

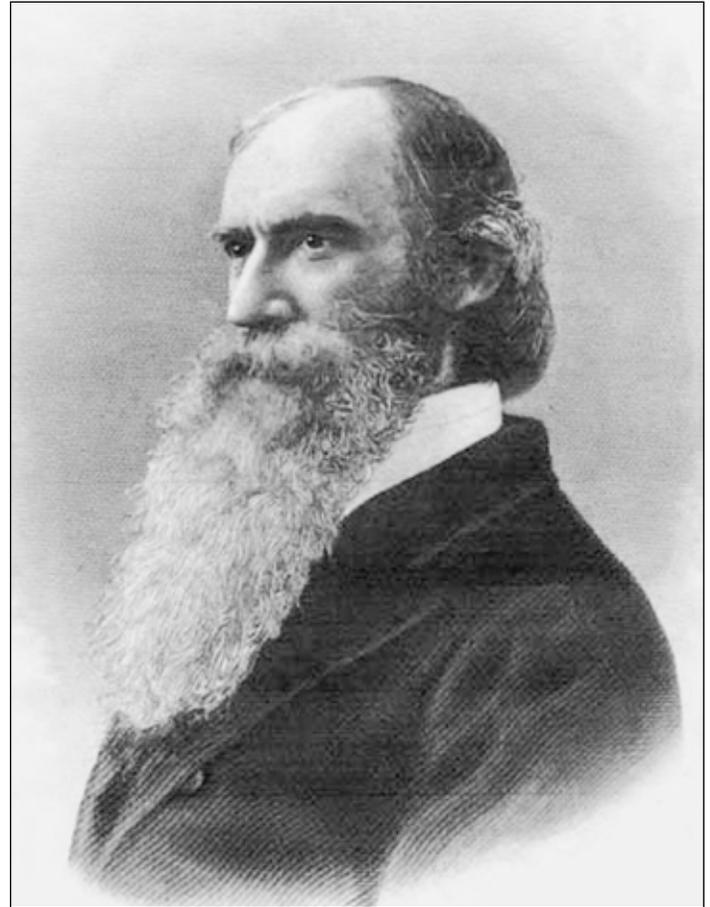
John Strong Newberry, MD (1822-1892)

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At the age of 33 John Strong Newberry became assistant surgeon and geologist on the 1855 War Department railroad survey. Led by Williamson and Abbot, the mission of the expedition was to find a location for a railroad link between the San Francisco Bay area and the Columbia River, tying together the western termini of the proposed Transcontinental Railroads between the San Francisco Bay area and the Columbia River. The connection was finally completed in 1927, crossing the Cascades just south of the current highway across Willamette Pass. At the time it was called Pengra Pass.

As one of the first well-trained scientists to travel through much of Oregon, Newberry made many discoveries in botany, paleontology and geology, especially in eastern Oregon. He was the first scientist to accurately interpret the drowned forests of the Columbia River as being due to landslides damming the river. (First noted by Lewis and Clark in 1807, these submerged snags are in the Columbia River between Cascade Locks and The Dalles.) Newberry was one of the first two geologists to recognize the power of water erosion in sculpting landscapes, then known as fluvialism (O’Conner 2018). He correctly observed and interpreted glacial activity in the Cascade Mountains: “All the projecting points and ridges of the older trap rock were worn down, smoothed off, and cut by deep furrows, which now pointed northeast toward the centre of the mountain mass formed by the Three Sisters ... there is little doubt that all this surface was once covered, not simply by lines of ice following the valleys, but by a continuous sheet.” He corresponded with Thomas Condon at the fledgling University of Oregon, and described many of Condon’s fossil plants in the paleontological literature, including the Bridge Creek Flora (McCornack 1928). Newberry also lent financial support for some of Condon’s collecting trips (Orr 1987).

Although this article emphasizes his time in Oregon, Newberry’s distinguished career spanned the width of North America, and encompassed a remarkable breadth of human knowledge: geology, paleontology, physiology, zoology, botany, and archaeology. For example, he conducted pioneering studies in the Grand Canyon; he was the first to propose a glacial causation for the Great Lakes. Conscientious and methodical, Newberry never published in haste simply to claim priority. He always searched diligently for previous work and compared his finds with those of other students in the field. He was clear and direct in his writing style and firm in his opinions.



Portrait of John Strong Newberry. Photo from Wikipedia Commons, cited as article by Fairchild 1893 as original source, Public Domain, photographer unknown.

Goetzmann (1979) noted that “Of Newberry it might be said that more than any other scientist since Fremont he had opened up new and unknown country to the civilized world.”

The Early Years

John Strong Newberry was born in Windsor, Connecticut on December 22, 1822. His father, Henry Newberry, came from early New England settlers. The founding ancestor of the Newberry clan in America was Thomas Newberry who settled near Dorchester, Massachusetts in 1630. Thomas’ widow moved to Windsor, Connecticut in 1636 and the family resided there for nearly 200 years and became locally prominent. Thomas’ son Benjamin

was one of seven men to whom the town of Windsor was patented in 1685. Benjamin's grandson, General Roger Newberry, was one of the proprietors of the Connecticut Land Company, which bought land from the State of Connecticut that eventually became the northern counties of Ohio. Known as the Western Reserve, coal deposits made this strip of land a valuable investment. Many of the early settlers in this area came from Connecticut. These rich coal deposits near the future city of Cleveland, Ohio, played an important role in John Newberry's life.

When John was an infant, his father moved the family, including John's mother (Elizabeth Strong) and nine older brothers and sisters, to the northern part of Ohio, where they settled at the falls of the Cuyahoga River. Four years later, in 1828, the coal mines opened near Talmadge, Ohio. Dr. Newberry often recalled with great pleasure that his father mined and transported the first load of stone (bituminous) coal for the commercial market in Cleveland.

Newberry's surroundings strongly influenced the future scientist. Young John Newberry spent many hours in his father's coal mines, exploring the fossil plants there. Prior to entering college, he made a collection of the living plants in the area, entitling it "A Catalogue of the Plants of Ohio." He filled a large room in his father's house with fossils from the surrounding area. In 1841 James Hall, a geology professor from New York, stayed at the Newberry home and studied the area around the Falls of the Cuyahoga. Nineteen-year-old John was his guide. Hall had a strong influence on John, showing him the importance not only of the ferns in the coal shales of his father's mines but



Newberry's gentian (*Gentiana newberryi*). Photo by Gerald Carr.

also of the mollusk remains in the local limestones. As the 19-year-old student showed the 30-year-old professor around, a friendship was kindled which would last for over 50 years. The two men remained lifelong colleagues and supporters. Hall's visit inspired Newberry to pursue naturalist studies.

Newberry graduated from the Western Reserve University at Hudson, Ohio, in 1846. In 1848 he took a medical degree at the Cleveland Medical School and married Sarah Brownell Gaylord. After his training in Cleveland he added to his medical skills by studying in Paris, France for two years. While in Paris he met many of the world's most famous geologists and became proficient in French. He studied as a botanical student under Brongniart. While abroad, he wrote his first paleontology paper, which was a description of a fossil fish locality at Monte Bolca, Italy, and was published in 1851.

In 1851 he returned to Cleveland and began the practice of medicine. His practice flourished as the community recognized him as a healer of uncommon skills. During this time, he continued his avocational interest in natural history. Indeed, after several years he found himself tiring of his medical practice and longing for a stronger connection to his first love, natural history. Using pressure from his academic contacts and some help from his previous mentor, Professor Hall, he obtained the coveted position of scientist and physician to the Pacific Railroad Survey.



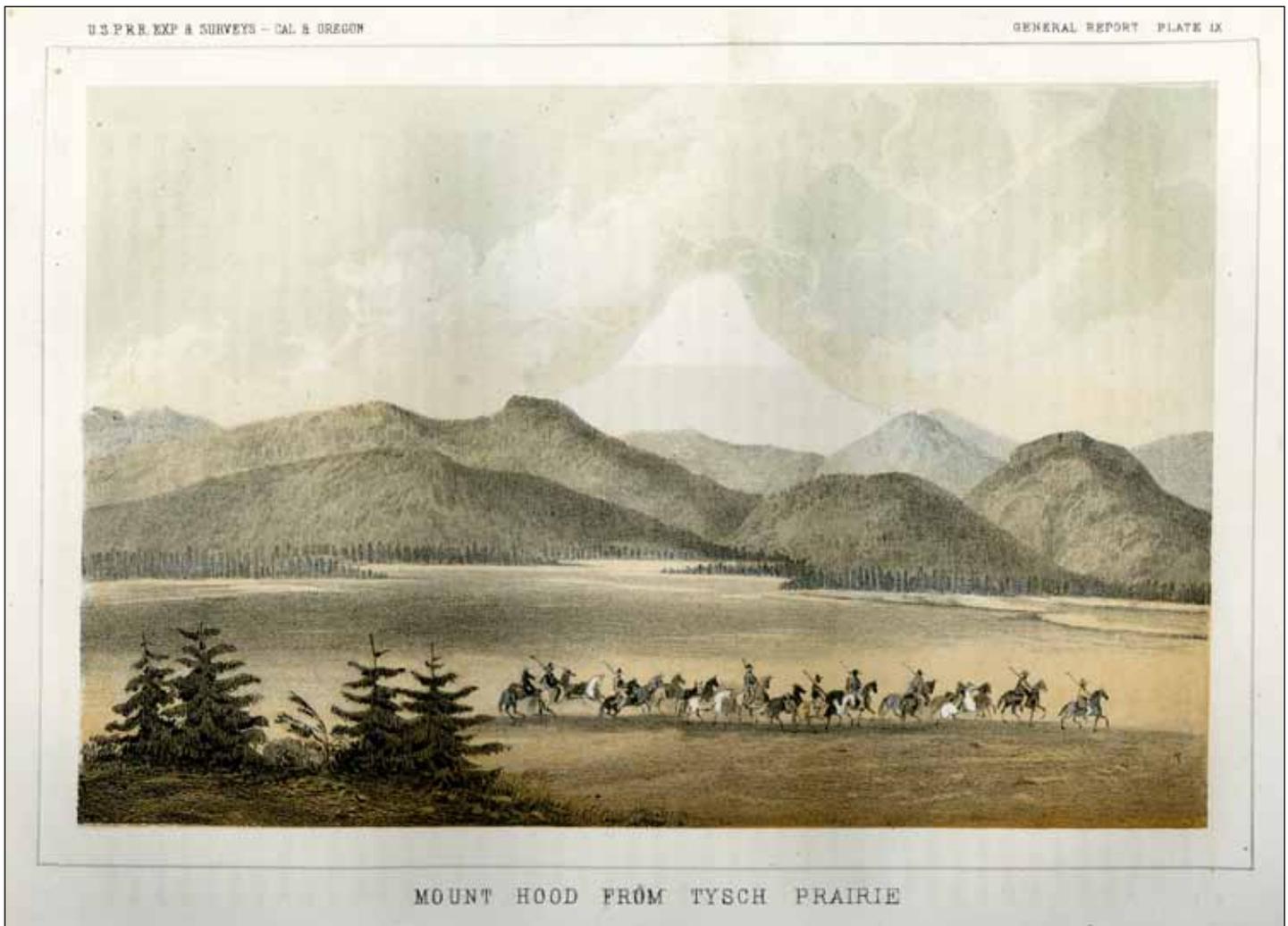
Newberry fleecflower (*Polygonum newberryi* Small, now *Aconogonon davisiae* var. *davisiae*). Photo by Paul Slichter.

The Railroad Surveys

The expedition was under the joint leadership of Lieutenant Robert Stockton Williamson and Lieutenant Henry Larcom Abbot. Leaving the San Francisco Bay area in May of 1855, the 28-man party traveled north through the Central Valley of California and arrived in the Klamath Basin of southern Oregon in August. They worked their way north along Klamath Lake and entered the drainage of the Little Deschutes River near the present town of Crescent. Along the way Newberry made geologic and botanic observations: *"In our travels, the general aspect of vegetation is made up of three distinct elements. Of these the first is presented by the grassy plains which border the streams flowing down from the mountains. On these surfaces grow a considerable variety of annual vegetation, some in its general character not unlike that of the Sacramento Valley. The second of these botanical phases is that of the sagebrush plains. These are surfaces on which little or nothing else except clumps of Artemisia will grow. The third is formed by forests of yellow pine which apparently finds on these arid surfaces its most congenial habitat. It sometimes happened to us that during a whole day's ride we were passing through a continuous forest*

of these yellow pine trees in which scarcely a dozen distinct species of plants can be found." (Newberry 1857)

Exploring for possible crossings of the central Oregon Cascades, the group passed near Black Butte and entered the Metolius River drainage. From there they traveled along the Deschutes River near Warm Springs. On September 6, Williamson left Camp 40 for a second exploration across the mountains; his party included Sheridan, Fillebrown, Newberry and mounted soldiers (dragoons). Abbot started with his small party for Fort Dalles, and the main body of the escort remained in Depot camp. Williamson's party crossed the Cascades between the Three Sisters and Mt. Jefferson, finding the ascent steep, impractical for a railroad. They reported that prospects appeared more favorable to the north and east, that by going northwest from Camp I on Whychus Creek, and skirting the northern base of Black Butte, the divide could be reached at a much lower point and the long sweep would decrease the grade. Later in September Williamson's party crossed the Cascades between the Three Sisters and Diamond Peak, arriving in the Willamette Valley. Abbot returned from The Dalles with supplies and his group crossed the Cascades between Jefferson and Hood during



Mount Hood from Tysch Prairie. Lithograph by John J. Young, Railroad Survey Report (Abbot 1857).



Newberry's cinquefoil (*Potentilla newberryi*). Photo by Gerald Carr.

a period of heightened hostilities with the Indians. In June of 1855 Joel Palmer, Superintendent of Indian Affairs for the Oregon Territory, had met in council with the Indian nations of the Mid-Columbia Region to establish an Indian reservation which would “get the Indians out of the way of American settlement.” In the Treaty, the Warm Springs and Wasco bands gave up ownership rights to a ten-million-acre area, which they had inhabited for over 10,000 years, obtaining exclusive rights to 640,000 acres. When a group of miners searching for minerals and a War Department Railroad Survey Expedition entered the treaty area, it appeared that the Americans intended to violate the agreement. Most likely the Expedition leaders did not see it that way and were just looking for a way across the mountains. A young Indian risked his life to guide the group safely across the mountains through a little-known pass. (This route is probably Abbot Road and Abbot Pass located on the Mt. Hood National Forest south of Highway 26.) From there, this party made its way to Fort Vancouver. Newberry travelled with Abbot's group northward to the Army outpost at

The Dalles, then on to Fort Vancouver. Despite the unrest in the Native American populations in Oregon, most of the group traveled south through the Willamette Valley to San Francisco. Newberry, however, went down the Columbia and met the rest of the party in the Bay Area in January of 1856.

The year after he returned from this expedition, Newberry was the geologist on the Colorado Exploring Expedition (Ives Expedition), which explored the lower Colorado River December 1857-58. He was the first trained geologist to visit the Grand Canyon and was the first person to recognize that this great tear in the earth was the result of erosion by running water. In 1859 he served as naturalist on the San Juan (Macomb) Expedition, which traveled to southwestern Colorado and the San Juan River

and adjacent parts of Utah, New Mexico, and Arizona (July-October). This report was finished in 1860 but the outbreak of the Civil War delayed publication until 1876.



Gnome plant (*Hemitomes congestum*). Photo by Paul Slichter.

Plants named for Newberry:

Abutilon newberryi S. Wats. (Malvaceae) Newberry's velvetmallow (syn. *Horsfordia newberryi* (S. Watson) A. Gray) California and Arizona.

Aconogonon davisiae (W.H. Brewer ex A. Gray) Soják (Polygonaceae) Newberry's fleecflower (syn. *Polygonum newberryi* Small) grows in the Cascade Mtns., Oregon and Washington. Williamson Expedition.

Astragalus newberryi A. Gray var. *newberryi* (Fabaceae) Newberry's milkvetch (syn. *Xylophacos newberryi* (A. Gray) Rydb.) The holotype was collected by Newberry at Camp 74, n. borders of Arizona in 1858. Macomb Expedition.

Astragalus newberryi var. *aquarii* and *escalantinus* A. Gray (Fabaceae)

Chrysothamnus newberryi Rydb. (Asteraceae) Newberry's rabbitbrush. Mexico.

Coreopsis californica (Nutt.) Sharsm. var. *newberryi* (A. Gray) E. Murray (Asteraceae) Newberry's tickseed (syn. *Leptosyne newberryi* A. Gray) California.

Cymopterus newberryi (S. Watson) M.E. Jones (Apiaceae) Newberry's springparsley (syn. *Coloptera newberryi* Coult.; *Peucedanum newberryi* S. Wats.; *Ferula newberryi* S. Wats.) Utah and Arizona.

Gentiana newberryi A. Gray (Gentianaceae) Newberry's gentian (syn. *Pneumonanthe newberryi* Greene; *Dasystephana newberryi* Arthur)

Gentiana newberryi A. Gray var. *newberryi* sensitive species in Oregon Cascades.

Gentiana newberryi var. *tiogana* (A. Heller) J.S. Pringle, Sierra Nevada, CA.

Hesperoyucca newberryi (McKelvey) Clary (Asparagaceae) (syn. *Yucca newberryi* McKelvey) now endemic to Arizona. Collected by Newberry 3 April 1858.

Hymenopappus newberryi (A. Gray) M. Johnston (Asteraceae) Newberry's hymenopappus. (syn. *Leucampyx newberryi* A. Gray) Gray named it in 1874. Colorado, New Mexico endemic.

Hemitomes congestum A. Gray (Ericaceae) Gnome plant. (syn. *Newberrya congesta* Torr. ex A. Gray; *Newberrya spicata* A. Gray; *Newberrya pumila* (Greene) Small; *Hemitomes pumilum* Greene; *Newberrya longiloba* Small). The type specimen was collected in 1878 by V. Rattan in Humboldt Co., California; taxon reference for *Newberrya spicata* A. Gray Proc. Amer. Acad. Arts 1880. 15:44. "Known from Dr. Newberry's advanced and imperfect specimens from Des Chutes valley in the Cascade Mountains, S. Oregon"

Penstemon newberryi A. Gray (Plantaginaceae) Mountain pride. In cultivation. Three

recognized varieties *P. n.* var. *newberryi*, A. Gray, *P. n.* var. *berryi* (Eastw.) N.H. Holmgren and *P. n.* var. *sonomensis* (Greene) Jeps. named by Dr. Asa Gray in 1857 in honor of Dr. J. S. Newberry, a member of Lt. Williamson's Pacific Railroad Survey party. An early synonym was *P. menziesii* var. *newberryi* A. Gray

Physaria newberryi A. Gray (Brassicaceae) Newberry twinpod. (syn. *Coulterina newberryi* Kuntze) Report on the Colorado River of the West, Ives 1861. Arizona, New Mexico, Nevada, Utah.

Potentilla newberryi A. Gray (Rosaceae) Newberry's cinquefoil. This remains an accepted name. Grows in northern California, Nevada, southeastern Oregon. Williamson Expedition.

Vesicaria newberryi A. Gray (Brassicaceae) Status of this taxon is currently unresolved; it is neither an accepted name nor a synonym. Ives Expedition Published in Colorado Expl. Surv. (1861) Bot. 6.



Type specimen for Newberry fleecflower, collected by Dr. Newberry on scoria, near the snowline (7000 ft.), Crater Pass of the Cascade Mts. Sept. 1, 1855. Image courtesy of the New York Botanical Garden.

Newberry's botanical observations in the Deschutes Basin and the Cascades

As botanist of the expedition, Newberry wrote the 102-page Botanical Report in the Railroad Survey (Abbot 1857), divided into two chapters: "Geographical Botany" and "General Catalogue of the Plants Collected on the Expedition." The Catalogue included Exogenous Plants by Asa Gray, John Torrey and J.S. Newberry, followed by Endogenous Plants (John Torrey), Mosses and Liverworts (W.S. Sullivan) and Lichens (Edward Tuckerman). The bulk of the collections were "exogenous," with only 44 species of monocots (endogenous plants), which included cattails, beargrass, trillium, mariposa lilies, veratrum, brodiaea, orchids, iris, sedges, rushes and grasses. Interestingly, some of the names are "new" to us: for example, *Dichelostemma*, *Melanthaceae*. Newberry sent his botanical specimens to Harvard University, where Dr. Asa Gray named *Gentiana newberryi*, *Newberrya spicata*, and *Penstemon newberryi* for the explorer. In addition to the geology and botany reports, Newberry

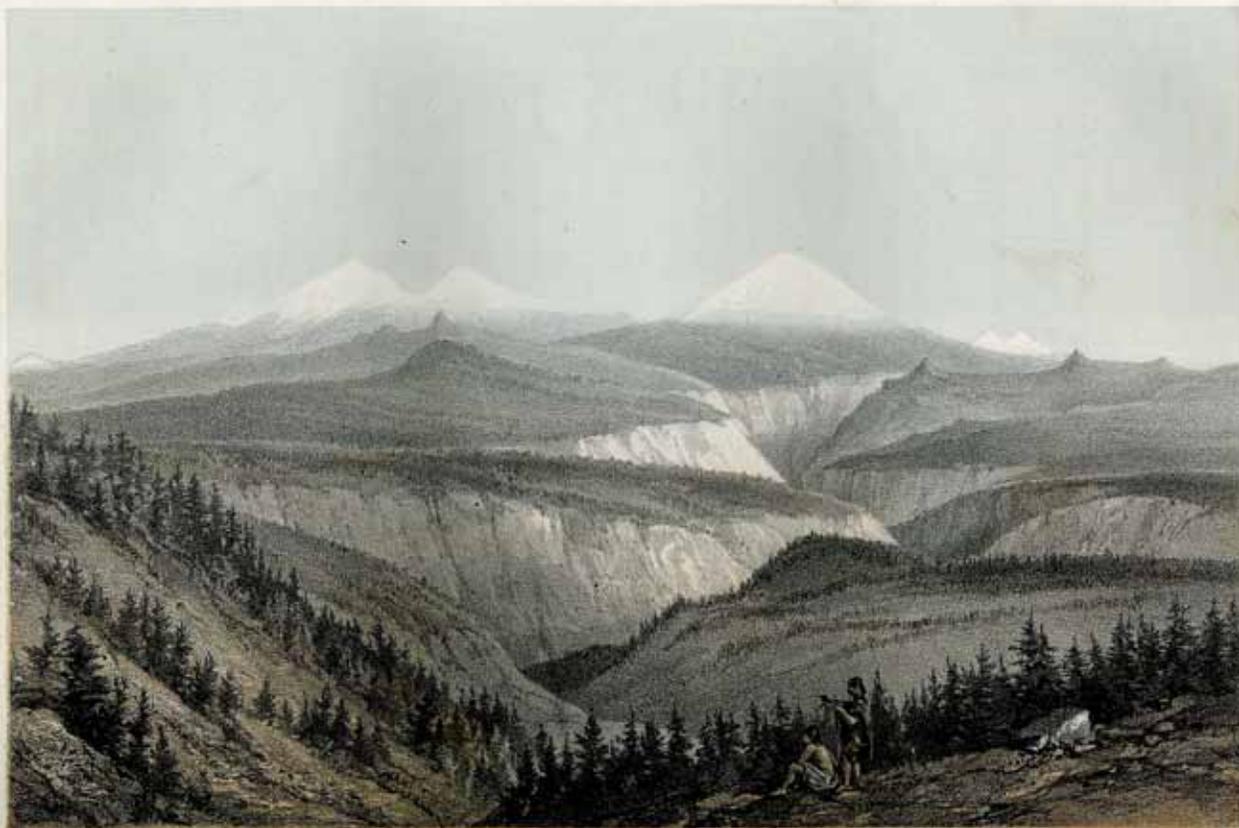
also reported on the birds and mammals. The impressive illustrations of landscapes and plants in Newberry's reports were created by Mr. Young, who suffered from "severe attacks of intermittent fever... while deprived of the services of a physician" (Abbot 1857). Done under the direction of the War Department, the Railroad Survey Expedition serves as an early example of botanical work accomplished under a "Defense Contract."

Looking for a potential route for the railroad, the exploratory party crossed and re-crossed the main crest of the Cascades in the vicinity of the Three Sisters, giving Newberry an opportunity to study the different belts of vegetation visible on the mountainsides. He was skilled at observing the botanical landscape, noting that the Deschutes Basin had the same general characteristics as the Klamath Basin, but as they traveled north towards the Columbia River, "the forest of yellow pines gives way to scattered trees of the western cedar [Juniperus occidentalis]. The plain bordering the Deschutes has an altitude of about 4,000 feet and is covered with a continuous forest of yellow pine. Along the streams coming down from the



Dwarf hulsea (*Hulsea nana*). Photo by Paul Slichter.

mountains are a few trees of the western larch. A few hundred feet up the mountain side the yellow pine is joined by the sugar pine [Pinus lambertiana] and Pinus contorta. At the height of 6000 feet the trees which I had mentioned gave place to white bark pine which then rises to the line of perpetual snow. The undershrubs in the forest consist mainly of chinquapin, rhododendron, and spirea. On the Alpine summits of the Cascades we collected about 50 minor flowering plants. Of these Menziesia empetriformis [pink mountainheath, Phyllodoce empetriformis], Saxifraga tolmei [Tolmie's saxifrage, Micranthes tolmei] and Penstemon Menziesii [Penstemon davidsonii var. menziesii] cover large surfaces with their flowers and with Gentians and Heaths and other alpine plants of the old world. In the Cascade Mountains in the vicinity of the Columbia River the largest number of trees are Douglas' Spruce [Pseudotsuga menziesii] and western balsam fir [Abies lasiocarpa]." (Newberry 1857).

THREE SISTERS AND CAÑON OF M^C KENZIE'S FORK OF WILLAMETTE RIVER FROM CAMP P.

Three Sisters, and Cañon of McKenzies Fork of Willamette River, from Camp P. Lithograph by John J. Young, Railroad Survey Report (Abbot 1857).

The Civil War

Shortly after Newberry completed his report for the San Juan Exploring Expedition, the Civil War broke out (April 12, 1861). Dr. Newberry reported to the War Department, in whose service he had been employed the past five years as assistant surgeon. Newberry was appointed to the newly organized civilian Sanitary Commission on June 14, 1861. In September he resigned from the War Department to become Secretary of the western branch of the Sanitary Commission with headquarters in Louisville, Kentucky. All operations in the Mississippi Valley were under his supervision. He traveled widely and was present at the battle of Chattanooga. He was recognized as providing outstanding service to the country and was proud of what he accomplished. He had a knack for organization and delegation.

Academic Years: Students and Friends

After the war ended Newberry moved to Washington, DC, where he worked at the Smithsonian Institution for almost two years. He also held a professorship at Columbia

University of Washington (later George Washington University). In 1866 Newberry accepted the position of chair of Geology and Paleontology in the School of Mines at Columbia College (later Columbia University) in New York City. During his 24 years in this position, he created a museum of over 100,000 specimens that he used to illustrate his lectures in paleontology and economic geology.

Newberry's students affectionately referred to him as "Uncle John." "Everybody loved him and there was not a student in his class that ever thought of taking advantage of him or playing tricks on him to get out of work, because the work of Dr. Newberry was a pleasure" (Orton 1896, p. 18). Newberry had a passion for music and was noted around the campfires of his earlier expeditions for his violin playing. Students at Columbia recalled his rich full voice as he sang to himself while working on his geologic collections. In the early hours of the night music could be heard coming from his apartment as he played his little cabinet organ. He was known to never pass a beggar in the streets without offering money to the less fortunate soul.

When the National Academy of Sciences was founded on March 3, 1863, Newberry was named as one of its

Oregon plants named or discovered by Newberry

- Abies Williamsonii* Newb. Mountain hemlock, now *Tsuga mertensiana* (Bong.) Carrière
- Chamaebatia foliolosa* Benth. Mountain misery. Collected by Newberry, California 1855. (Contributions from the New York Botanical Garden, Vol. 5: 398. Per Axel Rydberg 1909. Notes on Rosaceae). (*Spirea millefolium*) Newberry did not collect the type, Pl. Hartw. 308 (1839). Type locality "in montibus Sacramento." Valley of the Kaweah River (No. 1307). (Contributions of the United States National Herbarium, Vol. 4, 1893)
- Delphinium patens* Newb. Spreading or zigzag larkspur. Pac. Rail. Rep. vi. 65. (syn. *Delphinium patens* Benth.) California. Type named by Benth. From California
- Fragaria californica* Cham. & Schltld. California strawberry. now *F. vesca* ssp. *californica* (Cham. & Schltld.) Staudt collected by Newberry, cited as *F. chilensis* in the Pac. R. Rep. 6. 73. J. Gray Ann. Sci. Nat. 4. 8. 200. Also as *F. californica* same report. (Smithsonian Miscellaneous Collections 1878)

- Gentiana simplex* A. Gray oneflower fringed gentian. Now *Gentianopsis simplex* (A. Gray) H.H. Iltis Pac. R.R. Rep., vol. 6 p. 87, t. 16. 1857 Type locality: "Upper Klamath Lake," 2 August 1855, California. Range. Mountains of eastern Oregon south through the Mt. Shasta region and the Sierra Nevada to the mountains of southern California. Southern Idaho. Zone Canadian. (Smiley, Frank Jason. 1921. A Report upon the Boreal Flora of the Sierra Nevada of California. Vol. 9: 298.)
- Horkelia cuneata* Newb. Wedgeleaf horkelia. Pac. Rail. Rep. vi. 73. (syn. *Horkelia cuneata* Lindl.) California endemic.
- Hulsea nana* A. Gray Dwarf alpinegold. Type collected by Newberry at Crater Pass, Cascade Mtns. Pac. Rail. Rep. vi. 76. t. 13.
- Penstemon glaucifolius* A. Gray Azure penstemon. isotype collected by Newberry at Ft. Reading, California = *Penstemon azureus* Benth.
- Quercus kelloggii* Newb. California black oak

incorporators. In 1867 he was named as President of the American Association for the Advancement of Science. Likewise, in 1867 he was named as the president of the New York Academy of Sciences and remained president for 24 years. He was president of the Torrey Botanical Club from 1880 to 1890. He was one of the founders of the Cosmos Club in Washington, DC.

Newberry was still serving as chair at Columbia College when he suffered a paralyzing stroke on December 3, 1890. Partial recovery followed and he was able to complete some work in 1891. However, his paralysis progressed, and he passed away on December 7, 1892 in New Haven, Connecticut, at nearly 70 years of age. He is buried in Cleveland's Lake View Cemetery. Of his seven children, five sons and one daughter survived Dr. Newberry.

Acknowledgements

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Dr. Garrett is a family physician in Bend with strong interests in natural history, geology, and the native vegetation of central Oregon. He was co-founder of the High Desert Chapter in 1979 and has served as president of the state board of the Native Plant Society of Oregon (NPSO) in 1989 and 1990. He has served on the boards of The Oregon Chapter of The Nature Conservancy, the Oregon Environmental Council, the State

of Oregon Natural Heritage Commission, and the Native Plant Society of Oregon. He was chairman of the Citizen's Committee that successfully sought Congressional designation of the Newberry National Volcanic Monument and was the Governor's appointee to and chairman of the Newberry National Volcanic Monument Citizens Advisory Committee. He was named Oregon's Doctor-Citizen of the Year by the Oregon Medical Association (1991) and Bend's Citizen of the Year (1990) by the Bend Chamber of Commerce. He is the author of *The Newberry National Volcanic Monument: An Oregon Documentary* and has written on numerous other historical and natural topics including *Sisters Country* and *Oregon's Outback* with Dr. Ray Hatton. While working for the Monument, Dr. Garrett became fascinated with Dr. Newberry and decided to write an article about him. This article meshed perfectly with Rhoda Love's plan to publish a book about pioneer botanists, *Plant Hunters of the Pacific Northwest*. Dr. Garrett, who became an NPSO Fellow in 2010, has a long history with the journal *Kalmiopsis*. As NPSO president, he admired the California Native Plant Society's journal *Fremontia* and worked to create a journal for NPSO. The first issue of *Kalmiopsis* was published in 1991; this is Dr. Garrett's fourth article published in our journal.

Newberry National Volcanic Monument

The largest ice age volcano in Oregon and the National Monument located on its summit and flanks are named for Dr. Newberry. This came about as a result of interest in its potential for geothermal energy production. Beneath Newberry caldera there is a molten body of magma that produces large quantities of heat as evidenced by the caldera hot springs. It was this potential for energy production that led, in the 1980s, to a geothermal temperature well being drilled in the caldera that produced temperatures as high as 500 degrees Fahrenheit. In 1987 the Deschutes National Forest put out a notice for leasing of geothermal properties in and around the caldera. Because there was little concern for the non-commodity values of the volcano, a small group



The Newberry Caldera from Paulina Peak, showing East and Paulina Lakes and the Big Obsidian Flow. Photo by Stu Garrett.

of concerned citizens formed an exploratory group to look at a protective designation on the volcano. This led to the formation of a Newberry Volcanos Citizen Group to explore avenues for protection along with energy production. Second District Congressman Bob Smith agreed to carry a bill in the US House of Representatives designating the Newberry National Volcanic Monument. A consensus group of over 30 persons was formed which represented various interests such as conservation, fishing, hunting, geothermal energy production, snowmobiling, skiing, and others. Senator Mark Hatfield carried the bill through the US Senate and President George H. W. Bush signed it into law on November 5, 1990.