

**THE ELEMENTS OF
RAILROADING: A SERIES OF
SHORT ESSAYS REPRINTED
FROM THE RAILROAD GAZETTE**

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The Elements of Railroading: A Series of Short Essays Reprinted from the Railroad Gazette by Charles Paine

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CHARLES PAINE

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BY
CHARLES PAINE.

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ELEMENTS OF RAILROADING.

CHAPTER I.

SURVEYING AND CONSTRUCTION.

THE SELECTION OF MEN—FINAL LOCATION—TACT—ACCURATE
NOTES—SPECIFICATIONS—OVERSEEING—FOUNDATIONS—
TRACKLAYING.

The organization of the engineering party for the survey of a new railroad is usually intended to be a temporary one, yet its results are often enduring in their effect upon the road and upon the persons engaged in the surveys; the men, who go as rodmen, chainmen, and axemen, naturally become attached to the road in one capacity or another, even if a long interval shall elapse between the first surveys and construction. When the ground is broken, they will surely be at hand, and persist in being identified with the fate of the enterprise.

It is, therefore, worth while, in the beginning, to select the men with care; and if the men, of course, all the more the officers who are to command them.

The chief engineer in charge of the surveys should be chosen for well-known ability and experience in construction, united to an acquaintance with the needs of a road in operation; and not for any other kind of availability. An ignorant and unskillful location may cost not only unnecessary sums in construction, but perpetual expenditures afterward in the cost of hauling trains, or large outlays to remedy the defects of the road as first built. We may imagine a piece of country in which the location or construction of a railroad would be a very simple matter; but a region which is at all difficult will present problems requiring a high order of talent for their solution.

These are truths which are perfectly familiar to engineers; but are so often ignored by capitalists, or by their representatives, who undertake the direction in the building of railroads, that it seems advisable to reassert them whenever there is a favorable opportunity to do so.

The best location can not be determined except upon the ground; the most trained and expert imagination can not take in from contour maps all the details which are seized on a view of the problem upon the natural scale. The maps may be of great value in its determination after a study of