# NARROW NUGGETS

conducted by
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photos by the author

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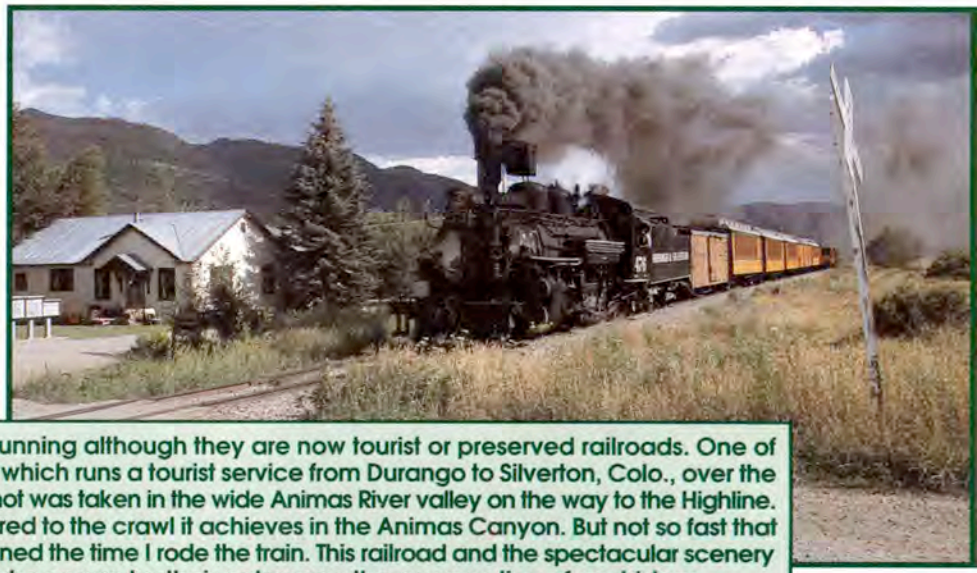
## Ideas for narrow gauge modeling



**There are many 3' gauge railroads still running although they are now tourist or preserved railroads. One of them is the Durango & Silverton Railroad which runs a tourist service from Durango to Silverton, Colo., over the spectacular Highline of the D&RGW. This shot was taken in the wide Animas River valley on the way to the Highline. Here the train runs at high speed compared to the crawl it achieves in the Animas Canyon. But not so fast that it cannot be buzzed by a glider as happened the time I rode the train. This railroad and the spectacular scenery attract many tourists and railfans alike who ensure by their patronage the preservation of our history.**

Our association grew out of a need to standardize the building of model railroad equipment by different manufacturers. In the early days, models from one manufacturer would not run on the track of another and cars from one company would not couple with cars from another. There is a very interesting parallel in the prototype railways in Britain in the late 19th century. The origins of the 3' gauge railroads is found in the great gauge wars of the emerging railway technology in Britain and a short look at that battle is illuminating.

When railway (in Britain they are referred to as "railways") building started in Britain there were as many different gauges as there were railways, and these gauges varied from 3'-10" to 5'-0". George Stephenson was one of the greatest builders of railways in Britain and chose a gauge of 4'-8½" for his railways. Thereafter, as new railways were built, they adopted this gauge and as more and more railways were built, this "standard" gauge became the de facto standard.

Another great railway pioneer in Britain was Isambard Kingdom Brunel and he chose a very wide gauge of 7'-¼". He felt that the wide gauge would offer more stability to trains which he predicted would one day reach speeds of 50 or 60 mph for passenger trains and 30 mph for freight. Brunel was very influential in the railway business and built many miles of broad gauge railways. As more miles of track were built to these two emerging gauges, the problems of interchange became obvious. The government in England decreed in 1846 that 4'-8 ½" be the minimum gauge to which future railways would be built. The rest, as they say, is history and the standard gauge of 56½" was adopted as the gauge to which railroads were built. How then did 3' railroads come to be?

One of the truths that emerged out of the broad gauge era was that these railroads were expensive to build because of the large rights-of-way required. The equipment was expensive to purchase because of its sheer size.

Industrial railways in the 19th century in Britain and Europe had for many years been using narrow gauge tracks. Mines, for example, often used 2' gauge railways for extracting ore. Mine cars were hauled by human or animal power on wooden or metal tracks. Many industrial railways like the slate quarries of Wales also used 2' gauge track. Most industrial railways built small gauge railways because of economic reasons. Narrow gauge tracks were cheaper to build than standard gauge ones because the ties were shorter. Because the equipment was smaller, the load on the track was less and the rail could be lighter, thus cheaper. The light track and equipment meant that the right-of-way could be built without the extensive foundation required for standard gauge. The less expensive right-of-way and equipment was the main advantage seen for narrow gauge and as a result was a natural for industrialists worried about costs.

As steam power came to the standard gauge railways, it also came to the narrow gauge industrial railways. This meant that locomotives were available for those engineers who wanted to try to adapt industrial equipment to common carrier railroads. As mentioned in the history of 42" gauge railroads, Carl Pihl, chief engineer of the Norwegian State Railways built the first common carrier narrow gauge railroad to a gauge of 3'-6". Charles Fox introduced 3'-6" to the British Empire by building lines in India and Australia in the 1860s. He also persuaded the government and promoters in Ontario to build the Toronto, Grey & Bruce and Toronto & Nipissing to 3'-6" gauge.

In the United States an engineer by the name of Horatio Allen built, in 1830, a 3' gauge railroad which had no grading but was instead built entirely on trestles. The South Carolina Railroad was 136 miles long, but was a failure. The trestlework deteriorated quickly and if there was a derailment, as you can imagine, the result was a catastrophe that the press quickly exploited. The railroad was quickly converted to more conventional grading by burying the trestles with fill.

While Fox was spreading the word about the advantages of 3'-6" gauge railroads, Englishman Robert Fairlie was doing the same for 3' gauge. Fairlie had invented a series of narrow gauge locomotives and to promote them he traveled around the world to where rail-

**Another tourist line is the Cumbres & Toltec Scenic Railroad which runs on the old D&RGW from Chama, N.M., to Antonito, Colo., through the Toltec Gorge. This also is a chance to see history up close and personal. This particular scene was taken in the late afternoon in the engine service area of the Chama yard. The engine is about to drop the ashes after a hard day of work. The enginehouse can be seen in the background. Another engine sits beside the enginehouse. Equipment has been lovingly preserved and is accessible for research or for enjoying the charm of narrow gauge railroading.**

road building was being considered and tried to convince the promoters that his "Fairlie gauge" was the best. His recommendations were made to the directors of the Pennsylvania & Sodus Bay Railroad in a pamphlet titled "On Small Gauge Railroads" by Major Alfred F. Sears.

In 1871, James P. Low made a similar recommendation to the uncompleted Blue Ridge Railroad. In the same year, Colonel Edward Hulbert published *The Narrow Gauge Railway* which promoted 3' gauge railroads as the best for future development. The 3' narrow gauge railroad movement had started in the U.S. By the end of 1871 railroads built to the 3' gauge had begun in the South, there was one in Pittsburgh and one had started in Denver which was slated to expand far and wide across the West.

The 3' gauge gained in popularity and comprised 95 percent of all narrow gauge lines in the U.S. The development of the 3' gauge was not without controversy however, and this controversy raged throughout the development of the 3' gauge railroads. Before the development of the 3' narrow gauge railroads there was a variety of different railroad gauges.

The development of the railroads in the United States was similar to the development in Britain in that there was a continuing argument amongst railroad builders and promoters as to the best gauge for a railroad. As a result, there was no clear standard gauge during early development. For example, in the northeast, 6' gauge was adopted by the New York & Erie, Delaware, Lackawanna & Western, Ohio & Mississippi; and the Atlantic & Great Western, a subsidiary of the Erie. Canadian railroads were using 5'-6" gauge so the Atlantic & St. Lawrence Railroad adopted this gauge because it connected with the Canadian railroads. Another broad gauge of 4'-10" was used by the Camden & Amboy. This gauge was also used on a stretch of the New York Central between Buffalo and Cleveland. In the Northeast railroads were also built to 4'-3" (Delaware & Hudson) and 3'-6" (Mauch Chunk, Summit Hill & Switch Back Railroad).

In the South the predominant gauge was 5'-0" and was used by the Louisville & Nashville, Mobile & Ohio and predecessors of the Southern, N&W and Illinois Central. West of the Mississippi the favorite gauge was 5'-6", while in California the gauge was 5'-0".

So obviously there was a continuous debate over the best gauge for building a railroad and this debate continued as long as railroads were being built. The 3' gauge railroads were no exception and debate over the economics of this particular gauge had its opponents as well as its proponents. Debates raged back and forth for years after the railroads were established.

As the economy of the late 1800s boomed, the problem of compatibility between railroads of different gauges became apparent. It was not possible to exchange cars between railroads of different gauges and so goods had to be transferred between cars. This took time and thus money. The increased cost of transportation of goods by rail resulted in a growing movement to standardize the gauge. This was done by Congress in 1863. The Pacific Railroad Act mandated that railroads build to 4'-8½" from the Missouri west so that they would be compatible with the railroads in the Northeast. Railroads in the South were still 5'-0", but because most of the railroads in the South were the same gauge, they had compatibility in the region. As a result, there was not as much pressure to standardize as in other areas.

The Janney coupler and Westinghouse brake system were coming into wide acceptance amongst railroads in the late 1800s, and by the turn of the century were chosen as the industry standard.

The momentum of conversion continued until, by the turn of the century, most railroads had converted to the 4-8½" standard. Large railroad companies emerged as did large economic cartels. These cartels attempted to determine the prices paid for moving commodities. The attraction of narrow gauge, as promoted by Fairlie, was the relative low cost of building a railroad. Many railroad promoters and backers found the narrow gauge an inexpensive way to get into the railroad business. This is what started the narrow gauge boom.

We'll take a look at this next time.