

FOODS FOR EARLY MAN

The foods used by early man we do not know much about except to know that he did live, must have eaten and did pass this way. I surmise in many places in this work that the known distribution of some of our useful plants may have come about by early man carrying them along, even if sometimes unintentionally.

I am sure that there are interesting things to be known about the useful plants that were not understood or even surmised by early man. Maize and ordinary beans (no beans really are ordinary) go far toward balancing a diet. Add a few more things, perhaps essentials, from chile peppers, avocados and the many other fruits, and the life span might increase. Who discovered these things and how did it come about that these foods seemed to have been used together? Pre-Columbian but relatively recent residents of our area obviously did use these foods together and came to like and to appreciate them, and these foods were good for them! The reason why they were good for them surely did not occur to these ancient people.

Foods from plants

Many plants produce more food than they need to build tissue or as energy. These foods are stored by the plant for later use or perhaps as reserves to help assure the perpetuation of the species. These reserves are mostly the plant products appropriated by man and by other animals. The reserve foods of plants are of three general classes, carbohydrates, proteins and fats. Man, in the course of time, has learned to cultivate those plants which store an abundance of reserve foods. The carbohydrates from plants are sugars, starches and reserve foods. The last includes the hemicelluloses, pectins, gums and mucilages. The important carbohydrate producing plants of our region includes maize, rice, sugar cane, sweet potatoes and cassava while the sorghums, potatoes, wheat, barley and oats are less important. These are the plants that provide energy to man. Proteins are body and muscle builders. There are several very important native plants that produce good proteins, mostly legumes. The principal ones are field beans, scarlet runner beans and lima beans. Chick peas, lentils and broad beans are introductions that have some relevance in our storable foods. The fats and

oils from plants are mostly stored in seeds and are valuable for their energy content. Cotton seeds, peanuts, coconuts, sesame, and African oil palm, the last two introduced from the Old World, are the principal sources of edible fats and oils.

Vegetables and pot herbs

The vegetables are a large group from over the world that is usually defined as plants which store their reserves in almost any part of the plant and when prepared as foods are usually cooked. Sometimes they are used as raw foods in salads or even eaten out of hand. The large number of both native and introduced plants from which pot herbs are prepared are vegetables. Tomatoes and avocados, technically fruits, are considered by many people to be vegetables. A large number of our food plants are often treated and thought of as vegetables.

Fruits

Fruits are abundant in Central America, both native ones and those introduced from other parts of the world. The native kinds range from the little known and seldom used ones like those found in certain verbenaceous and boraginaceous plants to fine sapotaceous and annonaceous fruits. Perhaps among the best known native fruits are the several avocados and the many annonas. Best known among the introduced fruits are bananas and plantains, the several kinds of citrus fruits, a few lesser ones. Mangoes, of course, from rather poor "turpentine flavored" seedlings to superb grafted mangoes are one of my favorite fruits. It is said even that good green mangoes make better apple pie than apples do, - and this is so especially if apples are expensive. Coconuts, as fruits, are a special case. They probably came to America, via the Pacific, at about conquest time but soon were spread widely by man on most tropical and subtropical shores of the Americas.

BEVERAGES

The beverage plants native to our region are several but only one, cacao, is very important. Cacao has been used not only as a beverage, when it is called cocoa, but the seeds were once used as a medium of exchange. In addition the chocolate made from it is a very good food. Overseas cacao is more impor-

tant, as a plantation crop, than it is in our region where it is native. The most important beverage plant in our economy is coffee, a native of Africa. The best coffees in the world are produced in Central America. Tea from the Old World has been grown in Central America but most tea used here now is imported. Alcoholic beverages used by pre-Columbian Central Americans were mostly those fermented from maize, several fruits and the sap of a few plants. These beverages were, and are, consumed almost at the time that they are fermented. Men in our region, so far as I know, did not discover how to make distilled liquors. The methods of distilling were introduced by Europeans and based mainly on sugar cane. Some pretty violent rums were and are produced.

SPICES AND FLAVORING MATERIALS

Spices, as a group, are not the most important of the useful plants of our region. Chile peppers are the outstanding native spices of our region. Vanilla is one of the most famous flavoring materials of the world, now often produced synthetically in the chemist's laboratory. Many spices from the Old World have been introduced, - cinnamon which is used lavishly by many Central American cooks, ginger, cloves, the common black peppers; a host of flavoring materials from umbelliferous plants, both herbage and seeds; mustards and many more.

MEDICINAL AND DRUG PLANTS

What medicine man some 20,000-15,000 years ago used a plant remedy for "snake bite" and thought it to be most efficacious since his patient did not die? What Quecchi medicine man in 1980 believes his remedy to be just as good? A snake bite may present a grave threat to life or possibly a few days discomfort. In either case the patient perhaps would have been quite as well off without the potion. We do not know about the snake bite remedy of the ancient Central American but the plant that the Quecchí shaman used is mentioned herein.

Drugs and drug plants have interested Central Americans from pre-Conquest times down to today. I am sure that all of the plants used to make remedies for the ills of man in our region for a thousand years past are not in this work. Knowledge about most goes back no farther than the written record. Most

of the information available has been recorded during the last three quarters century by fewer than a dozen people. What potentially useful drugs from plants may be here awaiting discovery? John Weilburg in 1959 was quoted as saying (Chemical Digest 18:12, 1959) that seven out of ten prescriptions written in that year could not have been filled in 1935 simply because the drugs to fill them did not exist.

TOBACCOS AND TRUE NARCOTICS

The tobaccos, closely allied to medicinal plants and once commonly used as drugs are native in America. Tobacco is addictive. While the true narcotics are not native here some of them may be cultivated. The true narcotics while useful in medicine cause a host of social ills when misused.

FIBERS

Fibers are to be found in many plants and the discovery of their usefulness was a simple matter. To make cotton fibers into a thread and then into a fabric, eventually how to weave the thread into a fabric on a loom was pre-historic technology by people who could not write, - not simple! What was simple was supplying something to tie a bundle or to hold a house together, then to find that the vine along the trail satisfied that need. The plants that produce fibers, native and introduced, are mentioned in the text.

TANS AND DYES

Tans and dyes are useful products to an incipient civilization and ones easily discovered by chance. Once the idea that such things did exist in plants I imagine that our early forbearers little by little found plants that would provide a variety of colors and ones, at the same time, useful in tanning animal skins or even to be used as cathartics. Many of the native dyes are no longer used. Synthetic dyes are cheaper and more stable. It will not be long before the native dye plants are forgotten.

FOREST PRODUCTS

Forest products, mostly building materials, have been and are used from ancient times to the present. With increasing

populations most forests doubtless were considered an impediment to the use of the land for the production of food. This is still the case in much of tropical America, at least where soils and water make agriculture possible and where any forest is left. Some very famous woods come from Central American forests, mahogany often called Honduras mahogany, Spanish cedar, rosewood, *Lignum Vitae*, *areno amarillo*, black walnut and cocobolo to mention a few. It is sad to relate that many of the kinds of trees that produce fine woods are mostly gone. This writer predicted a quarter century ago that Central American forests would be gone at the turn of the millenium.

RUBBER AND LATEX

The first rubber balls, used in games, were probably made in Central America or Mexico long before Europeans came to these shores. The latex to make these balls doubtless came from *Castilla* trees. These same *Castilla* trees in Central and South America were the principal commercial sources of rubber until the middle of last century. Plantation rubber from the South American *Hevea brasiliensis* yet has not been a successful crop in our tropical lowlands. Chicle, a latex, was an important forest product especially from Belize and Guatemala. It came, and comes, from *Manilkara achras* which also is the source of a tasteful fruit, *chico sapote*.

ORNAMENTALS

Indians trotting along the trail carry flowers from the trail-side to decorate an altar. Many who write about the useful plants do not include ornamental plants, but I do. Why? Because I like them. I once asked Dr. Standley why he had included a group of plants obviously neither trees nor shrubs in his "Trees and shrubs of Mexico." He thought a moment then said, "Because I wanted to!"

WEEDS

Plants that crowd out useful plants or take over fields and interfere with crop plants are said to be weeds. Weeds are sometimes described as plants out of place. I have put most of the conspicuous weeds in this work although they may be the antithesis of "useful." *Baltimora recta* is one of these kinds of plants even though there is a remote possibility that the seeds may prove useful.

THE TEXT

There follows an account of the families of plants in which useful plants are found, in alphabetical order. Each family is described briefly and then follows the plants belonging in that family in alphabetical order based on the scientific name. The literary citation follows the scientific name, and occasionally synonyms are cited when these names are ones that have been used often in our literature.

Common names known for the plant follow. These common names may be from Spanish, from an indigenous language, or from English. It will soon become obvious to the user that common names are not necessarily specific for a certain plant but that one name may be applied to very different plants.

The commentary for the plants is derived from many sources and from my own observations made over the years. It may not be complete but it is as complete as I could make it and reflects that information which I thought useful for this work.

ACKNOWLEDGMENT

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Finally to a multitude of informants in all the Central American nations my thanks for the knowledge that they have shared with me about the plants among which they lived.

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ACANTHACEAE

Herbaceous or suffrutescent plants, rarely trees or shrubs and a few scandent; leaves usually opposite, entire, undulate or undulate-dentate, often with conspicuous cystoliths; inflorescence terminal or axillary, spicate, racemose or paniculate, rarely cymose or of a single flower, floral bracts often conspicuous and 4-ranked; calyx usually 5-lobed, (truncate or 10-15 dentate in *Thunbergia*); corolla sympetalous, 4-5-lobed, zygomorphic; stamens 4 and didymous, or only 2, inserted on the corolla; staminodes sometimes present; ovary superior and sessile on the disk; fruit a capsule or rarely baccate or drupaceous.

A large pantropical family with perhaps 250 genera and 2,000 species or more. There are relatively few species of economic importance although there are many fine ornamentals for tropical climates. The plants in the following list were used as dye plants and perhaps now are rarely used.

Justicia macrantha Benth. Pl. Hartw. 78. 1841. *Jacobinia macrantha* Benth. & Hook. ex Hemsl. Biol. Cent. Am. Bot. 2: 521. 1882.

Azul, cuajátinta, jiquilete, pata de gallo, Sacatinta.

The leaves were used in Costa Rica to prepare a bluing for white clothes.

Justicia spicigera Schlecht. Linnaea 7:395. 1832. *Jacobinia spicigera* Bailey, Standard Cyclop. Hort. 3:1715. 1915. *J. scarlatina* Blake, Contr. U.S. Nat. Herb. 52:102. 1917.

Añil, cakixuxul, cuajátinta, hierba de Santa Inés, hierba de la Santísima Trinidad, hierba de tinaco, sacatinta, siitz, tinto.

The leaves are macerated in hot water and a blue dye, used as a bluing for clothes, is extracted. The plant is distributed from Mexico and Honduras to Costa Rica. It is commonly cultivated in Guatemala.

Justicia tinctoria (Hemsl.) D. Gibson, Fieldiana, Bot. 34: 74. 1973. *Jacobinia tinctoria* Hemsl. Biol. Cent. Am. Bot. 2:522. 1882.

Azul, azul de mata, sacatinta.

The macerated leaves extracted in water provide a dye used by laundresses as bluing for clothes. The species is not uncommon in dry thickets in southern Central America.

ACERACEAE

Trees or shrubs; leaves opposite, simple or usually palmately-lobate, rarely pinnately 3-5-foliolate; monoecious or dioecious; inflorescences corymbs, racemes or panicles; flowers perfect or unisexual; sepals of 4-5 lobes; the petals 4-5 or none, distinct; stamens 4-10, usually 8 from the edge of the disk; pistil 1, the ovary superior with 2 locules or carpels; styles 2, each with a terminal stigma; fruit a samaroid schizocarp of two 1-winged mericarps.

A family with but two genera and 100 or more species. The maples are widely distributed in the northern hemisphere, with perhaps 15 species in North America. Two species are found as far south as Guatemala. Maples furnish some good cabinet woods and one species (*Acer saccharum* Marsh) is the source of maple sugar in the United States and Canada.

Acer negundo var. *mexicanum* (DC.) Standl. & Steyerl. Field Mus. Bot. 23:60. 1944. *Negundo mexicanum* DC. Prodr. 1: 545. 1824.

Granado, palo de azúcar, palo de caballo, palo de vinagre, roxoch.

The bark and young shoots are said to be sweet. The tree is used in western Guatemala for making vinegar and the trees often have the limbs cut off close to the trunk, possibly to extract the sap for vinegar making.

AIZOACEAE

Annual or perennial herb; leaves alternate or usually opposite or appearing to be whorled, often fleshy; flowers perfect, regular; inflorescence of single flowers or axillary or terminal dichasia; sepals 5-8; corolla none (apparent petaloid staminodes); stamens usually 5, or many by splitting, the outer often petaloid; ovary superior or inferior; fruit capsular or baccate.

A large family, especially of southern Africa. There are perhaps as many as 100 genera and 500-600 species. The following species are cultivated in Central America.

Mesembryanthemum blandum Haworth, Suppl. Pl. Suc. 95. 1819.

Uña de gallo, portuguesa.

Commonly grown as an ornamental in cool dry regions.

Tetragonia expansa Thunb. Trans. Linn. Soc. 2: 335. 1795.

Espinaca, New Zealand Spinach, New Zealand ice plant.

Native of eastern Asia south to New Zealand. Commonly cultivated in Central America as a pot herb. It resembles true spinach, which does not grow well in the tropics. Many people not familiar with spinach think this to be spinach because of the common name which it has in Spanish. I have heard no other name in Central America. The plant thrives in the highlands and is occasionally found in the lowlands. New Zealand spinach was the last of the really useful food plants to be discovered and put into horticultural use.

AMARANTHACEAE

Herbs (ours), shrubs or rarely trees; leaves opposite or alternate, exstipulate, usually entire; inflorescences of solitary flowers but commonly capitate, spicate or racemose; perianth of usually 5 segments, scarious, hyaline or chartaceous, rarely herbaceous; stamens usually 5, opposite the perianth segments; ovary superior, free or adnate to the base of the perianth; fruit a membranaceous or fleshy urticle or nutlet, rarely a drupe or berry.

A large family most abundant in the tropics, especially of America and Africa. There are about 50 genera and 800 species of which a few are of economic importance, several ornamentals and a few used as food.

Alternanthera bettzickiana (Regel) Standl. Field Mus. Bot. 3: 254. 1930. Hierba té; adorno; herbilla.

Commonly planted as an ornamental in Central America as it is elsewhere in the world.

AMARANTHUS.— Possibly all or most of the species of *Amaranthus* produce seeds that may be used as grain and some produce these seeds in fair quantity. The tender new growths of most of the weedy kinds may be used as pot herbs. The cock's comb types of *Amaranthus* are commonly grown in Central America and on occasion the seeds of these may be used for food. Many species of the genus are widely distributed as weeds.

Amaranthus caudatus L. Sp. Pl. 990. 1753.

Chichimeca; chichimico; moco de chumpe; cola de zorro; bleo cimarrón; bleo rojo; bleo extranjero; amaranto; ses; pisón calaloo.

A common weed in many places. The seeds are mixed with crude sugar to make a confection called boroco. The seeds are used as a food grain in India.

Amaranthus dubius Mart. Pl. Hort. Erlang. 197. 1814.

Chic-ixtez, acilixtez.

The leaves are collected and used as pot herbs.

Amaranthus gangeticus L. Sp. Pl. ed. 2.1403. 1763.

Tampala.

Seen only in Honduras where it was cultivated as a pot herb. The species is widely grown in India and Sri Lanka. The seeds contain saponin which is said to be slightly toxic. Possibly native of Asia, now widely distributed.

Amaranthus hybridus L. Sp. Pl. 990. 1753.

Blado, blero, lero, mercolina, ses, huisquelite, huisquilete, quiec tes.

The leaves and tender stems used as a pot herb. A common and occasionally bad weed in old fields. The species may be American but now is dispersed to many parts of the world.

Amaranthus retroflexus L. Sp. Pl. 991. 1753.

Bledo, mercolina.

The leaves and tender stems are used as pot herbs. Often weedy in old fields.

Amaranthus spinosus L. Sp. Pl. 991. 1753.

Bledo, blero, ble do macho, huisquelite, ix tez, tsetz, labtzeta, spring pigweed.

The leaves and tender shoots are used as a pot herb in spite of the spines. Probably native of America but widely distributed as a weed.

Gomphrena globosa L. Sp. Pl. 224. 1753.

Amor seco, inmortal, siempre viva, botón, globe amaranth.

Commonly found in the markets of Central America and used for decoration in homes and churches, and for making funeral wreaths. The species is probably native of the American tropics and is cultivated and naturalized around the world.

AMARYLLIDACEAE

Perennial, mostly scapose plants from a rhizome, bulb or tuber; leaves usually linear or lorate, basal or sometimes cauline, often very thick and long persistent, the margins entire or often armed with durable spines; inflorescences umbellate, racemose or paniculate, sometimes a single flower; flowers perfect, regular or nearly so, the perianth usually in two series (3-3) of 6 tepals, free or sometimes connate; stamens 6, usually inserted on the base of the perianth segments or on the tube; ovary inferior, usually 3-celled; fruit capsular, 3-valvate or rarely indehiscent.

A large family with perhaps 75-80 genera and as many as 1,300 species. The genera are usually restricted to one hemisphere although two genera (*Hypoxis* and *Crinum*) are pantropical. There are about 35 genera in the American tropics. The most important economic plants belong in the genera *Agave* and *Furcraea*, which have strong and useful fibers in the leaves. There are many fine ornamentals and several of these are grown in our region. The genera *Allium* and *Phormium* are sometimes placed in this family but I have left them in the Liliaceae where they have been placed traditionally.

Agave brachystachys Cav. Descr. 453. 1802. *Manfreda brachystachys* Rose, Contr. U. S. Nat. Herb. 8:20. 1903.

Cebolla de cerro, lirio verde, amol, amole, ixmaxín, amol chipalcú.

The fleshy roots have been reported to be used in washing textiles and in preparing a fish poison or barbasco. These uses might indicate that a saponin is present. The roots also are thought to be useful in preventing baldness. The plant is occasional in the highlands of Central America. It is unlike most other species of *Agave* in that the leaves die back each dry season. The government of Guatemala, by executive decree, has prohibited the export of the roots of this species to obviate its extinction due to its therapeutic and industrial uses. What these uses may be is not stated.

The common name *amol* or *amole* is often applied to other plants used as barbascos. These names are used also in Mexico and Guatemala for plants the bulbs or roots of which are used as soap substitutes.

Agave lempana Trelease, Journ. Wash. Acad. Sci. 15:305.
1925
Maguey.

Originally from along the Río Lempa in El Salvador. It was cultivated for its fiber but apparently is not now commonly grown.

Agave letonae F. W. Taylor ex Trelease, Journ. Wash. Acad. Sci. 15: 393, fig. 1925.

Henequén, sisal, pita, maguey.

This *Agave* is grown abundantly in the vicinity of San Miguel in El Salvador and perhaps elsewhere in the country. The fiber is extracted and locally made into many products, the most important of which are ropes, twine, coffee sacks and hammocks. The fiber is very hard and makes rough sacking.

Agave letonae var. *marginata* Trelease, l.c. 395.

Similar to the species except the leaves marked with yellow. Possibly only a horticultural variation.

Agave seemaniana Jacobi, Abh. Schles. Ges. Vaterl. Cult. 1868: 154-1868.
Maguey.

A very attractive species which is occasionally abundant on drier, open hills from Guatemala to Nicaragua. The seed pods have been reported to be used in Guatemala as a fish stupeficient. The young leaves are said to be roasted and eaten but this seems unlikely since they contain a large amount of tough fiber. The fiber occasionally has been extracted and used to make twine in Honduras.

Agave sisalana Perrine, U. S. Senate 25th Congress sess. 2, doc. 300:tt. 1, 2, 4. 1838.

Maguey, mescal, pita, yaxci, sisal, sisal hemp.

Sisal is native of Yucatan and possibly also in Central America or was carried there in pre-conquest days because of its usefulness. The fiber of this plant is the principal export crop of Yucatan and is to be seen commonly cultivated there. Sisal is now widely cultivated in Africa and in Brazil. The species may be grown in dry regions and is found in the Guatemalan lowlands and elsewhere in Central America. Brazil is a large producer and consumer of the fiber, for coffee sacks. The most satisfactory binder twine is made from sisal. Sisal waste may be used in paper making. A form of the species (f. *armata* Trelease, Contr. U. S. Nat. Herb. 23: 118. 1920) has the leaf margins beset with spiny teeth.

Agave tecta Trelease, Trans. Acad. Sci. St. Louis 23: 145, tt. 2627. 1915.

Maguey.

Cultivated or possibly native in western Guatemala. This gigantic *Agave* is used in hedge rows around Quezaltenango and adjacent regions of Guatemala and is most attractive. The species is related to the Mexican agaves from which pulque is made. It is recorded that excellent pulque was made in Guatemala in colonial times. I have not seen the drink made in Guatemala, and if it were the makers would not advertise it for such preparations are illegal.

Bomarea acutifolia (Link & Otto) Herb. Amaryll. 112. 1837.
Alstroemeria acutifolia Link & Otto, Icon. 1: 5, t. 29. 1820.

Papa de venado, granadillo de canté.

The root tubers are edible but probably not very palatable, nor much used.

Bomaria edulis (Tuss.) Herb. Amaryll. 111. 1837.

Papa de venado.

The root tubers like those of the preceding species are edible.

Cordyline terminalis (L.) Kunth, Abh. Acad. Berl. 30. 1820.

In the Pacific islands the roots of this plant are said to contain up to 20 percent. of sucrose. The juice is extracted, fermented and then distilled to make alcohol. The plant is often used in Central America as an ornamental.

Furcraea: A genus of about a dozen species extending from Mexico to western South America. Perhaps most or all of the species have been used at one time or another for the fiber contained in the leaves. The generic name is sometimes spelled *Fourcroya* or *Fircroea*. Reproduction is often by bulblets which form in the place of flowers (as also happens with *Agave*). It is difficult to distinguish flowerless plants, or specimens, of *Furcraea* from *Agave*.

Furcraea cabuya Trel. Ann. Jard. Bot. Buitenzorg suppl. 3: 906, tt. 36, 45. 1910.

Cabuya, cabuya con espinas, pita floja, bis, amú kik.

Used in Costa Rica and Panama, and possibly elsewhere in Central America, for the fibers in the leaves. The species may also be found in western South America. The common name *cabuya* is one of the words used to mean string or twine in both Central and South America.

Furcraea cabuya var. *integra* Trel. l.c. 907, tt. 36, 37, 44, 45. Cabuya, cabuya sin espinas, cabuya de Olancho, cabuya blanca.

Cultivated and perhaps native from Honduras to Panama. Similar to the species but the leaves without spines.

Furcraea guatemalensis Trel. Trans. Acad. Sci. St. Louis 23: 149, tt. 32-34. 1915.

Maguey, mecate, icaj.

Probably used for its fiber but I have no specific data. *Furcraea melanodonta* Trel. l.c. 150, t. 35 is closely related and perhaps synonymous.

Furcraea quicheensis Trel. l.c. 148, t. 29.
Mecate, mecatl, cheche, maguey.

Native in western Guatemala and possibly also in adjacent Mexico. Distinctive in the genus because of the pale grayish-green and thin leaves. The leaves are used in religious ceremonies, especially on Palm Sunday and are carried long distances for this purpose. The common name mecate is derived from the Nahuatl mecatl, and is often used in Mexico and Central America for any kind of string or twine. Strips of the leaves are used in western Guatemala as a substitute for twine.

Furcraea samalana Trel. l.c. 149, t. 30.
Magueyón, magueyón macho, maguey.

Presumed native of Guatemala and said to be cultivated for its fiber in El Salvador.

Furcraea stratiotes Boye Petersen, Bot. Tidssk. 37:306. 1922.

Described from Nicaragua. I know nothing about it but possibly used for fiber.

ANACARDIACEAE

Trees or shrubs with resinous bark and sometimes caustic sap which may cause dermatitis in some persons; leaves alternate, rarely opposite, simple, 1-3-foliolate or odd-pinnate, exstipulate; inflorescence usually paniculate; flowers perfect or functionally unisexual; calyx with 3-7 lobes or segments, lobes sometimes accrescent; petals mostly 3-7 or rarely none, distinct or connate at the base; disc annular; stamens mostly 10 in two series, sometimes more or fewer or the stamens reduced to staminodes; ovary superior, most functionally 1-carpellate; fruit usually an indehiscent drupe.

A family of about 70 genera and perhaps 500 or more species, of which only a few are prominent in the American tropics. They are all trees or shrubs. Several important economic plants belong in the family and one, the mango, may well be the com-

monest fruit tree of the world. There belong here some of the least desirable plants, the poison ivys and relatives which fortunately are uncommon in the American tropics. Resins, oils, tannins, lacquers, edible fruits and "nuts" of several kinds come from the members of the family.

Anacardium excelsum (Bert. & Balb.) Skeels, U. S. Bur. Pl. Industry Bull. 242: 36. 1912.

Espavé, espavel, marañón de montaña, wild cashew.

One of the large trees of Central America, usually found at rather low elevations and along streams. The bark is used as a barbasco to stupify fish. The seeds have been reported to be edible, after roasting. The wood is used for planks in bridges and for rough and temporary constructions. The tree occurs from Nicaragua to northern South America.

Anacardium occidentale L. Sp. Pl. 383. 1753.

Marañón, jocote marañón, cajú, cashew, cashew apple.

One of the commonest trees in the American tropics from Mexico to Brazil.

Common in Central America but I have never seen trees that might not have been spontaneous, probably widely distributed in pre-conquest times. The tree has become naturalized in the old world tropics.

Several commercial products come from the cashew, cashew nuts, the seeds, are now common dessert nuts around the world. Some nuts are collected and roasted for local use in Central America but very few if any are exported. India and Mozambique are the largest producers while, in America, Haiti and Brazil export small quantities.

The cashew apple, not a true fruit but the swollen hypocarp is much sought after. Good ones have an exquisite flavor but persons who are very susceptible to poison Ivy may develop a rash from them. A quite acceptable wine may be made from the cashew apple. These wines, vino de marañón, are sometimes to be had in Comayagua, Honduras. In El Salvador the fruits are sometimes used to flavor rum which is then called aguardiente de marañón.

The nuts (seeds) are borne singly at the apex of the hypocarp. The fresh "nuts" contain an oil, cardol, which is caustic and may produce serious blisters on the skin. The oil is driven off in roasting. Cardol is sometimes used to make woods resistant to the attacks of termites and insects.

The leaves contain some 23 o/o of tannin but unfortunately are also high in non-tannins.

A gum similar to gum arabic exudes from the stems and is collected. India is the principal source. It is used as a substitute for gum arabic and is said to make wood resistant to insects when used as a coating. The gum also has pharmaceutical applications and also is used in book binding.

The dark shell oil, which collects during the roasting process has been found to be useful in the manufacture of synthetic resins and plastics. The oil is one of the best sources of phenols.

Astronium graveolens Jacq. Enum. Pl. Carib. 33. 1760.
Ronron, jobillo, zorro, ciruelo, ciruelillo, frijolillo, masicarán, palo obrero, quesillo, Gonzalo aloes (trade name), culin-zis.

The wood, which polishes well, has been exported for use in making veneers. It is used in turnery and for construction in Central America.

Bouea macrophylla Griff. Pl. Cantor. 15. 1855.

Bandaria, kundangan.

A rather interesting fruit but seen only at Lancetilla, Honduras. The fruit is similar to the mango but smaller, with thin skin and juicy flesh. Native of Malaya. It is suited to wetter climates than the mango will withstand.

Comocladia guatemalensis Donn.-Sm. Bot. Gaz. 56: 52. 1913.

Pata de pava, chinil-té, solimán.

A contact poison not unlike poison ivy. The affected parts may swell and the skin may blister. Lesions are said to heal

slowly. The hard red wood is reported to have been used for spear shafts. Known only from the department of Huehuetenango in Guatemala.

Mangifera indica L. Sp. Pl. 200. 1753.
Mango.

The usual name, used in all languages in Central America, is mango but there are literally dozens of names for the kinds and variations of mangoes. Native of the Indo-malayan region where many varieties have been in cultivation, or spontaneous, since time immemorial. Mangoes were first introduced into Mexico sometime after 1565 but soon spread over the tropics and subtropics of the western world. Mangoes do well in most regions of Central America, where it is not too wet, below 1,200 meters. Trees occur but rarely fruit in Guatemala City at 1,600 meters, or even a little higher. Mangoes are the most popular fruit of Central America and naturalized in much of the area. It is difficult to convince people that the trees are not native.

Mango seeds are often polyembryonic and the seedlings from such seeds are essentially equivalent to grafted stock. In recent years many improved and selected varieties have been brought into Central America and propagated vegetatively. There is hardly to be found a better fruit than good mangoes, nor a poorer one than some of the seedling kinds which often have the decided flavor and aroma of turpentine and are full of fiber.

A gummy substance sometimes exudes from the stem and, in India, this is collected and sold as a substitute for gum arabic and may also be used as a primary food. I do not know of it being collected or used in Central America.

Most mangoes are eaten as a fresh fruit out of hand but fruits are sometimes stewed or made into preserves. A wine, vino de mango is made from the fruit. Canned mangoes are rarely seen in stores of the United States but the fresh fruits are now commonly seen, and often at fantastic prices.

A good horticultural account of the mangoes is: Lal Behari Singh. *The Mango*, xiii — 438. 1960. Leonard Hall Ltd., London.

Metopium brownei (Jacq.) Urban, Symb. Antill. 5: 402. 1908.

Chechem, chechem negro, black poison wood, Honduras Walnut.

Native in Mexico, Belize; and the West Indies. The tree is a contact poison similar to poison ivy. The wood is sought after for certain kinds of cabinet work.

Rhus radicans L. Sp. Pl. 266. 1753.

Tripa de chompipe, tipachán, poison ivy.

Poison ivy is rare in Central America, found only in Guatemala and rather local there. The resinous sap, upon contact with the skin, may produce swelling, inflammation and pain difficult to relieve. Some persons are not susceptible. The species grows in much of temperate North America, Mexico, the West Indies and Guatemala.

Rhus striata Ruiz & Pavón, Fl. Peruv. 29. 1802.

Hinchador, hincha huevos, mala mujer, bien te veo, palo de sarna, palo de compadre, amté, amché.

A small tree or rarely a shrub native from southern Mexico to Peru. The plant causes a contact dermatitis similar to that of Poison Ivy. Abundant in the forest around Cobán, Guatemala and occasional elsewhere. The Indians of Alta Verapaz all know the plant and avoid it but I have collected it, before I knew what it was without bad effects. This, however, is not a procedure to be recommended.

Schinus molle L. Sp. Pl. 388. 1753.

Pimiento, pimientillo, pimienta del Perú, árbol del Perú, pepper tree.

Native of Peru but distributed in early colonial days as an ornamental. The fruits are not edible but contain an essential oil. The fruits may be pulverized and used in cooling drinks called horchatas or atoles. A gum or mastic exudes from the trunk of the tree and may be used in varnishes, in medicines and perhaps in other manners. The mastic is not collected or used in Central America so far as I know.

SPONDIAS: a gum which forms a gelatinous mucilage with water is said to be produced by several species of the genus. I do not know of the gum being collected in Central America. The wood of the species found in our region is rarely used for construction.

Spondias mombin L. Sp. Pl. 371. 1753. *S. lutea* L. Sp. Pl. ed. 2. 613. 1762. *S. radlkoferi* Donn.-Sm. Bot. Gaz. 16: 194. 1891.

Jobo, jocote jobo, ciruela, ciruela de jobo, jocote montero, jocote de jobo, ciruela de monte, jocote de invierno, pitarrillo, jobo jocote, poc, kinnim, hog plum.

A small tree distributed from Mexico through Central America to tropical South America. The plum-like yellow fruits are slightly acid and not very good, although few fruits are not eaten when they are ripe.

Spondias nigrescens Pittier, Contr. U. S. Nat. Herb. 18: 75, f. 82. 1914.

The fruits of this Costa Rican species are probably eaten.

Spondias purpurea L. Sp. Pl. ed. 2. 613. 1762.

Jocote, ciruelo, sismoyo, anum, canum, rum, run, unum, xúgut, abal; chiabal, Spanish plum, red mombin, hog plum.

A small to large tree cultivated or spontaneous and naturalized from Mexico and the West Indies to South America. Possibly also native in Mexico and Central America.

The fruit is superior to that of *Spondias mombin*, especially in selected varieties, although ordinary fruits are not very good. Most fruits get eaten sooner or later. The fruits may be stewed with crude sugar and are found occasionally in markets. A wine more probably a beer-like drink is said to be made from the fruits but I have never seen it.

Branches broken or cut from a tree and pushed into the ground during the rainy season soon strike root. The species is commonly used as a living fence post and consequently often abundant along roads. The trees put forth abundant inflores-

cences of small red flowers at the end of the dry season when the tree is usually leafless and are quite conspicuous.

ANNONACEAE

Trees or shrubs, rarely vines; leaves alternate, entire, exstipulate; inflorescences usually fasciculate and few-flowered or of solitary flowers; flowers perfect, regular, actinomorphic, usually the segments similar; sepals mostly 3, valvate or imbricate; petals usually 6, biseriate or the inner series missing; stamens many, spirally arranged; ovary superior, carpels many or rarely few; fruiting carpels sessile or stipitate, free or united into a fleshy often very large multiple fruit (*Annona*); seeds often arillate.

A family of some 75 genera and perhaps a thousand species. It is pantropical with a few species reaching to temperate regions. The members of the family are mostly trees. Several species are important for the fine fruits that they produce.

ANNONA: A tropical American genus of about 75 species of which a few are important as fruit trees. Several of these trees are in cultivation or door yard trees. Some fruits are fine while others are rather insipid.

Annona cherimola Miller, Gard. Dict. ed. 8. 1768.

Cherimola, cherimoya, chirimoya, anona, anona blanca, anona poshte, tubic, pox, pac, pap, tsumuy, tzumux.

The cherimoya is usually a small tree to as much as 8 meters tall. It is presumed to be native of Peru and Ecuador and doubtless was widely distributed in pre-Columbian times in tropical America. It is now to be found in tropical and subtropical regions of the world, either cultivated or naturalized. The species has been improved by selection and grafting. Grafting of selected forms is usually done on stocks of the same species. Fruits of selected trees are often very good although some people find them to be rather insipid. Fruits do not carry well and consequently are difficult to take to distant markets. The crushed seeds are said to be applied to the human body to kill lice or similar parasites.

Annona diversifolia Safford, Science, new series 33:471. 1911.

Anona blanca, perpauce, iliama, annona.

Native from Mexico southward along the Pacific coastal region to Nicaragua. It is occasionally cultivated and established in other regions. The fruit is similar to that of the cherimoya in size and in flavor is often considered to be superior. The plant will grow in the warm coastal areas where cherimoya does not thrive. The species has apparently not been improved by selection.

Annona glabra L. Sp. Pl. 537. 1753.

Anona, anonilla, guanábana silvestre, corkwood, bobwood, alligator apple, annona.

The fruits of this annona are rather insipid and are rarely eaten. The tree is native from Mexico through Central America, or at least is now found through the area. It is widely distributed in South America and is also in western Africa.

Annona lutescens Safford, Contr. U. S. Nat. Herb. 18: 41, ff. 49-50, t. 23. 1914.

Anona amarilla.

Cultivated and perhaps native in Alta Verapaz, Guatemala. Reported from Cuba. The flesh of the fruit is pale yellow. The tree is perhaps only a variation of *Annona reticulata*. The bark is said to be used in tying the framework of houses.

Annona muricata L. Sp. Pl. 536. 1753.

Guanábana, guanaba, guanaba ácida, guabana azucarón, soursop.

Native of tropical America and possibly native in Central America where it is not common. Occasionally naturalized (or native?) and cultivated in the warm regions. The tree is the most attractive of the annonas found in Central America and has some value as an ornamental. The fruits are the largest of any of the annonas, often weighing 3 or 4 kilos. The flesh of the fruits is quite variable as is to be expected from seedling trees; usually somewhat cottony, white, sweet or somewhat acid with a distinctive and agreeable flavor. Eaten as a dessert fruit and

used to flavor ices and drinks of various kinds. The wood is or was used to make yokes for oxen since it is believed not to cause their hair to fall.

Annona primigenia Standl. & Steyerl. Field Mus. Bot. 23: 7. 1943.

Anonillo.

Native of Mexico, Guatemala and Belize. The fruits are the smallest among the annonas and are said to be edible. I have not seen the tree.

Annona purpurea L. Sp. Pl. 537. 1753.

Anona, anón, anonillo, anona rosada, anona colorada, sincuya cop, oopchi, cahuex, tzumuy, custard apple, bullock's heart.

The custard apple is either native or was distributed by man in pre-Columbian times from Mexico and the West Indies through Central America and tropical South America. It is one of the favorite annonaceous fruits of Central Americans although possibly inferior to the guanabana and the cherimoya. It grows well up to middle elevations and is commonly cultivated, or at least seedling trees are not cut down when they become established. It is often found in markets. A powder made from the seeds is said to be useful in the control of lice. Bark from the trees is said to contain a fiber used as a substitute for string. The leaves are said to contain a blue or black dye and that they may be used to tan leather.

Annona scleroderma Safford, Journ. Wash. Acad. Sci. 3: 105, f. 1. 1913. *A. testudinea* Safford, Contr. U. S. Nat. Herb. 18: 18, ff. 22-23. 1914.

Anona del monte, poxte.

Native of Guatemala, Honduras and Belize in the lowlands. The fruits are edible but the seeds are large.

Annona squamosa L. Sp. Pl. 537. 1753.

Anona, anono, anón, chirimoya, saramuya, sugar-apple, sweetsop.

Widely cultivated and naturalized or native in much of tropical America, found occasionally in all Central American

countries. The fruits are considered to be very fine and are much sought after. The leaves are sometimes put in hen's nests to keep vermin away. The seeds, like those of other annonas, are considered to have insecticidal properties which in fact they do but in general they are not very effective for this purpose.

Cananga odorata (L.) Hook. & Thomson, Fl. Brit. India 1: 130. 1855.

Ilang-ilang, oil of ilang-ilang (sometimes ylang).

Ilang-ilang is cultivated as an ornamental in Central America. The principal use of this attractive tree is for the extraction of an essential oil from the flowers. The oil is much used in perfumery. The world production of the oil is perhaps less than 40-50 tons, most of which comes from islands of the Indian ocean. The trees do well in several places in Central America but whether it could be profitably grown as a crop is questionable. Native of southeast Asia.

Cymbopetalum penduliflorum (Dunal) Baill. *Adansonia* 8: 268. 1867-68.

Orejuela, anón de montaña, muc.

The dried petals, called orejuelas, have been used since ancient times in flavoring chocolate and are said still to be used in Mexico for that purpose. The petals are used in Guatemala to flavor beverages such as pinol and horchata. The plant, a tree often to 10-20 meters tall, might well be looked into as a source of a flavoring material for chocolate. The dried petals are occasionally found in markets in Central America. The tree is native from Vera Cruz in Mexico to Guatemala and Belize.

Malmca depressa (Baill.) Fries, *Acta Hort. Berg.* 10: 43. 1930.

Lancewood, wild soursop, elemuy.

Native in the rain forests from Vera Cruz in Mexico to Honduras. Fruits are said sometimes to be eaten. I have never seen fruits.

Rollinia jimenezii Safford, *Journ. Wash. Acad. Sci.* 6: 378, f. 3. 1916.

Anona, chirimoya, anonillo.

Native from Mexico to Costa Rica. The fruit is edible although quite acid and seedy.

Rollinia rensoniana Standl. Journ. Wash. Acad. Sci. 13: 351. 1923.

Churumuyo.

Known in Guatemala and El Salvador. The fruits are edible. Wood is used in El Salvador to make yokes for oxen.

SAPRANTHUS: The genus is not uncommon in Central America. The flowers are often large and have an odor suggestive of carrion.

Sapranthus microcarpus (Donn.--Sm.) Fries, Svensk. Vet. Akad. Handl. 34, No. 5: 12. 1900.
Palanco, chufle canjuro.

The fruits are small and have a disagreeable flavor, but even so are eaten. Native from Mexico to Honduras.

Sapranthus palanga Fries, Acta Hort. Berg. 10: 12. 1930.

Used in Nicaragua and Costa Rica for the strong fiber contained in the bark.

Xylopia frutescens Aubl. Pl. Guian. 602, t. 292. 1775.
Malagueto; majahua, capulincillo, capullín de montaña.

The oil is said to be expressed from the seeds in Honduras, and used as a hair dressing perhaps to give luster.

APOCYNACEAE

Trees, shrubs or herbs, often vines, usually with milky latex; leaves opposite or verticillate, rarely alternate, never serrate or dentate; flowers perfect, actinomorphic or slightly zygomorphic, normally pentamerous; inflorescences of single flowers or usually racemose or cymose; calyx 5-4-lobate often with glandular appendages within; corolla gamopetalous, funnellform or salverform, often appendaged within, 5-lobed; stamens usually 5, epipetalous; ovary superior, bicarpellate with the carpels free or united; stigma large, various in form;

fruits of united carpels, follicular, capsular, baccate or drupaceous; seeds usually naked, comose at the apex, with papery wings or sometimes arillate.

A large family of some 200 genera and 2000-3000 species, mostly pantropical but a few in temperate regions. Many are of horticultural interest, others of economic interest as sources of drugs. The latex of some kinds is poisonous.

Allamanda cathartica L. Mant. 2: 214. 1771.

Jalapa, alamanda, bejuco de San José, flor de estudiante, copa de oro, allamanda, amanda, campana.

A very attractive Brazilian vine or shrub now widely cultivated as an ornamental in tropical regions. Some varieties are in flower most of the year.

Aspidosperma stegomeris Woodson, Ann. Mo. Bot. Gard. 38: 178. 1951.

Chichica, sacuallón, bayo blanco, malerio blanco.

An important timber tree along the Pacific coast of Guatemala, perhaps now nearly exterminated. Also in Mexico, Belize and Costa Rica.

Cameraria latifolia L. Sp. Pl. 210. 1753.

Chechém de caballo, savanna white poisonwood, white poisonwood, iquiché, chechém.

The latex is poisonous and produces serious swelling and inflammation similar to that caused by poison ivy. A shrub or small tree of eastern Guatemala, Belize and the West Indies.

Catharanthus roseus (L.) G. Don, Gen. Hist. Pl. 4:95. 1838.

Chatas, chula, chuladitas, chatilla, clavina, lila, oaxaca, periwinkle.

Commonly planted in gardens at low and middle elevations. Naturalized and abundant in coffee plantations to about 1,400 meters and in coconut palm groves at sea level. The flowers are commonly rose-colored but forms with white flowers, white with rose or red centers are found.

Couma macrocarpa Barb.-Rodr. *Vellosia* ed. 2, 1:32, t. 1. 1891. *C. guatemalensis* Standl. *Trop. Woods* 7: 8. 1926.

Palo de vaca, palo de leche, barca, cow tree.

A curious tree found in Guatemala, Belize, perhaps Panama and on to Venezuela and Brazil. When the bark of the tree is cut or broken there is a copious flow of latex that is sweet and palatable. The latex contains a small amount of rubber and much material that resembles chicle.

FERNALDIA. — The genus was named by Robert E. Woodson for Merritt L. Fernald (1873-1950) who spent a lifetime studying the flora of the northeastern United States and adjacent Canada. Prof. Fernald is said to have wondered, out loud, if the specific names *pandurata* and *brachypharynx* had anything to do with his broad (fiddle-shaped) body and short neck.

Fernaldia brachypharynx Woodson, *Ann. Mo. Bot. Gard.* 19: 380. 1932.

Laroco (possibly also loroco).

The flowers and buds are commonly cooked as a vegetable. The roots are said to be very poisonous and used to poison rodents and other noxious animals.

Fernaldia pandurata (A. DC.) Woodson, *Ann. Mo. Bot. Gard.* 19: 48. 1932.

Loroco, quilite, fiddle-shaped *Fernaldia*.

The flowers are cooked in El Salvador with rice and other foods. The nutritional values are given by Munsell, Williams & others in *Food Technology* 15: 6. 1950.

Fernaldia pandurata var. *glabra* Molina, *Ceiba* 3: 95. 1952.

Loroco.

A glabrous variety from Honduras with the same uses as the species.

Haplophyton cinereum (A. Rich.) Woodson, *Ann. Mo. Bot. Gard.* 23: 231. 1936.

In Mexico this plant has long been known to have insecticidal properties, and its Nahuatl name, "actimpatl, signifies "flea killer." The roots are employed for killing flies, lice, fleas, cockroaches and other insects. The plant is occasionally abundant in Guatemala about Zacapa but so far as I know it has not been used as an insecticide. Found also in the southwestern United States.

Lacmellea panamensis (Woodson) Monachino, *Lloydia* 7: 286. 1945

Cerillo, espinudo, lagarto negro.

A species of Costa Rica and Panama, perhaps also in South America. A milk-like latex is said to be used sometimes as a substitute for milk, but I have not seen this nor do I have a reliable report that this is so. The latex may have been used to adulterate chicle or rubber.

Lacmellea standleyi (Woodson) Monachino, l. c. 285.
Palo de vaca, vaca tree, prickly vaca.

Known only from Guatemala and Belize where the abundant latex is said to be drunk. The fruit, with the odor of mango, may be eaten.

Nerium oleander L. Sp. Pl. 209. 1753.
Narciso, nerium, adelfa, oleander.

Planted commonly as an ornamental and sometimes naturalized, native of the Mediterranean region. The oleander is a popular ornamental since the attractive and sweet-smelling flowers are produced nearly the year around. The plant contains alkaloids which have been used in medicine as cardiac stimulants. The infusion of the leaves in an oil have been used as a remedy for infections of the skin. The latex or sap is caustic to some persons. The plant is reported to be toxic to livestock and 15-20 grams are said to be sufficient to poison a mature animal. The wood if used as a spit to roast meat may cause the meat to become toxic.

Plumeria rubra L. Sp. Pl. 209. 1753.

Flor de la cruz, nicté de monte, flor blanca, flor de mayo, flor de ensarta, zacnicté, frangipanni, Spanish jasmine, frangipancier (French).

Native and often abundant in the dry regions of south Mexico to Panama. The wild trees of Central America mostly have white flowers but cultivated kinds with rose, red, white and yellow flowers are to be found. The plants are usually leafless at flowering time and are showy and attractive. The tree has abundant white latex. The wood takes a high polish and is sometimes used in articles of turnery. Venerated by the Buddhists in India and commonly used in their temple grounds.

RAUVOLFIA. Several species of this genus have been studied in recent years as possible sources of the alkaloid reserpine, and perhaps a dozen or so other alkaloids. Reserpine is used in the management of hypertension and certain neuropsychiatric disorders. There are perhaps five species in Central America and one introduced, at least experimentally.

Rauvolfia serpentina (L.) Benth. ex Kurz, For. Fl. Br. Burm. 2:171. 1877.

Native of India and perhaps into southeastern Asia. For centuries the natives of the Himalayan foothills have used the plant for afflictions from insanity to snake bite. In the 1930s and onward research indicated that a physiologically interesting principle occurred in the plant. Reserpine was isolated in 1932 and since that time more than 1,300 articles on the botany, chemistry and pharmacology of the various species of *Rauvolfia* have been published. This species was introduced for experimental purposes in Costa Rica and perhaps elsewhere in Central America.

Rauvolfia tetraphylla L. Sp. Pl. 208. 1753.

Chalchupa, curarina, comida de culebra, amatillo (a Honduran town on the border of El Salvador is named for this plant) hierba de San José, matacoyote, señorita, chalchuapa, cohatacó.

This is a well-known plant in Guatemala, El Salvador and Honduras where it is used by the country people to treat malaria, and is reputed to be a remedy for snake bites. Guatemalan investigators have isolated two alkaloids, Chalchupine A and Chalchupine B, from the plant. The fruits are considered to be poisonous. The shrub is abundant on the Pacific plains and into the warmer interior valleys. — Throughout the West Indies, Mexico and Central America and into South America. Introduced into India.

Rauvolfia vomitoria Afzel. Stirp. Med. Sp. Nov. 1. 1818.

Native of tropical Africa. Formerly and perhaps still cultivated in Zaire as a source of reserpine. Once grown experimentally by Merck & Co. in Guanacaste province, Costa Rica.

Stemmadenia donnell-smithii (Rose) Woodson, Ann. Mo. Bot. Gard. 15: 369. 1928.

Copal, cojón, cojón de caballo, cojón de puerco, cojón de mico, cojón de burro, cojotón, tonché.

When the branches are cut they exude a large amount of white, sticky latex that seems to have the properties of gutta-percha. It has been used as an adhesive and in Guatemala sometimes chewed like chicle. The latex could be obtained in substantial amounts if it proved to have commercial value. Curiously a village in the department Jutiapa, Guatemala, was given the name "Cojón", presumably because of the abundance of this plant. Native from southern Mexico to Panama.

Stemmadenia galeottiana (A. Rich.) Miers, Apocy. S. Am. 76. 1878.

Cojón, cojón de caballo.

Ashes from the plant, when used in the making of tortillas, may cause death to persons eating the tortillas. This has not been confirmed from reliable sources.

Tabernaemontana chrysoarpa Blake, Contr. Gray Herb. 52: 81. 1917.

Chapupo, cojón, cojón de mico, cojón de gato, lechoso, palo de mico, huevos de mico, cojón de perro, chanchito.

The fruits yield a large amount of latex which is said to have been used to adulterate chicle, and sometimes chewed as gum. The yellowish white wood has been used in lowland structures but is not very good. Near sea level along the coast from southern Mexico to Panama.

Thevetia peruviana (Pers.) Schum. in Engler & Prantl, Pflanzfam. 4,2: 159. 1895.

Chirca, chilindrón, campanilla, campanilla amarilla, chilco, chilca, acitz, yellow oleander.

Cultivated as an ornamental in many tropical regions, thought to be native of tropical America, perhaps of Mexico. The seeds contain at least two glycosides of which one, Thevetoxin, is toxic. The milky sap is reported to be toxic also. A tincture of the bark has been used as a febrifuge and in large doses is said to be a purgative and emetic.

Vinca major L. Sp. Pl. 209. 1753.
Serenó, vinca, pervinca.

An ornamental, native of Europe and northern Africa, frequent in Central American gardens and often naturalized in coffee plantations and along moist roadsides.

ARACEAE

Terrestrial or usually epiphytic plants, one a water weed, acualescent or scandent, often with tuberous roots; leaves petiolate, entire or variously lobate or parted; inflorescences axillary or terminal, usually with many small flowers arranged on a terete, elongated spadix, this subtended by a foliaceous spathe; pistillate flowers below and staminate ones above on the spadix; perianth none or of 4-6 segments, these distinct or connate; stamens 1-many; fruits baccate with free or connate berries containing 1-many seeds.

The Araceae is a large family of perhaps more than 100 genera and 1,500 species. It is abundant in species and individuals in Central America. The group is a complicated one to study since adequate specimens are difficult to preserve and many species have been described on inadequate material. The family is pantropical with a few species extending into temperate regions. There are no aroids of outstanding economic importance in our region but in Oceania several are important food crops. The plants are most all herbaceous but a few are suffrutescent vines. The sap is often acrid and bitter, sometimes milky.

ANTHURIUM contains a great many attractive ornamentals of which one of the best is *A. scherzerianum*, mentioned below. Two other species have minor economic uses.

Anthurium scandens (Aubl.) Engler in Mart. Fl. Bras. 3,2: 78. 1840.

Bejuco real, elotillo, elotico, maicillo.

The strong and flexible stems are used in Costa Rica to make baskets and in tying together the framework of huts and other structures. The last three of the common names call attention to the fruiting inflorescence which resembles a minute ear of corn.

Anthurium rigidulum Schott, Oesterr. Bot. Zeitschr. 180. 1858.

Maicillo.

The fruiting inflorescences of this species are edible and used in Costa Rica, often in soups.

Anthurium scherzerianum Schott, Oesterr. Bot. Wochenbl. 53. 1877.

Lengua del diablo, anthurium.

A fine ornamental once common and abundant in the forests of Costa Rican mountains but now rare. Many forms occur but the bright red spathe of most forms is what makes the plant attractive. The species is said to have been found originally in Guatemala but now it is not known there as a wild plant.

CALOCASIA: Root crops of great importance in south-eastern Asia, the Pacific and now in many other parts of the tropical world. The botanical nomenclature of the taros and dasheens is complicated. They are placed sometimes in a single species but now often treated as two.

Colocasia antiquorum Schott in Schott & Engler, Meletem. Bot. 1: 18. 1832.

Malanga, taro.

Taro is not common in Central America. I have seen what I believe to have been this only once. An ornamental form is occasionally cultivated. The taro is one of the basic food plants of the Pacific region and may have been one of the first food plants domesticated by man in southern Asia, where it was native.

Colocasia esculenta (L.) Schott in Schott & Engler, l. c.
Ñampé, ñampy, papa malanga, coco, xacox, dasheen, taro.

Dasheens are not common in Central America but are to be found in the markets now and again, perhaps most commonly in Costa Rica. Native of southern Asia and widely cultivated in the tropics and subtropics. In Hawaii, and perhaps elsewhere, the petioles are a favorite food of the orientals. They may be diced and fried with meat or boiled as a pot herb. The fresh tubers of dasheens, like those of many other aroids, contain calcium oxalate crystals that cause a burning sensation in the throat. Cooking either destroys the crystals or makes them harmless.

DIEFFENBACHIA: Several not very distinct species of *Dieffenbachia* occur in Central America. The sap is said to be irritating to the skin and to cause serious inflammation, a reputation hardly deserved. Medicinal uses are reported, usually as a drying agent. *Dieffenbachia picta* (Lodd.) Schott, and others which may be only forms of it, are used in Central America and around the world in horticulture.

Dracontium pittieri Engler, An. Inst. Fis. Geogr. Costa Rica 8: 209. 1896.
Hombrón.

Pittier reports that the tuber of this species although acrid may be eaten after cooking. Known only in Costa Rica.

Monstera deliciosa Liebm. Dansk. Vid. Medd. Forsh. 19. 1849-50.
Harpón, piñanona, ceriman.

Native from Mexico to Panama and often cultivated as an ornamental. The well-ripened fruits are quite good although never abundant. The aerial roots are sometimes used in weaving baskets.

Monstera pertusa (L.) de Vries, Hort. Spaarn-Bergens 40. 1839.
Hoja de sereno, harpón, madre chirrivaca, colcuc.

The fruits when fully ripened are edible. The decorticated

and dried aerial roots are used to weave chair seats, hats and other articles. Native through Central America to South America.

Philodendron warscewiczii Koch, Ind. Sem. Hort. Berol. app. 14. 1855.

Guacamayo, cupapayo, copapayo, ocopapayo, mano de león.

The large fruits are sweet, juicy and edible. Like many other plants in the family they contain calcium oxalate crystals. Native from Guatemala to Panama.

Pistia stratiotes L. Sp. Pl. 963. 1753.

Lechuga de agua, lechuga, lechuga de sapo, repollo de agua verdolaga de agua, xicinchah.

Sometimes a weed and difficult to eradicate from quiet fresh water ponds. Perhaps spread as an ornamental in aquaria or ponds. Now found around the world in tropical and subtropical regions. Very unlike other members of the Araceae, the flowers are rarely noticed.

Spathiphyllum phrynifolium Schott, Oesterr. Bot. Wochenbl. 7: 159. 1857.

Gusnay, bushnay, busnay, güisnay, huisnay.

The young inflorescences are used in soups or fried in egg batter. Often seen in markets in Mexico, Guatemala and El Salvador. The common names are perhaps all variants of one Nahuatl name.

Syngonium podophyllum Schott, Syn. Aroid. 68. 1856.
Pico de guara.

Abundant in Central America. The fruits of this large epiphytic vine are said to be edible and used in El Salvador.

Syngonium salvadorensis Schott, Oesterr. Bot. Zeitschr. 8: 178. 1859.

Conde, anona conte, pico de guara, huevo de burro.

The spadices are said to be edible when ripe. Native from Mexico to El Salvador.

Xanthosoma violaceum Schott, Oesterr. Bot. Wochenbl. 3: 370. 1853.

Tiquisque, malanga, malanga colorada, quequihque, quequeshque, quequeque, quiscamote, quiscamo, badú, ox, munul, xcucutmacal, yautia.

All tall plants from large, thick rhizomes, the leaves broad and sagittate with an intramarginal vein; native in the American tropics and now widely cultivated in the tropics of the world. The root must be cooked before it is eaten. It has been estimated that the average yield of *Xanthosoma* is about eight tons per acre, equivalent to some 8 million calories. The young leaves are used for food in Oceania but I have not seen them so used in Central America. *Xanthosomas* are easily distinguished from the *Calocasias* by the intramarginal veins of the non-peltate leaves.

Zantedeschia aethiopica (L.) Spreng. Syst. Veg. 3: 715. 1826.

Cala, cartucho, calla, calla lily.

The callas, natives of southern Africa, have become naturalized in many places in Central America. Callas are commonly grown for the flower markets and are used in wreaths and funeral decorations as well as in roadside shrines and on church altars. Two other callas may be found as ornamentals, both certainly rare; the golden calla (*Z. elliottiana* (Knight) Engler) distinguished by the yellow spathe; and the spotted calla (*Z. albomaculata* (Hook. f.) Baill.) with white-spotted or streaked leaves.

ARAUCARIACEAE

Evergreen resinous trees with whorled branches; leaves awl-shaped to narrowly ovate; pistillate flowers in heads, becoming large, woody, deciduous cones.

Two genera and some thirty species of the southern hemisphere. The following cultivated as ornamentals in Central America.

Araucaria bidwellii Hook. Lond. Jour. Bot. 2: 503. 1843.

Native of Australia and grown as an ornamental in Central America where some very fine specimens are to be found. The leaves are flattened, 6-17 mm. broad.

Araucaria cunninghamii Sweet, Hort. Brit. 475. 1827.

Native of Australia and planted as an ornamental in Central America. Leaves rigid, narrow, sharp pointed.

Araucaria excelsa R. Br. in Aiton, Hort. Kew. ed. 2, 5: 412, 1813.

The Norfolk Island Pine is used as an ornamental, the seedlings often as pot plants. Leaves narrowly lanceolate, not spine-tipped.

ARISTOLACHIACEAE

Ours scandent vines; leaves alternate, petiolate, cordate and usually entire, flowers large to very large, in cymes or solitary, pendant, usually carrion-scented, perianth simple, adnate below the ovary and variously produced above the ovary, trilobate or asymmetric and entire; stamens 6-many; ovary inferior or semi-inferior, 4-6-celled; capsule opening irregularly or septicidally; seeds many.

There are about six genera and perhaps as many as 500 species in the family, mostly belonging in the genus *Aristolochia*. The family is mostly tropical with a few kinds in temperate regions. Those given below are of minor economic importance.

Aristolochia grandiflora Sw., Fl. Ind. Occ. 1566. 1806.

Guaco, chompipe, chumpa, güegüecho, hediondilla, bonete de fraile, bonete de diablo, güegüecho de zope, chompipina, flor de pato, flor de zopilote.

The roots have been reported to be poisonous to hogs and in Jamaica they have been reported to be used in criminal poisoning. In Central America the roots are said to be used for snake bite and the bite of poisonous animals.

Aristolochia maxima Jacq. Enum. Pl. Carib. 30. 1760.
Guaco, cuajilote, canastillo, tecolotillo.

The young pods are said to be cooked and eaten in Costa Rica. The plant, a vine, is not uncommon through Central America.