

into prosperity and wealth will, instead of being rivals, become stalwart supports of the central dome. The noble harbor, the navigable rivers radiating from it, the vast extent of productive country easily accessible, and the winds and currents of the ocean, all combine to fix the site of the metropolis, and man has but to follow the dictates of nature and to improve.

**THE NARROW GAUGE SYSTEM.**—A new style of railroad has within a few years past been favorably considered by the public, and promises on minor routes to become of general adoption. This is denominated the narrow-gauge system, and tracks of various widths are used. Recent experiments in England have shown that a track of but ten inches in width would be operated with good effect; and one very important road in Wales, having a gauge of but twenty-three inches, has been used with very good success for several years. At the military camp at Aldershot, England, the British Government has had constructed a road of eighteen inches gauge, with a double track, occupying a roadway of ten feet in width. Upon this a speed of twenty to thirty miles an hour is made with long trains and heavy freight. These successes demonstrate the feasibility and great economy of the system. Several narrow-gauge tracks have been laid in our Pacific-coast railroad system, and many more are in contemplation. The common gauge is thirty-six inches, or three feet, with corresponding weight of locomotive and cars and strength of rail. Of course, not so heavy trains can be taken, nor can equal grades be overcome as with the much heavier engines of the broad gauge, but, ordinarily, the system is effective and economical. Roads of three feet gauge are built and equipped at a cost, varying with the cost of grading, of from \$3,000 to \$20,000 per mile, while the cost of the ordinary broad gauge is from \$30,000 to \$50,000 per mile. The engines of the former may be made weighing from eight to fifteen tons, while those of the latter are from thirty to sixty tons.

Already a number of narrow-gauge roads are in operation, and more are in contemplation. The first on this coast over which ran a locomotive was that of the Newport Coal Mining Company, of Coos Bay, Oregon. This is of but three miles in length, and its chief use is the transportation of coal from the mine of the company to the ship-landing at the bay. It was constructed several years since, but was adapted to steam power in 1871, whence it is classed as a narrow-gauge of the modern pattern.

The other roads of this class now in operation are the Monterey and Salinas Valley Railroad, nineteen miles in length, the North Pacific Coast Railroad, from Saucelito to Tomales, fifty-two miles in length, the Nevada Central Railroad, from Pioche to Bullionville, twenty-two miles in length, the Utah Northern, from Ogden, via Logan, to Franklin, seventy-six miles, and the American Fork Railroad, from Lehi, on the Utah Southern Railroad, to the mining region of the American Fork, thirty-six miles in length. Of those proposed or in course of construction are the Stockton and Lone Railroad, thirty-five miles; the Santa Cruz and Watsonville Railroad, thirty-five; the San Juan and Salinas, twenty miles; the Los Angeles and Independence, via Spadra and the Cajon Pass, two hundred and twenty miles, or by San Fernando two hundred and nine miles, now completed from Los Angeles westward to Santa Monica, fifteen miles; the Colfax and Nevada, via Grass Valley, thirty-six miles; and in Nevada the Palisade and Eureka, which, when completed, will have a length of eighty miles. Several other projects are discussed, with a promise of work, the most extensive being the Humboldt Pacific Narrow Gauge Railroad, from the Big Bend of the Humboldt River, in Nevada, through the Klamath Lake and Rogue River Valleys, in Oregon to the Pacific Ocean, a distance of five hundred miles.

**THE PRISMOIDAL SYSTEM.**—From the broad six feet gauge to the gauge of ten inches, seems the extreme of reduction, but inventive genius will not rest at that. A single rail is now proposed, which, at first glance, seems impossible to be operated with safety. The rail is in the form of a prism, hence the name, upon the top of which the driving and supporting wheels run, the cars being supported in an upright position by wheels bearing on the sides of the prism. This form of railroad, it is maintained, can be constructed at about \$4,000 per mile, and operated with greater economy and safety than any other. A road on the prismoidal system is proposed from Santa Barbara to Bakersfield, a distance of one hundred miles, also as a street railroad in San Francisco. The elevated track would constitute a rigid obstacle at street or road crossings, which seems an insurmountable objection to its adoption, particularly in cities, unless greatly elevated.

**THE NORTHERN SYSTEM.**—The railroad systems of the Pacific Coast in the future may be classified as the Northern, Central and Southern. The first will have its western terminus on Puget Sound, with the Northern Pacific Railroad as its main trunk; the second will make San Francisco its center, with the Central Pacific, and perhaps the Thirty-fifth Parallel roads for main interior lines, and the third with San Diego as the western objective point, and the Texas and Pacific Railway for its grand interior and trans-continental route.

The Northern system comprises a line from Puget Sound, first to Kalama on the Columbia River, thence easterly to Duluth, the extreme western point of Lake Superior. This road has been endowed very liberally by Congress, its land grant being thirty-eight million four hundred thousand acres bordering the road, twenty miles on each side, in alternate sections in States and forty miles in the Territories. The eastern portion is completed from Duluth westward to the Missouri River, a distance of four hundred and sixty miles. This division crosses the northern portion of the State of Minnesota and the Territory of Dakota, commanding the fertile region through which it runs as well as the great valley of the Saskatchewan and the Red River of the North, of our British neighbor. It will have a length of about fifteen hundred miles, crossing the Mississippi and Missouri Rivers and ascending the valley of the Yellowstone to near the "Mauvais Terres," that wonderful land recently dedicated by Congress as a grand National Park. The Rocky Mountains are crossed in Montana and the Columbia River in the Territory of Washington. The route then descends that river, on its northern bank, to Kalama, and sixty-five miles from the sea, whence it runs to Puget Sound. This division has been completed, running through Cowlitz, Lewis, Thurston, and Pierce counties, threading the fertile valleys of the Cowlitz, the upper Chehalis, the Claquato, and by the shores of Puget Sound to the newly built city of Tacoma, a distance of one hundred and five miles from the Columbia at Kalama. With the exception of this division but little progress has been made on the Northern Pacific since the completion of the Eastern division from Duluth to Bismarck, on the Missouri River. The completion of the Puget Sound division accommodates the business of a section of great resources, possessing a mild and healthy climate, though of sparse population, and also forms the northern link in the great chain of railways running parallel with the Pacific Coast, connecting the waters of Puget Sound with the Bay of San Diego, with San Francisco as the central point.

**OREGON AND CALIFORNIA RAILROAD.**—The City of Portland, although untouched by the Northern Pacific trans-continental line, may still be regarded as the central point, on the Pacific Coast, of the northern system. That city, from its fine harbor, rich surroundings, and lines of river navigation, is fixed as the commercial entrepot of the north, and ultimately will have rail connection with all existing roads. The Oregon and California, together with the California and Oregon Division of the Central Pacific, connects the northern with the central system. This has its initial point on the east bank of the Willamette, opposite the city of Portland, the place bearing the name of East Portland, and is now completed to the town of Oakland, in Douglas County, a distance of one hundred and eighty-two miles. The principal towns on the route are Oregon City, Salem, Albany, and Eugene, with numerous other villages and stations. For upward of one hundred and forty miles the road traverses the fertile valley of the Willamette, thence over gently-rolling hills it enters the valley of the upper Umpqua, the entire section being well occupied and

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