poisons. Thus the family *Solanaceæ* contains the deadly nightshade, stramonium, and henbane, yet yields the potato, the egg plant, and the tomato, and even the potato itself may at times be poisonous. In the *Euphorbiaceæ* we find the manchineel, croton, and euphorbium, together with the cassava; and we have indeed poisonous varieties of the latter. Many similar illustrations might be cited. It is, therefore, not deemed feasible to essay a classification based upon botanical or any other general relationship, although, as a matter of convenience, the characteristics of several highly poisonous families are given below. While only a practical botanist can be expected to utilize this method of recognition to the fullest extent, yet surgeons in the army and navy and other travellers may gain great assistance by recognizing suspected plants as pertaining to the following families:

Apocynaceæ (the Dogbane Family).—This large family, of more than a thousand species, chiefly tropical, is probably, all things considered, the most commonly and powerfully poisonous. Its members are mostly heart poisons, well illustrated by apocynum, strophanthus, and oleander. Its poisonous constituents are bitter and chiefly glucosidal, though many alkaloids are contained, and a number of them, or the extracts containing them, enter into the manufacture of arrow poisons, especially in the Old-World tropics. Poisoning accidents by members of this family are rather common in tropical regions, sometimes occurring through the use of the stems for spitting meat, stirring food, or in similar culinary operations. The botanical characters are as follows: Juice usually milky; leaves (in the poisonous species) opposite, simple, exstipulate. Flowers regular, perfect, 5-merous; calyx inferior, persistent, imbricated; corolla tubular, the limb usually rotate, convolute; stamens five, borne upon the corolla and alternating with its lobes, the anthers two-celled; pistil dicarpellary, the carpels distinct or united; the ovary 2-celled or with two parietal placentæ; styles united or divided up to the simple stigma; fruit usually of two follicles, occasionally drupaceous; seeds frequently plumose.

Araceæ (the Arum Family).—This monocotyledonous family is well illustrated by the calla and calamus. Its members are chiefly tropical, and produce thick, somewhat succulent stems, frequently climbing tree trunks, and usually large, somewhat succulent, cordate leaves similar to those of the calla. A great many species produce bulbous or tuberous stem bases, commonly regarded as roots. Some of these, as the taro (*Calocasia esculenta*), are important foods. Others would be so but for their poisonous constituents. In a few cases, where these poisonous properties are mild, they are destroyed by thorough cooking, while in others this method fails and attempts thus to use them may result disastrously. The injurious principles fall into three classes: First, as in the seeds of peltandra and skunk's cabbage, needle-shaped raphides of calcium oxalate, occurring in great abundance, and irritating mechanically; second, as in our common wild turnip, acrid juices which are partly destroyed by drying; third, powerful alkaloids, some of them, or the extracts containing them, used in the manufacture of arrow poisons. The flowers of the aroids occur densely massed upon a cylindrical (as in calla) or a globular (as in skunk's cabbage) spadix, enclosed or subtended by a spathe (the white portion of the calla), though this is sometimes obscure. The plants are diœcious, or the staminate flowers are on the upper, the pistillate on the lower portion of the spadix. Rarely the flowers are perfect. There is usually no perigone, though sometimes this exists in the form of a number of scales. The filaments are very short, their anthers two-celled, the cells separated by a broad connective and opening dorsally. The ovary is variable in structure, the stigma terminal, small, sessile, or on a very short style. Fruit usually a berry, occasionally inflated.

Cactaceæ (the Cactus Family).—Beyond remarking that many leafless and spiny or succulent plants which do not pertain to this family are frequently mistaken for cactuses, little need be said of its characters. The juice is bland and never milky, the flowers are showy, polypetulous and polyandrous, and the inferior fruit is a many-seeded berry. In desert regions, in the absence of food, and more especially of drink, the flesh and juice of cactuses are often utilized. In such cases it should be borne in mind that while the spiny species are usually innocent, those which are unarmed, or nearly so, like the night-blooming cereus and the anhaloniums, are often narcotic or cardiac poisons.

Campanulaceæ (the Harebell Family), including *Lobeliaceæ* (the Lobelia Family).—The two divisions of this family here named have been regarded by many botanists as distinct families. Certainly there is a marked distinction between their properties, the former yielding roots rich in inulin and sometimes edible, whereas the Lobeliaceæ contend with the Apocynaceæ for first rank among poisonous families. The nature of the constituents and the character of the poisoning are pretty uniform and have been sufficiently detailed under Lobelia. Since the poisonous species are very widely distributed throughout both temperate and tropical regions and are quite showy and attractive, their recognition is unusually important; fortunately it is also quite easy. The juice is acrid and almost always milky; leaves alternate, exstipulate, simple, and commonly abundant; flowers perfect, mostly showy, usually 5-merous; calyx tube adherent, the limb mostly regular and persistent; corolla tubular, epigynous, irregular and oblique or two-lipped, its tube fissured on the upper side; stamens five, inserted upon or with the base of the corolla and alternate with its lobes, the filaments coherent for the most of their length, as well as the anthers.

Cucurbitaceæ (the Cucumber Family).—Notwithstanding that this family is rich in edible fruits, like the pumpkins, melons, and cucumbers, yet it contains also a very large number of poisonous species. The poisonous properties pertain usually to the roots or the fruits. The former class is typified in bryonia, and has been sufficiently considered under that title. The latter is illustrated in our accounts of colocynth and elaterium, and need not be further considered. No difficulty need be experienced in the identification of the *Cucurbitaceæ*, which are tendril-bearing vines, usually herbaceous, and the flowers of which are invariably constructed like those of the plants named above, though they are occasionally small or even minute.

Euphorbiaceæ (the Spurge Family).—The general and poisonous properties of this family have been considered in Vol. IV. The plants are readily recognized by their milky juices, in connection with the unisexual flowers, which are themselves inconspicuous, though often surrounded by showy modified leaves resembling a flower circle. The perigone and andrœcium are so extremely variable as to be difficult of any brief characterization. The ovary and fruit are almost uniformly three-celled and the latter few-seeded.

Iridaceæ (the Iris Family).—This monocotyledonous family almost uniformly contains irritant poisonous oleo-resins, well illustrated by that of the official *Iris*. Owing to their acrid properties they are not very likely to cause poisoning, except through their medicinal employment. Nevertheless, owing to the fleshy and obviously nutritive character of their rhizomes or tubers, they are not infrequently resorted to as famine foods in some countries, and disastrous results have sometimes thus occurred. These plants are perennial herbs with narrow, distichous, often succulent leaves. The flowers are perfect, with an adherent six-parted convolute and marcescent perigone. The stamens are three and adherent to the outer perigone segments. The ovary and seed pod are commonly three-celled, with a three-parted style, and the ovules and anatropous albuminous seeds are numerous.

Leguminosæ (the Bean Family).—This family has already been briefly considered in Vol. V. as to the general nature and properties of its poisonous constituents. As poisons, its members present peculiar dangers, which, upon the whole, are not equalled by those of any other family. These dangers lie in the fact that, while the poisonous constituents are very widely and irregularly distributed, and extremely subtle and uncertain, the family is at the same time the most highly nutritious as to albuminoid constituents in the vegetable kingdom. Even such edible articles as peas and beans are not entirely free from poisonous properties, which become apparent when they are fed in large quantities as stock foods. Although the poisonous properties pertain to all three of the sub-families, they are most common and conspicuous in the Papilionaceæ. The members of this family are rather easily recognized by their almost uniform habit of producing a legume for a fruit, and by their highly developed exalbuminous seeds. In the Papilionaceæ the leaves are alternate, stipulate, and usually compound, the flowers papilionaceous and nearly always perfect, the calyx more or less gamosepalous, the five or ten stamens almost always more or less coherent. In the two other sub-families the flowers, though often irregular, are not papilionaceous, and the stamens are commonly wholly or nearly distinct.

Liliaceæ (the Lily Family).—This very large monocotyledonous group is now, with good reason, divided into the Smilaceæ, Melanthaceæ, and Convallariaceæ as distinct families. Nevertheless, since they agree, excepting the Smilaceæ, as to their poisonous properties, the entire group is here considered. The plants are mostly herbs, growing from bulbs or fleshy rhizomes. The juices are usually bland, though sometimes, as in the onions, acrid. Indeed, the poisonous species have mostly acrid juices. The leaves are parallel-veined and usually sheathing at the base. The flowers are regular and possess a six-parted perigone in two circles. The family is distinguished from the *Iridaceæ* by its six stamens, which are usually free, or nearly so, and distinct. The ovary is three-celled and usually superior, the styles distinct or united. The pod is three-celled, the seeds are numerous and highly albuminous. This family, like the *Iridaceæ*, is very liable to cause poisoning accidents, owing to the succulent and nutritious properties of its underground portions and even of its herbage. The nature of its poisonous constituents, both chemically and physiologically, is too varied for any general description.

Loganiaceæ (the Nux Vomica Family).—This is here referred to as being a small family, closely related to *Apocynaceæ* and almost equally poisonous. It is closely similar to that family in its structural characters, but lacks the milky juice and the annular stigma. Accidental poisoning is scarcely likely to occur from its members, except through their medicinal employment, and those subjects are fully treated elsewhere.

Oxalidaceæ (the Oxalis Family).—This small family, for a long time regarded as part of the *Geraniaceæ*, is readily recognized by the close similarity of all its members in foliage and flower structure to the genus Oxalis, represented by the wood sorrel, the sheep or lady's sorrels, common garden weeds, and by many species cultivated in the conservatory. The herbage of these plants contains oxalic acid and, like the meadow, field, or kitchen sorrel (*Rumex Acetosella* L.) has, when eaten in excess, caused serious or even fatal results, both to children and to adults.

Papaveraceæ (the Opium Family).—This small family is almost uniformly narcotic-poisonous, very many of its species being also irritant. Its constituents are pre-eminently alkaloidal, and these alkaloids are very numerous and varied in their mode of action. Owing to their commonly irritant properties these plants are not likely to cause poisoning, except through their medicinal use. They have commonly milky or colored juices, mostly compound or lobed leaves, perfect flowers (usually regular), their parts free and, except as to the carpels, distinct. The seeds are numerous and small.

Pinaceæ or *Coniferæ* (the Pine Family).—The large family of cone-bearing evergreens is too well known to require description. Its constituents and properties have been sufficiently indicated in our accounts of *Juniper*, *Savin*, *Turpentine*, etc. Similar constituents exist generally throughout the family. Poisoning is not likely to occur, owing to the acrid and excessively disagreeable character of the tissues.

Ranunculaceæ (the Buttercup Family).—This large family is distinguished by its alternate, exstipulate leaves, flowers which show neither adhesion nor cohesion in any of their parts, innate anthers, anatropous ovules, and the small embryo in fleshy albumen, taken in connection with the acrid juices. These acrid juices are commonly cutaneous and internal irritant poisons. Attempts to utilize them for blistering purposes have been made, but the blister is not readily controlled. A great number of the species contain, in addition, principles which, upon absorption, act as cardiac paralyzants, of which aconitine may be taken as the type.

Simarubaceæ (the Quassia Family).—The constituents and properties of these plants have been sufficiently discussed in connection with quassia and simaruba. Their consumption so as to cause poisoning is almost impossible, owing to their very bitter taste. A curious case of poisoning by Ailanthus is recorded below under "Poisonous Leaves."

Solanaceæ (the Potato Family).—A description of the characters of this highly narcotic family is not called for, since pretty much all of the species likely to cause poisoning have been already considered in connection with the drugs, Belladonna, Henbane, Stramonium, etc., or below in connection with Solanum.

Umbelliferæ (the Parsley Family.)—This very large family, although it yields many important edible products (carrot, parsnip, parsley, celery, angelica, etc.), contributes also such violent poisons as conium, cicuta, and œnanthe. Its species are very readily identified. They usually possess, especially as to the poisonous species, hollow stems, petioles which are dilated and sheathing at the base, leaves pinnately compound, usually decompound, as seen in celery and parsely, flowers in (usually compound) umbels, these flowers usually minute, with five superior calyx teeth, five epigynous petals and stamens and fruits having the general structure of the well-known conium, anise, coriander, fennel, etc.

Violaceæ (the Violet Family).—Although not at all likely to be consumed in poisonous quantities, except as overdoses of medicine, the violets should be remembered as containing one or more emetico-cathartic poisonous constituents, very similar to emetine, and long mistaken for it. The violets are so well known that no description of them appears called for.

Local Cutaneous Poisons.

Poisonous plants can be conveniently divided into those locally poisonous to the skin and those internally poisonous. The first-mentioned class will be first considered.

They represent all grades of irritation, from a mild and brief itching to a severe corrosion or a dangerous or even fatal inflammation. The milder of these groups can be accorded but the briefest mention. A large number of them produce no effect upon most persons, but have been at times recorded as irritating to certain individuals with a highly sensitive skin, or who are subjects of idiosyncrasy. Illustrations of this class are seen in the fresh herbage of *Veratrum*, in various species of *Cypripedium*, *Catalpa*, *Rhododendron*, and *Kalmia*, and in *Vanilla*. In a number of cases the nature of the poison has not been ascertained, and it is possible that it is due to the presence of animal or vegetable parasites, or other foreign bodies. Others, like the various nettles (*Urtica*, *Urticastrum* [*Laportea*] *Urera*, etc.) are regularly irritating, but the irritation is temporary, though often very painful, and unless complicated does not call for treatment. In the last-mentioned genus of tropical American shrubs the stinging hairs of the ordinary nettle are magnified into needle-like prickles, several inches in length, intensely poisonous, and causing severe inflammation when contact with them is extensive and violent. The nature of this poison and its treatment have not been investigated, though doubtless much the same as in the nettles. Very similar to the nettles are the stinging hairs upon the various

species of *Jatropha*, *Tragia*, and others of the *Euphorbiaceæ*, *Sicyos* in the *Cucurbitaceæ*, *Echium*, and others in the *Boraginaceæ*. Those of the *Euphorbiaceæ* have also tropical relatives (*Hura*, etc.), in which the hairs are magnified into spines, the effects of which are severe.

The important cutaneous poisons, those requiring our attention, pertain chiefly to the families *Anacardiaceæ* and *Euphorbiaceæ*.

The poisonous members of the *Anacardiaceæ* are numerous, and their effects are of extremely common occurrence and very severe. The poisonous constituents, their mode of action, symptoms, and treatment are in all cases either identical or so closely similar that they can be readily considered under the one subject of Rhus poisoning, the further consideration of the respective individuals being confined chiefly to their description and recognition.

Rhus Poisoning.—The principal agent concerned in this accident is the herbage of *Rhus radicans* L., the common Poison ivy or oak, Climbing or Three-leaved ivy or sumach, Mercury, or Black mercury. There is considerable difference of opinion as to whether Linné's *R. toxicodendron* is identical with his *R. radicans*, but the title, as here used, includes both. The plant is a slender North American shrub, and occurs wild to some extent in Europe, where it has been introduced. It may lie prostrate upon the ground, though it prefers to climb shrubbery or trees, in sunny locations, or upon fences or walls, to which it clings by false or non-absorbing roots. Sometimes, especially southward, it grows with an erect, self-supporting stem. Having thus attained a support, its branches spread or droop outward to a considerable distance, being thus very apt to brush against the faces of those walking along country roadsides. Flower and fruit habit are well displayed in the accompanying cut (Fig. 3839). The trifoliolate, or occasionally quinquefoliolate leaves sometimes reach a foot and a half or even two feet, including the petiole, in length. The leaflets are very thin and present a peculiar satiny lustrous appearance. Although usually apparently smooth (sometimes conspicuously hairy on the lower surface), they in reality bear an infinite number of extremely fine and short hairs. The flowers are of a greenish-yellow and are followed by small drupaceous, pale green, smooth fruits, borne in loose bunches, quite unlike those of the ordinary red sumac.

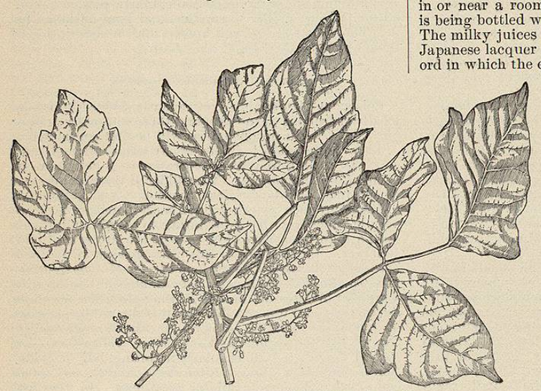

FIG. 3839.—Rhus radicans. (Two-fifths natural size.)

Some of the conditions by which poisoning can occur from this plant are in dispute. On theoretical grounds, if what is known of the nature of the poisonous constituent be taken into consideration, actual contact in some form appears to be requisite; yet innumerable and well-authenticated experiences render this view quite untenable. There is the widest difference in the susceptibility of different individuals, some being apparently incapable of being poisoned by it under any circumstances. Others, who have been exposed to it frequently for many years without result may suddenly become severely poisoned. Others again are extremely sensitive to its action, the most serious, or even fatal, results ensuing from even a moderate contact. Finally, cases are of common occurrence in which poisoning occurs apparently without any contact whatever, a strong wind blowing over the plant from a short distance constituting a sufficient occasion. It has been suggested that in such cases the pollen grains constitute a medium of transportation, but such occurrences take place when no pollen grains are present. It seems hardly credible that the almost microscopical hairs can be active in these cases, notwithstanding that experiment has demonstrated their power, in very small number, to effect slight poisoning when directly applied to the skin of sensitive persons, under specially favorable conditions.

Much speculation has existed, and many conflicting statements have been published, as to the nature of the active constituent, but the laborious researches of Pfaff have gone far toward clearing up this subject. He has located the poison in the fat or fixed oil which exists in fractional percentage, and which has been called *toxicodendrol*. This is an alcohol-soluble fat, in which character it resembles croton oil and its relatives. Its chemical nature is very incompletely known. Reasoning by analogy, we should assume that the oil is not poisonous in its own form, but only through its freed fat acid. If, as originally claimed by Maisch, who called in *toxicodendric acid*, this decomposition product be volatile and active, all of the inconsistencies regarding its action would be removed. The same or similar fat existing underneath the bark acts similarly, and here again it is notable that many cases of poisoning have been recorded as occurring by contact with the smoke emanating from a smothered fire of the wood of the plant. It is also stated that certain very sensitive persons cannot remain in or near a room where the tincture of the fresh drug is being bottled without the certainty of being poisoned. The milky juices of other species of Rhus, especially the Japanese lacquer tree, act similarly, and a case is on record in which the emanations from a bottle of this lacquer poisoned the faces of those smelling it, though there was no contact. Poisoning did not result where the substance came into contact with the mucous membranes of the mouth and nose.

There exist in the leaves, besides toxicodendrol, a small amount of resin, some tannin, wax, and other unimportant constituents.

Poison ivy has been highly recommended by the homœopathis as a medicinal agent, purely upon the dogmatic assertion *similia similibus curantur*, and it has even found its way into the United States Pharmacopœia, though it is to be dropped from the forthcoming edition. Making the most liberal allowance, we are obliged to conclude from the evidence at our command that its medicinal activity is practically *nil*.

Ivy poisoning first appears as minute, clustered, itching papules, which soon become surrounded by a bright erythema, in part produced by the inevitable scratching. The papules have by the next day become minute, deep-seated, eczematous blisters. For several days this appearance is not much changed, nor are the burning and itching diminished. Then the surface of the blisters gets rubbed off, the watery exudation moistens the surface affected, and often spreads the disease to other parts. The blisters finally become pustular, and then crusts and scabs cover the surface. The first appearance is always local, and if contracted in any of the usual ways is on either the hands or wrists or the face. In the latter situation the swelling is always great, the eyelids generally becoming completely closed by it. From the hands it easily extends to the breasts or male genitals, on the latter of which the burning is exceedingly hard to bear; occasionally it becomes general. The course of the affection in a single spot covers usually five or six days, but it may often spread over twice that time when different parts of the body are successively invaded. It heals without a scar, but is a little apt to return on successive summers.

FIG. 3840.—Rhus vernix. (Two-fifths natural size.)

There is rarely any difficulty in establishing a diagnosis. The symptoms present some superficial resemblances to those of erysipelas, but in the latter disease the underlying tissues are swollen and hard, whereas in ivy poisoning the effects are superficial and the surface is soft and somewhat fluctuating.

Numerous remedies and specifics are in use against Rhus poisoning; still its course, when fairly begun, is not often really aborted. The measures for its treatment may be divided into the following classes: (1) The destruction of the poisonous constituent; (2) the prevention of friction due to scratching the affected surface, and the prevention of the spreading of the poisonous matter; (3) the relief or prevention of itching and pain from atmospheric irritation.

The first of these results can be fairly well accomplished if measures are taken very promptly after exposure and before the symptoms of poisoning have fairly presented themselves. Ordinary washing is inadequate, unless very thorough indeed; and it is, in fact, liable to spread the poisonous substance over a wider surface. Washing with a great abundance of common cheap laundry soap, or even the application of a thick layer of this soap to the surface, has yielded good results. Washing with a strong solution of sugar of lead is a favorite method with some, and lime water, black wash, and other alkaline applications are useful. The discovery of the fatty nature of the poison serves to explain to some extent the principles of this line of treatment, the alkali probably saponifying the fat and destroying its activity. The second-named object is attained by the use of vaseline or some similar application, and this also accomplishes part of the third object, protection against the effects of the atmosphere. These applications should be made as lightly as possible, though thickly, and not by means of plasters or similar coverings. Excellent results have been attained by applying the fluid extracts of Grindelia, Eriodictyon, and similar resinous substances, as well as collodion. In these cases the effect is probably due to the deposit upon the surface of a thin protective coating resulting from the evaporation of the alcohol. Relief of the irritation is to be obtained by the application of carbolic acid. An excellent method is the use of the official lime liniment to which from one to five per cent. of carbolic acid has been added. To any small areas which exhibit a specially irritable condition, a solution containing ten per cent. of the acid may be applied. Great care should be taken, however, that no large area, and especially that no extremity, be covered up by even the weaker solution. A saturated solution of oxalic acid is highly recommended by some practitioners. As the eczema dries away, zinc ointment may profitably be applied to take the place of the other applications. The Cheyenne Indians are said to employ with great success an infusion or decoction made from the herbage of *Astragalus nitidus* Pursh., a near relative of the famous loco weed (*A. mollissimus* Presl.). This infusion is applied just when the eruption takes on its "watery" character. Since the constituents of this plant are entirely unknown, the principle involved in its employment cannot be stated. The fresh juice of the wild or great celandine, or jewel weed (*Impatiens fulva*) is said to have been used with excellent results.

Almost precisely similar in action to poison ivy is the Poison dogwood or elder or Swamp or Poison sumac (*R. vernix* L.; *R. venenata* D.C.) (see Fig. 3840). This species is an erect-branching shrub or small tree with a smooth ashy-gray bark, of swamp lands, throughout Eastern and Central North America. The habit of the leaves and inflorescence is indicated in the accompanying cut. The leaves are very characteristic, on account of their deep red petioles. The leaves sometimes reach a length of one and a half to two feet, are nearly smooth, and green on both surfaces. Flowers and fruit are very similar to those of the poison ivy.

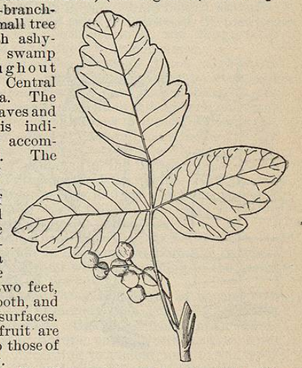

FIG. 3841.—Rhus diversiloba. (One-half natural size.)

The two species of Rhus above described pertain to the section *Venenatæ*, characterized by smooth fruits, and most, if not all, of the species of which are poisonous. The Japanese lacquer tree (*R. vernicifera* DC. or *R. vernix* Thunb.) has been already referred to. The lacquer is prepared from its milk juice, which frequently pro-

duces severe poisoning, as does the herbage. The tree closely resembles our *R. vernix* L. Species which quite closely resemble *R. radicans* are *R. microcarpa* (Mx.)

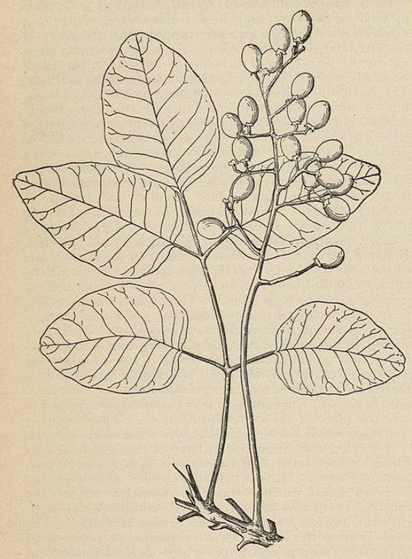

FIG. 3842.—Metopium. (One-half natural size.)

Steud. (*R. Toxicodendron microcarpa* Mx.) of our North Central States, *R. Michauxii* Sargent (*R. pumila* Mx.) of the Eastern United States, and, in the West, *R. Rydbergii* Small and *R. diversiloba* T. et G. (*R. lobata* Hook.), the

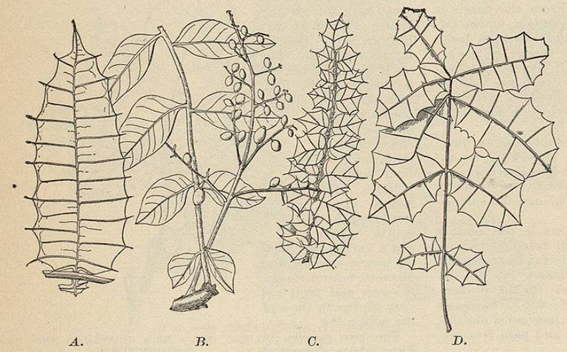

FIG. 3843.—Comocladia. (Reduced one-half.) *A*, Leaflet of C. glabra; *B*, base of leaf and fruit cluster of C. dentata; *C*, upper portion of leaf of C. ilicifolia; *D*, leaf of C. platyphylla:

Californian or *Pacific Poison Oak* (see Fig. 3841). The celebrated *Coral Sumac*, *Mountain Manchineel* or *Burnwood* of Florida and tropical America, has been referred to this genus as *R. metopium* L. or *R. oxymetopium* Griseb., but is now called *Metopium Linnæa* Engl. (see Fig. 3842). Its close relative in Cuba, *M. venosum* (Griseb.) Engl. has similar poisonous properties. These are small trees or large shrubs, and their fruits are reddish instead of greenish-white like the others named.

FIG. 3844.—Lithræa caustica. (Two-thirds natural size.)

The genus *Comocladia* P. Browne (*Dodonæa* Plum.) represents shrubs and trees of the central portion of tropical America, including the West Indies, which are violently poisonous. Several species are known as *Guao*, and a number are here illustrated (see Fig. 3843). Poisoning by these species has been successfully treated with an application of collodion. The following possess, in their respective localities, histories of poisoning similar to those of the *Venenatæ* and *Comocladia* described above: in Chili the *Litthi* (*Lithræa caustica* Miers (*Rhus c.* Hook.) (see Fig. 3844); in Mexico, the *Copaljote*, *Cuajiote* or *C. Blanco*, *Guajilote* or *Stinking Wood* (*Pseudosmodingium perniciosum* (H. B. K.) Engl. (*Rhus p.* H. B. K.); in Eastern Asia, *Melanorrhoe laccifera* Pierre; in the East Indies, *Holigarna ferruginea* March.; in Southeastern Asia, *Gluta Renghas* L.

The fixed oil of the cashew or caju nut, the ripened ovary of *Anacardium occidentale* L., a small tree, native of tropical America and largely cultivated and naturalized in other tropical countries, yields the vesicating principle *cardol*, evidently very similar to the poisonous element of Rhus. This substance exists in specially large amount in the middle layer of the pericarp, and the fatty substance thence exuding frequently causes poisoning. Cardol ($C_{21}H_{30}O_2$) is soluble in alcohol and ether. In the crude condition it varies from yellow to reddish or brownish, but can be decolorized. Poisoning

by it, and its treatment, are practically identical with those pertaining to Rhus.

The only other cutaneous poisons important enough to require consideration here are certain acrid juices of the Euphorbiaceæ. Types of this class are *Alcelos* and *Euphorbium* (which see). Others are referred to in our article on *Euphorbiaceæ*. In most of these cases the poisoning agent appears to be resinous. In croton oil and some others they are apparently fat acids. In the former class the saponification treatment offers little promise. In both cases protective and soothing applications are equally efficacious as in Rhus poisoning. Manchineel is the large tropical American (chiefly West Indian) tree *Hippomane Mancinella* L. It bears large, thick, ovate, acute, finely serrate leaves and an apple-like fruit containing several silvery seeds. Its milky juice is abundant and is the poisoning agent, its active constituent being apparently volatile. Treatment is much like that applicable to Rhus poisoning.

Internal Poisons.

In considering the poisonous plants which act through the entrance of their constituents into the circulation or into the alimentary canal, the primary requirement appears to be their identification. This, in a majority of cases, is most readily effected by reference to the objects themselves, rather than to the symptoms as in cases of poisoning by chemical substances. This fact has determined the following classification of these objects as plant parts.

To discuss all poisonous plants would require a large volume, and it has been deemed wise to treat the subject from the standpoint of a North American work, considering all plants of importance, or likely to become so, as poisoning agents in our own region, and including, from outside of this region, only such as are of primary importance. Moreover, no attempt is made to enumerate all those known to possess poisonous properties, since it is clear that many of them are not at all likely to be eaten. A still further restriction of the subject is made by omitting, except by mere mention, those poisonous plants or plant parts which become effective only through their medicinal employment, these having been sufficiently treated in the materia medica portion of our work.

Fruits and Seeds.

These products are placed first because of their greater liability to being eaten. Contrary to popular ideas, the

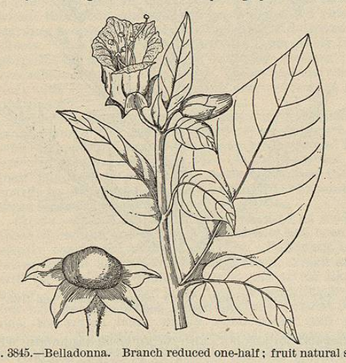

FIG. 3845.—Belladonna. Branch reduced one-half; fruit natural size.

number of poisonous fruits and seeds in North America is small. Even in country districts, where correct knowledge of this subject should be found, many perfectly innocent substances are commonly regarded as poisons.

Belladonna (fam. *Solanaceæ*).—Undoubtedly this is our most important poisonous fruit, its seeds containing the active constituents pertaining to the roots and leaves. The plant is rare in a wild state in this country, though very common in Southern and Central Europe. Its scarcity, however, renders it on some accounts the more dangerous, since it is thus not well known. It is a highly attractive, purple-black, shining, juicy berry, as indicated by one of its common names, "black cherry," and has been often eaten by children in the regions where it abounds. The accompanying illustration (see Fig. 3845) is ample for identification. The plant is a tall, widely spreading, smooth perennial herb, somewhat resembling the pokeberry plant, though not so large and wanting the strong purple stem coloration of the latter. All matters pertaining to the symptoms and treatment of poisoning by it will be found under *Belladonna*.

Bittersweet, True and False.—Rather closely related to belladonna is the true Bittersweet (*Solanum Dulcamara* L., fam. *Solanaceæ*). Leaf, flower, and fruit forms are shown on page 763, Vol. I., and the plant is there described. It is found both in Europe and in America, and grows commonly in the edges of swamps and along streams, especially where the water is stagnant, or where the ground is subject to overflow. Occasionally also it grows in other localities, as about shaded stone walls and fence rows. The branches are long, slender, sprawling, and widely spreading over bushes, and the fruits are pendulous. Nothing more attractive than these fruits can be imagined. They are of a ruby-red color, smooth, shining, and somewhat translucent, and children are very apt indeed to eat them. Their poisonous properties are rather mild unless large numbers are eaten. The seeds appear to be the poisonous portion. The properties are partly those of the drug Dulcamara, but more intense, and the poisonous constituent appears to be solanine.

False Bittersweet (*Celastrus scandens* L., fam. *Celastraceæ*) has been considered in the same connection. Its fruits are also attractive, but possess an acrid taste; hence they are not likely to be eaten in quantity. Their poisonous properties, due probably to a small amount of saponin, are comparatively slight.

Potato Fruits.—The small berries which develop upon potato plants are mildly poisonous, especially when unripe, in the same way as are the berries of true bittersweet. They have a nauseous, acrid, and disagreeable taste, and are not at all likely to be consumed.

Black Nightshade.—The fruits of black nightshade (*Solanum nigrum* L., fam. *Solanaceæ*) may be dismissed with the same remarks which have been applied to potato fruits. This plant grows like a tall, slender, and erect potato plant, in similar situations to those of bittersweet, though usually in dryer ground and more in the vicinity of barns and waste places. It is not very abundant, though somewhat common in the United States, as indeed in almost all other parts of the world. Its fruits are a little larger than large peas, and are of a greenish-black color. The fruits of many tropical species of Solanum are similarly, some violently, poisonous.

Other North American berry-like or fleshy fruits requiring consideration in this connection are the baneberries, or cohoshes, red and white, pertaining to the genus *Actæa* and the fruit of the yew.

Actæa (fam. *Ranunculaceæ*) is a genus of several species, probably more numerous than generally admitted by systematic botanists, distributed from Japan across Asia and the most of Europe, and in North America from ocean to ocean. According to ancient, and to one very recent authority, the half-score species of Cimicifuga are also included; but to most botanists familiar with the plants in a state of nature, an absurdity is involved in this association. The red and white berries have been recorded as poisonous, the medical botanist Lindley saying of them that they produce death with violent delirium, emesis, and catharsis (see Fig. 3846). The active constituents of the baneberries have not been investi-