Introduction

I guess all plants give ease in some way.

This guide centers on plants known to Appalachian herbalist A. L. Tommie Bass (whose practice is considered fully in volume 1*), but by additionally referring to analogous species—indigenous, naturalized, domesticated, and sometimes foreign to the United States—it has a broad coverage of herbs known worldwide. Many of these have had a prominent place in Western medicine. Relatively few are restricted to the United States; two hundred or so extend to the flora of Canada and Central and South America, and many more are found in Europe and elsewhere.

Two purposes of this guide are to record in detail the knowledge of herbalist Bass and to assess that knowledge in the context of historical usage and scientific, chemical, and pharmacological knowledge. In fact, the principal practical role of the guide arises because a large number of the herbs mentioned are now widely available through mail order and in health food stores, pharmacies, flea markets, and other outlets; further, they are very often recommended merely on the basis of their inclusion in a long list of undocumented uses in advocatory literature.\(^{1}\) The present account gives a sense of consensus usage in the past, evaluated by current knowledge and medical concepts that were once, but are no longer, fashionable. As such, the guide provides the potential user of an herb—as well as health care practitioners who may be called upon to give advice—an impartial framework to assess effectiveness and safety.

Unlike a number of recent publications, our outright criticisms of an herb's reputation are rare, for while the weight of scientific evidence may suggest ineffectiveness, data are too often incomplete—especially current knowledge of chemical constituents, physiological effects, and ethnobotanical considerations—to allow definitive conclusions. One value of the documented historical approach taken in the monographs is that in many cases it becomes clear which uses, out of a shopping list of suggestions still being published, have been the most popular. The monographs also sometimes provide corrections to the misuse of history found in recent writings, where the reputation of an herb is justified by historical “data” that cannot be validated.

When we commenced the project, we hoped that particular clues might emerge for chemical and pharmacological investigations into potential new drugs. However, while some clear suggestions for research topics can be found, the tenor of many accounts merely indicates some justification for usage as mild treatments (which does not suggest the presence of significant pharmacologically active constituents), or a sense that the reputations of some herbs are overstated, or at least beset with mixed messages about efficacy.

The monographs collectively provide not only an understanding of herbal medicine—its practical and conceptual features—but also insights into the more general story of fashions and fads that are significant parts of therapy. As facets of the story of therapy—professional and domestic—are unfolded, along with many botanical complexities, it becomes clear that treatment has long been an art.

\(^*\) Volume 1 is Trying to Give Ease: Tommie Bass and the Story of Herbal Medicine, which was previously published under the title Herbal Medicine Past and Present Volume 1: Trying to Give Ease.
SCOPES OF THE MONOGRAPHS

Ethnobotany and Ethnopharmacology

Volumes 1 and 2 reflect studies in ethnobotany and ethnopharmacology that focus on relationships between plants and man, and investigate and evaluate the use of drugs in their cultural settings. However, there is some debate over what to document about current usage of traditional drugs in order to make a record that will satisfy a range of interests. Many past accounts are of uncertain value because they give long lists of uses for each plant without attempting to indicate whether the data are hearsay, commonplace, or firmly based. This is perhaps unavoidable when information is taken from published reports, but many recent field studies are equally elusive.

It has been suggested that an ideal account, or “monograph,” of a medicinal plant should include (1) the plant (common and scientific names, infraspecific variation, habitat, availability of voucher specimen); (2) preparation of the medicine (plant part, collection, storage, preparation); (3) therapy (general and adjunct, disorder treated, kinds of practitioners, dosage regimen, route of administration, response to therapy, status of use); and (4) the patient (medical beliefs, community attitudes).

The monographs in this guide generally cover, first, Mr. Bass's verbatim information, compiled from many meetings with him; and, second, commentaries focusing, where relevant, on plant taxonomy, past uses and whether Bass’s knowledge has historical precedence, occasional comparisons with uses elsewhere and with related plants, and assessments of Bass’s knowledge in the light of phytochemistry, pharmacology, and the historical record. Where the monographs do not directly address such points as patients’ attitudes and the role of the placebo, relevant information has been summarized in the introductory sections or in volume 1.

Unfortunately, space does not allow comparisons with usages elsewhere, even though it is generally felt that detailed comparisons—including of closely related plants—in different locations would reveal activities based on pharmacological actions rather than on cultural factors. There is much to be said for this view, but careful and detailed attention has to be given to transmission of information and to theoretical ideas which are common to more than one culture.

Limited space also allows only occasional references to nonmedical uses. However, we hope enough is said—in the context of Bass’s intimate knowledge of nature—to emphasize that medicinal uses of plants are commonly just one aspect of a plant’s economic value to man, and hence man’s attitude to the plant. As seen in various monographs on “medicinal” plants used as foods, Bass appreciates that many plants, particularly vegetables, can serve as both food and medicine. His recollections suggest how he developed sympathy with the view that “while a garden feeds people, it also heals them.” The close association of foods and medicines merits comment not only because it contributed to Bass’s recent enthusiasm for selling some herbs as “foods,” but also because it illustrates scientific and cultural forces affecting the ways plants are used, and why some people believe that foods and medicines are inseparable.

The opinion that many foods have real therapeutic value (curing as well as preventing disease) was a conspicuous feature of regular medicine until the early twentieth century. Until around 1900, a physician’s armamentarium for treatment was always viewed as diet, medicine, and surgery. The reputations of various plants we consider—like chamomile, chicory, fivesinger, and plantain—at times rested partly on usage as a medicine or beverage, including as “diet drinks” to accompany medicines.

During the nineteenth century, attitudes
toward food plants changed, at least among the educated. Developments in chemistry that captured public imagination characterized food in terms of fats, carbohydrates, and proteins. This, with public sanction, tended to move consideration of food more and more into the realm of science: out of materia medica and clinical medicine and into physiological chemistry (especially the topic of digestion). By the early twentieth century, nutrition had become a specialist’s area of knowledge outside the mainline interest of physicians. Knowledge of the importance of vitamins in health and disease only partly returned the subject of nutrition and varied diets into the arena of clinical medicine, a return—which has accelerated in recent years—to what people often say is “common sense”; namely, that food and health go together.

The story of the common ground between food and medicine embraces theoretical concepts and empirically based knowledge that are often difficult to disentangle. Considerations, for instance, of “aliments,” or “nutrients,” have long been embodied in health advice and rules for maintaining health. While explanations for the rules sometimes embraced theories that foods alter blood in the same ways that many medicines do, it is often thought that the rules arose from empirical observations undertaken over a long period of time. Deciding on the respective roles of empiricism and theory is not easy; for instance, it is difficult to say whether sensory properties—once considered important in ascertaining therapeutic actions (see volume 1, chapter 1)—helped to determine that only the young shoots of poke should be eaten as a vegetable and the root taken as a medicine, or whether this was merely the result of experience with toxic effects. Bass knows, too, that the reputation of a plant as a food can depend on the mode of preparation; he considers that lightly cooked cabbage produces too much stomach acid or flatulence.

Although Bass has a fund of information and ideas on the healthfulness of vegetables and fruits—apart from their specific value for certain medical complaints—he has only recently begun to emphasize nutrition to his visitors; earlier, he had assumed that most had a good diet as long as they did not overcook greens. Nowadays, he wishes to share his knowledge—what he calls common sense—because of what he has heard about “junk food” and because he believes that his knowledge contains much Indian lore. He is attracted to Indian concepts that “medicine” or treatment, as a pervasive power, can be mediated in different ways which avoid absolute distinctions between food and medicine. Throughout the monographs, whose main sections we next outline, many other illustrations of man’s attitudes toward and relationships with plants can be found.

The herbalist’s verbatim comments.
Most studies on traditional medicine comprise information assembled, often indiscriminately, from diverse informants. A single source like Bass, with his unusually acute memory, is therefore of special interest. In many ways he has garnered and synthesized an entire community’s knowledge—certainly that of the “old-timers”—and he has subjected much of that knowledge to the experiences of himself and his visitors. Folks, he says, “often get things wrong.” While he has read a great deal about herbs, he tends to assimilate only the information which is compatible with or reinforces his existing knowledge. When he reads about a new plant or a new use for a plant for the first time, Bass generally “checks” it with his own experience before recommending it widely. Special weight can therefore be given to the credibility of his accounts, in contrast to much of the recent advocacy literature, which often indiscriminately pulls together information from the past, sometimes from the “panacea” phase of a medicinal plant’s history. It is, in
fact, of special interest that many past reputations have not reached him, which suggests that sometimes they may have little validity.10

Verbatim accounts (rather than summaries) offer the student of herbal medicine valuable data for various reasons. First, they provide original terminology so that readers do not wonder whether such terms as blood clots, high blood pressure, or hypertension are the words of informants or the interpretations of observers. Second, a context is often given for a particular reputation, such as strong local testimonials. A third reason is that verbatim accounts allow ready comparison of present practices with past reputations, which often raises questions about transmission of knowledge: why some persists and some does not.

Yet another reason for our often extensive accounts is to record Mr. Bass’s knowledge; it is clear to us that much of it will disappear with him unless it is preserved here. It is true that he has had some “apprentices,” but we believe that through them and their use of the health advocacy literature, the character of his herbal knowledge and practice—with its identifiable roots into the past and his own baseline of experience with nature—is unlikely to survive.

Authors’ commentaries.
The commentaries include botanical names and selected, commonly used synonyms, historical perspectives on usage, chemical constituents, physiological effects, and comments on Bass’s remarks. They are designed not only to provide an understanding of Bass’s knowledge and perceptions of a plant and why he uses or recommends it, but also to give a reasonably full account of the plant so that the information can have practical value for those using herbs or those in a position to advise on their use and how they may interfere with prescription or over-the-counter medication.

The plants. All plants tagged by asterisks have been collected on numerous field trips with Mr. Bass. Plants were gathered during the growing seasons of four consecutive years from favorite habitats near his home. Some were obtained within short rides into the mountains and valley, mostly within Cherokee County. A few collections were made just over the northwestern county line in Dekalb County.

The plants are listed alphabetically according to the best-known or a very well-known vernacular name. This seems preferable to using scientific names for headings, because it readily allows bringing together a “medical” group of plants; those that, as many herbalists say, “all act the same.”

Although vernacular names commonly apply to more than one species, the custom in many publications on medicinal plants is to use the name in singular form to cover a “group” of plants where close botanical and medical associations exist. On the other hand, when the plants are less closely related (that is, from different genera or possessing different medical reputations), the vernacular name in the plural is employed. The single-plural distinctions are, in some instances, subjective and open to debate, and they raise questions about the development of folk classification of plants, a topic considered in volume 1, where it was noted how Mr. Bass sees “families” of useful herbs. Singular and plural names provide an appreciation of different degrees of analogy at play. When, as in the case of many “brooklimes,” habit and habitat are the only common factors, it is not surprising that folk and scientific classifications are often at variance.

The innumerable synonyms for many plants not only raise thoughts about folk classification in general but also pose a question: Why do some names become more popular than others? It is often said that plants with many vernacular names have been widely known, but some of the best-known plants (e.g., angelica) have very few popular names.
The many cultural facets of the vernacular names listed cannot be explored, although the topic of plant names is of special interest to many people. Much of this interest lies in continuity and change, and for naturalized plants we start with English names used in the *Herball* of John Gerard, who took particular interest in vernacular names; italics indicate that the names are known to Mr. Bass. Additional names listed are those common in modern floras and older medical texts, and others with a medical connotation or known by Mr. Bass. The names given first for indigenous plants are frequently taken from B. S. Barton’s *Collections toward a Materia Medica* (1798), with those known to Bass italicized; others are well known in floras and medical texts, and some are little known but locally popular.

One feature of vernacular names is that whereas many are used very loosely by laypeople for a group of plants (e.g., bindweeds), botanists commonly employ them in a more restricted sense. This lack of consistency contributes to difficulties in evaluating past discussions on many plants.

A characteristic of most herbal practices is that herbs are gathered locally. There has been a great deal of discussion on differences, both small and large, in traditional practices from one region to another, and unquestionably a relevant factor is simply the availability of plants. The richness of medicinal plants in the Appalachian flora accounts for the description “crude drug capital of the world” and the long history of the commercial collection of Appalachian herbs. While Bass knows innumerable plants from the Appalachians, he has collected only about sixty regularly. The others he knows as alternatives or “fascimiles” to be used if the favorite medicines are unavailable. If one medicine does not “work” he is always ready to substitute another. Echoes exist of past attitudes toward the importance of being able to select from a large materia medica.

**Historical perspective.** The historical perspective in the commentaries not only documents many antecedents of Bass’s knowledge but also indicates the extent of long-term interest in a particular plant. This often suggests reasons for the depth of Bass’s knowledge on specific points. As we discussed earlier, professional medicine has been an important factor in sustaining lay knowledge; time and time again one sees a very close relationship between Bass’s knowledge and that recorded in onetime standard medical textbooks.

In contrast, much information given in recent herbal literature, despite claims to historical authenticity, has never been widely accepted. In fact, scientists who use the “historical approach” to identify potentially effective medicinal plants sometimes employ the historical record without sufficient discrimination. As the monographs make clear, the medical literature is full of sharp disagreements between one “authority” and another, and many uses were listed at the whim of a particular practitioner or author. By consulting a wide range of sources beyond the specific citations, we have tried to determine consensus opinion where it exists or existed regarding the popularity of the plants within regular and domestic medicine. Aside from printed textbooks, efforts were made to examine medical and popular journals as well as manuscripts such as medical student lecture notes.

Many plants employed by Bass are naturalized and commonly have uses extending back to classical times. To save space each account generally begins with information from Gerard’s famous *Herball*. Gerard provided much information from earlier writings on materia medica, such as those by Dioscorides, data from the oral tradition, and fresh observations. The influence of Gerard’s tome, widely used as a source for other studies and probably well known in the American colonies, was considerable. It, and the enlarged
second edition (1633) edited by William Johnson, helped spread Renaissance knowledge about medicinal plants and pointed the way to a more critical approach to drugs.13 Certainly, much revision of the medical use of plants took place after Gerard's work, particularly during the eighteenth and nineteenth centuries. In endeavoring to indicate the popularity of a plant in nineteenth-century America, we have relied on a series of generally critical authors, including B. S. Barton, W. P. C. Barton, E. Eberle, R. E. Griffith, L. Johnson, and R. Bartholow, as well as the U.S. Dispensatories. We indicate, where appropriate, whether or not indigenous remedies were promoted primarily by regular or by other practitioners.

Indigenous plants with uses similar to related European plants highlight questions about whether knowledge was acquired from American Indians, transmitted from the Old World, discovered independently by colonists, or a combination of these. Tentative answers will sometimes be given, although in most cases firm conclusions can never be reached. Indigenous plants without obvious European analogies raise questions about how medical uses were discerned by Indians, blacks, or whites, and whether new uses were developed from analogy with other plants.

When a plant has been widely used in regular medicine, it is generally recorded in the principal botanic/domestic medical literature. In the interest of saving space, reference to the latter is generally omitted unless additional pertinent information is recorded there. The thrust of much of the data is evidence of the dynamic relationship between herbal and regular medicine already considered.

Retrospective identification and its problems. Any comparison of medical uses recorded in the past with current practices raises vexing issues about the correct identification of plants. Recent remarks—made in the context of relations between academic botany and horticulture—raise relevant issues: "I am astonished by the fact that natural selection has not left a murkier trail of intermediate, connecting, divergent, ill-defined and misbegotten species, genera and families."14

It is, in fact, the apparent discreteness and orderliness of the vegetable kingdom that has enticed historians, botanists, and others to take up the challenge of identifying plants described in the literature prior to the general acceptance of the modern binomial nomenclature introduced by Linnaeus in 1753. Identification problems—especially for plants described in writings from ancient Egyptian and classical times to the late medieval period—are readily apparent, if only because of the commonplace use of vernacular names for more than one plant, the general lack of adequate plant and habitat descriptions and illustrations, and the need among commentators for an extensive knowledge of the flora of regions from which plants are described, as well as knowledge of evolutionary trends.

Retrospective identification, a difficult interdisciplinary area, relies much on earlier attempts and scholarship. These have to be used cautiously not because of inaccuracies when published (though some exist) but because of a host of revisions in nomenclature during recent decades. Whereas, even now, a new species may be named on the basis of a description and the deposition of a single herbarium specimen, more accurate descriptions of species in terms of variations within populations and geographical distribution follow the work of monographers using the current methodology of studying innumerable herbarium specimens supplemented by living specimens from the field, as well as chromosome counts and experimental studies.15 While recent developments from this approach indicate a greater awareness
of ecological variation and that immutability among generations of plants is not nearly so rigid as once thought, historians—employing archaeological and linguistic data and oral and written testimony—often infer that there is a considerable degree of constancy among plants employed in medicine. A recent discussion on medicinal plants in the writings of Theophrastus (c. 370–288 B.C.) seems to imply this: “Specific plants had names recognized throughout the Greek world, and where there is doubt, modern Greek sometimes preserves an essential work or core that helps key modern nomenclature.”

Certainly there are strong elements of constancy among generations of plants, and the average life span of a species is considered to be several million years. On the other hand, through an appreciation of geographical effects, mutations, polyploidy, and hybridization (sometimes perpetuated by apomixis—a specialized form of vegetative, that is, non-sexual reproduction), a new understanding of microevolution and the rapidity with which it can occur under certain circumstances has emerged. Variation within many species is reflected in much current terminology: chemical races, sibling species, microspecies, agamospecies, and aggregate species. Not all these terms have gained widespread acceptance—even though genetically determined variation is not disputed—in part because circumscribing and defining a species is, in some sense, a philosophical issue and hence open to interpretation in different ways. Consequences of variation, of special importance for anyone considering the historical record, not only open questions about past identifications but also questions about the extent to which hybridization and infraspecific variation exist nowadays (and existed in the past) and how they affect constituents.

Current knowledge—or rather the lack of it—generally makes it difficult to answer these questions with any precision. However, many of the monographs in this volume indicate whether or not varieties, subspecies, or cultivars exist, which may be relevant to understanding inconsistencies in the medical reputation of a plant, even though the specific effects of polyploidy, hybridization, and backcrossing in altering chemical constituents are far from clear in many cases. In part this is because gene changes affect enzymes, which, in turn, affect the formation of, for example, one alkaloid from another. Valerian, for example, occurs across Europe in a variety of polyploids—2n, 4n, and 8n—and this is considered to account for the recorded differences in medicinal value from one batch of roots to another. On the other hand, in the case of oaks, changes in tannin content as a result of hybridization—where an additive effect of the constituents from the two parents is postulated—may be inconsequential in the context of the imprecise methods of preparing such medicines as teas. Nevertheless, in general, possible effects of polyploidy and hybridization should be borne in mind where discrepancies exist in the stated activities or reputations of a plant.

While it is still correct to view a species as possessing a clear lineage from the earliest records to the present, the lineage should be viewed as a descending population (or gene pool) through a long, tortuous cylinder rather than a line of descent. For outbreeding species we can visualize occasional breaks between criss-crossing cylinders through which genes are exchanged by hybridization and backcrossing. An observer of species in the Roman world of Dioscorides transported in a time machine to, say, the British Isles of John Gerard (c. 1600) may well have found it easy to identify many plants described by Dioscorides; but equally he would have been bemused by portions of and occasionally all of a species population having unexpected sensory, morphological, or medicinal properties. Certainly this could have been the
case with plants cultivated or known to hy-
bridize readily; examples of the latter with
medical interest occur in the genera Amer-
lanchier, Crataegus, Rubus, Oenothera, and
Taraxacum.

The botanical nomenclature in the pre-
Linnaean literature we consulted needs spe-
cial comment, as do the botanical synonyms
listed. Each entry in John Gerard's Herball
(1597) included a list of names—Greek, some
from European languages, and English—
which implies a certainty of identification.
On the other hand, Gerard generally dis-
cussed plants in groups of two, three, four, or
more, and thus the names can often be seen
as group names, even though there are often
specific descriptive details (see, for example,
the couch grass monograph). With the help
of sometimes extensive botanical revisions
to Gerard's Herball by Thomas Johnson
(1633), later commentators writing
on plants from either botanical or medical
standpoints often felt confident in giving the
plants described in the Herball a revised pre-
Linnaean name or a post-Linnaean binomial
name. We have used influential writings by
Ray, Linnaeus, Woodville, Withering, and
Lindley to help identify the Gerard-Johnson
plants. This is supplemented by, for instance,
the studies of Jackson (1876), Gilmour (1972),
and Dandy (in Ray, 1973), and independent
assessments of Gerard’s descriptions.

Since the late eighteenth-century writings
of Woodville and Withering, new fieldwork
and new and revised taxonomy have led
to many scientific name changes, not all of
which have been generally accepted. Some
botanists, too, in ignorance of earlier work,
have given plants new names. Efforts since
the 1930s have led to the establishment of
the International Rules of Botanical Nomen-
clature, which are designed to reduce confu-
sion and contradiction. Nevertheless, many
plants are still commonly known by more
than one name not only in regional botanical
manuals and floras but also in the medical
and the horticultural literature. Synonyms
in much of the current world medical litera-
ture have been conveniently compiled by
G. Penso, and some of the most widely used
are repeated in the synonyms given for each
plant considered in the monographs; they fol-
low what is felt to be the commonly preferred
botanical name. Other selected synonyms
appear commonly in the older medical lit-
erature or in recent medical and botanical
writings.

Assessments of clinical value. Determining
the clinical value of a plant is difficult be-
cause of the many variables and uncertainties
at play. Not the least of these is the different
standards employed to assess efficacy, which
range from eradication of underlying prob-
lems to temporary relief of symptoms. The
latter includes “just feeling better,” which
may also be due to psychological or nutri-
tional benefits.

A complicating factor in understanding
efficacy is, of course, the placebo effect, not
only with respect to physiologically inert
herbs but also in those which possess some
pharmacological action. Any understanding
of placebo action (discussed in volume 1,
chapter 8) must assess data derived from the
methods of Western science and medicine,
even though many herbal medicines are still
employed within cultural frameworks alien
to Western scientific medicine. Simply to
provide a point of reference, it is necessary
to know if an herb possesses pharmacologi-
cal activity. Many of the monographs clearly
state that current knowledge of chemical con-
stituents offers sparse explanation for nume-
rous past reputations. Even when chemists
record constituents, rarely is the clinical sig-
nificance (or lack of significance) assessed.
Sometimes lists of constituents are mind-
boggling (as the 350 components in the vola-
tile fraction of banana).

On the other hand, we are almost certainly
ignorant of much potentially significant information, such as what might emerge from the growing interest in groups of chemicals once considered to have little significant effect (e.g., flavonoids and coumarins). Perhaps the way sesquiterpene lactones affect prostaglandins may be pertinent to feverfew’s reputation for treating migraine headaches. Other examples of physiological processes which may ultimately provide some explanation of reputations of certain medicinal plants, but where information is currently limited, include nonspecific stimulation of immune systems (possibly relevant to infections and rheumatism), stimulant actions on the mucosal linings of the stomach and duodenum to control ulcers, and various roles for endorphins.

An additional problem hardly considered in the monographs is the issue of synergism or other possible interactions among the constituents in a plant. While laboratory evidence supports synergistic action between certain active constituents in a limited number of plants, this is a far cry from the opinions of many herbalists—based on their experience—implying that it is a widespread phenomenon. In fact, this is part of the view (noted in volume 1) that the effectiveness of many herbs rests on the combined actions of several constituents. It is hard to overestimate the importance of such an idea among herbalists. Since the 1830s, arguments can be found in the regular medical literature that whole-plant extracts are better medicines than the isolated active constituents used alone.22 This notion has generally disappeared from twentieth-century medical literature, though its pervasiveness in herbal medicine is indicated in remarks made in 1986: “Many herbs contain pharmacologically active constituents which when isolated have apparently contrary properties and that often makes the whole plant safer (and more efficacious) than might be concluded if merely judging the herb by one isolated active ingredient.”23

Another difficulty in assessing herbal efficacy is that some scientific papers are too readily interpreted—in the absence of critical attention—as satisfactory explanations of clinical reputations. People sometimes overlook the fact that chemical and pharmacological data must always be assessed in the context of dosage, pharmacokinetics, and clinical practice. A good illustration of this is Gran’s (1973) finding that uterine activity increases on taking decoctions of Oldenlandia affinis, which is traditionally used by the Lulua population in Zaire to accelerate childbirth. He isolated serotonin from the plant but found that the usual decoction from about one hundred grams of dried plant would not give a higher yield than about two milligrams of serotonin. Since serotonin is rapidly destroyed when taken orally, it could have no action. Gran’s in vitro experiments with isolated organs showed that the increased uterine contractions produced by the water extract persisted after treatment with methysergide. The logical assumption that one or several other active compounds were present led to the isolation of an oxytocic peptide.24

If the lack of detailed chemical information on many of Mr. Bass’s plants means that definitive pharmacological assessments, or even informed hypotheses, cannot be made at present, we should appreciate that for a long time usage of herbs for symptomatic relief has rested on the nonspecific properties of the major groups of constituents. As F. P. Porcher stated in 1863: “Each [plant] is distinguished by the composition of its principal constituents; these are generally astringent principles, narcotics, stimulating vegetable oils, cooling, refrigerant acids, bitter tonics, cathartics.”25

It is still customary to make such generalizations; for instance, a “standard” use
of essential-oil-bearing plants (e.g., basil, melissa, sweet marjoram, and various spices) is as carminatives; and tannin-rich plants are used for diarrhea, hemorrhages, sore throat, hemorrhoids, and skin diseases.

In summary, while the monographs frequently suggest that once-popular reputations are no longer valid, before dismissing outright the positive testimony of Mr. Bass and many earlier writers, we should remember that a wide range of other factors—medical and social—may ultimately be shown to be relevant. Unquestionably, much research is needed.

The history of therapy. The growing interest in the history of therapeutics was noted in volume 1. Collectively the monographs provide a great deal of data for the story of treatment. We refrain from making interpretations of overall trends in terms of attitudes and directions in professional and lay medicine, but much of what is said illuminates why considerable differences of opinion over the value of a remedy often exist, although more so before recent decades. The monographs often reveal sharp differences of opinion, which were certainly translated into practice on occasion. Such differences, too, sometimes reflected subtle attitudes and sometimes the resurrection of faded ideas—hence sustaining them as cultural threads.

These include the almost patriotic regard for indigenous remedies, the notion that exotic remedies are powerful, faith in personal observation and testimony (even if based on only a few cases), a sense of tradition, a readiness to argue from analogy (encouraging faith in long-standing notions such as the doctrine of signatures), an intuitive belief in any concept embracing the notion of balance, and a readiness to accept new scientific and clinical knowledge, especially if it adds support to established practices.

THE QUALITY OF HERBS AND HERBAL REMEDIES

The Plants

Even if knowledge of constituents and pharmacological action contributes to explaining past reputations of medicinal plants, difficulty in assessing their effectiveness can still arise from many factors—additional to genetic variations associated with varieties—that may affect the types and the amounts of constituents present. Soil conditions and inappropriate collecting, drying, and storage, as well as the manner of making plants into medicines, are all relevant. Before marketing or being prepared into medicines, herbs are rarely assayed for concentrations of active principles. Quality, therefore, is generally a subjective assessment, even though based on various factors, some discussed below. The considerable variation that can occur may account for some of the contradictions in the older literature on the activity of medicinal plants.

We cannot consider these factors for each plant, but the following comments on collecting and preparing herbs serve as an introduction to some relevant literature and, largely through Mr. Bass's verbatim remarks, indicate knowledge and perceptions still widely held in the Appalachians. In fact, the extensive quotations from Bass underscore that while he knows of many special habitats and the whereabouts of good-quality plants, he collects where it is most convenient. One reason we include extensive quotations is because similar habitats, such as roadsides, are available to everyone.

Finding plants: habitats.

"Tame" and "wild" plants. Bass appreciates long-standing opinions that localities can affect the "strength" of a plant. The taste of wild blackberries, for instance, is "superior" to that of cultivated brambles. Bass holds that wild plants generally grow in ideal con-
ditions (where "nature intended"), but he knows that "soil is not everything." Thus, he says:

On the north side of mountains is where the strongest medicine grows. It's on account of keeping out of the hot sun. In West Virginia and up in the northern part of North Carolina and north Georgia, that's the reason the ginseng brings more money. You see, the hot sun has the tendency to take out the strength. It's kinda like keeping anything in the refrigerator, you know. The colder the country is, the more the ginseng brings. The furs is the same. You take a fur skin here in Alabama, it brings a little over half what one'll bring in West Virginia.

We don't have here in the valley plants like ginseng, goldenseal, black cohosh. We don't have too much of anything in the way of strong medicine. The strongest things we have are pokerooot, and devil's shoestring, and the Indian hemp. The rest of it is more mild like yellow dock, boneset, queen-of-the-meadow, and redroot.

We are not certain whether Bass's generalization about a difference between the north and south sides of mountains is always valid, or his view that mountains anywhere, with their cooler climates, are good for herbs, though both ideas are long-standing ones. While Bass talks about the sun "weakening" plants, he intimates that this happens because of drier soil; certainly the possibility exists that differences in humus content are at play.

It is well known that a variety of environmental factors can affect medicinally active constituents in general. While data on this has been growing in recent years—much of it conflicting—there is a paucity of information on most medicinal plants, particularly the indigenous ones used by Bass. Although studies necessarily focus on determining the effects of isolated environmental factors, in practice the production of "secondary" plant constituents (many being physiologically active) is affected by a complex combination of factors (for example, the size of the root) which can also influence the plant as a whole and hence the concentrations of constituents.

Despite the difficulty in sorting out the impact of each variable, well-known examples of soil effects include (1) an increase in content of mucilage in Althaea officinalis when grown in sandy rather than clay soils; (2) higher yields of alkaloid in Atropa belladonna, Hyoscyamus niger, Datura stramonium, Datura inoxia, and Nicotiana species by increasing either inorganic or stable manure nitrogen (in contrast, nitrogen has been shown to lower the total alkaloid content in Lobelia species); (3) phosphorus, potassium, and trace elements can all affect alkaloids, glycosides, and essential oils; and (4) tannin concentrations can vary considerably in quantity according to general soil conditions. Other well-studied effects include the action of sunlight (shaded plants have been shown to have lower alkaloid and tannin contents), while temperature and rainfall can affect amounts of alkaloids, glycosides, and volatile oils. Continuous rain can lead to loss of water-soluble substances from leaves and roots by leaching. All of these problems lend weight to arguments that, ideally, medicinal plants should be cultivated to improve standardization. One example attracting recent attention is feverfew, which has become relatively popular for the treatment of migraine.
The Wolf Creek Sand Company got sand out of the creek—just anywhere along it.)

The road entrance to Wolf Creek is the site of a long-vanished homestead. Mr. Bass is not especially interested in the remnants of past domestication, like lilies, yucca, prickly pear, black walnut trees, catnip, and an occasional beauty bush, but he has many memories of the old hog pen. "Everyone used to have a hog pen, and lots of plants grew around them: The dirt is rich from the slop and you could find Jerusalem oak, dog fennel, careless weed, Spanish needle, cocklebur, pursley, and knotweed."

Another site of past domestication—an old gin yard—affords another instance of "good-quality" plants, this time calamus and brooklime, along with an ethos of tradition. "It was an old-time gin back in 1924; you had to throw cotton into the press and press it with your feet. They also had a sawmill and a gristmill. The ground—we call it gumbo—became so rich here because they put the sawdust pile out there. This was before my day, but I've hauled off sawdust from the sawmill." Notwithstanding special sites, Bass collects the majority of plants he uses or recommends from his yard and "the roadsides, railroad right-of-ways, old wood roads, what we call old logging roads, and out in the fields—what we call the terraces, which is in the rolling country like where I live."

We quote Bass's detailed account of such sites largely because many herbs are widely distributed weeds or ruderals, but also because it illustrates how man alters plant habitats. The consequences of some of these changes on the active constituents of many plants can only be conjectured. (All the plants mentioned below are considered in the monographs.)

Around here you have to build what we call terraces, which is a ditch that collects the water. We generally have them about anywhere from an acre to two acres apart and they run around the hills and it catches the water to keep it from washing away. The dirt is mounded up, you know, and a lot of the rich dirt is there; it has a tendency to grow all kinds of weeds, which are actually the herb plants. You find pokerooot, and bear's foot, elephant's foot, mullein, five-finger grass, and spiderwort, and sometimes you find jewelweed. Also you find ragweed, plenty of it, and hyssop.

And also in any of the low places along the right-of-ways, the highways, you find boneset, queen-of-the-meadow, and Joe-Pye-weed. The highways were good ways for seeds to travel. Of course, if the right-of-way is along the water course, you're liable to find yellowroot, too. Elderberries are along the right-of-way, too. You'll find the tulip tree and the bald elder in the low places on the right-of-ways and also the tag-alder and in some areas, why, you're sure to find the black-haw and things like that. Of course, right in our area I only know of one. It is growing along the highway, County Road 15, right down below me here.

Just old fields and country roads is an awfully good place to look, and on ditch banks, a fine place for sassafras and wild cherry and herbs like that. Also five-finger grass or wild strawberry. An old field that's laid out for a number of years, be sure and go along the ditches and ditch banks and check them for different kinds of herbs.

The railroad is a good place. I've walked the railroad lots of times when I was selling enlarged pictures. I tried to sell fruit trees, but I never did so good with that. You find mullein, yellow dock, sassafras, the clover blooms, the red clover and the brown-top clover. And then we've got what they call the sweet clover, which grows way up high, kind of like alfalfa. You'll find that along the railroad right-of-way.
The reason that's such a good place to collect, especially along the railroad tracks, is because back in the olden times when everything was transported by rail, why when they unloaded hay at a depot or switch track, they'd leave the boxcar door open. You see, the seed that was collected in the hay—there's no telling how many different kinds of herbs was in it—the seeds would blow out along the right-of-way. That was how we got quite a number of all kinds of obnoxious [noxious] weeds. We've got the Johnson grass and the Bermuda grass and many, many more weeds that we didn't have here in the South, but they came in from the West and East and other places. Of course there's things in our area that went the other way.

If you're collecting herbs in woods, find old log roads, where the timber has been cut and where they hauled out the logs. And also a snaking trail. Most people, city people, don't know what it is, but it's a place where you snaked logs, or dragged, you might call it. I don't know why they called it snaking, but that's the way the loggers called it. You take a log chain or a large chain and put it around the logs, looped it around one end of a log, and then you hook a tractor—we used to hook mules or horses—and drag that log down to where they want it, to the sawmill or where they're going to load it. Well, that makes a kind of a ditch or a furrow, and the more of them you'd snake, you know, the deeper it gets. Well, now, that has a tendency to pull seedpods and things along and you'll find lots of herbs growing along the snaking trails.

And then in hunting herbs in the woods, like ginseng, goldenseal, star-root and bloodroot, black cohosh, angelica, and all those kinds of roots, why, you can find old logs, old rotten logs where a tree has fallen or the tree tops, and that's where you find the most generous amount of different kinds of herbs. The birds gathers the seed from these plants and some of them pass through their system and they'll germinate, you know, and come up. You see when that tree is cut down or fallen down, why, these seeds comes up around them, and that's a good place to collect all kinds of roots and herbs. And then if you're in the woods or along the right-of-ways and we'll say you find a plant that you're hunting, say, yellow dock, or mullein, and it's on a grade or a hill, why, you follow that all the way down and you're more than apt to find this same kind of plant down below because, you see, the seed will wash down-grade. You'll maybe find a pretty good area where you'll find the same kind of plants like smartweed, ragweed, and plantain.

Of course now, if there's a branch or a creek or a river going under a bridge or anything, you can look along there for the skullcap and bugleweed and yarrow and things like that. But we highly recommend when you're hunting herbs to be sure to study the right-of-ways, especially the railroad right-of-ways. But, of course, now they're not as prolific as they used to be because they poison the vegetation and a lot of it is killed and don't never come back up.

Harvesting in season.
Dried herbs supplied by Bass invariably appear to be of good quality—dry, no obvious mold or insect infestation, recently collected (or, at most, a couple of years old), and unadulterated by other plants. However, as with the purchase of all herbs, it is generally not known whether they have been collected at optimum times and from favorable habitats, dried carefully, and stored under adequate conditions. Of the several factors which can unfavorably affect active constituents, collection has perhaps received most attention.

Guidelines for gathering medicinal plants from John Quincy's Dispensatory (1719), one
of the best-known medical books in colonial America, reflect notions extending back to classical times and still accepted today:

"Herbs are at [their] best beginning to flower, and should be gather’d when there is no rain or dew upon them . . . they ought to be dry’d in the shade . . . . Flowers and seeds should be gather’d likewise with the same caution, dry. . . . Fruits are best at their full ripeness . . . . Roots are best taken up in the beginning of the Spring, for Reasons obvious to all. Barks are best for being fresh dry’d. The same will also hold true in woods of all kinds." 32

There is general agreement nowadays that most roots, whether gathered for the entire root or the root bark, are best dug in the fall or early in the spring, but roots of annual plants can be collected just before flowering. 33 In essence, this reflects the notion that roots should be collected when growth has ceased; if harvested during the growing season, shrinkage and loss of weight is greatest, which is thought to correlate with reduced concentrations of constituents.

Many specific directions for individual plants have appeared in the drug literature, but, unfortunately, it is often unclear whether they are based on empirical evidence about the strength of a root or given to aid in collection when aerial parts can be identified. For instance, it has been specifically stated that the perennial couch grass (Elymus repens) should be collected in the spring, not the fall; Mr. Bass knows of this but attaches little importance to it. 34 Other examples appear in the correspondence of Appalachian root and herb dealer C. J. Cowle in the 1850s and 1860s. He once wrote to a dealer that "the cotton root is important to collect before the cotton is fully ripe." 35

Spring is usually recommended as the time for gathering bark from branches of trees and shrubs, because rising sap makes separation of the bark easier. Again, there are exceptions: wild cherry bark, for example, is said to be best collected in the autumn, when it contains the greatest concentration of cyanogenic glycoside. 36 Similarly, black alder (prinos) and sweet birch are known as "autumn" barks on the presumed basis of maximum activity at that time. 37 Such exceptions are easy to forget in the face of the "authoritative" generalization that "bark should be collected when it slips most easily, during the dormant or in early spring." 38 The suggested optimal time for gathering leaves is when they have "attained full development," generally understood to be just before the plant blossoms.

Opinions that drugs of inferior strength are marketed "because they are not collected in the proper season" or at the plant’s proper age are generally based more on empirical than laboratory data. 39 Even so, sufficient information is available to indicate that seasonable variations can be significant. Examples include: Mentha piperata (relatively high proportion of pulegone in young plants, replaced by menthone and menthol as leaves mature); M. spicata (change from the predominance of carvone in young plants to dihydrocarvone in older ones); Digitalis purpurea (glycoside content varies with age; purpurea glycoside A is formed last but eventually reaches a constant maximum of 50 percent of the total glycoside); Agave spp. (steroidal sapogenins isolated from young, mature, old, and flowering plants have successively fewer hydroxyl groups); and Datura stramonium (the hyoscine/hyoscyamine ratio falls from about 80 percent in young seedlings to about 30 percent in mature fruiting plants). 40

Mr. Bass’s verbatim remarks. Bass’s knowledge summarizes much that has been published in scores of textbooks on materia medica and guides for herb collectors, but his inimitable style, detailed knowledge, and occasional departures from published advice justify the lengthy excerpts that follow. Bass’s information on prices (as of January 1984) and suggestions for marketing have been retained; these provide not only insights
into ways of “making money” out of herbs, still commonplace in the Appalachians, but also further insights into his skills as a backwoodsman and herbalist.

Barks from aerial parts:

Spring is the time for barks. Early in the spring, as soon as the buds start putting out, you need to make arrangements with loggers and landowners, if you don’t own land yourself, to peel the bark off of little saplings. You can peel black-haw bark off the tree; it don’t get to be large, and they grow in thickets—kind of like sassafras. The bark runs about seventy-five cents to a dollar a pound. For a dollar a pound you’d have to take the outside bark off (ross it) and get the inside—just use the inside bark. Now the bark of the root will bring twice as much as the tree, but you have to dig the roots up and you can’t hardly make any money at that.

Wild cherry bark’ll run you about twenty to thirty-five cents a pound; that is, the young tree; the bark of an old tree is a little cheaper. It weights real heavy. For your own use in the spring of the year, peel something like a half-gallon bucket full of wild cherry bark and some sweet gum bark. It’ll do you for the whole season. The young bark, you don’t have to ross it, you just sell the whole thing. But if it’s a big tree bark, which if you follow the loggers and get them big trees, why Lord, a lot of times you’ll get a hundred pounds off of one tree and you can make pretty good—it’s hard work.

White oak bark will run you about ten, fifteen cents a pound, but it weighs heavy. In the summertime you can make money at that. You can go around to where they’re logging and make a deal with the loggers to peel their logs; makes them pretty and clean. You scrape the outside bark off and just peel off the inner bark. Red oak bark runs about the same.

If you happen to be in an area where there’s slippery elm, why it’ll run you about a dollar a pound rossed—that means just taking the outside bark off.

And then sassafras tree bark will run you about ten or twenty cents a pound. And you can peel it pretty well. But I’d recommend that if you’re going into the herb business to make a living and make money, don’t sell no sassafras roots to the herb buyers. Sell that direct to the people to make their own tea. You can go on Saturday to the curb market or the flea market or the trade day. Just put your sassafras in bags. Dry it real good—bone dry, and then put it in pint or quart plastic bags, and tie the top. If you fill a quart bag, just full enough to tie it real good, you can sell it for a dollar easy. That makes a gallon of tea. And there’s no telling how many dollars worth you can dig in a day. And you’ll just sell the hound out of it. And you can make so much more than you can selling it on the market. Some companies can’t sell the barks as much as you can in the spring of the year, up till about the first of July. The sap runs real good, and it peels off easy. Some companies buys dogwood bark, but there’s not a regular market for dogwood bark, like sassafras and wild cherry and slippery elm.

Root barks:

Root bark often fetches more than tree barks. Sumac root bark runs anywhere from seventy-five cents to a dollar a pound—dry. And it’s easy to skin, and it’s pretty heavy, and the roots stay right on top of the ground. I actually believe that a feller could take a rototiller or some kind of a plow, and he could just get them up real good. I’ve never dug any of them for the market because it used to be just three cents a pound, but now it’s running anywhere from sixty-five to a dollar. And if you want to dig and peel sumac root bark, you can peel that
most any time of the year. It's a good idea to wear rubber gloves or something because there's a gum on that stuff, and it'll get on your hands. Just takes kerosene or gasoline to get it off. It's just like tar. It's a messy root to handle.

Whole roots:

You can gather every kind of root along in June, and gather on up as long as you can see the dead tops and tell what you're hunting. When the tops die down is the best time to gather the roots, because the sap goes down and makes them weigh heavier.

Hydrangea root: You can dig it anytime, spring, summer, winter, or fall. Cut the roots in about six-inch pieces. One buyer is giving fifty cents a pound; sometimes you'll get a stump that'll weigh five or six pounds. You can use a power saw and cut it up in pieces. And then you take a garden hose and just hose the dirt off it, and pile it up and let it drain for two or three days. It don't have to be plumb bone dry. And then get you a bunch of sacks. Go to a feed store where they grind feed for cattle and get you a bunch of burlap sacks, and just put your hydrangea roots in that. But be sure before you dig a bunch of it that you make a deal with the houses that buys this stuff and be sure you get a contract, because hydrangea is not a regular used medical herb.

Yellow dock, you can sell it anytime. You can make money if you can find it. Find any old-timers that'll tell you what it is. Some calls it grub-root, and some calls it unicorn root, but anyway we call it star-root. Has leaves on it looks kind of like a spoon. Stays green all winter, pretty green leaves and has a seedpod and blooms like a tassel, kind of like a corn tassel. And smells so good in May and June, when it's in bloom. Beautiful plant. And it'll run you anywhere from three to five dollars a pound, if you can find it.

Then yellowroot, what we call actual yellowroot, you can make big money agathering that anytime and selling it direct to the people. Now it won't bring you but fifteen or twenty cents a pound if you sell it to the herb handlers. You can pull the whole plant up, and break it up or cut it up into pieces as big as a match. A plastic bag full will fetch you a dollar a pound at curb markets or trade days.

We don't have burdock right here, but it's a big old coarse root and it really weighs heavy. You make good money if you can find it—price is running anywhere from forty to fifty cents a pound.

Of course, ginseng, everyone knows it's the most valuable herb that we have. And we don't talk about it too much because it's too hard to find and hard for anyone...
that don’t know what they’re doing to get it. If you find it, the law is you’re supposed to dig it not earlier than July and plant the berries back.

Goldenseal is another valuable one you dig in July or August. It’ll bring in eight dollars a pound now. And dandelion, it’s bringing about seventy-five cents a pound, and queen-of-the-meadow’s running about forty-five to fifty cents a pound. Black cohosh will run you anywhere from seventy-five cents to a dollar. Blue cohosh will run, will bring a little less. And these now, and mayapple, sassafras, bloodroot, and wild alum is all medical plants that there’s a market for most of the time.

Entire herbs, leaves, and flowers:

Any kind of herbs, that’s the whole plants, you gather them in July, August. September, when the bloom starts. We’re talking about gathering the medical leaves, the herb part of the bushes.

We’ll start off with sassafras. It’s better to start gathering the sassafras leaves in early June and continue on to sometime in August. They start to turning yellow, and you don’t want to gather them then. You want them a good green, dark green color.

And goldenseal, if you happen to be in an area where there’s goldenseal, why, you save the tops. It’s bringing three dollars a pound, the tops of the goldenseal. And I notice now they buy the ginseng tops.

You can gather boneset, something like a big armful of the whole plant, or you can take the leaves off. You can tie a string around a bunch of the whole green plant and hang it up in the dry, in the shed, and that’s for your coughs and colds. Boneset generally runs you thirty-five or forty cents a pound.

If you put you out a little catnip or a patch of catnip and a patch of garden sage, why you can sell it all the time, direct to the public. Of course, now, catnip will bring you a dollar a pound dry; that is, the leaves. And sage will run you about two dollars on the market, but you can get four dollars easy selling it on trade days and flea markets and direct to the people. It’s easy growing, just a little bed will make you a whole heap. I have a lady friend now, and I buy, I guess, fifteen or twenty or twenty-five or thirty dollars worth from her, and she’s only got one patch. And I don’t buy all she has, she sells some to other people. And so that’s a good way to make money on the side.

There’s not much to say on flowers. The main one marketable is elder flower. If you have a contract to gather them, why, you want to get them in full bloom. Queen Anne’s lace you also get in full bloom.

Drying and storage.

Appropriate drying of medicinal plants is another factor critical to their quality. After ensuring removal of soil, Bass dries many plants in the sunshine to minimize mold growth, but recognizes traditional advice that herbs, leaves, and flowers are best dried in the shade to avoid loss of color. (The latter, correctly or otherwise, has always been associated with reduced activity.) Large roots, he says, need to be cut to ensure rapid drying.

For quick drying of herbs, Bass recommends a building with a metal or tar roof, such as a barn or smokehouse. An alternative is to spread out material “real thin on wire or poultry netting.” If dried on the floor or on paper, the herbs need to be “stirred” at times. In practice, Bass uses a porch or shack or, sometimes, stove heat for roots and barks collected in winter.

Bass’s storage of dried herbs—commonly in burlap or large brown paper bags hung throughout his many shacks—appears haphazard, though most bags are off the ground, out of the reach of vermin, and air freely circulates around them. His turnover of material is such that few items are stored for
very long. Items that store badly (like calamus and aromatic herbs) are collected only in amounts for immediate needs and sold in jars rather than in plastic bags. Bass considers that most plants, if stored under conditions of dry atmosphere and lowish temperatures, will remain active for many years.

Bass’s detailed recommendations on drying plants include:

Wild cherry bark is easy to dry if you keep it spread out thin. It’ll soon dry where you can break it up with your hand easy. But if you pile it up like piling up wood or something, she’ll mold on you and just rot. And watercress’ll do the same thing. Of course, most of the herbs are the same, excepting one herb that’s mighty near dry when you dig it, and that’s star-root. And you may make more money digging it than any other root we know of, if you can find it. It’s just a dry, hard root. It’s just about as heavy when it’s dry as it is when you dig it out of the ground when it’s green.

Adulteration, misidentification, substitution.

Bass is conscientious in gathering plants. Although we have found few instances of his herbs admixed with other plants, adulteration—accidental and deliberate—has always characterized herb collecting. Appalachian root and herb dealer C. J. Cowle, for example, wrote to Henry Taylor (30 December 1857): “Your liverwort turns out to be wild ginger root and top—All your roots are in bad order—very much mixed.” 42 Although little adulteration occurs in Bass’s herbs, he does collect—as noted in the monographs—some plants different from those generally accepted for the vernacular name he uses.

Plant parts collected.

A further consideration affecting herbal medicines is whether or not the “correct” plant part is used for a particular purpose. While a consensus can generally be found as to whether, say, tree or root bark is the most effective part employed, any part of a plant has probably been used on various occasions. Bass recommends leaves of sweet gum, apple, and sourwood rather than the barks, at least in the summer. Occasionally he advocates the tops of goldenseal and ginseng instead of the roots. No published support for these particular substitutions has been found, but Bass believes them to be effective substitutes so long as they are fresh and an extra-strength tea is made, because, generally, barks and roots are “stronger.”

Herb collecting: Some realities and concerns.

Despite Bass’s conscientiousness in following most traditional practices, he illustrates the typical realities of herb collecting, especially with respect to correct identification and quality. Sometimes this relates to ignorance or deliberate fraud, but more often to local situations.

Like many herbalists, Bass commonly collects outside the “correct season” in order to fulfill orders on demand. Thus some items are gathered throughout the summer (e.g., leaves of peach or sweet gum), and others, such as bay leaves, throughout the year, “since it is always green.” A few plants he collects whenever he finds a convenient source of supply, like squawvine in the winter. Furthermore, visitors occasionally bring substantial amounts of material (e.g., yellow-root) from undetermined places. 43

Bass’s knowledge, conscientiousness, and integrity are admirable, yet it is clear that scientific doubts about the quality of some of his herbs can be raised, particularly where he uses “substitutes.” He has no theoretical knowledge of collection, drying, and storage of herbs in relation to constituents, only traditional knowledge. Admittedly this appears to have a strong empirical basis, but, without a knowledge of constituents and the factors
affecting them, he is not constantly thinking of ways to ensure top quality.

If words of caution are in order about herbs, they are even more applicable to those gathered by less-experienced collectors. The longtime tendency to blame the problems of the botanical drug trade on “ignorant herbalists,” “unlearned pharmacists,” and “worst of all” on women, cannot be fully denied. Yet this fails to recognize the genuine problems of collecting on a commercial scale and filling orders throughout the year.

While concerns over miscollecting and potential variation due to ecological factors are appropriate, to what extent do variations in constituents between batches of herbs affect treatment? To answer this, each plant species has to be considered separately, as do the purposes for which it is used and the conditions under which it is employed. Unfortunately, precise information on the effects of the many variables is lacking for most plants, but it can be said that differences in quality—as long as they are not extreme—may be inconsequential for some plants, such as those used as inhalants or for bitter and astringent medicines. On the other hand, many plants, like Indian hemp and poke, need to be treated with considerable caution. From a public health standpoint, more attention needs to be paid to the quality of such plants, and where appropriate standards do not exist (e.g., macroscopical and microscopical descriptions and ash values), they should be established. Yet even in an ideal world of adherence to established standards for herbs, many other variables that can affect activity have to be considered, such as the manner in which a plant is extracted, compounded into medicines, and administered.

Herbal Medicines: Preparation and Doses

The modes of preparing and administering plants or extracts to ensure maximum efficacy—and maintaining consistency from one batch to another—have always been central to the practice of pharmacy. Extraction procedures—for instance, whether water or alcohol is used, and how much heat is employed—have long been known to produce variations in quality. Such considerations are especially important when determining whether plants have been extracted in a manner that ensures that properties demonstrated in the laboratory are having a clinical effect. Many of the monographs in this volume include quotations which suggest that one type of preparation is superior to another. For instance, eyebright juice was once recommended as superior to the distilled water, and was sometimes considered more effective than the tincture or infusion.

Undoubtedly, differences in preparation sometimes accounted for discrepancies in reputation. A. Clapp reported in 1852, with only some exaggeration, that the “discrepancy of opinion, of competent and honest observers of the medical virtues of the same plant, is difficult to explain in any other way than that the article employed differs in strength of age, the place of growth, time of collections, mode of preservation, fresh or dried, &c.”

Another significant variable is the method of administration. Time and time again it has been emphasized that the form in which a medicine is given must not only be adapted to the nature of the remedy but also to the “caprice of the patient.” Unquestionably, whether a medicine is applied externally or administered orally affects activity. This is sometimes overlooked, as when it is said that statements in the older literature indicating that cabbage applied externally helps skin “cancers” support the view that cabbage may protect against certain internal tumors.
For the most part, before Bass started promoting capsulated herbs he preferred selling dried herbs, or that visitors gather their own for preparation into medicines. This was not only because it was less trouble but also because he has never used alcohol, and fermentation develops quickly in aqueous medicines unless they are refrigerated. Mr. Bass makes clear that in the past, whiskey—white whiskey or moonshine—was the usual menstruum for herbs. Such medicines were “stronger than when made with water. Of course, for some of them, it was an excuse to take whiskey.” Ratsvein, sarsaparilla, and mayapple were favorites in whiskey. Other factors are also considered significant to the strength of the tea, or at least its action. One, according to Bass, is that teas act differently if taken hot rather than cold. Hot teas, for instance, always promote a sweat and tend to produce a laxative action. Bass’s general advice for preparing a small quantity of medicinal tea is two teaspoons of herb to a teacup of water.

Like most herbalists, Bass puts considerable faith in compounded preparations. This follows long-standing practices; indeed, some would say it is at the heart of herbal medicine. Bass first learned about making medicines such as the Bass Salve and a “vinegar stew” from his mother. He is always ready to point out that over-the-counter and prescription medicines used to be quite complicated and included one ingredient for each symptom.

Bass’s formulation of medicines embraces two approaches that mirror aspects of medicines of the past. One approach reflects “polypharmacy” (sometimes called Galenic medicine); that is, combining many items in a preparation on the basis that two or more substances act better than one, or that a particular medical consideration often needs medicines for both specific action and general constitutional treatment. For instance, a woman with rheumatism may require “in addition to rheumatism medicines, a female medicine and a tonic.” Bass occasionally suggests polypharmaceutical preparations with as many as twelve or more items; he frequently says that in such mixtures the ingredients work together “like a team.”

Bass is also aware of an alternative approach to formulation which gradually became commonplace within regular medicine during the eighteenth and early nineteenth centuries, replacing the blunderbuss polypharmaceutical approach. The new approach included fewer items, often only four; perhaps just the principal ingredient, one other to augment its action (“to work together” or enhance its action synergistically), another to counteract side or unwanted effects of the main ingredient, and a fourth serving as a vehicle for the other items. The reference to synergism is a reminder of the importance of the concept to herbalists that the whole plant serves as a better medicine than the isolated constituents, a notion discussed earlier. Whatever the number of ingredients in a preparation, Bass often says that botanicals act in a much gentler fashion than chemicals.

In practice, Bass prepares his medicines in his yard on a small, wood-fired heating plate, in a shack made for “cooking” medicines, and, sometimes, inside on his kitchen stove. Ingredients are not always measured carefully. “Teacupfuls” and “ounces” of the washed fresh or dried herbs are commonly “measured” by hand, though his long experience in assessing quantities must not be forgotten. In fact, one sees Bass going back to times before the nineteenth century, when measurement of herbs by handfuls was commonplace.

In general, if he is preparing a gallon of medicine, a teacup of plant part is used. It is boiled for a few minutes and then simmered for a further fifteen to twenty minutes. A “flavoring” agent like wild cherry is frequently added (“it’s also a good blood purifier and tonic”). After simmering, four
pounds of sugar or honey or six pounds of corn syrup are added for each gallon, followed by a short reheating.

The liberal supply of sweetening merits comment. Some think it is a reflection of Bass's sweet tooth; but in fact, despite current concerns about taking too much sugar, he holds a once-common view that sugar is medically valuable. It was once a major ingredient in many pharmaceutical preparations, not only for preservative action but also because it was considered to have particular physiological actions. Bass believes it has blood-purifying properties—an opinion held in the past—though he views honey as more effective. His faith in herbs is such that, although he disguises bitter medicines with sugar, he believes the medical value associated with bitterness is unimpaired.

A "standard" dose for most medicines is one tablespoonful three times a day, though for something like his "reducing" chickweed he recommends six ounces three times a day. It seems fairly clear that many visitors do not measure the doses precisely; some say they just take "swigs."

Precision, in terms of accurate weighing and measuring in both making and administering medicines, is not a feature of the herbal practice of Mr. Bass and his visitors, adding to the variables associated with collection, habitats, drying, and storage. Considerable variation from batch to batch has been seen in Bass's cough medicine and in teas made by him and visitors. Yet a belief in the efficacy of herbs is so strong that an almost cavalier attitude to the survival of potency exists. Even if molds develop in a medicine, Bass says it just needs to be reheated.

A complication exists, too, when Bass recognizes that on occasion he collects "weak" medicines. He explains:

Well, now, if we was making medicine—we'll say now that we were going to make a tonic—and we had black cohosh, which loves to grow in damp ground. Well, if we could get the black cohosh growing in that good soil, we would use but about half of what we would if it was growing in dry soil, where it hadn't got the moisture. And then say we was going to use wild yam with the black cohosh. Well, if we couldn't find the yam in the low place where it was well nourished, why, we would have to use a double portion. And it works that way on the plants of any kind. Of course, you people that works in the laboratories, you've got microscopes and you've got all them things to check this out, but you just take a common person, why, you've got to use some other system. And, therefore, my way in testing, many years ago—of course I don't use that system now, because I can look at the plant and tell whether it's full of medicine or vitality or vim or whatever you might want to call it. I can tell by looking at it because I've seen so many, all of the different plants, but to start off with, we taste and smell them.

Testimony from visitors suggests that variations in the strength of medicines are commonly not noticed. On the other hand, numerous visitors say that if the medicine wasn't working well, they would just take more or consult with Mr. Bass. In fact, there is a clear sense that dosage is monitored according to how it relieves symptoms.

Issues and questions about dosage of herbal remedies are complex, in part because of differing attitudes. Outside the herbal world of Mr. Bass and others of his generation, traditional wisdom about herbs is disappearing fast. Nowadays, most people using herbs have little knowledge about their quality and need guidance in making medicines. Some guidance follows past approaches of recommending specific doses, but, unfortunately, there is much contradiction in recently published literature. Even the British Herbal Pharmacopoeia (1983),
one of the most authoritative recent publica­
tions, often does not follow earlier “standard”
doses, and for no clear reason. However, it
does make efforts to standardize prepara­
tions, as reflected in the following instruc­
tions: for infusions, 500 ml (approximately
1 pint) of boiling water is to be poured over
30 g (about 1 ounce) of finely cut material in
a previously warmed vessel and allowed to
stand for fifteen minutes before straining. A
decoction, on the other hand, is prepared by
boiling 1 ounce of material in 500 ml of water
until the volume is reduced by one quarter. 54

The dosage issue in modern herbalism is
complicated by the growing commercializa­
tion and availability of herbs—sometimes
freeze-dried (assumed to be as potent as
the fresh herb. and perhaps having differing
properties from dried material) in capsules as
well as in the form of alcoholic tinctures and
other extracts. Correlating the relative doses
of these preparations is full of pitfalls and
often impossible without a detailed knowl­
dge of the extraction process. Many herbal­
ists, however, say that what is important is
self-monitoring (perhaps with the aid of the
herbalist) of the effects of a particular prepa­
ratin. One argument is that precise dosage
is not necessary (as it is with potent pre­
scription drugs) because the effects of many
herbs are more constitutional than specific.
Whatever the merits of such general com­
ments, some herbs are potent, and safe usage
requires knowledge and understanding.

HEALTH CONCERNS AND
HERBAL MEDICINES

Although cautionary remarks appear in many
of the monographs, some general comments
are appropriate to underscore the fact that
care and thoughtfulness are necessary in
taking any herb or herbal medicine. Concerns
are growing as more and more people take
herbs—often purchased from health food
stores—without the benefit of traditional

wisdom or the knowledge of modern science.

Bass is correct in saying that too many
people go “cadillacking” along with herbs
and take large doses. 55 Many “feel” that herbs
are safe because they have been used for hun­
dreds of years or because some of them have
“magical powers.” That large numbers of
plants are poisonous—some in small doses
—is either unknown or forgotten, while little
or no appreciation exists that apparently in­
ocuous plant remedies may have serious
long-term health implications. 56

Certainly among recent converts to herbs,
who are altering patterns of usage, traditional
wisdom and caution are generally nonexis­
tent. This is compounded by the lack of
cautions expressed in many advocacy books,
pamphlets, and leaflets sold in health food
stores. It is unfortunate, too, that herbs are
commonly sold as foods or nutrition prod­
ucts, which encourages tendencies to take
large doses ("the more the better"), for this
contributes to casual attitudes.

The abuse of herbs by some advocates,
and the ready availability of a few danger­
ous herbs among large numbers commonly
considered “worthless,” add to long-standing
concerns that patients taking herbs com­
monly delay seeking regular medical advice.
The latter opinion, probably overstated, is
part of a growing literature on health con­
cerns over herb use; some of it is scientifi­
cally based, but more of it is scare litera­
ture. Yet, even if concerns are overstated
and the crusading approach of much of the
scare literature can be justified on the basis
of safeguarding the public, scare tactics are
probably not the most effective educational
approach. 57 They generally fail to consider
culturally complex clusters of ideas, which
frequently include innate opposition to many
legislated public health measures and general
suspicion of the establishment. The credi­
bility of the FDA ("the establishment") is cer­
tainly low in many people’s minds, and FDA
statements like the following ignore the deep
public concern over side effects of drugs, even aspirin: "Given the availability of modern medicines with proven effectiveness and safety when used as directed, treating ailments with herbs is both unnecessary and risky." While health education is certainly a difficult task, those involved have to be very knowledgeable about herbs, nonjudgmental, and able to work with and mold existing attitudes. 58

As we briefly consider health concerns under three broad headings—direct toxic or side effects (including hallucinogenic), the quality of herbs, and interactions with other medicines taken along with herbs—an appreciation that no medication is totally safe for all people in all doses has to be kept in mind, as well as the possibility of special risk factors. In fact, some general considerations need to be constantly borne in mind.

Any assessment of the use of herbal remedies must recognize the patient; indeed, physiological differences among individuals are some of the most difficult factors to assess in connection with herbal medicines. Just as doses of powerful prescription drugs have to be tailored to the needs of individual patients, similar considerations apply to herbal medicines. These range from biological differences in an individual's serum proteins (which affect the binding of certain active principles) 59 to general effects of age and illness. Older patients, for instance, with reduced kidney function, eliminate some medicines relatively slowly; liver ailments, too, can be important because the liver plays a major role in the metabolism of many drugs.

A wealth of information on rates of drug metabolism has been obtained in recent decades. In fact, a new discipline, pharmacokinetics, has emerged, which focuses on appropriate dose regimens for particular patients and illnesses. Unfortunately, herbal remedies have been ignored; there is a general sense that all herbs have the same dose (two teaspoons per teacup for medicinal strength). Bass, from experience, knows when this is too strong, but even he does not tailor dosage for the elderly as was once recommended. This may be all the more significant if they are taking prescription medications or if dietary irregularities exist.

Another general consideration is that a preparation with a high risk of adverse side effects is unacceptable for relatively minor complaints, especially where alternative, safer preparations are available. On the other hand, life-threatening problems may justify the use of drugs with a high possibility of side effects. Any herbal preparation with potentially harmful effects is generally unacceptable unless it is safer and more effective than other treatments employed for the same purpose.

**Direct Toxic Actions**

Toxic effects can be usefully considered under three headings: (1) toxic or narcotic actions in small doses; (2) plants with harmful actions readily overlooked; and (3) plants often believed to be safe, but with recently recognized "hidden" or silent dangers, which only become apparent after a long time.

**Toxic or narcotic actions in small doses.** Many of the best-known poisonous medicinal plants (for instance, *Strophanthus* spp. and *Strychnos nux vomica*) are not considered in this volume because they are overseas drugs generally unavailable on the American market. Even so, many dangerous plants are readily collected in North America; examples include the celebrated solanaceous plants *Atropa belladonna* (deadly nightshade), *Datura stramonium* (jimsonweed), and *Hyoscyamus niger* (henbane). Of these, jimsonweed, still well known for the treatment of asthma (used often as stramonium cigarettes), has acquired a particular reputation for producing "highs" or hallucinations characterized by "seeing" small people or...
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animals. Hyoscyamus niger and Atropa bella-donna have been used less often for their hallucinogenic properties.

The worldwide use of hallucinogenic plants is an intriguing topic. While it does not impinge much on Bass's practice, the sixty or so hallucinogenic plants found in the New World, as well as those commonly available in U.S. health food stores (excluding plants classified as euphoriants, stimulants, and hypnotics), have aroused frequent interest. The latter include yohimbe, catnip, juniper, kavakava, mandrake (Mandragora officinarum), nutmeg, periwinkle (Catharanthus roseus), and stramonium. Catnip, juniper, periwinkle, and stramonium are all known to Bass, although only stramonium can produce hallucinogenic effects in the doses generally recommended.

Plants with harmful actions usually overlooked.

Allergies. Countless plants have been listed as occasional culprits in allergies. Mitchell and Rook's invaluable reference book, Botanical Dermatology (1979), notes and analyzes reports of skin injuries caused by 248 families of plants, comprising some 1,405 genera and thousands of species. While most of the plants listed are not used medically—or at least only rarely—allergies to medicinal herbs may be more widespread than appreciated, and potential problems have been reported in recent years for a growing number. One is the popular chamomile. While most people can drink chamomile tea without fear of untoward effects, it has been implicated in allergic reactions among those sensitive to compositous pollen, and at least one case of anaphylactic shock has been reported. Anyone with known allergies should also avoid such teas as goldenrod, marigold, and yarrow.

Particular interest has also focused on ragweed, alfalfa, and bee pollen. Bass has discussed ragweed and other "allergy treat-
ments" as follows: "You can make a tea from ragweed (or anything else you are allergic to, like pine tops) and drink two or three cupfuls while you have an allergy. People have told me they have been helped." The popularity of this notion, at least in Bass's region, suggests that it is widely practiced, and it is not surprising that allergic reactions have been reported. Alfalfa, although not as popular and without ragweed's strong traditional reputation, has been promoted vigorously in recent years by the herbal advocacy literature. According to some reports, it has exacerbated allergic symptoms in sensitive individuals.

Examples of unanticipated allergic responses have arisen from the increasingly popular use of seaweed (kelp) as a slimming aid. Kelp contains large quantities of potassium iodide, and it has been estimated that up to 3 percent of the population may be oversensitive to iodine. Just how many allergies go unrecognized is, of course, open to speculation, just as is the extent of food sensitivity in general.

Foods. This heading is included not only because many people use herbs as foods, or at least food supplements, but also because of a growing interest in using many plants as greens. Dangers are direct and indirect. A potentially serious problem involves poke. Most people know that only the young shoots should be eaten (collected in the early spring or purchased in cans) but are unaware of the considerable toxicity of the plant in general. It is sometimes forgotten, too, that recommendations for cooking include parboiling twice and discarding the water on both occasions (see Poke). Allergenic effects of foods are less obvious. A good example is alfalfa (mentioned above), a popular low-calorie vegetable. Other concerns are growing over possible estrogenic effects.

Compounded herbal preparations. Compounding herbs is basic to herbal practice, but unanticipated results can occur. The
phenomenon of synergism (or just additive effects) can become a serious issue if the remedy is taken with other drugs. An interesting example was reported in 1983 in a twenty-five-year-old woman who developed abnormal menstrual bleeding. She had been taking large quantities of a “seasonal tonic” herbal tea for two months, containing, among other ingredients, ground tonca beans, melilot, and woodruff, all of which contain coumarins well known for their anticoagulant effect. Other medications she was taking included acetaminophen, vitamin A, and bromalain, which may well have further potentiated the anticoagulant effect of the herbs.66

Hidden dangers. In recent years some well-known medicinal plants that have been widely used for centuries have been found to have potentially toxic effects, perhaps related to use over a long period of time or in particularly large quantities, or due to individual physiological idiosyncrasies. Examples include sassafras, comfrey, and ginseng. Sassafras is a particularly good example. Although it has been used as a tea for countless generations, and particularly as a spring tonic, studies in the early 1960s reported that safrole, the major chemical constituent of the oil, is hepatotoxic in rats. Other studies have confirmed this. While the FDA has prohibited the use of safrole as a flavoring agent,67 many people question the relevance of studies on rats, particularly in view of the many testimonials from lifelong sassafras drinkers that the plant does no harm.68 On the other hand, it has been estimated that one cup of sassafras tea may contain as much as 200 mg of safrole—more than four times the minimal amount believed hazardous to man if consumed on a regular basis.

Without question drinking sassafras tea is unwise. In the past, when sassafras was generally taken as a spring tonic, there may have been few untoward effects, but patterns of usage have changed, and many people now drink it frequently. An old saying known to Bass is of interest here; it warns about bad luck if sassafras wood is burned indoors, but whether or not this has any link to toxic effects is unclear.69

The major concerns over comfrey are discussed in the monograph, but the constituents causing alarm—pyrrolizidine alkaloids—are also distributed throughout a wide range of plants. In fact, epidemiological investigations suggest that a number of plants with the alkaloids may be implicated not only in acute epidemics of disease but also in chronic public health problems associated with insidious liver damage.70

Implicit faith in herbs sometimes leads to inappropriate usage. The administration of peppermint and chamomile teas to a ten-week-old Mexican-American child for a cold is perhaps a good example. The teas were continued while the child deteriorated, unfortunately to a state of hyponatremia.71

Another issue pinpointed by epidemiological studies is whether high doses of tannin may be associated with unusual incidences of cancer. It has been suggested, for instance, that in the Sea Islands, South Carolina, high intake of tannin in “bush tea” made from red oak bark, wax myrtle (bayberry), marsh rosemary, sweet pond lilly, blackberry root, and sweet gum is possibly related to an unusual incidence of esophageal cancers. The possibility that milk in tea binds tannins and hence protects against carcinogenic activity, if it exists, has been raised.72

The Quality of Commercial Herbs

In the context of the many factors affecting growing conditions and activity of plants, it is relevant to ask whether batches of a particular plant may have an unexpectedly high, and hence toxic, concentration of certain constituents. There is no evidence to suggest that this has happened. On the other
hand, “external” contaminants—deliberate, accidental, or incidental—have occasioned considerable concern, particularly in recent years.

Greatest interest lies in “fortification” of herbal medicines with opiates, amidopyrines, phenylbutazone, and corticosteroids. A well-documented case is an antirheumatic remedy, Chuifong Toukuwan, an “exclusively herbal” preparation produced in Hong Kong. At various times batches of the remedy have been found to contain dexamethasone, phenylbutazone, indomethacin, phenacetin, amidopyrine, mercuric sulfide, hydrochlorothiazide, and diazepam. Several cases of agranulocytosis (some fatal), cushinoid complications, and acute psychosis have been described following the use of these tablets.

Less dramatic but more perplexing cases have been reported. One example, from North Carolina, noted arsenic intoxication following the ingestion of an herbal tea made from yellowroot (Xanthorhiza simplicissima). The arsenic was thought to have come from accidental contamination of the soil and streams of the plant’s natural habitats.

A more anticipated type of contamination is fungal, especially in badly stored products. Mycotoxins are discussed in the Glossary.

Interactions with Food and with Other Drugs

We have mentioned one case of drug interaction, or at least untoward effects from combining ingredients in a compounded preparation, and we noted that interactions are a potentially serious problem among the elderly. Unfortunately, despite the widespread use of herbs and herbal products, little information is available on interactions with either medicines (prescribed or over-the-counter) or foods, and our remarks are thus very general.

An issue pertinent to the use of many herbs is the effects of tannins, which are widely distributed in barks and roots and undoubtedly in substantial concentrations in many herbal teas. Tannins are known to form complexes with iron and with certain large organic molecules like alkaloids. It has been said that tannins in tea slow down the absorption of iron; whether this could contribute to iron deficiency, especially in women, has not been studied in detail.

Another situation affecting absorption is the repeated and excessive use of laxatives, known to be widespread. Particular problems may arise among those who believe that the gastrointestinal canal should be “cleaned” after each meal. A comparable problem is the excessive use of ipecacuanha to produce vomiting among those with eating disorders. Myopathies have been reported as a result of toxic effects of the constituent alkaloids.

Incompatibilities with prescription products are generally an unknown quantity but, undeniably, potential difficulties can arise if an herb is given along with a prescription drug, especially if both possess the same pharmacological action. Concerns over the administration of hypoglycemic herbs to diabetics taking insulin were noted in volume 1. Innumerable other problems may occur within the categories of diuretics (perhaps exacerbating the loss of needed potassium), cardiac drugs (hawthorn is known to be used along with prescribed digoxin), and anticoagulant therapy (coumarin-containing herbs can add to the action of prescribed anticoagulants). Sassafras has been reported to inhibit liver microsomal enzymes, thereby prolonging the actions of drugs that are normally inactivated by the physiological system. In the absence of detailed knowledge it is inadvisable to take any herbal preparation along with a prescription product.
Notes

1. Many wholesale and retail catalogs list available herbs. A few lists have been published in the academic literature: for example, Sullivan (1981, pp. 179–96), Trease and Evans (1983, pp. 668–79; Asian medicines in Britain).

2. For reasons of space, a comprehensive approach to ethnobotany—"concerned with the totality of the place of plants in a culture" (Ford, 1978)—is not developed. See also comments in Alcorn (1984, pp. 2–8), who underscored the importance of understanding the pervasive interactions between man and plants in a particular culture. For comments on one aspect of ethnobotany, see Holmstedt and Bruhn (1983).

3. Two studies serve as examples: Bolyard (1981) included much recently recorded information but no details about informants apart from names. Bass finds some of the listed uses "unusual"; information on the backgrounds of the Kentucky informants might help assess whether recorded uses are mainline or hearsay. Lewis and Elvin-Lewis (1977) is a popular textbook, and sources of information can often be gathered from the bibliography. However, the sections on "herbology" (e.g., for nervous system, heart, and circulation), which tend to stress Indian uses, are in line with textbook format and without documentation or other means of evaluation.

4. Croom (1983). For other suggestions on the data for an ideal monograph, see Penso (1980). Noteworthy too are recent discussions on establishing parameters for the study of ethnopharmacology. For example, Malone (1983) stressed some of the common problems in natural product research, many of which are indicated in our account; Farnsworth and Loub (1983) highlighted the difficulty of handling a large amount of diverse information.

5. For examples of papers that spotlight this view, see Stevenson (1979), Bye (1986).

6. The well-known dictum attributed to Cato is quoted by Riddle (1984), who provided late Roman examples not only of the close association of vegetables and medicines but also the value of having readily available items as household remedies.

7. Salmon, in his preface, felt constrained to say: "It may probably be demanded, how I being a physician should be induced to write a book of cookery? But such as ask this question know little of the art ofphysick" (1710).

8. See such textbooks as Friedenwald and Ruhræ (1999).


10. Comment on a methodology paper by Trotter and Logan (1986, pp. 91–112) is relevant. The authors suggested that intra- and intergroup similarities in the use of medicinal plants have arisen and persist because particular remedies produce reactions that are both predictable and considered to be desirable. While they argue for the need for a sufficiently large data base to offset variation, the extent of this is considerable, as indicated below.

11. For an introduction to Gerard and vernacular names, see Rydén (1978). For consistency within the text (and justified on the basis of inconsistency in the past literature), hyphens have sometimes been added to older names or two words are written as one.

12. The celebrated Herman Boerhaave (1741) reflected a persistent thread in herbal practice when writing that no medicine can be proven of service in every disease; on the contrary, what has cured one disease under particular circumstances has, in different constitutions and stages of the very same disease, proved to have pernicious consequences.

13. For background to Gerard, see Jeffers (1967). For some testimony to contemporary usage of Gerard, see comments written on 15 September 1653 by a student, Henry Power, to his mentor Dr. Thomas Browne (Browne, 1964).


15. For some background focusing on wild plants see Stace, "Wild Hybrids" (1975, pp. 111–25), also Stace (ed.) (1975).

16. Scarborough (1978). For his reference to modern Greek, see Dawkins (1936). However, it should be appreciated that much research on Greek flora is still needed; cf. Greuter (1975, pp. 18–37); for consistency of vernacular names indicating linearity in descent, see Rydén (1984).


18. There are many accounts of the development of
binomial nomenclature and modern rules. Of interest, because of emphasis on the latter, is Gledhill (1985).


20. For instance, papers such as Oliver-Bever (1983) list many details of chemical constituents, but it is not clear, even on close reading, whether or not they explain the alleged reputation.


22. For some background see Batley (1838).

23. McIntyre (1986). Other comments have been made in volume 1, chapter 8.


25. Porcher (1863, p. vi). On 22 October 1852 C. J. Cowle wrote to a customer: “You do not have to be told that a root from its native bed is stronger & better than the same kind from a garden.” For a published reference, W. Lewis (1769) wrote: “Vegetables should be gathered chiefly from those soils in which they naturally delight. or in which they are found most commonly to rise spontaneous.”

26. Much detail—unfortunately not scientifically evaluated—has been recorded. Dioscorides, for instance, in his influential materia medica (c. A.D. 50) wrote that “herbs should be gathered when the weather is excellent, for it makes a great difference if the collection is done after recent droughts or heavy rains. Similarly, sites are important, whether they are in the mountains, high up, windswept, cold and acrid, for the properties of such plants are stronger” (translation by Scarborough and Nutton, 1982). In the 1950s Fluck (1955) wrote authoritatively: “Laymen, drug producers and even scientists often believe that special types of climate, e.g., the alpine one, would produce medicinal plants with the highest therapeutic value.”

27. Various facets of the story of the botanical drug trade have appeared, but no overall account. Issues
still current are found in Nutton (1985).

44. Criticisms of herbalists and old women have often arisen in connection with the separation of domestic from regular medicine. Early instances are given in Palmer (1985).

45. A few authors have highlighted the realities. Porcher wrote: “The roots of medicinal plants, although more advantageously gathered at certain periods do not lose their medicinal virtues in consequence of being dug in midsummer. It is probable that most of those imported are thus collected by savages or ignorant persons, when the plant is in full leaf, it being the more easily recognized” (1863, p. 5).

46. See respective monographs for issues of toxicity.

47. This includes attention to the effects of cultivation. Such recent reports as in issues of Acta Horticulturae, no. 144 (June 1984), and no. 122 (April 1983), give a sense of the growing importance of this development.

48. Clapp (1852, p. 5).

49. Numerous writers could be quoted. Of special interest is J. A. Paris; his many editions of Pharmacologia (1820 onward) endeavored to place prescribing on a more scientific footing.


51. For background see Crellin and Scott (1970).

52. For some background, see Mintz (1985, pp. 96ff.).

53. The lack of precision has been noted by P. Singer (1976). His “defense,” that the dosage of modern psychotropic drugs is variable, is perhaps not really addressing the issue.


55. Bass bemoans the fact that people are no longer cautious.

56. For a general review of poisonous plants on humans, see Hardin and Arena (1974). Poisonous plants appeared third (behind cosmetics and salicylates) in “The ‘Big Tens’ of Poisoning in the U.S.A.,” Clin. Tox. 10 (1977): 383–84. Subsequent hospitalizations, however, are low. For general literature on poisonous plants (often highlighting dangers to animal stock), see Muenscher (1951), Kingsbury (1964), Lampe and McCaan (1985). The worldwide literature on toxic plants is considered and can be relevant to the U.S. scene, some more than others; cf. Contreras and Zolla (1982). Brief reviews of poisonous plants are commonplace and tend to be repetitive. See, however, the series “Drugs Used in Non-orthodox Medicine,” in Dukes (ed.), Side Effects of Drugs, nos. 1–11 (1977–87); Vulto and Buurma, ibid., no. 6, stressed that the efficacy and toxicity of nonorthodox (including herbal) remedies is poorly documented (p. 416).

57. Scare tactics can be subtle, insofar as they warn about dangers of herbs without providing a sense of dosage. One instance is noted in Tyler et al. (1981), where among many cautionary comments there is reference to the fact that senna tea can result in diarrhea, dehydration, and related complications (p. 498). While this is true, it is a view hardly accepted by those who have taken a senna pod or a few leaves in a cup of water from time to time over the years. For the comment about physicians needing to consider herbs, see Vulto and Buurma (1984).

58. There is growing discussion about whether or not herbs should be “controlled” primarily through regulation or via education. Opinions range from attitudes such as those reflected in Goldfrank et al. (1982), which tend to produce hostility among users of herbs, to the view that the best approach to control is through education, as expressed by Gold and Gates (1980).

59. For a thought-provoking paper on serum proteins, see Raichelson (1979).

60. The literature on hallucinogens is vast, but for some introduction see Schultes (1969). Of special interest is the difference in the number of known hallucinogens in the New World compared to the Old World. For some discussion see LaBarre (1975), who argued that the difference between the Old and New World uses has not been resolved on rational botanical grounds and suggested that given their ancient vision quest and universal shamanism, perhaps Indians are culturally programmed to value, seek for, remember, and use any available psychotropic plants because these provided a manifest experience of the supernatural world (p. 39).

61. Isaac (1980) showed low toxicity in animals. For further comments, see “The Chamomiles”
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62. The added danger of mistakenly collecting the poisonous tansy ragwort (Senecio jacobea) was also pointed out.

63. Polk (1982).

64. For brief discussion see Vulto and Biurma in Dukes, ed., 1984, pp. 895–907. Potential side effects also exist.

65. Concerns have arisen, for example, over the widespread distribution of salicylates in two hundred edible plants; South (1979).

66. Hogan (1983). Bromalain is a proteolytic enzyme derived from pineapple. It was taken in this case as part of a weight-reduction regime to remove fatty deposits from hips.

67. For a review see Segelman et al. (1976).

68. We should add that sassafras is still widely available in health food stores (Tyler, Honest Herbal, 1982, pp. 201–3).

69. The need for further studies is clear from the review by Enomoto (1987).

70. For pertinent discussion of the public health concerns, see Schoental (1972), Furuya et al. (1987). There is also much concern over aflatoxin, which has been shown to relate to the incidence of primary liver cancer in parts of Africa and Asia, perhaps in association with hepatitis B antigen. There is less concern in the United States, where levels of aflatoxin in crops are carefully monitored.


72. Cf. Morton (1978, 1979). Among other discussions, Kapadia et al. (1976) noted items of concern such as southern bayberry, cherry bark, oak, and persimmon because of tannin content. Morton (1979) suggested that the British habit of adding milk to tea effectively binds tannins. Many factors are, of course, at play, including natural variations. One aspect is indicated in Goldstein and Swain (1963).


75. Disler et al. (1975). It is also relevant to note Daly and Cooney (1978), who concluded that "although tannic acid does precipitate most alkaloids, it does not necessarily prevent their gradual absorption through the walls of the gastrointestinal tract into the blood stream." They recommended activated charcoal alone. Many drugs interact with tannins. See Lasswell et al. (1984).

76. For discussion see de Smet and Vulto in Dukes, ed., 1987, pp. 422–24.

77. For some general comments, see Griffin and D'Arcy (1984, pp. 363–63).