

ATLAS OF MEDICINAL PLANTS OF MIDDLE AMERICA

BAHAMAS TO YUCATAN

JULIA F. MORTON,
D.Sc., F.L.S.

Director

Morton Collectanea

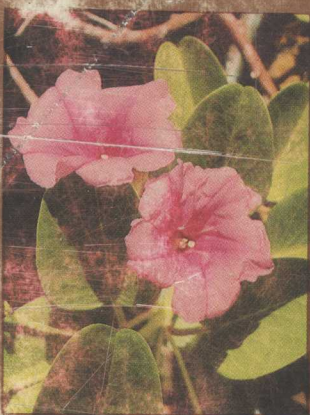
University of Miami

Coral Gables, Florida

This atlas is unequalled with respect to scope, currency and validity. Based on the author's own far-reaching experience as well as on the widely scattered literature, the book constitutes a definitive reference on Middle American medicinal plants for all professionals interested in botany, pharmacognosy, folk medicine, and related areas.

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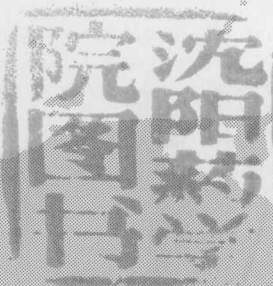
MIDDLE AMERICA

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By

Julia F. Morton, D.Sc., F.L.S.

*Director
Morton Collectanea
University of Miami
Coral Gables, Florida*



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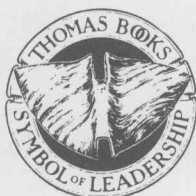
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*A tribute to my brothers,
George Nelson McHugh and
Martin Stephen McHugh,
my models of fortitude*

WEST INDIAN WEED SONG.

Taylor's Version.

1. One day I meet a old woman selling, and I wanted something to eat
I thought I could put a little bit in she way, but I take back when I did meet.
I thought she had bananas, orange or pear, nothing that I need,
I asked the old woman what she was selling, she said she was selling weed.
2. She had she coat tie up over she waist, and was stepping along with grace,
She had a pair of old clogs on her feet, and was waddling down the street,
Just then she start to name the different weed, and I was really more than glad,
I can't remember all she call, but these were a few she had.
3. She had the Manpeabber, Womanpeabber, Tan-tan, Fall-back and Lemon-grass,
Minnie-root, Gully-Root, Granny-back-bone, Bitter-tally, Lime-leaf and Caroon,
Coolie-bitters, Cariella-bush, Flat-earth and de Iron-weed, Sweet-bloom, Foul-tongue
and the Wild-daizzie
Sweet-sage and even to you.
4. She had de Cat-mint, de Pepper-mint, Soldier-rod, Pastee-lena and de Cow-foot bush,
Milk-weed, Fit-weed, Bird-vine, de Bishop-cap-bush and de Rock-balsam,
Surinam bitters, de Wild-green-tree, Three-fingers and the Wurum-bush,
A worm-grass, Z-grass, Man-grass, Carron-crow, Snake-bitters and also Tezzan.
5. She had de Cassava-mama, Okra-babba, Jacob-ladder, mixed with Finegona,
Job-tea, Peter-parslee, John-Belly-parslee and the White Clary,
Bill-bush, Wild-cane, Duck-weed, Aniseed, War-bitters and Wild-grey-root,
She even had down to a certain bush Barbados call Puss-in-Boots.
6. When I hear the names she call, I went down, can't even talk,
She start to call from Camp Street corner, never stop till she reach Orange walk,
The woman had me so surprise, I didn't know what to do
Till a girl come along, one cuff in me eyes, and I didn't know who was who.
7. Sweet-broom, Sweet-sage and the Lemon-grass, I hear them good making tea,
When I hear Dutch-grass, and the Wild-daisy am good to cool the body.
Yes the Woman-tongue was even listed, calling out all the time,
She only had a little Congo-eye, but the other one now left blind.
8. She had Tansa-bitters, Pumgranate-bark, Congo-cane, de Pear-leaf, de young Bizzie-
bizzie,
Young Grape-vine, Back-pain, Stinging-nettle, Do-ra-me bush and de Broad-leaf
thyme,
De Mimosa-leaf with the Evergreen-seed, Bitter-fence, bitter just like gall,
Doctor Doodles squashy bitters, and the Anamus grass, Snake-bitters and dat didn't
even all.
9. She had de Bitter-gumma, Potta-demma, Congo-lalla and the Creva-cot broom,
Stavilla, Wild-samatoo, Sour-sop leaf, and the Half-of-it weed,
Cool-de-body, Sweet-mint, Porter-bush, White Clary and de Xmas bush;
Cat-tongue, and even the Monkey-ladder, and this the rest you may need.
10. She had de Pap-bush, Elder-bush, de Black-pepper bush, French-to-you and de
Cure-for-all,
Sapodilla, Tamarind-leaf, Money-bush, and de Soldier-parsley,
Pumpkin-blossom, with the Double-do-me, and Congo-pumps in galore,
Physic-nut, and even the Lily-root root is the list of her every day soup.

Foreword

Mankind has been on the earth for five million years in Ethiopia and northwestern Kenya, but it was not until we had the record of Neolithic hunters and gatherers of about 10,000 BC that we knew they collected plants for medicinal purposes. It was undoubtedly by trial and error that they found certain were beneficial for their health. Usually it was the women who knew about such medicinal plants.

In modern times, the women in Mexico are known as *curanderas* due to their great knowledge of plant properties and methods of preparation. For example, Maria Jesus di Ayala of Tepoztlán, near Cuernavaca, was a *curandera* famous for curing tuberculosis in its early stages. Patients came to see her from many miles away. Maria would listen to each chest to determine the breathing pattern. If the lung disease was too advanced, she would send the patient away, telling him to consult a Spanish-speaking doctor. Otherwise, she wrapped the patient in a blanket and placed him in a brick chamber covered with heated stones to make him perspire. The patient remained in this chamber about ten minutes, after which Maria's sons pulled him out. This was a critical period, as the patient could easily develop pneumonia at this point. The blanket was changed and the patient was carried into a room in an adobe hut. Each hour he was given a concoction of herbal (*Nah. Tsontzonton*) tea, which caused him to sweat more; each hour the blanket was changed. After four days of this treatment, the patient was usually better, experienced little coughing and could walk home. Folk medicine was practiced in this manner in this small village whose inhabitants spoke Nahuatl upon Cortez's arrival in Mexico.

Looking back, we know that ancient man lived a short life, rarely more than fifty years. The incidence of infant mortality was high, possibly higher than anywhere in the world today. I know that Bedouin mothers in Arabia today expect four out of six children born to them to die before their first birthday. On the other hand, the people of Abkhazia in the Caucasus, the Hunza of North Pakistan and the Indians of Vilcabamba, Peru, include many centenarians of both sexes, and a few individuals more than 120 years old are reported living in Anatolia. When I was in Sukhumi on the Black Sea, I saw photographs of old men and women whose ages ranged from 110 to 137. The Director of the local museum where the photographs were exhibited became furious when I questioned him, saying, "If you want to see a man ninety-nine years old, I will take you down the street to meet him. His father also lives there!"

The questions and problems that may arise when the human lifespan is lengthened must be dealt with by future societies. In the meantime, the large United States drug companies have agents scouting the world for plants to improve medical remedies, and researchers are experimenting with native plants from all corners of the world in their laboratories.

I recall one amusing incident regarding this search. Some years ago, Dr. William H. Sturtevant of the Smithsonian Institution was asked by Secretary Dillon Ripley to collect medicinal plant specimens from the Seminole Indians in the Florida Everglades. Dr. Sturtevant located the son of a Seminole witch doctor, who, for a small sum, agreed to supply him with medicinal herbs, which he would bring to the Miami Airport each month for shipment to a pharmaceutical laboratory. For twelve months the herbs were shipped, but the laboratory could detect no medicinal benefits from any of the plants. Finally, Dr. Sturtevant traveled to Florida again to talk to the witch doctor's son in the Big Cypress Swamp. He told Dr. Sturtevant that he had tried faithfully to do his job. When Dr. Sturtevant asked him what happened if he could not find a particular plant required for the recipe of a decoction, his reply was, "It doesn't matter. I breathe on the decoction and chant a prayer and it works all right." This explained why the laboratory's tests were unfruitful!

In my own case, in 1934, I collected useful plants and drugs of Iran and Iraq and gathered data, which were published with the help of Dr. David Hooper of the Wellcome Historical Medical Museum in London. The specimens were collected at the request of my Chief Curator of Anthropology at Field Museum of Natural History, Dr. Berthold Laufer, who at that time was writing a book entitled *Irano-Sinica* to complement his earlier great work, *Sino-Iranica*. When I reached Moscow on my way home, I learned that Dr. Laufer was deceased. As a result, it was necessary to find someone else who could identify the plants I had collected. The Director at Kew Gardens told me that Dr. Hooper was the only man for the job. Dr. Hooper agreed to study them, and in due time, I received his manuscript, which incorporated my medical notes with his determinations on each plant. Our joint publication was called *Useful Plants and Drugs of Iran and Iraq* and was published in 1937 by the Field Museum of Natural History, Botanical Series, Vol. 9, No. 3, pp. 71-241.

In addition, I collected useful plants in Dhahran and Riyadh, Saudi Arabia and in Dubei on the Pirates Coast, now called the Arab Emirates, as well as in an area near Karachi. My main collection, however, was from Tepoztlán, Mexico, published in 1953 as *Notes On Medical Plants Used in Tepoztlán, Morelos, Mexico*, in *America Indigena*, Vol. 13, No. 4, pp. 291-300.

Dr. Julia Morton has collected medicinal plants widely in Middle America, from northern Venezuela, through the West Indies and the Bahamas, and in Central America and the Yucatan Peninsula, recording their uses by both botanical and vernacular names. She has assembled data in a practical tabular form on the properties and effects, including toxicity, of each specimen, numbering more than 1000.

Dr. Morton has studied her vast collection of plant literature in the Morton Collectanea at the University of Miami and has published many books and articles. This huge atlas will long stand as a tribute to her industry and researches.

Henry Field

Introduction

Over the past fifteen years, my field investigations* have required the exploration of folk-medicine practices in several Caribbean islands, northern South America, Central America, southern Mexico and coastal South Carolina. In most areas, it is plain that current uses of plants are an amalgamation of African, European and American Indian customs, embellished by experimentation with and adoption of novel local materials. In the French West Indies, there are obvious influences from Southeast Asia (formerly French Indochina) [note *Eupatorium ayapana* and *Centella asiatica*]. And ties with India are most evident in Trinidad.

In the course of field work across northern Venezuela and in Panama, Costa Rica, Guatemala and Yucatan, I found a great diversity of fresh and dried plant materials displayed and sold by vendors in the public markets and along the curbs of adjacent streets, as well as in special shops—*hierbaterias*.

The folk remedies employed throughout this entire area, whether purchased or found readily at hand, fall roughly into three classes: (1) certain well-known European medicinal herbs (such as rosemary, borage and marjoram) introduced by the early Spaniards and still commonly cultivated; (2) indigenous wild and cultivated plants, the uses of which have been largely learned from the Indians, some being collected locally, others brought down from the Andes; and (3) ornamental or other plants of relatively recent introduction, for which “curative” uses have apparently been invented without any historical bases.

Dr. Erwin Dieseldorff, writing on the medicinal plants of Alta Verapaz, Guatemala, said that “the Indians experiment with plants they don’t know, sometimes with bad results for their patients and themselves.”¹²⁴ Steggerda, taking a critical view in Yucatan, stated, “The art of healing among the Maya is a precarious procedure at best, for the Indians know little or nothing of modern medical practice and their own brand of medicine is a mixture of folklore, superstition and herbal concoctions . . . [They] recommend treatments which they have learned from practice, from other herb doctors, or from their own patients.”⁵⁰¹

A fourth category of remedies includes some commonly available fruit, vegetable and other natural products used for self-medication by middle and upper classes who shun the native “herb” markets.

Dieseldorff said that “Most of the medicinal plants [of Alta Verapaz] have been discovered by the people and adopted by the medical profession after testing in hospitals.”¹²⁴ Old-time physicians and pharmacists sometimes had to seek out local substitutes for temporarily unobtainable pharmaceuticals—for example, dogwood (*Cornus florida*) in the southern United States³²⁸; nicker nut (*Caesalpinia bonduc*) in Mexico and the Caribbean³⁰¹; or “anything bitter” in place of quinine; the wild

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Krameria ixina in Curaçao in place of imported rhatany (*K. triandra*) as an astringent.²²¹

Most of my South and Central American surveys took place in the fall and winter. It is reasonable to assume that, at the same stalls, visited at a different season, one would encounter some additional plants, especially those that are not abundant at any time and may sell quickly. It is the prevailing custom, however, to display and sell fresh plant material (which the people love for its fragrance, beauty and lushness), and any surplus is allowed to dry and is kept as reserve. Thus, there exists, behind, around and above each stall, a constantly growing “warehouse” of plants of past seasons, and when I search through these accumulations I usually find just a repetition of current stock. There is little deliberate drying of folk-remedy plants, except where the native markets have been modernized by municipalities and one sees signs of sophistication such as the sale of dried and fragmented dual-purpose flavoring-and-medicinal herbs in plastic bags. I may have missed some species but, at least, I can say that of the 108 species collected in my survey from Caracas to Maracaibo, 35 are plants not reported by Pittier, Schnee, Albornoz, Chiossone, Ernst, nor, to my knowledge, any other authors as folk remedies of Venezuela.³²⁴

Generally, the buying and selling of folk-remedy plants still flourishes despite transplantation of some markets into great concrete conglomerate-market structures, except in certain tourist centers, where I believe there may be official efforts to suppress the trade. In the central markets of Mérida, Yucatan, for example, there are no great displays. Women flower vendors have a limited number of fresh herbs tucked in between their buckets of blooms as a sideline, and these are plants used for female medical problems. Scattered inconspicuously here and there between fruits and vegetables on the widespread maze of counters, one finds little groups of just two or three specialties. Only one man has a separate medicinal plant display—mainly tobacco leaves with a few other items—and just on weekends. In Cozumel, medicinal plants were not in evidence in the market at all, though plentifully visible in home gardens and on roadsides. I was reminded of Aruba, where the government discourages folkways, hoping to present a modern face to the visitor.

On North Caicos, one local plant expert told me that he used to practice bush medicine, but now it’s illegal to do so “and we just treat ourselves.” This is the state of affairs also in the Bahamas. A young woman on North Caicos told me how she became plant-wise. When she was a girl and her mother had to go out to work, she was left in charge of her younger brothers and sisters. To teach her how to care for them, the mother would bring a plant into the house and show her how to use it. The next time it was needed, the girl was sent out to get it, and later she depended on the same plant remedies in raising her own numerous children.

In most Latin American cities, there is a gap between the scientific community and the native vendor. The University staff and other professional people do not frequent the markets and, though some have an interest in medicinal plants, they have not made themselves familiar with their local resources. For my part, I enjoy a comfortable relationship with the vendors and find them all kind, informative and patient, the only problem being the lively trade, the steady stream of customers who interrupt but who often contribute bits of information as well.

The vendors are always eager to add to their own store of knowledge. An herb

lady in the Central Market of San José, Costa Rica, during a lull, showed me a little booklet—*Medicina Herbaria: 34 Yervas Caseras, Extractos de Medicinas Natural*—by Professor Blas Gracia Alcover. There was no publisher's imprint. She pointed out the names and descriptions of various plants and claimed that the booklet was very good, but I saw that the SALVIA was *Salvia officinalis* and not the local SALVIA (*Pluchea odorata*); the booklet included flax (*Linum usitatissimum*) and other European plants, so it is a foreign product and misleading when the Spanish names of certain European species are the same as those applied to unrelated local plants.

Medicinal Plant Uses

My collection and identification of specimens from the wild, from home gardens and, most of all, from native markets, and gathering information on their uses, has revealed certain common concepts and patterns of usage in all areas. Primary, of course, is the universal employment of astringents (mainly tannin-rich plant parts) for the control of diarrhea, dysentery, hemorrhages, sore throat and hemorrhoids, for application to ulcers, tumors and skin diseases, and to prevent abortion—the relation between cause and effect being quite clear.

There is standard use of aromatics (basil, melissa, sweet marjoram and various spices) as digestives and carminatives; of grasses and cucurbit seeds as diuretics; of urinary irritants as aphrodisiacs; and the highly irritant, purgative and sudorific as treatment for venereal disease. There is obvious logic in the employment of certain plants or plant products in measured dose to achieve the degree of action desired: stimulation of menstruation, promotion of labor or expulsion of fetus.

But there is still a holdover from the "Doctrine of Signatures" evident in the certainty that deep red decoctions will enrich the blood. This belief is attached in the Bahamas and Caicos Islands to the infusion of the wood of *Caesalpinia reticulata*, to the combined infusion of the barks of *Bourreria ovata*, *Swietenia mahagoni* and *Bursera simaruba*, and to the decoction of the roots of *Leucaena leucocephala*, all a rich red in color. I have noted that plants with yellow flowers (such as *Cochlospermum vitifolium*) are conspicuous among remedies for jaundice. Decoctions of the yellow flowers or deep yellow flesh of the squash and pumpkin are also recommended against this malady. In Guatemala, *Clidemia setosa* is believed to overcome sterility in women because of the testicle-like pair of sacs at the base of the leaf blade.⁴⁹⁰

In Cuba, the infusion of *Peperomia pellucida* is believed to be good for the heart because the plant has heart-shaped leaves. In San Felipe, Venezuela, the decoction of *Achyrocline satureioides* is said to overcome impotency, and this is doubtless a superstition based on the "everlasting" character of the dry flowers.

Gines et al. point out that the Indians of the Perija region of Venezuela use plants of the open plains as remedies for sunstroke on the premise that plants that can tolerate full sun must have the ability to relieve those who suffer from excessive exposure. It seems to me from a perusal of their book that the most common remedies for these Indian fishermen are treatments for sunstroke and seasickness, but the authors' collaborator, Dr. Luis Carbonell, noted that the most frequent illnesses of the Chaké were digestive and respiratory. Diarrhea, and also dysentery, he attributed to the lack of hygiene in the preparation and consumption of food, the utensils

being unclean, and fruits, often overripe, being picked up from the ground and eaten without washing. In many cases, these Indians merely bathe with a plant decoction to relieve ailments¹⁷⁴; I found this Indian practice reflected in the ways of the people of Coro, Venezuela, the vendors often informing me that a plant is used for bathing and drinking (*bañar y tomar*) or for bathing only.³²⁷ The Indians of the Perija region bathe with plant decoctions for superstitious reasons also, especially to improve their marksmanship or promote good luck in hunting.¹⁷⁴ To the Maya, certain numbers are considered important, 9 especially. "Many concoctions call for 9 leaves of a plant, or 9 drops of a medicine..."⁵⁰¹ The reader will note that in certain cases in Curaçao, plant remedies are taken for 9 days in succession, though 7 occurs in some recipes.

When I first introduced the topic of domestic plant usage in a conference with the physicians of Curaçao, they were quite amazed and said, "Oh, you mean when they are sick?" This query expresses a limited view of folkways, for I dare say that the consumption of bush teas may be greater in the wishful enhancement of, or thwarting of, natural functions than in the actual treatment of illness. Therefore, the terms "folk medicine" and "folk remedies" are inadequate to convey what is really going on. Inasmuch as cohabitation and procreation are prime preoccupations in the underdeveloped societies, there is habitual use of aphrodisiacs, emmenagogues, bush teas throughout pregnancy, and others to "clean out" and restore vitality thereafter. These are not considered medicines and may be completely missed by epidemiologists and other surveyors.

Medicinal plants are often carried from island to island or elsewhere. On one visit to the Curaçao market, I was surprised to find *Vernonia menthaefolia* being sold under its Cuban name, ROMPEZARAGUEY. This is not a Curaçao plant. It was probably being grown by a Cuban who brought it to Curaçao, just as it, and various other Caribbean plants, have been introduced into southern Florida and are grown there by West Indian residents for domestic use. (Throughout the United States today, Latin residents are ingesting decoctions of plants brought in by themselves, their friends or relatives.) In Aruba, I learned from a hotel maid that she had worked fifteen years in Curaçao, where *Lippia alba* (OREGANO) is very popular. She brought a plant to Aruba for her aunt's garden. Friends have grown plants from cuttings of this one. It is also grown by the Colombian wife of an Aruban. She taught the family to drink the decoction as a stomachic.

Rarely a plant has come into use by mistake, because of its vernacular name. In Bonaire, *Desmanthus virgatus* is erroneously believed to be the same as the WATAPANA SHIMARON (*Acacia glauca*) of Curaçao, and it is therefore used in the same ways. In Curaçao and Coro, the decoction of *Krameria ixina* (CADIA DEL PERRO) is commonly consumed in the belief that it is the same as the CADILLO DEL PERRO much prized in Maracaibo as beneficial to the liver. They tell the same story about restoring a dog's liver by soaking it in the decoction after it had been buried for several days, but the plant of Maracaibo is actually the wholly dissimilar, innocuous *Urena sinuata*.

Literature on Medicinal Plants of Middle America

I have sought out and acquired over the years numerous articles, booklets and books on medicinal plants of the geographical area to be covered. For the sake of

other investigators, it is necessary to point out strengths and weaknesses of some of this literature and samples of fallibility. Among the best examples of valid reports of first-hand investigations are Wong's "Some Folk Medicinal Plants from Trinidad"⁵⁵⁷ and Steggerda's "Some Ethnological Data Concerning One Hundred Yucatan Plants."⁵⁰¹ They are concise but careful to tell us the part of the plant used, how it is prepared and the ailments to which it is applied. Steggerda also mentions nonmedicinal uses as well. In contrast, Oakes and Morris, who reported on a largely first-hand inventory of 59 plants sold by "weedwomen" in the Virgin Islands, tabulate their uses but without specifying the parts used and give no hint of preparation.³⁷⁰

Often a reporter is inaccurate as to the part of the plant employed. It is a common error to use the word "leaves," though it should be known that the general practice is to employ the whole aboveground herb, or leafy stems or branch tips, not just the leaves, unless these are large leaves of trees. Nonbotanists have the most difficulty in identifying plants and plant parts. The anthropologists Halberstein and Saunders give a first-hand account of the "Traditional Medical Practices and Medicinal Plant Usage on a Bahamian Island,"¹⁹⁰ but their *Guaiacum officinale* should be *Guaiacum sanctum*; their *Acalypha godseffiana heterophylla* should be *Acalypha wilkesiana*. Their "leaves" of *Ambrosia hispida* should be stems and leaves. They say the fruit of *Melicocca bijuga* is eaten to alleviate abnormal blood pressure and other circulatory problems. Actually, it is the leaf decoction that is taken to relieve these troubles. In their discussion of the prickly pear (*Opuntia stricta*), they say "boiled leaves taken for alimentary disturbance." The leaves of prickly pears are mere deciduous bracts. What is meant is the "joint" (flattened branch); and it is also the joint, not the fruit, that is sliced and applied on arthritic and rheumatic places. In addition, it is the joint, not the "crushed plant" that is used as shampoo.

Frequently, in reporting uses, the word "infusion" is employed indiscriminately, regardless of the fact that most plants or plant parts are boiled and the product is a decoction. An infusion results when the plant material is merely steeped, not boiled, and the local people are usually careful to stipulate an infusion when a decoction would be too strong. As they say in South Carolina in reference to steeping plant material, "you draw it." Gines et al. provide an example of unconsciously inaccurate reporting under *Heliocarpus americanus* where they state (in Spanish), "The Indians boil its bark and leaves, thus preparing an infusion which is drunk against constipation."¹⁷⁴

The language of folk medicine is often poorly understood by field workers. The word "stomach" often refers to the intestines—as it does in the common expression "stomachache." The complaint that the "stomach is running off" means that one has diarrhea. To "check the stomach up" means to stop diarrhea. It intrigued me to find these expressions shared by the South Carolina Low Country and the Bahamas and Turks and Caicos Islands, the result of interchange of plantation ownership and slaves in times past.³³⁴

Perhaps most people realize that "bad blood" refers to syphilis and a "blood purifier" is taken in hope of treating this malady. Less familiar are phrases such as "cold in the body," which must be interpreted as leucorrhea. The expression is based on the vaginal discharge as suggesting the discharge from the nose or through the mouth when one has a cold in the head or chest. By "heat" is meant urinary

burning. "Bearing down" denotes the presence of hemorrhoids, not muscular stress during labor. A "weak back" indicates incontinence of urine. "Strain," or "man's strain," or "strain in the loins" (or, as one inexperienced researcher reported, strain "in the lines" or "weakness across the lines" [Cfr. Eldrige,¹³⁹ *Coccoloba diversifolia*, *Colubrina arborescens* and *Malpighia polytricha*]) refers to gonorrhea, not hernias from lifting. A potion taken to "build up energy" or enhance "man's nature" is an aphrodisiac. Some field workers, unaware of the true meaning, take the word "energy" literally, as do Halberstein and Saunders in relating that the berries and leaves of *Eugenia axillaris* "are eaten to build up energy and physical stamina; known to be a source of quick energy."¹⁹⁰ [The berries are eaten as food; the leaves are probably not eaten but used to make a decoction.]

Fallibility of the literature is also evident in the extent to which writers have been prone to "pad" their publications by copying from their predecessors without establishing applicability in the regions that their writings purport to cover. There are various instances of this in Nuñez Melendez' *Plantas Medicinales de Costa Rica y su Folclore*.³⁶⁷ His paragraph on medicinal uses of the peanut (*Arachis hypogaea*) is just a slightly rephrased and shortened version of the "Aplicaciones" in Roig y Mesa's "*Plantas Medicinales, Aromáticas o Venenosas de Cuba*" which are attributed to Grosourdy's "*El Médico Botánico Criollo*" [1864] by volume, page and item number. When presenting the uses of *Tamarindus indica*, Nuñez Melendez' mention of the decoction of the bark as employed against asthma and amenorrhea and that of the leaves as used against worms and gastrointestinal disorders is easily recognizable as a "lift" from Roig y Mesa without recognition of the fact that the latter is quoting from Standley's *Trees and Shrubs of Mexico* (Vol. 23, Pt. 2, p. 412) in regard to these uses in Madagascar. In other instances, Nuñez Melendez has used verbatim extracts from Manfred's *7,000 Recetas Botánicas*, published in Argentina in 1947,²⁹⁷ without citing the source, and these uses cannot therefore be taken seriously as uses prevailing currently in Costa Rica. In truth, the publication in question appears to be largely compiled from the literature. In my first morning in the public markets of San Jose, I purchased bundles of plant material of twelve species, conspicuously displayed, which are not included in the book. Several more omissions were acquired in subsequent market explorations. In Nuñez Melendez' other publication, *Plantas Medicinales de Puerto Rico*,³⁶⁸ one can point to the same kind of copying without citing the source, and this casts doubt on the applicability of the material to Puerto Rico. As just one example, the therapeutic uses of *Myrospermum frutescens* are drawn from Roig y Mesa⁴¹⁷ (p. 358), who has drawn them, admittedly, from Grosourdy.

Duke personally collected specimens and information on which his *Darien Ethnobotanical Dictionary*¹³⁴ is based, but he has embellished his material freely with uncredited excerpts from the literature, especially Irvine's *Woody Plants of Ghana*.²²³ Easily recognizable examples are to be found under *Mimosa pigra*, *Symphonia globulifera* and *Pentaclethra macrophylla*. In the latter case, he has erroneously shown the African species. The Central American species is *Pentaclethra macroloba*. In using Duke's publication, one must remember that, unless the author specifically states that the plant is used by the local people (Indians, Negroes or other ethnic groups), the uses may have been drawn from extraneous literature.

Roig y Mesa's work is comprehensive and highly respected, and all the plants included occur in Cuba, though many have no known medicinal use there. It is disappointing to find that species to which a page or two or even more may be devoted are not used in Cuba and the only information on use is drawn solely from Grosourdy (and is therefore quite obsolete) or from Drury's *Useful Plants of India*, Pittier's *Plantas Usuales de Venezuela*, Standley's *Trees and Shrubs of Mexico* or other literature. However, this author meticulously cites his sources and, accordingly, is not misleading. I have recently been told that this book has been reprinted in East Germany, and Cuban residents in Miami are eager to acquire it.

Plant Identifications

More than half of the species included herein are those that I have personally collected and studied, and most of these are represented by specimens maintained in the Buswell Herbarium of the University of Miami, with the exception of those that are very common fruit, ornamental or other plants abounding in southern Florida. Nearly all of the plants collected during field work have been identified by me, and any errors are mine alone. I turned to Dr. Robert Read, Curator of the Herbarium, Smithsonian Institution, for identification of *Pachyptera hymenaea*, and to Robert G. Stolze, Custodian, Pteridophyte Herbarium of the Field Museum of Natural History, for his best opinion as to the identity of the tree fern petiole which he suggests came from *Dicksonia gigantea*; also to Dr. Tobias Lasser of the Instituto Botánico, Caracas, for identification of the pieces of stem of *Aristolochia maxima*. Later I found this species growing in the wild near El Cinco, Venezuela, and gathered specimens of the vine with foliage.

John J. Fay, Curator of Botany of the Field Museum, examined my *Matricaria* specimen and assured me that it is *M. courrantiana* as treated in the *Flora of Guatemala*. He confirmed my tentative identifications of *Vernonia scabra* and *Helenium amarum*, the latter never before reported from Venezuela. He examined the *Taraxacum* plants as sold by Guatemalan vendors as two different herbs, DIENTE DE PERRO and AMARGON, and explained that, though the vendors make a distinction, the two are merely variations of the one species, *Taraxacum officinale*.

Scope of This Atlas

In order to create a comprehensive guide to medicinal plants known or reasonably assumed to be in current use in Middle America, I have added species from pertinent sources shown in the Bibliography. Technically, all of Mexico is embraced in the geographical definition of Middle America, but I have not attempted to include all the species covered by Martinez in *Las Plantas Medicinales de Mexico*,³⁰¹ which was originally based largely on the writings of Hernandez (1570-1575), has gone through several editions and is still available. There is no way of knowing which plants have gone out of use without making an actual survey, and I cautiously discontinued mine with Yucatan to avoid amassing more information than I could handle or could be published in a convenient form. Of course, a great many of the plants utilized elsewhere are also employed in Mexico, and I have drawn upon Martinez and Standley for Mexican applications of these species.

I had no intention of covering all the plants dealt with by Garcia Barriga in his three-volume "*Flora Medicinal de Colombia*,"²¹⁶⁶ since my range takes in only

northern Colombia as part of that coastal and adjacent inland strip of South America which has more in common with the offshore islands than with the rest of the continent. I did not add species from Roig y Mesa, blending in his remarks only as to Cuban uses of species already derived from my own observations or the reasonably recent field reports of others. Had it been feasible, I would have preferred to make a present-day inventory of medicinal plants in Cuba.

Perhaps I have been too fastidious. With the World Health Organization's appeal to developing countries to encourage folk medicine in order to offset the shortage of physicians, one may assume that virtually all plants that have been advocated in the past will be brought back into circulation, whether or not they have been screened for effectiveness or capacity for producing harmful consequences. Enthusiasm for recommended "cures" is easily aroused, but precautionary advice is not so easily communicated.

I should emphasize here that this book is not meant to be a catalog of plant materials recommended for use, and it is not intended to promote their use. It is offered as an identification guide for those who wish to investigate the currently accepted or potential usefulness of the species described, or the hazards that may be attendant upon their utilization.

Omitted are various spices, such as cloves, nutmeg, cinnamon, camphor and caraway, which are purchased in *boticas* and employed as carminatives, etc., but which are not obtained from local plants.

Plant Arrangement in this Atlas

I have grouped the plants by families, and these are arranged in the natural order favored by Marie Neal in her excellent work, *In Gardens of Hawaii* (Special Pub. 50, Bernice P. Bishop Museum, Honolulu 1965). I find this convenient because her book includes most of the families represented in this Atlas. There are only minor differences between the system she followed and that employed by Adams in *Flowering Plants of Jamaica*. Though some laymen object to family arrangement, they should realize that it brings together the plants most likely to have similar properties and physiological effects and thus is informative and helpful for everyone.

Within each family, the genera appear in alphabetical order and the species are alphabetically arranged under each genus, for quick finding and comparison by layman and professional alike.

Vernacular Names

Often a colloquial name is the only clue a stranger has to start with, and I have, therefore, felt it an important service to assemble all possible "common" names recorded throughout Middle America. Unfortunately, these are legion. Approximately 16,500 are listed in the Vernacular Name Index, despite the fact that I have deliberately refrained from including the names applied to these plants in India, the Philippines, Africa and other foreign countries where the plants are also utilized. I have omitted, too, names artificially concocted by botanists; for example, APETALOUS BURR BUSH (for *Triumfetta lappula*) and WHITE CORYMBOSE MORNING-GLORY (for *Turbina corymbosa*), which would never be adopted in common parlance.