

Botanicals as medicaments

By Seymour E. Wheelock, M.D.

This article is a web-exclusive supplement to a feature titled “Wild Greens” in the Spring 2006 issue of DARTMOUTH MEDICINE magazine. The feature explores the accidental poisoning in 1966 of seven individuals, including two members of the Dartmouth Medical School faculty, due to the accidental misidentification of a wild plant. Botanicals have, of course, been both used and misused through the ages. Following are some additional insights into ways that plants have helped and hindered the maintenance of human health. The feature “Wild Greens” itself can be accessed on the web at <http://dartmed.dartmouth.edu/spring06/>, under the “Features” tab.

The treatment of human ills with the leaves, weeds, roots, and seeds of plants is an ancient phenomenon. The Greek physician Dioscorides in the first century A.D. discoursed on botanicals at length. Theophrastus, an able pupil of Aristotle, lent his voice to the subject as well, reflecting critically on superstitions that he dutifully recorded. Pliny the Elder, “an industrious but wholly uncritical compiler” generated a baffling proportion of unnatural history in his work *Natural History*, a summary of all he could find in existing works about plants, animals, and minerals and their relation to humankind.

Each century absorbed information from the preceding one. The Dark Ages yielded to the medieval era and the medieval period drifted into the Renaissance. The end of the 16th century was notable for the transformation of the classic “herbal”—common wisdom regarding the medicinal use of plants—into a book describing plants that had value scientifically and/or esthetically in addition to their application to the multiple ills of human beings. But when the *Systema Naturae* of Linnaeus became available, it was clear that the age of the herbalist was fading fast before the more enlightened discipline of botany.

Consider these two 200-year-old quotations about *materia medica*—as drugs used to be called, a term whose literal meaning, in Latin, is “medical matter”:

From *Every Man his Own Doctor* by William Buchan, M.D., published in 1816 by N. Whiting of New Haven, Conn.:

“In this small volume a treatise is presented of the *Materia Medica* and a scrutiny of the medicinal properties of indigenous plants that are most generally known in the United States. The reader will at once see the advantage of being made acquainted with the herbs that he is daily treading under foot and which were given for the use of Man. Thusly any person of common observation need not be at a loss (in most cases) to know which are the most proper to be used.”

From *The Indian Guide to Health* by Pocahontas Nonoquet and Dr. Richard Carter, published in 1812 in Selby County, Kentucky:

“The wise man will find in the latter part of this work a *Meteria Medica* [sic] which points out the “simples” wherewith the Greate Creator has in his wisdom planted in our gardens, fields, and forests for the divine healing of most, if not all, of our Infirmities.”

Now fast-forward to the 21st century and check out the shelves of any of the thousands of natural food stores scattered across the country. Take note of the bewildering profusion of botanical “remedies.” Truly, we live in our therapeutic past, even as we deal with the complexities of today’s pharmaceutical giants and their miracle drugs.

But back at the dawn of the 19th century, the United States comprised a disparate populace whose health care still perfectly illustrated the words of an anonymous German writer of the 15th century:

“Many thousands and thousands of perils and dangers beset man. He is not fully sure of his life for one moment . . . but the Creator of Nature who has placed us amid such dangers has mercifully provided us with a remedy—that is, with all kinds of herbs, animals, and other created things to which He has given power and might.”

These words were penned by the author of one of many printed tracts on medicinal plants—treatises that still retain, across the centuries of their use, the name herbals. Herbalists’ chimeric literature is based sometimes on reality, often on superstition, frequently on religious conviction, and cheerfully on idiosyncratic personal reflection.

Despite unabashed charlatanry, fraud, and misconception of reality, patients did get well—sometimes because of, but sometimes in spite of, the “simples” and compounds with which they had been treated. On innumerable occasions, the vile concoctions they were prescribed had no physiological effect at all. But the herbalist did utilize a wide armamentarium of formulations whose actions were based on physiological fact. There were aromatics, emollients, mild digestive stimulants, antispasmodics, diuretics, carminatives, vermifuges, anodynes, purges, “cathartics for the costive” (that is, those afflicted with constipation), emetics, sudorifics, counterirritants, heart stimulants, and narcotics.

In some instances, herbalists of the past failed to recognize the usefulness of many plants whose active principles are familiar today—such as cascara, quinine, and, most spectacularly, digitalis, whose beneficial effect on diseased hearts did not reach Europe until the heyday of the herbalist was drawing to a close.

It was inevitable, therefore, that 19th-century practitioners of the healing arts in the United States felt adrift. There was no uniform organization of the *materia medica* at their disposal. The only pharmacopoeias to which they had recourse were based on the often-conflicting pronouncements of English and Irish herbalists, with liberal additions from assorted exotic cultures and the more than 100 different Native American groups then populating the United States and Canada.

True, some places had put in place measures to regulate the preparation of medicines early in the 19th century; the pharmacopoeias of the Massachusetts Medical Society (1808) and of the New York Hospital (1810) had some impact, but their influence was quite local. Elsewhere, the practice of pharmacy was exceedingly unsettled and varied from section to section, from village to village, and even from one physician to the competitor down the street.

The absence of a uniform national pharmacopoeia was keenly felt, but no significant action to create one was taken until 1818. In that year, Dr. Lyman Spalding, then an officer of the New York Medical Society, sounded the alarm: “In the United States the evil of irregularity and uncertainty in the preparation of medicines has been felt with peculiar weight. The character of medical preparation is liable to vary in every state and city of the union. The physician is exposed, unknowing, to the administration to his patients of medicines different from those

which his judgment has prescribed.”

It is of interest that Spalding had been an early pupil of Dartmouth Medical School's founder, Dr. Nathan Smith, and later served as Smith's assistant at Dartmouth. He had clearly been well trained. “This evil,” Spalding trumpeted in 1818, “is due primarily to a lack of cooperation by many physicians in the great country!” His suggestion that a national pharmacopoeia be formed “under the authority of and by the conjoint labors of the profession throughout the union” was received with almost universal approval. And so, at long last, one came to be.

The statement made regarding the objective of a national pharmacopoeia was to the point: “The value of our *materia medica* is of great variance. Some embody principles of highest quality and usefulness. Others are laden with pretensions not proved. It is our responsibility to select among substances of medical power those best understood and established and to form from them preparations in which their powers can be exerted to greatest advantage. To these must be affirmed convenient and definite names.”

Word went out to all medical societies, medical schools, and colleges with the information that the United States had been divided into four grand divisions: Northern, Middle, Southern, and Western. Delegates were to be elected from each division's medical bodies. Deliberations by each division over a pharmacopoeia were to be commenced at once, approved at a preliminary convention, and considered at a General Convention “in the city of Washington on the first of January 1820.” From all this disparate information, a national pharmacopoeia was to be distilled, and “the elixir of reason and common sense was to be made universally available to all medical bodies, apothecaries, and pharmacists in the United States and its territories.”

Easy to say, enormously difficult to do! A roll call of some of the names on the conventioners' name tags is of interest: from Vermont came Drs. Selah Gridley and Erastus Torrey; from New Hampshire Drs. Reuben Mussey, Ebenezer Learned, Mathias Spalding, and John Batchelder; from Massachusetts Drs. John Warren and others; from Brown University Dr. William Ingalls; and from Connecticut Drs. William Tolley and Eli Ives. Lyman Spalding's old Dartmouth mentor, Dr. Nathan Smith also attended, as one of the representatives of Yale Medical College, to which he had by then moved.

Despite an unexpected period of mild weather that rendered the rough roads of the time almost impassable, the General Convention did indeed meet in Washington as scheduled. Dr. Samuel Mitchell of New York was appointed president and Dr. Thomas Hewson of Philadelphia took office as secretary.

It is almost disrespectful to relegate the mountain of taxonomic toil which then ensued to a few lean sentences. Bulky “essays” produced by the members of the four divisional conventions, “having undergone deliberate examinations,” were united into one work. The title *The Pharmacopoeia of the United States of America* was adopted by noisy acclaim and the precious pages were handed over to a committee charged with seeing to its publication. “We have now thrown our weight into the whole process formerly dominated by the English,” cheered the exhausted conventioners. They then resolved that a second General Convention be held “in the present location” in 1830. Each division was to elect by ballot three delegates to see to the revision and augmentation of the book.

The first national pharmacopoeia was duly published as 1820 came to a close. It was not judged perfect by all, but it became a bestseller and in most parts of the union almost exclusively regulated the preparation of medicines. And the General Convention of 1830 would catch the errors, duplications, and omissions occasioned by the magnitude of the undertaking of 1820.

The promised General Convention of 1830 was held in Washington on January 4. In order to broaden the horizons of the conclave, the surgeons general of the Army and the Navy plus three members of Congress who were physicians were invited to join the elected delegates.

The gathering was charged with taking an enlightened look at the 1820 book and instituting such revisions as were deemed necessary. A committee was duly appointed to see to that task. But, aghast at the stacks of paper and vociferous testimonials with which it had been entrusted, the committee went into executive session and chickened out, stating: "Several important modifications are mandatory which require a more particular examination than your committee can possibly give them; therefore, your committee recommends that the exacting challenge be referred to a 'Committee of Revision' which shall prepare for the press a revised edition of the *Pharmacopoeia* and make the necessary arrangements for publication."

During the ensuing Washington winter, they debated ointments, tinctures, infusions, confections, extracts, pills, syrups, tonics, spirits, medicinal waters, and cerates (this last a compound of active ingredients in a base of lard or white wax). There were 400 preparations in the 1820 edition (including, as it happens, two pertinent to the article "Wild Greens" in the Spring 2006 issue of DARTMOUTH MEDICINE—*Helleborus foetidus*, or "bearsfoot," and *Helleborus niger*, or "black hellebore"). By the time the 1830 edition was ready for press, the number of preparations had increased to 720 (and, again pertinent to the article "Wild Greens," veratrum was indexed by name—*V. album* and *V. viride*).

The Convention was called again and again. In the 1880 edition of the *Pharmacopoeia*, there were 1,161 "prescriptions"; 240 items had been added (including American and Indian cannabis, as well as the extract and tincture of *Veratrum viride*) and 200 deleted.

The changes through the years also included an increasing number of pages devoted to tables of reagents, specific chemical characteristics of some botanicals, methods of preparation, and indications for use—all hints of the coming revolution in the worlds of medicine and pharmaceuticals.

In fact, as I write, sitting before me are both a copy of the first *Pharmacopoeia of the United States*—the one published in 1820—and the latest edition of the *Physicians' Desk Reference*, a pharmacological resource that contains some 10,000 citations for the multitude of preparations available to today's doctors in humankind's ceaseless struggle to attain and sustain optimum health.

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