup)

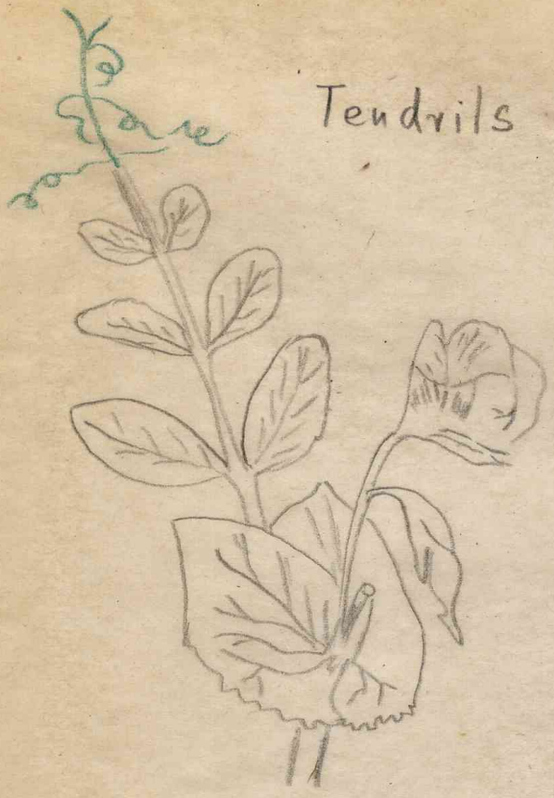
The Corolla ..... is built up of petals (Greek: petalos - out - spread, flat) which are sometimes brightly coloured.
(Latin: coronula - a little crown)

The Androecium ..... consists of the aggregate of stamens which form the male part of the flower and produce the pollen.
(Greek: andros... male and
oikos - house)

Gynoecium or aggregate of pistils
(Greek: Gyne - female and oikos-house)
..... is the central part of the flower and consists of one or more transformed leaves which by folding together and uniting at the edges form closed receptacles called caspels.
(Greek: kaspos - friut)
It is the female part of the flower and produces the ovules which mature into seeds.

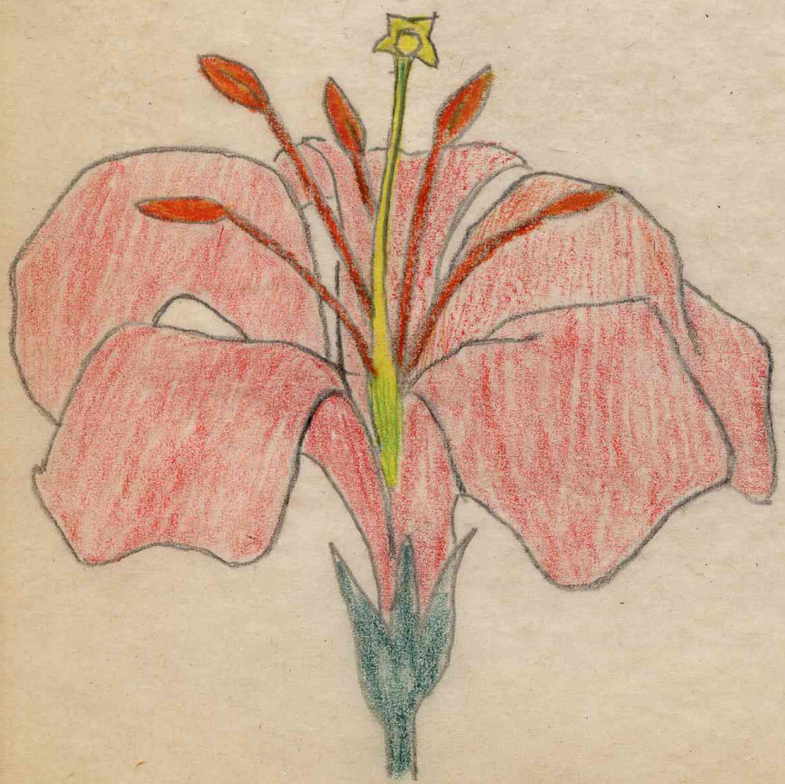
The Axis ..... the portion of the general stalk along which flowers are disposed is called the axis of the inflorescence.
(Latin: axis - acle)

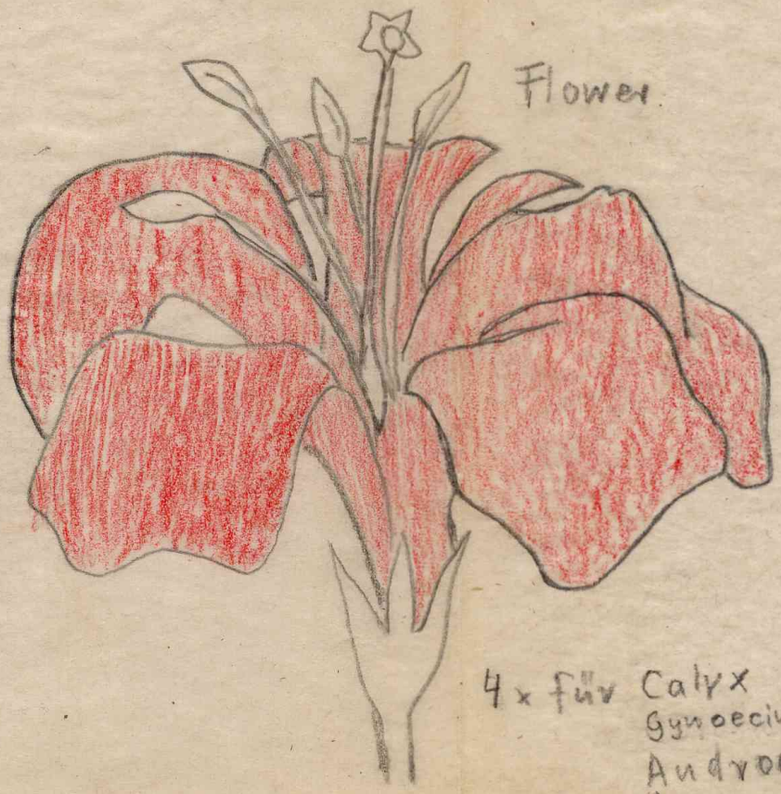
Tendrils



Pitchers

Parts of the Flower





Flower

4 x fur Calyx
Gynoecium or aggregate of pistils
Androecium
Axis

2. A flower is said to be:

Terminal	..... when it is located at the apex of the stalk. (Latin: terminus - boundary)
Axillary	..... when it is springing from the axil of a leaf.
Peduncle	..... is both the flower stalk of the solitary flower and the peduncle on which a flower cluster is raised. (Latin: pes, pedis - foot; diminutive - pedunculus)
Pedicel	..... The pedicals are the ultimate branches of the peduncle which form the stalks of the single flower of an inflorescence. (Latin: pediculus - small foot)
Receptacle Torus or Thalamus	..... is the part to which the floral leaves are attached. (Latin: thalamus - chamber)

3. When the peduncle is present the flower is said to be peduculate. (Rose)
When the peduncle is absent the flower is said to be sessile. (wheat)

4. A flower is complete ..... when all the parts are present. (Pea)

A flower is incomplete ..... when one or more are lacking. (Oak, Hazel)

5. A flower is perfect ..... if both the stamens and the pistil are present. (Rice, wheat)

A flower is imperfect..... when one or both are lacking. (Oak, Hazel, Begonia)

6. The symmetry of flowers.

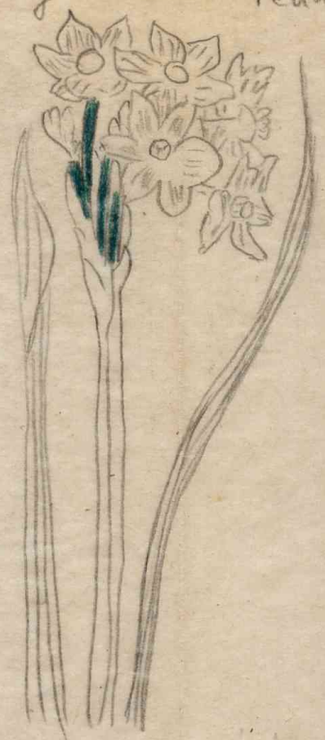
The symmetry is said to be:

Regular or Actinomorphic	..... when the flower is capable of division into two like halves by each of three or more longitudinal planes. They are therefore radio-symmetrical. (wallflower, rose) (Greek: aktis, aktinos - ray - morphe - form)
Irregular or Zygomorphic	..... when the flower can only be divided into similar halves along one plane. (pea, Deadnettle, Pansy) (Greek: zygon - a pair)

2. The Flower is said to be:

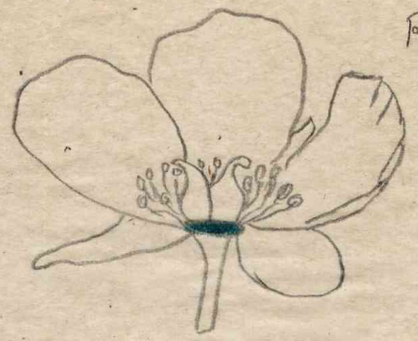
Terminal

Axillary



Peduncle

Pedicle



Receptacle
Thorus or Thalmus

3. When the peduncle is present the Flower is said to be:

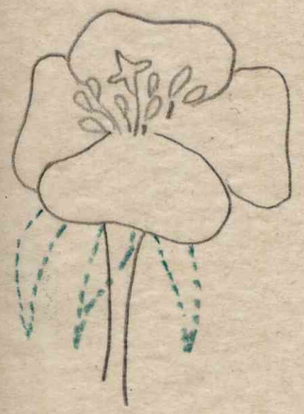
pedunculate

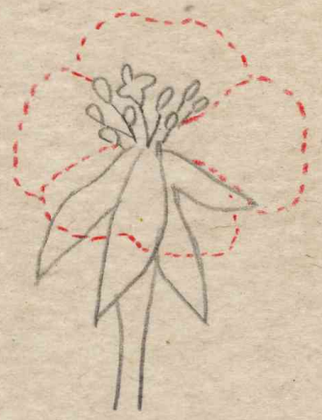
Sessile

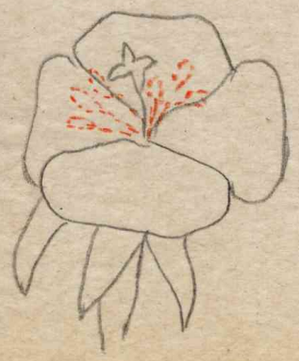
4. A flower is:

complete

incomplete

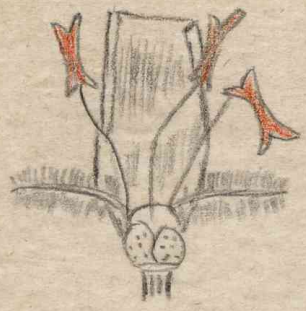




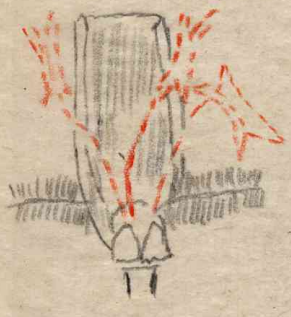


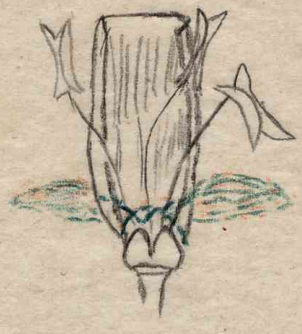
5. A Flower is:

perfect



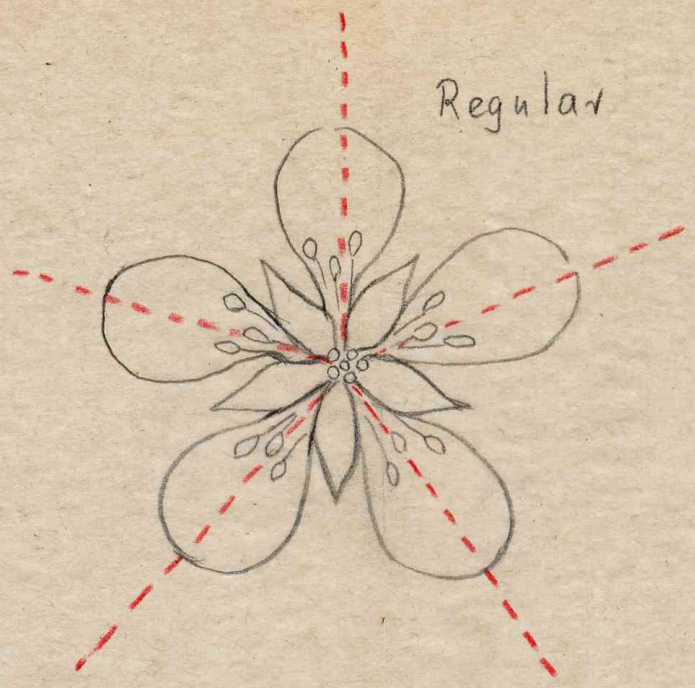
imperfect



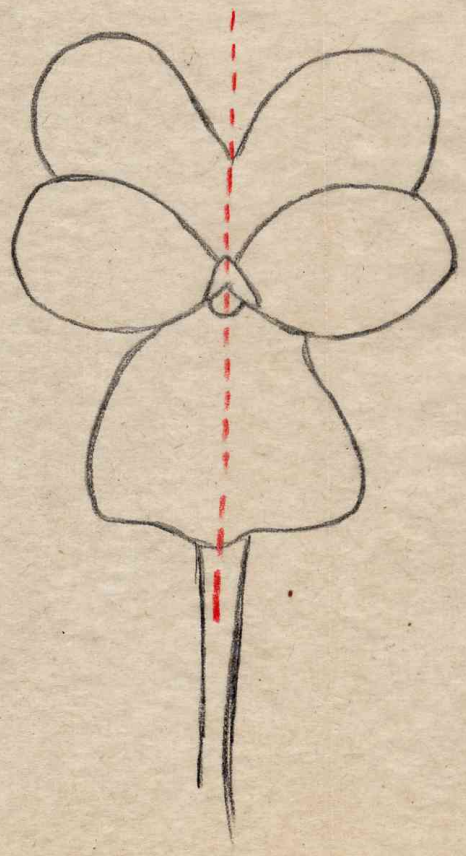


6. The Symetry of flowers

Regular



Irregular



Asymmetrical ..... when the flower can not be bisected so as to form two similar portions. (Lantana)

7. Types of the Calyx

The calyx is said to be:

Polysepalous or Dialysepalous ..... when the sepals are distinct from one another. (Buttercup)
(Greek: polys - many;
Latin: separare - to separate
Greek: dialein - separate)

Gamosepalous ..... when the sepals are partly or entirely united. (Deadnettle, Primrose)

8. The Calyx is said to be:

Petaloid ..... when the sepals are white or coloured as in Christmas Rose; Anemone.

Green ..... when the sepas are green as in most ordinary flowers.

9. The position of the calyx in relation to the pistil varies. It may be:

Inferior or Hypogynous ..... when the calyx is fixed below the ovary. (Wallflower, Buttercup)
(For derivation see Nr. 12)

Superior or Epigynous ..... when the calyx is fixed above the ovary. (Current, Parsley)

10. Perianth ..... is the name given to the floral leaves collectively, especially when not differentiated. (Tulip)
(Greek: peri - near; anthos - flower)

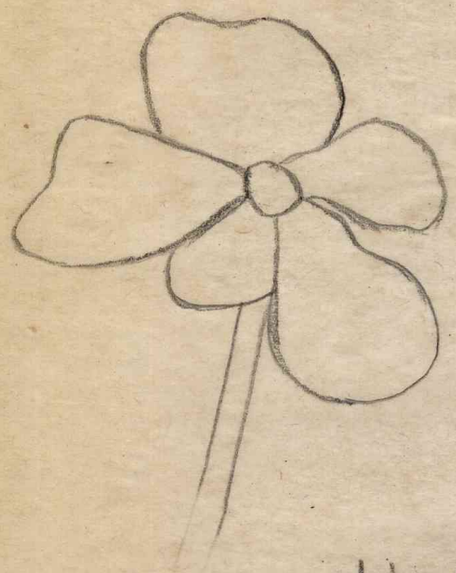
11. The Corolla is called:

Gamopetalous ..... when the petals are united. (Primrose)

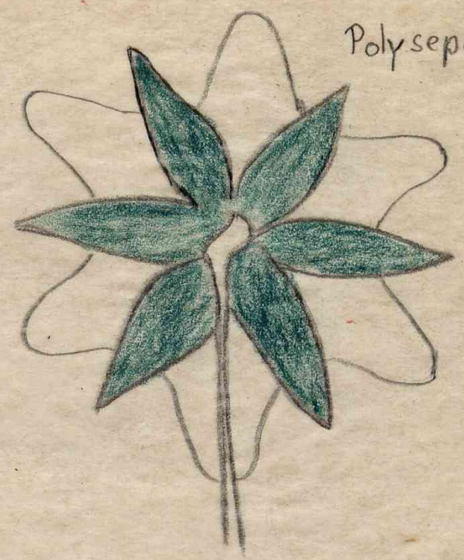
Polypetalous ..... when the petals are separate. (Buttercup, Wallflower)

2. Types of Calyx

Asymmetrical



Polysepalous

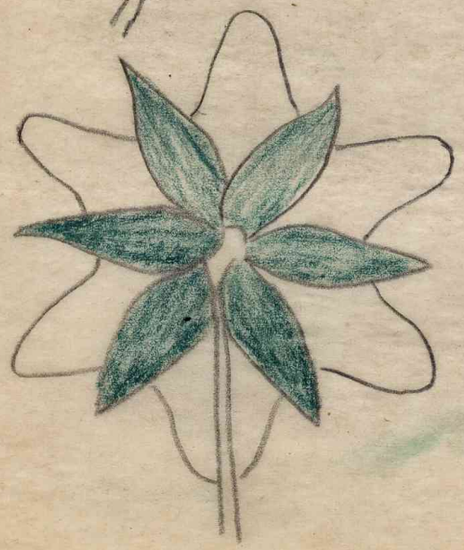


Gamosepalous

8. The Calyx is said to be:

Petaloid

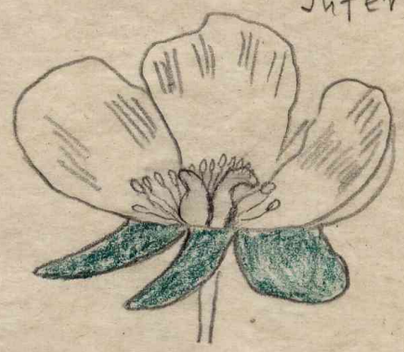
Green



9. The position of the calyx in relation to the pistil varies

It may be:

Inferior



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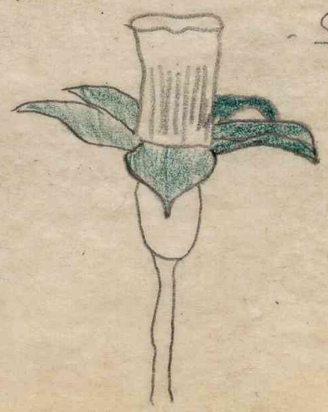
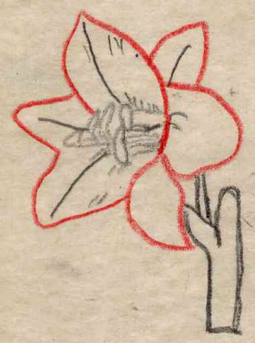
Superior

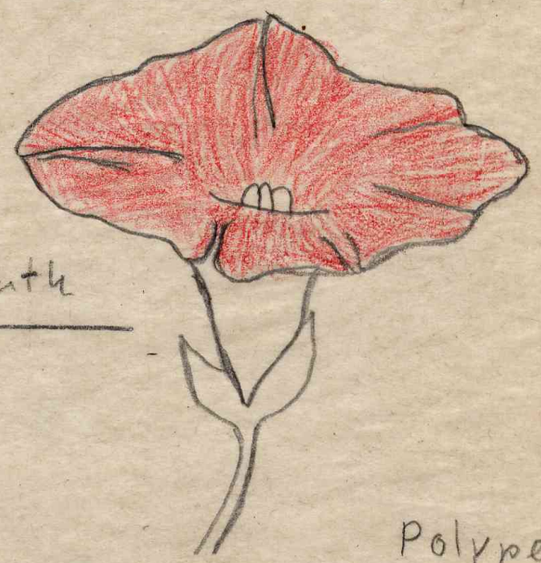


10. Periauth

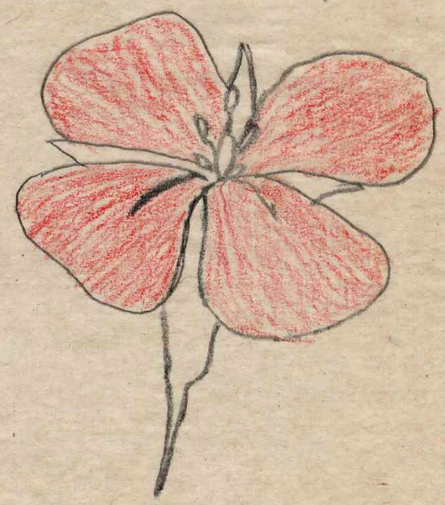


11. The corolla is called:

Gamepetalous



Polypetalous



12. Position of Corolla
The corolla is said to be:

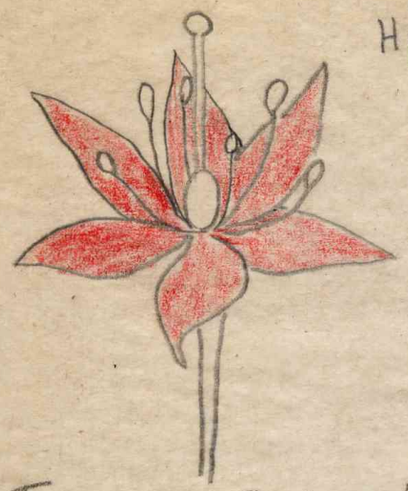
Hypogynous	..... when it springs from beneath the pistil. (Wallflower, Poppy) (Greek: ypo - beneath; gyne - female)
Perigynous	..... when the petals are attached to the calyx. (Rose, Apple) (Greek: peri - around)
Epigynous	..... when it springs from the top of the ovary; (Cow-Parsley) (Greek: epi - upon)

13. The forms of Corolla

Gamopetalous
The flower is said to be:

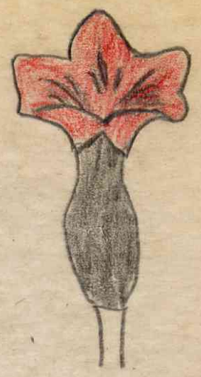
Spurred	..... when the corolla has developed a spur. (Monkhood,) (Middle English: spure - a spur)
Tubulae	..... when the corolla is in the form of a tube. (Thistle) (Latin: tubus - a tube)
Imbutiform or Funnel shaped	..... when the corolla has the appearance of an inverted cone or of a funnel. (Convolvulus) (Latin: imbutus - a funnel)
Ligulate	..... when the corolla is tongue-like or strap shaped. (as in the floret of the dandelion) (Latin: lingus - tongue)
Companulate	..... when the corolla is bell shaped. (Hare bell) (Latin: campane - a bell)
Labiate	..... when it is an irregular corolla of five petals resembling open lips, the upper lip being formed by the fusion of two petals and the lower of three. (Deadnettle, Salvia) (Latin: labium - lip)
Personate	..... when it is a labiate corolla, whose throat is masked by a projection of the base of the lower lip. (Antirrhinum; Greek: rhis - nose) (Latin: personatus - masked)

12. Position of Corolla

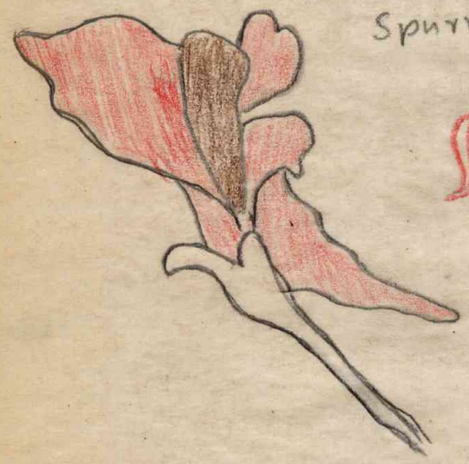


Hypogynous

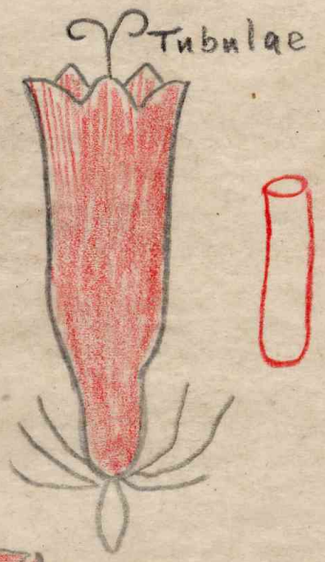
Perigynous



13. Forms of Corolla



Spurred



Tubulae

Funnel shaped

Ligulate

Campanulate

Labiate

Personate

Rotate ..... when the petals are disposed like the spokes of a wheel.
(Borage, Forget-me-not)
(Latin: rota - wheel)

Hypocrateriform ..... when the corolla is salve -shaped; having a slender tube below and a spreading border above. (Primrose)
(Greek: hypo - below;
krater - cup)

Urceolate ..... when the corolla has a swelling below and contracts at the mouth. (Heather)
(Latin: urceolus - a small water-pot)

14. Polypetalous
The flower is said to be:

Cruciform ..... when the corolla has four petals in the form of a cross. (Wallflower)
(Latin: crux, crucis - cross)

Rotate ..... when the petals are disposed like the spokes of a wheel. (Field Geranium, Stork's bill)

Papilionaceous ..... when the corolla has the form of a butterfly. (Pea, Gorse)
(Latin: papilio - butterfly)

15. The Stamen (Latin: stamen - thread) consists of

Filament ..... is the stalk to which the anther is attached.
(Latin: filum - thread)

Anther ..... is the part of the stamen which develops and contains pollen.
(Greek: antheros - flowery)

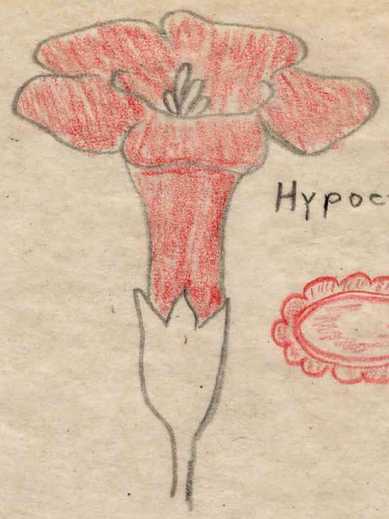
Pollen ..... is a fine yellow dust, each grain consisting of a single cell.
(Latin: pollen, pollinis - fine flour)

16. Relationship of stamens to each other
Stamens are said to be:

Free ..... when they are distinct or separate. (Buttercup)

United ..... when they are joined together. (Lupin)

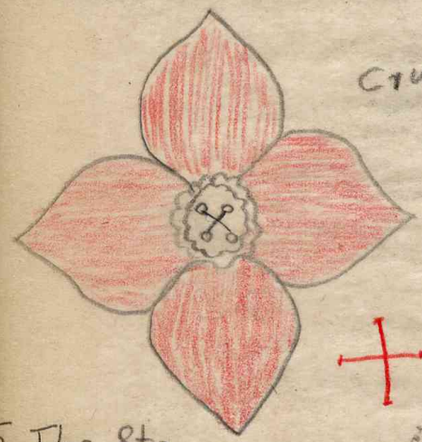
Rotate



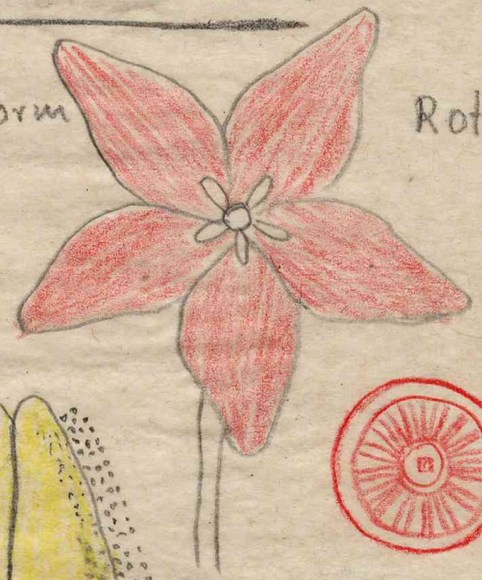
Hypocrateriform

Urceolate

14. Forms of Polypetalous Corolla



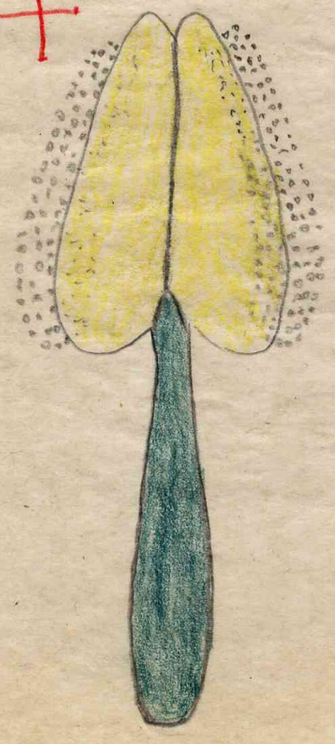
Cruciform



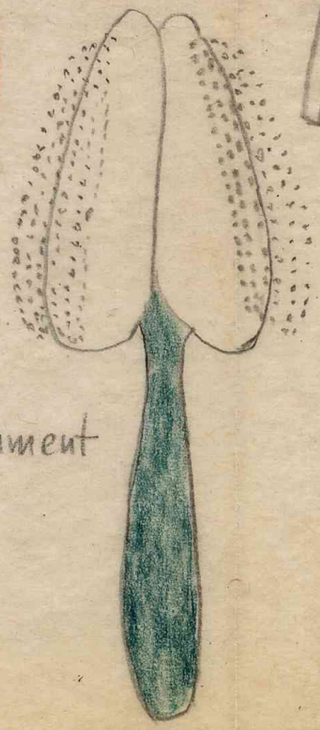
Rotate

Papilionaceous

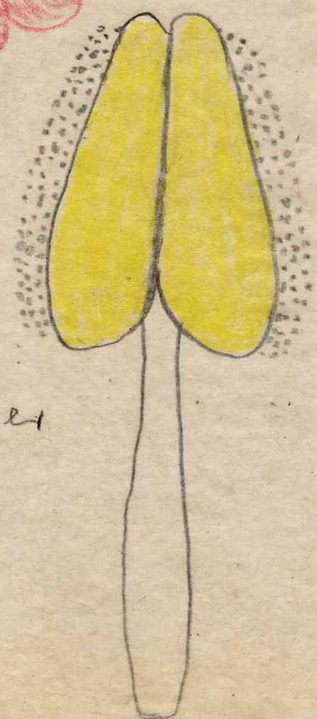
15. The Stamen



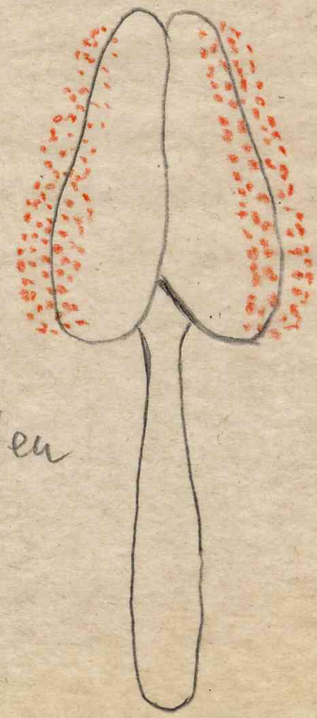
The Filament



The Anther

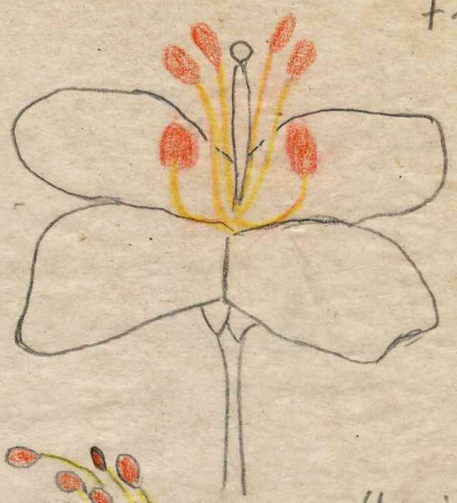


pollen



16. Relationship of stamens to each other

Free



United

17. Relationship of stamens to each other when free
Free stamens are said to be:

Didynamous ..... when there are four stamens, two long and two short. (Deadnettle, Foxglove)
(Greek: dis - twice;
dynamous - powerful)

Tetradynamous ..... when there are six stamens, four long and two short. (Wallflower)
(Greek: tetra - four)

18. Relationship of stamens to each other when united
The stamens are called:

Monadelphous ..... when they are all in one bundle. (Mallow, Passion-flower, Lupin, Lobelia)
(Greek: monos - alone;
adelphous - brother = in one brotherhood)

Diadelphous ..... when they are divided into two bundles as in the pea.
(Greek: dia - twice)

Polyadelphous ..... when they are divided into several bundles as in St.John's wort.
(Greek: poly - many)

Syngenesious ..... when the stamens are united by their anthers. (Dai sy, Dandelion, Borage)
(Greek: syn - together;
genesis - generation)

19. The position of stamens
Stamens are said to be:

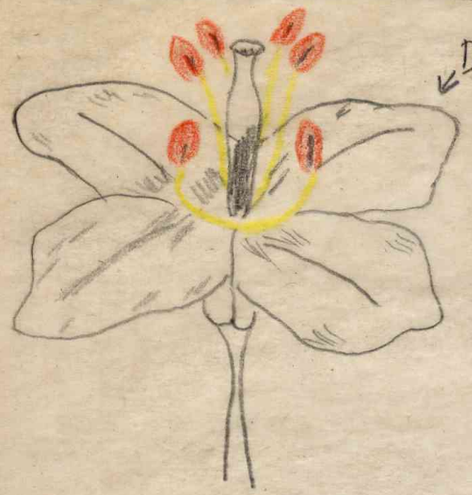
Hypogynous ..... when they spring from beneath the pistil. (Buttercup, Wallflower)
(Greek: hypo - beneath,
gyne - female)

Perigynous ..... when they are insected on the calyx. (Rose, Apple)
(Greek: peri - around)

Epigynous ..... when they are insected on top of the ovary. (Fools Parsley, Hemlock)
(Greek: epi - upon)

Epipetalous ..... when they are united to the corolla. (Primrose, Mint)

17. Relationship of stamens to each other when free



Didynamous

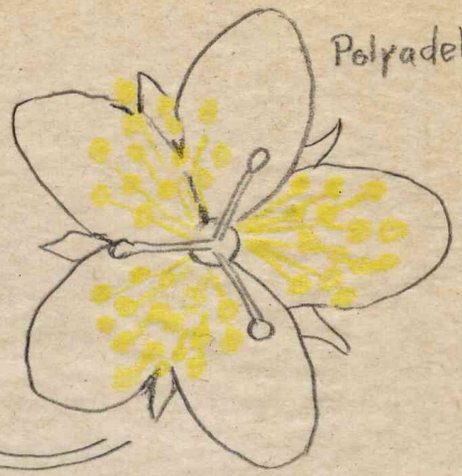
Tetradynamous

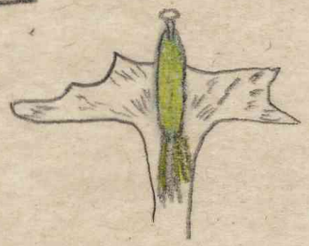
18. Relationship of stamens to each other.

Monadelphous

Diadelphous

Polyadelphous

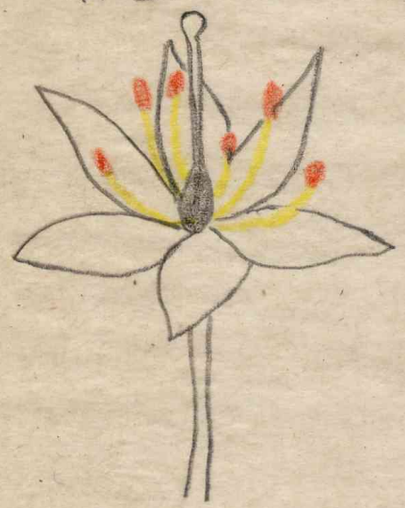




Syngenesius

19. The position of stamens

Hypogynous



Perigynous

Epipetalous

Epigynous

Gynandrous ..... when they are united in a mass and joined to the pistil. (Spotted-orchid)
(Greek: gyne - woman or female
aner, andros - man or male)

2o. The filaments are said to be:

Long ..... if they are longer than the pistil. (Fuchsia)

Short ..... if they are shorter than the pistil. (Mallow)

21. Filaments Filaments are usually slender and cylindrical but sometimes they are partly or wholly transformend or develop various appendages.
a) curved - elastic ..... pellitory - nettle
B) petaloid ..... white water lily, rose
c) broadened at the base...campanula
d) thickened throughout...barberry
e) appendages..... borage, asclepia, oleander, pansy.

22. Forms of anther
Anthers may be:

Round or globose ..... Nettle, Goosefoot.

Elliptical ..... Meadow Saffron.

Pointed ..... Heather, Borage.

Flexuose ..... bending in a zig-zag manner. (Gourd, Tribe-Melon)

23. Adhesion of Anther to Filament
(Latin: adhaere - stick together)
Anther is called:

Versatile ..... when it is fixed by or near its middle to the very tip of the filament and so is free to swing. (Grasses, Meadow-Saffron)
(Latin: versare - to turn around)

Basifixed or innate ..... when it is joined to the filament by the base. (Carex, Scirpus, Hemp)
(Latin: basis - a base)

Dorsifixed or aduate ..... when the filament enters the whole length of the back of the anther. (Magnolia, Crowfoot)

Gynandrous

20. The Filaments are said to be:

Long

short

23. Adhesion of Anther to Filament

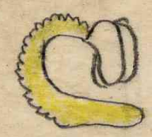
Versatile

basifixed

dorsifixed

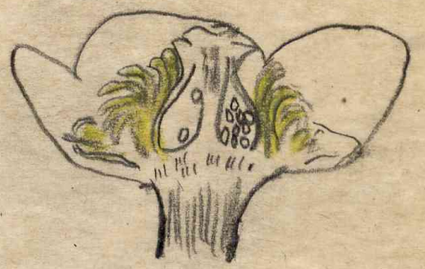
21. Filaments

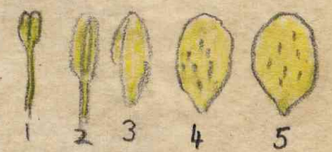
a) Curved elastic



c) broadened at the base

b) petaloid





1 2 3 4 5

d) Thickened throughout

22. Forms of anther

rounded or globose

pointed

eliptical

Flexuose

e)

(a)

(b)

(b)

(c)

(d)

24. Relationship of stamens to pistil is said to be:

Interorse	..... when the lobes of the anther face the pistil. (Magnolia - Vine) (Latin: interoreus - inwardly directed)
Excorse	..... when the lobes of the anther turn away from the pistil. (Meadow Saffron, Iris) (Latin: excoreus - outwardly directed)

25. Deliscence of anthers.
Line of deliscence - Latin: deliscere - to gape

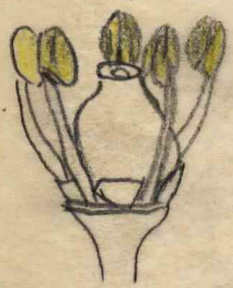
The suture line or line of deliscence	..... masks the place where the anther opens to discharge the pollen. It corresponds to the edge of the leaves.
Central	..... when it is on the face of the anther. (Grape , Vine)
Lateral	..... when it is on the sides as in innate anthers. (Fir, Fuchsia)
Transverse	..... when the anther splits horizontally. (Lady's Mantle)
Pores	..... sometimes the split only takes place at the apex, so forming holes or pores. (Rhododendron, Nightshade, Potato)
Valves	..... sometimes the split forms valvesas . (Basberry)

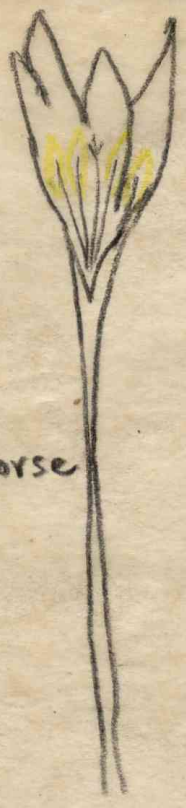
26. The pistil consists of:

The ovary	..... is the enlarged part of the pistil at the base of the style. It contains the ovules which form the seeds. (Latin: ovum - egg; ovarium - receptacle of eggs)
The style	..... is the pillar-like structure connecting the stigmas and the ovary. (Greek: stylos - a pillar)
The stigma	..... is the area of the pistil (generally placed at its apex) which receives the pollen grains. Its surface i s usually moist or viscid.

24. Relation ship of stameus to pistil is said to be:

Interorse





Excorse

25. Deliscence of anthers

The suture Line

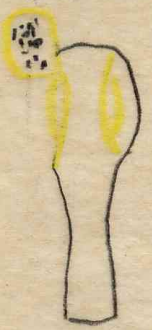
central

Lateral

transverse

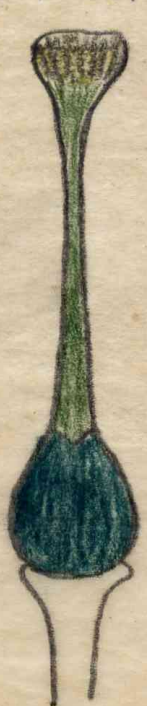
pores

valves



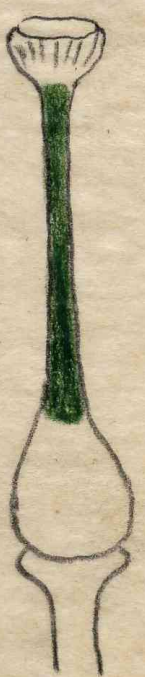
26. The pistil consists of:

The Pistil

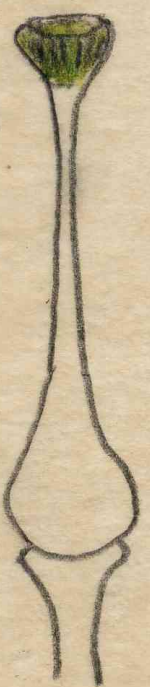


The ovary

The style



The stigma



27. Types of pistils
The pistil is said to be:

Monocarpous ..... when it consists of a single carpel. (Pea, Grass)
(Greek: mono - one, alone
parpos - fruit

Apocarpous ..... when two or more carpels are seperate or distinct with seperate styles and stigmas. (Buttercup, Peony)
(Greek: apo - seperate, Karpos - fruit)

Syncarpous ..... when two or more carpels are united. (Wallflower, Deadnettle)
The number of stigmas usually indicate the number of carpels, but in certain cases both the styles and the stigmas are united.
(Greek: syn - together, karpos -fruit)

28. Position of pistil
The pistil is:

Superior ..... when it is inserted above the other parts of the flower. (Buttercup, Foxglove)

Inferior ..... when it is inserted below the other parts of the flower. (Fool's Parsley, Daffodil)

29. The outer surface of the style is said to be:

Hirsute .....when it is hanging (Clematis, Bell flower

Glabrous ..... when it is smooth. (Primrose)

30. Adhesion of the style to the ovary is said to be:

Lateral: ..... when it springs from the side of the ovary. (Strawberry)

Terminal: ..... when it springs from the top of the ovary. (Primrose)

Gynobasic ..... when it springs from the base of the ovary. (Lady's Mantle)

32. Types of stigmas

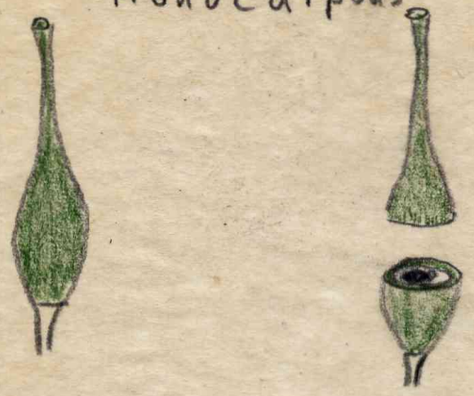
Round or capitate ..... (Primrose)

Peltate (shield like).....(Rock Rose, Barberry)

Hairy ..... (Periwinkle, Nettle)

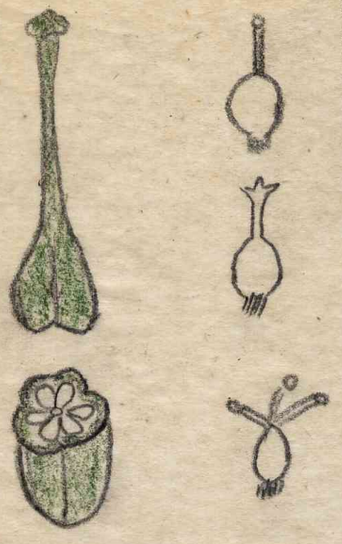
27. Types of pistils

Monocarpous



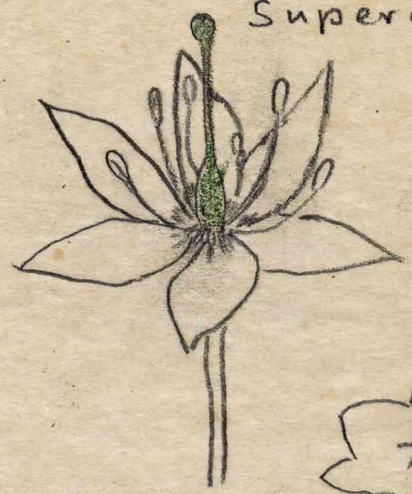
Apocarpous

Syncarpous



28. Position of pistil

Superior



Inferior

29. The outer surface of the style is said to be.

Hirsute

Glabrous

30. Adhesion of the style to ovary is said to be;

Lateral

Terminal

Gynobasic

32. Types of stigmas

Round or Capitate

Peltate

Hairy

Feathery ..... (Wheat)

Sessile ..... when the style is absent the stigma is to be said "sessile". (Nettle, Poppy)

33. The Ovules are attached to a part of the ovary called the placenta. It is a ridge or cushion of tissue formed by the growing of the margins of the carpels. The mode of this attachment is known as the "placentation".

Marginal ..... is so called when in an ovary which is formed from a single carpel, the ovules are arranged along the ventral margin. (Pea, Bean, Larkspur)
(Latin: Placenta - a cake)

Parietal placentation ..... is so called when the wall of the ovary beard the placenta. (Poppy, Wall-flower)
(Latin: paries, paretis - a wall)

Free central placentation .....is so called when the placenta is unconnected with the wall of the ovary. (Primrose, Stichwort)

Axile placentation ..... is so called when the carpels meet in the center and form a central or axile column. The ovules are attached to this column. (Daffodil, Tulip, Hyacints)

Basal placentation ..... is so called when the ovary contains a single ovule and this springs from the base. (Buttercup)

34. An inflorescence ..... is a collection of flowers produced from a common stalk. It consists of the main stalk or penduncle, and the small stalks or pedicels, by which the flowers are attached to the main stalk.
(Latin: in - in , flos - flowers)

Indefinite inflorescence... is one in which the floral axis continous to grow beyond the first flowers which are produced in the axil of leaves. The lower flowers open first.

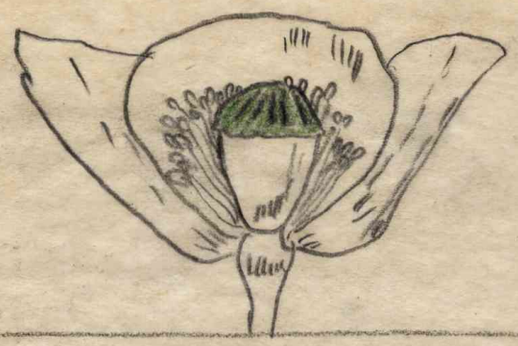
Definite inflorescence..... is one in which each floral axis ends in a solitary flower. The top flowers produced by the terminal buds open first.
(Latin: definire - to limit)

35. Indefinite inflorescence is called:

Spike ..... when the pedicls are absent, so that the flowers are sessile along the axis.
(Plantain, Bistost, Verbena, Willowwheat)
(Latin: spica - a wheat head)

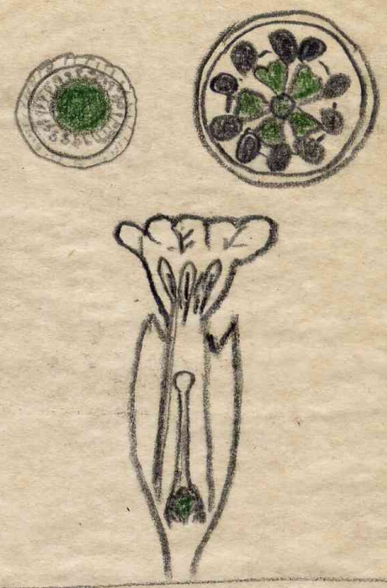
Feathery

Sessile



33. Placentation

Free central

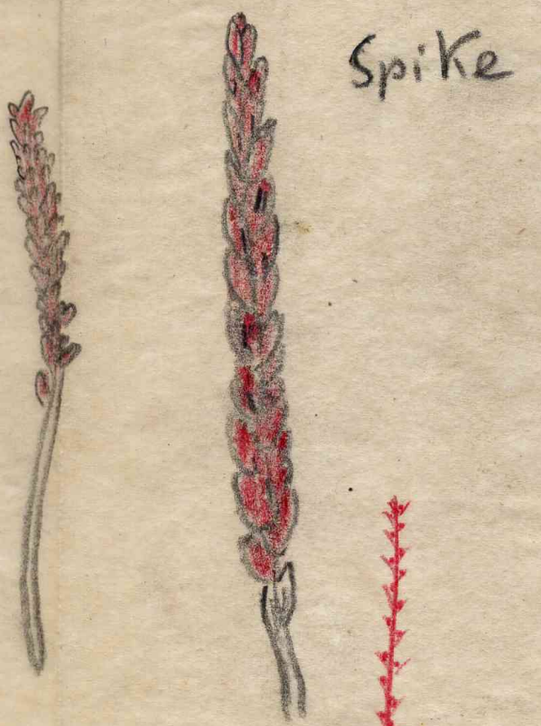


34. An inflorescence

Indefinite Inflorescence

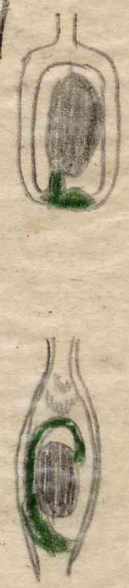
Definite

35. Indefinite inflorescence



Axile

Basal



Raceme ..... when the pedicels are present and the flowers distributed along the elongated axis developing from below towards the apex. (Currant, Hyacinth)
(Latin: racemus - a bunch of grapes)

Panicle ..... when the axis of the inflorescence branches and each brach forms a raceme. (Rhubarb, Oats)
(Latin: paricule - a tuft of plants)

Corymb ..... when the pedicels are produced at different levels and are of different lengths forming a cluster which is convex or nearly level.(Candytuft, Cherry)
(Latin: corymbus - a cluster of flowers)

Simple umbel ..... when the axis is greatly contracted so that the pedicels appear to spring from the same point and are all of eaqual length forming a flat or rounded flower cluster. (Cowslip)
(Latin: umbell - a little shadow umbrella)

Compound umbel ..... when each pedicel bears a secundary umbel. (Fools, Parsley, Carrot)

Capitulum ..... when the axis is contracted and the flowers are sessile, forming a rounded or flat cluster. (Daisy, Dandelion, Clover)
(Latin: capitulum - a small head)

Spadix ..... is a spike with a fleshy or succulent axis bearing male und female flowers. It is usually enclosed by a large leaf called spathe. (Arum or Cuckoo Pint)
(Latin: spadix - a palm branch, broken off with its fruits)

Catkin ..... The catkin is a crowded spike of small spetalous, unisexual flowers. Catkins are the male flowers of Oak, Hazel, Sweet chestnut, Willow, Poplar and Birch. (Cat and kin from its resemblance to a cat's tail)

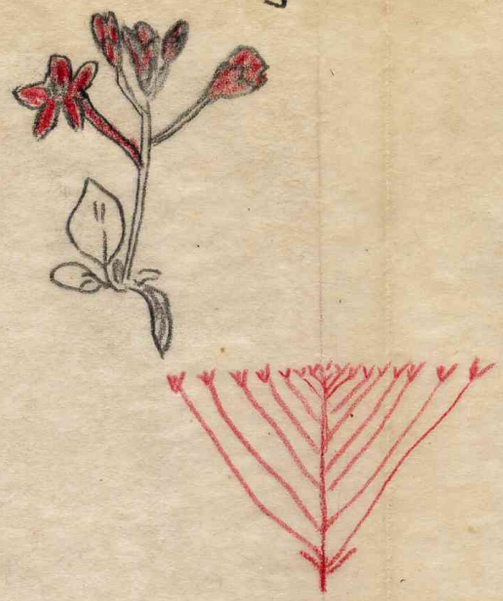
36. Definite inflorensce .....

Solitary flowers ..... when the apex of the peduncle produce a single flower. (Tulip)
It is sometimes produced in the axil of a leaf. Then it is said to be solitary or axillary. (Poor ma's weather glas, Ground Ivy)
(Latin: solus - alone)

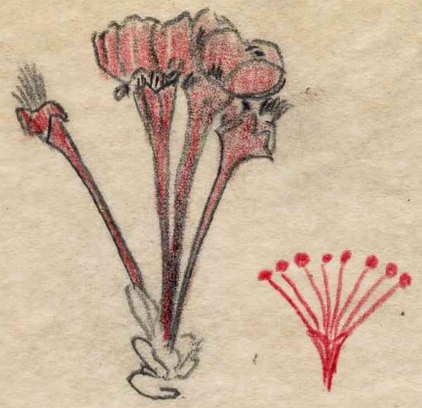
Raceme

Panicle

Corymb



Simple umble



compound umbel

36. Definite inflorescence

capitulum

Spadix

Catkin

Solitary flower

~~Dichotomous~~
Cyme

..... In this inflorescence the main axis always ends in a single flower which may be the only one produced, or the inflorescence may be continued by secundary and tertiary axes. (Wood Anemone)
(Latin: cyme - the young shoot of a cabbage)

Dichotomous Cyme

..... when the apex of the axis is occupied by a flower, which opens first. From beneath this flower two new branches are produced. In true dichotomy, the main axis forks repeatedly into two branches uniformly developed. In some cases one of the two branches is regularly suppressed, forming the scorpoid type. In others each alternate one is suppresed forming the helicoid type (This is called false dichotomy) (Mouse - ear, Chickweed)
(Greek: dixa-in two, tennein - to cut)

Delicoid Cyme

..... When the flowers are born on one side of the axis causing it to curl spirally. (Alskoemeria)
(Greek: elix - spiral
eidos - shape)

Scorpioid Cyme

..... when the cyme is developed on both sides of the peduncle, (Forget-me- not) and is curved at the top like a scorpion's tail.
(Greek: scorpios - a scorpion
eidos - form)

Verticilaster

..... is a false whorl, formed of two merely sessile cymes placed in the axis of opposite leaves. (Deadnettle)
(Latin: vertex - whirl
Greek: aster - star)

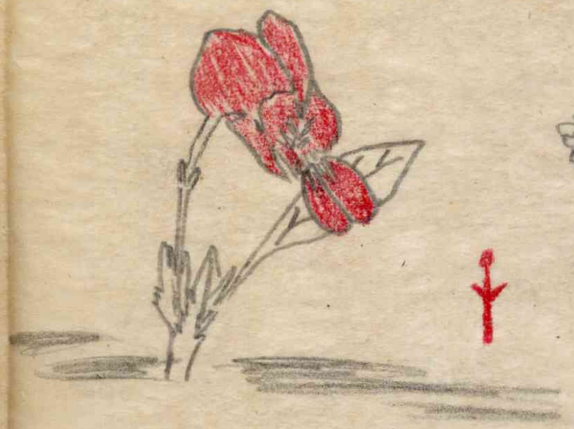
Verticil

..... is a circle of leaves, flowers, or inflorescnences about the same point of the axis, forming a whorl.
(Common Mare's Tail, Black Horehound)

Glomerule

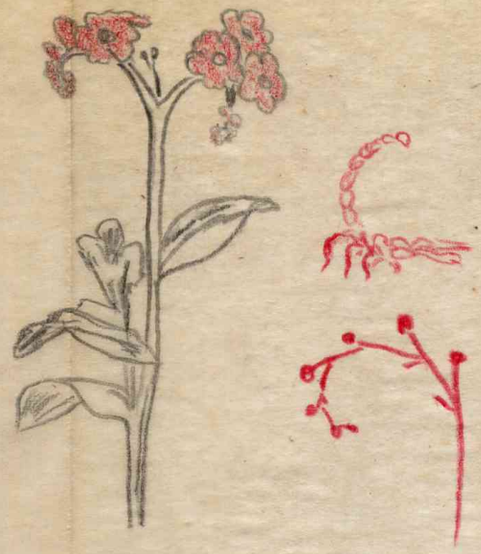
..... is a compact sessile cyme in which the flowers are crowded as to resemble a head. (Nettle, Box, Valerianella)
(Latin: glomerula - a small ball)

Cyme

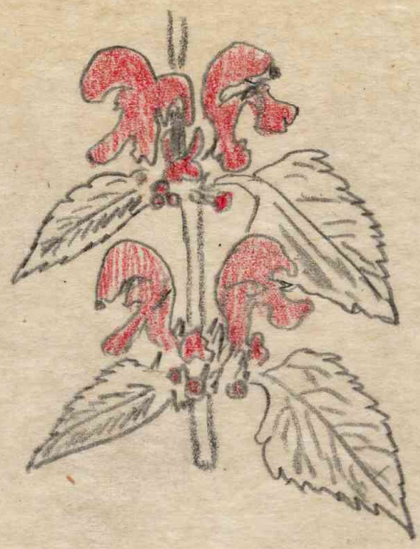


Dichotomous

Scorpoid

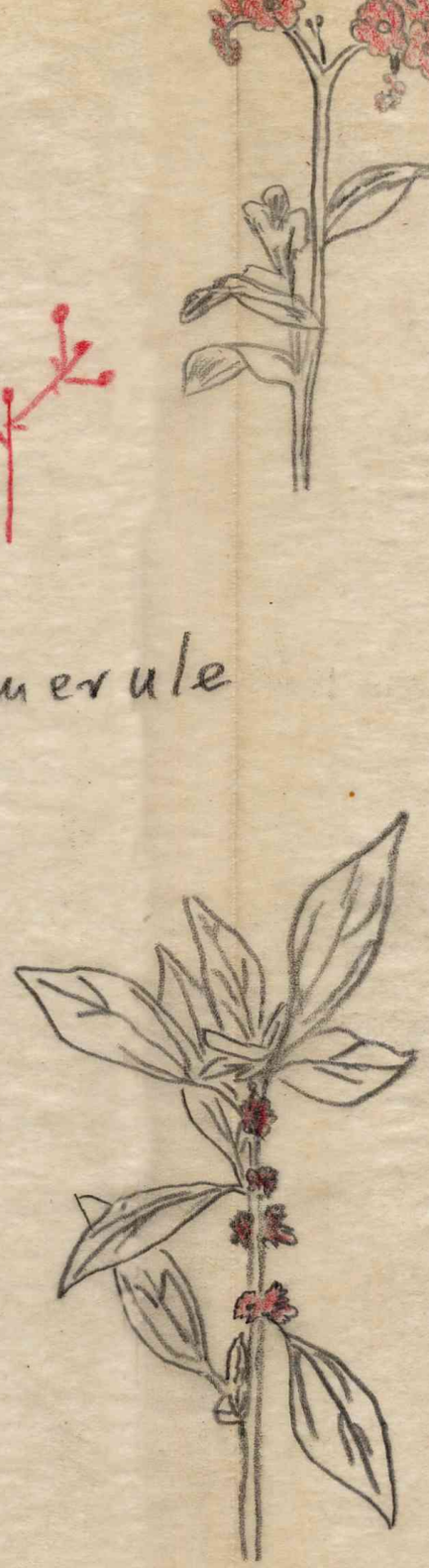


Verticilaster



Verticil

Glomerule



Helicoid

37. The bracts ..... are the modified leaves in the axil of which the flowers are produced. (Latin: bractea - thin plate of metal or wood)

Bracts are called:

Leafy ..... when they resemble ordinary leaves. (Pimpernel)

Scaly ..... when they have the form of a scale. (Hop, Pineapple)

Wooden ..... when they are formed of wood. (Pine)

Spathe ..... when the bract is large and surround the inflorescence. (Palm, Cuckoo Pint) (Latin: spatha - spathe)

Involuere ..... is a whorl of bracts subtending or supporting a flower cluster. They may be scaly or leafy. (Daisy, Dandelion) (Latin: involucrum - a wrapper, a covering)

Cupule ..... is a cup shaped in volucre in which the bracts have become hard and fused together. (Acorn, Oak) (Latin: cuppa - a cup)

F R U I T

A fruit ..... is the ripened ovary and its contents, including such adjacent tissues as may be inseperately connected with it.

The wall of the ripened and variously modified ovary which in the fruit protects the needs is called"Pericarp". Greek: peri - round, carpos -fruit. It may be thin and foliaceons or membraneous as in the legume and most capules; fleshy as in berries; hard or bony as in nuts. Sometimes it shows three distinct layers.

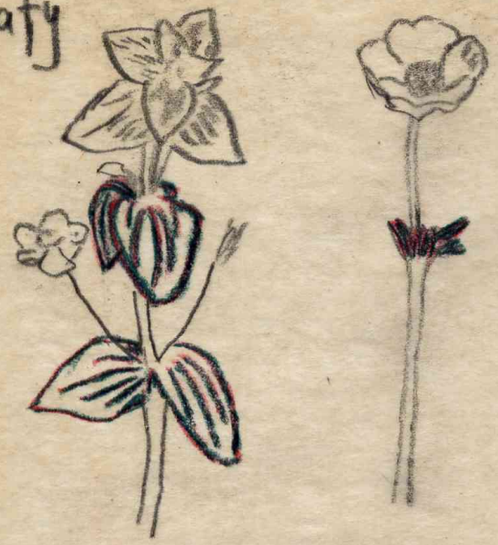
F1.

Epicarp .... is the outer layer of the wall, usually corresponding to the peel. (Greek: epi - on, upon)

Mesocarp ..... is the middle layer of the wall. When fleshy it is called sarco carp, (Greek: sarx; saroos - flesh) corresponding to the fleshy part of a peach, cherry, plum.

37. The bracts

Leafy

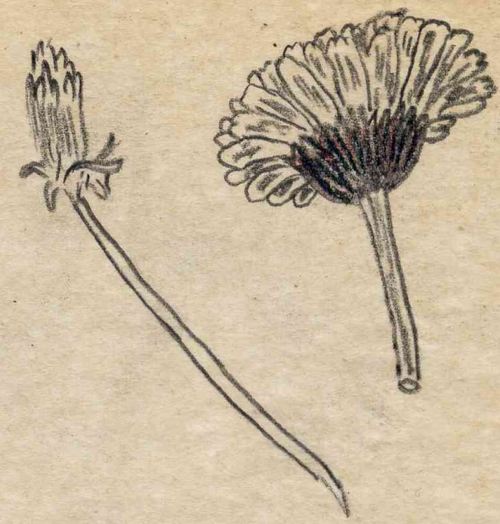


Scaly

Wooden

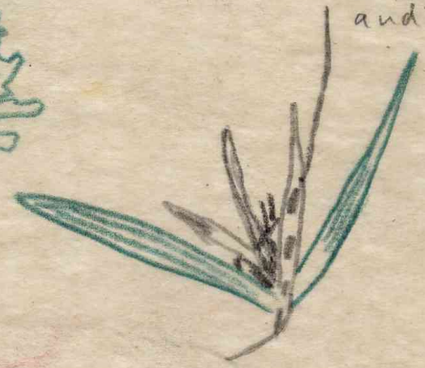
Spathe

Involucre



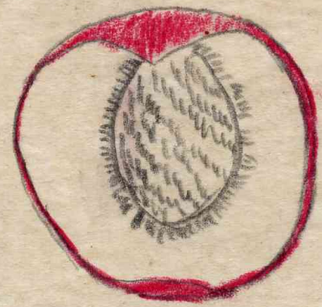
cupule

Glumes: are the chaffy, scaly bracts of the cyperaceae and the graminae Latin gluma - a husk

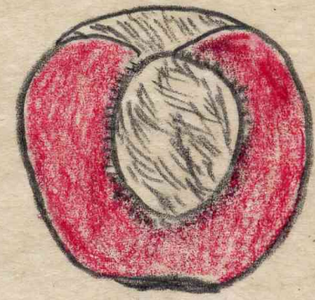


FRUIT

Epicarp



Mesocarp



Endocarp ..... is the inner layer of the wall usually corresponding to the stone of a plum or peach.
(Greek: endon - within)

F2. Classification of the fruit based on the pericarp:

Succulent fruits ..... when some portion or the whole of the pericarp is succulent.
(Latin: succulentus - juicy, from sucus - juicy)

Dry fruits ..... when the pericarp is hard and dry.
(Middle English: druye - free from moisture)

F3. Classification of the fruit based on the transformed flower. Fruit may be:

Simple ..... when it comes from the transformation of the ovary of a single flower in which the pistil has only one carpel. (Gooseberry)

Aggregate ..... A fruit consisting of a mass of achenes or drupelets, it comes from the transformation of a single flower in which there is more than one carpel or ovary, each giving rise to a fruitlet. The fruit therefore consists of an aggregation of fruitlets. (Raspberries, Blackberries)
(Latin: ad - and gregare - to collect into a flock)

Collective or Composite ..... when it is formed from an inflorescende. The ovary of each flower in developing joins with the others to form a single mass. These composite fruits are called syncarps which means carpels joined together. (Pineapple)
(Latin: compositus - made up of parts)

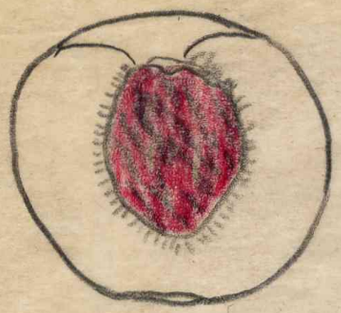
F4. Succulent fruits simple, aggregate, composite:

Simple The Drupe ..... is a fruit in which the epicarp and the mesocarp are succulent, but the endocarp extremely hard. (Cherry, Plum, Apricot, Walnut)
(Latin: drupa - overripe wrinkled olive

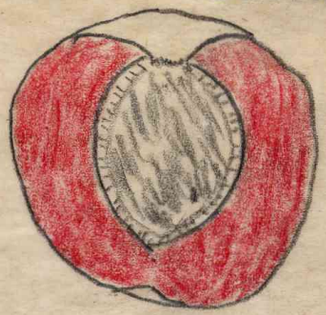
The Berry ..... is a fruit in which the whole of the pericarp is soft and succulent. (Gooseberry, Grape, Currant, Orange)
(Middle English: kerie)

Endocarp

F2. Classification on the fruit based on the pericarp



Succulent fruits

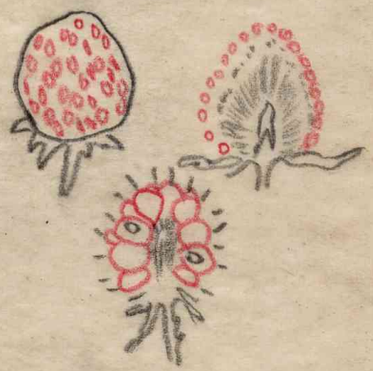


Dry Fruits

F.3 Classification of the fruit based on the transformed flower

simple Fruit

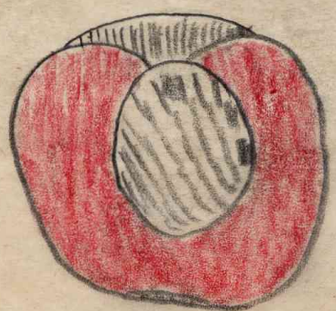
Aggregate



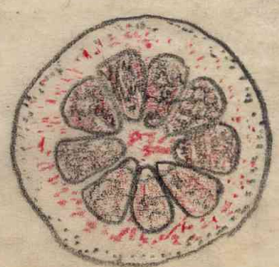
collective or Composite

F.4 Succulent fruits simple, aggregate, composite

Simple: The Drupe



The Berry



The Pepo ..... is a hard-rinded berry belonging to the gourd family. (Pumpkin, melon, cucumber etc.)

Pome ..... is a fruit in which the fleshy part and the skin are formed from the thalamus. Imbedded in it are several cartilaginous papery or bony carpels. (Apple)
(Latin: pomum - a fruit)

Aggregate ..... when fruitlets are succulent, separated and each contains a seed. (Blackberry, Raspberry)

Composite ..... Pineapple, Mulberry

F5. Dry fruits

Deluscent ..... when the pericarp bursts open to allow the seed to escape.
(Latin: deliscere - to burst open)

Indeluscent ..... when the pericarp does not burst open to allow the seeds to escape.

F6. Deluscent

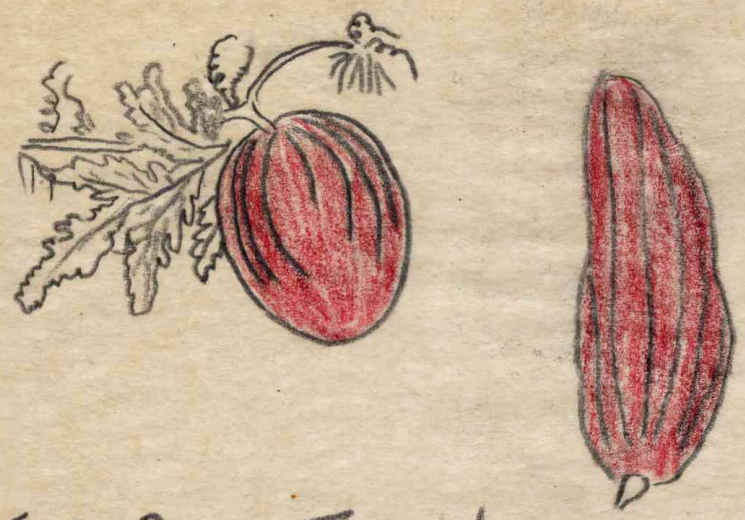
Capsule ..... is a dry fruit, usually many seeded and composed of two or more carpels which may open by pores, valves or teeth. (Poppy, Lily, Foxglove, Violet)
(Latin: capsula - a little box)

Siliqua ..... is a fruit formed by two carpels. The two walls of the fruit seperate and hang freely from the apex thus leaving free the structure made by the fusion of the two placentas to which the seeds are attached. (Wallflower, Rape, Mustard)
(Latin: silique - a pod)

Legume is a fruit composed of a single carpel which delusces along both the ventral and dorsol sides. (Pea, Vetch, Bean, Clover)
(Latin: legumen - a pod)

Follicle is a fruit in which the single carpel or carpels open along one side only, usually the ventral side.(Columbine, Aconite, Larkspur)
(Latin: folliculus - a small bag)

The Pepo



Pome

Aggregate

Composite

F.5. Dry Fruits

Deluscent

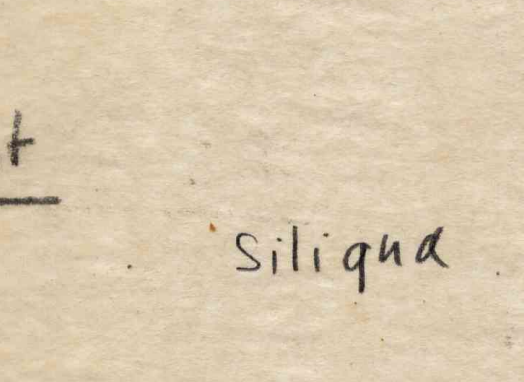
Indeluscent

F.6 Deluscent

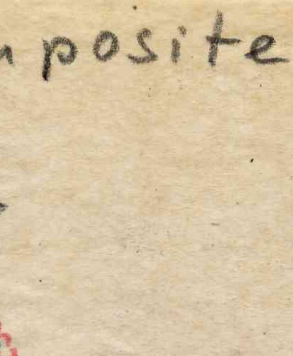
capsule

Siliqua

Follicle



Legume



F7. Indeluscent Fruit

Achene ..... is a one seeded fruit in which the pericarp is membreanous or leathery. It is hard, dry and small. (Buttercup, Rose)
(Greek: a - not , inein - to gape)

Samara or Winged Achene ..... is a fruit in which the pericarp has developed a membrane or wing. (Ash, Elm)
(Latin: samaea - the seed of the elm)

Schizocarp ..... is a dry, many seeded fruit which splits into a number of one seeded and indeluscent parts. (Fool's Parsly, Maple, Geranium)
(Greek: skizein - to split)

Nut ..... is a policarpellary one-seeded fruit in which the pericarp is hard and woody. It is derived from an inferior syncarpous ovary. It is usually wholly or partly enclosed by a structure called cupule which is formed by the fusion of the bracteoles developed under the flower. (Hazel, Oak, Beech, Chestnut)

S E E D S

The Seed of a flowering plant is the fertilised and ripened ovule.
(Middle English - seed)

It consists of two parts:

The Spermoderm Samenschale ..... which is the seed coat or outer covering which encloses and protects the embryo.
(Greek sperm - a seed; derma - a skin)

The Embryo Keimling ..... which is the miniature plant.

S1. The Spermaderm (Greek: sperma - seed, germ; derma - skin) consists of:

The Testa äußere Samenhülle ..... which is the hard external coating.
(Latin: testa - a shell)

The Tegmen innere Samenhülle ..... which is the inner coating, thin and delicate. There is a little hole perforating them which is called th micrpyle.
(Latin: tegere - to cover)

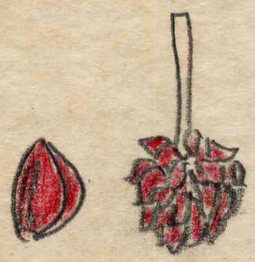
F.7 Indulescent Fruit

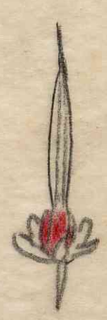
Achene

Samara or Winged Achene

Schicocarp

Nut





Seeds

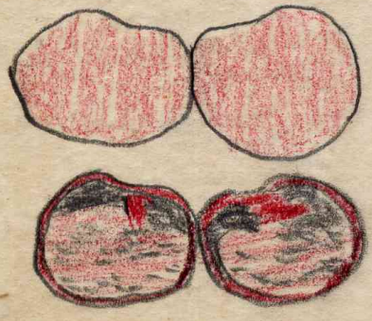
The seed consists of two parts

The Spermoderm.

The Embryo

The Tesla

The Tegmen



The Micropyle ..... is a very small aperture in the depression or hilum.
(Greek: mikros - small; pyle - a gate)

Hilum ..... is a depression marking the place of attachment to the short stalk of the seed.

S.2. The Embryo consists of: (Greek: en- in; bruin - to swell with)

The Radicle ..... which is placed in front of the micropyle and will develop into the root of the plant.
(Latin: radicula - a small root)

The Plumule ..... which will develop into the shoot - stem and leaves - of the plant.
(Latin: plumula - a small feather)

S3.

These are accompanied by either one or two masses of nourishing matter which are called seed leaves or cotyledons.
(Greek: kolydeon - a cup-shaped hollow.)

Monocotyledon ..... is the term applied when there is only one seed leaf present.
(Maize, Coconut, Wheat)
(Greek: momo - one - alone)

Dicotyledon ..... is the term applied when there are two seed leaves present. (Bean)
(Greek: dis - two)

Micropyle Hilum

S.2. The embryo consist of:

Radicle Plumule