

The  
**PALIMPSEST**  
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THE EDITOR

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### THE PURPOSE OF THIS MAGAZINE

THE PALIMPSEST, issued monthly by the State Historical Society of Iowa, is devoted to the dissemination of Iowa History. Supplementing the other publications of this Society, it aims to present the materials of Iowa History in a form that is attractive and a style that is popular in the best sense—to the end that the story of our Commonwealth may be more widely read and cherished.

BENJ. F. SHAMBAUGH

*Superintendent*

### THE MEANING OF PALIMPSESTS

In early times palimpsests were parchments or other materials from which one or more writings had been erased to give room for later records. But the erasures were not always complete; and so it became the fascinating task of scholars not only to translate the later records but also to reconstruct the original writings by deciphering the dim fragments of letters partly erased and partly covered by subsequent texts.

The history of Iowa may be likened to a palimpsest which holds the records of successive generations. To decipher these records of the past, reconstruct them, and tell the stories which they contain is the task of those who write history.

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# THE PALIMPSEST

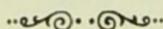
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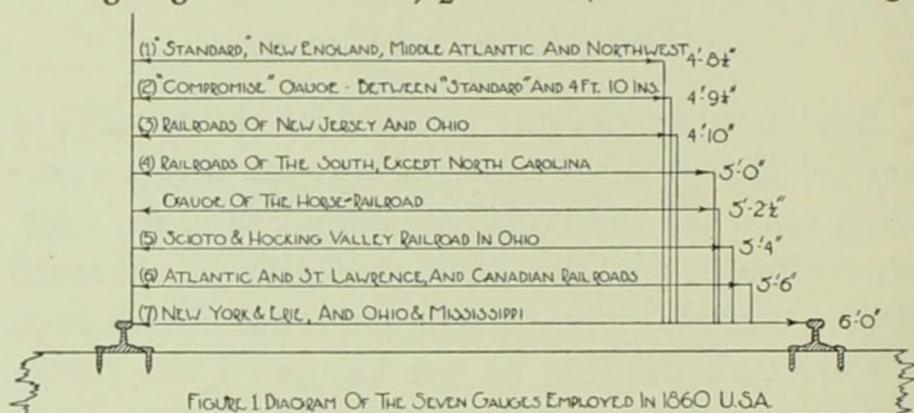
## The Matter of Gauge

Speeding across the prairies of Iowa aboard any of the palatial transcontinental trains operating upon the railroads that converge at the eastern terminus of the Union Pacific in Council Bluffs, probably not a single passenger gives even a transitory thought to the gauge of the tracks over which he is riding. Yet it was in connection with this junction that one of the most basic problems confronting railroad builders was definitely settled — the width of the track which was eventually to become “standard”.

While essentially a construction problem, the origin of the present “standard gauge” of four feet eight and one-half inches is not without historical significance. Introduced from England, through the early importation of British locomotives, this “standard” wheel span corresponded to the width of the early English road cart, meas-

ured from inside rim to inside rim. More than forty years elapsed, however, from the date of the earliest railroad construction in America, until the time when this gauge came into almost universal use in the United States.

In 1860 there were "seven widths of gauge in the United States, (in addition to the horse railroad gauge of 5 feet 2½ inches)". In New Eng-



land and the Middle States (with the exception of New Jersey) and in North Carolina and the Northwest, the 4 foot 8½ inch gauge was prevalent. The 4 foot 10 inch gauge was most common in New Jersey, Ohio, and on the extension of the Pittsburgh, Fort Wayne and Chicago line to Chicago. The 5 foot gauge was usual in the South, although several of the older lines were of the 4 foot 8½ inch gauge. The Scioto and Hocking Valley Railroad in Ohio used the unmatched gauge of 5 feet 4 inches. Corresponding to

the Canadian gauge of 5 feet 6 inches were the Atlantic and St. Lawrence road and lines in Louisiana and Missouri. Next in width came the New York and Erie, with its tributaries, and the Ohio and Mississippi gauge of 6 feet. The Chicago and North Western was also begun on the 6 foot gauge but afterward changed to 4 feet 8½ inches. The seventh gauge was the "compromise" of 4 feet 9¼ inches on the Cleveland and Toledo Railroad, laid between Toledo and the junction of the northern and southern division which were respectively of the 4 foot 8½ inch and the 4 foot 10 inch gauge.

Thus, by the time railroad construction was getting under way in Iowa, there was throughout the country wide divergence of opinion and practice in respect to this all-important matter. Perhaps this may be accounted for by the fact that there existed, at that time, no transcontinental east and west lines. Inasmuch as most freight business was purely "local" in character, rather than "through", it was cheaper and easier to suffer the inconvenience of transfer of such long-haul traffic as developed on a line than to rebuild the roads and consequently the rolling stock of the entire system.

The problem provoked heated controversy, and the adoption of a uniform gauge was stubbornly

resisted as long as possible by the adherents of the various gauges in the futile hope that their own gauge might ultimately be adopted by the other roads and they would be spared the enormous expense of making the change. Furthermore, engineers were not agreed as to the proper width of the most economical and practicable gauge, and there was then no national authority, such as the Interstate Commerce Commission, to force the issue. While the disadvantages of these frequent changes in gauge at junctions were apparent to all, the public was utterly powerless to remedy the situation.

At such points, on interline shipments, all freight had to be transferred to cars of the other gauge. Passengers were likewise discommoded. Various devices were employed to obviate these difficulties, though none with very marked success. Where the difference in the gauge was not too great, narrower wheel trucks were fitted with wide-flange wheels and run over slightly wider tracks. Thus, cars made for the 4 foot 8½ inch gauge were used from St. Louis to Philadelphia, although for a "considerable part of the distance" they traveled over tracks of 4 foot 10 inch gauge. On the latter gauge there was a play of 1½ inches between the flanges and rail, which was certainly not desirable.

The Delaware, Lackawanna and Western Railroad was extended by means of a third rail over the New Jersey Central to tide-water, an arrangement which was also commonly practiced elsewhere throughout the country, especially in city terminals. Later, cars were built with exchangeable wheel trucks in order that they might be adapted to different gauges without transfer of freight. A German device enabled temporary trucks to be installed on freight cars by allowing the axle of the permanent truck to rest upon a saddle above the temporary truck. Thereby cars of different gauges could be transferred short distances at city terminals for the purpose of loading and unloading.

This annoying and perplexing matter of the diversity of gauge of American railroads was finally settled by President Lincoln. When the Union Pacific was built, he was called upon to locate the eastern terminus and to establish the official gauge of this road. Inasmuch as the railroads already building westward from Chicago, which were to form immediate connections with the new trans-continental line, were all of the standard 4 foot  $8\frac{1}{2}$  inch gauge, he very wisely designated this as the width of the Union Pacific. Roads of any other gauge, expecting eventually to share in the great east and west flow of commerce, were, there-

by, compelled to adopt this gauge as their own and remodel their lines accordingly.

During the halcyon days of railroad supremacy in transportation, there were occasional rumors concerning the construction of a super-railroad from the Atlantic to the Pacific, employing a gauge of six or seven feet. These projects were sometimes "promoted" as investment schemes to swindle gullible stockholders. One such road was to have crossed Iowa from east to west on a "bee line" regardless of cities, entering the State at the mythical town of Burriss City on the Mississippi in Louisa County and emerging at Council Bluffs on the western border. Considerable grading and other work was actually done on this line, but no wide gauge track was laid.

After the main railroad systems had been built, a demand developed, on the part of isolated communities which had previously been left without adequate transportation facilities, for a cheaper form of railroad construction, whereby their needs might be satisfied without the almost prohibitory cost of building standard gauge track. A narrower gauge promised most of the advantages of the wider track without excessive financial burden, for narrower gauge meant less grading, smaller bridges, less expensive equipment, and many other savings. The cost of such a line, in

some instances, was less than forty per cent of the cost of a standard railroad. This seems to have been the prototype of the industrial railroads used in mines and large construction projects, where the gauge is as narrow as sixteen inches.

In general throughout the United States, only two gauges are now employed by railroads, for experience has proven that the "standard" 4 foot 8½ inch and the "narrow" gauge of three feet

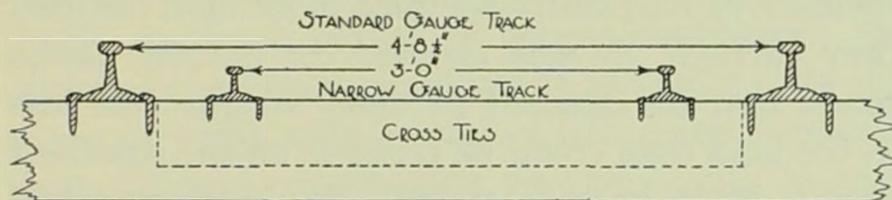


FIGURE 2. COMPARATIVE WIDTH OF THE STANDARD AND NARROW GAUGE TRACK

exemplify the maximum and the minimum width of track which may be efficiently operated as common carriers. Although there are a few short lines, mostly in Maine, employing a gauge of two feet, it is too narrow to be used extensively. A track less than three feet wide is impracticable, due to instability and lack of carrying capacity; while on tracks above standard the ratio between the weight of the car and the weight of the freight increases adversely to the gauge. This relation of the "dead load" to the "pay load" spells profit or loss in railroading.

The narrow gauge railroads, besides providing

transportation service which otherwise might never have been obtained, performed the no less important function of stimulating the management of standard gauge roads toward increased efficiency. At the time of the introduction of the narrow gauge, standard roads were not permitted to carry more than ten tons of freight per car, and any excess of this amount was charged double rates as a penalty for overloading. The cars themselves frequently weighed more than the load they carried. It was claimed for narrow gauge roads that the amount of dead weight was less to the load than could be possible on the standard gauge, since narrow gauge cars which weighed only about five tons were rated for loads of seven and one-half tons.

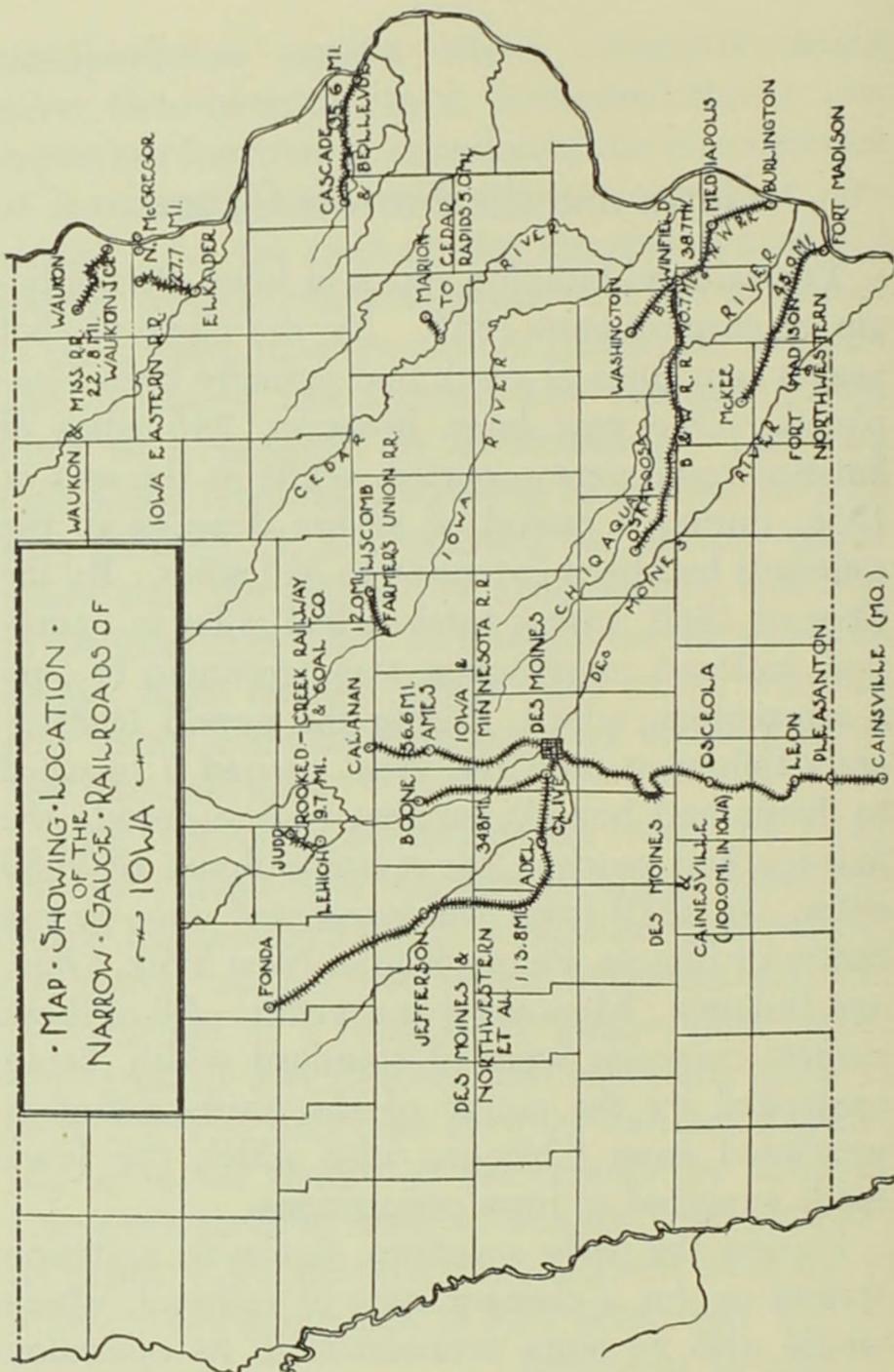
This officially advantageous ratio of "pay load" to "dead load" on narrow gauge lines compelled the standard roads to increase their freight-car loads. As a result, within ten years after the introduction of a competitive gauge, their carrying capacity was doubled and maximum loads of from thirty to fifty tons are now carried, depending upon the nature of the commodity handled. Locomotives have likewise become comparatively so much more efficient that modern railroading scarcely resembles that of fifty years ago.

BEN HUR WILSON

## Iowa and the Narrow Gauge

The railroad building epoch in Iowa did not begin in earnest until 1855. By the close of that year a few miles of track had actually been completed. One year later, however, 246 miles of finished road were reported, while at the end of 1858, during a period of severe depression, the railroads had been extended to 343 miles. By the close of 1860, with a total of 655 miles in operation, railroad construction was beginning to gain a momentum, which, during the period immediately following the Civil War, carried it forward by leaps and bounds, so that in one decade the mileage had reached the sizeable figure of 2683 miles. In 1870 Iowa was surpassed only by the States of Illinois, Pennsylvania, New York, Ohio, and Indiana. Missouri was seventh. All of these earliest railroads were of standard width, being controlled by the gauge of the roads radiating westward from Chicago, with which the Iowa roads expected to form connections.

During the early seventies, however, agitation sprang up for a cheaper type of railroad, which would also be more economical in its operation



MAP SHOWING LOCATION OF THE NARROW-GAUGE RAILROADS OF IOWA

WAUKON & MISS R.R. 22.8 MI. WAUKON TO JONES

IOWA EASTERN R.R. 27.7 MI. ELKADER TO N. McCREGOR

CASCADES 6 MI. BELLEVUE

MARION TO CEDAR RAPIDS 5.0 MI.

WASHINGTON

WALWORTHFIELD 3.8 MI. W. R. R. WORTH 3.8 MI.

McKEEL RIVER

FORT MADISON 3.5 MI. NORTHWESTERN

FORT MADISON

JUDG. BROOKED - CREEK RAILWAY & GOAL CO. LEHIGH 9.7 MI.

CALANAN 12.0 MI. WISCONSIN FARMERS UNION R.R.

IOWA RIVER

CH. 10 AQUA OSKA TO OSKA

MOINE RIVER

WASHINGTON

WALWORTHFIELD 3.8 MI. W. R. R. WORTH 3.8 MI.

McKEEL RIVER

FORT MADISON 3.5 MI. NORTHWESTERN

FORT MADISON

FONDA

JEFFERSON

DES MOINES & NORTHWESTERN ET AL 113.8 MI. LADEL

BOONE 56.6 MI. AMES

MINNESOTA R.R.

DES MOINES

DES MOINES

CAINSVILLE (100.0 MI. IN IOWA)

OSCEOLA

PLEASANTON

CAINSVILLE (MO.)

DES MOINES

CAINSVILLE (100.0 MI. IN IOWA)

OSCEOLA

PLEASANTON

CAINSVILLE (MO.)

DES MOINES

CAINSVILLE (100.0 MI. IN IOWA)

OSCEOLA

PLEASANTON

CAINSVILLE (MO.)

DES MOINES

CAINSVILLE (100.0 MI. IN IOWA)

OSCEOLA

PLEASANTON

CAINSVILLE (MO.)

and up-keep. This discussion centered attention upon narrow gauge construction, which grew rapidly in popularity until nearly a score of such lines were promoted within the State and fourteen were actually built, comprising approximately five per cent of the total construction or about 575 miles of track. Aside from a few scattered ventures of small importance, these narrow gauge roads of Iowa may be divided into two distinct geographic groups; those building westward from the region of the Mississippi, serving the immediate hinterland, and those radiating outward from Des Moines.

A number of short independent narrow gauge lines were constructed about the same time. One of the earliest of these was the Farmers Union Railroad which was incorporated in 1875 and began operating that year a wooden-rail track from a sawmill near the Iowa River west of Liscomb in Marshall County, eastward through Conrad Grove (now Conrad), to the town site of Beaman, a distance of about twelve miles. The equipment of this road consisted of a single engine, a caboose, and some freight cars. After being operated for a few months, it fell into disuse, owing to flimsy construction and lack of adequate financial support. While the road was of little economic value, it is historically significant as be-

ing the first railroad line in Iowa to be abandoned.

During the following year, in 1876, the Crooked Creek Railway and Coal Company constructed a narrow gauge railroad from Judd in Webster County, a station on the Illinois Central, south to the town of Lehigh on the Des Moines River, a distance of about eight miles. The road began operation with one engine, one combination passenger car, twenty-eight coal cars, three other cars, and "no telegraph". With only one locomotive the danger from head-end collisions was exceedingly remote. The mileage was subsequently increased to 9.7 miles and the road was standardized by November 8, 1880. This was probably one of the earliest jobs of widening the narrow gauge within the State.

Articles of incorporation were adopted in 1874 for another early narrow gauge line, the Waukon and Mississippi Railroad Company, situated in the extreme northeastern corner of the State. This road ran southeastward from Waukon a distance of 22.8 miles to a point on the Mississippi River where it connected with the Chicago, Milwaukee and St. Paul road at Waukon Junction. Begun on April 29, 1875, construction was finally completed in 1877, when on October 27th, "at 3 o'clock P. M., the engine 'Union Prairie' rolled up to the platform of the Waukon depot for the

first time." In May, 1880, this line passed into the hands of the Milwaukee railroad and soon thereafter was changed to standard gauge.

At almost the same time, in November, 1875, the Iowa Eastern Railroad Company completed and opened 19.1 miles of narrow gauge track to provide Elkader, situated at an isolated spot on Turkey River, with railroad facilities. From Elkader this road extended northeastward through a rugged country, touching the towns of Stulta, St. Olaf, Farmersburg, Froelick, and Beulah. It formed a junction at Beulah with the standard gauge trunk line of the Milwaukee building westward from North McGregor (Marquette) entirely across the State.

The motive power of this road consisted of two locomotives, one named the "Pathfinder" and the other "Diamond Joe". These were equipped with six drive wheels, said to be the first such engines west of the Mississippi. All side rods and bars were of polished steel, while shiny brass bands ornamented the boiler, smoke-stack, sand box, and steam dome. The other rolling stock consisted of two coaches, two baggage cars, and about thirty box cars and twenty-five flat cars.

After the Iowa Eastern Railroad was completed many bad washouts occurred on the Elkader end of the track so that the trains could run

only to Stulta, two miles northeast of the terminal. Moreover, the iron-plated wooden rails employed on about four miles at the Elkader end of the line proved impracticable, particularly in very cold weather when the iron strips curled up and derailed the coaches.

The property of the narrow gauge line was steadily improved, however, the wooden rails were replaced with iron rails, and in the autumn of 1881 the road was acquired by the Milwaukee system. The work of widening to standard gauge was completed in the spring of 1882.

In the year 1879 the Cedar Rapids and Marion City Railroad Company built a narrow gauge steam motor line from Marion to the city limits of Cedar Rapids, a distance of five miles, connecting with the horse car service in the business portion of Cedar Rapids. Two years later "the property, rights and franchises" of the Marion line were purchased by the Street Railway Company of Cedar Rapids, which rebuilt, extended, and electrified the entire system.

The Fort Madison and Northwestern Narrow Gauge Railway Company was organized on July 17, 1871, for the purpose of constructing a line westward from Fort Madison, through West Point, Birmingham, and on to Council Bluffs by the way of Oskaloosa. Surveys and grades were

made and ties and rails were laid to West Point, where the first engine arrived about June 1, 1879. On October 16th of the same year the road was reorganized under the name of the Fort Madison and Northwestern Railway Company, which secured the original twelve miles of narrow gauge previously built for the sum of "forty thousand dollars for the whole concern, including road-bed, right of way, iron, locomotives, cars, buildings, etc., with all other appendages thereto."

By 1883 this line had been extended to Birmingham, a distance of 41 miles, and two years later to McKee (afterward called Collett Station), 45 miles from Fort Madison. In 1890 the road was sold to the Chicago, Fort Madison and Des Moines Railway Company, which corporation widened the line and extended it to Ottumwa, a total distance of 71 miles. For a short time the road was leased and operated as a feeder by the Santa Fe, connecting with the main line at Fort Madison. It was subsequently purchased by the Burlington system and now constitutes the Ottumwa-Fort Madison branch.

On New Year's Day, 1880, a narrow gauge line was completed, 35.6 miles in length, running over a picturesque part of Iowa from Bellevue on the Mississippi to Cascade, an inland town in Dubuque County. This road was begun on Sep-

tember 19, 1873, by the Chicago, Bellevue and Western Railroad Company. Within a year and a half of its completion, however, it was acquired by the Milwaukee interests. Now it has the unique distinction of being the sole surviving narrow gauge line in the State of Iowa.

Radiating from Des Moines, a number of narrow gauge roads were built, all of considerable importance. Rivalry sprang up between the towns of Nevada and Ames in Story County, both located on the main line of the North Western, to become the junction for a connecting road to Des Moines. The Iowa & Minnesota Railroad Company was organized in 1866 with the avowed intention of building such a line and its promoters very cleverly played each community against the other to secure as much financial support as possible. This sort of subterfuge was commonly employed by early railroad builders, and in this instance the company finally decided in favor of Ames. Not until July 26, 1874, however, was the road actually completed. This narrow gauge was subsequently extended beyond Ames and, by April 1, 1878, it had reached the now forgotten spot called Calanan (near Jewell), 56.63 miles northward from Des Moines, and was projected, though never completed, to Humboldt, a total distance of 105 miles. After being operated four or

five years as a narrow gauge road, it was purchased by the North Western and promptly widened to standard gauge as far as Ames in 1883. The portion above Ames to Calanan was widened later.

The longest single narrow gauge railroad ever operated in the State ran from Des Moines northwest through Adel and Jefferson to Fonda, a distance of 113.8 miles, and in addition this road operated a branch 34.8 miles in length from Clive, seven miles west of Des Moines, to Boone. This line was built piecemeal by several corporations. The first stretch of seven miles was laid in 1878 by the Des Moines, Adel and Western between Waukee and Adel. This road was absorbed by the St. Louis, Des Moines and Northern, organized on April 4, 1881, which completed the line from Waukee into Des Moines by December, 1881. In the meantime, a company known as the Wabash, St. Louis & Pacific Railroad extended the line northward from Adel, reaching Jefferson in 1880, and eventually Fonda, 46 miles beyond. The road between Clive and Boone was completed on August 8, 1882. Meanwhile, on January 23, 1882, that portion of the road between Clive and Waukee and the undivided half interest of the road between Clive and Des Moines was conveyed to the Des Moines and Northwestern, a

company afterward controlled by F. M. Hubbell of Des Moines and Grenville M. Dodge of Council Bluffs. By 1888 these men had likewise acquired control of the entire property from Des Moines to Fonda, which they operated under the name of the Des Moines and Northern until about 1898 when it was acquired by the Milwaukee system. Previously, however, the road had been widened to standard gauge.

Another important narrow gauge road running out of Des Moines was the Des Moines, Osceola and Southern, organized at Osceola in 1880 for the purpose of constructing a line from that city to the State capital. Much of the stock was subscribed locally and, with the further aid of some eastern capital, construction was started early in the spring of 1881, the road being completed to Des Moines during the summer of the following year. The "southern" part of the road, which ran from Osceola through Leon into Missouri, was completed in 1884. The only interstate narrow gauge railroad operating in Iowa had 111 miles of track, of which 11 miles was between Pleasanton, Iowa, and Cainsville, Missouri. The road was built at a total cost exceeding one million dollars.

Inasmuch as the road was built on a mileage contract, many queer alignments of track were made in order to increase the profits of the con-

tractors. In making the circuit from St. Marys around to New Virginia a horseshoe curve was executed which was unique in Iowa railroad construction. Within the first two miles south of Osceola there were ten trestles, and when the road was broadened this construction was reduced to one mile with only one large fill and one bridge. In 1885 the road passed into a receivership, and was acquired by a new company known as the Des Moines and Kansas City Railroad Company. This corporation was later absorbed by the Burlington and the track broadened.

One of the most successful narrow gauge systems built in the State was a combination of two roads in southeastern Iowa, comprising the tracks of the Burlington and Northwestern (B. & N. W.), operating between Washington and Burlington, via Winfield and Mediapolis, a distance of 38.77 miles, and the Burlington and Western (B. & W.), a line 70.7 miles in length extending westward through Henry, Washington, Jefferson, Keokuk, and Mahaska counties, from Winfield to Oskaloosa. Schedules were so arranged that at Winfield the B. & W. trains made close connections with the Washington trains for Burlington, and at times joint operation of trains was practiced, making in reality a unified system of opera-

tion, though each road all the while maintained its own corporate entity. Below Mediapolis these lines ran into Burlington over the tracks of the Burlington, Cedar Rapids and Northern, a distance of 13.73 miles. Since the latter road was of standard width, a third rail had to be laid between the broad gauge track.

The B. & N. W. was incorporated on March 3, 1875, and the B. & W. on June 7, 1881. Both roads were completed by 1884, though not without a bitter struggle with the Central Iowa Railway which built a branch from Oskaloosa to the Mississippi at Keithsburg in 1883. The Burlington and Western line was surveyed so that it crossed and recrossed the proposed right of way of the Central Iowa between Winfield and Oskaloosa. It is said that many serious encounters occurred during the construction of these parallel roads when one, under cover of darkness or by other strategic means, attempted to tear out the track of its rival and install its own rails instead.

The period following the completion of these lines proved to be one of unusual prosperity for railroads, and it appears that there was sufficient business for both companies. For short hauls on its own line the narrow gauge could operate more economically than the heavier road, but as time elapsed more and more through business devel-

oped, especially in the shipment of grain and cattle to the eastern market. This necessitated unloading and rehandling freight at the Burlington terminal, and this additional expense proved a serious handicap for the narrow gauge. After several years this difficulty was partially overcome by installing narrow gauge trucks under standard gauge cars and operating mixed trains of both types of cars. The change was quickly made by hoisting the cars with hydraulic jacks so that wide or narrow trucks might be substituted. These "hit and miss trains" presented an odd appearance, especially when equipped with engines smaller than the standard size freight cars they were hauling. Occasionally for excursions, passenger coaches were supplied with temporary narrow gauge trucks, although the speed of the trains was greatly impaired.

These lines, passing through exceptionally rich agricultural territory, eventually became important feeders for the Burlington and there were rumors of absorption and standardization. This talk, however, began many years before the actual event occurred. The "widening" was not accomplished until June 29, 1902, an occasion which attracted the attention of railroad engineers as well as the general public, for this was the last narrow gauge railroad in Iowa to be widened.

BEN HUR WILSON

## Widening the Narrow Gauge

"The little engines, coaches and freight cars made their last regular runs on the Narrow Gauge system today", announced a dispatch from Washington, Iowa, in the Burlington *Hawk-Eye* on June 28, 1902. "Conductor Moreland and Engineer Pierce's train between here and Winfield will make its four regular trips today for the last time. There will be no service for the public tomorrow. Early in the morning the remaining coaches and freight cars which have not been sold will be run into Burlington. It is the intention of the company to have the entire system widened out tomorrow. Chicago, Burlington and Quincy rolling stock will be pressed into service Monday and used until the new rolling stock for the B. & N. W. is built."

It was with no little regret that many of the patrons of the road witnessed the passing of the "cozy little trains". Particularly was this true of the younger generation whose sense of appreciation for the diminutive had not yet been fully outgrown. However, the advantages which were to accrue by the operation of standard gauge equipment far outweighed all sentimentality.

Efforts were made to dispose of the obsolete rolling stock as advantageously as possible. The freight cars were offered for sale at ten dollars each. Since they were readily adaptable for use as coal houses, chicken coops, and small granaries, they were eagerly snapped up as bargains. Many were sold and some may yet be seen in farm yards along the line, still in serviceable condition. The engines and coaches, about ten each, were moved west, to be used on other narrow gauge Burlington lines in Colorado.

On Sunday, June 29, 1902, a remarkable engineering feat was accomplished. Approximately 125 miles of rails were transposed from the narrow gauge of three feet to the standard gauge of four feet eight and one-half inches. And the job was virtually completed between daylight and dark.

Much preliminary work and planning was necessary before the day upon which the actual transfer was made. The original iron rails being small were all replaced with heavier steel. Considerable road-bed had to be widened to carry the longer cross ties for the broad gauge track, which likewise required the rebuilding of many culverts and bridges, as well as other minor alterations such as changing switch stands and depot and stockyard platforms. Much of this general prep-

aration was accomplished so gradually, over a period of several years, that the public was scarcely aware of what was taking place.

Practically the first intimation of the project was from a news item published in the *Oskaloosa Herald* on April 19, 1900, under the caption "To Widen Out". From that time preparations moved more rapidly. Especially during the last six weeks preceding the widening, materials such as spikes, plates, angle iron, frogs, and crossings were distributed along the line at the proper places.

For the purpose of cutting the seat in which the rails were to rest in their new position on the uneven ties, a unique "adzing" machine was designed and constructed in the Burlington shops. It consisted of two gangs of circular saws mounted the correct distance apart upon the opposite ends of a single shaft which could be lowered to the ties. This machine, installed upon a small flat car and operated by steam power, was run over the entire road, cutting uniform grooves as it went, thus accomplishing in a few days what would have required the services of many men all summer. Moreover, the work done in this manner was truer and more satisfactory than would have been possible to accomplish by hand. Low places of course could not be remedied in this

fashion, but had to be fixed by tamping gravel under the ties or by shimming up beneath the rail with wooden blocks.

After all the preliminary details had been arranged, a date was set for the actual widening of the track. Approximately five hundred skilled workmen were hired, stationed at selected places, and instructed in their duties in order that the job might be accomplished in the allotted time of one day. General Manager Robert Law was in supreme command for the occasion, and he established headquarters at the Winfield junction as the most strategic location. By the record established he demonstrated his capacity for the undertaking. C. McEnery and Robert Shields, Roadmasters on the Rock Island, and Roadmaster J. T. Sheehan of the Burlington also proved to be able and energetic lieutenants.

"Before the people have rolled out from under their bed clothes tomorrow morning," predicted the Washington dispatch of June 28th, "the work of widening will be well under headway. The work is to commence bright and early at 4:30 o'clock. With nearly one hundred men, Roadmaster Robert Shields, of the C. R. I. & P., will start out to do the work between here and Winfield. He will divide his men into three sections. Foreman Bailey of the Rock Island, with one set



of men, will remain here and do the work in the yards of this city. All the spikes are ready, some of the outside ones being driven. The inside spikes holding the Narrow Gauge rails have been drawn with the exception of four to a rail. The rails can be taken up and placed quickly tomorrow by pulling the four remaining spikes and turning the rail over to its place. The work between Winfield and Burlington and Winfield and Oskaloosa has been assigned to workmen from the C. B. & Q., and the B. C. R. & N. and the Hannibal and St. Joe and other lines."

The last regular narrow gauge train to leave Oskaloosa was the Saturday evening 6:15 passenger running eastward to Burlington. Later, however, a special train in charge of Conductor "Billy" Moreland, drawn by engine No. 38 with Engineer N. Beather at the throttle, Frank Borton firing, and Ray Wells performing the duties of brakeman, carried about two hundred workmen out along the line. Sharply at "4 o'clock the last narrow gauge train pulled out" of Oskaloosa.

Groups of men, distributed at intervals of four miles, immediately began the task of converting the narrow gauge into a broad gauge road. The last gang disembarked at a spot about midway between Hedrick and Martinsburg, whereupon the train backed to Hedrick, ran on a side track,

and the engine was "killed" forthwith and put out of service. "A dead engine and abandoned equipment standing apart on the siding made a picture that will not soon be forgotten by those who saw it and it was generally regretted that the condition of the day made the taking of photographs impossible."

At four-thirty Sunday morning a delegation of Burlington newspaper men accompanied by representatives of the *Galesburg Mail* and the *Chicago Times-Herald* boarded the narrow gauge construction train carrying about one hundred and fifty "sturdy tracksmen, who proceeded to the scene of the contest against time and the elements". It was the last narrow gauge train to leave Burlington. Having distributed workmen at prearranged intervals along the line to a point beyond Brighton, this train was backed to Brighton where it was sidetracked as obsolete. This equipment, as well as that at Hedrick, was later hauled back to Burlington on standard cars.

Laborers worked mostly in gangs of from sixteen to twenty. Usually six men were assigned to pull the spikes, four to move the loosened rails into place, and six to drive the spikes which fastened the rails in their new position. The others finished any necessary odd jobs. Each gang was in charge of an experienced foreman.

Such strenuous work required ample quantities of food, and the company made liberal provision for the meals of the men during the day — breakfast, dinner, and supper. Contracts were let for supplying forty-five hundred sandwiches, or about fifteen per man, for the entire day. Five hundred dozen hard boiled eggs were also prepared, about a dozen for each man. Many brought supplementary lunches of their own. The provisions were distributed by the same train that brought the crew, while coffee and a barrel of water were deposited at stated distances.

From his headquarters at Winfield, General Manager Law directed the work "both by wire and in person." By his calm demeanor he appeared to strangers as an unconcerned spectator, but he was actually "keeping the wires hot" as the work progressed. He gave no heed to wind and rain; his only anxiety was to get through.

And how those gangs did work! It was no picnic. The job was done under most unfavorable circumstances. Not only was the ground soggy, but a cold, incessant rain beat down all day upon the hurrying workmen. While the spectators admired the systematic procedure and the foresight with which equipment had been provided, they could not but admire most the "patience and fortitude, the grim, silent determination

which possessed all concerned in the work, from the chief who directed it, down to the muscular fellows who without murmur plied their sledges throughout the day, drenched to the skin — all working as if the balmy breezes of June were cooling them and a gentle sun was shining upon their efforts.”

No event had occurred since the opening of the line a quarter of a century before that attracted so much attention as the widening of the gauge. Thousands of people flocked to the stations to watch the men at their work and to greet with applause the first standard gauge train that rolled in sight. “It was no mere idle curiosity that caused these people to leave their comfortable homes and brave the inclement weather. Many well informed people were out, and they were fully impressed with the importance of the change.”

What the spectators missed was the “peculiar cheerful music of the steel hammer ringing on the spike. Under favorable conditions it would have been a great anvil chorus” that was played along the line that day. But the rain had continued so long the ground was saturated and did not offer the proper resistance to the tie as the spikes were driven home by the lusty strokes of the men.

While no particular speed contests were conducted, there were sections that reported as much

as one mile an hour. Others made slower time, the conditions being less favorable, but there was no lagging anywhere along the line. Some fast spurts made by the different gangs were two miles by H. Jackson near Winfield in two hours; and three miles in three hours by J. T. Sheehan between Hedrick and Martinsburg including a crossing of the Central Iowa. Roadmaster Calvin made three and a half miles in three and a quarter hours. Starting from Mediapolis as soon as the up train had passed, McEnery made his allotted four miles by ten o'clock while the gang working to meet him from the opposite direction was still almost two miles distant. Although his men were tired, they worked on, widening an additional mile in another hour.

Running east from Oskaloosa, the first broad gauge train was the Burlington "extra" which had brought the workmen up from Ottumwa over the Rock Island. It followed the widening of the rails and was run as a regular morning passenger, No. 24, leaving Oskaloosa nearly seven hours late and not arriving in Burlington until after two o'clock Monday morning. Equipped with flat cars and passenger coaches, it picked up tools and extra supplies as well as gathering up the men for their homeward journey. Slowly the train pushed eastward, being compelled to wait occasionally at

railroad crossings where installation was most difficult. Most of the delay occurred near Brighton, however, where a temporary strike had been inaugurated. Another wait was occasioned by the accidental derailing of a car on a freight train near Coppock. The east-bound passenger met the regular west-bound train, "The Fox", at Coppock where the crews changed trains and returned to the terminal whence they had started.

At Coppock the workmen were called from their comfortable coaches to widen a switch track so that the trains might pass. Inasmuch as this job was done after darkness by lantern light it took a long time. To the passengers it seemed as though orders would never come for the train to proceed. During the weary wait an improvised press banquet was held, attended by the Burlington reporters as well as the newspaper men on the east-bound train from Oskaloosa. Though "the menu was not very elaborate, there were no complaints upon that score."

It was past midnight before the return journey to Burlington was resumed. The "down" train ran surprisingly smooth and silently, due to the "soft condition of the road-bed — and comparatively good time was made." The coaches were filled to capacity with tired, soaked, weary men. It was no occasion for "hilarity, celebration, trou-

ble, or noise." The men were so exhausted that they went to sleep in the most grotesque and uncomfortable positions imaginable. "In one of the cars a sextette of young men, several of whom had pleasant voices and knew how to use them, whiled away an hour with familiar songs", but they had no audience for there was "no sign of approval or of protest from the weary toilers, who were apparently dead to the world."

Roadmaster McEnery became reminiscent as he chatted with the reporters on the train. "We have established a world-wide record today", he declared, for transforming "a narrow gauge to a standard road, and have smashed all previous attempts by fully thirty-six hours." The best previous record, he said, was the widening of sixty-five miles of road in two days.

"Twenty-six years ago, June '76, I remember the first rail I laid for the B. & W.", he continued. "And now today I've witnessed the windup of the narrow gauge and again assisted in starting a project in which the farmers and citizens are rejoicing as much as they did twenty-six years ago this month."

BEN HUR WILSON

## From Bellevue to Cascade

Beside the North Fork of the Maquoketa River, situated on the line between Jackson and Dubuque counties, lies the town of Cascade. As a pioneer village it was neglected by all the early railroad building activities, and the lack of such transportation threatened for a generation to doom the community to oblivion.

At intervals for thirty years, various projected railroad schemes included Cascade on their route, only to fail, one by one, leaving the community in deeper despair. The earliest of these proposed roads was the "Ram's-Horn", first broached in 1848. It was to have extended from Keokuk to Dubuque by way of Iowa City, Cedar Rapids, and Cascade. An "air line" directly across Iowa, passing from Bellevue through Cascade, was suggested, but interest in this road was soon overshadowed by a more promising "Southwestern" route from Dubuque, which likewise pledged a station at Cascade. The organization of the Davenport and St. Paul seemed promising but it "also went up in thin air".

If ever a community had reasons to feel discour-

aged Cascade certainly did. Outside aid had apparently failed, and it seemed that the town would have to build the railroad if there was ever to be one. Various citizens bestirred themselves.

On October 13, 1876, Dr. W. H. Francis of Cascade wrote to Captain M. R. Brown of Bellevue concerning the feasibility of constructing a narrow gauge road from Bellevue to Cascade. The matter "met with instant favorable response on the part of the people of Bellevue." All winter the subject was discussed. On March 9, 1877, a meeting was held by the citizens of Bellevue for the purpose of organizing and financing a preliminary survey for a narrow gauge road to Cascade.

Not until August 4, 1877, however, was the Chicago, Bellevue, Cascade and Western Railroad Company organized at Bellevue. This arrangement was apparently not entirely satisfactory, for another meeting was held at Garrytown and a third at Cascade on August 30th when final details were settled. Officers and a board of directors, including three men from each township on the route of the proposed road, were elected. It appears that capable, energetic men were chosen, who believed that the road could actually be built. From the name of the company it may be assumed that the promoters held high hopes that the new railroad might eventually become an im-

portant link in a trunk line across the State connecting with the Milwaukee narrow gauge then building westward to Galena from the lakes.

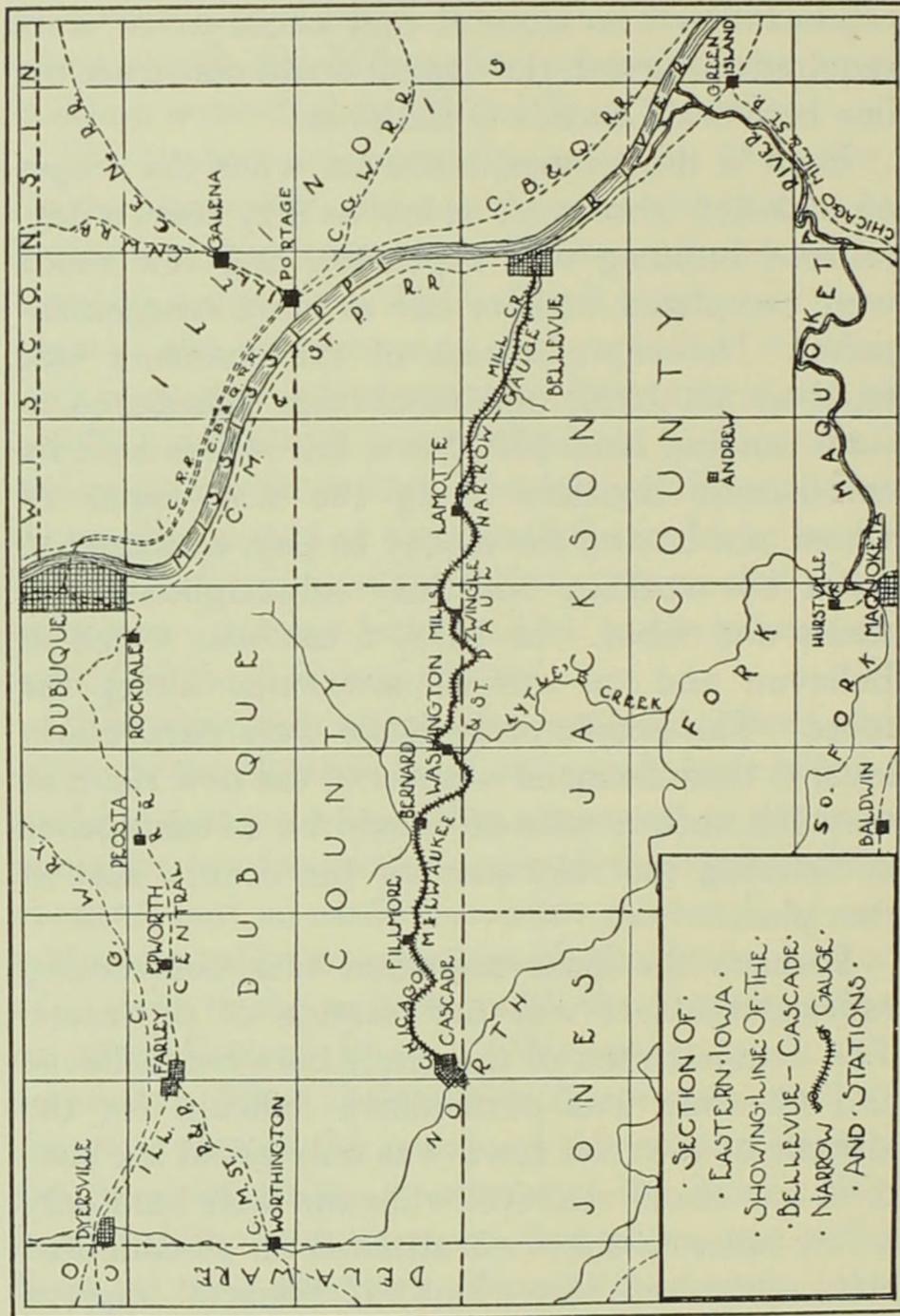
The project was eyed jealously by Dubuque, for the "gate city" did not welcome competition at Bellevue. According to a *Cascade Pioneer* editorial in September, 1877, D. A. Mahoney was urging "the business men and capitalists of Dubuque to take active steps to build, or assist in building a Narrow Gauge Railway to Cascade," and warning them that "the loss of the trade of the southern part of the county" would be incalculable. He warned his fellow citizens that Cascade was "putting her shoulder to the wheel" in behalf of the Bellevue project.

"The time for action has come," declared the editor of the *Pioneer*, "and our people have organized for a purpose, and that purpose is to secure a home market for the products of the surrounding country, and an outlet for other markets" by establishing rail connections with the grain market at Galena to the east and with the thriving cities on the Missouri River. "We understand", he continued, "that Dubuque business men scoff at the very idea of the people of this section having the financial ability to construct the road. We beg to differ with them on that point, and refer them to the directory elected to manage the

organization who alone if they chose to, or were required to furnish the capital could construct the line between Cascade & Bellevue."

Even in those times, however, when the wages of unskilled labor were as low as fifty cents a day, railroad building was expensive, and few roads were completed without one or more reorganizations. The capitalization of the company was fixed at \$200,000, and stock was distributed in sums ranging from \$5000 to a few shares held by enthusiastic boosters along the way, some of whom, not having the money to pay, arranged to assist by working out their subscriptions with teams and labor. In 1878, a tax was voted in Bellevue and in various townships along the route. The people of Bellevue were particularly loyal in their financial support of the new road, as they felt such a railroad would be advantageous in securing the relocation of the county seat at that place.

Perhaps the most important task confronting railroad builders was the location of the route. The determination of the grade between Bellevue and Cascade was particularly difficult, for the altitude of the river town was only about six hundred feet above sea level while the table land only a few miles to the west attained an elevation of eleven hundred feet. But the financial support



SECTION OF  
 EASTERN IOWA,  
 SHOWING LINE OF THE  
 BELLEVUE-CASCADE  
 NARROW GAUGE  
 AND STATIONS.

which might be expected from the various communities that were directly benefited was as important as the engineering factors in determining the location of the right of way.

At the lower end of Bellevue, Mill Creek empties into the Mississippi, and it was the valley of this little stream that afforded the only practicable opportunity of reaching the prairies inland. For a distance of about two miles, the line runs on the north side of Mill Creek, then crosses to the south side for about three miles, and thence returns to the north side, climbing steadily all the while until it emerges upon the uplands. Passing on westward with a great sweeping S curve, the road reaches the first station at the town of La Motte, eleven miles from Bellevue. A mile and a half east of La Motte is a long siding which is used for "doubling", since the grade ascends there at the rate of about one hundred feet per mile.

Beyond La Motte the topography of the country is of bold relief, and the line contains many stiff grades and sharp curves. Passing Zwingle slightly more than four miles west of La Motte, the line continues down grade to Washington Mills on Otter Creek, twenty-two miles from Bellevue. About fourteen miles from Bellevue, the road passes into Dubuque County and thence along the county line between Dubuque and Jack-

son counties through Bernard and Fillmore to Cascade. At two sharp curves the right of way dips over into Jackson County for a distance of about a mile in each instance. Nineteen and six-tenths miles of the entire route lies in Dubuque County and sixteen miles in Jackson.

With very little ready cash in the treasury but with unswerving faith that the job could actually be accomplished, the directors launched bravely upon their undertaking and on September 19, 1878, the first ground was broken at Cascade. According to the *Cascade Pioneer*, it was an event "that will never be forgotten by the present generation. It was a grand gala day for Cascade and five thousand people were present to participate in the happy occasion." The line was partially graded to Washington Mills, and some work was done at Zwingle and La Motte that year.

By the close of the season, however, the cash was practically exhausted and a reorganization was imminent. On January 7, 1879, J. W. Tripp resigned the office of president whereupon Vice-president James Hill assumed the management until March 1st, when he was made president. On May 9th, George Runkel, acting in behalf of J. F. Joy, a Detroit capitalist, proposed to take over the unfinished road and complete it without

further delay. The offer was accepted and the old company's franchise was transferred at Zwingle on May 17th to the Joy interests, operating under the name of the Chicago, Clinton, Dubuque & Minnesota Railroad Company. The new management prosecuted the work of construction with vigor, and on January 1, 1880, the road was completed from Bellevue to Cascade.

"At Last We Have It!" proudly announced the *Cascade Pioneer*. "On Monday it became apparent that the track would be completed to the town on Tuesday. Although no general celebration was announced, yet a large number of people gathered at the depot to see the last rail laid and the train come in. The laying of the track to the depot was completed at noon. Engineer Allen Woodward and his fireman, Sam Elmer, on No. 2, were patiently waiting for the completion of a switch east of the depot, while an immense crowd of men and boys occupied every available space on the cars, to enjoy their first ride on the narrow gauge."

As soon as the switch was completed, "Woodward seized the bar of the throttle valve of No. 2" and backed the train up the track "as far as the O'Brien place," then, reversing the lever, he "sent the little engine flying towards Cascade, and in a few minutes drew up at the depot" where

a cheer of welcome went up from the multitude. Vice-president Runkel honored the members of the press by inviting them to ride in the cab of the engine. Among the number were John Blanchard of the *Monticello Express*, Tom Duffy of the *Dubuque Herald*, and the editor of the *Pioneer*.

More than fifty years have now elapsed since the celebration of this notable event in the history of Cascade, but the little narrow gauge trains still make their daily trip from Bellevue and return. At seven in the morning, after the arrival of the mail at Bellevue, the little engine and cars, constituting the mixed train, begin their "up" trip, which is made on the leisurely schedule of ten miles per hour. Between stations, however, considerably greater speed is attained than the schedule indicates, as one hour is allowed for climbing the steep grade up Mill Creek to La Motte. When business is heavy or the track is slippery, this is accomplished by "doubling". The train is divided and part is taken up and side tracked at the summit while the engine and crew return to the bottom of the hill for the remainder of the train.

There is always considerable switching at the stations en route, "spotting" cars at the elevators, coal sheds, and stock-yard platforms, as well as the work of loading and unloading the local freight at the depots. Much of the scheduled time

is consumed in this manner, especially at Cascade where one hour and ten minutes is allowed for the turn around and work in the yards. At 11:25 A. M. the train begins its "down" trip to Bellevue, where it arrives in due time at 2:40 P. M.

A ride on the downward journey is a delightful experience. At places the train travels high on the edge of a precipitous bluff where wonderful vistas greet the eye in every direction. Again the track leads through deep valleys close to a crystal-clear, gurgling little stream, hemmed in on either side by rocky ledges. But most of the way the route is across open farming country, more prosaic though none the less beautiful.

For the amount and quality of service expected, the road is well equipped with motive power and rolling stock. There are in use about fifty box cars, thirty-eight stock cars, twenty-six coal and flat cars, and one caboose. The passenger equipment consists of two coaches both of the combination express and passenger variety. Four engines, numbers 1, 2, 3, and 4, constitute the motive power of the road. A rotary snow plow is used to remove the deep drifts from the numerous cuts through the hills. The engines are of regular type, one with four drivers and three with six drivers about four feet in diameter. They are all equipped with automatic couplers and air brakes.

Occasionally, when in need of repairs, they are loaded on a specially constructed flat car and transported to the Milwaukee engine shops at Dubuque or Marquette where they are repaired without being removed from the car.

Compared with modern transportation units, the little engines, cars, and coaches seem Lilliputian, yet for the territory served they are adequate. The trains are operated as efficiently and perhaps more economically than their more impressive neighbors out on the main line. Freight has to be transferred at the Bellevue terminal. Two small coal cars are required to handle the standard load of thirty tons, five narrow gauge box cars of grain fill only one large box car, and two narrow gauge stock cars make up one standard gauge carload of hogs or cattle. Formerly the task of loading and unloading was all done by hand and sometimes as many as ten or twelve men were employed in this operation, but in recent years modern machinery has been installed. A clam-shell bucket loader is used for transferring coal, and belt conveyors for grain and corn.

There can be no doubt that the building of the narrow gauge saved the life of Cascade. In 1876 it was only a straggling village, "lazing along side of a sandy street". It had once been a way station on the Western Stage Company line,

"but that means of transportation had long ceased to exist, when the railroads came west of the Mississippi river." Only the existence of a few churches seemed to hold the town together. Then along came Isaac W. Baldwin with a few cases of type and a Washington hand press. Apparently "he had about as much excuse for running a newspaper in this village as he would have had peddling peanuts in a grave yard", but he exerted a decisive influence on public opinion by his *Pioneer* editorials. Cascade got its railroad, and in consequence grew into a prosperous community of more than twelve hundred inhabitants.

From time to time there have been several attempts to induce the Milwaukee to transform the road into a standard gauge, but the company has always maintained that the business was not sufficient to warrant the unusual expense due to the topography of the country.

Thus the sole survivor of the narrow gauge railroads in Iowa continues to function, perpetuating the history of an early phase of railroading. Tourists in northeastern Iowa who come across the Bellevue-Cascade railroad for the first time find it an interesting surprise. What impresses them as an amusing curiosity is none the less a genuine railroad of vital importance to a number of substantial communities.

BEN HUR WILSON

## Comment by the Editor

### *STANDARDS*

People yearn for certainty. There is satisfaction in conclusions. To establish bounds is natural, even though the limits be tentative like horizons.

In a world of relativity, what can be known precisely? A thing is large or small only in comparison with other objects. The span of a person's life is shorter than a sequoia tree's existence but longer than a squirrel's. A commodity has value in terms of other goods.

If a train runs between two towns in a certain time, how far could it run in a different time? There can be no calculation until the elements of the problem are accurately defined. Since both space and time are infinite, they can be comprehended only in finite measurements. Let a specific distance be determined and the extent of the universe can be described in terms of that unit; let the duration of daylight be known and age can be stated in terms of that phenomenon. Without criteria of measurement, science would lose validity and history its sequence. People must know,

and the process of learning involves the use of established instruments of judgment. Thus the quest for standards began.

In primitive times the dimensions of the human body, being convenient and reasonably constant, were utilized as units of measurement. From the point of the elbow to the tip of the middle finger was a cubit; the distance from the point of King Henry's nose to the end of his thumb was a yard; and the reach of both arms from tip to tip was the spatial length of an embrace or a fathom. A single grain of wheat weighed a grain; three dry barleycorns from the middle of the ear laid end to end constituted an inch; and shoes are still numbered according to the length of a grain of barley in a system of numeration by thirteens.

But such variable standards were inadequate for the complicated relations of the modern world. From universal constants, such as the movement of the stars, the length of a terrestrial meridian, or a correlation of temporal and spatial factors in the vibration of a pendulum, mathematicians derived more accurate units. The French meter, which is a fractional part of a meridian, is 39.37 inches long, while the seconds pendulum measures 39.13 inches. Through comparison with such precise standards, it has been possible to establish uni-

formity in common units. Thus haphazard custom has been wedded to science.

If a physicist should determine the ideal width for a railroad, considering the weight, mass, velocity, and other essential qualities of the traffic, how closely would it approximate the wheel span of the old English cart? Perhaps the fifty-six and one-half inch standard gauge, which had that humble origin, is relatively scientific.

J. E. B.

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