

Poisonous Flowering Plants

This is the fifty-eighth in NATURE MAGAZINE'S series of educational inserts.



By E. LAURENCE PALMER

I HAVE never written one of these inserts without enjoying it, and this is no exception. Starting with the idea for this feature, I thought I would have no trouble finding abundant references in literature to poisonous flowering plants. While such botanists as Pammel, Muenschner and others have thoroughly covered the subject, flowering plant poisons do not seem to have been virulent enough or interesting enough to be featured by writers of popular prose. True, we have much about the poison hemlock that Socrates drank, but ordinarily the literary artists have preferred to refer to poisons either figuratively or in quite general ways. This may be because they knew little about specific plant poisons. If so, perhaps an insert on plant poisons will be particularly welcome.

Quack "medicine men" have, of course, used these plants. These gentry are neither good literary artists nor qualified botanists or chemists. Search for references to flowering plant poisons in *The Bible* reveals that poisons described are those of actual or supposed animal origin, such as might come from asps and dragons, or the implied poisons of a subjective nature that arise from unkind words, thoughts or deeds. Just to see how many of my readers have an interest in this subject let me enlist them to advise me of any references in *The Bible* to flowering plant poisons. I suppose some would say that the apple of the Garden of

Eden was a poison, but here I seek information on Biblical plant materials that either caused death through a physiological process, or caused sickness or severe skin disturbances by contact, or because they may have been eaten. I hope that someone can find that I am wrong.

Shakespeare, who is more often than not specific and correct in his natural history, seems to have joined other writers in trying to appear erudite by the use of generalities when it comes to poisons. The witches' brew of *Macbeth* is a concoction

of superstitions, rather than a recipe for a lethal mixture. To Shakespeare, a dagger seems more dramatic and effective than the goblet; cold steel more to be feared than insidious infusions. I think he passed up an opportunity here, but we can forgive him this when we remember how much he made of other opportunities, and what a contribution he made to our language. As one listener commented on the recent showing of the film *Hamlet*, "It was just a collection of common sayings for the most part."

Should you be a detective story fan, I am reasonably sure you can find references to mysterious poisons of plant origin. You will find some that are purported to be able to stop the victims in their tracks, even killing them with their hands suspended in the air. I recently read one such story in which prussic acid was the poison. On the other hand, you will find some thrill-invokers who prefer that the victims die in the most excruciating pain and with violent and distressing contortions. In this insert, we are not concerned with this sort of material, even though some of the plant poisons here considered may have these qualities.

I have yet to read a detective story in which the villain administered the fatal draught in such a manner that its delayed action protected the culprit. What could one not do with white snakeroot as a producer of poisonous milk in cattle if a clever writer put his mind and talent to such a plot?

There is no doubt that folklore will yield an abundance of information, and misinformation, about the commoner poisonous flowering plants. You will still find neighbors who will disown your friendship if you do not believe them when they tell you that you can become immune to poison ivy by chewing the twigs of the plant. Others will tell you that you can rub poisoned spots with the crushed leaves of jewel weed and receive relief thereby. I know one man who boasts that poison ivy never bothers



MOONSEED



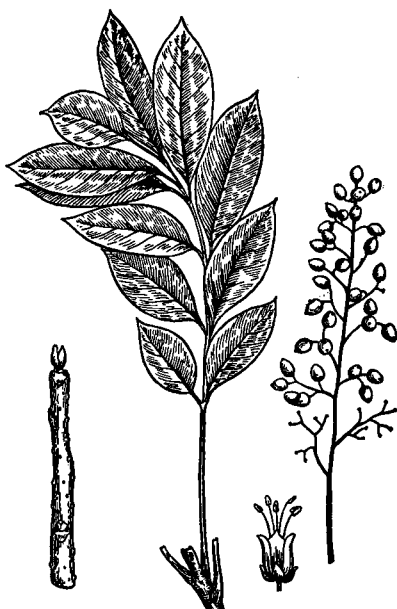
HOP



FALSE HELLEBORE



SPOTTED SPURGE



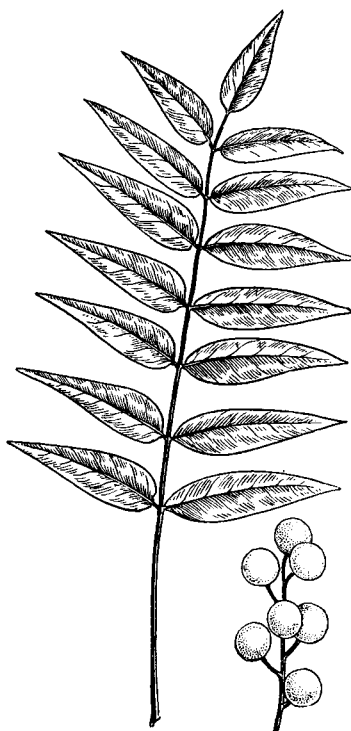
POISON SUMAC



POISON HEMLOCK



POKEWEED



SOAPBERRY



EUROPEAN YEW

him and implies that he considers himself so tough that it never will. I can only pity him when I remember the confidence I used to have in my own hardness. These plants do not breathe poison, and few, if any, can give off dangerous gases in effective quantities.

Fortunately, in all this realm of fact and fancy, there is a body of demonstrable fact that it is good for us all to know. Without such knowledge, your experiments with the plants of your locality may well give you itching skins, distressed innards, crazy hallucinations, distorted vision, or business for the local undertaker and for the lawyer who settles your estate. We can here, in our consideration of a mere eighteen plants, only tap the possibilities of the field, but the same can be said of any other unit of this series of special inserts.

I would suggest as a first step to increasing your understanding of this subject that you write the agricultural college of your State asking for any bulletins they may have dealing with the State's poisonous flora. You might suggest that, if they have no such literature available, they refer you to sources of information, or at least send you a list of the plants that have been known to affect the health of human beings or of their closely associated domestic animals. You might set up a series of types of poisoning that are of particular interest to you, and by being specific in your requests you may get more help than if you generalize. Here are some of the types of poisoning that are caused by plants.

Poisons that cause dermatitis, itching skins, or other similar disturbances, either by contact when dry or wet or after the material may have been eaten. You will probably find none that can have such effects without contact through eating or by touching. You will find that, occasionally, poison ivy or poison oak may affect indirectly through smoke, through dogs or pets that may have rolled in it and come in contact with broken tissues, through shoes or clothing that may have come in contact with ruptured plant tissues, or through handling fresh or dried plants, intentionally or otherwise. In our charts we have given you help on such plants of this category as poison ivy, poison sumac, poison hemlock, ginkgo, soapberry, milk spurge, celandine, blue cohosh, hops, showy lady-slipper, wild hemp, false hellebore. To this list we might well have added the commoner nettles, wild parsnip, tree of heaven, dog fennel, osage orange, catalpa, lily-of-the-valley, virgin's bower, fleabane, bitter buttercup, jack-in-the-pulpit, motherwort, bloodroot, papaw, Jimson-weed, buckwheat, wild carrot, wild

ginger, and so on. True, many people are susceptible to only a few of these, and some may be susceptible to none. A few unfortunates may be susceptible to them all. While some may not affect you at one time, they may at another, and this variation may be due to your condition, or to the condition of the plant.

As the virulence of the poison of these dermatitis-causing plants increases, so their reputations vary. You will find persons in your neighborhood who will believe that they can get the poison of poison ivy by merely passing near the plant, that it may be carried to one by the wind-blown pollen, and that its effects may be corrected by all sorts of ineffective treatments. You will find much less folklore about poisonous properties of dog fennel, for example.

Plants that cause poisoning when eaten. Just as plants that cause dermatitis vary in their effects, so plants that cause poisoning when eaten vary also. Some that may be eaten safely by one kind of animal may not be eaten safely by another, and, again, some animals of a given kind may be affected while others of the same kind may not. The different parts of a plant may vary in their poisonous nature, and a given part may vary with its age. The stems of skoke, pokeweed or inkberry are often sold in the market as an asparagus substitute. As such, they are most acceptable. When skoke is mature, however, the stems may contain a serious poison, which may or may not be found in other parts of the plant. I have known of students in my classes who ate the seeds of skoke without ill effect, and others who had most unpleasant results. Each of these students ate the seeds contrary to my advice. One now believes me and the other probably does not.

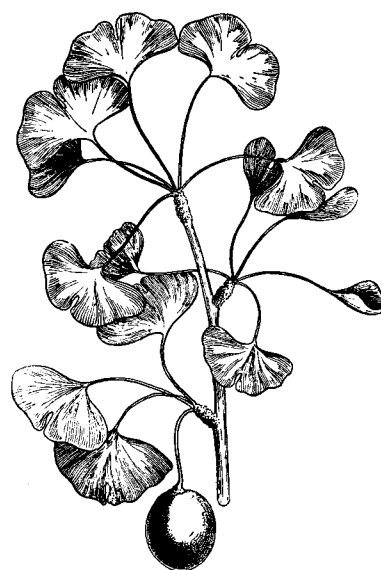
It is interesting to point out that, while skoke is mentioned as a plant that might be used as an asparagus substitute, to some persons young shoots of asparagus may cause a rather considerable dermatitis.

We cannot here give the details of all the common plants considered in the accompanying charts, or discussed in the advocated supplementary references, but we can mention that certain plants produce unfortunate conditions if the seeds are eaten, while others are dangerous when their leaves, stems or roots are eaten.

Of the *plants whose seeds are most likely to cause trouble* we have considered corn cockle, a plant that has a wide distribution and that may be found in grain fields in many parts of the country. A surprisingly small amount of the seeds of that plant ground into stock feed may be seriously poisonous (Continued on page 480)



POISON IVY



GINKGO



CORN COCKLE



SHOWY LADY-SLIPPER



WATER HEMLOCK

NAME SCIENTIFIC NAME	MAIDENHAIR TREE <i>Ginkgo biloba</i>	ENGLISH YEW <i>Taxus baccata</i>	FALSE HELLEBORE <i>Veratrum viride</i>	SHOWY LADY-SLIPPER <i>Cypripedium reginae</i>
DESCRIPTION	Tree with height to 80 feet. Straight slender trunk with relatively few branches and generally a slender form. Twigs that bear leaves are short, stout and coarse. Leaves to 5 inches long, usually notched at center of outer edge; pale green with veins more or less parallel; borne in clusters.	Tree reaching a height of to 60 feet, with a trunk diameter to more than 8 feet; dark, deeply furrowed bark, which is reddish, flaky and smoother when young. Leaves are evergreen, pale yellow beneath and deep dark green above, with lighter lines on the under side, to 1 1/4 inches long.	Height to 8 feet. Stem stout, coarse, leafy, unbranched, rather tough. Perennial. Leaves to 1 foot long and to 6 inches wide, folded like a plaited fan, clasping at base, with prominent veins, pointed oval, the upper shorter than the lower. Short rootstock with fibrous roots.	Height to 3 feet. Stems erect, densely covered with somewhat sticky hairs, leafy from top to bottom. Leaves alternate, without petioles, to 7 inches long and 4 inches wide, pointed at tip, but in general elliptic, conspicuously parallel veined, somewhat brash to touch. Roots coarse, fibrous.
RANGE AND RELATIONSHIP	Native of China and Japan, but known as a fossil before it was found alive by civilized man. Has grown practically unchanged since mid-Paleozoic times, when it appeared among the first of our fossil land plants. It has been known as a living fossil.	Widely established as an ornamental throughout suitable parts of the world, and hardy almost to the northern border of the United States. Native of Europe and North Africa and east to the Himalayas. A somewhat similar form, <i>T. brevifolia</i> , is found in our Northwest and south to California.	Found in wet areas, either shaded or in open, from New Brunswick through southern Canada to West Coast and south to Georgia and the Pacific Coast States; more or less common throughout northern hemisphere growing in New York to 4000 foot elevation. A dozen north temperate species; 5 North American.	Usually found in wet, wooded bogs in isolated localities but often abundant. Newfoundland to Minnesota and south to Georgia in highlands. With about 20 species found in north temperate areas one half of which are in North America and most of which are beautifully flowered.
REPRODUCTION	Plants are either staminate or "pistillate." Staminate catkins are slender, stalked and numerous. "Pistillate" are on long stalks and develop into a fruit with a bad smell, but which contains sweet, edible seeds of a resinous quality. Fruit resembles a large, brown, spoiled cherry in general.	Fruit a berry-like structure to 1/2-inch across and surrounding the egg-shaped seed, which is brown, egg-shaped and to 1/4-inch long. Trees are usually either bearers of pollen or of seeds; inconspicuous spring flowers and conspicuous fall fruits.	Flowers in large, brush-like, to 2-foot-long terminal cluster, with the upper usually staminate and the lower with stamens and pistils, with 3 sepals and 3 petals, greenish-yellow, to 1 inch across. Fruit to 1 inch by 1/2 inch, smooth, green; a capsule, with many seeds, maturing May through July.	Flowers 1 to 3, sepals white and no longer than lip. Petals narrower than sepals and white, with the lip enormously developed and to 2 inches long, for the most part white with crimson stripes on the white. Fruit a many-seeded capsule, rather persistent.
ECOLOGY	Broken or crushed "fruits," when handled, not infrequently give the handler a rather serious dermatitis, and this may result even when seeds are being cleaned in a small way for the study of the plant. Since the "fruiting" plants bear these unpleasant "fruits" they are not commonly cultivated.	Grown mostly as ornamentals, but the wood has gained fame as Yule logs and for other purposes. Wood, bark, leaves and seeds are poisonous under some circumstances when eaten, but not when merely handled. The red pulp of the fruit apparently is edible, but the seeds should be avoided.	Evil-tasting and so avoided by cattle ordinarily. Resembles remotely the edible but not delicious skunk cabbage. All parts poisonous, yielding, in European relatives, <i>V. album</i> and <i>V. officinale</i> , alkaloids veratrine, veratridine, cevidine, veratrobine and jervine; fatal to sheep, chickens and others.	Leaves and stems bear hairs containing a fatty acid that may be poisonous to many individuals, particularly when perspiring, and most virulent during flowering time. Effect is similar to that of poison ivy in some cases, and appears 8 to 12 hours after exposure, or may appear as mild dermatitis.
ECONOMIC IMPORTANCE	Tree is normally grown as an ornamental, or as a curiosity, but its slender shape suits it well for city streets and its neat appearance is pleasing unless the tree is a pistillate one and yields the unpleasant "fruits." Propagated by seed, by layering, by grafting, or by cuttings.	Chief sufferers from poisoning by yew are cattle, horses, sheep and goats that may have eaten large amounts of the leaves or of the twigs. The poison probably is the alkaloid taxine, which is recognized as a heart depressant. Western yew is poisonous if eaten in large quantities.	Symptoms include vomiting or attempted vomiting, difficulty in walking, paralysis, spasms, convulsions, chills, loss of sight and even death. Treatment is stimulated vomiting, respiration and enforced quiet with tannic acid antidote. Plant yields readily to ordinary cultivation.	It would be fortunate for this beautiful plant if everyone was susceptible to its poison, and if this were well-known, because its beauty marks its doom in some areas. It flowers in June through to September, and is found commonly associated with poison sumac. May be known as nerve-root.

MARLUANA, SOFT HEMP <i>Cannabis sativa</i>	HOP <i>Humulus lupulus</i>	POKE, SPOKE, INKBERRY <i>Phytolacca americana</i>	CORN COCKLE <i>Agrostemma githago</i>	BLUE COHOSH <i>Caulophyllum thalictroides</i>
Height to 12 feet. Stems 1/2-inch through, but may reach height of 20 feet with 2 inch diameter if grown in hills; coarse and rough. Leaves opposite or alternate, mostly palmately compound-ed or coarsely toothed, with 5 to 11 narrow leaflets, dark green, to 6 inches long, with notched margins.	A perennial vine to 30 feet long, climbing and sending forth new shoots each spring. Stem angular, twining, rough, weak, coarse, dying back each year. Leaves mostly opposite, palmately lobed and palmately veined, commonly roughened the upper-most may be alternate and entire, and less coarse.	Height to 12 feet. Stems smooth, sparingly branched, weak, divided on inside by discs that separate lens-shaped cavities, purplish, somewhat succulent. Leaves, simple, alternate, pointed at both ends, to 12 inches long with to 4-inch petioles, smooth, deep green. Root to 6 inches in diameter.	Height to more than 3 feet. Winter annual. Stems unbranched or with few branches, slender, erect, densely covered with silky white hairs that are appressed and somewhat sticky. Leaves opposite, linear to lance-shaped, to 4 inches long and to 1/4-inch wide, the lower-most being conspicuously narrow at base.	Height to more than 3 feet. Stem erect, unbranched, slender, smooth, bearing single thrice-compounded leaf that may resemble three leaves, and a flower cluster. Finer or smaller segments of leaves may be to 3 inches long and are usually three-lobed at tip. Knotty, thick rootstock that is perennial.
Introduced from Asia, coming to Europe about 1500, B.C., and to America with the first pioneers. Has been cultivated since 28th century B.C. Now well established as an escape in rich river bottoms from coast to coast, particularly in Mississippi and Missouri valleys, in South and in Mexico.	Native of America and Eurasia and cultivated widely, particularly in Pacific Northwest, England and Germany; was formerly a staple crop in New York State. Many escape and become established in thickets and hedgerows, particularly on moist alluvial or swampy soils. Under cultivation since ninth century.	Most likely to be found in recent woodland clearings or along borders of woodlands, pastures or waste places. Tropical in origin. Ranges from Maine to Minnesota and south to Arkansas and Mexico, with some 24 species that are related, but this one typical of eastern North America.	Native of Europe and northern Asia but widely introduced and established in Canada and the United States, where it commonly appears as a winter annual that survives with crops of rye and winter wheat. Not too common as a roadside weed. There are two known species in the genus.	Found in rich woodlands from New Brunswick to Manitoba and south to Nebraska and South Carolina, being found in North Carolina up to 5000-foot elevation. Usually found associated with hardwoods. Native of eastern and central North America, with a related species found in eastern Asia.
Staminate and pistillate flowers on separate plants, the staminate with 5 stamens and 5 sepals and the pistillate in spike-like structures, each flower yielding a single, hard, seed-like fruit. Seeds are sown in March and harvesting is done some 4 months later, with 1 ton of fiber yield per acre.	Staminate and pistillate flowers on different plants, the pistillate developing in cone-like, hairy catkins that develop into short, thin-scaled, resinous catkins. Staminate are in loose axillary spikes, each with 5 sepals and 5 stamens. Pistillate are two-flowered catkins.	Flowers borne on short stems attached to a long, open spike that droops at the tip, and arises from axil of upper leaves. Calyx of 4-5 persistent, round sepals. Stamens to 30, inserted at base of sepals. Fruit a juicy, black berry bearing to 15 seeds that may become bird-borne. Summer flowers.	Flowers solitary on the ends of long, slender stems, with 5-lobed calyx, 5 purple petals, 10 stamens, 5 styles and eventually a single capsule fruit that bears many dark brown to black seeds, which are about the size of grains of wheat but are covered with small warts in eccentric rows.	Flowers greenish-purple, to 1/2-inch across, relatively inconspicuous, borne in terminal clusters. Petals, 6, smaller than and opposite the sepals. Stamens 6, maturing after the pistil in April and May. Fruit looks like a good sized blueberry, to 1/3-inch through, borne in loose, open clusters.
Plant is raised primarily for its fiber, which is used in twines, in making oakum and packing material since it endures friction and heat well. Plant requires soils with higher phosphoric acid content than necessary for corn, wheat, oats or cotton. Retting of fiber may require to 10 weeks of processing.	Fruiting calyx and the fruits bear yellow, resinous grains that give bitterness and aroma considered desirable in brewing beer. The brashness of the leaves, flowers, or even of the catkins, may cause a dermatitis to some people, particularly if plants are handled too much.	While young shoots may be cooked and eaten with safety and profit, much as is asparagus, the older plant tissues yield a bitter, poisonous substance. This may be eaten by men, who eat the seeds, stems or roots. Juice from berry forms a primitive and rather permanent natural dye.	Unfortunately the fruits mature at the time cereals also mature. Fortunately seeds rarely retain vitality more than one year. Control may be largely through use of clean grain, or letting infested land lie fallow for a year. Seeds in cattle feeds are most dangerous.	Rootstock bears the alkaloid methylcytisine and some glucosides. Leaves are avoided by grazing animals, possibly because of bitter taste, but may be irritating to sensitive parts of the mouth. Some persons get a dermatitis from the leaves simply through handling them as specimens, not usually serious.
Marijuana from the dried leaves is smoked as a tobacco, and is a most dangerous habit-forming drug that produces an exhalation that is usually followed by severe depression; may affect heartbeat, causing death, and if use is prolonged may cause a delirious, maniacal rage approaching insanity.	Resinous product is used in medicines, in poultices, as a sedative and as a tonic. The dermatitis is not ordinarily bad nor long persistent, and may not be caused consistently even with different individuals. Plant is attacked by a stem borer which is in turn effectively attacked by skunks.	Poison resembles saponin and the alkaloid phytolaccine. In some 2 hours symptoms may develop including vomiting, purging, spasms, convulsions and sometimes death due to respiratory paralysis. Root is most poisonous part of plant. Poison has been used as medicine for skin diseases and rheumatism.	Poisons include a glucoside githagin and a saponin agrostemmic acid. One fourth pound to 1 pound of ground cockle seed per 100 pounds of live weight of animal may be fatal to animals. Symptoms include vomiting, nausea, vertigo, diarrhoea, depressed breathing and death. Oils recommended as drinks for treatment.	Berries may appear to be edible but should be avoided as food at all times by both humans and stock. In spite of the poisonous properties, however, the plant has been considered as of medicinal value and bears the name papoose root, squawroot and blue ginseng.

NAME SCIENTIFIC NAME	MOONSEED <i>Menispermum canadense</i>	CELANDINE <i>Chelidonium majus</i>	BLACK CHERRY <i>Prunus serotina</i>	MILK SPURGE <i>Euphorbia maculata</i>
DESCRIPTION	Twining vine reaching a length of 12 feet or more, more or less smooth and rather tough. Leaves alternate, heartshaped, 8 inches long and half as wide, with 3 to 7 lobes that are distinct or obscure and with margins unbroken. Stems woody and without stipules at the leaf bases.	Height to 2 feet, sprawling weak stem, sparingly hairy, yielding a pungent yellow juice when broken. Leaves alternate, thin, to 10 inches long, nearly twice compounded with bases expanding and clasping the stem, pale green, weak and rather flabby and conspicuously veined.	Tree reaching a height of more than 100 feet, with a trunk diameter of to 5 feet. Bark dark reddish-brown to black, peeling off in squarish flakes that are irregular. Twigs with bitter aromatic bark. Leaves alternate, to 6 inches long, stiff and firm, lighter beneath and shining green above.	Sprawling weed with stems to 1 foot long. Stem slender, freely branching, green with fine hairs and yielding an abundance of milky white juice when broken. Leaves opposite to 1 inch long with finely toothed margin and green with central purple brown spot, finely haired. Root system deep.
RANGE AND RELATIONSHIP	Usually in shady woodlands, or along streams and marshes where woody plants may be used as a support. Ranges from Georgia to Quebec and west to Nebraska and Manitoba. Essentially a tropical family with 3 small genera to be found in eastern United States.	Native of Europe but widely naturalized in America, or at least through northeastern United States from Maine, Ontario in Canada and south to North Carolina. Usually found near old home sites or along roadsides in the shade in town or out, but usually in rich soil.	Ranges from Nova Scotia to Florida and west to Texas and South Dakota, with closely related species extending range. Similar poisonous properties to be found in choke cherry, western choke cherry, sweet cherry and pin cherry, or fire cherry, collectively ranging to Pacific Coast.	Widely distributed over the world and usually found in waste places where soil is poor. This species is native of North America but there are more than 4000 species in the family in the world and about 1000 in the genus. It is not found in the far north in North America or in Old World.
REPRODUCTION	Flowers to 1/6-inch across, in loose clusters, with 4 to 8 sepals and 6 to 8 white petals and 12 to 24 stamens, not too conspicuous. Fruit a bluish berry not unlike a grape, to 1/3-inch in diameter and containing a spirally curved, sharp-angled stone. Fruits should never be eaten. Flowers in June.	Flowers in loose, open clusters arising from axils of leaves, yellow, to 3/4-inch across, with 2 sepals, 4 petals and many stamens and in flower from April through September ordinarily. Fruit a long, slender, coarsely roughened capsule yielding many shining, crested, smooth seeds.	Flowers of black cherry borne on short stems along a central axis that is at first erect but eventually droops; borne on leafy branches, fruit small, about 1/2-inch through, juicy and delicious.	Flowers inconspicuous, whitish, borne in small clusters in leaf axils. Both pistillate and staminate flowers are found on the same plant and flowering takes place from June to November. Pollination may be effected by insects or by self. Fruits appear as pods bearing gray 4-angled seeds.
ECOLOGY	The stones of the fruit are so sharply angled that they have been known to injure the intestinal tracts of animals that eat them, the injury being mechanical. In addition there is a poison in the plant that is an alkaloid, most abundant in the rootstock, which may be large.	Stock may be poisoned by eating the leaves, or other parts of this plant. Some human beings develop a bad dermatitis from handling the leaves, or from the juice where it touches the skin. Neither poisoning is common since the plants do not invite eating or handling by man or beast.	Wilted leaves may be seriously poisonous to cattle, particularly leaves arising from vigorous young shoots, but virulence decreases with the summer season. Poison includes hydrocyanic acid, prussic acid. This poison does not seem to be produced in plums.	Poisonous properties found in this plant are also found in toothed spurge, sun spurge, snow-on-the-mountain, cypress spurge, flowering spurge and others. The poisonous substance is the little understood euphorbon and trouble may be caused by eating or touching these plants.
ECONOMIC IMPORTANCE	Plant may injure plants about which it twines by strangling them. The resemblance of the fruit to grapes is so close that the plants should not be grown where children may think they bear grapes. The poison is bitter but unripe grapes are sour and the bitterness may not be a deterrent.	Plant yields the bitter alkaloids chelidonium, protopine and chelerythrine, which may act as a purgative or diuretic, and may cause congestion in lungs or liver, or serve as a narcotic to the nervous system. Children have been known to be poisoned by painting themselves with the orange-yellow juice.	Symptoms include staggering, uneasiness, convulsions, difficult but increased breathing, loss of control of eyes and tongue, bloating and frequently death due apparently to effect on heart and lungs. Poisoning takes place quickly and glucose or corn syrup as a drench is recommended.	These plants, eaten, may act as a purge or emetic with accompanying swelling of mucous membranes of eyes, nose and mouth, fainting spells, weakness, abdominal pains, collapse, scours and even death. External trouble from juice may be a severe dermatitis to some persons.

POISON IVY, POISON OAK <i>Rhus toxicodendron</i>	POISON SUMAC <i>Rhus vernix</i>	SOAPBERRY <i>Sapindus drummondii</i>	POISON HEMLOCK <i>Conium maculatum</i>	WATER HEMLOCK <i>Cicuta maculata</i>
A vine or low erect shrub or sprawler close to the ground. Stem bears aerial roots that provide a support at times. Stem may reach high into trees and may have a diameter of to 4 inches with a rough fissured bark. Roots shallow. Leaves alternate, compounded of 3 leaflets each to 4 inches long.	Tree or shrub which reaches a height of to 25 feet and a trunk diameter of to 6 inches. Bark coarse and gray. Leaves alternate to 15 inches long, 7 to 13 entire leaflets, each thin, pointed, oval, to 4 inches long and to 1¼-inches wide. Twigs coarse but buds small. Leaves brilliant in fall.	Tree. Height to 50 feet. Trunk diameter to 2 feet. Bark well fissured when old. Leaves alternate, pinnately compound, deciduous, with 4 to 9 pairs of leaflets each to 4 inches long and whole leaf to 1½-feet long. Leaflets with uneven base and more or less entire margins.	Perennial herb. Height to 5 feet. Stem smooth, hollow, purple-spotted. Well branched above. Leaves smooth, the lower well-petioled and the upper without petioles. Petioles spread at base and sheath base. Leaves pinnately dissected with segments thin, egg-shaped and cut at the tips and sides.	Perennial herb. Height to more than 6 feet. Stem jointed, smooth, hollow between joints, often purple-spotted. Leaves alternate, 2 or 3 times pinnately compounded. Leaflets mostly with saw-toothed margins. Upper leaves smaller than lower. Leaves to more than 1 foot long. Roots, fleshy, tuber-like, several.
In dry or wet lands in deep or shallow soil, on trees or walls or fences. By some botanists variations are considered as separate species but the plant is found in one form or another from British Columbia to Mexico and east to Nova Scotia and Florida and in Bermuda and the Bahamas.	Found almost exclusively in swampy places, but ranging from Maine to Florida and west to Minnesota and Louisiana. It is closely related to poison ivy, differing conspicuously in the shrub habit and the larger number of leaflets in the leaves. The entire nature of the leaflets is characteristic.	Erratic in range, ranging from Missouri to Kansas and Mexico east into Louisiana and west into Arizona, usually on hill-sides or in river bottoms. Related evergreen, <i>S. saponaria</i> , is soapberry of commerce and is grown in southern Florida and southern California. About 1000 species in the family.	Native of Europe but well established in America. Most commonly found in waste places from Nova Scotia to Michigan and south to Indiana and Delaware and erratically on to the West coast. Many consider but one species, but some recognize a second from South Africa.	Relatively common in low marshy grounds and swamps from New Mexico to Manitoba and east to Florida and New Brunswick. Native of America with 4 related species in western America and a total of 8 species in the north temperate zone. It may on occasion survive in pastures.
Flowers appear in early summer in open clusters in leaf axils each with 5 greenish-yellow sepals, 5 separate stamens and a 1-celled ovary that ripens into a white berry-like fruit with a ¼-inch diameter that persists through the winter and have a stony interior.	Flowers are borne in loose open clusters in leaf axils the clusters being to 8 inches long while the flowers themselves are inconspicuous, greenish and to 1/12-inch across. Some flowers may lack stamens. Calyx is 5-cleft. Stamens and petals are 5 and fruit a white, hard-centered, 1/6-inch berry.	Flowers found in open clusters that are to 8 inches long. Flowers white to 1/6-inch across, with 4-5 sepals, 4-5 petals, 8-10 stamens and a 3-celled ovary that develops into a 3-seeded berry in fall, is ½-inch through and turns from an unripe yellow to a ripe black. Sepals shorter than petals.	Flowers are borne in flat umbels that may measure 3 inches across and are supported by slender stems to 1½ inches long. Flowers are white, under 1/10-inch broad, and develop a fruit in the form of a pair of 5-ribbed nutlets and about 1/10-inch long. Fresh leaves are nauseating.	Flowers borne in compound umbels to 3 inches broad. Flowers are small, white to 1/10-inch across each with 5 petals and 5 stamens and producing a fruit of 2 joined carpels with prominent ribs and solitary oil tubes between each rib, while in poison hemlock the tubes are in the ribs.
Poison is toxicodendrol, which is found in roots, stems, leaves, flowers, and fruits. It is not volatile and usually is freed through ruptured tissue. It can be carried on smoke of the burning tissue, can remain virulent for years, is soluble in alcohol and can be spread by soap or by rubbing.	Poison of poison sumac is similar to that described for poison ivy or poison oak, but has been considered by some as more virulent than in poison ivy. In either plant, it may appear in the wood, more abundantly just under the bark, as a dark, sometimes shining substance.	Plant contains poisonous saponins that are particularly abundant in the fruits. Since fruits are used as a basis of soap they get handled vigorously and some persons are susceptible to the poison and develop an uncomfortable dermatitis. It is not a serious poison, however.	Poison is found especially strong in leaves and fruits during the flowering and fruiting time. Principle is coniine, and alkaloid and possibly conydrine and methylconiine. While the poisonous principle may be well distributed in the plant it may be not important in spring roots but it is still bad.	Poisonous principle is a resin-like cicutoxin, which is soluble in alcohol, chloroform and dilute acids, and is most abundant in early growths. In cut roots a poisonous, yellow, aromatic oil is freed in abundance. The poison is probably our most violent native plant poison.
Individuals vary in susceptibility to poison. Individuals may vary at different ages. Usually effects appear as watery pustules on the skin within 24 hours. Calamine solution with 2% phenol is used as treatment, or baking soda or Epsom salts may be applied in an emergency. Do not use oily soap.	Poisoning is treated as suggested under poison ivy. Great care should be taken in handling old or fresh specimens, or objects that have been touched by them by susceptible persons, and it should be remembered that the poison may be carried on smoke. It is not volatile and cannot be carried by air.	Wood of the soapberry is used in making boxes and baskets, since the growths of each year are easily separated into thin, pliable strips. The tree bears its flowers in fall and the fruits in the spring, and does best on soils of moist clay or dry limestone.	Poisoning causes weakening of muscle power, ending in weakening of lung muscles and death, and may be accompanied by loss of sight, but there is an absence of convulsions. Domestic animals as well as man may be killed by this poisoning and an emetic is the recommended treatment.	Symptoms of poisoning include nausea, vomiting, great pain, diarrhoea, difficult breathing, staring eyes, frothing mouth, weak pulse and violent convulsions which may continue until death brings relief. Poisoning is not necessarily fatal but treatment is difficult if possible.

(Continued from page 475) to cattle. That other plant seeds may affect you internally is obvious to anyone who has taken the extract of castor bean seeds, well known as castor oil. And that the seeds of some plants can affect you externally you know only too well if you have ever applied a mustard plaster to some portion of your anatomy. We might call attention, also, to the fact that the seeds of the moonseed plant are so constructed that they have been known to cause mechanical injury to intestines through which they may have passed. Other plants whose seeds should be avoided as food include, of course, Jimson weed, bouncing bet, flax and some of the smartweeds. Most interesting accounts are to be found in the history of the early Jamestown colony describing the behavior of early colonists who ate the seeds of Jimson weed and then thought they were monkeys and had other hallucinations. The plant traces its name Jimson weed to this incident in Jamestown history.

There are plenty of *plants that produce mechanical injury* that may be as unpleasant as an outright case of poisoning. In fact, would you not feel that there was some poisonous effect caused when a number of cactus spines get under your skin and cause pain and swelling. Similar unpleasantnesses may be caused by other plants, among which are sandbur, thistles of many kinds, porcupine grass, barley, cutgrass, poverty grass and wild oats. Some of these may not affect us seriously, but a domestic animal that may feed on certain of these plants may be seriously injured and its usefulness to us may be impaired. Not a few of these plants may be serious because of indirect reasons. If a horse or cow eats some plant materials that injure the mouth tissues so that food cannot be eaten, the animal may starve. If another plant causes swelling of the eyes, the animal may not see and, because of this, may die.

Of course, there are all sorts of poisonous effects arising from grazing animals that feed on herbage of different types. Sometimes the most serious results arise from the most unsuspected sources. For example, cuttings of many of the wild cherry trees that have wilted may, through the production of hydrocyanic acid, cause serious results to domestic stock. Other plants of this type include flax, Johnson grass and even sorghum.

Not a few of our apparently *innocuous cultivated plants may yield poisonous substances if eaten*. You may have heard stories of persons who mistook narcissus bulbs for onions, with disastrous results. Among the Jezebels, Januses, or sirens in our flower gardens are lily-of-the-valley, English yew, narcissus, opium poppy, larkspur, daphne, foxglove, castor bean and English ivy, any one of which can make trouble to those who eat them.

There is a considerable group of *plants that are to be found in the forage available to domestic grazers that may produce most unusual behavior*. Some of these may cause blind staggers and death, and some may have won for themselves the unenviable name of locoweed. Included in this list would be a number of the milk vetches, saltbush, shad scale, gumweed and some of the lupines. The unenviable qualities of these plants may be most serious in soils containing selenium compounds. The same plants growing in soils free of selenium may be harmless. One of the rather unusual of these poisons may, strangely enough, affect white animals, or animals with unpigmented skins, and have no effect whatever on dark-skinned animals. These photodynamic plants are probably most widely represented by St. Johns-wort, buckwheat, ladys-thumb smartweed and even alsike clover. Poisonous plants may affect cattle feeding in the sun but may not bother in the shade.



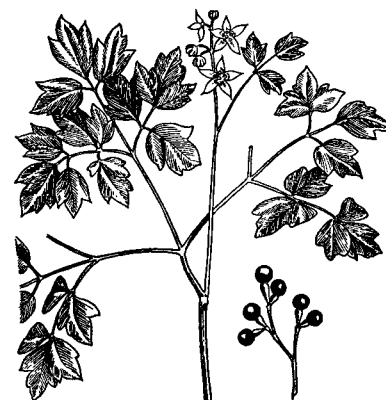
CELANDINE



WILD CHERRY



MARIJUANA



BLUE COHOSH