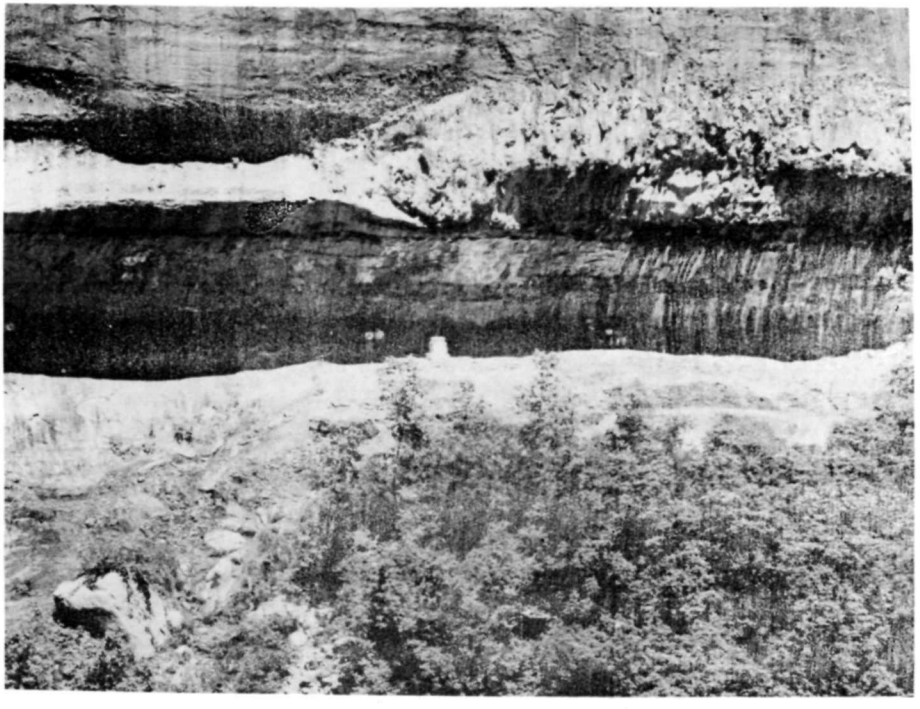
Self-Guiding Nature Trail to the WEEPING ROCK

— Trail Distance 1/4 Mile —



You may use it free, but if you take it home, Please leave 5 cents.

This leaflet is provided as an aid to better understanding and appreciation of the natural features along the short trail of 1/4 mile to the Weeping Rock and its Hanging Gardens.

THE FLOWERS YOU SEE TODAY, MAY BE HERE TOMORROW, IF?

Look for the numbered stakes beside the trail.

1. This large tree with the silvery-green leaves is the Fremont Cottonwood . (Populus fremonti is its scientific name.) In the spring many hair covered seeds develop that give the appearance of cotton, hence the name Cottonwood. Pioneers of Southern Utah found the ashes of this tree a source of lye for use in the making of soap. The lye was mixed with animal fats.

2. The stream beneath the bridge, except in times of heavy rainfall, has its source in the water that comes from the Weeping Rock. Many forms of plant life find a favorable habitat in this stream. Minnows and two kinds of suckers are the kinds of fish found. Canyon toads and the common garter snake occasionally seen; and you may also find a slate-gray colored bird, the Water Ouzel or Dipper.

3. As you cross the bridge, the trail divides. The left-hand trail leads to the Weeping Rock; and the right-hand trail leads to Hidden Canyon, Echo Canyon and Observation Point at the terminus of the East Rim Trail, which provides the best view of Zion Canyon.

Cable Mountain View - The high mountain above is Cable Mountain. On the left end of its flat summit is a heavy wooden frame that once held pulleys, wires, and cables which were used to convey sawed lumber and logs from the East Rim to the canyon floor near this spot.

This cableway, which became known as the "Zion Cable" was constructed in 1904 by David Flanigan; and by 1906 more than 200,000 board feet of sawed lumber had been lowered from the cliff. The cable operated until 1930 when operations were suspended and the cable and lower frame were removed.

4. The shady lane through a variety of trees provides a habitat for many plants and animals. Note the lop-sided leaf of the Netleaf Hackberry (Celtis reticulata), also its very rough surface. This plant is the only member of the Elm family growing in Zion National Park. The small cherry-like fruits provide food for many birds. In the past Indians also gathered and ate hackberries.

5. The tree with the yellowish-green and deeply lobed leaves is a member of the maple family commonly known as Boxelder (Acer negundo). The winged seeds and lobed leaves are both characteristics of the maples. This tree does not live long and seldom attains heights of more than 35 feet or diameters greater than a foot.

6. Immediately ahead between the Weeping Rock and Cable Mountain is the winding path of the East Rim Trail.

During early pioneer days this path offered the only feasible route for a trail from Zion Canyon to the communities east of here. At a still earlier date the Indians used this same area as a way in and out of the Canyon.

7. This tree is the Gambel Oak (Quercus gambelli). It is locally known as Utah White Oak and is one of the most common trees on the mountain slopes. Its presence indicates the location of damp soil, and it is found at elevations up to about 8,000 feet. In association with the shrub form it often forms dense thickets which provide valuable browse for deer. During autumn the reds and deep orange shades of these leaves add color to the landscape.

8. The shrubby plant with the prickly leaves is the Wavyleaf Oak or Scrub Live Oak (Quercus undulata). It is known as a "Live" oak because it does not shed its leaves in fall as many other oaks do. This tree favors the dry, rocky slopes and provides valuable cover in slowing down the removal of soil that so often accompanies the normal summer thundershower.

9. How can plants live on solid rock? Note the various plant forms on this rock. Part of the rock is being converted into soil by the action of these plants called lichens. These pioneer rock breakers are composed of two plants which live together in a harmonious association of mutual helpfulness (symbiosis). One plant called alga, manufactures food materials in the pressence of sunlight. The other plant, a fungus, draws its food from the alga but reciprocates by supplying water which it absorbs and holds for future use.

10. This tree is known as the Bigtooth Maple (Acer grandidentatum) These trees have very shallow root system and generally favor soil that is not too dry. The wood is heavy and close grained. The leaves are similar to the sugar maples of the East, and this species also exudes sap that contains maple sugar.

11. The vine above is Canyon Grape (Vitis arizonica). Lacking sufficient self-support, it attaches itself to other plants by means of tendrils and clings to them throughout its life. Although the grapes produced are small and sour, they are readily eaten by some birds, and the Indians ate them both fresh and dried. Early pioneers found the grapes excellent source of jelly. Mule deer relish the leaves and tender vines. In Autumn the leaves turn a beautiful purplish-red color.

12. Across the stream on the opposite canyon wall a rather positive color change in the rock is evidnet. The lower deep-red rocks (Kayenta formation) represent materials believed to have been carried into the Zion area eons ago by slow moving streams. Originally the materials were chiefly sand and silts containing small quantities of lime and iron.

The lime cemented the sediments together and the iron has provided the vivid red coloring. Above the deep-red beds are the massive sandstone deposits (Navajo Formation) that comprise the major peaks of Zion. At one time a great desert covered this area, and huge dunes accumulated atop each other to a depth of 2000 feet. These sandstones in Zion contain small amounts of iron, and the entire layer is cemented weakly by lime.

13. This shrub, called Emory Baccharis or Water Willow (Baccharis emoryi), is confined to low altitudes, along streams. It often grows 8 or 10 feet tall and might easily be mistaken for a willow except for its yellow rayless flowers that produce an abundant crop of downy seeds in late summer or early fall.

14. This tree with tear-drop shaped leaflets in groups of five is the Velvet Ash (Fraxinus velutina). The mature seeds of the ash are winged and hang in clusters. The tree grows only where water is readily available the year round, but it does not grow rapidly. Pioneers valued its tough wood for many uses in their farm work.

15. During the geologic period called the Pennsylvanian great swamps existed in parts of America. In these swamps giant plants grew, and from their remains many tons of coal and barrels of oil have been derived. The fern family and the horsetail family formed a conspicuous part of these ancient forests. A representative of each of these two groups grows in the damp soils here today. The small fern with the blackish stem is the Southern Maidenhair Fern (Adiantum capillus) and the Scouring Rush (Equisetum arvense) is the deep green, straight stalked, jointed plant. It bears cone-like flowers in season.

16. The white deposit on the rock surface is lime which collected in a seam or crack in the sandstone layers. Water seeping down through the sandstone dissolved lime from portions of the rock and the re-deposited it in cavaties.

17. Two kinds of columbine grow in moist places such as this. The yellow-flowered variety is the Golden Columbine (Aquilegia chrysantha) and the one with the red spur is (Aquilegia rubicunda) or Red-Spurred Columbine. These flowers bloom profusely in June and sometimes continue well into July.

The plant with the linear alternate leaves growing here in association with the columbine is Fat Solomonplume (Smilacina amplexicaulis) which produces a small white flower in terminal clusters during the month of June.

PLEASE LEAVE ALL FLOWERS FOR OTHERS TO ENJOY

On pages 8, 9, 10 and 11 are a total of 24 flower sketches of the more common flowers of Zion. A study of these drawings may help you indentify flowers you find along the trails.

If you desire more help in learning the flowers, trees and shrubs visit the Park Museum where you may secure additional information and publications relating to the natural history of the park. The Ranger-Naturalists are here to help you.

18. Note the accumulation of debris (dead leaves and grass) on the slope above the trail. The decaying material adds humus to the soil and provides nourishment for a variety of plants. The protective cover of trees and shrubs helps prevent the washing away of the top soil. This relationship of plants to each other and to the animal life present is called ecology.

19. Note the hanging gardens high on the cliff above. The water seeping from the rock wall supplies these plants with the necessary food supply. It is always a puzzle as to how plants can get started on such steep walls or over hanging cliffs. No doubt the seeds are carried upward by the wind and lodge in the moss or lichens of the rock surface and in that way germinate, take root and grow.

20. This forest glen affords suitable habitats for a great variety of birds. Early morning or late evening is possibly the best time of day to watch and listen for the birds. Grosbeaks, Western tanagers, finches, vireos and towhees are the more common summer residents.

21. The low growing creeping plant with the holly-like leaves is the Creeping Mahonia or Hollygrape (Mahonia repens). It is not a grape; although its berry looks very much like a grape and is used for the making of jelly. It is a member of the Barberry family and produces a lovely yellow bloom in May or early June. In autumn the leaves turn beautiful shades of red, yellow, and purple.

22. This minature waterfall has its source in the water dripping from the Weeping Rock. Minerals carried by the water are deposited on the surface as the water evaporates on the surface of the rock.

23. There are two species of roses in Zion National Park. This one is the Blackstem Rose (Rosa melina). It is found in the cool canyons, shady places and on the high plateaus. Its flowers which bloom in June or early July are a definite rose color.

Note how the Canyon Grape is using the rose bush for support. The choking effect of the grape vine may prove detrimental to the rose if it robs the rose of too much of the needed sunlight.

24. View of the Weeping Rock. Studies of deserts reveal that small temporary lakes and oases are not uncommon. Geologists believe that such was the case in the ancient desert that covered the Zion area millions of years ago.

As water accumulated in these small lakes it carried in fine particles of rock and soil which settled to the bottom and there formed layers of clay-like materials. Since that time these layers of clay have consolidated into water resistent shale.

Occasionally these layers of shale occur high on the canyon walls and interrupt the downward perculation of water that has entered the rocks from the plateau above. When this occurs, water accumulates and runs down over the face of the rock and weeps in many places in much the same manner as we see it on this dripping wall.

A great variety of flowering plants can be found in this area throughout the year, but they come and go with the season and, therefore, are difficult to mark on a nature trail. Along the wall inside the dripping spray you may find a plant with broad basal leaves and flowers with purple petals that are reflexed or turned backward. It is called Shooting Star (Dodecatheon pauciflorum) and is one of the conspicuous parts of the flora in the months of May and early June.

Another plant common along this wall is one with bright green and opposite leaves is a member of the Figwort family called the Crimson Monkey Flower (Mimulus cardinalis). The large orange-red flowers present a remarkable display, and they are found blooming in the very moist places throughout much of the summer. The plants bloom more than once in the same season.

The white material on the rocks above in the wall of the Weeping Rock is a secondary deposit of lime known as calcareous tufa. Water from rain and melting snow absorbs a small amount of carbon dioxide from the air before it enters the sandstone from above; thus a weak solution of carbonic acid takes lime from the sandstone and carries it in its downward movement. When the lime bearing waters are stopped by the layers of shale in the sandstone beds, the lime is redeposited on the surface of the rock in the manner illustrated here, as evaporation occurs.

As the water perculates through the sandstone in these moist places and removes more and more of the lime, the rocks become increasingly softer. Plant roots that have pentrated cracks or weak zones in the rock layers exert increasing pressure, and eventually some slabs or layers of sandstone fall.

Note where the root system of some of these plants developed prior to the prying off of the thin slab. Most of these roots have become coated with the limestone left by evaporating water and have become fossil roots. Fossil leaves, shells, and the bodies of animals are sometimes preserved by the limestone covering them.

Pulpit View of Lady Mountain One of the pointers on the marker beneath the arch indicates the location of Lady Mountain. This great monolith is made up of parts of the three most conspicuous geologic formations found in Zion National Park. At the base, the deep red sandstone and shales are water lain sediments of the Triassic period called the Chinle and Kayenta formations. The two thousand foot cliff of sandstone is the Navajo formation and is composed primarily of sands deposited by wind. The cap rock of the mountain is made up chiefly of marine limestone and shale and is the Carmel formation.

The Carmel formation has been definitely established by study of its fossils as belonging to the Jurassic period. The Navajo formation has been tentatively assigned to the same period.

Lady Mountain is 6940 feet above sea level and 2679 feet above the canyon floor. There are few if any cliffs in Zion as sheer as the one you see from this point.

25. The pool below the Weeping Rock Springs is very changeable. Ordinarily this pool is beautiful, green in color, and flourishing with aquatic plants and animals. At times of severe down pours of rain, the pool may be scoured clean of nearly all forms of life and then appears very drab. This condition will prevail until nature can again restore the living forms.

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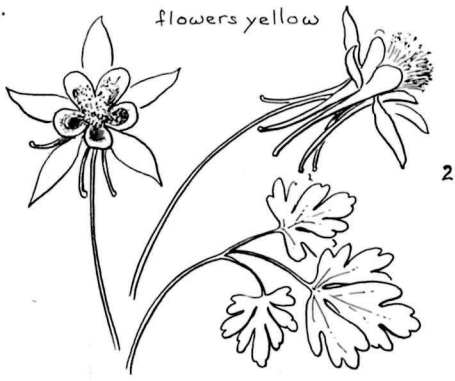
Zion National Park has a great variety of plant and animal life, and many unusual species will be encountered chiefly because of the very great variety of habitats. The moist cool canyons afford a home for plants generally found only in northern latitudes or regions of higher elevations. On the other hand, the generally arid climate has produced many of the typical desert varieities and the oddity is that these two extremes are frequently found side by side.

If you have questions on any phenomena discovered, do not hesitate to ask the Ranger-Naturalists for the information you desire. You will find them at the Zion Museum at the regularly scheduled guided trips and at the Evening Campfire Programs near the South Campground.

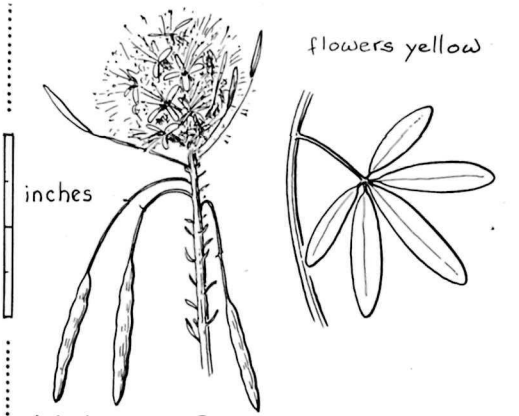
There are other self-guiding nature trails and roadside exhibits which have been provided to help you in your enjoyment and better understanding of what you see.

The flower sketches on the next four pages may help you identify the more common plants you will find along this and other trails of the park.

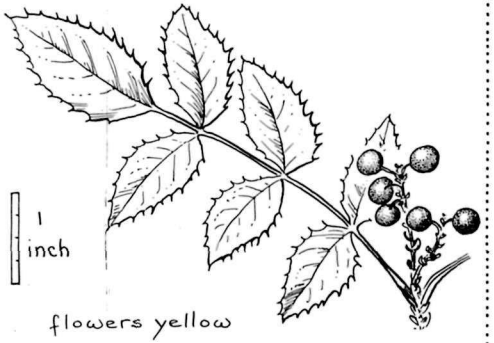
8.



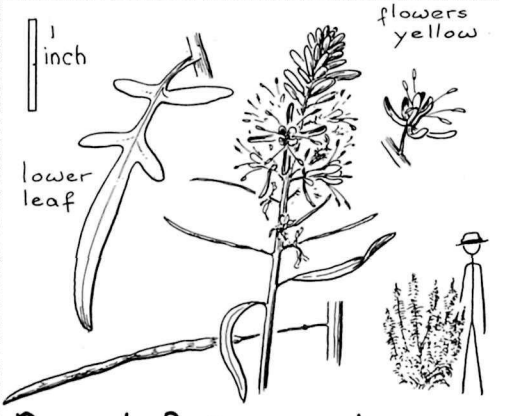
Golden Columbine
(Aquilegia chrysantha)



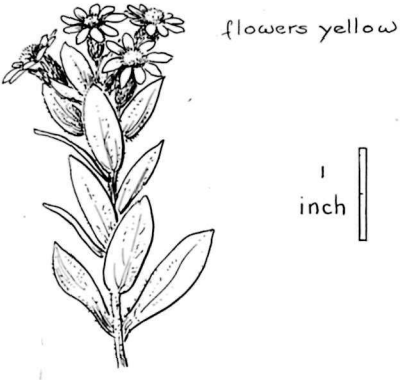
Yellow Spiderflower
(Cleome lutea)



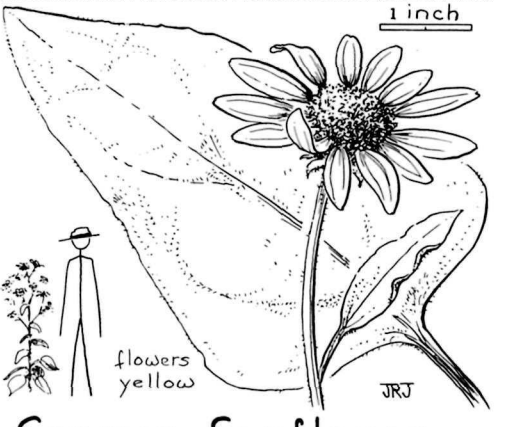
Oregon grape
(Mahonia repens)



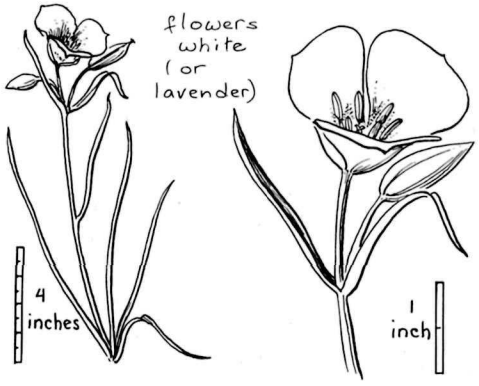
Desert Princes plume
(Stanleya pinnata)



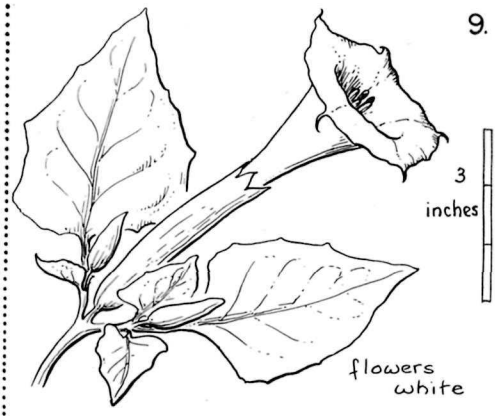
Hairy Goldaster
(Chrysopsis villosa)



Common Sunflower
(Helianthus annuus)

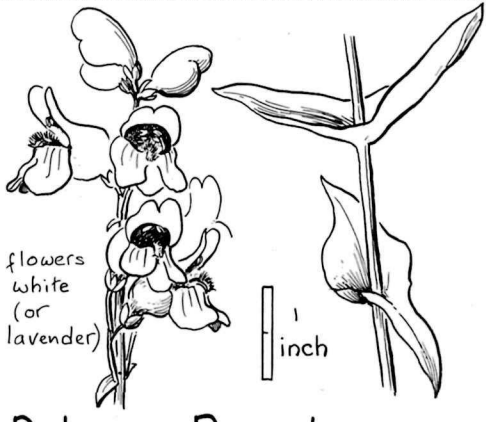


Segolily Mariposa
(Calochortus nuttalli)

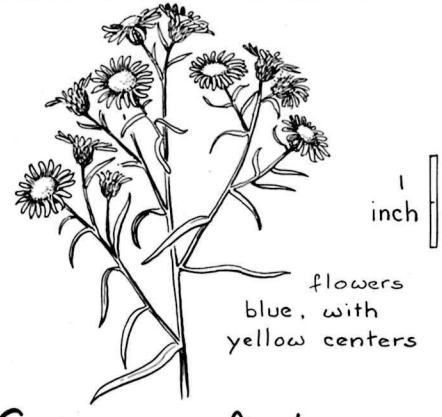


Sacred Datura
(Datura meteloides)

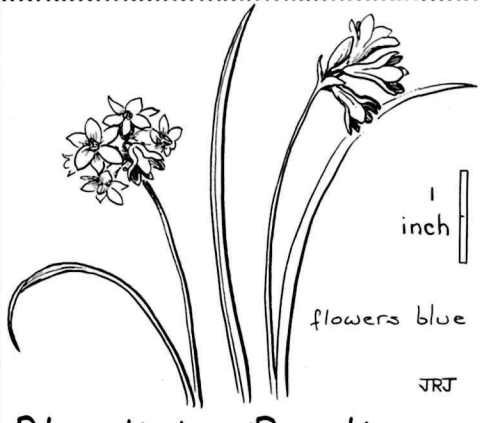
False Solomonseal
(Smilacina stellata)



Palmer Penstemon
(Penstemon Palmeri)



Common Aster
(Aster adscendens)

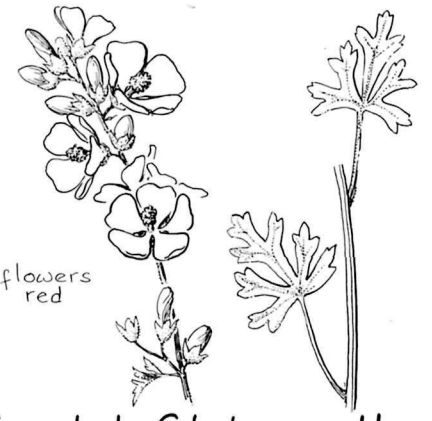


Bluedicks Brodiaea
(Brodiaea capitata)

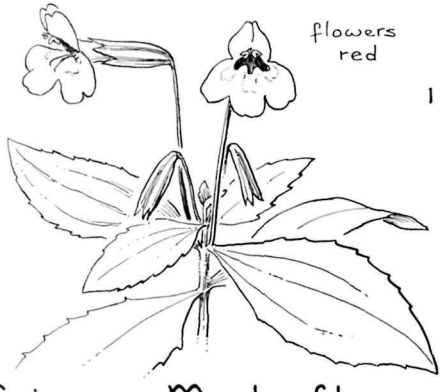
10.

2 inches

Indian Paintbrush
(Castilleja linariaefolia)



Scarlet Globemallow
(Sphaeralcea coccinea)



1 inch

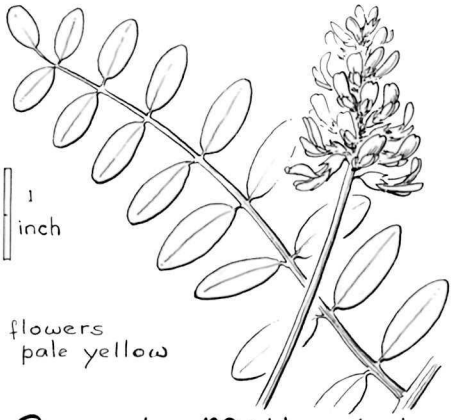
Crimson Monkeyflower
(Mimulus cardinalis)

Western Cardinalflower
(Lobelia splendens)

1 inch

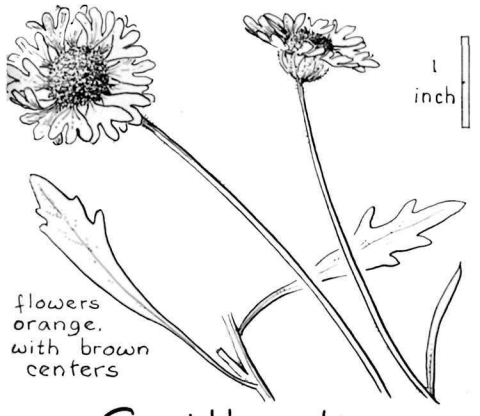
Darkthroat Shootingstar
(Dodecatheon pauciflorum)

Colorado Four-o'clock
(Mirabilis multiflora)

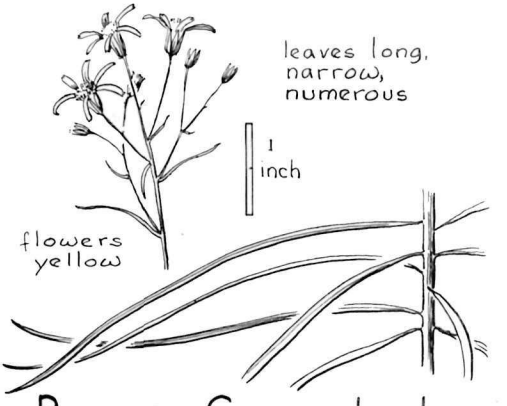


Canada Milkvetch
(Astragalus canadensis)

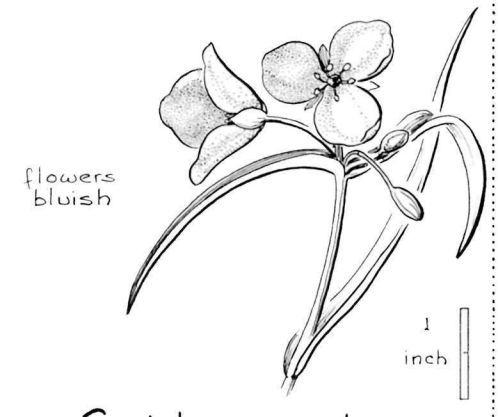
Rubber Rabbitbrush
(Chrysothamnus nauseosus)



Gaillardia
(Gaillardia)



Broom Groundsel
(Senecio spartioides)



Spiderwort
Tradescantia occidentalis)

Fremont Geranium
(Geranium Fremonti)

The Weeping Rock in Zion National Park

This leaflet has been produced by the Zion-Bryce Natural History Association in cooperation with the National Park Service.

The flower drawings are the work of Jeanne R. Janish and have been included in the hope that they may stimulate an interest in learning to know the flowers commonly found in this area. Other and more complete publications on flowers are available at the Zion Museum and other public contact stations in the park.

If you desire further information on the natural history of the area do not hesitate to ask the Park Rangers and Naturalists.

You may use it free, but if you take it home, PLEASE leave 5 cents.