

QK21  
.S63  
1908-09  
c.2

## A BIOGRAPHICAL HISTORY OF BOTANY AT ST. LOUIS, MISSOURI<sup>1</sup>

BY DR. PERLEY SPAULDING

LABORATORY OF FOREST PATHOLOGY, BUREAU OF PLANT INDUSTRY,  
U. S. DEPARTMENT OF AGRICULTURE

THE history of botany in St. Louis extends back nearly to the beginning of her political history. The city was founded in 1764, and while it is not as old as most of the other large cities of this country it seems to have been one of the earliest settlements made in the great northwestern region, comprising what was once known as Upper Louisiana. Boston, New York and Philadelphia were already large cities for that time and were centers of botanical activity. In 1795 when Michaux visited the Illinois Territory, Cahokia, Kaskaskia and St. Louis were the principal places west of Vincennes and as late as 1800 St. Louis had a population of less than 1,000. At about this time the fur traders changed their headquarters from Cahokia and Kaskaskia to St. Louis, causing a corresponding increase in population and commercial influence of the latter town.

The Jesuit missionaries were the first white persons to visit the Mississippi Valley and the adjoining country; they undoubtedly explored the Missouri Territory, but probably not so extensively as they did the Illinois Territory. They were versed to some extent in the art of medicine and knew the plants which were generally used for medicinal purposes. They learned the uses of plants new to themselves from their Indian wards, and in this way they must have obtained a considerable knowledge of the plants of the Missouri country. How much farther they may have carried their botanical studies is unknown to the writer. During the period between the founding of St. Louis and the first visit of Michaux to Cahokia there were undoubtedly persons who studied the botany of the St. Louis district. Whether they formed any collections of the plants is not now known and there seems to be no records of any such study.

For all practical purposes André Michaux may be said to have been the first botanist to work in the vicinity of St. Louis.

Botany has passed through a number of distinct periods at St. Louis, as in other places; it can not be said to have had a "pharmaceutical" period, as that stage was nearly past in the general history of the science when the city was founded. The medical properties of

<sup>1</sup> Published by permission of the Secretary of Agriculture.

the plants of the eastern states and of Europe were already well known at the close of the eighteenth century. Of course many new western plants were discovered, the medical properties of which had to be determined; but this was not the main object in making a study of them. We find three distinct periods of botanical work which include the one hundred and thirteen years that have elapsed since Michaux's visit. These may be designated as follows: First, exploration by botanists on transient visits of a few days' to a few months' time; second, collecting by persons who lived in or near St. Louis for a number of years; third, modern botany as contrasted with the purely systematic work of early days. These three periods overlap one another, but can still be distinguished without difficulty. The first includes most of the work done previously to 1850; the second began with the work of Engelmann and his numerous contemporary collector friends, who relied upon him for assistance in naming their collections; it may even be said to extend until the present time, as considerable work is still being done upon the local flora of the district; the third period may be said to date from the founding of the Shaw School of Botany, and the assumption of control of the Missouri Botanical Garden by the board of trustees.

André Michaux, the great French botanist, who explored so extensively the territory of the thirteen original colonies as far west as the Mississippi River, is the first botanical worker concerning whom published records have yet been found as having worked in the vicinity of St. Louis. He is known to have visited Kaskaskia and Cahokia, and the evidence seems to indicate that he must have visited the west shore of the Mississippi, since a few species are listed in his "Flora" as coming from the Missouri River.

André Michaux<sup>2</sup> was born at Satory, near Versailles, France, in 1746. He was destined by his father for the superintendence of a farm of the royal estate, and early became interested in agriculture. Upon the death of his young wife, at the birth of their son, François André, he devoted himself to scientific studies, especially botany. He studied botany under Bernard de Jussieu, and sought in foreign lands for strange plants. In 1779-81 he traveled in England, the Auvergne, the Pyrenees and Spain. In 1782-5 he was in Persia in a political capacity, but really to explore a country at that time almost unknown to scientific men; he intended to return to Persia, but was requested in 1785, by the French government, to introduce into France such North

<sup>2</sup> Hooker, W. J., *Amer. Jour. Sci. and Arts*, 1st series, 9: 266-269, 1825.

Gray, Asa, *Ditto*, 1 ser., 42: 2-9, 1842.

Coulter, J. L., *Bot. Gaz.*, 8: 181-183, 1883.

Rusby, H. H., *Bull. Torrey Bot. Club*, 11: 88-90, 1884.

Sargent, C. S., "Scientific Papers of Asa Gray," 2: 23-31, 1889.

Thwaites, R. G., "Early Western Travels," 3: 11-19, 27-104, 1904.

American trees as might be of economic importance. In the autumn of 1785 he embarked for New York, accompanied by his young son; here he spent a year and a half collecting plants and starting a botanical garden in Bergen County, New Jersey; he found, however, that the southern climate was more suitable for many of his plants, and he accordingly removed to Charleston, South Carolina, in 1787, where he established another garden, about ten miles from the city. During this year he explored the mountains of the Carolinas; the next he journeyed through the swamps of Florida, and the next he visited the Bahamas, and again searched the mountains for plants of economic importance—especially ginseng. In 1792 he collected around New York and in New Jersey; thence he went up the Hudson to Albany and along Lake Champlain, reaching Montreal June 30, 1792. From Montreal he went to Quebec, and thence by way of the Saguenay to Hudson's Bay. He then returned to Philadelphia, where he proposed to the American Philosophical Society an exploration of the great western territory, by way of the Missouri River. A subscription was begun for the purpose, and Thomas Jefferson drafted detailed instructions for the journey. Michaux, indeed, is stated to have started west and to have proceeded as far as Kentucky when he was overtaken by an order from the French government to relinquish the journey for a political mission. This mission seems to have had for its object the control of Louisiana by the French, through the aid of the trans-Allegheny Americans. In carrying out this plan Michaux made a journey in 1793 to Kentucky by way of the Ohio River, and returned over the "Wilderness" road, and through the valley of Virginia. Early in 1794 he made another extensive tour in the southern states and the North Carolina mountains. In 1795-6 he made a much longer journey, going from Charleston to Tennessee, thence through Kentucky to Vincennes, Indiana, where he stayed from August 13 to 23. From here he went to Kaskaskia, and from there he visited Cahokia and the vicinity. Upon looking over his "*Flora Boreali Americana*" we find several species of plants mentioned therein as coming from the Missouri River. It seems quite probable then that he must have visited some locality near this river during this trip, as this is the only visit to this section of which we find any mention in his journal. He mentions St. Louis as being in a prosperous condition, but makes no further allusion to it. Except for the evidence of these few species as given in his "*Flora*," we should not know that he had gone west of the Mississippi River, and this, of course, is somewhat uncertain, as it is very possible that some person at Cahokia, who may have been on the Missouri River, had out of curiosity picked up some strange plants and happened to bring them to Cahokia at the time Michaux was there. He made a short visit here and then went to Fort Massac, near the mouth of the Tennessee River, and from

there proceeded up the Cumberland River by boat, as far as Clarksville; he then visited Nashville, Knoxville, Louisville, and Morganton, finally arriving at Charleston again in April, 1796. During all of this time he collected eagerly, and more or less extensively. His journals, however, give no indications of the species or the number of them found at Cahokia. He seems to have found a considerable number at Kaskaskia, at which place he spent most of his time while in Illinois. In his "Flora" we find mentioned about 100 species as occurring in the Illinois territory; this, however, at that time included all of the territory north of the Ohio which was visited by Michaux. This seems to have been his last extensive trip in America; and in August, 1796, he embarked for Amsterdam and was shipwrecked on the coast of Holland. He is said to have been nearly drowned himself, and a large part of his collections were lost. He remained in France for several years, studying his collections and preparing the manuscript for his "Flora." In 1800 he joined an expedition to Australia, but, becoming disgusted with the management, he landed on the Island of Mauritius, but from there he soon went to Madagascar; here he established a botanical garden and began collecting extensively; but he soon fell victim to the unhealthy climate, and died on November 13, 1802.

Michaux probably traveled more extensively in North America than any other early botanist. He was the author of numberless new species and many new genera of American plants. Unfortunately, the genus, *Michauxia*, which commemorates his name, is one discovered by himself in Persia; so that his name is not thus associated with North American botany, which was so greatly advanced by his studies and explorations.

Immediately following the exposition held at St. Louis in commemoration of the purchase of Louisiana from France, there was held another exposition upon the Pacific coast to celebrate the centennial of the arrival of the Lewis and Clark expedition at the mouth of the Columbia River. This expedition was the first to penetrate overland to the Pacific coast and the results of its successful termination were of immense importance to the entire northwestern country. The journals of the expedition contain many references to plants seen, and especially to those which were peculiar or interesting, or which were used by the Indians.

In the previously mentioned attempt at the exploration of the northwest country, Michaux was to accompany the party. In the expedition which finally did make the journey there was no person who could be called a botanist. Although Captain Lewis was a very keen and observant man, he could not overcome his lack of botanical training, and the results in this regard were hardly what they would have been had Michaux been with the expedition. The journey up the Missouri River was made in boats manned with oars and, owing to the rapid current of

the river, progress was slow, thus affording opportunity for a considerable amount of collecting to be done. During the ascent of the river quite an extensive collection of plants was made, but this had to be left behind when the Rocky Mountains were crossed, and was consequently lost. During the much more hurried return of the expedition another collection was made, but it was much smaller than the first, and comparatively few species seem to have been collected about St. Louis. While this expedition did but little for St. Louis botany directly, it turned the public attention to this section, and finally led to careful botanical exploration by a number of capable botanists a few years later.

Captain Meriwether Lewis<sup>3</sup> was born near the town of Charlottesville, Virginia, on August 18, 1774. His family was one of the most



FIG. 1. CAPTAIN MERIWETHER LEWIS; from *Analectic Magazine and Naval Chronicle*, Vol. 7, 1816.

distinguished of that state. Several of his uncles were very prominent in their time, one of them having married a sister of George Washing-

<sup>3</sup> Jefferson, Thomas, "Biography of Capt. Lewis in *Analectic Magazine and Naval Chronicle*," 7: 329-333, 1816.

Allen, Paul, "History of the Expedition under the Command of Captains Lewis and Clark," etc., 1814, reprint by New Amsterdam Book Company.

ton. Meriwether lost his father early in life, and one of his uncles acted as his guardian. At the age of thirteen he was sent to the Latin school, where he remained until he was eighteen, when he returned home to help run the farm. At the age of twenty he entered as a volunteer a body of militia which was called out by General Washington to quell troubles in the western states, and from the militia he entered the regular service as a lieutenant. When twenty-three years old he was promoted to a captaincy and made paymaster of his regiment. He was personally well known to Thomas Jefferson, and when the latter proposed that two persons should be sent up the Missouri River, across the Rockies and down the Columbia to the Pacific Ocean, he eagerly offered to go. A few years later Jefferson, remembering the eagerness of Captain Lewis to make the trip, made him leader of the expedition, which successfully carried out the plans, and is now known as the Lewis and Clark Expedition. Captain Clark was made the leader in the absence of Lewis. The expedition started in 1803 and returned in 1806. Congress gave both leaders grants of land, and Lewis was made governor of the territory of Louisiana, while Clark was made a general of militia and agent for Indian affairs. Upon assuming his duties as governor, Lewis found many factions and parties, but his even-handed justice to all soon established respect for himself, and eventually removed animosities. While on a trip to Washington he suffered a temporary attack of insanity, and committed suicide on October 11, 1809.

Pursh has named a genus of the Portulacaceæ, *Lewisia*, in his honor.

During the early part of the nineteenth century it was much the fashion for botanists to collect living plants and cultivate them in gardens, these gardens sometimes being quite extensive. Sometimes they were but temporary resting places for the plants until they could be sent to European countries as novelties to be introduced there because of some desirable quality. André Michaux had such gardens into which he gathered his plants, and when opportunity offered sent them to France. Many of our early botanists had their own gardens in which they cultivated all of the different plants they could find, and thus became acquainted with every detail concerning them. The Bartram and Marshall gardens near Philadelphia were good examples of these early collections of living plants.

Among many persons sent from Europe to this country for the purpose of collecting new and rare plants was one John Bradbury,<sup>4</sup> who was commissioned to act as the agent of the Liverpool Botanical So-

<sup>4</sup> Bradbury, John, "Travels in the Interior of America in the Years 1809, 1810 and 1811," 1-346, 1819, 2d edition.

Short, C. W., *Transylvania Jour. of Med.*, etc., 34: 12-13, 1836.

Britten, Jas., and Boulger, G. S., "Biographical Index of British and Irish Botanists," 21, 1893.

ciety. Comparatively little seems to be known about Bradbury. He was a Scotchman who had lived for a long time in England, when he received his commission from the Liverpool Botanical Society in 1809. Upon arriving in this country, Bradbury spent several days at the house of Thomas Jefferson, so that the latter became acquainted with him and his abilities. Jefferson spoke highly of him as a naturalist, and Short, a later writer, mentions him as "an English gentleman of very respectable attainments as a naturalist." In the light of our present knowledge he seems to have fully deserved such an estimation, as he discovered a considerable number of new species as well as a new genus of plants during his travels in the Missouri country. Indeed, several of our more characteristic species bear his name, and in later years he was honored by Torrey and Gray, who named a new genus *Bradburia*, in commemoration of his services in exploring our western flora.

Mr. Bradbury at first intended to make New Orleans his center of operations, but following the advice of Jefferson he changed that intention and came to St. Louis instead. He descended the Ohio River by boat, making such observations and collections as he could at the various stopping places, arriving at St. Louis on the last day of the year 1809. The entire season of 1810 was spent about St. Louis, making short excursions of not more than eighty or one hundred miles distance in all directions, and he accumulated a considerable collection of plants which were sent to Liverpool the succeeding autumn. No definite data can now be obtained as to the number of species contained in these collections, as Bradbury never published a complete list of them, although he did give a list of the rare and more interesting plants in his journal, which was published after his return to England.

Early in the spring of 1811 Bradbury, accompanied by a young and zealous botanist named Thomas Nuttall, joined a fur-trading expedition, and with them ascended the Missouri River as far as the Mandan villages, not far from the site of the present town of Bismarck, North Dakota. Upon reaching this point the expedition divided and part of it, including Bradbury, returned to St. Louis. The others went on still farther, and Nuttall remained with them until their return to St. Louis some months later. This voyage was made in a steamer, and progress was necessarily slow while going up the river, so that our naturalists had ample time and opportunity for collecting. A collection even larger than that which had been made around St. Louis is said to have been accumulated.

Before Bradbury had finished his preparations for departure to England, the war of 1812 broke out, and he remained for several years in this country until the close of hostilities. He finally reached Liverpool in 1815, and found that during his long absence his plants had been inspected by Pursh, who was at that time in England preparing the

manuscript for his "Flora Americanæ Septentrionalis." Pursh published the most interesting of these plants in an appendix to his work, and this seems to have discouraged Bradbury from publishing as extensively upon them as he probably would have otherwise done. In 1817 Bradbury published his journal of travels on the Missouri in the years 1809-10-11, and in an appendix to this gave a list of the rare and most interesting plants of his collections. He did not, however, issue a complete list, and so far as now known no such list has ever been published. The second edition of his travels was issued in 1819, and in the editor's preface it is stated that Mr. Bradbury had already returned to St. Louis and taken up his residence there. Baldwin, who passed through St. Louis in 1819 with the Long expedition, mentions meeting Mr. Bradbury there at that time. His name is given in the St. Louis city directory for 1821,<sup>5</sup> but no definite information regarding him after this date has yet been found.

During the early part of the nineteenth century it was the policy of the national government to send expeditions of a military character to explore the unknown sections of the western country. Shortly after Bradbury made his tour of the Missouri, an expedition was fitted out and placed under the command of Major S. H. Long. This was intended to make more complete and detailed exploration of the Missouri and its main tributaries, and to make more accurate scientific observations of the country passed through. The necessity of having competent scientific men accompany the expedition was recognized, and several such men were appointed for the purpose.

The botanist of the expedition was Dr. William Baldwin.<sup>6</sup> He was a son of a minister of the Friends in Pennsylvania, being born in Newlin, Chester County, in 1779. He studied medicine at the University of Pennsylvania and took his degree in 1807. Meanwhile he had become interested in the study of botany, and upon settling in Wilmington, Delaware, to commerce practising his profession, he collected extensively in the vicinity. Pulmonary weakness forced him to remove to Georgia in 1811, where he served as surgeon to a gunboat flotilla during the war of 1812. He kept up his collecting and study of the plants of this new region, and because of his ability as a botanist he received an appointment as surgeon to the U. S. frigate *Congress*, during a cruise to various South American ports. Baldwin made extensive collections and notes wherever opportunity offered, and he returned with a

<sup>5</sup> Learned by the aid of the St. Louis Historical Society.

<sup>6</sup> Thwaites, R. G., "Early Western Travels," Vol. 14.

Darlington, William, "Reliquiæ Baldwinianæ," 1-346, 1843.

Redfield, John, *Bot. Gaz.*, 8: 233-237, 1883.

Harshberger, J. W., "Botanists of Philadelphia," 119-125, 1899.

very considerable amount of valuable material. About this time the Long expedition was being organized, and Baldwin was recommended to act as botanist for the party. His health was delicate and the appointment was accepted in the hopes that it would be improved by the journey.

Baldwin joined the other members of the scientific staff at Pittsburg and embarked upon the steamer which was to take the expedition to Council Bluffs. This being the early days of steamboating, the one used by the expedition gave more than ordinary trouble and caused

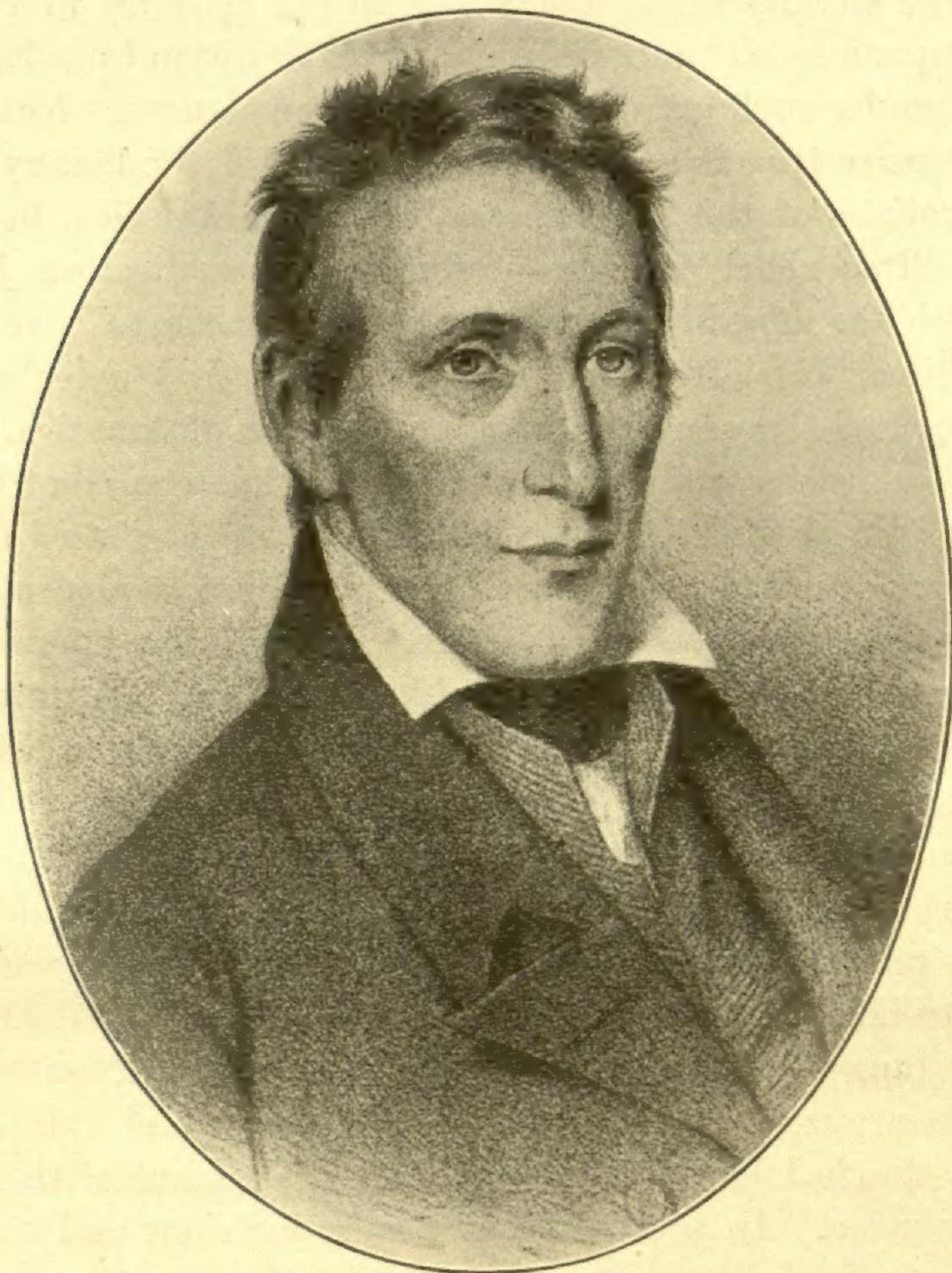


FIG. 2. DR. WILLIAM BALDWIN; from Darlington's "*Reliquiæ Baldwinianæ*."

vexatious delays. According to the letters of Baldwin it also leaked continually, and this made the interior damp and totally unsuited for such a prolonged voyage. Baldwin's health constantly grew worse, and even while descending the Ohio River the party halted to allow him to recover from an attack of illness, and he was forced to depend upon the others to bring specimens to him on the boat, as he had not sufficient strength to walk any considerable distance. St. Louis was finally reached on June 9 and a stop of several days was made. The voyage

was resumed on the twenty-first, and on July 13 they reached Franklin, then the uppermost town of any importance on the Missouri. Here Baldwin was left behind at the house of Dr. Lowry, where he remained until his death on August 31. During his stay in Franklin Baldwin botanized as much as his limited strength would permit, and entries were made in his diary as late as August 8, the date of the last entry. A list of plants found around Franklin by him during this time attests the earnestness with which he pursued his beloved science. The journals of the expedition show that he collected about one hundred species in the vicinity of St. Louis and on the Missouri to Franklin.

His companions all unite in praise of his devotion to science and his persistence under such extremely trying circumstances. Notwithstanding his extensive travels and his earnest study of the botany of several different sections of this country and of South America, he published but little. Two short articles, presented for publication just before starting with the expedition, are all that are known to have been published by him. He left numerous manuscripts and notes which have aided Torrey and Gray in their work on the flora of America. His herbarium was extensive and very valuable, and has contributed much to the works of Pursh and Nuttall. Baldwin also contributed to Muhlenberg's catalogue, and he maintained an active correspondence with many of the foremost botanists of his day. Nuttall has honored him by naming a genus of the Compositæ *Baldwiniana*, and has thus connected him in a most permanent manner with that science to which he so earnestly devoted himself.

The Long expedition proceeded and on September 17 went into winter quarters near Council Bluffs. Major Long meanwhile went east, and on his return brought with him Dr. Edwin James, who had been appointed to take the place of Dr. Baldwin.

Edwin James<sup>7</sup> was born in Weybridge, Vermont, on August 27, 1797. Edwin was the youngest son of Deacon Daniel James, who was a native of Rhode Island, and had moved to Vermont at the beginning of the Revolution. In youth he was very industrious and applied himself to his studies with perseverance. His education was obtained at the district school, and later he attended Middlebury College, where he graduated in 1816. Subsequently he studied medicine with his elder brother in Albany, New York, for three years. During this time he became interested in botany and the natural sciences, which were then being taught by Professor Amos Eaton. Upon the recommendations of Captain Lewis Le Conte and Dr. John Torrey he was appointed to the place left vacant by the death of Dr. Baldwin. The trip with Major

<sup>7</sup> Thwaites, R. G., "Early Western Travels," Vol. 15.

Parry, C. C., *Amer. Jour. Sci. and Arts*, 2d series, 33: 428-430, 1862.

Sargent, C. S., "Silva of North America," 2: 96, 1891.

Long was a hurried one, although it was made overland from St. Louis to Council Bluffs and but few plants were collected near St. Louis. James remained with the expedition until its close. His efficient labors are proved by the subsequent publications founded upon his observations and collections. The present Pikes Peak was first named James's Peak, by Major Long, but for some unexplained reason the earlier name has not remained in use.

The next two years after the return of the expedition were spent in compiling his results, which were published in 1825, and were of much historical and scientific value. During the next six or seven years he served as a surgeon in the regular army at extreme frontier posts, and here he studied the Indian languages and translated the New Testament into the Ojibwe tongue. He also published a biography of John Tanner, a man who was captured by the Indians while a child, and was brought up by them. When the medical department of the army was reorganized he resigned and returned to Albany, where he was associate editor of a temperance periodical. Upon leaving this he went west and settled near Burlington, Iowa, where he spent the last days of his life in agricultural pursuits. On October 25, 1861, he was run over by a wagon and injured so seriously that he died three days later.

The genus *Jamesia*, of the Saxifrage family, was named in his honor by Torrey and Gray.

The results of the exploring expeditions seem to have directed attention to the Missouri country, so that a number of men of ability came to that section and made botanical explorations of greater or less extent. Before the Long expedition had finished its work an amateur botanist, Dr. Lewis C. Beck, was collecting about St. Louis.

Dr. Lewis Caleb Beck<sup>8</sup> was born in Schenectady, New York, on October 4, 1798. In 1817 he graduated at Union College; he then studied medicine and began to practise at Schenectady in 1818. He moved to St. Louis in 1820 and lived here until 1822. During this time he collected quite extensively and later published a list of his collections. His introductory note is self-explanatory and is as follows:

During my residence in Missouri, in the years 1820, 1821 and 1822, a portion of my time was occupied in the investigation of the vegetable productions of that and the adjoining state. Upon my return I was so fortunate as to receive, uninjured, the collections which I had made.

Until the present season (1826), however, I have not had leisure to examine them with the necessary attention, and to revise my notes upon the recent plants. This work I have now commenced, and submit to you the first part,

<sup>8</sup> Appleton's "Cyclopedia of American Biography," 1: 213, 1887.

Anonymous, *Amer. Jour. Sci. and Arts*, 2d series, 16: 149, 1853.

March, Dr. Alden, Gross's "Amer. Med. Biography," 679-696, 1861.

Beck, L. C., *Amer. Jour. Sci. and Arts*, 10: 257-264, 1826; 11: 167-182, 1827; 14: 112-121, 1828.

for publication in your valuable journal. Those species which are presented as new are minutely described, and in all cases where the western specimens of known plants differ from the eastern, this difference is stated. By this means we shall become acquainted with, at least, some of the peculiarities in the vegetation of that interesting section of the United States. Concerning the more common plants, the habitats and times of flowering only are mentioned. The catalogue, it is hoped will contribute somewhat to increase our stock of knowledge, and will be particularly interesting to geographical botanists, and to future writers upon the botany of the United States.

This annotated list, which was continued in three volumes of *Silliman's Journal*, mentions about two hundred species of plants, and is the earliest extensive list known to the writer. Many of Beck's plants are cited in Riddell's "Synopsis of the Flora of the Western States," published in 1835, but apparently only a portion of them are so mentioned.

In 1822 Beck moved back to Albany and remained there the rest of his life. He held positions as professor of botany and other sciences at a number of institutions up to the time of his death; Rensselaer Polytechnic Institute, Rutgers College and Albany Medical College being those with which he was most prominently connected. Dr. Beck was well known in botanical circles, being the author of a manual of the botany of the northern and middle states, of which two editions were issued. He also published a number of botanical papers. He was a well-known writer on chemical and medical subjects besides; and published a manual of chemistry which passed through four editions. He seems to have been a conservative writer, as his bibliography contains but twenty-three titles. Dr. Beck died at Albany on April 20, 1853.

After Beck closed his work in the vicinity of St. Louis there seems to have been a period of nearly ten years when there was no botanical work done. In 1831, however, there began a period of activity which has continued more or less regularly up to the present time. The first botanist to start this activity was Thomas Drummond.

## A BIOGRAPHICAL HISTORY OF BOTANY AT ST. LOUIS, MISSOURI. II.

BY DR. PERLEY SPAULDING

LABORATORY OF FOREST PATHOLOGY, BUREAU OF PLANT INDUSTRY,  
U. S. DEPARTMENT OF AGRICULTURE

THOMAS DRUMMOND<sup>o</sup> was born about 1780. He is known to have been a native of Scotland, but the exact place of his birth is unknown, as is also his early training and education. He was a brother of James Drummond, the Australian botanical explorer, and is known to have succeeded George Don in the nursery at Forfar. In 1825-6-7 he accompanied the Second Overland Arctic Expedition, led by Sir John Franklin, as assistant to Dr. Richardson, who was the naturalist of the expedition. In Canada Drummond explored very extensively, even into the Rocky Mountains and on the Mackenzie River where the main part of the expedition did most of its work. Upon the completion of the journey he returned to England, and from 1828 to 1829 he was curator of the Belfast Botanical Garden. Soon after his return to England he published a work upon the American mosses, which was chiefly the result of his collections made in Canada. He again sailed for New York under the patronage of Drs. Hooker and Graham, for the purpose of exploring the southern and western United States. Beginning his tour at New York City in the spring of 1831, he went to Philadelphia, visited Bartram's garden, thence to Baltimore, Washington, and to Wheeling on foot. At the last-named place he embarked for St. Louis, descending the Ohio River and coming up the Mississippi by boat. It was his original intention to join some fur-trading expedition to the far western country, but he arrived in St. Louis too late for this. He accordingly remained in St. Louis and collected in the vicinity until the next winter. He lost considerable time by sickness, but in January he sent a collection of several hundred species of phanerogams and a considerable collection of mosses and hepatics to Hooker at Kew. Hooker

<sup>o</sup> Date of birth and photograph supplied by Mr. J. R. Drummond, grandson of Thomas.

Hooker, Wm. J., *Companion to the Jour. of Bot.*, 1: 21-26, 39-49, 95-101, 170-177, 1835; 2: 60-64, 1836. *Journal of Botany*, 1: 50-60, 183-202, 1834. *Botanical Miscellany*, 1: 178, 1849.

Lasègue, A., "Musée Bot. de M. Benj. Delessert," 196-198, 1845.

Sargent, C. S., "Silva of North America," 2: 25, 1891.

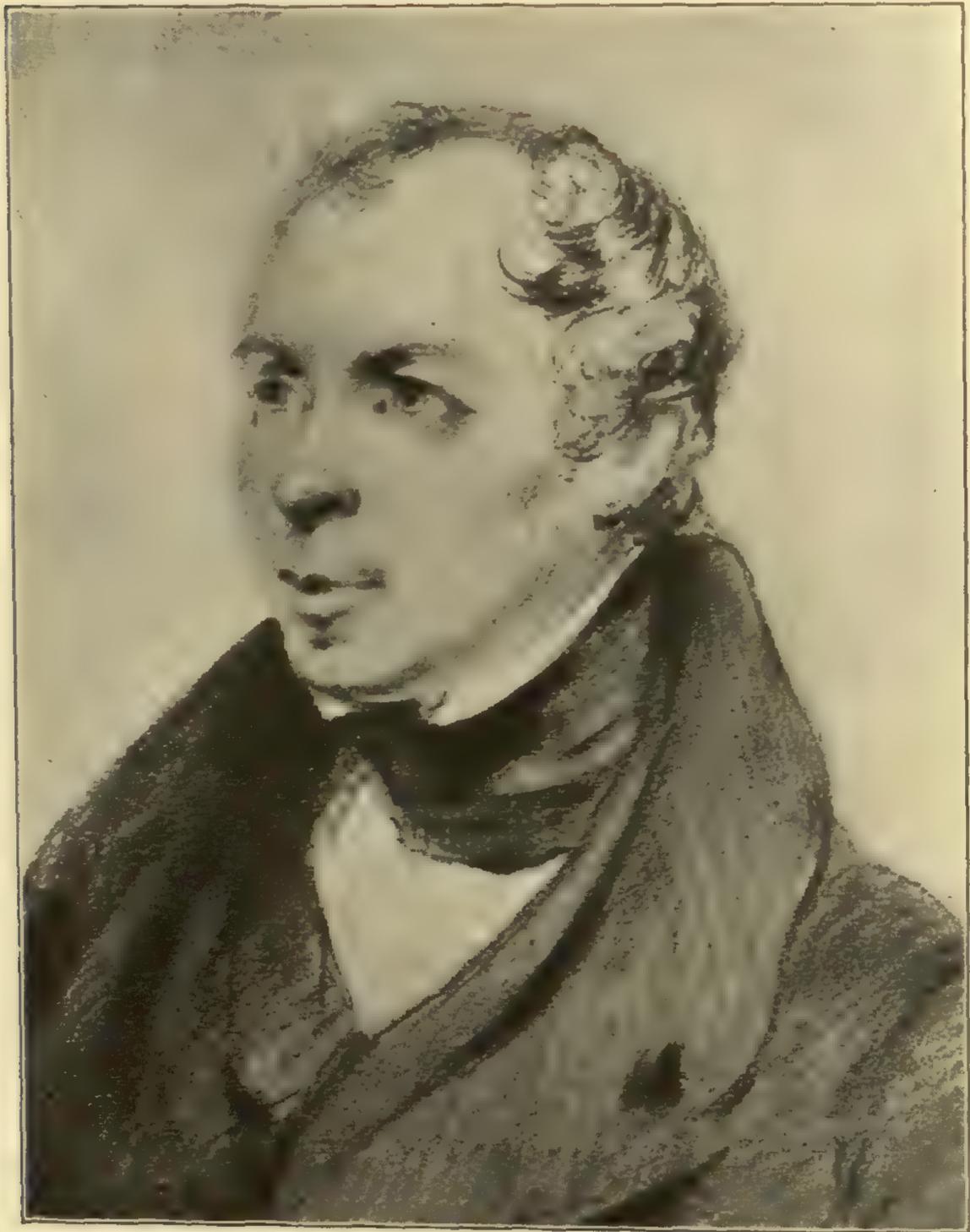


FIG. 3. THOMAS DRUMMOND.

From a crayon portrait at the Kew Gardens; by permission of the Kew Garden authorities, through the kindness of Mr. J. R. Drummond, grandson of Thomas.

seems to have prepared his collections for distribution, and we find him publishing a list of about two hundred and fifty species which were collected around St. Louis by Drummond.

During the next spring and summer Drummond collected in the vicinity of New Orleans, and here he obtained even more plants than he did at St. Louis. He next went to Texas, which he was one of the first to explore botanically. Here he gathered a rich harvest, in spite of a season of the most unfavorable weather. He then returned to New Orleans and went to Appalachicola in 1835 for the purpose of exploring the Florida peninsula. He soon left western Florida with the intention of reaching Key West by way of Havana, Cuba. Hooker learned that Drummond was taken sick while at Havana and died very suddenly in March, 1835.

Harvey dedicated the genus *Drummondita* to the two brothers.

<sup>9a</sup> By an unfortunate error, this portrait of Thomas Drummond was in the last issue of the MONTHLY printed as a portrait of William Baldwin, and the portrait of William Baldwin was printed as the portrait of Meriwether Lewis.



FIG. 4. PRINCE MAXIMILIAN: from his "Reise nach Brasilien."

Very appropriately *Drummondia*, a genus of American mosses, was named in Thomas's memory by his patron, Sir William Jackson Hooker. Numerous species of our phanerogams are also named after this most industrious and successful collector.

Even persons of royal lineage were numbered among the many naturalists who came to America for the purpose of exploring unknown sections for new plants and animals, and to make scientific observations. While (~~Prince~~) Alexander von Humboldt attained eminence for his travels and scientific worth, he was not the only royal person who did so, although we generally hear no other mentioned. Alexander Philip Maximilian, Prince of Wied neu-Wied, came to the New World on two different occasions. On the first tour he visited Brazil, and on the second he visited the United States and especially the northwestern or Missouri country.

Prince Maximilian<sup>10</sup> was born on September 23, 1782, in Wied

<sup>10</sup> Thwaites, R. G., "Early Western Travels," Vols. 22, 23 and 24.

Maximilian, Prince, "Reise nach Brasilien," 1820-1.

Sargent, C. S., "Silva of North America," 9: 138, 1896.

neu-Wied, a small principality of Rhenish Prussia. He was from boyhood of a studious inclination, and early became interested in the natural sciences. In spite of this he was in the Prussian army at the battle of Jena, and was among those captured by the enemy. He returned to his studies at the end of this war, but was among the victorious army which entered Paris in 1813. In this service he earned the iron cross of Chalons and a major-generalship. During all of this time he had been planning a scientific expedition to Brazil in order to satisfy a keen desire to add to the world's knowledge, imparted to him by the celebrated Professor Johann Friederich Blumenbach, of whom he was a favorite pupil. Early in 1815 he started for Brazil. He was joined in South America by two other German scholars, and the trio spent two years studying the flora, fauna and native races of this country. His resulting publications gave him a high rank among the scientists of the period, and his "Reise nach Brasilien in den Jahren 1815 bis 1817" was soon translated into the French, English and Dutch languages.

In 1832 Prince Maximilian started on a second enterprise—a trip to the trans-Mississippi region. He arrived in Boston on the fourth of July. He brought with him a very capable artist, for the express purpose of obtaining portraits of famous Indians. He made more or less brief visits to Boston, New York and Philadelphia, and then went to Bethlehem, Pennsylvania, and thence through the coal region, reaching Pittsburg in the autumn. The journey was then continued overland to Wheeling, where they embarked for the voyage down the Ohio River. They turned aside for the purpose of visiting New Harmony, Indiana, where then was located the best library of American and natural history west of the Atlantic seaboard. Here the winter was spent studying and preparing for the journey on the Missouri River. On March 16, 1833, the journey was resumed and they arrived in St. Louis before the fur-trading expeditions had left on their annual trip to the northwest. Following the advice of several St. Louis men, the journey was made by boat up the Missouri River, instead of by land, as was at first planned. On April 10 the journey was commenced, and by the twenty-second they had reached Fort Leavenworth. The expedition was continued to Fort McKenzie, on a branch of the Yellowstone River, among the Blackfoot Indians, where they remained for two months. The return trip was begun on September 14, and the succeeding winter was spent at Fort Clark, near the present town of Bismarck, North Dakota. The next spring Prince Maximilian returned to St. Louis and journeyed eastward by way of the Ohio canal and Lake Erie to New York, where he embarked for the Old World on July 16, 1834. Upon returning from the upper Missouri country the collections which had been made were left behind to be sent down the river in another steamer which was soon to follow the one carrying the party. A fire broke out on this steamer and

many of the collections were destroyed because they were not deemed of as much value as other things which were on board.

After his return to his native city Prince Maximilian worked over his collections and other material with the aid of a number of experts, and published several papers upon his results. In 1843 he published his "Systematic View of Plants Collected on a Tour on the Missouri River." His collections are preserved in the museum of his native city, where he died in 1867.

Martius honored him by naming a genus of Brazilian and West Indian palms, *Maximiliana*, thus very appropriately connecting him with the botany of that country, of which he was one of the pioneer explorers.

Hardly had Prince Maximilian started for home before another explorer was at work on the Missouri. This person was none other than Thomas Nuttall, the greatest botanist of this country in his time. As has been already mentioned, he had visited this section in company with John Bradbury in 1811.

Thomas Nuttall<sup>11</sup> was born in the town of Settle, England, in the year 1786. His parents were in very moderate circumstances, and the boy was early apprenticed to a printer. After several years he had a disagreement with his employer and went to London seeking for work. Here he came very near total destitution. When about twenty-two years of age he emigrated to America, landing in Philadelphia. During his youth he so improved his spare moments that he acquired an intimate knowledge of the Latin and Greek languages, and he seems to have studied other branches, as he was described at the time of his landing as "a well-informed young man, knowing the history of his country, and somewhat familiar with some branches of natural history, and even with Latin and Greek." Nuttall knew nothing of botany at this time, but very soon after he became interested in the "amiable science," and also began an acquaintance with Dr. Benjamin Smith Barton. His studies of plants naturally led him into making short excursions which soon lengthened as his interest deepened, until he had visited the lower part of the Delaware peninsula and the coast region of Virginia and North Carolina.

At about this time Nuttall became acquainted with John Bradbury, and he eagerly proposed to accompany him on his trip up the Missouri River. Accordingly, Nuttall joined Bradbury at St. Louis, and early

<sup>11</sup> Short, C. W., *Transylvania Jour. of Med.*, etc., 34: 14-16, 1836.

Meehan, Thos., *Gardeners' Monthly*, 2: 21-23, 1863.

Durand, Elias, *Proc. Amer. Phil. Soc.*, 7: 297-315, 1860.

Sargent, C. S., "Silva of North America," 2: 34, 1891.

Britten, Jas., and Boulger, G. S., "Biographical Index of British and Irish Botanists," 129, 1893.

Anonymous, *POP. SCI. MONTHLY*, 46: 689-696, 1895.

Harshberger, J. W., "Botanists of Philadelphia," 151-159, 1899.

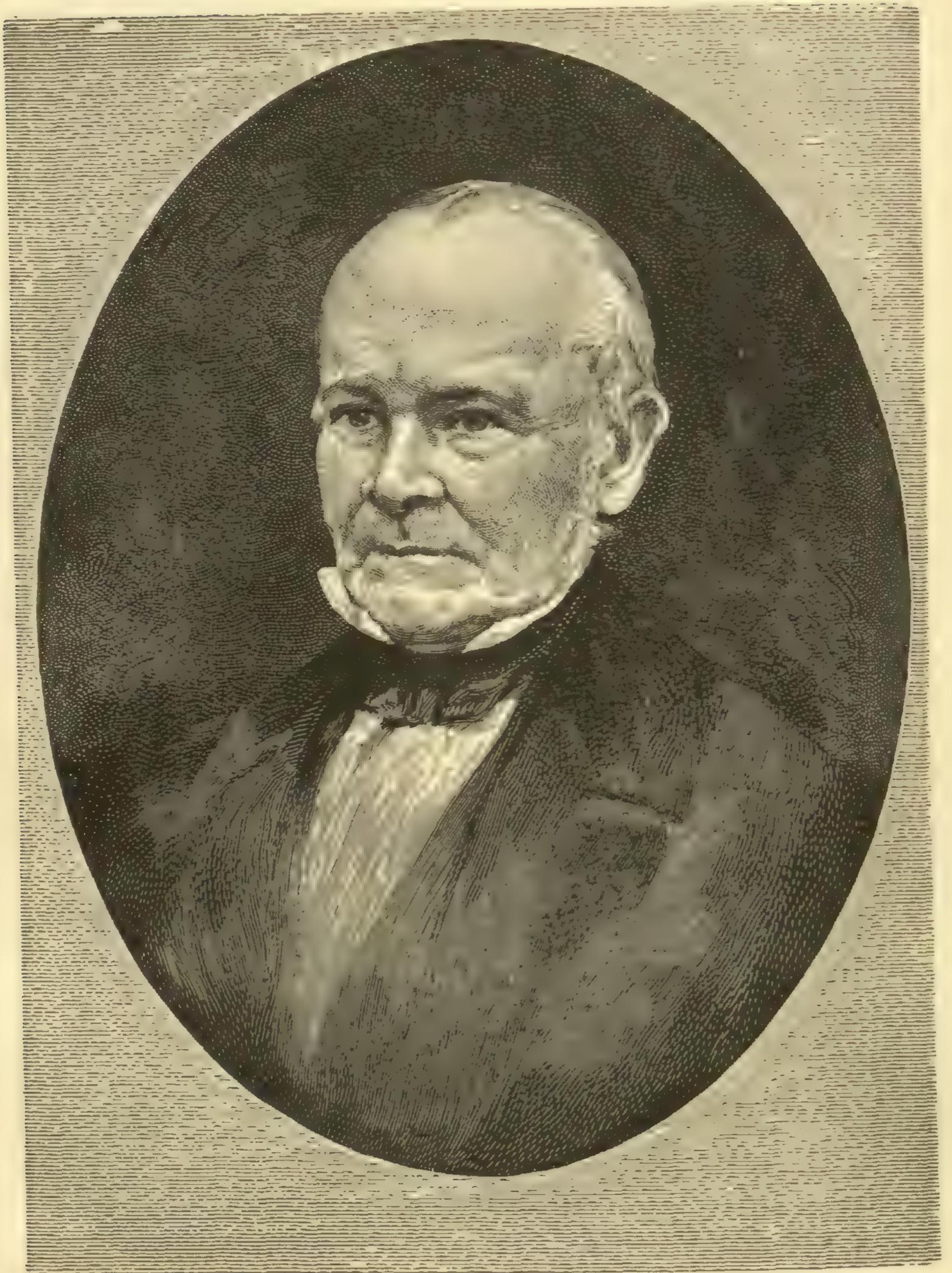


FIG. 5. THOMAS NUTTALL; FROM THE POPULAR SCIENCE MONTHLY, Vol. 46, 1895.

in the spring of 1811 the two made the journey up the river to the Mandan villages, as previously described in this paper. Both naturalists were more than once in extreme danger, but Nuttall brought back with him many treasures of seeds, plants and other objects of interest. The next eight years he remained at Philadelphia, studying in the winter the collections which he made during his summer excursions to various parts of the country east of the Mississippi, from the Great Lakes to Florida. At about this time he was preparing the manuscript



FIG. 6. ENTRANCE OF THE LINNEAN GREENHOUSE AT THE MISSOURI BOTANICAL GARDEN, ST. LOUIS, MISSOURI; showing the three busts of Linnæus, Gray and Nuttall.

for his "Genera of the North American Plants," which did not appear until 1818. Nuttall himself set most of the type for this work. In 1818 he started from Philadelphia for Arkansas, reaching Fort Bellepoint on April 24, 1819. He made this his center of operations, exploring in various directions and making large collections. He was taken sick with fever and on recovering made one more excursion and then set out for home, reaching New Orleans February 18, 1820. At this time he had made a journey of over five thousand miles through a country still in the undisputed possession of the Indians, and almost wholly unexplored by scientific men. Immediately upon his return to Philadelphia in 1820 he began to study his collections and to write his



FIG. 7. BUST OF THOMAS NUTTALL over the entrance of the Linnæan Greenhouse at the Missouri Botanical Garden, St. Louis, Mo.

“Journal of Travels into the Arkansas Territory During the Year 1819,” which was published the following year.

At the end of 1822 he was called to Harvard College as curator of the botanical garden, there not being enough money to support a professorship. He soon became dissatisfied with this and took up the study of ornithology, producing a two-volume manual of this science. About the beginning of 1833 Nuttall went to Philadelphia with the collection of plants made by Captain Wyeth during an overland journey to the Pacific Ocean. A second journey was to be made and Nuttall resigned his position and spent the interval before the departure of the expedition studying the Wyeth collection and his own Arkansas plants.

Mr. Nuttall went in company with John K. Townsend, the two



FIG. 8. GRANITE OBELISK IN THE MISSOURI BOTANICAL GARDEN NEAR THE MUSEUM—  
in honor of Thomas Nuttall.

being sent by the American Philosophical Society. The two arrived at St. Louis on March 24, 1834, on the steamboat *Boston*, from Pittsburg. They started from St. Louis, going on foot to the point of rendezvous at Boonville, Mo., where they joined the Wyeth party. The brief period while they went on foot from St. Louis to Boonville is the one which concerns us at present. Unfortunately the season was so early that Nuttall found but few plants in bloom.

The expedition ascended the Missouri River to the headwaters of the Columbia, and then followed that to its mouth. When winter came on with our travelers on the Pacific coast they took passage for the Sandwich Islands, where they arrived January 5, 1835. Here

Nuttall remained for two months collecting plants and sea shells upon the different islands. He then separated from his companion and sailed for California. He spent most of the spring and summer upon the Pacific coast and then returned to the Sandwich Islands, where he embarked upon the same vessel that Dana was serving his "Two Years Before the Mast," to come home by way of Cape Horn. He arrived at Philadelphia in October, 1835, and settled down to study his treasures. For several years he worked thus and published two important memoirs. At Christmas, 1841, Nuttall went back to England, where he resided the last seventeen years of his life. This was not from choice, but because of the conditions under which an estate was left to him by his uncle, requiring him to live in England nine months of the year. He used his ample grounds for growing rare plants. Just previously to leaving the United States he wrote a supplement to Michaux's "Sylva." In the preface his wanderings were outlined. He returned to America but once, when he took the last three months of 1847 and the first three months of 1848. At this time he studied the plants brought by Gamble from the Rocky Mountains and Upper California, and published a paper upon them. His death occurred on September 10, 1859, resulting from overstraining himself in opening a box of plants.

Torrey and Gray dedicated a genus of the Rosaceæ *Nuttallia*, to this prince of scientists.

Henry Shaw has honored him by placing a small obelisk of granite near the north end of the museum building in the Missouri Botanical Garden, with the following inscriptions: on the north side, "In Honour of American Science," and on the south side, "To the Memory of Thomas Nuttall, born in England 1786 and died September, 1859. Honour to him the zealous and successful naturalist, the father of western American botany, the worthy compeer of Barton, Michaux, Hooker, Torrey, Gray and Engelmann." He also placed over the entrance of the main greenhouse in the Garden three busts: that of Linnæus in the middle, and those of Nuttall and Gray on either side.

Although Nuttall explored the Missouri country on two different occasions and worked in Arkansas, he seems never to have published any considerable list of plants found by himself near St. Louis.

## A BIOGRAPHICAL HISTORY OF BOTANY AT ST. LOUIS, MISSOURI. III.

BY DR. PERLEY SPAULDING

LABORATORY OF FOREST PATHOLOGY, BUREAU OF PLANT INDUSTRY,  
U. S. DEPARTMENT OF AGRICULTURE

EXPLORATION in the Missouri country was commenced in 1835 by Karl Andreas Geyer, a collector who became well known for his botanical explorations in the northwestern section of the United States. His explorations extended over a number of years and ranged from Illinois westward to the Pacific. He traveled especially in the territory included between the Mississippi and the Missouri River as far north as North Dakota.

Karl Andreas Geyer<sup>12</sup> was born in Dresden, Germany, on November 30, 1809. His father was a market gardener of very moderate circumstances. The boy was naturally bright and studied Latin under the tutelage of a kind-hearted man who helped him with his lessons, which were studied while he was selling his father's produce in the streets of the city. In 1826 he entered the garden at Zabelitz as an apprentice. In 1830 he removed to Dresden and engaged as assistant in the botanic garden there. In this place he had numerous friends, among whom was Dr. H. G. Reichenbach, whose lectures upon botany he attended with great regularity. He seems to have been a very likable and attractive person, drawing the attention of those with whom he came in contact. In February, 1834, he left Dresden for America. Here he collected plants during the summer months and worked at odd jobs in the winter, thus maintaining himself for several years. In one case he entered a newspaper office as compositor, but a few months later he was writing the leading articles for the same paper that he had helped set in type.

Geyer's first great journey in this country was in 1835, when he visited and explored the plains of the Missouri with a single companion. In 1836 and the succeeding years he went with Nicollet surveying the country between the Missouri and the Mississippi River. In 1840 he collected around St. Louis and in Illinois, making very considerable collections during this season. While in St. Louis he became acquainted with Dr. George Engelmann and this friendship seems to have lasted as long as Geyer was in this country. Engelmann seems to have worked over his collections, as we find him publishing upon them

<sup>12</sup> Anonymous, *Chronik des Gartenwesens*, 3: 185-187, 1853.

Reichenbach, H. G., *Kew Garden Miscellany*, 7: 181-183, 1855.

in 1844. He also came into possession of some of Geyer's collections, as it is definitely stated that they had been deposited in the Engelmann herbarium.

In 1841 Geyer went with Fremont to the Des Moines River in Iowa territory, where he found a number of new plants. In 1842 he explored the upper Illinois territory and formed the herbarium which was first offered for sale. In 1843 he began the journey from Missouri to the Pacific coast, lasting through the years 1843 and 1844. He explored the northwestern country very extensively and penetrated to hitherto inaccessible places by accompanying missionary trains on their visits to the different Indian tribes. He finally reached Fort Vancouver, and from there sailed on November 13, 1844, for England, going by way of the Sandwich Islands and Cape Horn. He arrived in England May 25, 1845, and spent some months at Kew, working over his collections and sorting out small lots of plants to sell. A large part of his profits from such sales was used in defraying expenses caused by a sickness brought on by his previous hardships. In September, 1845, he again returned to his home in Saxony, after an absence of eleven years. At first he entered the employment of head-gardener Lehman in Dresden, and later in the Royal Botanical Garden. His wanderings had shown him the value of a home, and on August 24, 1846, he married Miss Emma Schulze. Besides his duties for the garden he taught students the English language, his pupils coming from every class in Meissen. Geyer also took a prominent part in the local society for the advancement of science. During the last three years of his life he was editor of *Chronik des Gartenwesens und Feuilleton der Isis*, a periodical published at Meissen on the first and fifteenth of the month, from January 1, 1851, to December 15, 1853. Geyer's death occurred just before the end of the third volume, and it was discontinued with the third volume. While in no wise neglecting his duties at the garden, he came in written communication with the prominent botanists of the time and rounded out his collections. Heart disease troubled him considerably in his latter days and finally caused his death on November 21, 1853.

In 1835 a physician, George Engelmann by name, settled in St. Louis and soon built up a lucrative practise. During his spare moments he worked upon botanical problems, and before long he had established a reputation among botanists such that at his death he was ranked among the foremost of botanical workers.

Dr. George Engelmann<sup>13</sup> was born at Frankfort-on-the-Main, Feb-

<sup>13</sup> Gray, Asa, *Proc. Amer. Acad. Arts and Sci.*, 19: 516-522, 1884.

Sander, Enno, *Trans. St. Louis Acad. Sci.*, 4: 1-18 (Supplement).

Anonymous, *POP. SCI. MONTHLY*, 29: 260-265, 1886.



FIG. 9. DR. GEO. ENGELMANN; by courtesy of the Director of the Missouri Botanical Garden.

ruary 2, 1809. He was the eldest of thirteen children. Aided by a scholarship he went to the University of Heidelberg in the year 1827, where he had as fellow-students and companions Karl Schimper and Alexander Braun. Political embarrassments caused him to go in the autumn of 1828 to Berlin University for two years, and finally to Würzburg, where he took his degree of Doctor of Medicine in the summer of 1831. His inaugural dissertation, "De Antholysi Prodrumus," published at Frankfort in 1832, testifies to his truly scientific mind.

---

Trelease, Wm., and Gray, Asa, "Botanical Works of Engelmann," 1-548, 1887.

Sargent, C. S., "Silva of North America," 8: 84, 1895.

White, C. A., "Biogr. Mem. Nat. Acad. Sci., 4: 3-21, 1896.

It is a morphological study founded chiefly upon monstrosities, and it had the honor of receiving the notice and approval of Goethe, who offered to place in Engelmann's hands his notes and sketches, which intention was frustrated by his death before it had been carried out. This first paper has been very favorably commented upon, and compared with much more extended and pretentious works of a similar nature.

The spring and summer of 1832 were passed at Paris in medical and scientific studies with Braun and Agassiz as companions. He then became the willing agent of his uncles, who had resolved to make some land investments in the Mississippi Valley, and he sailed from Bremen for Baltimore in September. He joined some of his relatives



FIG. 10. RESIDENCE OF DR. GEO. ENGELMANN IN ST. LOUIS, MISSOURI; by permission of the Director of the Missouri Botanical Garden.

who had previously settled in Illinois near St. Louis, and made lonely journeys on horseback through southern Illinois, Missouri and Arkansas. He finally established himself in St. Louis as a doctor of medicine late in the autumn of 1835. At this time St. Louis was a frontier town of eight or ten thousand inhabitants. Beginning in poverty, he soon built up a large practise and so established himself in his profession that he was able to go back to Germany for some months. While there he married his cousin, Miss Dora Hartmann, in June, 1840.

Again in 1856 he left his practise for a two years' absence, devoting

the first summer to botanical investigations at Cambridge, and then visiting his native land in company with his wife and son. In 1868 the family again visited Europe for a year, the son remaining to study at Berlin. The mother died in January, 1879, and Englemann's own health failed alarmingly. A journey to Germany was taken in 1883 and the voyage was so beneficial that he was able to resume his botanical work. Serious symptoms soon caused him to return and the ocean voyage again proved very restorative and he resumed his labors with increased vigor. Increasing infirmities, however, gradually reduced his working powers until his death, which took place on February 4, 1884.

Upon first coming to this section of the country Dr. Engelmann traveled on horseback through southern Illinois and in Missouri and Arkansas; and during the latter part of his life he explored the mountains of North Carolina and Tennessee, the Lake Superior region and the Rocky Mountains and contiguous plains in Colorado and adjacent territories, thus being able to study in place, and with the acuteness of judgment which characterized his work, the Cacti, Coniferæ, and other groups of plants which he had investigated for years. In 1880 he made a long journey through the Pacific states, where he saw for the first time growing naturally many plants which he had described and studied over thirty years before.

Dr. Engelmann's papers are voluminous even for a man who could devote all of his time to botany; but it must be remembered that he had a large practise as a physician, which took most of his time, and that botany was taken up only in spare moments. When this is taken into account, together with the fact that he was also interested in other sciences (especially meteorology), their extent is nothing short of marvelous. The memorial volume of his papers published by Henry Shaw contains eighty-seven different papers of varying length. These have been grouped in this volume under the following headings or general topics: Cuscutineæ, Cactæ, Juncus, Yucca and Agave, Coniferæ, Oaks, Vitis, Euphorbiaceæ, Isoetes, Miscellaneous, Lists and Collected Descriptions of Plants, and General Notes. It was the custom of Dr. Engelmann to take any scrap of paper and make notes upon it which might occur to him, together with sketches showing characters of the plant in hand. All such notes were at his death collected and mounted in a set of large books which are now in the possession of the Missouri Botanical Garden. These notes were so numerous that they made a library in themselves, filling sixty of these books.

His method of working was to take a single group of plants and work it out systematically so far as was in his power. His treatment of the genus *Cuscuta* in his first monograph of that group increased the number of species from one to fourteen without going west of the

Mississippi Valley. Seventeen years later, after an investigation of the whole genus in the principal herbaria of this country and of Europe, he published a systematic arrangement of all the *Cuscutæ*, giving seventy-seven species, besides a number of varieties.

Dr. Engelmann's authority upon the *Cactaceæ* was of the very highest. He established the arrangement of these plants upon floral and carpological characters. This work was carried on through a series of papers beginning with his sketch of the botany of Dr. A. Wislizenus's expedition from Missouri to northern Mexico, and continued in his account of the giant cactus of the Gila, in his synopsis of the *Cactaceæ* of the United States, and in his two memoirs upon the southern and western species contributed to the Pacific Railroad Reports and to

Emory's "Report on the Mexican Boundary Survey." He had made preparations for a revision of at least the North American *Cactaceæ*, but upon his death much knowledge of this difficult group was lost.

His papers on the American oaks and the *Coniferæ* are of the highest interest, and are some of the best specimens of his botanical work; and the same is also true of his study of the vines. Nearly all that we know of this genus scientifically is directly due to Dr. Engelmann's investigations.

His work is characterized by a minuteness and carefulness of observation, coupled with a nicety of discrimination which made him a master in systematic work, his treatment

of the yuccas and agaves, the genera *Juncus*, *suphorbia*, *Sagittaria*, *Isoetes*, the *Loranthaceæ*, *Sparganium* and *Gentiana* giving him an eminence among fellows botanists to which few attain. His name was upon the rolls of many societies devoted to the investigation of nature, and he was the recognized authority upon those departments of his favorite science which had most interested him. His name has been given to a monotypical genus of plants, *Engelmannia*, by Torrey and Gray. Numerous species also bear his name.

Shortly after Dr. Engelmann settled in St. Louis, Nicholas Riehl.

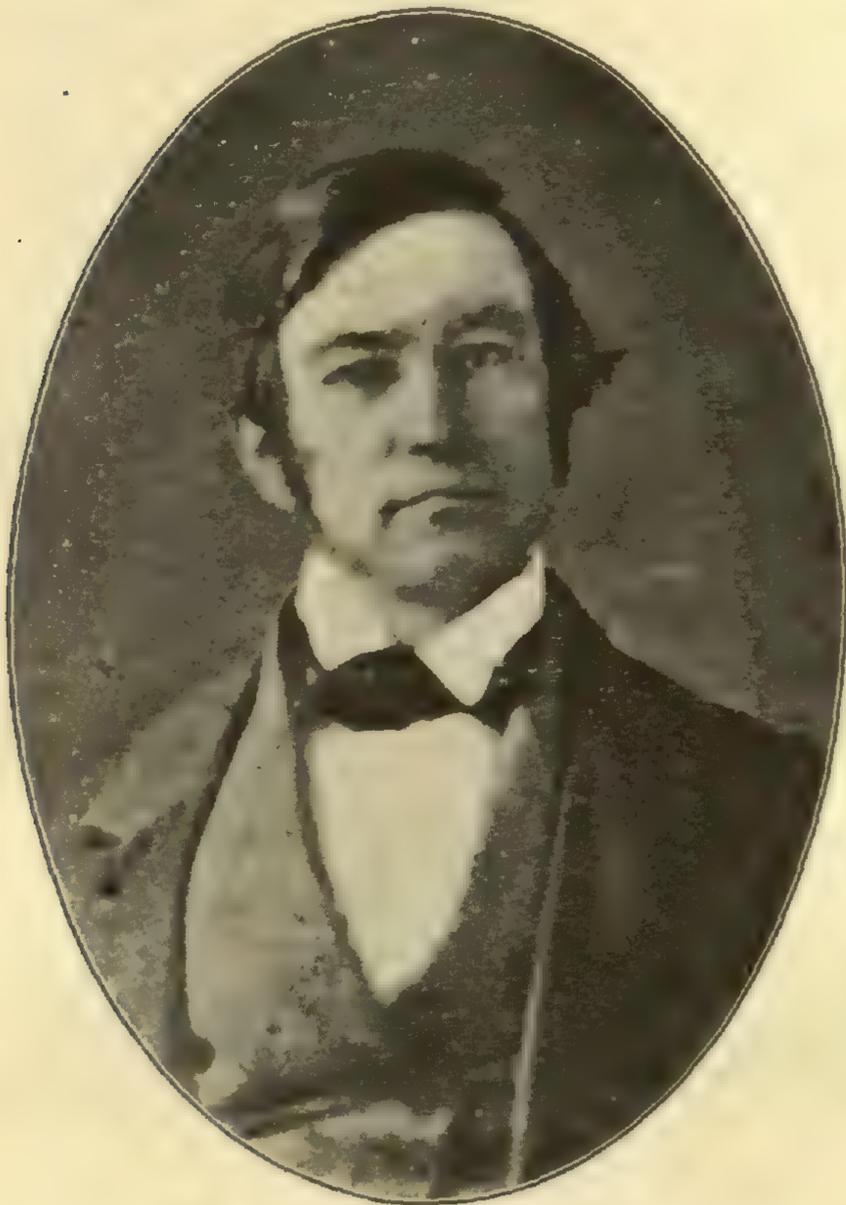


FIG. 11. NICHOLAS RIEHL;  
from a photograph kindly loaned by his son,  
Mr. E. A. Riehl.

a native of France, came to his city and settled on a piece of land on the Gravois Road in South St. Louis, and began to collect botanical specimens.

Nicholas Riehl<sup>14</sup> was born in Colmar, province of Alsace, France (now Germany), about 1808. His father's business was that of manufacturing cloth; not liking it, Nicholas sold it after the death of his father, and divided the estate. He took his share and traveled over much of Europe and America, coming as far west as St. Louis. Taking a liking to this part of the country, he returned to his old home and married. The two returned to St. Louis in the spring of 1836, and settled on a piece of ground on the Gravois Road in Carondelet, just outside the St. Louis city limits, and established a nursery. This is believed to have been the first nursery in St. Louis county, if not in the state of Missouri. The nursery business he carried on with success and profit until the time of his death in September, 1852. Riehl evidently collected botanical specimens some years before he came to this country, as specimens in his herbarium bear dates as far back as 1830, which were collected in the vicinity of Colmar. He also collected considerably in the vicinity of St. Louis in 1838. He had printed labels made for the collections made in this year, and they number not far from two hundred. Besides the specimens bearing the printed labels, there are many with incomplete labels which undoubtedly were collected here also. His entire collection was sold to Mr. Henry Shaw, who was at that time just starting to develop his botanical garden. The larger part of them were collected in Europe or were exchanged with European collectors. Mr. Riehl was a friend and admirer of Dr. George Engelmann, and was much interested in the work which he was doing. The Riehl nursery furnished Mr. Shaw the first trees which he planted in his newly started botanical garden.

In the forties Theodore C. Hilgard was collecting the native plants of the vicinity of St. Louis.

Theodore Charles Hilgard<sup>15</sup> was born at Zweibrücken, Rhenish Bavaria, on February 28, 1828. His father, Theodore Erasmus Hilgard, was a lawyer, who in 1836 resigned from the Supreme Court of the province and emigrated with his family to America, settling on a farm near Belleville, Ill., which at that time was the home of many other educated Germans who for political reasons had preceded him. Theodore was the sixth of a family of eight. The schools being poor and few in number, Theodore with the other younger children received his primary education from his elder sisters and elder brother Julius,

---

<sup>14</sup> Information and photograph supplied by Mr. E. A. Riehl, of Alton, Illinois, son of Nicholas.

<sup>15</sup> This sketch is adapted with very slight changes from a manuscript kindly furnished by Professor Eugene W. Hilgard, brother of Theodore.

while all received their higher training, especially in the languages, from their father. The boys aided in the farming operations and Theodore early manifested a marked interest in the natural sciences, and especially in botany; in which, however, his father could not help him. He soon found an enthusiastic helper in his younger brother Eugene, and together they made extensive collections of the native plants and insects of the vicinity. Dr. George Engelmann, a second cousin, greatly assisted the boys in their botanical studies.

Early in 1847 Theodore went to Europe and entered the University of Heidelberg as a student of medicine. Henle, Chelius and Hasse then made Heidelberg the most notable center for medical study outside of Vienna, while Bischoff represented botany. Hilgard at once began to make what subsequently became a very complete collection of the flora of central Europe. The revolutionary agitation of 1848 some-

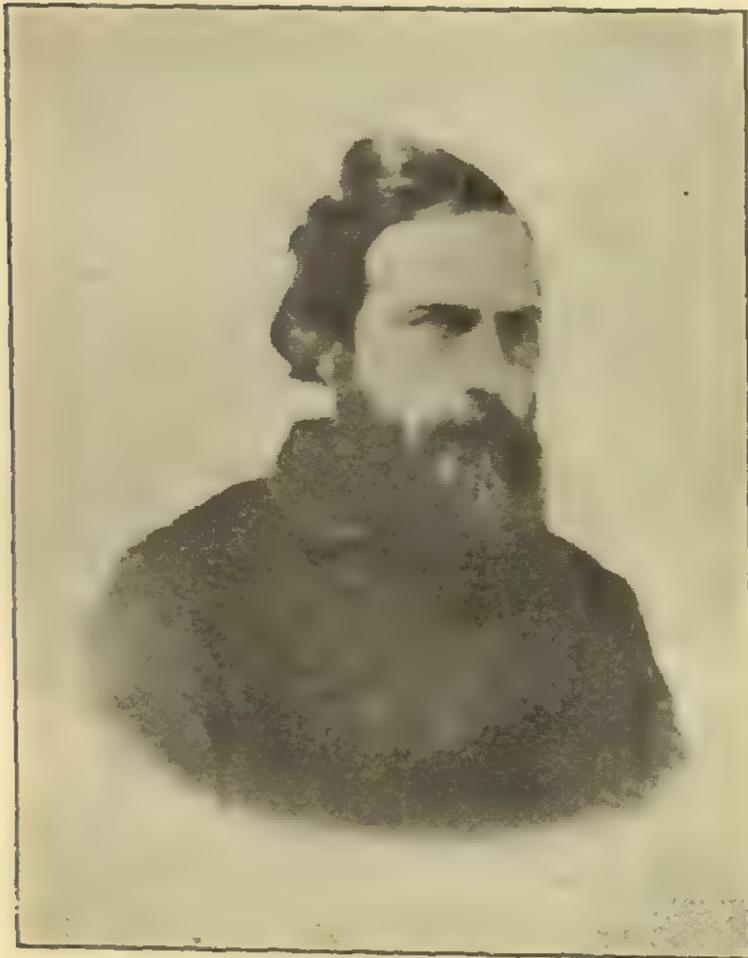


FIG. 12. DR. THEODORE C. HILGARD; by courtesy of Dr. Eugene Hilgard.

what disturbed the regularity of the course of study, but no actual interruption occurred until, in the spring of 1849, active revolutionary movements took place in Baden itself. Theodore then (with his brother Eugene, who had meantime joined him) went to Zürich, and there passed three semesters, studying especially microscopy under Naegeli, and physiology under Ludwig, besides attending the natural history lectures of Oken. During this time the brothers made extended excursions on foot through Switzerland and collected the Alpine flora. In 1851 Theodore went to Vienna to study, where were then such medical celebrities as

as Rokitansky, Oppolzer, Bednar and Hebra. After nearly two semesters, during which he gave much time to botanical study in the great Endlicher collection, he was obliged to go to Malaga to bring back his widowed sister. While there he made an extensive collection of Mediterranean plants which greatly interested him. On his return he went to Würzburg, where he graduated in June, 1852, *summa cum laude*, as doctor in medicine, surgery and obstetrics. He then went to Berlin to study ophthalmology with Graefe, as well as surgery. In the summer of 1853 he returned to America, taking a position as ship physician on an emigrant vessel, on which he experienced an epidemic of cholera.

Soon after his arrival he went on a visit to the west to see whether he had best practise his profession there. On the way he sustained a severe shock to his spine in a steamer accident. It took him several weeks to recover somewhat, but he never fully recovered. He was disappointed in the outlook and returned to the east, where he took up practise in Philadelphia. There he became a friend of Elias Durand, a druggist and botanist, who in the latter capacity was requested to elaborate the botanical collections made by Heermann while with the Williamson Pacific Railroad Expedition. Durand proposed to Hilgard that they should collaborate in this work, and the latter being by nature an expert draughtsman, he not only described, but drew the illustrations of a large number of the "Plantæ Heermanianæ" accompanying the final report of the expedition. The strain of this work seemed to develop the spinal injury into a serious inflammation, from which he was prostrated for months. After recovery which was, however, never complete, he resolved to begin practise in St. Louis, and removed there in 1855.

He continued to practise in St. Louis from that time until 1870, much handicapped by the spinal weakness which obliged him to refuse much lucrative practice. His spare time was chiefly devoted to botanical studies, now more especially to the cryptogams, whose development he studied under the microscope, in the use of which he became very expert. In these studies he found that the then current classification and nomenclature of these organisms was seriously at fault, many merely developmental forms being classed as separate species, genera and even orders. He also worked zealously in devising a system of arrangement of the phanerogams which would express their mutual cross relations, the best graphic presentation of which on a flat surface he found in the pentagrammatic form. Comparative anatomy and the homotaxy of organs and structural parts also formed a favorite subject of investigation. Most of his work on these subjects was published in the *Proceedings* of the St. Louis Academy of Sciences, of which he was a charter member; also in the *Proceedings* of the American Association for the Advancement of Science and in the *St. Louis Medical Reporter*. He also helped in the organization of the "Humboldt Institute" library which for some time had a very useful cultural influence. In 1865 he married Miss Georgina Koch, daughter of Mr. A. Koch, of *Zeuglodon* fame. No children came of this union.

As the state of his health precluded his acting as an army surgeon, he remained at St. Louis during the war in hospital and private practise. After the war medical practise seemed to become more and more incompatible with his strength, and he gave it up and joined his brother Eugene at the University of Mississippi, where at that time a lectureship of botany was contemplated. But it failed of realization, and he

accepted a position in the U. S. Coast Survey as observer in the magnetic survey then being made on the basis of the "Bache Fund." In this he continued until 1873, when he found it necessary to settle to a quiet life. The last year of his life was passed at New York City, where in March, 1875, he died of an abscess of the lungs.

The Hilgard collection of plants, embracing about 12,000 species, was taken by his brother Eugene to the University of California, where it was destroyed by fire in 1897.

Shumard in his presidential address before the St. Louis Academy of Sciences in 1869 spoke as follows concerning a collection of plants given by Hilgard to the Academy:

Our botanical collection embraces an extensive series of lichens and mosses amounting to several hundred species, chiefly from western states and territories. These were collected by Dr. T. C. Hilgard, of this city, and by him presented and arranged in our museum.<sup>16</sup>

In the fire which destroyed part of the academy museum a few years later, this collection was also destroyed.

<sup>16</sup> Shumard, *Trans. St. Louis Acad. Sci.*, 3: XII., 1869.

[Reprinted from THE POPULAR SCIENCE MONTHLY, March, 1909.]

## A BIOGRAPHICAL HISTORY OF BOTANY AT ST. LOUIS, MISSOURI. IV

BY DR. PERLEY SPAULDING

LABORATORY OF FOREST PATHOLOGY, BUREAU OF PLANT INDUSTRY,

U. S. DEPARTMENT OF AGRICULTURE

ONE of the best known of the botanical collectors of this country who worked shortly after the middle of the last century was August Fendler. He, like numerous others, came to America from Germany in the late thirties. From 1864 to 1871 he lived at Allenton, Missouri, about thirty miles from St. Louis. While living at Allenton Fendler arranged the first botanical specimens in the herbarium which was just being started by Henry Shaw for his Botanical Garden. These numbered about 60,000 and consisted of the herbaria of Bernhardt and Riehl, the latter containing a considerable number of local species. Because of his extensive and excellent collections, he became known to botanists and botanical institutions. While he was widely known by reputation, he seems not to have been well known personally, because of his excessive diffidence.

August Fendler<sup>17</sup> was born August 10, 1813, in the town of Gumbinnen, in eastern Prussia. When he was six months old his father died, and two years later his mother married again. His parents had but scanty means and his school training for a number of years could scarcely be called schooling. When about twelve years old he was sent to the Gymnasium, and was here for about four years, when his parents were obliged to take him from school because of financial troubles. He was apprenticed to the town clerk's office, and here began to think of traveling in foreign countries.

At the end of his apprenticeship he had an offer to accompany a prominent physician as his clerk in a journey of inspection along the Russian frontier of Prussia where the cholera was beginning to be feared. Fendler was soon in the midst of the cholera and remained for some time, returning home when the disease had abated. He now learned the trade of tanning and currying during the next two years. In the fall of 1834 Fendler was admitted to the Royal Gewerbeschule, but the strain upon his already frail health caused him to abandon it after finishing the first year with credit.

<sup>17</sup> Canby, W. M., *Bot. Gaz.*, 9: 111-112, 1884; 10: 285-290, 301-304, 319-322, 1885.

Gray, Asa, *Amer. Jour. Sci. and Arts*, 3d series, 29: 169-171, 1885.

Sargent, C. S., "Silva of North America," 12: 123-124, 1898.

In the fall of 1835 he started with a knapsack upon his back from Berlin as a traveling artisan, passed through parts of Silesia, Saxony, to Frankfort, down the Rhine, and finally coming to Bremen. Early in the spring of 1836 he embarked for Baltimore, Maryland, arriving with but two dollars in his pocket. In Philadelphia he worked in a tannery

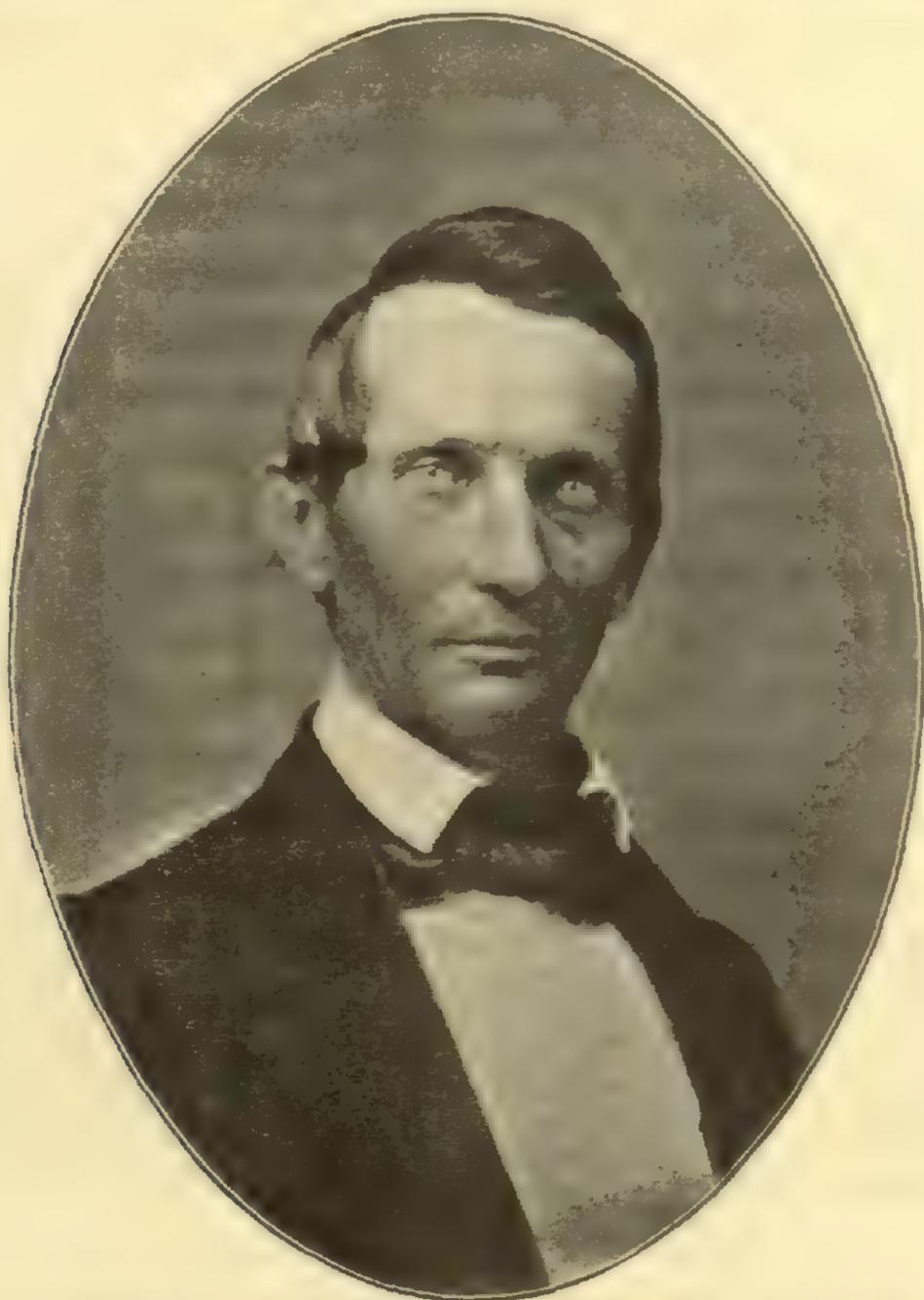


FIG. 13. MR. AUGUST FENDLER, at about the time he lived at Allenton, Mo.

for a time, then went to New York and worked at the lamp manufacturing business. The financial panic of 1837 caused this business to be closed in the spring of 1838.

Having made up his mind to go to St. Louis, he started as soon as possible. The easiest way was from New York to Albany by boat, thence to Buffalo by canal, to Cleveland by steamer, to Portsmouth on the Ohio River, and then down the Ohio and up the Mississippi by steamboat. This trip took thirty days.

In St. Louis, which had then about 13,000 inhabitants, he soon got employment, but decided to go to New Orleans because of the approaching winter. He left St. Louis about Christmas, 1838, on foot, with his knapsack on his back; he crossed the Mississippi and walked along through the thinly settled forests of Illinois, the cane-brakes of Kentucky, and a part of Tennessee, where he fell in with two others going to the same destination. At the mouth of the Ohio they joined in buy-

ing a skiff and set out for New Orleans in it. They soon were caught by a steamer going their way and they boarded her and abandoned their skiff. Upon arriving in New Orleans the talk about Texas decided him to go farther west, and he arrived in Galveston in January, 1839. He stayed in Texas about a year and then returned to Illinois where he taught school for some time.

In the fall of 1841 he found an uninhabited island in the Missouri about three hundred miles above St. Louis, and he took up his solitary residence there. When the spring rise came it caused him to leave.

In 1844 he sailed for home, and while on this trip first learned that sets of dried plants might be sold. On his return to America and to St. Louis he began to collect and was aided by Dr. Engelmann in naming his specimens. He visited different parts of the country between Chicago and New Orleans for the purpose of collecting. Dr. Engelmann commended him to Dr. Asa Gray, and he was furnished with the authority to accompany some troops which were being sent to Santa Fé, so that he had free transportation for himself and luggage. He returned to St. Louis in the fall of 1847. In the spring of 1849 he started on another collecting trip to the West. He was unsuccessful, having lost most of his stock of drying papers in a flood, and he was forced to return to St. Louis. Upon his arrival here he found that all of his large collections and notes and journals had been destroyed in the great fire which burned much of the business section of the city during his absence. In 1849 he embarked for Panama, and after four months again returned to Arkansas, and finally went to Memphis, where he went into business. In 1854 he went to Venezuela and collected for four years, during this time exploring alone mountain ranges which were scarcely known at that time. He made very large collections, which are of great value. He returned to Missouri in 1864 and bought a tract of land in the town of Allenton, about thirty miles west of St. Louis. This he began to clear and cultivate in company with his half-brother, who was half-witted, and who always was dependent upon him. Here he remained for seven years, with the exception of a month spent in the Gray Herbarium, assisting in its arrangement. During this time Mr. Letterman became acquainted with him, and from 1870 to 1871 they met two or three times a week and nearly every Sunday with green plants to be identified. He seems to have collected but little in the vicinity, but was very familiar with the plants of the general neighborhood. After clearing his land and putting up his house, mostly with his own hands, he spent most of his time writing a book. This is undoubtedly his "Mechanism of the Universe," which was unfortunately published at his own expense later. Failing health forced him to dispose of his farm and remove to another climate. In 1871 he sold the farm and left for Europe, intending to live there the rest of his days. He, however, returned and

settled at Wilmington, Delaware, in 1873. While here he finished his book and published it. Repeated attacks of rheumatism compelled him to seek a warmer climate, and he and his brother went to the island of Trinidad. They lived at Port of Spain, landing in June, 1877; here the remainder of his life was spent in making botanical observations and collecting, especially among the ferns. Advancing age restricted his



FIG. 14. HOUSE BUILT BY AUGUST FENDLER IN ALLENTON, MISSOURI, and occupied by him during his residence here from 1864 to 1871. The small ell has been added by subsequent owners.

efforts to the immediate neighborhood, and when this was exhausted he did but little. His death occurred in November, 1883.

An appreciation of his work from one who knew him best follows:

It is needless to say that Fendler was a quick and keen observer and an admirable collector. He had much literary taste, and had formed a very good literary style in English, as his descriptive letters show. He was excessively diffident and shy, but courteous and most amiable, gentle and delicately refined. Many species of his own discovery commemorate his name, as also a well-marked genus, *Fendlera*, a Saxifragaceous shrub which is winning its way into ornamental cultivation.<sup>18</sup>

<sup>18</sup> Gray, Asa, *Amer. Jour. Sci. and Arts*, 3d series, 29: 169, 1885.

Dr. F. Adolph Wislizenus came to America from Germany in 1835; he landed at New York and lived there for the next two years. In 1837 he went west, settling near Belleville, Ill. Two years later he came to St. Louis and lived in that city practically all the rest of his life. He is not known to have performed any botanical work in the vicinity of St. Louis, but he is included in the present paper because of having made a very considerable collection of plants in New Mexico, Mexico, and other parts of the great American arid plain. This collection was



FIG. 15. DR. ADOLPH WISLIZENUS; by permission of the St. Louis Academy of Sciences, from a photograph in their possession.

one of the first from the region visited, and is considered especially important because Dr. Wislizenus was one of the first to give an accurate, scientific account of the sections visited by him. This is especially true of Mexico, of which there were very erroneous and distorted ideas in the United States.

Dr. Frederick Adolphus Wislizenus<sup>19</sup> was born in 1810 at Koenigsee, in Schwarzburg-Rudolstadt, one of the numerous tiny German principalities of that period. He was the youngest of three children of a Protestant minister whose ancestors were said to have fled from Bohemia, victims of the religious fanaticism which resulted in the persecution of Hus and his followers.

<sup>19</sup> Engelmann, Geo. J., *Trans. St. Louis Acad. Sci.*, 5: 464-468, 1890.

Sargent, C. S., "*Silva of North America*," 6: 94, 1894.

Wislizenus, F. A., "*Memoir of a Tour to Northern Mexico*," 1-141, 1848.

POP. SCI. MONTHLY, 52: 643, 1898.

Wislizenus studied medicine at the University of Jena in 1828, and later at Göttingen and Würzburg. He was a member of the "Burschenschaft," but escaped arrest when that was broken up by the authorities. He followed his friend and teacher, the great clinician Schoenlein, to Zürich and there joined an expedition to aid Mazzini in his struggle against Austrian rule; but the Swiss troops disarmed them on the border so he was forced to return to his studies.

Wislizenus graduated in Zürich in 1834 and soon sailed for New York, where he began to practise his profession in 1835. Here he remained two years writing constantly for the German papers of the city. He then went west in 1837 and joined some of his fellow-exiles who had settled in St. Clair County, Illinois. In 1839 he came to St. Louis and immediately seized an opportunity to accompany an expedition of the St. Louis Fur Company for trading with the Indians. He thus went far into the Northwestern country towards the source of the Green River in the Wind River Mountains. When the expedition started to return he joined a band of Flat-head and Nez Percé Indians. He thus crossed the Rocky Mountains to Utah and went as far as Fort Hall, the most southern post of the English trading company. Here he could find no guide to take him to California, so he returned; crossing the Green and the south fork of the Platte, he followed the Arkansas to Missouri. During this trip he had no facilities for making scientific observations and collections, so it was wholly without any such results.

On his return to St. Louis in 1840 he resumed his practise of medicine. He was identified with early efforts towards the establishment of an Academy of Science, and aided Dr. Engelmann in his efforts to found a botanic garden, and was an earnest worker in the Western Academy of Science. He soon gained a lucrative practice, but as soon as the opportunity offered he was again in the field. He joined a trading expedition to Mexico, well equipped this time with instruments and apparatus for scientific work. In Santa Fé they first learned of the war between Mexico and the United States, but Wislizenus obtained a pass and proceeded to Chihuahua, where he with other Americans was seized and imprisoned. He was sent to a small mountain town of the interior and there had ample opportunity to carry on his collecting and observations in the neighborhood during the winter. Upon the arrival of Col. Doniphan's troops in the spring he was released and accompanied them in a professional capacity until their disbanding at New Orleans in 1847, when he returned to St. Louis.

Senator Thomas H. Benton became interested in him and his experiences in Mexico, and finally was the cause of his being summoned to Washington and being requested to prepare for publication the results of his investigations. His resulting "Memoir of a Tour to Northern Mexico in 1846 and 1847" was considered important enough so that the senate ordered 5,000 copies printed for distribution. This publication

gave a good account of the country which was then much misunderstood and misrepresented, and resulted in correcting many erroneous ideas regarding that section of the American continent. It contained many very valuable data concerning the meteorology, geology, topography and botany of the region. Among the valuable results of this tour was a botanical collection containing many new plants which were classified and described by Dr. Geo. Engelmann, of St. Louis, who commemorated the valuable services of Wislizenus to science by applying his name to a new genus, *Wislizenia*, as well as to several of the new species of the collection.

Wislizenus again returned to St. Louis from Washington upon the completion of his report, and served faithfully during the cholera epidemic of 1849. As soon as this was over, however, he went to Constantinople in 1850 to bring back with him as his bride, Miss Lucy Crane, a sister-in-law of Hon. Geo. P. Marsh, whom he had met while in Washington. After visiting his old home in Thüringen and the large cities of the Old World, the two returned to the United States. Leaving his wife with her friends in the east, he went to Panama and California in search of a more desirable location. But he again returned to St. Louis and finally settled down permanently. He was one of the founders of the St. Louis Academy of Science and an active worker and one of the officers of the St. Louis Medical Society and of the Western Academy of Sciences. He was for many years president of the German Medical Society of St. Louis. His barometrical observations and his botanical and mineralogical collections, together with his memoir, are distinct additions to science. He was interested in meteorology from 1858 till his death, and in 1861 he commenced to study the atmospheric electricity with the belief that this would be of value in connection with meteorology. He discontinued this study, however, upon arriving at the conclusion that it was valueless in this connection—a fact which is now generally acknowledged. His last days were spent in seclusion, he being closely confined to the house by his infirmities and the loss of his sight. He died on September 22, 1889, in his eightieth year.

In 1851 there began a most important movement for the advancement of botany in St. Louis.<sup>20</sup> In that year, Mr. Henry Shaw, while on his last visit to Europe, first conceived the idea of establishing for himself a country estate on lines similar to those of many of the large English ones. In fact he had already started to build a home in the country district west of St. Louis.

This idea of a large private estate seems to have soon become changed to that of a botanical garden, for in 1857 he commenced active opera-

<sup>20</sup> Trelease, Wm., Mo. Bot. Garden Report, 1: 84-90, 1890. *Plant World*, 5: 1-4, 1902. "The Academy of Science of St. Louis," *POP. SCI. MONTHLY*, 62: 118-130, 1903. "The Missouri Botanical Garden," *POP. SCI. MONTHLY*, 62: 193-221, 1903.

tions to this end. He even at one time planned a grand school of botany with all the appendages and equipment necessary for a college of botany. This was modified in its first inception, but has been carried out to a degree. Very soon he built a botanical museum, bought herbaria and built greenhouses in which tender and exotic plants might be grown, while the grounds themselves were planted with many of the more hardy species. In 1859 he secured the passage of an act of the Missouri state legislature enabling him to deed or will to a board of trustees such property as he might wish, to be used for the maintenance of the Missouri Botanical Garden, as he prophetically named it. In 1885 he founded the Shaw School of Botany in connection with Washington University of St. Louis and provided for very close relations between the school and the garden. The estate deeded for the use of the garden was valued at about one million two hundred and fifty thousand dollars. This has increased very materially in value with the rapid rise in real estate in and about St. Louis. From the small beginnings of a private estate, the garden has developed until there were in cultivation in 1906, over seventeen thousand species and varieties of living plants; fifty-five thousand books and pamphlets in the library, including a very fine collection of pre-Linnæan works, and five hundred and sixty thousand sheets of dried specimens. The garden has issued eighteen annual reports, and is in exchange relations with nine hundred institutions interested in botany, gardening, horticulture or forestry. The library is one of the finest of the botanical libraries of the world, and all resources of the garden are placed at the free disposal of those capable of using them. Thus Mr. Shaw's life-work has reached its fruition, and a fitting memorial is rising steadily to more and more impressive proportions.

Henry Shaw<sup>21</sup> was born in Sheffield, England, July 24, 1800. He was the eldest of four children. His father was a manufacturer of grates, fire irons, etc., and owned a large establishment. Henry's early education was obtained at Thorne, a neighboring village, and his favorite place for study was an arbor in the garden. He was later transferred to Mill Hill, about twenty miles from London. This was termed a "dissenting" school, but was also considered one of the best private schools in the Kingdom. He remained here about six years, leaving probably in 1817, thus finishing his schooling. He studied while here considerable Greek, more Latin, more than the average amount of mathematics, French, and undoubtedly German, Italian and Spanish. With this scholastic training he began to assist his father at the home establishment for a year, after which he accompanied him to Canada. In this same year, 1818, his father sent him to New Orleans, mainly to investigate cotton raising. He stayed in Louisiana but a short time,

<sup>21</sup> Dimmock, Thos., *Mo. Bot. Garden Report*, 1: 7-25, 1890.

as he did not like the climate nor were there financial inducements for his doing so. He was now his own master and decided to go north and try his fortune in the then small and remote French trading post known as St. Louis. He accordingly embarked upon the *Maid of New Orleans*, and after a long and tedious voyage landed at St. Louis on May 3, 1819.

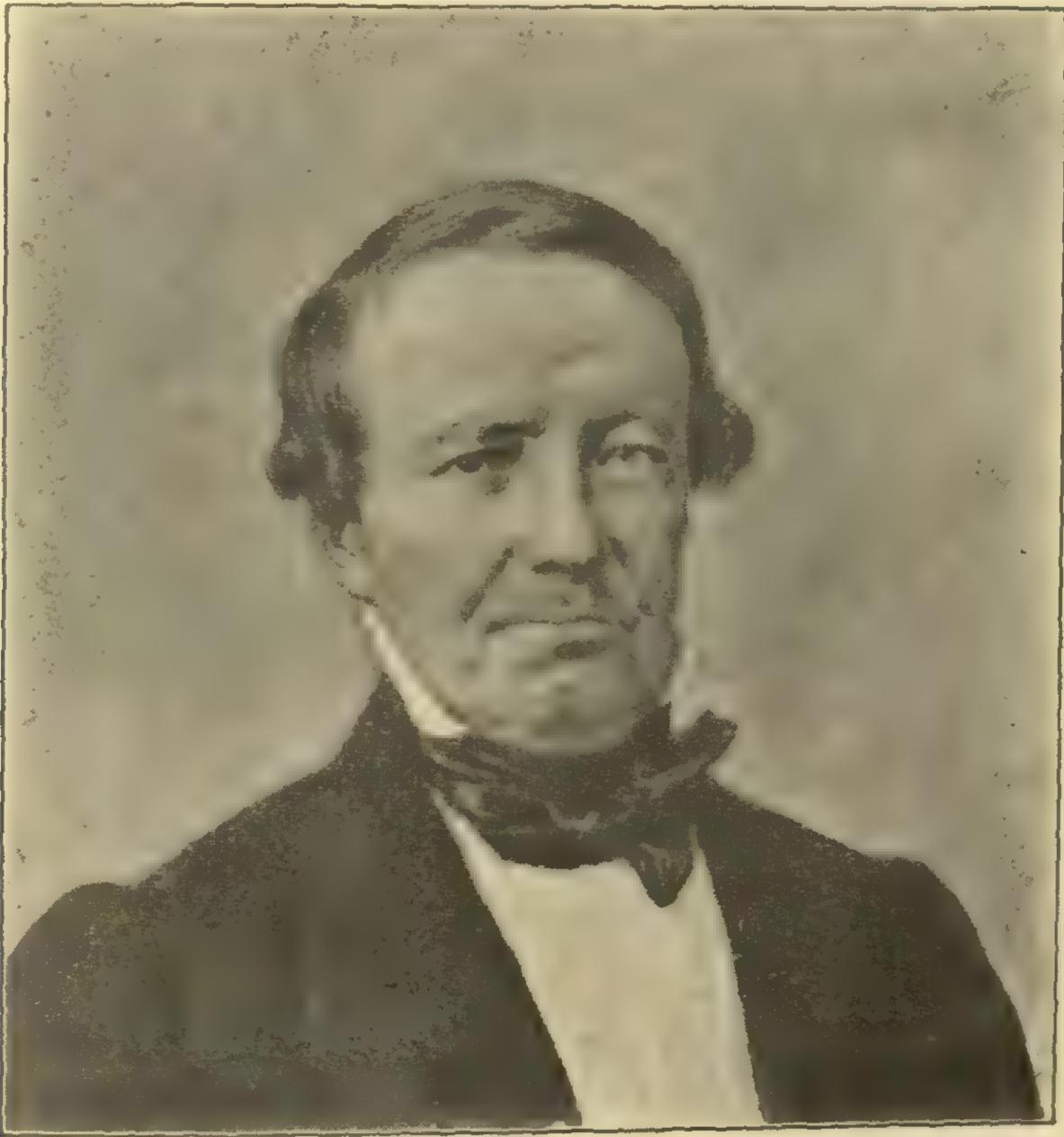


FIG. 16. HENRY SHAW; from a watercolor painting at the Missouri Botanical Garden, by permission of the Director.

He began business on the second floor of a building which he found for rent, and for a time lived, cooked and sold his small stock of cutlery in this one room. The capital with which he bought his first stock of goods was furnished by his uncle. While Mr. Shaw's main object at this time was to make money, and while he denied himself many youthful enjoyments, he still did not thus deny himself beyond reasonable limits.

He had been succeeding in business, and when the balance sheet for 1839 was struck it showed to his own great surprise a net gain for the year of \$25,000. His figures were gone over again and again until there could be no doubt of the fact. It seemed to him that "this was more money than any man in my circumstances ought to make in a single year." Accordingly, the following year, when opportunity offered, he closed out his business. At this time he was forty years of age, physically and mentally unimpaired, and vigorous, a free man, and the possessor of \$250,000, equivalent to more than \$1,000,000 at the present time.

In September 1840, Mr. Shaw made his first visit to Europe, stopping on his way at Rochester, New York, where his parents and sisters resided. He took an extended tour on the continent and, returning to St. Louis in the autumn of 1842, arranged his affairs for another absence in Europe. This lasted for about three years, during which time he visited all of the accessible European localities, together with Constantinople and Egypt. A journey to Palestine was prevented by the prevalence of the plague in that country.

Early in 1851 his last trip abroad was made, the first World's Fair being then held in London. While on this visit the idea first occurred to him to make a garden of his own, modeled after those which are so well known upon the great private estates of England. Mr. Shaw returned in December, 1851; the mansion at Tower Grove had been finished in 1849, and the one on the corner of Seventh and Locust streets was then being built. After this time he was in St. Louis, with the exception of short summer vacations at the Atlantic coast or the northern lakes. Seemingly a man of leisure, he was really a very busy man for the next thirty years, and was never an idler until compelled to be.

In 1857 the late Dr. Engelmann, who was then in Europe, was commissioned by Mr. Shaw to examine botanical gardens and to obtain such suggestions as he might think of value. About this time a correspondence was begun with Sir William J. Hooker, Director of Kew Gardens, who wrote on August 10, 1857:

Very few appendages to a garden of this kind are of more importance for instruction than a library and economic museum, and these gradually increase like a rolling snowball.

Accordingly, Mr. Shaw in 1858-9 erected a building for this purpose. The selection of books was entrusted largely to Dr. Engelmann in consultation with Hooker, Decaisne, Alexander Braun and others of his botanical friends. At the same time Dr. Engelmann urged upon Mr. Shaw the purchase of the herbarium of the recently deceased Professor Bernhardt, of Erfurth, Germany, which was offered at a very small price. Hooker wrote January 1, 1858:

He [Engelmann] tells me of the herbarium of the late Dr. Bernhardt, of Erfurth, which he expects to buy for St. Louis. That ought to be a good commencement for the more scientific part of the establishment. . . . The state ought to feel that it owes you much for so much public spirit, and so well directed.

Mr. Shaw has told that he at one time planned a grand school of botany, with residences for the faculty, laboratories, etc., opposite the main gate; but he abandoned the project because of the advice of Dr. Asa Gray.

In 1866 Mr. Shaw secured the services of Mr. James Gurney from the Royal Botanical Gardens of London, whose practical experience and

faithfulness contributed very largely to make the Garden and Tower Grove Park what they are to-day. Mr. Shaw, however, never abandoned his personal supervision, and he thus spent the last twenty-five years of his life perfecting what he had begun. Until the summer of 1885 he had not been out of St. Louis, except to drive out to dine with a friend, for about twenty years. At this time the hot weather caused a failure of his usual good health, and he went to northern Illinois and Wisconsin for some time. He returned much improved and resumed his accustomed avocations with renewed vigor.

On the twenty-fourth of July, 1889, he received numerous visitors who congratulated him upon the beginning of his ninetieth year. Although weak, he was able to meet them in the drawing-room, and his mind was as clear as ever. This, however, was his last public appearance. An attack of malaria resulted in his death on August 25. On Saturday, August 31, he was laid to rest in the mausoleum which had been already prepared in the midst of the garden which he had created—not only for himself, but for all succeeding generations.

Mr. G. W. Letterman is one of the few persons who have worked upon botany in the vicinity of St. Louis during their whole lifetime. Mr. Letterman has worked especially in Missouri, but is also very familiar with the plants of the region included in eastern and northern Texas, Louisiana, Arkansas and Indian Territory. He has accumulated a very large herbarium, in which the flora of St. Louis is represented probably better than in any other private herbarium.



FIG. 17. MR. GEO. W. LETTERMAN.

George Washington Letterman,<sup>2</sup> the son of John and Charlotte (Blair) Letterman, was born near Bellefonte, Center County, Pennsylvania, of a family which had lived for three generations in Pennsylvania, his father being of Dutch, and his mother of Irish descent. From the public school he entered the State College in Center County, but left before graduation to join the Union Army, in which he enlisted as a private; serving until the end of the war he was mustered out of the service with the rank of captain of volunteers. After crossing the plains to New Mexico in 1866, he returned to Pennsylvania, and then going west again to Kansas, with the idea of becoming a farmer in that state, he finally, in 1869, settled in Allenton, Missouri, a railroad hamlet about

<sup>2</sup> Sargent, C. S., "Silva of North America," 13: 79-80, 1902.

thirty miles west of St. Louis. Here Mr. Letterman taught in the public schools uninterruptedly for twenty years, and then for two years served as superintendent of schools in St. Louis County. Shortly after settling in Allenton Mr. Letterman met August Fendler, the botanist, who had a farm at this time in the neighborhood. This meeting with Fendler stimulated his interest in plants, especially in trees, and led to an acquaintance with Dr. Engelmann, for whom Letterman made large collections of plants in the neighborhood of Allenton, with many notes on the oaks and hickories. In 1880 he was appointed a special agent of the Census Department of the United States, to collect information about the trees and forests of Missouri, Arkansas, western Louisiana and eastern Texas, and later he was employed as an agent of the American Museum of Natural History in New York, to collect specimens of the trees of the same region for the Jesup collection of North American woods. The distribution of the trees of this region before Mr. Letterman's travels was little known, and much useful information concerning them was first gathered by him. Of his numerous discoveries species of *Vernonia*, *Poa* and *Stipa* commemorate the name of Letterman.

The above account is taken verbatim from Sargent's "Silva of North America," as it is the only authentic account of Mr. Letterman's life available. Mr. Letterman still lives at Allenton, Missouri, and is carrying on his botanical work. From the accounts of those in a position to know, his herbarium is very large, and at the present time probably contains as complete a representation of the St. Louis flora as any other, with the possible exception of the Eggert collection, which, however, can hardly surpass it. Mr. Letterman is connected with the local botanical societies, and is well known by the botanical workers of the city.

One man who has left an enduring impression upon botany, although his life work was along other lines, was Dr. Charles Valentine Riley.<sup>23</sup> Dr. Riley was born at Chelsea, London, September 18, 1843. His boyhood was spent at Walton-on-Thames, where he became acquainted with W. C. Hewitson, the author of a work on butterflies. This acquaintance undoubtedly turned his inclinations towards entomology. He studied for three years in the school at Dieppe and afterwards at Bonn. His teacher at the latter place urged him to study art at Paris, but this was not done. At the age of seventeen he emigrated to Illinois and when about twenty-one went to Chicago as reporter and editor for the *Prairie Farmer*. He was for six months in an Illinois regiment during the latter part of the Rebellion. He attained such success as an entomologist that he was made State Entomologist for Missouri in 1868, and he held this office until 1877, when he went to Washington in the government service. During this period he and his assistants, Miss Mary E. Murtfeldt and Mr. Otto Lugger, worked out two cases of the relation of insects to plants which are of more than ordinary interest.

In 1863 there were first noted in France the ravages of the Ameri-

<sup>23</sup> Howard, L. O., *Proc. Soc. Prom. Agric. Sci.*, 17: 108-112, 1896.

can *Phylloxera* upon the tender European varieties of grapes. These injuries became so serious that in 1872 the trouble was known not only in France, but in Portugal, Switzerland, Germany and England, and the entire grape and wine industry of Europe was threatened with annihilation. Riley became much interested in the problem of controlling the pest and finally hit upon the plan of grafting the susceptible European varieties upon roots of the resistant American species. This simple expedient undoubtedly saved the grape industry of Europe and also incidentally prevented a tremendous loss of money.

The second case was one of purely scientific value and interest. Dr. George Engelmann had noted that the character of the pollen of *Yucca* indicated that pollination of the flowers must be accomplished by some kind of an insect. Riley took up this hint and finally, with the aid of his assistants, discovered that the pollination was actually performed by the *Pronuba* and *Prodoxus* moths. This line of work was continued for twenty years, and a series of publications upon it issued at various times during this period.

Incidentally his work was of interest to botanists in many other cases, but these two seem especially noteworthy. He won an enviable reputation among entomologists the world over. He died the latter part of the year 1895.

Because of her botanical work, as well as her association with Dr. Riley in working out the pollination of *Yucca* and other problems, Miss Mary E. Murtfeldt deserves mention. In 1885 Professor S. M. Tracy, then of Columbia, Missouri, published a list<sup>24</sup> of the plants of the state. In this list one finds many species from the vicinity of St. Louis credited to "Murtfeldt" as their collector. These specimens were collected by Miss Murtfeldt not long before the publication of the "Tracy" list and are still in her possession, forming a collection of about 500 numbers. Miss Murtfeldt's first scientific work was in botanical lines, but this later changed to entomology, her botanical knowledge being indispensable in following out the life histories of new or little known insects upon their host plants. Many of her later botanical specimens are of much interest from the entomological standpoint and were prepared for that purpose alone. Miss Murtfeldt is well known among entomologists for her work, which has been mostly of this nature.

In 1874 Mr. Henry Eggert, as he was known, came to St. Louis, went into business, and began the study of the local flora and the formation of an herbarium which probably represented the flora of that vicinity at the time of his death, the best of any in existence. Eggert came to America from Prussia when about thirty years of age; he had already collected and studied the plants of different sections in Europe,

<sup>24</sup> Tracy, S. M., "Flora of Missouri," *Mo. State Hort. Soc. Report* (Appendix), 1-106, 1885.

and his work about St. Louis seems to have been simply a continuation along similar lines to that already done in Europe. Although he lived in St. Louis and in later years in East St. Louis, he seems to have been somewhat of a hermit, and was not understood, or even comparatively well known, by his neighbors. He seems to have been an enthusiast upon botany, and his botanical collection was apparently his one luxury and hobby.

Heinrich Karl Daniel Eggert<sup>25</sup> was born March 3, 1841, in the town of Osterwieck, Prussia. He was educated at a seminary in Halberstadt, and became a teacher in the public schools of the neighboring



FIG. 18. THE EGGERT HOUSE IN EAST ST. LOUIS, ILLINOIS; practically as it was at the time of the death of Henry Eggert.

city of Magdeburg. He early became interested in the study of plants, and before leaving Europe he had made botanical collections in the Harz Mountains and on short journeys to Kreuznach and in Bohemia. Dissatisfied with the small salary of a German school teacher, Eggert came to America in 1873, and for a few months worked on a farm in southern New York. From New York he went to St. Louis, where he remained for a number of years and then removed across the river to East St. Louis, where he lived the rest of his lifetime.

The first work which he seems to have taken up in St. Louis was that of carrying papers for the local press. He carried papers for about twenty years, handling both a morning and an evening one. He worked early and late, never sparing himself and always living by himself in a secluded manner. Comparatively few persons ever saw the in-

<sup>25</sup> Sargent, C. S., "Silva of North America," 13: 51-52, 1902.

terior of his house, and still fewer were on really friendly terms with him, as we ordinarily use that phrase. While he had but little to do with his neighbors he never seems to have had any enemies.

Eggert's first start in making more money than usual was at the time of the great outbreak of the American *Phylloxera* in the vineyards of Europe, destroying immense numbers of the vines and threatening the entire wine and grape industry of Europe. It was finally discovered that the American native grapes might be used as stocks upon which to graft the more susceptible European varieties, so that a vine was obtained which had roots of the American resistant species with the top of some desirable but susceptible European species. This work resulted in an immense demand for the seed of some of our native species of grapes. Eggert's knowledge of botany led to his being recommended as a suitable person from whom to get these seeds. For at least two or three years he made a business of collecting and selling them to foreign countries. The business was quite remunerative and in the proper season he is said to have made several hundred dollars a month in this way. He seems to have kept up his carrying of papers at the same time. At first he carried them on his back, taking immense loads in a bag slung over his shoulder. As his business grew he bought a horse and wagon and still later he employed others, so that at one time he conducted a considerable business of this kind. He never relinquished his botanical work, and in early days he collected specimens for sale to botanists and for use in colleges and schools, thus making some little money. In later years his left arm and hand became affected with a partial paralysis which he attributed to his severe work in carrying such heavy weights of papers slung over that shoulder.

His money he invested in farms and similar property, and he succeeded in amassing considerable property. In his personal habits he was always very frugal, his only luxury seeming to have been his botanical collecting. In 1896 he sent to Germany for his nephew, August Eggert, and turned his greenhouses over to him to run. This nephew lived more or less intimately with him. Mr. Eggert was always of a peculiar disposition, apparently being constantly in fear of some attempt upon his life. He had hallucinations in which he thought every one had designs upon his life, and these became worse as he grew older. His mind was undoubtedly unbalanced, and on the night of April 18, 1904, he shot himself with a revolver.

As mentioned above, Eggert early learned botany and collected extensively all of his life. He collected assiduously all around St. Louis for a considerable distance, and his collection probably represented the flora of this district better and more completely than any other ever made. He also went on collecting trips to various parts of Missouri, Illinois, Arkansas, Alabama, Tennessee and Texas, and the southeastern states. He seemed to possess a genuine love for botany, and his

determinations seem to have been, as a rule, correct beyond the ordinary. He was a charter member of the Engelmann Botanical Club, and was its first vice-president. He was also a member of the International Association of Botanists, and was made one of its vice-presidents.

Personally, he seems to have had no enemies; he always remembered an injury, either real or fancied, and was unstinting in his expression of dislike for those who had in any way incurred his displeasure. His love of botany and his fine herbarium made him well known to the local botanists, yet he never seems to have been on really intimate terms with many of them. He was always ready to exchange specimens of rare plants or local species, and his herbarium was thus greatly enlarged by exchange from other countries as well as from all parts of the United States. During early days he collected specimens for the purpose of selling them, but as he grew older he could rarely be induced to sell his specimens, preferring to exchange.

His herbarium at his death was estimated to contain about 60,000 specimens, and was considered very valuable. It was acquired by the Missouri Botanical Garden, and is at present being incorporated with the herbarium of that institution as rapidly as possible. His herbarium is especially valuable for the reason that it was the basis of a local flora published by Eggert in 1891 under the title "Catalogue of the Phænogamous and Vascular Cryptogamous Plants of the Vicinity of St. Louis, Mo." His preface is characteristic and self-explanatory, so that it may well be given:

Since<sup>26</sup> the publication of Mr. Geyer's catalogue of the Plants of Illinois and Missouri, about 1842, no other effort has been made to publish a list of plants growing in the vicinity of St. Louis but my own partial lists of species found in former years. I hope my present catalogue of Plants growing in a radius of about 40 miles around St. Louis will be welcome to botanists until a local flora is published.

Since 1874 I have systematically looked over the ground in all directions, so that very few plants will have escaped my observation; but as I could only go out one day at a time, in places too far off from railroads, there still may be found something new. Railroads also will bring new immigrants from other regions when some of our own plants may have vanished, so that it will be a very important matter for later botanists to know what in former years was growing here. This idea mostly led me to have this catalogue printed.

With the exception of a few plants reported to me by Mr. Letterman, of Allenton, Mo., all plants are collected by myself. The catalogue contains nearly 1,100 different species and varieties, so that St. Louis need not be ashamed of her flora.

This catalogue of Mr. Eggert's is by far the best and most nearly complete list of our plants which has yet appeared. Besides the above mentioned catalogue, a number of small lists of desiderata were dis-

<sup>26</sup> Eggert, Henry, "Catalogue of the Phænogamous and Vascular Cryptogamous Plants in the Vicinity of St. Louis, Mo.," 1-16, 1891.

tributed to Eggert's correspondents for a number of years. Aside from these he published absolutely nothing, so far as now known. Exact localities were not given either in his lists or upon the labels accompanying his specimens, but he is known to have kept a note-book in which all such data were given. This note-book disappeared during the changes following his death, and thus much valuable and intimate knowledge of our flora was lost. As mentioned above, his entire herbarium is now in the possession of the Missouri Botanical Garden, where it will receive the best of care and will be accessible to all botanists desiring to use it.

One of the more recent collectors who have worked in and about St. Louis, especially upon the fleshy fungi, is Dr. N. M. Glatfelter.

Dr. Noah M. Glatfelter was born in York County, Pennsylvania, on November 28, 1837. He lived on a farm until he was seventeen years of age, when he began teaching school. He finished seven terms, and during the time attended successively the York County Academy, Lancaster County Normal School, and Franklin and Marshall College at Lancaster, Pa., for two thirds of the sophomore year. He then commenced the study of medicine with Dr. John L. Atlee, of Lancaster. In 1862 he attended the medical lectures at the University of Pennsylvania, and graduated from the same institution in 1864. He then received a commission from President Lincoln as Assistant Surgeon of United States Volunteers. In 1867 he left the army in Dakota territory. Ever since that time he has practised medicine in and near St. Louis.

About 1889 Dr. Glatfelter commenced collecting the herbaceous plants in the vicinity of St. Louis and obtained specimens of most of the species of the district. This herbarium is still in the collector's possession. From 1892 to 1898 he gave special attention to the willows of St. Louis, and contributed papers on the venation of *Salix*, on *Salix* hybrids, on *Salix longipes* and on the relations between *Salix nigra* and *S. amygdaloides*.

In 1898 he became interested in the collection and study of the Hymenomycetes. This has led to the accumulation of about five hundred species, making quite an exhaustive collection of these fungi. This work is being continued and has already resulted in the discovery

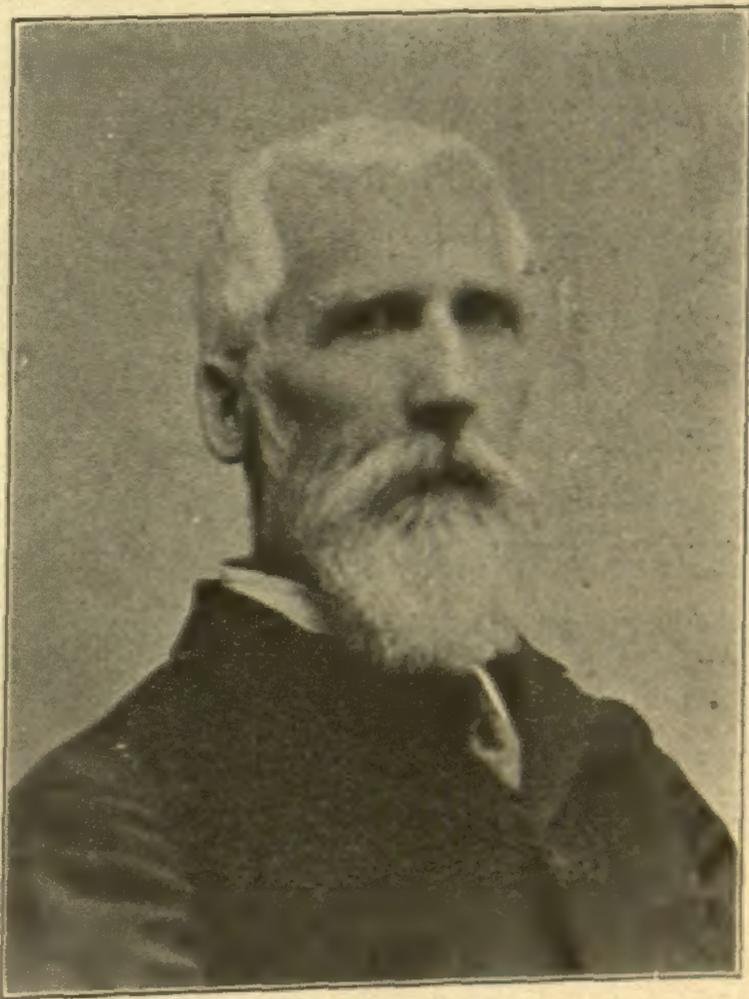


FIG. 19. DR. N. M. GLATFELTER; about 1900.

of a number of species new to science, several of which have been named in honor of their discoverer. This material has been submitted to Professor Chas. H. Peck, so it is authoritatively named.

In 1906 a list of this collection was published by the St. Louis Academy of Science.<sup>27</sup> The specimens are mostly in Dr. Glatfelter's private herbarium. Collecting has also been done in Pennsylvania in 1899, 1905 and 1906, and somewhat in other states. The herbaceous herbarium has been increased by exchanges, so that it numbers over 4,000 species. Dr. Glatfelter is a member of the local botanical societies and is still collecting the fleshy fungi, to which he is giving most of his attention.

The more recent botanical workers of St. Louis we find grouped into two distinct bodies; the staff of the Shaw School of Botany, and of the Missouri Botanical Garden, and the investigators of the Mississippi Valley Laboratory of the United States Department of Agriculture. In the former group, which has existed for the longer time, the following persons should be mentioned: Dr. William Trelease, director of the Missouri Botanical Garden since the death of Mr. Shaw, and also professor of botany in the Shaw School of Botany. Besides administering the affairs of these two institutions, and bringing them to their present development and efficiency, he has published many scientific papers; the earliest ones were concerned with fungi and various plant diseases; then the pollination of flowers was taken up; and of late years his work has been in the systematic revision of certain groups, such as the genera *Acer*, *Rumex*, *Yucca*, etc. Under his management the botanical garden has issued eighteen annual reports of scientific material, which have given that institution a name for scientific research, although it can hardly even yet be said to have fairly emerged from the preparatory stage of its development. Associated very closely with Doctor Trelease since 1894 is Mr. H. C. Irish, who has had general charge of the grounds, greenhouses and outdoor planting. Mr. Irish has published papers on horticultural subjects, including a scientific revision of the genus *Capsicum*, and of the "garden bean," and has in preparation another extensive paper along similar lines. Mr. C. H. Thompson has been connected with the garden for a number of years, and is engaged also upon scientific investigations. Dr. J. A. Harris, librarian of the garden, has published a number of scientific papers, and is engaged upon others, in the preparation of which the extensive and excellent library facilities of the garden are being fully employed. Others who have been connected with the garden staff, and who are now well known scientifically, are Dr. L. H. Pammel, Dr. H. J. Webber and

<sup>27</sup> Glatfelter, N. M., "Preliminary List of Higher Fungi Collected in the Vicinity of St. Louis, Mo., from 1898 to 1905," *Trans. Acad. Sci. St. Louis*, 16: 33-94, 1906.

J. B. S. Norton, all of whom worked more or less upon the fungi of the locality while at the garden. Dr. S. M. Coulter, assistant professor of botany in the Shaw School of Botany, has, ever since coming to St. Louis, been working upon ecological problems.

The second group of botanists is a small one, of whom the following have been more or less intimately connected with the local work being carried upon the flora of the vicinity: Dr. Hermann von Schrenk, in charge of the Mississippi Valley Laboratory until its removal to Washington in 1907, has published a number of scientific papers dealing with the diseases of forest trees and of timber. Some of these were worked out from material collected around St. Louis, either partially or entirely. Dr. von Schrenk continues his work at St. Louis, having severed his relations with the United States Department of Agriculture upon the removal of the Mississippi Valley Laboratory from St. Louis to Washington. Drs. G. G. Hedgcock and Perley Spaulding, assistants of Dr. von Schrenk, were also engaged upon problems relating to the diseases of fruit and forest trees. All three have collected the fungi of the vicinity, and have been intimately connected with the botanical activities of the place.

Besides the above workers should be mentioned Mr. John Kellogg, long employed by the garden, who is very familiar with the local flora, and has a very good private herbarium; Dr. N. L. T. Nelson, who is collecting the mosses of the vicinity; Mr. H. M. T. Hus, who is collecting the algæ; and numbers of others who have collected in the locality at various times.