

CHAPTER III

WILD SEEDS OF FOOD VALUE, AND HOW THEY HAVE BEEN UTILIZED

The bounteous housewife, nature, on each bush
Lays her full mess before you.

Shakespeare.

THE Spanish conquest of Mexico and Peru brought to the knowledge of the white race a number of vegetable foods that are to-day on every American table-such as Indian corn, the potato, the pepper, and certain varieties of beans. Others are still unknown to the world at large. Among the latter that Cortés found in every-day use in Mexico was a square-stemmed, blue-flowered herb, which the chroniclers of that time called Chian or Chia. It seems to have ranked in popularity with staples like maize, frijoles, maguey, cacao and chili, and was grown with these in the fields and floating gardens of the Aztecs, for the sake of the small but numerous nutritious seeds of a pleasant, nutty flavor. Writers on the products of the New World

USEFUL WILD PLANTS

in the first couple of centuries of the Spanish domination always speak of Chia with respect. Later, when upper California came in for settlement, the diarist of Portola's expedition to the Bay of San Francisco specifies it as among the gifts offered by the Indians to their white visitors; and archeologists, grubbing in prehistoric graves in Southern California, have turned up deposits of the seed left as viaticum of departed souls, which attest the antiquity of its use within the limits of the United States. Even to-day, shopkeepers in the Spanish quarters of our own Southwestern cities as well as street venders in the towns of Mexico include Chia as part of their stock in trade.

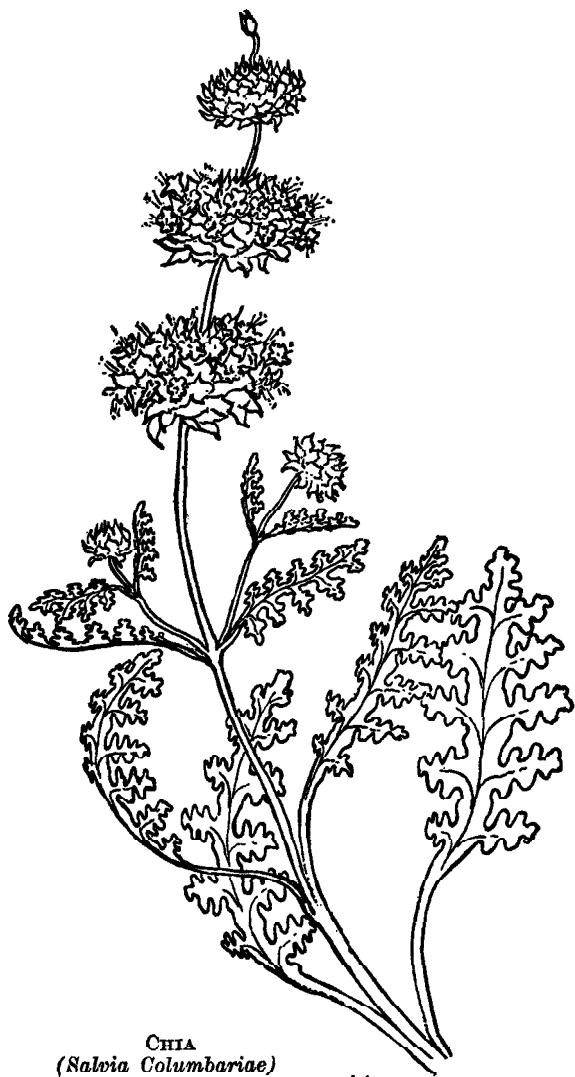
One wonders what this all but forgotten food can be.

It is the name applied to at least five or six distinct species of plants, of somewhat different aspects, most of them belonging to the genus *Salvia*. The seeds are flattish and more or less shining, suggesting small flaxseed, of whose character they somewhat partake, being oily and mucilaginous. For human consumption they should be parched and ground, when they may advantageously be added to corn-meal, and this mixture made with water into a mush was a favorite item in the old Mexican

WILD SEEDS OF FOOD VALUE

dietary. Some of the present-day Indians of Southern California mix Chia meal with ground wheat, imparting to the latter a delicate, nut-like flavor, though the mucilaginous character of Chia disposes the mixture to gumminess. Pure Chia meal, mixed with water, cold or hot, swells to several times the original bulk, and is best eaten as a semi-fluid gruel. Old time travelers in our desert regions used to provide themselves with this meal, which constituted an easily portable and highly nutritious ration eaten dry with the addition of a little sugar.

The species indigenous to the United States are *Salvia Columbariae*, Benth., and *S. carduacea*, Benth. Both are winter annuals native to the Pacific side of the continent. The former is the more common, found in dry ground throughout Southern California and adjacent parts of Nevada, Arizona and Mexico. The small, blue flowers, crowded in dense, prickly, globular heads, interrupted upon the stalk (which passes through the midst like a skewer), appear from March to June, and the seeds are ripe a month or so later. They are easily gathered by bending the stalks over a bowl or finely woven basket, and beating the heads with a paddle or fan, which shatters out the seeds. That is the Indian method; but when the plants grow plentifully, as



CHIA
(*Salvia Columbariae*)

WILD SEEDS OF FOOD VALUE

they sometimes do as thick as grass in a field, or as they may be made to do by sowing the seed in cultivated ground, they can be cut, threshed and winnowed like flax or wheat.¹

A wild food plant that has had a remarkable influence in geographic nomenclature is the Wild Rice (*Zizania aquatica*, L.). It is the *folk avoine* of the French voyageurs, and the *menómin* of the Northwest Indians, to one tribe of whom—the Menominees—it gave a name. Mr. Albert E. Jenks, whose exhaustive monograph, “The Wild Rice Gatherers of the Upper Lakes,”² is a mine of information about the plant, instances over 160 places (counties, townships, towns, railway stations, rivers, creeks, lakes and ponds) which have borne a name synonymous with this same Wild Rice. It is of the same family as the rice of commerce, and is a species of annual grass found growing by the acre, even the hundreds of acres, in ponds, swamps and still waterways, both fresh and brackish, in virtually every State of the Union east of the Rocky Mountains, and also in Japan and China. It is exceptionally abundant in the regions bordering on the Great

¹ An important use of Chia is as the basis of a soft drink. See the chapter on Beverage Plants.

² Printed in the 19th Ann. Report, Bur. Amer. Ethnology.

USEFUL WILD PLANTS

WILD RICE
(*Zizania aquatica*)



Lakes both in American and Canadian territory—a beautiful, stately grass, rising from two to twelve feet above the water and bearing in summer ample panicles of delicate, yellowish-green blossoms of two



An Indian of the Great Lakes Region threshing wild rice by means of a dasher-like stick.

(Courtesy of the *Bureau of American Ethnology*.)

WILD SEEDS OF FOOD VALUE

sexes. These are succeeded in September by the purplish spikes of ripened seeds occupying the tip of the panicle. The seeds are slender and cylindrical, one-half to three-fourths of an inch long, within a long-bearded husk and attached so loosely to the branchlet that bears them that they drop at a touch. They must needs be gathered, therefore, with great care or many may be lost. The Indians customarily harvest them just before they attain complete ripeness, visiting the rice swamps with canoes, which they push ahead of them, pulling the fruiting stalks over the hold of the canoe and beating the seeds into it with a stick.³ The grain is then taken ashore where it is dried, either in the sun or by artificial heat upon racks under which a slow fire is kept burning. The husk must then be threshed off, which may be done by pounding with a heavy-ended stick in a bucket; and finally the chaff is got rid of by winnowing. The seeds are then ready for use or for storing away. Readers of old journals of the sojourners in the Northwestern wilderness will recall the important rôle played by such stores of Wild

³ The best results are attained by first tying the standing stalks together at the head into small bunches. This is done a couple of weeks before maturity and serves to conserve the grain and lessen the depredations of the birds-particularly the bobolinks-which are famous rice eaters.

USEFUL WILD PLANTS

Rice (or Wild Oats, as the seed was as often but improperly called) in fighting hunger through the long, remorseless, northern winters.

The food value of Wild Rice is high. It is rich in carbohydrates (starch and sugar) and is also well stocked with flesh-producing proteids. Indeed, as a nutrient, it seems quite in the class of its cousin, the cultivated rice; and, like the latter, it swells with boiling, so that a little goes a long way. The Indians use it generally in mixture with stews. If cooked alone, two parts of water to one of rice is the usual proportion, and from a half to an entire hour is required for boiling it. White people who test Wild Rice usually pronounce it palatable, particularly in the form of a mush served with cream and sugar, and Mr. Jenks reports a wilderness soup made of Wild Rice and blueberries that sounds as if it ought to be good even in New York.

Two other water plants should be noted for their valuable edible seeds. One is the Water Chinquapin, mentioned in the previous chapter because of its useful roots, but which owes its popular name to the more obvious virtue of its palatable, nutlike seeds. These, boiled or baked, are considered by many the equal of chestnuts. The other is the Great Yellow Pond Lily of the northwestern Pacific Coast

WILD SEEDS OF FOOD VALUE

(*Nuphar polysepalum*, Engelm.), whose globose, yellow flowers, sometimes as much as five inches in diameter, are a frequent and charming sight afloat on the bosom of shallow lakes and marshy ponds of the coast region from northern California to British Columbia. The globular seed vessels are full grown in summer, and it is the practice of the Indians to gather them in July and August, and, after drying the pods, to extract the seeds, which may then be kept indefinitely. These are commonly prepared for consumption by tossing them about in a frying pan over a fire until they swell and crack open somewhat as popcorn does, which they resemble in taste. They may be eaten thus out of hand, or ground into meal for making bread or mush.⁴

The common Sunflower of our gardens, whose monster heads appeal to esthetes because of a particular style of languid beauty they possess, and to birds and chickens because of their luscious, oleaginous seeds, is but a coddled form of one of our commonest wild plants—the Annual Sunflower (*Helianthus annuus*, L.) This species is indigenous throughout western North America, and sheets summer and autumnal plains for miles with the gen-

⁴ Coville, "Notes on Plants Used by the Klamath Indians of Oregon."

USEFUL WILD PLANTS

erous gold of its cheery blossoms. The dark gray or blackish seeds of the wild plant are much smaller than those of the cultivated form, but are exceedingly numerous, with a white, oily, floury content that is rich in nutriment. They used to form an important part of the dietary of the Plains Indians, who sometimes cultivated the plants amid their corn. The ripe seeds were parched and ground into meal, and bread made of this meal has been spoken of with approbation by white travelers-even as the equal of corn bread. There can be no doubt of its value in situations where the flours of civilization are difficult to procure. As a source of oil sunflower seed is by no means insignificant, yielding, according to Havard, about twenty per cent. of an excellent table article. To most of us, indeed, the Wild Sunflower is a plant of unsuspected uses: its stalks possess a fibre of some worth and its flowers are good honey producers as well as a basis of a yellow dye said to be fast.⁵

In our Spanish Southwest the term *pinole* is in use

⁵ *Helianthus annuus* is a coarse, much branched plant, three to six feet tall, the rough stem frequently mottled, the root (being annual) easily pulled up. The large flower heads are yellow-rayed with a dark center that is an inch or so across. Leaves petioled, ovate, six inches or more long, with toothed edges, rough to the touch. The seeds of the closely related species, *H. petiolaris* Nutt., are similarly useful.

WILD SEEDS OF FOOD VALUE

to mean meal made from the seeds of wild plants. Of these a great number have been utilized in past times for this purpose by the aborigines, and still are to some extent by old Indians whose taste for the pabulum of the long ago has not been lost. There is, it seems, a certain tang to the native vegetable foods of the wild comparable to the gaminess of wild flesh, that meets a need in untamed man not satisfied by the suaver products of civilization. The preparation of pinole is in a general way as follows: Provided with a large gathering basket of close weave and a paddle, usually of rough basket-work, the harvester beats the seeds-one sort at a time into the basket, until a sufficient quantity is obtained. The chaff is then separated by sifting or by winnowing in a light breeze, and any prickles or hairiness natural to the seeds are singed off by dropping hot pebbles or live coals among them in a shallow basket and tossing all about at a lively rate. More prosaically, the same end may be attained with a frying pan kept agitated over a flame. This singeing process, moreover, serves to parch or partially cook the seeds, which are then ground in a mortar and the husks winnowed out. The residuum of meal, mixed with a little salt, may be eaten dry without further preparation. Indians in old

USEFUL WILD PLANTS

times frequently made forced marches of a day on no other ration than a small sack of pinole, consumed in instalments as they traveled.⁶ More often, however, it is moistened with water and eaten as mush or thinner as a gruel, or baked in the form of cakes. While the different sorts of seeds are collected and ground separately, it is not unusual to combine them for consumption, as taste may dictate.⁷

It would be tedious to enumerate all the plants which have been found of sufficient food value to grind into pinole, but the following may be mentioned as of especial interest and worth:

Of wide distribution in our Far West are two annual species of the homely Goosefoot or Pigweed. One is *Chenopodium Fremontii*, Wats., with more or less mealy leaves of triangular shape, a plant usually a foot or two high but sometimes attaining in overflowed lands a height of six feet or over ; the other is *C. leptophyllum*, Nutt., with very narrow leaves that are scarcely mealy. The latter species occurs also in seashore sands of the Atlantic coast from Connecticut to New Jersey. The inconspicuous green

⁶ For white consumption, the digestibility of this ration is improved by thorough and repeated grinding and parching after each operation.

⁷ V. K. Chesnut : "Plants Used by the Indians of Mendocino Co., California." Printed as Contributions from the U. S. National Herbarium, Vol. VII, No. 3.

WILD SEEDS OF FOOD VALUE

flowers of both species, clustered in paniced spikes, are succeeded in late summer and autumn by an abundance of small black seeds of farinaceous content. It stimulates our respect for these humble, weedy plants to know that the seeds of an allied species, *Chenopodium Quinoa*, have from the dawn of history been a valued food of the native Peruvians and Bolivians, and have been cultivated by those races. The Zuñi Indians of New Mexico, according to Stevenson, have a tradition that the seeds of *C. leptophyllum* were one of their principal foodstuffs in the infancy of the race before the gods sent them the corn plant. Afterwards, *Chenopodium* meal mixed with corn meal and salt, made into a stiff batter and moulded into balls or pats and steamed, became a favorite dish with epicurean Zuñis.⁸ The seeds of a prostrate, mat-like Amaranth (*Amaranthus blitoides*, Wats.), a weedy plant with spikelets of greenish, chaffy flowers, native to the Rocky Mountain region and westward, also formed an important item in the ancient diet of the Zuñis, who believed that the original seeds of it had been brought up from the underworld at the time of the race's emergence into the light of day. In later years, the

⁸ "Ethnobotany of the Zuñi Indians." 30th Ann. Report Bur. Amer. Ethnology.

USEFUL WILD PLANTS

meal made from these seeds has been used, like that from *Chenopodium*, in admixture with corn meal. Similarly useful to desert, Indians are the seeds of species of Saltbush (*Atriplex canescens*, James, *A. lentiformis*, Wats., *A. Powellii* Wats., *A. confertifolia*, Wats., etc.).

White Sage (*Salvia apiana*, Benth.), one of the most famous of Pacific Coast honey plants, produces slender, wandlike thyrses of pale blossoms whose seeds, though small and husky, are exceedingly numerous and rich in oil. They are still gathered by Southern California Indians, who bend the plants over a large basket and beat the seeds into it by striking with a seed-beater, as described before when treating of Chia. The seeds, mixed with wheat, are parched in a frying pan, and all is reduced to a fine meal by pounding in a mortar. This stirred in water with a sprinkling of salt is then ready to be eaten, or drunk, according as the mixture is thick or thin. It, too, is called *pinole*. The sage seeds have much the taste of Chia, the botanical relationship being close, but they are not mucilaginous.

Several species of wild grasses are utilizable for pinole. One of these is the Wild Oat (*Avena fatua*, L.), suspected of being the progenitor of the cultivated oat, and abundant in certain parts of the West,

WILD SEEDS OF FOOD VALUE

particularly on the Pacific Coast where extensive areas are covered with it as with a crop. The seed resembles the cultivated grain, but is so hairy as to stick in one's throat and choke one. After thoroughly singeing off the hairs in a pan or basket tray, the grain may be reduced to flour, and used like ordinary oat-flour. Another pinole grass, is *Elymus triticoides*, Buckl., locally known as "wild wheat" and "squaw grass". It is a tall, slim grass with usually glaucous stems, and grows densely in moist meadows and alkaline soil throughout the Pacific Coast and eastward to Colorado and Arizona. An allied species, more robust, with very dense flower-spikes of a foot long and larger seeds, serves a similar purpose. It is commonly called "rye grass" and is the *Elymus condensatus*, Presl., of the botanists. It, too, is abundant in damp, alkaline ground and along streams throughout the Far West, and Mr. Coville⁹ has suggested that it may be worthy of experimentation as a cultivated grain for that region.

A Southwestern grass of wide distribution, particularly in the deserts, in sandy places (both moist and dry) and on arid hillsides, is the so-called Indian

⁹ "Plants Used by the Klamath Indians," Washington, Gov't Printing Office, 1897.

USEFUL WILD PLANTS

Millet or Sand-grass (*Oryzopsis hymenoides*, Nutt.). It is a perennial, growing in bunches a foot or two high, with peculiar panicles whose thread-like, twisting branchlets are tipped with husks containing small, blackish seeds, which have long been valued by desert Indians for flour making. This is one of the wild grains upon which the Zuñi Indians of New Mexico have been in the habit of relying in times of failure of their cultivated crops; and Dr. Edward Palmer tells of parties of Zuñis being seen as far as ten miles from their villages carrying enormous loads of these seeds for winter provision. Still another desert grass with, edible seeds, but restricted in its distribution in our country to Southern California, is *Panicum Urvilleanum*, Kunth, which the desert Coahuillas call *song-wal*. It is a stout perennial, one to two feet high, the whole plant, including the seeds, more or less hairy, and is quite near of kin to the millet of the Old World, whose nutritious properties it shares.

Among the various gummy plants of the Pacific Coast known there as Tarweeds is one called Chile Tarweed (*Madia sativa*, Molina). It is a heavy-scented annual, one to three feet high, sticky and hairy, with rather narrow, entire leaves, and inconspicuous, pale yellow flowers of the daisy type, the

WILD SEEDS OF FOOD VALUE

rays barely a quarter of an inch long, expanding only at evening and early morning. This and some kindred species have been utilized by the California Indians for *pinole*. The Chile Tarweed has a special interest in the fact that in Chile, where it is also abundant, it has been cultivated from very early times. The seeds, when scalded, yield under compression a considerable percentage or a mild, agreeable oil, suitable for table purposes, soap-making, and notably for lubricating machinery, as it does not solidify short of 10° Fahr. Some eighty years ago, the plant was introduced into cultivation in Europe, where, I believe, it is still grown to some extent, and an oil-cake is made of the seeds for cattle.

To the traveler in the hill country of central and Southern California and western Arizona a familiar shrub is a species of wild plum with shining, ever-green, holly-like leaves (*Prunus ilicifolia*, Walp.), maturing in autumn an abundance of crimson or dark purple fruits in size and appearance like small damson plums. They are disappointing, however, in that they are almost entirely stone, though such thin covering of pulp as there is, is pleasant enough to the taste. It is an interesting fact in connection with the Indian's inventive genius that this fruit be-

USEFUL WILD PLANTS

came long ago one of his important food sources; though it was not the pulp but the apparently hopeless pit that was turned to principal account. Gathering the plums in late summer, the Indians would



spread them in the sun until thoroughly dry, when the stones would be cracked and the kernels extracted. These are bitter and astringent like acorns, and at first blush as unpromising as the uncracked pits themselves. When rid of that deleterious principle, however, the kernels are nutritious and diges-

WILD SEEDS OF FOOD VALUE

tible (by Indian organs, at least), and have always formed a cherished item in the native dietary, wherever the shrub grows. It is quite generally known by its Spanish-Indian name *islay*. Barrows, writing of this food,¹⁰ states that the kernels are crushed in a mortar, leached in the sand basket (presumably like acorn-meal) and boiled as mush; but an intelligent old Indian of Mission Santa Inés, one Fernando Cárdenas, who is familiar with the customs practised by Southern California Indians, has informed me that the process as observed by him was to put the unground kernels into a bag and dip the sack in hot water again and again, until the meats became sweet. They were then ground, fashioned into balls and eaten so with great gusto. As I have personally never seen either process, I record both for the curious to test for themselves.

It would seem reasonable to expect edible seeds of many of the wild members of the useful Pea family, which is abundantly represented in all parts of the country. As a matter of fact, few seem to have been found worth while even by Indians of the most catholic taste. The Groundnut, *Apios tuberosa*, has been mentioned in a previous chapter as

¹⁰ "The Ethnobotany of the Coahuilla Indians of Southern California."



HOG PEANUT
(*Amphicarpaea bracteata*)

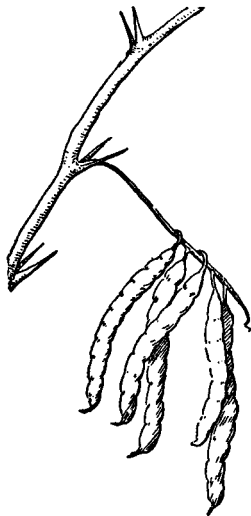
WILD SEEDS OF FOOD VALUE

having been utilized, both seeds and tubers; and something should be said of another leguminous plant popularly called Hog Peanut (*Amphicarpaea bracteata*, Nutt.). It is a slender vine with trifoliate leaves, the stem clothed with brownish hairs, and is frequently met with in damp woodlands and thickets throughout the eastern half of the United States. In late summer it is graced with small bunches of pale purple or whitish pea-like blossoms, pendulous from the leaf-axils, while from near the root solitary, inconspicuous flowers on thread-like stems put out and bury themselves loosely in the ground, or creep shyly beneath a covering of fallen leaves. The showy upper blossoms are mostly abortive, though a few manage to develop short pods containing three or four small purple seeds apiece, edible when cooked. Of much greater worth are the subterranean seed-vessels which bear a single large pea, in each. These peas are quite nutritious. They are mature in September and October, but retain their vitality throughout the winter, so that they may be dug even in the spring if one knows where to look for them.

The most valuable of all our wild legumes is doubtless the Mesquit-bean, the *algarroba* of the Mexicans. It is the product of a well-known tree

USEFUL WILD PLANTS

(*Prosopis juliflora*, DC., and its varieties) abundant throughout the arid region on both sides of the Mexican border. It is, indeed, the characteristic tree of the Southwestern deserts, giving to those



MESQUIT
(*Prosopis juliflora*)

gray wastes touches of living color very grateful to the eyes starving for the sight of a really vivid green. The pods, in shape and size resembling string beans, are produced abundantly in drooping clusters, which, ripening in late summer, become lemon yellow. The juicy pulp, in which the hard, bony seeds are embedded, is exceedingly sweet, containing, according to Havard, more than half its weight of assimilable nutritive properties, of which sugar is

in the proportion of from twenty-five to thirty per cent. All stock thrives on the pods, and it is on this account rather than on any appeal to his own stomach that the white man's regard for them is grounded; but upon the Indian, who has ever a sweet tooth, they have a strong claim as human food. There is before me, as I write, a jar of coarse mesquit



MESQUIT
(*Prosopis juliflora*)

USEFUL WILD PLANTS

meal, and it is as cloyingly fragrant as so much molasses. Mr. Edward H. Davis, of Mesa Grande, California, to whom I am indebted for the specimen, writes concerning it :

“The mesquit meal is used to-day by the desert Indians the same as centuries ago. The pod is pounded up in wooden mortars made from the mesquit-tree trunk hollowed out by fire and set firmly in the ground. A long, slender, stone pestle is used to pound with. The beans are so brittle that enough for dinner can be prepared in eight to ten minutes. The meal is mixed with water and eaten so, being sweet and nourishing. The edible part is the pulp of the pods only; the seeds are not digestible by either man or beast, but will pass through the digestive tract unchanged. However, by pouring warm water over the seeds a sweetish, rather lemon-tasting drink is made and much relished by the desert Coahuillas.”

The Pima Indians of Southern Arizona formerly used mesquit meal as a makeshift for sugar, mingling it with their wheat or corn pinole to sweeten the latter.¹¹ The raw beans picked from the tree may be chewed with enjoyment and some nutritive profit,

¹¹ John Russell Bartlett, “Personal Narrative of Explorations in Texas, New Mexico, California, etc.” Vol. II: 217,

WILD SEEDS OF FOOD VALUE

as one travels. The quality of mingled acidity and sweetness which they possess before perfect maturity acts also as a thirst preventive, much as do the pods of the carob-tree of the Mediterranean basin. Indeed, the Spanish term *algarroba* applied in Mexico and our Southwest to the Mesquit bean, is a case of transference, *algarrobo* being the word used in Spain for the carob-tree. A feature of the Mesquit-bean, by the way, to be reckoned with, is the fact that the pods are a favorite resort of a species of pea-weevil (*Bruchus*) for the deposit of their eggs. As a consequence Mesquit meal is particularly liable to infestation by these small beings to a degree that is somewhat of a shock to white sensibilities, though the Indians are indifferent to their presence; yet, I suppose, after all, it is no worse than skippers in over-ripe cheese, which some white epicures delight in.¹²

The Mexicans make a sort of gruel, called *atole de mezquite*, by boiling the mesquit pods, mashing them to a pulp in fresh water, and straining. A nutritious beverage is thus obtained, agreeable to some tastes. So altogether useful is the mesquit tree that it is not surprising to learn that it figures

¹² A useful by-product of the Mesquit-tree is a gum that exudes from the bruised bark and may be used for the purpose of gum arabic, which it much resembles.

USEFUL WILD PLANTS

in the folklore of some regions where it grows. In Mexico a curious tradition is current to this effect: Long before the Spanish Conquest, the Apostle Thomas, in his heavenly home, became interested in the Aztecs, and descending to earth appeared to them in the guise of the Mexican herogod Quetzacoatl and preached the gospel. The Aztecs heard the doctrine but coldly, and so San Tomás in most unchristian dudgeon departed, leaving the curse of sterility upon the plain of Anáhuac and turning all its cacao trees into mesquites, which remain mesquites to this day!

Closely related to the Mesquit-bean and of similar utility is the Screw-bean, called by the Mexicans *tornilla*. It is a curious, slender, spirally-twisted pod, borne in clusters, upon a small tree (*Prosopis pubescens*, Benth.) having much the same geographical range as the mesquit. The Screw-bean is even more sugary than the Mesquit-bean, and it may be made by boiling to yield a very fair sort of molasses. Water in which a small quantity of the meal is soaked makes a palatable and nutritious beverage. In making Screw-bean meal, the Indians grind the whole pods, seeds and all.