

The Arrival of the Railroads. Part 2.

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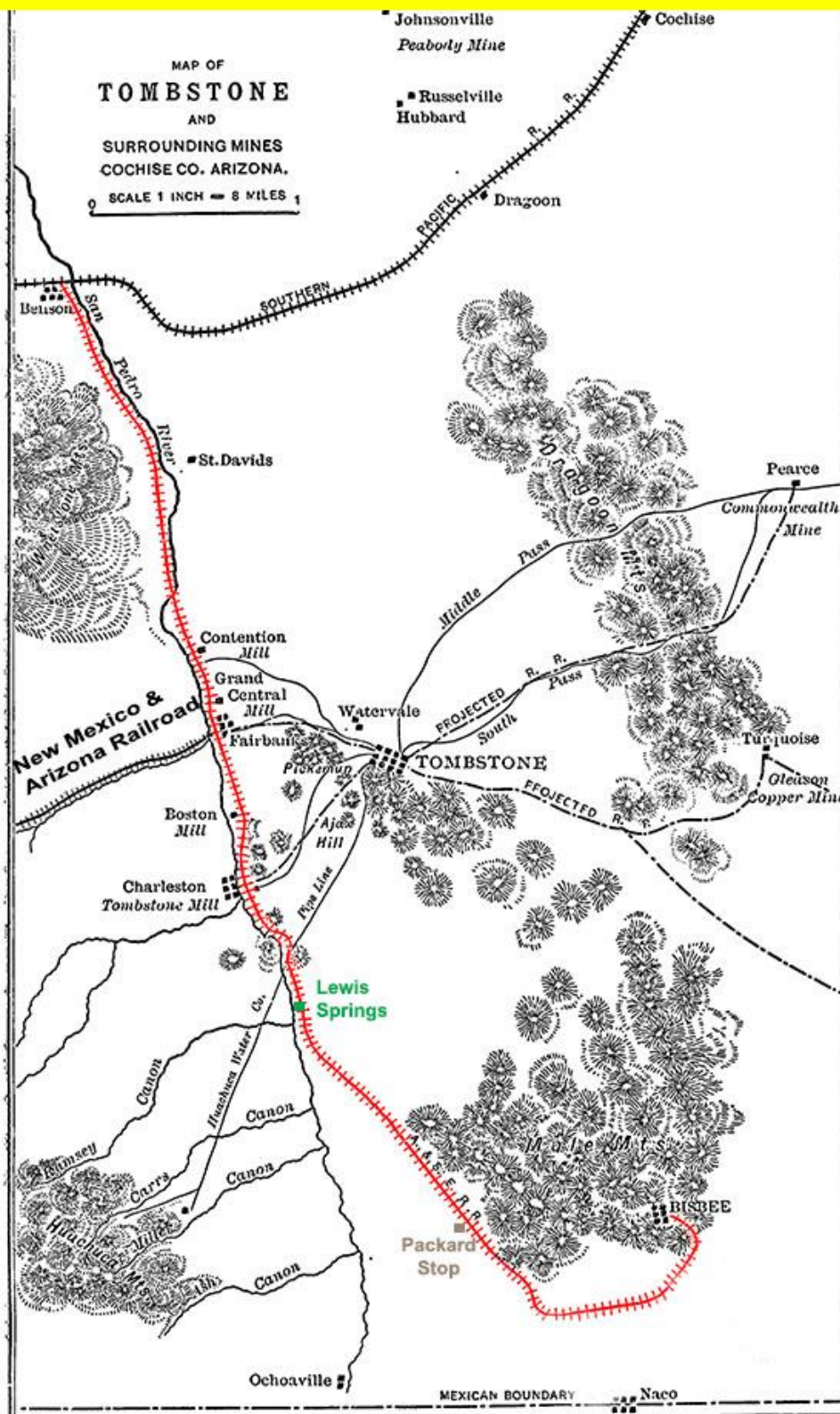
The Copper Queen and its associated railroads

Transportation needs of the Copper Queen Mine resulted in Phelps Dodge building a short railroad that over time grew into an important regional transportation resource in the Southwest. The American exploitation of minerals in the Bisbee area dated back to a scout for Apaches (Bailey, 2002, p. 11-64; McClintock, 1916, p. 424-427, 182-189 abs.). On May 9, 1877 Lieutenant John A. Rucker led a 15-man detachment of mostly Apache and civilian scouts of Company C, 5th Cavalry from Fort Bowie. Jack Dunn, an accomplished scout, suggested the detachment look for Indians at springs in the Mule Pass of the Mule Mountains. Water at the first spring visited was brackish, and Rucker decided to make camp and have Dunn search for better water the next morning. Not only did Dunn find good water but he also noticed a mineral that often occurred with silver. He took samples and informed Rucker and another government employee, T. D. Byrne, of his find. The three men had all dreamt of striking it rich and paced off a rectangle 900 x 300' in size. Nearly two months passed before they registered their claim, but on August 29, 1877 Byrne filed a claim with the Pima County Recorder for the "Rucker Mine." The claim gave the date of discovery not as in May but rather as August 2, possibly a date when the three men were not on duty. Over time prospectors became aware of the mineral riches in the area, filed claims, and began mining ore. It soon became apparent that the mineral riches consisted not of silver but rather of copper.

By 1881 the largest copper mine was the Copper Queen Mining Company owned by the eastern based Phelps, Dodge & Company. That firm had retained the services of Dr. James S. Douglas, an expert geologist and metallurgist who investigated possible mining opportunities for the company. He persuaded the company in 1881 to purchase for \$40,000 the Atlanta Mine that was situated near the Copper Queen, and for his work and counsel received a 10% interest in the Atlanta claim. Further mining work revealed that both the Atlanta and Copper Queen mines had competing claims on a nearby large body of ore. The owners of the two companies wisely realized that it would take years of lawsuits to settle ownership and that the only winners would probably be the lawyers. Phelps, Dodge & Company agreed to buy an interest in its rival, and in August 1885 the two companies merged into a new entity operated under the name of Copper Queen Consolidated Mining Company (Cox, 1838, p. 43; Douglas, 1913, p. 535-536, 618-619 abs.; Graeme, 1999, p. 40). Soon after the merger, copper prices fell, and Phelps Dodge bought most of the remaining stock to bring its ownership to 90%. The company appointed Douglas as manager of the new Copper Queen company which soon began producing large amounts of copper ore.

Douglas soon realized that transportation difficulties and costs significantly limited expansion of ore production and a corresponding increase in profits (Bailey, 1883, p. 36-38; Cox, 1938, p. 103-105; Douglas, 1899; Douglas, 1913, p. 542, 625 abs.; Graeme, 1992, p. 47-48; Graeme, 1999, p. 42-43; Hofsommer, 1992, p. 86; Myrick, 1981, p. 177-254).

Phelps Dodge Railroads (shown in red, adapted from Church, 1903).
 (Track positions changed over time as Phelps Dodge RR found & constructed better grades.)



When he first arrived in the area, mining companies transported tons of supplies and black semi-refined copper daily by mule team wagons over 30 miles of roads via Mule Pass to Fairbank where the New Mexico and Arizona Railroad Company had a station. The freight transportation along the route to Fairbank was initially done by Carr at a rate of \$7 per ton and later by Durkee for \$6 a ton (Douglas, 1906, p. 26). The mule-pulled ore wagons were typically eight feet high, had rear wheels six feet in diameter and with a 10-inch tread and held about five tons each (Cleland, 1952, p 139). Teamsters often joined three such wagons together and used teams of 18 or 20 mules to haul them tandem fashion. A teamster controlled a set of wagons with a single "jerk-line" that attached to the leading mules (Robinson, 1919, p 249, 267 abs). A long steady pull caused the leaders to turn to the right while a series of jerks resulted in them moving to the left.

The expanding operations of the Copper Queen required the movement of additional tons of copper ore, thousands of board feet of lumber for use in the mines, tons of coke and coal, and many other materials needed by the company or its workers. Transportation needs for the Bisbee copper mines reached 20,000 tons per year, an amount expensive and difficult to move by mules.

The company experimented with a steam traction engine built by John Fowler & Co., popularly dubbed "Geronimo" because of the problems it caused. The engine cylinders were 6.5 x 11.25" in diameter, the piston stroke was 12 inches, the engine ran under a pressure of 140 pounds, and had a 220-gallon water tank. The traction engine could haul 20 tons of freight provided it was on ground that provided sufficient traction. The company put the machine to work on the road between Fairbank and Bisbee, an approximately 30-mile route with long grades of ten percent. The device proved "utterly unsuitable for long-distance haulage in an arid region." It could move with difficulty through dry sand, but after rains its wheels slipped and could not obtain traction on a muddy road. A rain storm could therefore bring the engine to an immediate standstill. The Copper Queen would have had to build a hard road-bed to secure regular operation during all types of weather. Moreover, while the engine was very well built, it needed more frequent repairs than would an engine running smoothly upon railroads. Douglas (1906, p. 26) remarked that "it was dangerous to operate it at a distance from the machine shop." It was also difficult to establish water supplies for such an engine in an arid region.

However, when the engine ran under favorable conditions, it could haul materials much more economically than did teams of mules. For several months, the Copper Queen used the machine to pick up the coke-loads of two 18-mule teams whose gross weight of loads and wagons was approximately 20 tons. The traction engine hauled the coke over a 9 mile stretch of the Mule Mountain toll-road that had ten percent grades and then returned daily over the same road stretch with a load of copper. This type of operation however required transferring copper ore or coke between the traction engine and mule teams. The company gave up using the device in the Bisbee area, and repurposed it for hauling 30 tons of ore daily in two trips from a mine located three miles away from Globe over a hard mountain-road.

Management of the Copper Queen began investigating the possibility of constructing a railroad between Bisbee and Fairbank. The straight-line distance between the two localities was approximately 30 miles. The company investigated two possible routes. The shorter one substantially followed the route of the toll-road but involved heavy grades and had room for

only a narrow-gauge railroad. The longer line was approximately 37 miles in length because it went around the southern end of the Mule Mountains, but it had room for standard-gauge rails and had maximum grades of only 2.5 percent. A major reason for selecting the longer route and a standard-gauge railroad was to avoid the transfer of fuel between narrow-gauge and standard-gauge railroads. Such transfer would involve significant loss of coke that was very friable. There would also be the time and labor involved in transferring copper ore and other materials between railroads with different gauges.

People in Tombstone hoped that the anticipated railroad would go through their town. The Tombstone Epitaph on April 14, 1888 published an article (TE, 1888a) declaring that for more than a year it had been "an open secret" that the Copper Queen Mining Company was determined to reduce the costs of transporting coke and crude bullion by building a railroad line between Bisbee and Fairbank. The newspaper correctly noted that the company had considered constructing a narrow-gauge road from Fairbank through Mule Pass to Bisbee but abandoned that idea because of the steep gradients through the canyon. The paper then asserted that the Atchison, Topeka and Santa Fe Railroad Company wanted "to take a hand in the building of the road. That company already has a line surveyed from Fairbank to Deming through Tombstone, and has expended thousands of dollars on the grade." The newspaper concluded that the railroad company would benefit because the route through Tombstone to Deming would give it a direct connection between its Sonora railroad and the main Santa Fe system to the East. The newspaper correctly reported that Superintendent Ben Williams of the Copper Queen Mining Company had stated that there would be a railroad built between Fairbank and Bisbee. The paper noted that J. E. Durkee & Co., who had the contract for holding bullion and coke, had been officially notified of the fact and had discharged 15 men who were working on the existing road and on improvements to it near Fairbank.

The Arizona and South Eastern Rail Road Company was incorporated on May 24, 1888 with Lewis Williams as president, Ben Williams as agent, and George Noteman as Secretary. The capital stock was \$400,000 and the Directors were Thomas Mitchell, of Los Angeles, and Ben Williams, Lewis Williams, J. W. Howell, J. H. Hoadley, S. W. Clawson, W. H. Brophy, and M. J. Brophy of Bisbee (SJH, 1888).

The Copper Queen Consolidated Mining Company controlled the new firm and decided to build a standard gauge railroad with light rails (40-pound) if such could be done for \$200,000 and on the advice of the Santa Fe retained Mr. Wambaugh for 15 days to make a preliminary survey and cost estimate (Douglas, 1906, p. 26). His estimate was within the prescribed limits, and the company proceeded with the building but found that actual costs far exceeded the estimate. The company paid most of the costs for establishing the new railroad by purchasing all its capital stock for \$400,000 (Myrick, 1981, p. 185). The railroad company issued \$85,000 worth of 6% mortgage bonds that were due in 1893. Construction of the line cost \$457,419, including \$132,199 spent for grading, \$116,232 for rail, and \$85,849 for crossties. The completed line was 36.2 miles in length, had no tunnels, but had 31 pile bridges. Newspapers commonly referred to the new railroad and to future extensions eastward into New Mexico and Texas as the "Bisbee Road."

Construction of the new railroad was not without problems. On December 20, 1888, there was a serious accident between Camp 19 and the end of the track (TE, 1888b). A locomotive was pushing ahead of it two flat cars loaded with iron and building material on

which approximately 30 workers were riding when the foremost car ran over a bull lying on the track. The collision threw both cars and the engine off the track. One of the cars crushed John McAatee to death against the bank. Two other men suffered serious injuries that were not fatal, and most or all the remaining workers suffered various injuries. In another accident, H. Scott Knight, a bookkeeper who had taken a job in railroad construction, was seriously injured on December 29, 1889 (AWE, 1889) when he touched a candle to the tip of a fuse, and the powder in a hole exploded prematurely. The blast hit him in the face and produced great damage including the probable loss of one eye.

Equipment expenditures were frugal, including only \$12,273 for two locomotives. The first was a secondhand engine that had been built in 1857 by Breese, Kneeland, and Company as a wood-burning locomotive (Guenzler, 2009; Wikipedia, 2016). It became locomotive 1 of the new railroad company and is on display at the Railroad and Transportation Museum of El Paso. During its ownership by the new railroad company it probably was converted to burn coal as indicated by its straight stack and extended smokebox. The locomotive was configured as a 4-4-0 (4 leading wheels on 2 axles, 4 coupled driving wheels on 2 different axles, and no trailing wheels), weighed 457,500 pounds, had a boiler pressure of 110 psi, and had 2 cylinders, 15 inches by 22 inches each. The second locomotive was a new 2-6-0 (2 leading wheels on 1 axle, 6 powered and coupled driving wheels on 3 axles, and without trailing wheels) from Baldwin. The company completed its initial purchase of rolling stock by obtaining two passenger cars from the Pullman Palace Car Company, one boxcar, and eight flat cars. The total cost of rolling stock was \$19,001.

On February 1, 1889, the citizens of Bisbee celebrated the arrival of the first official train from Fairbank (ASB, 1889; Myrick, 1981, p 181-187). People lining the tracks in Bisbee heard the whistle the first train around noon as it came up the canyon, pulled by locomotive 1, and began a celebration.

The new railroad established a schedule (TDP, 1889) whereby every day but Sunday a mixed train of passenger and freight cars left Bisbee at 7 AM and arrived at Fairbank two and a half hours later. The return trip left Fairbank at noon, and arrived at Bisbee at 2:30 PM. The railroad adjusted departure times as needed and on September 20, 1891 had a schedule of leaving Bisbee at 7 AM and arriving in Fairbank at 9 AM, leaving Fairbank at 10 AM and arriving at Bisbee at 12:30 PM on all days but Sunday (TP, 1891).

While the new railroad was considerably more expensive to build than anticipated, it successfully reduced freight costs from \$6 to approximately \$1 per ton (Douglas, 1906, p. 26) and was a financial success, paying off its entire mortgage debt within only 17 months (Myrick, 1981, p. 181-187). James Douglas then became president of the railroad for the life of the company well into the history of its successor. The Arizona and South Eastern Railroad also helped the economy of Bisbee and through interchange at Fairbank the New Mexico and Arizona Railway.

TOMBSTONE PROSPECTOR	
Arizona & Southeastern R. R.	
Time Card.	
LEAVE.	ARRIVE.
Bisbee 7.00 a.m.	Fairbank 9.00 a.m.
Fairbank 10.00 a.m.	Bisbee 12.30 n'n
<i>Daily, except Sunday.</i>	
(Pacific time.)	
BEN WILLIAMS, Supt.	

Timetable from TP, 1891.

Tonnage hauled by the railroad for the fiscal year ending June 30, 1891 was 31,399 and two years later was 32,470 tons despite a slight decline in copper bullion shipments. The Copper Queen required two tons of coke and one or two tons of bituminous coal for every ton of copper ore produced. Coal, coke, and copper were more than 80 percent of the annual tonnage until 1894 when M. M. Sherman of Tombstone imported a large shipment of cattle from Mexico that required a special 16-car train. That train left Bisbee on October 27, 1894 and was part of a shipment of 845 head of cattle that Sherman was sending to Kansas City. The next week he sent 12 cars of cattle to Los Angeles. Cattle transportation rose to 5340 tons in 1895, 6700 in 1896, and 10,286 in 1897, after which cattle traffic declined to about 3000 tons per year for the next few years.

Ben W. Williams, manager of the Copper Queen Company's business, was manager of the railroad and was assisted by W. A. Harvey, Superintendent, and V. R. Stiles, agent at Bisbee (Oasis, 18949). The railroad ran one train each way daily. Jerry Briggs was the conductor, and John McTear served as engineer, while Frank Armstrong fed the boiler with coal. The Copper Queen Mining Company was an extensive and profitable business with several mines in the Bisbee area and approximately 600 employees.

Miffed feelings by a Santa Fe official over a lost lumber contract resulted in the executives of the Copper Queen deciding to build a railroad from Fairbank to Benson (Douglas, 1906, p. 26-27; Myrick, 1981, p. 187-194). In 1893 the freight contract between the Copper Queen and the Santa Fe expired, and the latter company put off negotiations on a new contract while awaiting the results of a different set of negotiations with the Southern Pacific Railroad. The Santa Fe verbally agreed to keep the old rates in force until there was a new arrangement. (The Santa Fe transported materials for the Copper Queen between Fairbank and the Southern Pacific Railroad at Benson along its New Mexico and Arizona Railroad.) Meanwhile, the Copper Queen was dealing with the problem of obtaining large amounts of lumber at prices as low as possible. For approximately ten years it had purchased lumber from Mr. Ross whose sawmills were in Rock Canyon in the Chiricahua Mountains. The federal government decided that the land on which Ross was cutting was agricultural rather than mineral and instituted criminal action against Ross and a civil action against the Copper Queen. The mine owners decided that it would be better to obtain lumber from Oregon than face expensive legal fees.

The two competitors for transporting Oregon timber were the Southern Pacific, which imported it through San Pedro, California, and the Santa Fe, which brought it in through Guaymas. The Copper Queen awarded a contract for one million feet of lumber at a time to the lowest bidder which was the Southern Pacific, which gave a bid only \$0.25 lower than that from the Santa Fe. Mr. Hanly, the Santa Fe Traffic Manager, expressed his irritation at the results by raising the freight charges for the Copper Queen. Executives at the Copper Queen decided that it was time to extend the Arizona and South Eastern Railroad from Fairbank to Benson, thereby eliminating the need to pay fees to the Santa Fe.

Ranchers along the San Pedro river between Fairbank and Benson found in the week of March 18, 1894 that Ben Williams, Supervisor of the Arizona and South Eastern Railroad, Surveyor Beckwith and a contractor were in their area and estimating the probable costs of extending the railroad to Benson (TE, 1894a). The railroad people and the contractor made it clear that the railroad would be extended, and the contractor negotiated with the ranchers for hay and grain. The public also learned of a rumor that the Copper Queen was stockpiling bullion

at Bisbee with a possible intention of waiting until the new road was constructed or the New Mexico and Arizona Railroad provided lower freight rates. People learned on March 25, 1894 that the railroad had a powerful new engine under construction (TE, 1894b). By early June the new locomotive had showed that it could pull nearly double the number of cars into Bisbee that had been hauled by previous smaller engines (TE, 1894d). The more powerful engine enabled the Bisbee Road on November 30, 1894 to move across its tracks the heaviest train to then for the railroad, consisting of 17 freight and one passenger car (TP, 1894). The new more powerful locomotive however required that bridges be strengthened, and work on them began in June 1894 (TE, 1894e).

The Arizona Republican reported on March 29, 1894 that the New Mexico and Arizona Railroad faced losing freight from Bisbee that would include about 40,000 tons annually for the Copper Queen Mining Company (AR, 1894). The paper concluded that it was doubtful if the former railroad could operate profitably if the new line was built but concluded that such a new line would be "a blessing" to the traveling public because it would do away with the existing layover at Fairbank for connections.

People in the valley were surprised on May 12, 1894 when the Copper Queen Mining Company on May 12, 1894 began having eight 14-mule teams haul cargo between Fairbank and Benson (AWC, 1894a; CS, 1894; TE, 1894c). The teams carried copper bullion from Fairbank to Benson and returned the next day with mining timbers and lumber. Teamsters loaded the wagons at night, and the mule teams pulled them along the road during the day. It was a highly unusual sight to view mules pulling cargo along a roadway that paralleled a railroad. The intention was to temporarily transport 15,000 tons of freight each way between Benson and Fairbank by mule teams until the extension of the Arizona and South Eastern Railroad reached Benson. Later in May the Copper Queen greatly increased the number of mule teams to meet a goal of moving 1,250,000 feet of timbers from Benson to Bisbee before the rainy season began (Oasis, 1894a; TE, 1894d). The importance of meeting this goal was shown in the first quarter of June when workers began to unload a cargo of 1 million feet of lumber at the San Pedro wharf with the expectation that the Southern Pacific railroad would soon transport it to Benson (Oasis, 1894d). The work of loading and unloading wagons and caring for and feeding the mules produced a temporary increase in prosperity in Benson. The big teams hauling freight required large amounts of hay and grain that was purchased from ranchers between Benson and Fairbank, resulting in hay selling for \$12 a ton along the river (AWC, 1894a). On July 1, the contract for moving a million feet of lumber and a million pounds of copper between Benson and Fairbank was completed, and the teams involved in that work departed (TE, 1894g).

The movement of cargo by the mule teams resulted in many heavy loads passing over the wagon road (Oasis, 1894cc). For example, on June 2, 1894 Jack Scherer's two teams hauled to Benson, on four wagons, more than 32,000 pounds of copper bullion. Each team included 14 animals and hauled two wagons. The Oasis opined that the loads were "the heaviest in the annals of freighting." By early June, 1894 people began noticing that the heavy freight teams were severely cutting the road between Benson and Fairbank.

In late May, 1894 the Copper Queen began working to secure right of way for the extension to Benson, and Ben Williams stated that construction work would begin by the middle of June (Oasis, 1894b). By early June, 1894 all rights of way had been secured, the route survey completed, bids received for grading, and a contract awarded to Ward and Courtenay

for grading the route, laying track, and constructing culverts and bridges (Oasis, 1894cc; TE, 1894f). Most of the right of way was across public lands, and a plat of the survey had been filed with the US land office at Tucson. Rights-of-way across one or two private properties were secured by purchasing the ranches outright. At Fairbank, the railroad purchased the right of way from Leon Larrieu to cut its grade around a rock cliff along which he had established a ditch.

Ward had publicly estimated in early June that the extension would be completed and ready to run cars within 60 days (TE, 1894f). However, Ward & Courtney encountered an unexpected delay in beginning their work on the railroad extension to Benson (Oasis, 1894f; Oasis, 1894e). Their entire work outfit was at Eddy, New Mexico (Carlsbad). Ward sent for the outfit as soon as the contract was signed with the railroad, but before it could be loaded onto cars there was a series of washouts on the railroad between Eddy and Pecos, the junction with the Texas & Pacific. The contractor had the livestock and later equipment items taken overland to El Paso for railroad shipment from that place, but heavier items had to remain at Eddy until repair of the Pecos road. An advance contingent of graders and 100 teams arrived in Benson on June 20, 1894, but there still were not enough harnesses to use all the teams, and some animals had to be turned out to pasture on alfalfa at St. David.

By the end of June, the contractor had about 100 men and 40 teams at work and in expectation of the arrival of the missing equipment was advertising for 300 laborers who upon arrival of the equipment would begin working for a daily wage of \$1.25 (AWC, 1894b; AS, 1894; Myrick, 1981, p. 190; Oasis, 1894f). The missing equipment appeared on July 13, and the next day workers began laying rails in the Benson area at the switch connection with the Southern Pacific (Oasis, 1894g; TE, 1894h).

By July 21 the contractor had completed eight miles of grading, and by July 26 had moved its headquarters camp to the rock cut camp two miles north of Fairbank. But it was unable to lay much in the way of tracks because the national Pullman strike had blocked or delayed the receipt of necessary materials (Oasis, 1894ff). The contractor had received enough tracks and ties for approximately a mile of rails but could not lay tracks because of a lack of trap bolts, anglebars, and spikes. A large shipment of piling and bridge timbers arrived in Benson on August 4, and the company began building what was estimated to be a total of 62 bridges for the railroad extension (Oasis, 1894h; Oasis, 1894j). The missing trap bolts, spikes, and trimmings finally arrived on August 8, enabling the contractor to soon begin laying track. A construction engine came down from Benson on August 9 to help with the track laying (Myrick, 1981, p. 191). By August 23 the tracks were approximately seven or eight miles south from Benson, and by September 6 the tracks reached the northern edge of California wash, located just south of current day St. David (Oasis, 1894k; Oasis, 1894m). Workers suspended track laying until completion of a 150-foot bridge across the wash on September 10 (Oasis, 1894n). The Oasis noted on September 20 that for construction of the extension the railroad had received 55,000 ties and 7321 steel rails. The project by then was close to completion. At about noon on September 26, 1894 workers completed the bridge across the San Pedro river approximately two miles north of Fairbank (Oasis, 1894o). By that evening only a few hundred feet of track remained to be laid.

Work on the new railroad line was not without hazards. The teamster Gus Butler suffered a serious accident near one of the grading camps while moving a load of barley on

August 6, 1894 (Oasis, 1894h). While he was crossing a gulch, a rough place in the road resulted in him being shaken from his seat and falling under the wagon wheels which ran over him, breaking three ribs and his jaw in two places. Fellow workers brought him to Benson where Dr. Wright attended to him. A blast in the rock work on the railroad on August 11, 1894 wrecked three boxcars on a sidetrack of the New Mexico and Arizona Railroad at Contention, threw the track out of line, and broke three rails. On August 12 teamsters of Ward & Courtney who were loading barley from their warehouses onto their wagons accidentally dropped nearly two tons of barley onto James Willie (TE, 1894i). The accident created a three-inch gash on his head which Dr. Wright successfully stitched, and the teamster rapidly recuperated. In an accident on August 13, 1894 a falling rail cut off the toes of a track layer (Oasis, 1894i). In an accident whose nature was not recorded a man named Witherspoon broke several fingers of his left hand on August 29, 1894 while working on a pile driver (Oasis, 1894l). On the evening of September 25, 1894 John Evarts, a brakeman, got his left hand caught while making a coupling and lost his thumb at the first joint and his middle finger at the second joint (Oasis, 1894o). Dr. Wright amputated the injured members.

A fight on August 6, 1894 between Dick Grines and a Mexican laborer, whose name was not recorded, came close to starting a major fight between American and Mexican workers at a rock camp approximately two miles north of Fairbank (Oasis, 1894h). The Mexican reportedly attacked Grines with a knife, and the latter shot him dead and then delivered himself to authorities in Tombstone. The companions of the man who was shot were very angry, and for a time it was feared that there would be conflict between the two different ethnic groups which each had approximately equal numbers of men out of the 200 laborers at the place.

Workers made a connection on September 29, 1894 between the new extension of the Arizona and South Eastern Railroad at Fairbank, and cars ran over the tracks from Benson to Bisbee for the first time (TE, 1894j). As of October 11, 1894, the railroad was running occasional freight trains over the new extension but expected to wait a few more weeks before running passenger trains until final work was done on some of the bridges (Oasis, 1894p). The railroad began running regularly scheduled freight trains across the extension on October 15, 1894 and anticipated soon starting passenger service (Oasis, 1894q). The company also was looking forward to carrying its first shipment of Sonora cattle that would come in at Bisbee on September 28, consisting of 40 carloads of beef belonging to M. M. Sherman of Tombstone, and en route to Kansas City.

Passenger train service over the new extension began between October 25 and November 1, 1894 (Oasis, 1894r; Oasis, 1894s). The weekly advertisement for the Arizona and South Eastern Railroad on October 25 listed only trains between Bisbee and Fairbank while that published on November 1, 1894 included Benson. Train service between Bisbee, Fairbank, and Benson was daily except on Sunday. When freight traffic or other needs warranted, the railroad ran additional

Arizona & Southeastern R R

lv-6:20 a. m.	Bisbee	ar-2:30 p. m.
" 6:32 "	*Don Luis	" 2:15 "
" 6:57 "	*Packard	" 1:50 "
" 7:35 "	*Water Tank	" 1:10 "
" 7:50 "	*Charleston	" 12:50 "
ar-8:05 "	Fairbank	lv-12:30 "
lv-8:15 "	"	ar-11:45 a. m.
" 8:25 "	*Contention	" 11:35 "
" 8:45 "	*Land	" 11:15 "
ar-9:15 a. m.	Benson	lv-10:45 "

*Flag Stations. Stop on signal.

Daily, except Sunday.

BEN WILLIAMS, Supt.

Timetable from Oasis, 1894t.

trains (TE, 1895a). This policy of adding trains as needed remained in force as the Phelps Dodge controlled railroad expanded and eventually assumed different names.

Working on the new railroad could be hazardous. A carpenter on a railroad bridge had a severe fall on November 24, 1895 that the Tombstone Epitaph expected would kill him (TE, 1895b). He was working on a bridge and when a train approached stepped onto a plank on it to get out of its path. Unfortunately, the plank gave way, causing him to fall. On February 18, 1896 Jerry Briggs, a conductor of train No. 1, was killed at the Packard station while attempting to perform a "flying switch" (AR, 1896; GG, 1896). Such a switch was a potentially dangerous maneuver in which a person disconnected one or more railroad cars from a locomotive while the train was moving and as the locomotive pulled away switched the cars to another track so that they rolled to a desired position under their own momentum. His foot became caught in the switch and he felt lengthwise on the track in such a way that a wheel passed over him and cut his body almost longitudinally. People gathered his remains and sent them on the same train to Bisbee where he had lived.

A careless railroad engineer caused an accident at approximately 8:30 PM on January 29, 1896 on the tracks of the Arizona and South Eastern Railroad at Fairbank (Oasis, 1896). Train No. 3 of the New Mexico and Arizona Railroad had reached Fairbank that night and was unloading freight. Engine No. 16 under the charge of engineer Andy Linder and brakeman S. S. Johns were sent to put a freight car south of the train that was being unloaded. To reach the place where the car was to be left, engine 16 had to pass over a three-way switch that belonged to the Arizona and South Eastern Railroad and that could switch traffic to any one of three different directions. All engines were supposed to come to a full stop before reaching the switch so that the crew on board could check to be sure the switch was in the proper position. The engineer failed to stop and went into the switch at a rate of speed estimated at 6 to 8 miles per hour. The result was that both the engine and its tender ended up in a ditch, with the engine buried to the axles in sand. Railroad workers labored until 2 AM to get the engine and tender back on the track.

People not associated with the railroad could also suffer severe injuries if they did not exercise proper caution near the tracks. During the night of September 23-24, 1895, a man apparently laid down on the tracks near Bisbee, and a train ran over him, cutting off both his legs and killing him (TE, 1895b).

The Arizona and South Eastern Railroad after the extension between Fairbank and Benson was still a small enterprise (Poor and Poor, 1897, p. 259, 461 abs. & p. 1310, 1522 abs.). As of 1895 it had 57 miles of 40-pound steel track, three locomotives and only 11 cars, comprising 2 combination cars (apparently carrying passengers and light freight such as luggage), 1 box car, and eight flat cars. For the fiscal year ending in June 30, 1896, the railroad earned \$237,420, consisting of \$19,072 from passenger service, \$217,044 from freight service, and \$1304 from other services. The railroad had net earnings of \$142,210 and paid \$40,000 in dividends. Its officers were James Douglas of New York, President, Joseph Van Vleck of New York, Vice President & Treasurer, and Benjamin Williams of Bisbee, General Superintendent.

The railroad had been built for relatively light traffic, and its expansion and increased freight traffic resulted in the need for the installation of heavier rails and extensive realignments of the road (ADO, 1899a; ADO, 1899b; Douglas, 1899; Myrick, 1981, p. 266; WO, 1889). Executives had originally estimated that a 40-ton locomotive would haul the anticipated

amount of 30,000 tons of freight by a series of single daily trips between Benson and Bisbee. They believed that a 40-pound rail would be heavy enough for locomotive of that size when it was pulling cars loaded to even the maximum capacity of 60,000 pounds. The light rails were made at the Joliet works of the Illinois Steel Company and used both in the first section of the road from Fairbank to Bisbee and then in the extension to Benson.

The road between Benson and Bisbee ran over easy grades for 30 miles along the valley of the San Pedro River and then began to climb 2.5 percent grades. The 55.3 miles of road included 45.1 miles of straight track and 10.2 miles of curves, with a maximum curve of 12°. There were 38.1 miles of ascending grade, 10 miles of descending grade, and only 7.2 miles of level railroad.

The topography of the railroad placed strong stresses on both the track and locomotives. The railroad company had however laid the light tracks on a well-made gravel and clay road-bed and had given more than normal care to the maintenance of the bed. Three section-gangs worked on maintaining the 55-mile stretch. The rails had been laid on split redwood ties 6 by 6 by 8 feet, 2640 to the mile. While the ties showed no signs of decay, the rails had cut into them, but except for the ties on the heavy curves it was possible to simply turn over the ties and reuse them on various light-duty extensions. Only five of the 40-pound rails had broken during 10 years of use, and most of the other rails were in perfect condition except that the outside rails laid on heavy curves were somewhat worn. The railroad had however found that the heavy rolling-stock that it ended up using produced unduly rapid cutting of the tires of the driving-wheels because of the light-duty nature of the 40-pound rails.

With the 40-pound rails a locomotive of safe weight on a 2.5 percent grade could haul only five cars, pulling an average load and a passenger coach. By 1898 the railroad was moving not the originally estimated 30,000 tons of freight annually but rather more than 84,000 tons. The railroad had been forced to use three engines and three train-gangs over the 40-pound rails. By switching to 60-pound rails, the company could save money by using heavier locomotives and a train that would do all the hauling with a single crew. Additionally, by 1899 the cost difference between 40 and 60 pound rails had significantly decreased.

Part 3 of this series on San Pedro railroads will explore the continued growth of Phelps Dodge railroads and the development of Lewis Springs into a popular destination for special excursion trains.

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