

THE FIRST RAILWAY IN CHINA.

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In a recent consular report, Mr. Sheridan P. Read, U. S. Consul at Tien-Tsin, gives an interesting account of the construction of the first railway in China, the engineer of which is a member of the American Society of Civil Engineers. We abstract the report as follows:

Seventeen years ago the only semblance of a railway in the whole Chinese Empire was an iron tramway, about 10 miles long, at the Kaiping coal mines, 50 miles from Tien-Tsin. Small cars loaded with coal were pushed over this tramway by coolies, who received 10 cents in Mexican silver for 12 to 14 hours' work per day. About this time the works were placed under the charge of Mr. Claude W. Kinder, M. Inst. C. E. and M. Am. Soc. C. E., an energetic young English engineer, who at once ventured to propose many changes tending to increase the efficiency of the plant and to decrease expenses. The Chinese directors of the mines did not regard his efforts with favor and the Peking Government promptly vetoed his attempts at progressive measures. But despite the Peking authorities, and native superstitions, Mr. Kinder determined to have a locomotive, if he had to build it himself, and he did build it. Four small driving wheels were ordered from the United States; a disabled stationary engine furnished the boiler, and a broken down winding engine the cylinders. With few tools and little outside help these parts were fitted together, and the "Rocket" was at last put upon the track with great yellow dragons emblazoned upon its sides. It was the first locomotive in China, and was a startling object to the Chinese, who expected all manner of dire consequences as the result of the innovation. The Peking authorities were horrified and at once ordered the Rocket dragon to be summarily suppressed. But the Chinese mine directors permitted it to be used in short trips inside the yard, at first, and its travels were gradually extended without producing the war, pestilence and famine expected. At last imperial permission was granted for its free use.

This was the beginning of railways in China, and the builder of the first locomotive is now Chief Engineer and Superintendent of the Imperial Railways of China. The line as at present finished begins at Tien-Tsin, it then passes 27 miles to Tongku, six miles from the mouth of the Pei-ho, at the Gulf of Pechihli. From Tongku the line swings northeast to Shang-Hai-Kuan, the terminus of the present operated road, and 177 miles from Tien-Tsin. Surveys have been made for an extension of 200 miles beyond Shang-Hai-Kuan and about 10 miles have been built. When finished the railway is to reach Kirin, the centre of Manchuria, and a branch is to be built to the head of the Gulf of Liaotung, where there is a good harbor. Active work on this line was interrupted by the late Chinese-Japanese war.

The greater part of this railway runs through a flat, alluvial country, subjected to heavy floods during the rainy season. The sharpest curve has a radius of 1,000 ft, and there is only one of these, made necessary to avoid two cemeteries. The most of the curves have not less than 3,000 ft. radius, and the maximum gradient is 0.75%. The country traversed is strictly agricultural, with no large towns, and the people are very poor. The Kaiping coal mines are the only mining industry in operation; though deposits of coal; iron, gold and silver only await intelligent development. All trains are "mixed" freight and passenger, with four trains each way daily from Tien-Tsin to Tongku, and one train daily from the latter point to the terminus. The

average speed is 15 miles per hour, and while the road has paid its running expenses, it yields no interest on its first cost of construction and equipment.

The building was done after English methods and ideas of permanency, without regard to first cost or work required of it. No wooden structures find place upon it; stone, brick, concrete and steel being the materials used. The road is standard gage, with from 12 to 15 ins. of stone ballast, and is laid with steel 60-lb. Sandberg rails. These rails were rolled at Barrow, England, and were delivered at Takee for less than \$21 per ton. The wooden ties are 8 ft. long by 6 ins. wide by 9 ins. thick, and are spaced 28 ins. between centers. These ties came from Japan, Oregon and Vladivostock, and cost about 72 cts. each in Mexican silver. Owing to the enormous rainfall of 140 ins. in a rainy season of four months only, the culverts on the line have unusually large openings. The soil is an alluvial deposit from 20 to 60 ft. deep. The masonry on the line is first-class cutstone laid in English Portland cement, which latter costs about 75 cts. less per barrel than it does in the United States. All foundations are carried to the solid rock, caissons, sunk by the pneumatic process, being used for the deeper ones. The length of bridge spans varies from 20 to 200 ft., though the majority of the bridges are short and made up of plate girders.

The Lau-ho bridge is the most important engineering work. This bridge has two roadway spans of 30 ft. each, ten spans of 100 ft. each, and five spans of 200 ft. each; the total length between the faces of abutments being 2,170 ft. The 200 ft. spans are pin-connected and were designed by Sir Benjamin Baker on American types—with English details. Mr. Read criticizes the result as curious and incongruous, especially in its peculiar lateral system.

The company builds all its own girder work up to 100 ft. spans. The main shops are at Tang-Shau, where cars and locomotives are repaired and all passenger and freight cars are built. All cars have four-wheel trucks, with iron truck frames, made by the company; the framing of the cars is teak wood, and the sides and tops are made of Oregon pine. With the exception of one American engine, built by the Grant Locomotive Works, the locomotives are all English or Scotch, of the mogul type. American cast-iron car-wheels have been tried, but the steel-tired European wheels are preferred. All cars are equipped With Janney couplers, the one American detail in the rolling stock.

The wages paid are as follows, all payments being at the rate of Mexican silver: Common laborers, \$4 per month; firemen, \$5 to \$6; enginemen, \$14 to \$45. The two highest paid native enginemen now on the road receive \$41 and \$46 per month, while an English engineman receives \$200 per month, as a maximum. The section-hand receives \$4 per month; foreman, \$6; a native clerk, \$80, if he can speak and write both Chinese and English. The cost of timber is very great, and wooden trestles are out of the question. All station houses are built of brick, plastered inside, for the same reason, and station platforms are made of stone or concrete filled in with earth and cinders.

*Note: Many of the Chinese workers who built this first railroad in China had worked on building the Central Pacific Railroad across California, Nevada and Utah between 1863 and 1869 and later built other CPRR routes north to Oregon and south to Los Angeles.
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