
Benjamin Stanley Revett and his Breckenridge Gold Dredges

By Mark and Karen Vendl

Benjamin Stanley Revett is often referred to as the “Father of Gold Dredging in the United States,” although he was not the first to use bucket-line gold dredges. He was, however, the first to use them in the state of Colorado, in the Breckenridge District. This took place shortly after the first bucket-line gold dredge was introduced into the United States near Bannack, Montana in 1894–95. The Breckenridge deposits presented a unique set of problems, mainly because of their depth to the bedrock, where the majority of the gold lay, and because of the coarse nature of the gold-bearing gravel. Revett’s expertise, enthusiasm, and ability to promote did much to forward the use of gold dredging. He became known throughout the mining world as an expert in placer mining, with his services being in demand as far away as Africa, Columbia, and Siberia. But it is in the Breckenridge District where Revett made his greatest impact.¹

Since the discovery of placer gold in Summit County by Ruben Spalding on 10 August 1859, the placer deposits of the Breckenridge District of Summit County have been the most productive in the state of Colorado. From 1859 through 1957, placer gold production in Summit County is estimated to have been \$15,643,483, substantially more than that of any other county in Colorado. In fact, the Breckenridge District is the only one in the state in which there was placer mining each year—except during World War II—from the discovery of gold into the 1960s. Nearly all of this production came from the Blue and Swan rivers and their tributaries, and from French Gulch.²

The gold in the placer deposits of the Breckenridge District originated in the igneous rocks in the mountains and hills lining the gulches. One such, Farncomb Hill, is famous for its very highly crystallized gold. These mountains were eroded by glaciers, and the resulting gold-bearing gravels were deposited in the valleys in the form of gla-

cial moraines. After they were deposited, the gravels were rearranged by rivers. The greatest known thickness of Breckenridge gold-bearing gravels, about ninety feet, is near the Gold Pan Pit. The width of deposits in the Breckenridge District ranges from six hundred to three thousand feet.³

The placer deposits of the Breckenridge district fall into two distinct types: those beds lying above the level of the rivers, called bench, gulch, or high-level placers; and those below river level, called deep or low-level placers. Until the late 1890s, operations were confined almost entirely to the bench placers. How to mine the deep plac-



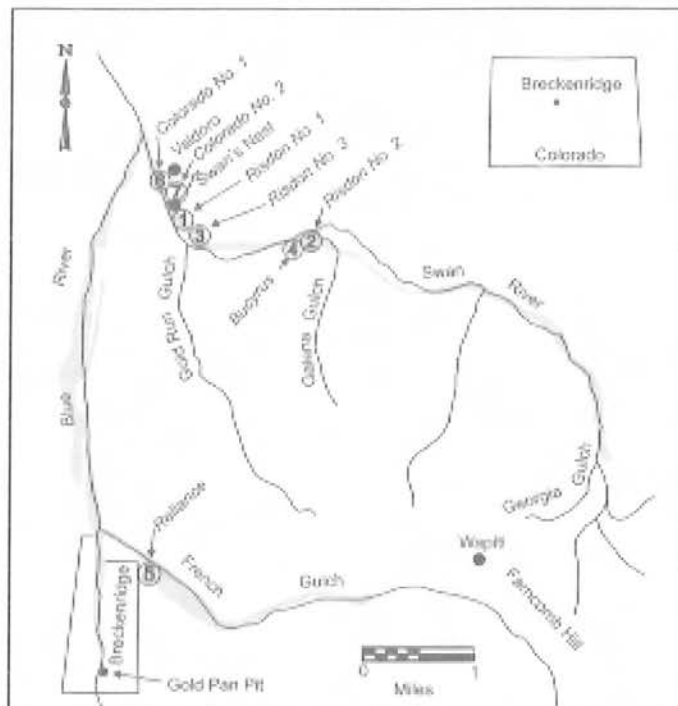
*Benjamin Stanley Revett.
(Courtesy of the Colorado
Historical Society)*

ers presented a major problem at the time, because of their fifty-foot average depth and the number of large boulders they contained. Also, gravels from the deep placers somehow had to be brought up to the ground surface. Because of these problems, powerful excavating and hoisting equipment, considerable capital, and more advanced engineering skill were needed to begin successful mining of the main stream deposits. However, it is these same deposits that held the majority of placer gold in the Breckenridge District, and they were a tempting lure to anyone who could overcome these obstacles.⁴

After Spalding's initial discovery of gold in Summit County, a typical mining boom began: for the first few years, simple methods were used to work the richest and shallowest of the placers. Over the next few decades, the high-level placers were worked by more elaborate means, especially by hydraulic methods. However, due to the geology of the main river valleys in the Breckenridge District, the deep gravel deposits awaited some mechanical method of mining. The means to recover this hard-to-reach gold would be provided by Ben Revett.⁵

Benjamin Stanley Revett was born in 1858 in Calcutta, India, where his father, Benjamin Kinsley Revett, was a high-ranking officer in the British Navy. His mother, Isabel Bruce, was a direct descendant of Robert Bruce, King of Scotland. Young Benjamin was their only son, with one older and two younger daughters. As a youngster, he was sent from India to attend school in Scotland and England. He once studied for the grand opera in England, but gave this up to become a mining engineer. Revett worked for seven years for the firm of Rankin and Blackmore, Ltd., in Scotland, and gained ship-building experience during that time.⁶

In 1884, he was hired by the Twin Lakes Hydraulic Mining Syndicate, Ltd., of London,



Map of the Breckenridge district, Summit County, Colorado, showing the location where Revett's dredges were built. The shaded areas show the extent of dredging in the district. (Modified from Parker, 197 and Pritchard, 1988)

and was immediately sent to work at their placer operation in Granite, Colorado. He became manager of these operations in 1887, and oversaw the construction of miles of ditches, flumes, tunnels, and sluices to bring water to the operation. All of these improvements greatly increased the output of the property.⁷

Sometime in late 1893 or early 1894, Revett was hired by John F. Campion to manage the Wapiti Mining Company, a placer mining group on Farncomb Hill near Breckenridge. Revett managed the hydraulic mining operation at the Wapiti, and it was during this time that he became familiar with the extent of the gold-bearing gravels of the Swan River. Revett continued as manager of the Wapiti until 1897, when he turned the operation over to brothers Maurice and Frank Griffin of San Francisco.⁸

In 1894, Revett joined forces with Samuel S. Harper to begin the mining of the deep gravel deposits near Breckenridge. At this same time,



*Ben Revett (left) and a customer coming off Farncomb Hill.
(Courtesy of the Colorado Historical Society.)*



*One of the first two dredges under construction on the Swan River in 1898.
(Courtesy of the Amon Carter Museum, Fort Worth, Texas.)*



Stock certificate for the North American Gold Dredging Company issued to Mary Revett. (Authors' collection.)



Stock certificate for the Colorado Gold Dredging Company issued to Ben Revett. (Authors' collection.)

Harper was involved with H. J. Reiling in the construction of the first bucket-line dredge in the United States at Bannack, Montana. It can be assumed that during this period Revett heard something of the dredge boats operating in New Zealand, discussed the use of a dredge boat with Harper, and knew something of the first dredge operations at Bannack. Revett promoted the project, while Harper furnished the experience.⁹

In April of 1894, Revett started purchasing placer claims on the Swan River with the idea that the gravels of the Swan Valley could be mined, either with hydraulic elevators or by the dredge boats just being introduced in the United States. To determine the extent of the gold-bearing gravels, Revett began sinking a shaft to bedrock along the Swan River, near the mouth of Galena Gulch, in 1895. But because of the large quantity of water present, this shaft was not successful. He then undertook to test the gravels with an oil-well or "Keystone" drill. This was probably the first application of such an implement to gold-placer prospecting in Colorado. The district's gulches and valleys were system-

atically drilled in places, either with random holes or with traverse lines of holes spaced one hundred feet apart.¹⁰

During 1896 and 1897, Revett spent most of his time making plans to form a dredging company, and promoting it to eastern backers. Samuel Harper transferred his holdings in Summit County to Revett in 1897, and on 1 September of that year, Revett organized the North American Gold Dredging Company. The company's head office was in Portland, Maine, but it was formed to carry out business in Breckenridge, Colorado, with Revett as its resident agent. In November 1897, Revett's North American company contracted with the Risdon Iron Works of San Francisco, for two light, steam-powered "New Zealand"-type dredges, with three-cubic-foot buckets, each with a capacity of one thousand cubic yards per day. These were the third and fourth dredges constructed by the Risdon Iron Works—the first two were employed in California—and were known in Breckenridge as the Risdon No. 1 and Risdon No. 2 dredges.

Both dredges were assembled on the Swan



The Wapiti Mine. Note the hydraulic operation in background. Revett managed this operation for John Campion from 1894 to 1897.

(Authors' collection.)

River, one near Valdoro and the second at the mouth of Galena Gulch. The first dredge went into operation in May 1898, and the second shortly thereafter. The steam-powered dredge boats were ninety feet long and thirty feet wide. From the top of each dredge, Revett flew beautiful silk pennants with a hand-worked representation of a swan, after the Swan River. After initial reports of great success, with the dredges moving two thousand cubic yards per day, they proved to be too light to mine the heavy gravels encountered. Another problem was that the stackers were too short, so rock fell back into the pond underneath the dredges. Despite the ineffectiveness of these dredges during the first season, another attempt was made to use them in 1899. However, the Risdon No. 1 and Risdon No. 2 dredges were dismantled and shipped to California by the end of 1899, in an effort to get

some salvage value out of the machinery.¹¹

On New Year's Day, 1898, Revett married Mary Griffin, sister of Maurice and Frank Griffin, who were still managing the Wapiti operation. Revett personally designed a summer home for Mary, to be built on the Swan River. Swan's Nest, as the home was known, was completed by June 1898, and became the scene of elaborate parties. According to the *Summit County Journal*: "Revett's house is the most elegant and elaborate in this part of the state. The original design of the house was by Mr. Revett, an artist of no small ability." The house was semi-circular in design, consisting of a large central portion with two small wings, and a long veranda along the entire front. The large central hall had a huge fireplace made of dredged rock. Placed on the fireplace were a series of hand-painted tiles, the work of Mary Revett, depicting famous American Indians. Another unique feature of Swan's Nest was the three-foot-wide doors. Ben was described as a handsome man who stood five feet-seven inches tall, and, at 300 pounds, was almost that wide. Revett had the extra-wide doors built, according to Belle Turnbull, "so the dignity of its owner need not suffer by having to pass through a door sideways."¹²

On 20 November 1900, the Revetts' daughter, Francis, was born in San Francisco. Ben was in Siberia at the time, examining placer deposits for the Venture Company of London. For the next decade, this set the pattern: the Revetts would spend the summer at Swan's Nest, and Mary and Francis would spend the winter in California, while Ben traveled the world consulting.¹³

After the failure of the first two Risdon dredges, Revett realized that he needed more powerful dredges to handle the heavy gravels of the Swan River. In 1899, Revett and his North American Gold Dredging Company ordered two new dredges to work the Swan. The third dredge was also built by the Risdon company. Locally, it was called the Risdon No. 3, and was the thir-



"Keystone" drill used in summit County, Colorado to test the value of placer deposits.
(Courtesy of the Colorado Historical Society.)



*View of the Bucyrus Dredge, showing the bucket line.
(Courtesy of the Colorado Historical Society.)*

*Reliance Dredge in French Gulch two miles east of Breckenridge
during a visit by a Colorado School of Mines Class.
(Courtesy of the Colorado Historical Society.)*





Visiting investors and management sitting on a work car near the Gold Pan shops, Breckenridge. Ben Revett is seated at the far right.

(Courtesy of Maureen Nicholls.)



Ben Revett at a "cleanup" on one of his dredges.

(Courtesy of Glenn and Mary Campbell.)



*Ben Revett (left) in his big rock chair in front of Swan's Nest.
(Courtesy of Glenn and Mary Campbell.)*



Mary Revett driving her buggy in 1910. She sometimes transported gold to Breckenridge this way.

(Courtesy of Glenn and Mary Campbell.)

teenth dredge built by the Risdon company. The No. 3 dredge was assembled on the Swan River during the summer of 1899 at the same location as the No. 1 had worked previously. The new dredge could process one to two thousand cubic yards of gravel per day, but was only in operation from August 1899 until sometime in 1900.¹⁴

The fourth dredge was built for Revett's North American company by the Bucyrus Company of South Milwaukee, Wisconsin, at a cost of forty thousand dollars. This dredge was erected on the Swan River at the prior location of the No. 2 dredge. It was launched 19 August 1899, and was in full operation by October. The contract with Bucyrus was for a complete dredge boat, including the hull, which was unusual, since Bucyrus usually only furnished the main machinery. The Bucyrus dredge was considerably heavier than the No. 3 dredge built by Risdon. The Bucyrus had a capacity of twenty-five hundred cubic yards per day, and needed a crew of three men. This dredge had no stacker, and the boulders were directly returned to the dredge pond. Its sluice was mounted on a separate pon-

toon, which was connected to the dredge by a sliding joint. It was the early belief of Bucyrus Company designers that this long sluice would save more gold and could be operated along with short sluices aboard the main boat. Bucyrus later changed to a more conventional design, using many short sluices on the dredge. The Bucyrus dredge operated each summer through 1904, although, despite early stories to the contrary, it was not particularly successful. However, the Bucyrus dredge was the first dredge to travel any great distance upstream.¹⁵

Revett's North American company was experiencing financial difficulties by 1900, since its dredges were producing no revenues. Much of the stock in the North American company had been pledged by the stockholders to the Merchants Bank of Boston. This Bank had failed and was in the hands of a receiver, which was the chief reason the dredge company was having trouble meeting its obligations. It became apparent that Revett's North American company needed reorganization, a move which produced its successor, the American Gold Dredging Com-

pany of Portland, Maine. Revett owned a one-third interest in the old company and stated that he would be active in the new one.¹⁶

The first four dredges in Summit County were experimental, and their limited work was done entirely in the Swan River Valley. In 1903, Revett returned east to promote a dredging company that would operate in French Gulch, and he also started acquiring claims in the Gulch. The following year, Revett organized a group of investors from both the United States and England to undertake the French Gulch operation. At Revett's insistence, the Reliance Gold Dredging Company was not incorporated. Revett was its trustee and manager of the operation.¹⁷

In 1905, Revett began constructing the Reliance dredge in French Gulch for the Reliance Gold Dredging Company. This was a steam-driven, nine-cubic-foot, open-connected, double-lift Bucyrus dredge of Revett's design, with a capacity of twenty-five hundred cubic yards per day. This new dredge, the Reliance, began operation in April 1906. It was the first successful dredge in Colorado, and worked in an

area of relatively high-grade gravel. It was reported to have produced one thousand dollars per day in 1906. Early in 1908, Revett's associates prevailed over his objections, and the Reliance company was incorporated. In the same year the dredge was modified: the bucket line was changed to close-connected, five-cubic-foot buckets; the dredge was converted to electric power; and a stacker was added. The actual capacity in 1909 was twenty-eight hundred cubic yards per day. Revett showed that it was possible to operate dredges throughout the winter by operating the Reliance dredge through the entire winter season of 1908-09. But valuable months were lost during the following summer in overhauling and altering the dredge. The Reliance dredge continued operating until 1920.¹⁸

The success of the Reliance dredge sparked the Breckenridge gold-dredging industry. Excepting 1938, from 1906 to 1939 there were one to five dredges operating in the district. The greatest activity was in 1918 and 1919, when five dredges operated.¹⁹

In 1907, The Colorado Gold Dredging Com-



*The Tonopah No. 1 Dredge on the Blue River. Note that the stacker is covered by canvas, allowing winter operation.
(Authors' collection.)*

Ben Revett's home on the Swan River, Swan's Nest, beautifully restored by owners Glenn and Mary Campbell.

*Photographed in September, 2001.
(Courtesy of Glenn and Mary Campbell.)*



pany, for which Ben Revett was the promoter, contracted with the Bucyrus Company for two electrically-operated dredges with nine-cubic-foot buckets: the Colorado Nos. 1 and 2. These two dredges cost \$150,000 each, and were assembled just below Swan's Nest on the Swan River near Valdoro. Also in 1907, Revett took over management of the Gold Pan Mining Company, whose shops provided parts and repairs for Revett's dredging operations.²⁰

Mary Revett was injured in a buggy accident in 1909. She spent months recuperating, first in California, then in Denver. In 1913, Mary left for San Francisco because Francis had developed a heart ailment and because of her dissatisfaction with living in the mountains. Swan's Nest stood empty. By then Revett had seen his fortune diminish, and he was forced to sell the Reliance dredge to the Tonopah Placers Company. In turn, he was hired by them as a consulting engineer. In addition to the Reliance dredge, the Tonopah company also took over the Colorado Nos. 1 and 2 dredges, and the Gold Pan Mining Company properties. In 1915, five dredges operated in the Breckenridge area, three of them belonging to the Tonopah company.²¹

Revett spent the rest of his life either traveling about inspecting placer mining projects or residing either at San Francisco's Bohemian Club or the Denver Club. Despite having reportedly made and lost three fortunes during his mining

career, Revett's friends saw to it that he lived in high style at his clubs and at the best hotels. He died at the age of 68, on 1 June 1927, in a Denver hospital following an auto accident.²²

Many improvements in the long development of dredging can trace their origins to the pioneering efforts of Benjamin Stanley Revett in Summit County, Colorado. The ingenuity and resourcefulness that Benjamin Stanley Revett brought to Summit County, solved the problem of how to mine the deep, gold-bearing gravels of the Breckenridge District. In addition to his contributions to the industry, Revett left a legacy still visible in the county today. The most obvious element of this are the dredge piles along the Swan and Blue rivers and in French Gulch. But these are slowly disappearing. The dismantled hull of the Bucyrus dredge remains in a pond on the Swan River, near Galena Gulch, at a Summit Historical Society site. Revett's palatial home, Swan's Nest, was abandoned for a time, but still stands in the Swan River Valley. It has been lovingly restored to its former magnificence by its new owners, Glenn and Mary Campbell.²³ ■

The authors would like to thank Maureen Nicholls and Glenn and Mary Campbell of Breckenridge, Colorado, for their kind assistance while conducting research for this article, and for providing photographs.

Revett's Dredge Boats in Summit County, Colorado²⁴

<u>Name of Dredge</u>	<u>Owner</u>	<u>Builder</u>	<u>Operating Year(s)</u>	<u>Specifications</u>	<u>Area of Operation</u>	<u>Disposition</u>
1. Risdon No. 1	North American Gold Dredging Co.	Risdon Iron Works San Francisco	1898	96' long, 30' wide 3 cu ft per bucket 1000 cu yds/24 hrs 100 horsepower engine wood-powered	Swan River	unsuccessful, too small, dismantled
2. Risdon No. 2	North American Gold Dredging	Risdon Iron Works San Francisco	1898	96' long, 30' wide 3 cu ft per bucket 1000 cu yds/24 hrs 100 horsepower engine wood-powered	Swan River	unsuccessful, too small, dismantled
3. Risdon No. 3	North American Gold Dredging American Gold Dredging Co.	Risdon Iron Works San Francisco	1898	80' long, 30' wide 3.5 cu ft/bucket 2000 cu yds/24 hrs wood-powered two-person crew	Swan River	unsuccessful, too small, dismantled
4. Bucyrus	North American Gold Dredging American Gold Dredging Co.	Bucyrus Company South Milwaukee, Wisconsin	1899-1904	100' long 2500 cu yds/24 hrs steam-powered three-person crew	Swan River	successful; dismantled hull in pond at Galena Gulch Summit Historical Society Site

5. Reliance	Reliance Gold Dredging Co.	Taylor Iron Works High Bridge, New Jersey	1905-1920	500 tons, 44 buckets 9 cu ft/bucket 3000 cu yds/24 hrs 425 horsepower engine coal, then electric-powered	French Gulch	successful, dismantled
Tonopah No. 3	Tonopah Placers Co.					
6. Colorado No. 1	Colorado Gold Dredging Co.	Bucyrus Company South Milwaukee, Wisconsin	1908-1942 non- continuous operation	115' long, 40.5' wide 42 buckets, 9 cu ft/bucket 3000 cu yds/24 hrs Modified by Tonopah Co.: 100 buckets 4000 cu yds/24 hrs 70' dredging depth	Blue River	successful, dismantled
Tonopah No. 1	Tonopah Placers Co.					
7. Colorado No. 2	Colorado Gold Dredging Co.	Bucyrus Co. South Milwaukee, Wisconsin	1908-1919	115' long, 40.5' wide 42 buckets, 9 cu ft/bucket 3000 cu yds/24 hrs electric-powered Modified by Tonopah Co.: 51 buckets 50' dredging depth	Swan River	successful, dismantled
Tonopah No. 2	Tonopah Placers Co.					

Remains of the Bucyrus Dredge in a pond on the Swan River in 1991. This is now a Summit Historical Society Site.



Notes

1. Erl H. Ellis, *The Gold Dredge Boats Around Breckenridge, Colorado* (Boulder, Co.: Johnson Publishing Co., 1967).
2. Ben H. Parker, Jr., "Gold Placers of Colorado," *Quarterly of the Colorado School of Mines* 69, no. 3 (July 1974): 126. Ben H. Parker, Jr., *Gold Panning and Placing in Colorado* (Colorado Geological Survey, Information Series 33, 1992), 48.
3. Wade L. Crow, "The Breckenridge Placer Problem," 1901, Master's thesis, Colorado School of Mines, 1901, 3-4. Arthur Lakes, Jr., "Gold Dredging Operations in Breckenridge District, 1911," *Mining and Engineering World*, 12 Dec. 1911: 1103. Frederick Leslie Ransome, "Geology and Ore Deposits of the Breckenridge District, Colorado, 1911," U.S. Geological Survey, Professional Paper 75: 7, 177-78.
4. Crow, "Breckenridge Placer Problem," 2. Ransome, "Geology and Ore Deposits," 175.
5. Crow, "Breckenridge Placer Problem," 1-2. Ransome, "Geology and Ore Deposits," 175.
6. Ellis, *Gold Dredge Boats*, 28. Trevor Glynn Thomas, "The Revett Story," *Summit County Journal*, 22 and 29 May 1953.
7. Ellis, *Gold Dredge Boats*, 28. Thomas, "Revett Story." Belle Turnbull, "Gold Boats on the Swan," *Colorado Magazine* 39, no. 4 (1962): 243.
8. Ellis, *Gold Dredge Boats*, 31. Thomas, "Revett Story."
9. Turnbull, "Gold Boats on the Swan," 247. Ellis, *Gold Dredge Boats*, 34.
10. Lakes, "Gold Dredging Operations," 1105. Ransome, "Geology and Ore Deposits," 19.
11. Ellis, *Gold Dredging Operations*, 39-42. Parker, "Gold Placers of Colorado," 15. *Summit County Journal*, 24 Feb. 1900, 1.
12. *Summit County Journal*, 18 June 1898, 2. Ellis, *Gold Dredge Boats*, 31-32. Mary Ellen Gilliland, *Summit* (Silverthorn, Co.: Alpenrose Press, 1980), 293-94. Turnbull, "Gold Boats on the Swan," 251.
13. Ellis, *Gold Dredge Boats*, 31-32.
14. Ellis, *Gold Boat Dredges*, 43-50. Parker, "Gold Placers of Colorado," 15-17.
15. Ellis, *Gold Boat Dredges*, 51-58.
16. Ellis, *Gold Boat Dredges*, 59-63.
17. Ellis, *Gold Boat Dredges*, 64. Turnbull, "Gold Boats on the Swan," 257.
18. Parker, "Gold Placers of Colorado," 16-19. Ransome, "Geology and Ore Deposits," 181. Turnbull, "Gold Boats on the Swan," 259.
19. Parker, *Gold Panning and Placing*, 23.
20. Ellis, *Gold Boat Dredges*, 79. Maureen Nicholls, *Gold Pan Mining Company and Shops* (Breckenridge, Co.: Quandary Press, 1994), 28. Ed Auge, "History of the Breckenridge Mining District," *Summit County Journal*, 28 Jan. 1938.
21. Gilliland, *Summit*, 295. Nicholls, *Gold Pan Mining Company*, 29. Thomas, "Revett Story." Turnbull, "Gold Boats on the Swan," 261.
22. *Denver Post*, 2 June 1927, 10. Thomas, "Revett Story."
23. Thomas, "Revett Story."
24. Sandra Pritchard, *Roadside Summit: Part II, the Human Landscape* (Dillon, Co.: Summit Historical Society,