

## For "a Voluptuous Glow of Health and Vigor": Medical Botany in Kentucky, 1792-1910

Michael A. Flannery

Lloyd Library and Museum, 917 Plum Street, Cincinnati, Ohio 45202

Gilbert Imlay waxed eloquent in his 1792 description of the natural beauty of Kentucky. Flowers "full and perfect" bejeweled an "eternal verdure" that bestowed "a voluptuous glow of health and vigor."<sup>1</sup> Imlay's poetic hyperbole may have been the first suggestion in print that Kentucky's vegetable kingdom held especially valuable medicinal properties. This impassioned description of Kentucky flora presaged the efforts of the medical profession to restore health and vigor to a populace persistently ravaged by diseases such as cholera, typhoid, influenza, tuberculosis, dysentery, and a host of more vaguely defined maladies like "intermittent fever," "torpid liver," and "marasmic debility."

Only one year before Imlay's letters on "the importance of that rising country," this land had been known merely as "the Kentucky District," the thinly populated, barely explored western frontier of the Old Dominion. In 1792 the 15th state in the Union stood in the vanguard of the trans-Appalachian West; with that distinction came the responsibility of advancing Euro-American science and learning into the hinterland. But in so doing it also learned *from* the hinterland and was as much transformed by the frontier wilderness as it was a transformer of it. Nowhere is this more apparent than in the interaction of physicians with the flora native to the eastern woodlands. This paper seeks to underscore this point by examining the history of medical botany in Kentucky. First, however, a clear definition of the subject must lay the foundation for the study to follow.

### MEDICAL BOTANY DEFINED

At first glance the term *medical botany* would seem fairly straightforward, but earlier historical work in the field leaves this open to question. In 1914 Howard Kelly published a collection of biographical sketches devoted to "medical botanists commemorated in our botanical nomenclature"<sup>2</sup> and thus made taxo-

nomic namesakes the single criterion for inclusion in his book. Years later Ronald Stuckey published a valuable study of physician/botanists in the Ohio Valley.<sup>3</sup> Yet neither approach is, strictly speaking, medical botany as it has been traditionally understood by the medical community. Medical botany is not related in any direct sense to taxonomy, nor is it restricted to those physicians who may have happened to develop an interest in scientific botany. Some physicians did contribute to botanical nomenclature; some even became intensely interested in the structure, growth, and distribution of plants, but *all* physicians had a vested interest in medical botany by virtue of their *materia medica*.

For purposes of this paper medical botany must be understood in terms historically familiar to physicians. In this regard Robley Dunglison's medical dictionary, a standard reference work for 19th-century American physicians, provides the most serviceable definition of medical botany as "the knowledge of the properties, characters, &c., of those vegetables which are used in medicine."<sup>4</sup> As such, medical botany is inextricably tied to the vegetable *materia medica* and to the various pharmaceutical compendia that have formed the ongoing commentary on the physician's armamentarium; the concern of medical botany for plant taxonomy is purely derivative and passive, based upon whatever the taxonomist tells the medical community, and aspects integral to scientific botany have normally been of only marginal interest to the physician. Medical botany, then, is about plants that have played a role in the *materia medica*. The focus on Kentucky will reveal that the state has been an especially abundant resource for medicinal plants and an active area of pharmacognostic inquiry.

### SETTING THE STAGE FOR KENTUCKY: PRE-PHARMACOPEIAL MEDICAL BOTANY

The initial temptation in examining the history of America's medicinal plants is to assume



that the Native Americans' familiarity with plants as remedial agents greatly influenced white settlers and ultimately physicians. It is known, for example, that about 170 drugs used by North American Indians eventually became official in the *United States Pharmacopoeia* (USP) or the *National Formulary* (NF).<sup>5</sup> Indeed the *United States Dispensatory* (USD) listed even more. But despite many references in the medical literature to Native American usages of medicinal plants, it can easily be exaggerated, as pharmacy historian David Cowen has pointed out:

First it must be noted that the 170 Indian-used drugs that attained official status (not necessarily for the same medical uses) represented but one-third of our basic list. Two-thirds, at least, did not attain official status. Furthermore, about half of those that were placed in the 1820 pharmacopoeia were relegated to the secondary list, obviously considered of less importance by the profession.

It is, furthermore, impossible to say how many of the Indian-used plants were in use by the Indians before their contacts with European culture. There [are] a few plants on the basic list that we know were taught to the Indians by the Europeans. *Datura Stramonium* for example, was dubbed "the white man's medicine" by the Indians according to Rafinesque. Walter J. Hoffman, an ethnologist who was initiated into the Grand Medical Societies of two Indian tribes, was convinced, in 1885, that "the efficacious Indian remedies had been learned from whites." At least 35 of the plants on the basic list were either naturalized or adventive plants.<sup>6</sup>

While Native American medicine unquestionably played a significant role in domestic and empiric healing systems, Cowen concluded that "North American Indians made little substantial impact on professional practice."<sup>7</sup>

The investigation of American medicinal plants by the mainstream scientific community followed a course similar to settlement, first following the coastal regions and later pushing inland into the vast wilderness. One of the earliest discussions of medical botany in British North America came from John Bartram (1699–1777). His writings on indigenous plants useful in medicine first appeared in the *American Almanac* in 1741 and represents, according to one historian, "one of the earliest [publications] in American pharmacognosy."<sup>8</sup>

The American Revolution provided further stimulus to medical botany with the arrival of Johann David Schöpfung (1752–1800), a Hessian

army surgeon serving the Ansbach troops in the employ of His Majesty King George III battling America's "impudent rebels." From June 1777 until the war's conclusion in 1783, Schöpfung treated the sick and wounded at hospitals in New York, Philadelphia, and Rhode Island. In practicing his office physic, the enterprising Bavarian became intrigued with the possibilities of the New World flora, and from July 1783 to June 1784 he set forth on a tour that took him from Philadelphia to Maryland into Virginia, the Carolinas, and ultimately to Spanish Florida and the Bahama Islands.<sup>9</sup> This medico-botanical expedition formed the basis of his *Materia Medica Americana* (1787), the first book-length study devoted exclusively to medicinal plants indigenous to the United States.<sup>10</sup>

Such efforts sparked both praise and criticism and led to further work in the field. Benjamin Smith Barton (1766–1815), professor of theory and practice of medicine at the University of Pennsylvania and a tireless advocate of utilizing the local flora in medicine, readily acknowledged Schöpfung's contribution, but added, "He has given us nothing from his own experience. He ascribes active powers to plants which are nearly inert, and appears to me to be, in some measure, governed by the old notion of Signatures<sup>11</sup>: one of the tyrants of the ancient schools."<sup>12</sup> Barton attempted to correct Schöpfung's deficiencies by writing his own treatise on American medicinal plants. The fruits of that labor produced his impressive two-volume study titled *Collections For an Essay Towards a Materia Medica of the United States* (1798–1804). It is generally regarded as one of the chief works leading toward the first USP (1820).<sup>13</sup>

#### THE GOLDEN AGE OF MEDICAL BOTANY, 1799–1860

Barton passed on to his students his enthusiasm for a medical botany composed of native species. One of his more noteworthy medical students was the Kentucky native Daniel Drake (1785–1852). Drake provides an appropriate means of linking medical botany on the national scene with the scientific community in Kentucky. In late 1817 this Barton protégé joined the medical faculty at the progressive Transylvania University in Lexington as professor of *materia medica* and medical botany.



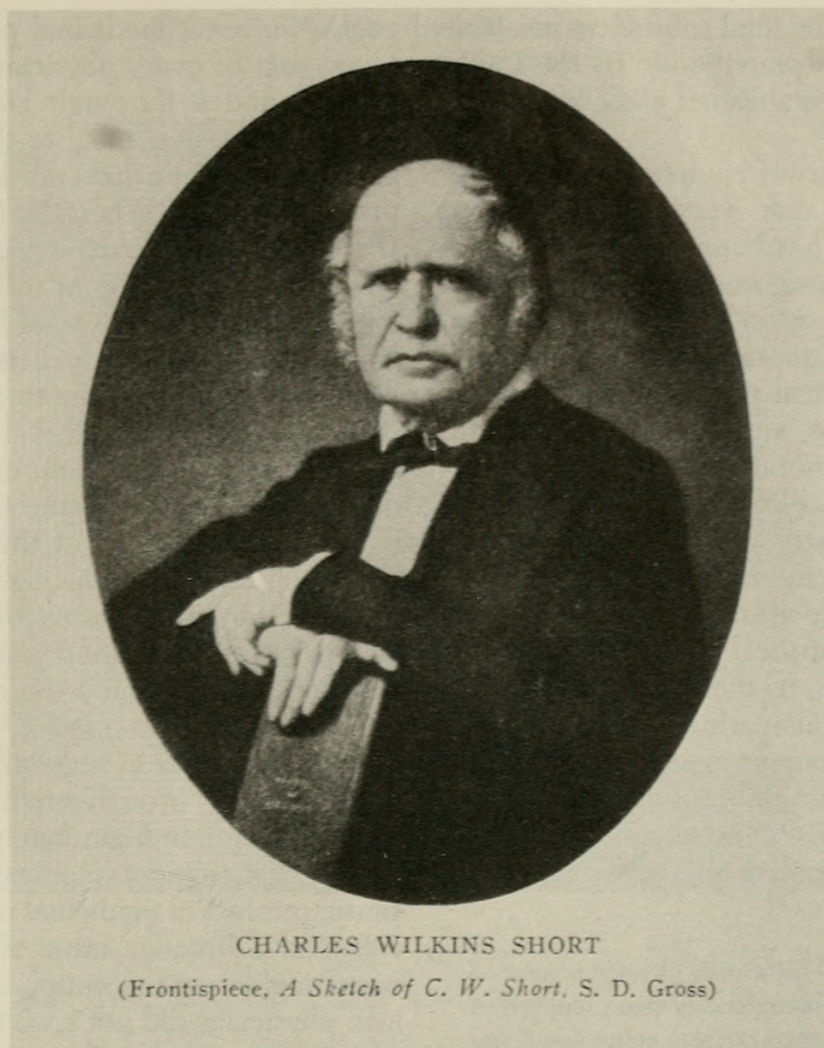


Figure 1. Charles Wilkins Short (1793–1863), one of Kentucky's most noteworthy medical botanists. In 1825 he left his medical practice in Christian County to join the Transylvania University, Lexington, as professor of materia medica and medical botany. In 1838 he accepted a faculty position at the Louisville Medical Institute; he remained in Louisville until his retirement in 1849. Asa Gray dedicated the genus *Shortia* to him. Photo from Howard A. Kelly, *Some American Medical Botanists* (1914). Courtesy Lloyd Library and Museum, Cincinnati, Ohio.

Since 1799 Transylvania, the oldest institution of higher learning west of the Appalachian Mountains, had been actively developing an outstanding medical department. Drake assumed his teaching duties in 1818, the same year that the innovative Bostonian Horace Holley (1781–1827) took the presidency of the university. There Drake joined a talented faculty composed of Samuel Brown (1769–1819) and Benjamin Dudley (1785–1870). In 1819 Charles Caldwell (1772–1853), a protégé of the famous Philadelphia physician Benjamin Rush (1745–1813), was added to the ranks. Here Drake witnessed an educated Lexington citizenry “captivated by the on-going spectacle of scientific advance.”<sup>14</sup>

Drake was ambitious and restless, and his tenure at Transylvania was sporadic. After

1818 he left the school, to rejoin it later from 1823 to 1827. The professorship of materia medica and medical botany formerly taught by him was assumed by the talented physician Charles Wilkins Short (1793–1863) (Figure 1) who left his practice in Christian County, Kentucky, to join the faculty in 1825. By the 1830s, however, the glory of Transylvania was waning, and both Drake and Short eventually joined the faculty of the rival Louisville Medical Institute, a school founded in 1837 by a faction of dissatisfied Transylvania faculty members headed by Lunsford P. Yandell (1805–1878).<sup>15</sup>

Whatever the various fortunes of the state's medical schools, all medical curricula worthy of the name would have included courses on medical botany. Students had to understand medicinal plants because they made up such



a large portion of the total substances available to the 19th-century practitioner. By the 1800s, plants had a long-established place in the *materia medica*.

Brief explanations of complex historical developments always risk oversimplification, but western medicine has been historically dominated by two enduring traditions: one initiated by the Greek physician Galen (130 A.D.–ca. 201 A.D.), whose humoral pathology called primarily upon botanical preparations known as simples, composites, and entities to bring the body back into humoral balance; the other associated with Paracelsus (1493–1541), whose arcane iatrochemistry intertwined mysticism and spagyric medicine to introduce chemicals into the therapeutic armamentarium.<sup>16</sup>

Despite the historical animosity between these two traditions, by the 18th and 19th centuries virtually all allopathic<sup>17</sup> (i.e., orthodox) physicians relied upon an armamentarium that combined both chemical and vegetable products. Charles Wilkins Short stated the situation in 1833 to his *materia medica* students at Transylvania quite well:

Our attention . . . is principally directed to *mineral* and *vegetable* preparations, and of those supplied us by the former, none others equal in utility, excellence and universal employment the preparations of Mercury and Antimony, for without the aid derived from these giant remedies, our art would be stripped of its main resources. It must be confessed, however, that compared with the two minerals just named and their preparations, all other mineral remedies sink into comparative insignificance; and we are compelled at last to seek in the *vegetable* world for that exhaustless store, whence by far the greater number of our remedies are drawn. This circumstance, then, will be my apology for devoting the present exercise to an address strictly introductory to a study of the vegetable *Materia Medica*, in which I shall endeavour to point out the importance of the study of Botany to the Physician, and to show its close relationship with the study of Medicine.<sup>18</sup>

Short was telling his students what every physician already knew. Likewise, Drake told students at the Louisville Medical Institute in 1844 that one of “the classes of subjects from which candidates might advantageously select” in pursuing their medical theses was the study of “our medicinal plants.”<sup>19</sup>

The emphasis of Short and Drake upon medical botany was not an attempt at peda-

gogical novelty; medicinal plants were an integral part of every physician’s arsenal against disease, and a thorough knowledge of their properties was essential to the effective practice of 19th-century medicine. The USP proves the point. When the first edition of the USP appeared in 1820 it included 425 different botanicals among its substances, comprising 67 percent of the total list of “officials.” By 1840 the number had risen to 488 botanicals or 70 percent of the total list of USP substances (see Figure 2).<sup>20</sup> Furthermore, the commonwealth offered an especially rich laboratory in which to pursue the study of these plants; over one-third of the total number of botanicals ever listed throughout the history of the USP are indigenous to Kentucky.<sup>21</sup> No wonder that Dr. Short not only collected plants but championed the cultivation of medicinal species in the state.<sup>22</sup>

In fact, interest in vegetable *materia medica* was so strong throughout the antebellum period that it might legitimately be called America’s golden age of medical botany. In this sense, interest in medicinal plants in Kentucky reflected a broader wave of systematic work occurring across the nation as a whole. American physicians did not have to search publishers’ catalogs long to find examples of important texts in medical botany written by their colleagues: there were Jacob Bigelow’s three-volume *American Medical Botany* (1817–1820); William P. C. Barton’s two-volume *Vegetable Materia Medica of the United States* (1817–1818), a title that would have made his uncle Benjamin proud had he lived to see it; William Zollickoffer’s *A Materia Medica of the United States* (1819); R. Eglesfeld Griffith’s *Medical Botany, or, Descriptions of the More Important Plants Used in Medicine . . .* (1847); and Asahel Clapp’s *A Synopsis, or, Systematic Catalogue of the Medicinal Plants of the United States* (1852).

Despite the importance of the plant kingdom in medicine, it did not completely dominate 19th-century therapeutics. As suggested by Short, chemicals like mercury (more commonly referred to by physicians as *calomel* or mercurous chloride) and antimony (most commonly used as tartar emetic) exerted an influence wholly disproportionate to their numbers within the active *materia medica*. The reasons for this are complex but tied to an almost ir-



**Official Phytomedicines in the U.S.:**

Percentage of Total USP

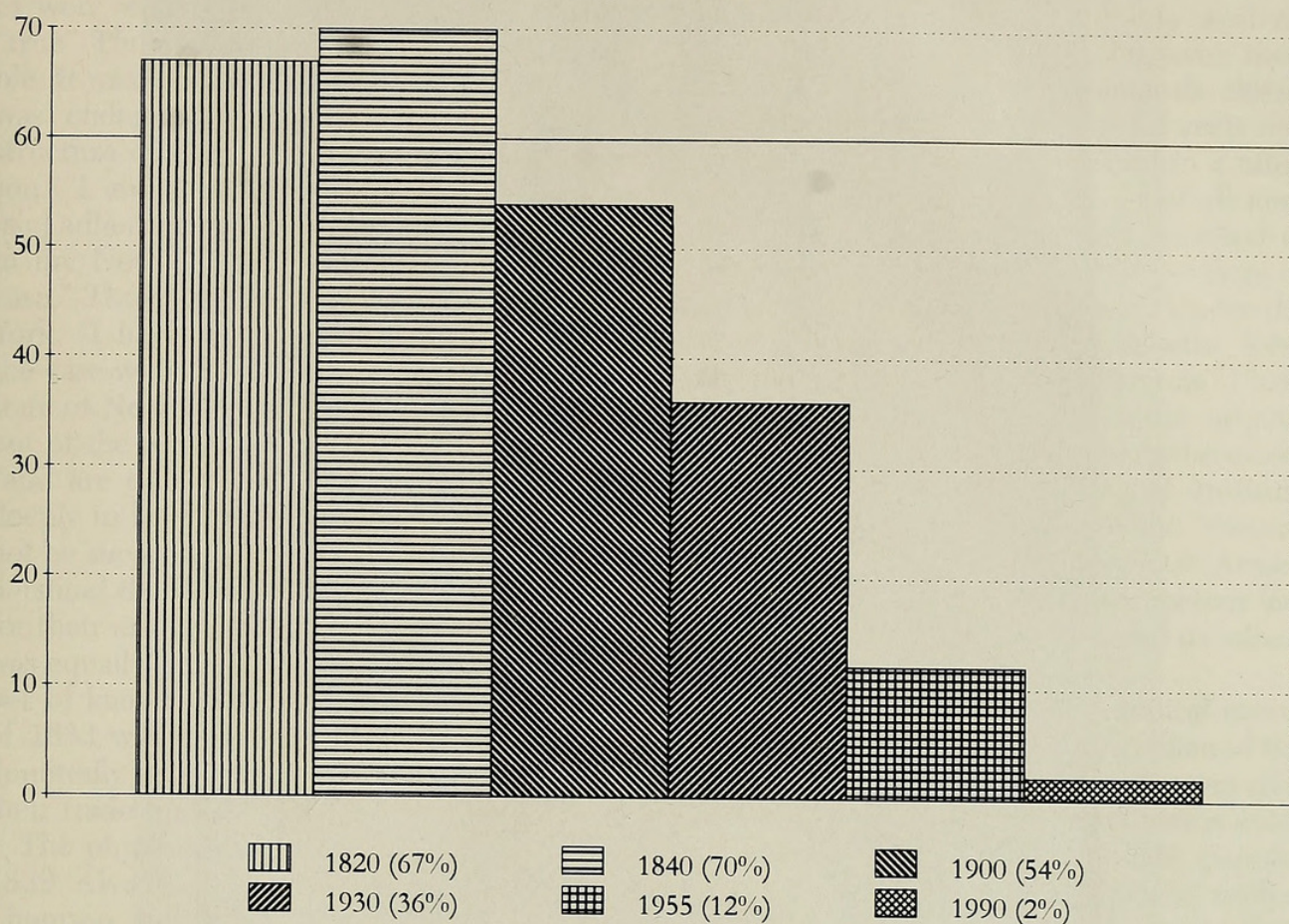


Figure 2. Official phytomedicines in the United States, 1820–1990: percentage of total in the *United States Pharmacopeia*. Adapted from Wade Boyle, *Official Herbs* (1991). Courtesy Lloyd Library and Museum, Cincinnati, Ohio.

rational faith among allopaths in heroic therapeutics. Convinced that “powerful methods were very efficacious if employed judiciously,”<sup>23</sup> physicians could administer excessive doses of calomel and antimony as well as engage in debilitating bloodletting with the most liberal interpretations of “judicious.” Furthermore, it was a practice that died a slow death, continuing well into the 1870s. “The acceptance of constitutional pathology,” wrote medical historian John Haller, Jr., “led many practitioners to the almost exclusive use of calomel as the ‘best bilious purgative’ and, in general, they prescribed the drug until the patient’s tongue turned brown or until he began to salivate. Armed with calomel, the lancet, and a few other purgatives and believing that disease was a condition the philosophy of which they had mastered, doctors considered themselves prepared to treat successfully almost every case that presented itself.”<sup>24</sup> Such arrogance made enemies, and by 1840, even with botan-

ical substances predominating the officinals of the USP, a diverse but increasingly powerful group of medical sectarians stood ready and able to challenge the orthodox profession for what they regarded as the gross abuses of heroic therapies.

#### THE BOTANICO-MEDICAL MOVEMENT

While medical botany was being systematically investigated by the allopathic profession, the discipline found a less learned but certainly more ardent champion in Samuel Thomson (1769–1843) (Figure 3). This self-taught, self-proclaimed herbalist used his book *New Guide to Health, or, Botanic Family Physician* (1825) to attack the “mineral doctors.” Casting the allopaths as pompous elitists relying more upon credentials than knowledge, Thomson insisted—in a declaration that presumably excluded his own work—that “the practice of physic requires a knowledge that cannot be



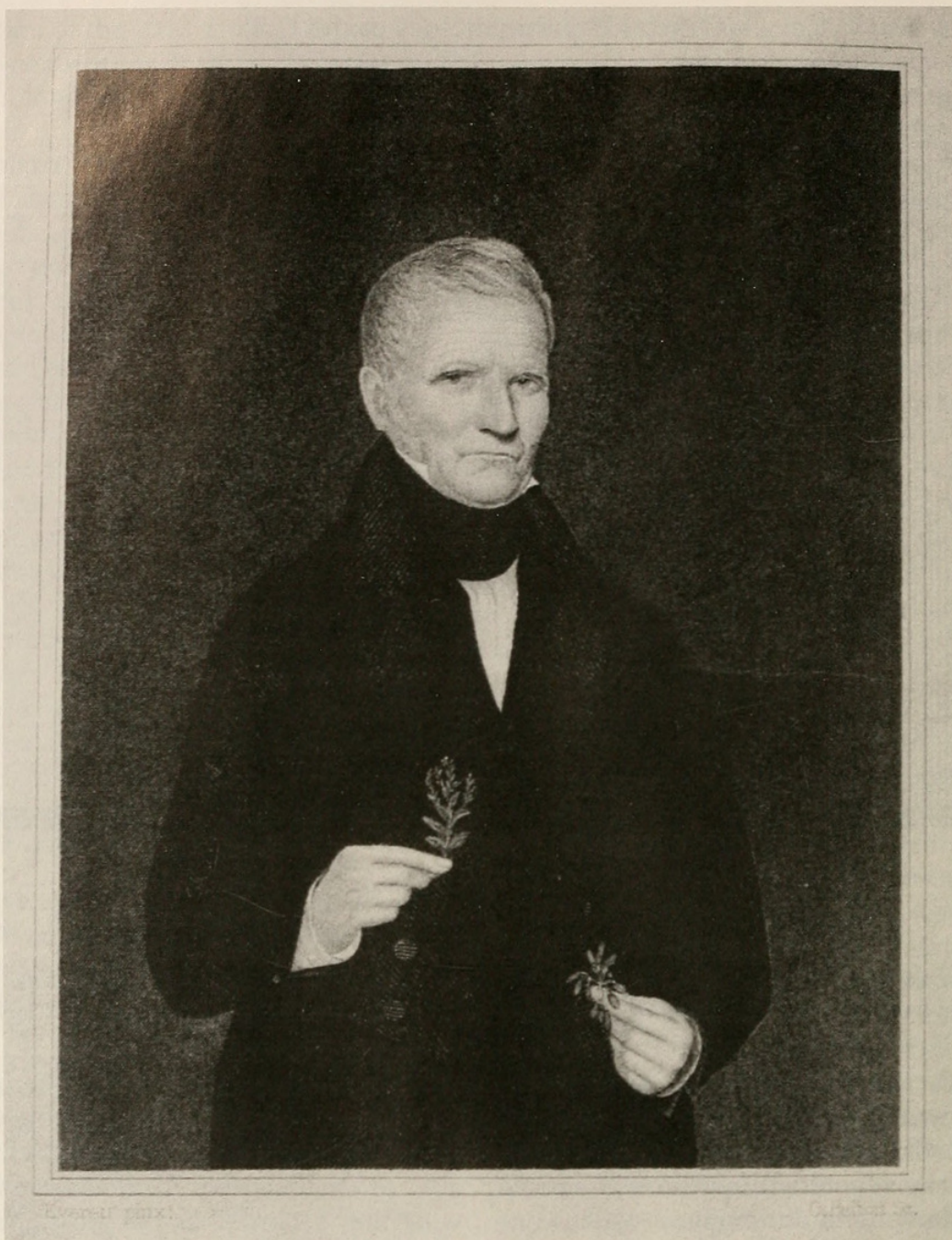


Figure 3. Samuel Thomson (1769–1843). With his *New Guide to Health* (1825), Thomson began a grassroots movement of botanical medicine in opposition to regular medicine. He attacked orthodox practitioners for their “learned” prescriptions of calomel and antimony. Insisting that no degree from any medical school was necessary to practice the healing arts, Thomson declared, “People who are capable of raising their food and preparing the same, may as easily learn to collect and prepare all their medicines and administer the same . . . .” Photo from Samuel Thomson, *The Thomsonian Materia Medica* (1841). Courtesy Lloyd Library and Museum, Cincinnati, Ohio.

got by reading books.”<sup>25</sup> Thomson spread his therapeutic gospel by charging interested individuals 20 dollars for instruction on using his numbered remedies (Lobelia #1 being an especial favorite).<sup>26</sup> In order to ensure that his personally designated agents could operate unimpeded by statutory regulation, Thomson championed the repeal of state licensing for physicians throughout the young nation. This

met with general popular approval, and in state after state licensing laws were either rendered toothless by making penalties for unlicensed practitioners virtually non-existent or were revoked outright.

Thomson’s fatal flaw was his rejection of formal education. Not only did this attract the illiterate and ill-prepared to the group, but with Thomsonians practicing the botanic faith



for a mere 20 dollars and a copy of the latest edition of the *New Guide to Health*, allegiances were weak and the means of legitimating “true” Thomsonians became next to impossible. It was a widespread problem and one that was endemic with the loose and informal structure of the sect insisted upon by Thomson. “I am glad to hear that you scrupulously [sic] adhere to the principles I have laid down in my *New Guide* for the treatment of disease,” Thomson wrote to R. K. Frost of New York. “I have been informed that this is not the case with many of the practitioners of the state of New York. They are taking my system out of the hands of the people,” he declared, “and are doing it an essential injury. This is deeply to be regretted for their practice cannot be successful, and I wish the public to understand that I do not hold myself responsible for their errors.”<sup>27</sup> What was true of New York was equally true of Kentucky. The actual number of known agents in Kentucky by the end of 1833 was only four,<sup>28</sup> but there were undoubtedly many more itinerant healers plying their trade under the Thomsonian name.

The physio-medicals avoided this pitfall. In 1839 Alva Curtis (1797–1881) split from Thomson and created his own Independent Thomsonian Medical Society. Like Thomson, these independents rejected all heroic therapy. Unlike their predecessor, however, Curtis called for the immediate establishment of colleges ready to train a cadre of botanical sectarians, soon to be dubbed *physio-medicals* or *physio-pathic* practitioners.<sup>29</sup> Despite Thomson’s own consternation at the collapse of his sect, he was not vilified by his progeny. “Those independent Thomsonians who extended botanic practice beyond the scope of Thomson’s original plan,” wrote John Haller, “were always ready to applaud the founder’s commitment to self-expression and self-government. From their perspective, Thomson had labored hard in the vineyards of medical reform to bring reason out of therapeutic chaos.”<sup>30</sup>

Perhaps even more important among these colorful sectarians were the eclectics. Started by Wooster Beach (1794–1868) under the name *Reformed* medicine, this group rejected adherence to any preconceived theory of therapeutics. Instead they claimed, as their name would imply, to choose methods from *any* medical group. This system of so-called “sci-

entific empiricism” was one that would presumably maintain objectivity, thus leaving therapeutic choices open to *any* and *all* schools of practice. In reality, however, their armamentarium comprised botanicals chiefly drawn from America’s fields and forests and their canonical faith was grounded in a nihilism that not only rejected the use of all minerals but opposed anything that smacked of efforts by allopaths to assert their privilege or preeminence to medical authority. Under the able administration of Beach’s apostle, Kentucky native Thomas Vaughan Morrow (1804–1850), eclecticism spread from its original home in New York to Ohio, where the establishment of the Eclectic Medical Institute (EMI) in 1845 made Cincinnati the “mecca” of eclecticism for nearly 100 years.<sup>31</sup> Armed with a comparatively large and competent faculty, the EMI prospered and spread its adherents throughout the Midwest.

The success of the botanico-medical movement rested in the socio-political milieu of the period. Riding the crest of the egalitarian spirit of Jacksonian democracy, the botanico-medical movement gained considerable popular support. Its emphasis upon a materia medica of indigenous plant species had a grass-roots appeal that resonated well with a newly independent nation that was exuberantly expansionist, jingoistic, and xenophobic.<sup>32</sup> At the same time regulars could easily be depicted as elitist remnants of an Old World order that were ill-suited to the requirements of a young republic. Even allopathic practitioners knew that such charges would fall upon attentive and sympathetic ears. This is probably why Charles Wilkins Short, even in an introductory lecture on vegetable materia medica delivered to fledgling Transylvania University medical students, did not let the sectarian challenge go unanswered. He accused all botanical physicians of being “ignorant pretenders” to “the noble science of botany” and he branded their therapeutics as “the panaceas of the quack.”<sup>33</sup>

Interestingly, Short had a colleague at Transylvania who would have disagreed—Constantine Samuel Rafinesque (1783–1840). Restless, inquisitive, and eccentric, Rafinesque investigated subjects from archeology to zoology. Despite his wide ranging interests, it was Rafinesque’s work in botany that made him both noteworthy and notorious. This and other as-



pects of his diverse and prolific career cannot be examined here. Suffice it to say that Rafinesque was captivated by the possibilities of scientific discovery in the comparatively unexplored trans-Appalachian West, and when an opportunity to join the progressive Transylvania University presented itself, he eagerly accepted.

Rafinesque arrived in Lexington in 1818 and soon commenced his teaching duties at the university in natural history. But there was trouble almost from the beginning. Rafinesque accused president Holley of despising the "natural sciences" and felt that his requests for support were largely ignored and his contributions unappreciated.<sup>34</sup> Nonetheless, he held onto his professorship and even asked for appointment to the chair of materia medica, a request that was refused because he was not a physician. Undaunted, Rafinesque made numerous contributions to the study and description of Kentucky flora.<sup>35</sup> Eventually he was permitted to teach medical botany, giving his first course on that subject in 1823–1824.<sup>36</sup> By then he had already given evidence of his disdain for the allopathic profession. When he contracted measles one year before, he insisted that he had "recovered in spite of the Physicians, by taking none of their poison, antimony and opium, while many died in their hands."<sup>37</sup> Rafinesque continued to offer his course in medical botany through the winter term of 1825–1826. His acerbic personality and idiosyncratic opinions won him few friends, and in 1827 he left Transylvania University "with curses on it."<sup>38</sup>

The school was never again visited by this erratic genius, but there is little doubt that Rafinesque's plant investigations during his Transylvania years formed the basis for his magnum opus in medical botany, *Medical Flora, or, Manual of Medical Botany of the United States of North America*.<sup>39</sup> Of the 100 monographs in the *Medical Flora* no more than a dozen are foreign to Kentucky.<sup>40</sup> The extraordinarily high number of species indigenous to Kentucky in the *Medical Flora* make this work one of the first in-depth publications devoted to the medicinal plants of that region, preceding Ohio botanist/physician John Riddell's (1807–1867) "Western Flora" by 6 years.

The impact of Rafinesque's *Medical Flora* was significant. Although attacked by regular

physicians,<sup>41</sup> it was highly regarded and widely used by members of the botanico-medical movement. Alva Curtis, for example, thought highly of the *Medical Flora* and included it among the texts used at his Botanico-Medical College and Infirmary in Columbus, Ohio.<sup>42</sup> Likewise, eclectic physician/historian Alexander Wilder (1823–1908) praised the "marked thoroughness" of Rafinesque's work in medical botany.<sup>43</sup> "The introduction to the *Medical Flora*," he concluded, "is a very complete presentation of the whole subject. The learned professor, as with the ken of a prophet, had almost foreseen and divined the advent of the new American Reformed School of Medicine, and he threw the gate open for its arrival."<sup>44</sup> Indeed eclectics like Wilder, Harvey Wickes Felter (1865–1927), and others suggested a direct link between Rafinesque and the eclectic movement. Modern historical investigation has shown, however, that although Rafinesque approved of Wooster Beach and his "Reformed Medicine," attempts to label Rafinesque an eclectic partisan are without foundation.<sup>45</sup> Still, Rafinesque's *Medical Flora* ranks as a major contribution to the literature of American medical botany, becoming in historian Francis R. Packard's words, "the *vademecum* of the Botanic physicians."<sup>46</sup>

Thus, through Rafinesque's major contribution to medical botany, the flora of Kentucky exerted a powerful influence over the botanico-medical movement. Despite this fact, eclectics themselves were never a significant force in Kentucky. Much of the reason lay in the remarkable productivity of the allopathic schools. While Transylvania continued to churn out physicians, the Louisville Medical Institute was growing at an unprecedented pace and would soon surpass her rival in Lexington. The situation was accurately and almost prophetically summarized by Daniel Drake in his valedictory address to graduates of the third session of the Louisville Medical Institute on 10 Mar 1840:

What is the number of our rival schools? Twenty-five, the whole in operation last winter being 26. If the 2,400 pupils had been divided equally among the 26 schools each would have had 92  $\frac{1}{2}$ . It appears then, that your institution has had more than double its equal share, that is, 204 instead of 92  $\frac{1}{2}$ . Is it the greater age of the Institute, which has drawn to her twice the number she would have received under an



agrarian distribution? Certainly not, for of her 25 rivals, but three were younger, while 22 were older than herself. And what is her *relative* rank among these competing institutions? The University of Pennsylvania during the session just terminated, as heretofore, stood *first*, Transylvania University second, the Medical Institute of the city of Louisville third! Yes fellow citizens, you have founded and endowed a school which in less than three years outstripped 20 and became the third in the two Americas, and would have been the second, if the second had not been a *Kentucky* school. The two schools of this state have together 460. It is in medical education the second state of the Union. The Keystone State in her three schools has but 200 more . . .

But can Louisville overtake Lexington? In the first session of your school, the difference between it and Transylvania was 147 in favour of the latter, in the 2d session it was 91, reduced 56; in the 3d it was 52, reduced 39. Thus nearly two-thirds of the difference has been already sunk . . . Transylvania can only hope to sustain her, near her average but your Institute may expect advance till it shall become the second school in the new world and from our geographical position ought to remain the second.<sup>47</sup>

The Louisville school never did attain the lofty position predicted by Drake, but it *did* soon surpass the waning Transylvania University. Furthermore, the allopathic medical school at Louisville, which by 1846 became the Medical Department of the University of Louisville, sustained its remarkable ability to produce physicians in quantity if not quality. By 1912 it was estimated that one-third of all physicians in the United States were Louisville graduates.<sup>48</sup>

No sectarian group could compete with such a tremendous and continuous output of allopathic physicians. Even faced with these overwhelming numbers, there remained a persistent, albeit small, botanico-medical presence in Kentucky. In 1881 a Kentucky State Eclectic Medical Association was formed in Newport.<sup>49</sup> But by 1889 D. Alden Loomis, an eclectic physician from Louisville, was bemoaning conditions in a state that was glutted by practitioners of every stripe and dominated by regulars:

The state has been an asylum for all classes of medical men and women. As fast as they were driven out of Indiana and Illinois under existing laws they would settle here [Louisville]—Clairvoyants, Cancer-doctors, Faith-cure, Christian Science advocates, Electricians, and in nearly every case they claim to be Eclectics. As only good things are counterfeited,

this speaks well for our system of medicine, but it has relegated us to its rank and file of most illiterate and unpopular people, thereby injuring us as a corporate body of medical men. Louisville does not contain a single true Eclectic physician. A few good men are located in the western part of the State. They are holding up the banner of our cause and making their names and influence felt.

There are others Eclectic at heart and who secretly practice the principles set forth in our leading publications, but they are faint-hearted and dare not publicly announce themselves as of us. As a rule the State is Allopathic and "joined to her idols."<sup>50</sup>

By 1893 G. T. Fuller of Lowes, Kentucky, estimated eclectic strength at about 150 throughout the state, or one to every 35 square miles.<sup>51</sup> Eclectic practitioners could continue to be found in rural Kentucky even into the 20th century. In 1909 there were 14 active Kentucky members in the National Eclectic Medical Association, and they doubled their number that year to 28.<sup>52</sup> It should be remembered that despite comparatively small numbers, rural physicians—even eclectics—tended to have a multiplier effect in the community they served. George Taylor, for example, remembered the practice of his father, an eclectic physician working in Graves County, Kentucky, from 1889 to 1915, as quite active and exerting a powerful influence over the provision of health in the region. "He waged a never ceasing war against the many diseases, morbid humors and other ills and indispositions to which the human body is heir," he recalled, "getting little financial reward . . ."<sup>53</sup>

Though few in number by the early 1900s, eclectics made medical botany an integral part of their therapeutics whenever and wherever they practiced: it was, in fact, their *raison d'être*. Two of their more important remedial agents, goldenseal (*Hydrastis canadensis* L.) and purple coneflower (*Echinacea angustifolia* DC. and *E. purpurea* (L.) Moench) (Figure 4), were highly valued by eclectic physicians. Some of their substances had official status within the regular medical community. *Hydrastis*, for example, was official in the USP in 1830, fell from favor, and resurfaced in the fourth USP revision of 1860, where it remained through 1920. *Echinacea* on the other hand never had standing in the USP. Nonetheless, *echinacea* and *hydrastis* were listed in the eclectics' dispensatory.<sup>54</sup>





Figure 4. *Echinacea purpurea*. Illustration from William P.C. Barton, *A Flora of North America* (1822). Barton called the plant *Rudbeckia purpurea* long after Conrad Moench had described the genus *Echinacea* (1794). Asa Gray adopted the Moench nomenclature in 1848, a change reported to the American Medical Association by A. Clapp in 1850. Courtesy Lloyd Library and Museum, Cincinnati, Ohio.

Both plants are found throughout Kentucky. The famous pharmacist and phytochemist John Uri Lloyd (1849–1936) indicated that Kentucky was at the heart of the range of

goldenseal. This made Kentucky an important source for a medicinal plant whose distribution was not exceptionally wide and whose habitat was quite fragile. “Hydrastis has no



power to adapt itself to altered conditions of growth," Lloyd wrote. "Cultivating the land is sure to exterminate it at once, and even cutting off the trees will cause it to disappear in a few years. It is the common report from all botanists that the plant is becoming scarcer every year. In many places where it formerly grew abundant," he concluded, "it is now reported rare."<sup>55</sup> Although abundant nowhere, today *hydrastis* can still be found throughout Kentucky.<sup>56</sup> *Echinacea angustifolia* and *Echinacea purpurea* are also indigenous to the commonwealth. *Echinacea angustifolia* is found in the Mississippian Plateau or Pennyroyal region of Kentucky; the range of *E. purpurea* in Kentucky extends from the Western Coal Fields to the Mississippian and Cumberland plateaus.<sup>57</sup>

The generally accepted story of echinacea's introduction into the medical profession is particularly interesting and in some senses inaccurate. Lloyd wrote that a self-taught "physician" named H.C.F. Meyer of Pawnee City, Nebraska, sent him some of the crude drug in late 1885, and that the sender claimed to use it as a "blood purifier." Subsequent investigations by eclectic physician John King (1813–1893) verified echinacea's therapeutic value. Echinacea was marketed by the Lloyd Brothers pharmaceutical firm as a "powerful antiseptic, locally and internally, in diphtheria, typhoid conditions, cholera infantum, [and] blood poisoning."<sup>58</sup> Historians of this plant acknowledge its earlier medicinal uses among Native Americans for snakebite and toothache as well as its use among Europeans for saddle sores on horses as early as 1762, but Lloyd and King are generally credited with echinacea's introduction to the professional medical community.<sup>59</sup> While it is true that John King investigated the properties of echinacea and that John Uri Lloyd was the first to manufacture an echinacea preparation on a commercial basis, the medicinal uses of the plant were not unknown to physicians. John Riddell listed *Rudbeckia purpurea* (now *E. purpurea*)<sup>60</sup> in his 1834 "Western Flora" as aromatic and carminative.<sup>61</sup> In 1850 Dr. A. Clapp, who appears to be the first medical botanist to prefer the name *Echinacea* over the older name *Rudbeckia*, recognized the use of the purple cone-flower in folk medicine (known as *black Samson*) and reported its properties to his allo-

pathic colleagues.<sup>62</sup> John King and Robert Newton (1818–1888) referred to the medicinal properties of this plant (under the old genus *Rudbeckia*) years before it had come to Lloyd's attention. Calling it "red sunflower," King wrote in 1852 that *R. purpurea* "is said to be used with benefit in syphilis; the root is the part employed, and which, when fresh, is acrid and burning."<sup>63</sup>

#### MEDICAL BOTANY AMONG REGULAR PHYSICIANS IN KENTUCKY AFTER 1860

In spite of the commonwealth's rich medicinal plant resources, Kentucky plants played a greater role in eclectic practice than eclectic practice played in Kentucky. Never strong or numerous, eclectics and botanic practitioners in general played a negligible part in Kentucky's health care delivery.

This was not so for allopaths. The Kentucky State Medical Society, formed through the efforts of William Loftus Sutton (1797–1862) in 1851, exerted a powerful influence on medical practice throughout the Commonwealth. Regular physicians employed a wide range of plants in the healing arts. Figure 2 shows that botanical substances predominated allopathic pharmaceuticals throughout the 19th century. The influence of the botanico-medical movement, even in states where it was weak like Kentucky, was felt by regular practitioners. The remedies of the botanics were popular and widely compounded and dispensed. During the last half of the 19th century eclectic preparations were manufactured on a large scale. "As a result of this pharmaceutical activity," concluded Alex Berman, "many plant ingredients and formulae used exclusively in Thomsonian and Eclectic pharmacy passed into the general pharmaceutical literature, the *U.S. Pharmacopoeia* and the *National Formulary*. Emphasis on indigenous plant medicinals by Botanic practitioners stimulated faculty and students of the Philadelphia College of Pharmacy to submit certain of these plants to proximate analysis. The sale of Eclectic remedies through regular drug channels constituted an appreciable economic link with American pharmacy."<sup>64</sup>

Whether associated with sectarian practice or not, there is substantial evidence to conclude that physicians prescribed a large num-



ber of botanical substances and that the nature of the materials prescribed changed surprisingly little until the 1930s.<sup>65</sup> Furthermore, historically speaking, neither time nor region seems to have played an important role in defining what 19th-century allopathic physicians prescribed. David Cowen and Donald Kent, for example, found few variations in the substances prescribed by physicians in New Jersey in 1854 and those of Kentucky in 1887.<sup>66</sup> That 1887 survey of Kentucky physicians also shows that most of the drugs prescribed were botanically based.<sup>67</sup> What is perhaps most interesting is the fact that a comparison of eclectic and regular physicians' prescriptions published by Lloyd in 1912 indicated that the top five favorite herbal drugs were virtually the same between the two groups: echinacea (*E. angustifolia* and *E. purpurea*), aconite (*Aconitum napellus* L.), bryonia (*Bryonia dioica* Jacq.), macrotys (*Cimicifuga racemosa* (L.) Nutt.), and gelsemium (*Gelsemium sempervirens* (L.) Ait. f.).<sup>68</sup> In fact, the same survey revealed that out of more than 200 plant-based drugs, echinacea, which never had USP status, ranked first among regular practitioners' favorite botanical prescriptions. For eclectics the favorite was gelsemium with echinacea trailing at fifth place. "The two studies . . .," Lloyd concluded, "indicate that the practicing physicians of America now freely employ any remedial agent that appeals to them as being useful, regardless of either its origin, or the school affiliations of its introducers."<sup>69</sup>

What Lloyd neglected to mention was that by the time of this study the age of the vegetable materia medica had passed. In 1910 three signal events announced the end of medical botany as a subject of importance in the healing arts. First was the fact that the ninth decennial revision of the USP included 367 botanicals out of 773 total official substances; for the first time in the history of the USP plant-based drugs represented a minority of the pharmacopeia.

The factors leading toward the steady reduction of botanical medicines are complex, but much has to do with important European innovations in organic chemistry and the laboratory synthesis of chemical constituents during the last quarter of the 19th century. The synthesis of salicylic acid (an antiseptic, antifungal, and keratolytic agent) by Hermann

Kolbe (1818–1884) in 1874 and the development of antipyrin (an antipyretic and analgesic agent) in 1883 by Ludwig Knorr (1859–1921) thrust Germany into the forefront of pharmaceutical chemistry. Furthering this work in Germany, Paul Ehrlich (1854–1915) struck the second great blow against botanical drugs by realizing the Paracelsian dream of developing demonstrably effective chemotherapeutic agents. This occurred in 1910 when arsphenamine was shown in clinical trials to be effective against encephalitis and syphilis.<sup>70</sup> Presented with the technology and expertise to develop *patentable* synthetic compounds, drug companies throughout America rushed to add this new and profitable class of pharmaceuticals to their inventory. In contrast there was little economic incentive to continue a line of plant-based drugs. As botanical houses closed down across the country in the first half of this century, so did phytomedicinal research and development. Reflecting this trend, the percentage of botanicals in the USP witnessed a precipitous decline (see Figure 1).

The third stroke was delivered not against the vegetable materia medica directly but against the botanical sectarians with the publication of *Medical Education in the United States and Canada* by Louisville native Abraham Flexner (1866–1959).<sup>71</sup> The now-famous Flexner Report surveyed the condition of medical education throughout America and, in short, found it wanting. Believing that there were far too many medical schools, that most were at best second-rate, and that this situation caused the graduation of too many ill-prepared physicians, Flexner personally visited each degree-granting institution then in operation with the expressed purpose of reducing their number. Attempting to cast all medical education in the United States in the mold of Johns Hopkins University, Flexner deemed all schools that fell short of the clinical research model imported from Germany unworthy of survival. Whatever the merits or demerits of Flexner's scheme, virtually all sectarian schools were branded substandard. Although general trends in medical education had already been reducing the number of schools in operation, the Flexner Report was the death knell of the botanico-medical movement. In the years following the Flexner Report school after school closed its doors per-



manently. These factors combined to significantly diminish the influence of medical botany in American medicine. As the sun set on the vegetable materia medica nationally, so too did the long shadows of the herbal dark age fall upon Kentucky.

### CONCLUSIONS

The details of what has been called the modern "herbal renaissance" are beyond the scope of this paper. Nevertheless, that there has been a tremendous revival in medicinal plant investigation in recent years is undeniable. This research phenomenon has closely paralleled the renewed interest in alternative medicine. There is no greater evidence for this than in the National Institutes of Health (NIH) Office of Alternative Medicine created by Congressional mandate in 1992. In an ironic twist, medicinal plants, which have historically been such an integral part of mainstream medicine, are now being seriously investigated through the offices of an agency devoted to alternative and complementary therapies.<sup>72</sup>

Medicinal plants have been the subject of thousands of documented *in vitro* and *in vivo* studies in Europe.<sup>73</sup> But many in the field of phytomedicine like Varro E. Tyler, professor emeritus of pharmacognosy at Purdue University, insist that America must catch up and launch its own comprehensive program of systematic phytotherapeutic assessment. As ethnobotanists and pharmacognosists rush to Belize, the Amazon rain forest, and similar warmer climes, we may be ignoring potentially valuable and pharmacologically active plants in our own backyard. Calling the study of American medicinal plants "a neglected area of research," Tyler stated that plants indigenous to North America "are much more likely to yield truly useful medicines, following suitable re-investigation, than the little-known exotic plants from far away places. These once widely used remedies ceased to be employed in medicine, not necessarily because they were ineffective, but because they were not patentable, and therefore not profitable."<sup>74</sup>

To summarize, then, this paper warrants a number of conclusions: (1) the vegetable kingdom has played a significant role in the therapeutics of *both* regular and sectarian practitioners; (2) historically speaking, many of the species listed in the major American drug

compendia are native to Kentucky (over one-third in the USP alone); (3) although Drs. Short and Drake had a keen interest in medical botany and taught in the state for many years, it was Constantine Rafinesque who produced the first major work devoted to native Kentucky medicinal plants with his *Medical Flora*; (4) despite the fact that Rafinesque's *Medical Flora* was a standard reference work among the botanico-medicals, Kentucky itself never sustained a large, organized botanical movement mainly because of the tremendously high production of allopathic physicians by the Louisville Medical Department; (5) echinacea, an important medicinal plant indigenous to Kentucky, was *not* first introduced to the medical community by John Uri Lloyd in 1885 or by John King's subsequent investigations but was recognized to have therapeutic use by physicians of the trans-Appalachian West at least as early as 1834; (6) even though botanical sectarians were overwhelmed in the state, medical botany flourished in Kentucky among all physicians throughout the 19th century; (7) the prescribing habits of allopathic physicians from the 1800s through the early 20th century do not seem to have been appreciably influenced by time, place, or a preparation's association with regular or sectarian medicine; (8) medical botany declined in Kentucky as part of a national trend that saw the introduction of new synthetic drugs; and (9) there has been renewed interest in botanical medicine in recent years.

Given the recent renewed interest in herbal medicine and the support of the NIH Office of Alternative Medicine, Kentucky, with its rich resources of historically useful medicinal plants, would seem to be an ideal region for phytopharmaceutical prospecting. Unfortunately, there seems to be little activity in this area. Except for some collaborative work between the Tobacco and Health Research Institute (THRI) at the University of Kentucky and the Audax Company of Leitchfield, Kentucky, a drug development firm with a natural product emphasis,<sup>75</sup> there is no concerted effort between academic departments and appropriate national, state, local, or private institutions to systematically examine the medicinal properties and economic potentials of native Kentucky plants. This is all the more unfortunate since many (echinacea and gold-



enseal being just two good examples) have a long-established tradition of medical use. The many native Kentucky plants that present viable candidates for phytopharmaceutical investigation, plus the assertion of OAM advisory council member and FDA official Dr. Frank Temple that botanicals hold the most promise of yielding useful pharmacological discoveries,<sup>76</sup> should make the commonwealth well positioned to submit grant proposals in this area.

But before this can begin individuals from many disciplines (e.g., economic botanists, taxonomists, pharmacognosists, bioengineers, historians of medicine and pharmacy) within the state will have to collaborate in the endeavor.<sup>77</sup> Whenever and however that may occur, the starting point is an appreciation of the commonwealth's rich heritage in medical botany. The future may indeed be in our past.

### ENDNOTES

- 1 Gilbert Imlay, *A Topographical Description of the Western Territory of North America*, 3rd ed. (London: J. Debrett, 1797), p. 28. Although appearing in several subsequent editions, Imlay's work was originally published in 1792.
- 2 Howard A. Kelly, *Some American Medical Botanists: Commemorated in Our Botanical Nomenclature* (Troy, NY: Southworth, 1914).
- 3 Ronald L. Stuckey, "Medical Botany in the Ohio Valley (1800–1850)," *Trans. & Studies Coll. Phys. of Phil.* 45 (1978):262–279. Jerry Stannard's "Medical Botany," in *A Short History of Botany in the United States*, ed. Joseph Ewan (New York: Hafner Pub. Co., 1969), pp. 146–152, gives a very brief sketch of a very complex subject that deserves honorable mention.
- 4 Robley Dunglison, *A Dictionary of Medical Science*, new ed. (Philadelphia: Henry C. Lea, 1874), s.v. "botany, medical."
- 5 *Kremers and Urdang's History of Pharmacy*, revised by Glenn Sonnedeker, 4th ed. (Philadelphia: J. B. Lippincott, 1976. Reprint, Madison, WI: AIHP, 1986), p. 147. See also Sonnedeker's "Representative Drugs of the American Indians" listed in appendix 1, pp. 377–378.
- 6 David L. Cowen, "The Impact of the Materia Medica of the North American Indians on Professional Practice," in *Botanical Drugs of the Americas in the Old and New Worlds = Amerikanische pflanzliche Arzneien in der Alten und Neuen Welt*, Veröffentlichungen der Internationalen Gesellschaft für Geschichte der Pharmazie, bd. 53, edited by Wolfgang-Hagen Hein (Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1984), pp. 51–63.
- 7 Cowen, p. 56.
- 8 Christopher Hobbs, "The Medical Botany of John Bartram," *Pharm. Hist.* 33(1991):181–185. The Hobbs article also includes a valuable reprinting of Bartram's *Descriptions, Virtues and Uses, of Sundry Plants of these Northern Parts of America*, 186–189.
- 9 Originally published as *Reise durch einige der mittlern und südlichen Vereinigten Nordamerikanischen Staaten* (1788), it has been translated by Dr. Alfred J. Morrison. It is available under that same title with the addition of an informative introduction in *Bull. Lloyd Library* 16 (1911).
- 10 Johann David Schöpfung, *Materia Medica Americana* (Erlangæ: Sumtibus Io. Iac. Palmii, 1787). Reprinted in its entirety in the *Bull. Lloyd Library* 6, reproduction series 3 (1903).
- 11 The doctrine of Signatures was an ancient, mystical belief that God or some spirit force had "signed" certain plants so as to suggest their therapeutic value. Thus plants with heart-shaped leaves became good for the heart, walnuts were good for the brain, etc.
- 12 Benjamin Smith Barton, *Collections for an Essay Towards a Materia Medica of the United States*, *Bull. Lloyd Library* 1, reproduction series 1 (1900), p. 3.
- 13 See Glenn Sonnedeker, "The Founding Period of the U. S. Pharmacopeia. II. A National Movement Emerges," *Pharm. Hist.* 36(1994):3–25.
- 14 Qtd. in Eric H. Christianson, "The Conditions for Science in the Academic Department of Transylvania University, 1799–1857," *Register Ky. Hist. Soc.* 79(1981):316.
- 15 This divisive episode is covered in detail in John D. Wright, Jr.'s *Transylvania: Tutor to the West*, rev. ed. (Lexington: University Press of Kentucky, 1980), pp. 145–157.
- 16 *Iatrochemistry* comes from the Greek word *iatros* ("physician") which refers to the belief that illness stems from too much acid or alkaline substances in the body. To correct this "acrimony" in the system, acid or alkaline chemical drugs were administered to correct this imbalance. *Spagyric medicine* refers to the application of alchemy to the healing arts. Based upon mystical theories of transmutation of substances, it is derived from the Greek word *spao* (to separate) and *ageiro* (to assemble). For details see Sonnedeker, *History of Pharmacy*, pp. 41–45.
- 17 The term comes from the Greek word *allos* (different) and *pathos* (illness), meaning to cure a disease by prescribing remedies different from the symptoms presented. The term was coined by Samuel Hahnemann (1755–1845), founder of homeopathy, to distinguish his *similia similibus curantur* (like cures like) principle from the regular or orthodox profession's *contraria contrariis* (cure by contraries). See Samuel Hahnemann, *Organon of the Art of Healing*, 5th ed., trans. by C. Wesselhoft (New York: Boericke & Tafel, 1878), pp. 92–93. Today the term *allopath* no longer has Hahnemann's original connotations and it is merely synonymous with the regular medical profession.



- <sup>18</sup> Charles W. Short, "An Introductory Address to a Course of Lectures on Materia Medica," *Transylvania J. Med. Assoc. Sci.* 6(1833):461–462.
- <sup>19</sup> Daniel Drake, *An Introductory Lecture on the Means of Promoting the Intellectual Improvement of the Students and Physicians of the Valley of the Mississippi* (Louisville: Prentice & Weissinger, 1844), p. 10.
- <sup>20</sup> Wade Boyle, *Official Herbs: Botanical Substances in the United States Pharmacopoeias, 1820–1990* (East Palestine, OH: Buckeye Naturopathic Press, 1991), p. 57.
- <sup>21</sup> The actual percentage is 35.8 percent or 115 of 321 species listed by Wade Boyle, pp. 14–55. Indigenous Kentucky species were verified against the USP list by consulting Edward T. Browne, Jr., and Raymond Athey, *Vascular Plants of Kentucky: An Annotated Checklist* (Lexington: University Press of Kentucky, 1992).
- <sup>22</sup> See Charles Wilkins Short, "On the Cultivation of Certain Medicinal Plants," *Transylvania J. Med. Assoc. Sci.* 2(1829):512–523.
- <sup>23</sup> Alex Berman, "The Heroic Approach in 19th Century Therapeutics," *Bull. Am. Soc. Hosp. Pharm.* (Sept.–Oct. 1954):323.
- <sup>24</sup> John S. Haller, Jr., *American Medicine in Transition, 1840–1910* (Urbana: University of Illinois Press, 1981), p. 78.
- <sup>25</sup> Samuel Thomson, *New Guide to Health, or, Botanic Family Physician*, 9th ed. (Columbus, OH: J. Pike, 1833), p. 10.
- <sup>26</sup> The Thomsonian movement is covered in considerable detail by Alex Berman in his "Thomsonian Movement and Its Relation to American Pharmacy and Medicine," *Contributions from the History of Pharmacy Department of the School of Pharmacy, University of Wisconsin* 2(1952):405–538. For other studies on Thomson and his movement see Susan E. Fillmore, "Samuel Thomson and His Effect on the American Health Care System," *Pharm. Hist.* 28(1986):188–191; and William G. Rothstein, *American Physicians in the 19th Century: From Sects to Science* (Baltimore: Johns Hopkins University Press, 1972), pp. 125–151.
- <sup>27</sup> Letter to R. K. Frost, Boston, 9 December 1837, rare book room, Lloyd Library and Museum.
- <sup>28</sup> Berman, "Thomsonian Movement," 417.
- <sup>29</sup> The most thorough account of this botanical sect is John S. Haller, Jr., *Kindly Medicine: Physiomedicalism in America, 1836–1911* (Kent, OH: Kent State University Press, 1997).
- <sup>30</sup> Haller, p. 31.
- <sup>31</sup> For information on Morrow see Michael A. Flannery, "Thomas Vaughan Morrow, 1804–1850: The Apotle of Eclecticism," *Trans. Ky. Acad. Sci.* 57(1996):113–119; for a complete assessment of the eclectic movement see John S. Haller Jr., *Medical Protestants: The Eclectics in American Medicine, 1825–1939* (Carbondale: Southern Illinois University Press, 1994).
- <sup>32</sup> This aspect of the botanical movement is thoroughly examined in Alex Berman, "Social Roots of the 19th Century Botanico-Medical Movement in the United States," *Actes du VIII<sup>e</sup> Congrès Internationale d'Histoire des Sciences* (1956):561–565.
- <sup>33</sup> Short, "An Introductory Address," 462–463.
- <sup>34</sup> C. S. Rafinesque, *A Life of Travels*, *Chron. Bot.* 8(2) (Philadelphia: F. Turner, 1836. Reprint, Waltham, MA: Chronica Botanica, 1944), pp. 321–323.
- <sup>35</sup> See Willem Meijer, "The Contribution by Rafinesque to the Early Botanical Exploration of Kentucky," *Cas-tanea* 38(1973):261–265.
- <sup>36</sup> Rafinesque, pp. 324–325.
- <sup>37</sup> Rafinesque, p. 324.
- <sup>38</sup> Rafinesque, p. 327.
- <sup>39</sup> C. S. Rafinesque, *Medical Flora, or, Manual of Medical Botany of the United States of North America*, 2 vols. (Philadelphia: Samuel C. Atkinson, 1828–1830). For a discussion of the individual species monographed in the *Medical Flora* see Michael A. Flannery, "The Medicine and Medicinal Plants of C. S. Rafinesque," *Econ. Bot.* 52(1) (1998):27–43.
- <sup>40</sup> The exact percentage of the plants in the *Medical Flora* native to Kentucky is 86.13. This was determined by matching Rafinesque's species with those found in Browne and Athey (see note 21). This was verified in John L. Riddell, "Western Flora," *Western J. Med. Phys. Sci.* 2(1834):329–592.
- <sup>41</sup> Drs. A. Clapp and R. Eglesfeld Griffith suggested that Rafinesque's work was both unreliable and unsafe. Clapp's reservations regarding *Medical Flora* are quoted in Alex Berman, "C. S. Rafinesque (1783–1840): A Challenge to the Historian of Pharmacy," *Am. J. Pharm. Educ.* 16(1952):409–418; Griffith's comments can be found in his "On *Fraseria walteri*," *J. Phil. Coll. Pharm.* 3(1832):272–273.
- <sup>42</sup> Haller, *Kindly Medicine*, p. 35.
- <sup>43</sup> Alexander Wilder, *History of Medicine* (Augusta, ME: Maine Farmer Pub. Co., 1904), p. 421.
- <sup>44</sup> Wilder, p. 424.
- <sup>45</sup> Alex Berman, "A Striving for Scientific Respectability: Some American Botanics and the Nineteenth-Century Plant Materia Medica," *Bull. Hist. Med.* 30(1956):25–31.
- <sup>46</sup> Francis R. Packard, *History of Medicine in the United States*, Vol. 2 (New York: Paul B. Hoeber, 1931), p. 1229.
- <sup>47</sup> Daniel Drake, *Daniel Drake, M.D., Frontiersman of the Mind: Three Unpublished Addresses of Daniel Drake, M.D., to Medical Students at Transylvania University, Cincinnati College, and the Louisville Medical Institute* (Cincinnati: Crossroads Books, 1985), pp. 36–38.
- <sup>48</sup> Medical Historical Research Project of the Work Projects Administration, *Medicine and Its Development in Kentucky* (Louisville: Standard Printing, 1940), p. 215.
- <sup>49</sup> *Trans. Nat. Eclectic Med. Assoc.* 12(1884–1885):74.
- <sup>50</sup> D. Alden Loomis, "[Report on] Kentucky," *Trans. Nat. Eclectic. Med. Assoc.* 16(1888–1889):376–377.



- <sup>51</sup> G.T. Fuller, "[Report on] Kentucky," *Trans. Nat. Eclectic Med. Assoc.* 21(1893):28.
- <sup>52</sup> *Nat. Eclectic Med. Assoc. Q.* 1(1909):7.
- <sup>53</sup> George F. Taylor, "Horse and Saddle Doctor," *Register Ky. Hist. Soc.* 61(1963):237.
- <sup>54</sup> For a full discussion of their therapeutic uses among eclectics see entries for *echinacea* and *hydrastis* in Harvey Wickes Felt and John Uri Lloyd, *King's American Dispensatory*, 19th ed., 4th rev. (Cincinnati: Ohio Valley, 1909), pp. 671–677 and pp. 1020–1030, respectively.
- <sup>55</sup> John Uri Lloyd, "*Hydrastis canadensis*," *Drugs and Medicines of North America* 1(1884–1885):83.
- <sup>56</sup> Browne and Athey, p. 55.
- <sup>57</sup> Browne and Athey, p. 123.
- <sup>58</sup> See John Uri Lloyd, *A Treatise on Echinacea*, Drug Treatise, no. XXX (Cincinnati: Lloyd Brothers, 1917), pp. 3–6, 13–16. *Echinacea's* immunostimulant properties were not known until Victor von Unruh reported that the plant "increases the phagocytic power of the leukocytes" in his "*Echinacea angustifolia* and *Inula helenium* in the Treatment of Tuberculosis," *Nat. Eclectic Med. Assoc. Q.* 7(1916):63–75.
- <sup>59</sup> See, for example, Varro E. Tyler, *The Honest Herbal*, 3rd ed. (New York: Pharmaceutical Products Press, 1993), pp. 115–116; Steven Foster, *Echinacea: The Purple Coneflowers*, Botanical Series, 301 (Austin, TX: American Botanical Council, 1996), p. 4; and Roy Upton, *Echinacea* (New Canaan, CT: Keats Publishing, 1997), pp. 12–13.
- <sup>60</sup> The changing nomenclature of this plant may be responsible for the confusion regarding the exact history of *echinacea's* introduction to the medical community. Originally this plant was known as *Rudbeckia purpurea*, so named by Linnaeus. In 1794 Conrad Moench (1744–1805) revised this to *Echinacea purpurea* in his *Methodus plantas* (Marburgi Cattorum: Libraria academiae, 1794), p. 591. Moench's revision was not immediately acknowledged by botanists, however. Rafinesque complicated matters by referring to the genus *Echinacea* as *Helichroa* (his own invention) in his *Medical Flora* of 1830 (vol. 2, p. 227). In his brief entry Rafinesque mentions the medicinal use of this plant by the Mandan Indians. Nevertheless, the generally recognized name remained *R. purpurea* until Asa Gray (1810–1888) adopted Moench's change in his *Manual of the Botany of the Northern United States* (Boston: J. Munroe, 1848), p. 223. Today the genus *Echinacea* is universally preferred over *Rudbeckia* for this species. See Werner Greuter et al., *Names in Current Use for Extant Plant Genera*, Regnum Vegetale, v. 129 (Königstein, Ger.: International Association for Plant Taxonomy, 1993), p. 383.
- <sup>61</sup> Riddell, p. 500.
- <sup>62</sup> Clapp cited Asa Gray (see n. 60) on both the binomial name and medicinal use of *E. purpurea* in his "Report of the Committee on Indigenous Medical Botany and Materia Medica for 1850–51," *Trans. Am. Med. Assoc.* 5(1852):689–906. Also published as *A Synopsis, or, Systematic Catalogue of the Medicinal Plants of the United States* (Philadelphia: P. G. Collins, 1852).
- <sup>63</sup> John King and Robert S. Newton, *The Eclectic Dispensatory of the United States of America* (Cincinnati: H. W. Derby, 1852), p. 351.
- <sup>64</sup> Alex Berman, "Botanic Practitioners of 19th-Century America," *Am. Prof. Pharmacist* 23(1957):912.
- <sup>65</sup> This is readily seen in a perusal of E. N. Gathercoal, *The Prescription Ingredient Survey* (n.p.: American Pharmaceutical Association, 1933). This study compiles and summarizes the findings of seven national prescription ingredient surveys: the Ebert Survey of 1885; the Hallberg Survey of 1895; the Hallberg-Snow Survey of 1907; the Charters Survey of 1926; the Cook Survey of 1930; the Gathercoal Survey of 1930; and the USP-NF Survey of 1931–1932.
- <sup>66</sup> David L. Cowen and Donald F. Kent, "Medical and Pharmaceutical Practice in 1854," *Pharm. Hist.* 39(1997):100.
- <sup>67</sup> An item-by-item count showed that 52.2 percent of all prescriptions were botanical. W. B. McRoberts, "What Physicians Prescribe," *Tenth Annual Meeting of the Ky. Pharm. Assoc.* 10(1887):63–64.
- <sup>68</sup> John Uri Lloyd, "Vegetable Drugs Employed by American Physicians," *J. Am. Pharm. Assoc.* 1(1912):1228–1241.
- <sup>69</sup> Lloyd, "Vegetable Drugs," 1234.
- <sup>70</sup> Sonnedecker, *History of Pharmacy*, p. 50.
- <sup>71</sup> Abraham Flexner, *Medical Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching*, Bulletin no. 4 (New York: The Carnegie Foundation, 1910).
- <sup>72</sup> The best information on the research and programs of the NIH Office of Alternative Medicine is available on the Web at <http://altmed.od.nih.gov/oam/about/general.shtml>.
- <sup>73</sup> See the studies summarized in Melvyn R. Werbach and Michael T. Murray, *Botanical Influences on Illness: A Sourcebook of Clinical Research* (Tarzana, CA: Third Line Press, 1994).
- <sup>74</sup> Varro E. Tyler, "'Pharmacognosy'! What's That? You spell it how?," *Econ. Bot.* 50(1996):8.
- <sup>75</sup> Telephone conversations with Dr. Maelor Davies, director of the THRI, June 1, 1998, and Alex Day of Audex, June 3, 1998.
- <sup>76</sup> James Harvey Young, "The Development of the Office of Alternative Medicine in the National Institutes of Health, 1991–1996," *Bull. Hist. Med.* 72(Summer 1998):295.
- <sup>77</sup> Current work at the University of Kentucky in the promising field of bioengineering is reviewed in Jeff Worley, "UK's Tobacco and Health Institute Branching Out: Tobacco as a 'Factory' to Grow New Products," *Odyssey* 15(Spring 1998):3–7.





Flannery, Michael A. 1999. "For "a Voluptuous Glow of Health and Vigor": Medical Botany in Kentucky, 1792-1910." *Journal of the Kentucky Academy of Science* 60(1), 15-30.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/104094>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/335455>

**Holding Institution**

Smithsonian Libraries and Archives

**Sponsored by**

Biodiversity Heritage Library

**Copyright & Reuse**

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Kentucky Academy of Science

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.