

A good sketch will suggest ideas and furnish information at a glance that pages of written matter will not convey. It places the whole situation before the eye so that the mind may quickly grasp the idea.

A companion to the sketch book is the camera. We have in mind an exceedingly interesting and valuable report on an hydro-electric proposition, in which was incorporated a photograph of the power house site and a neat sketch of the power house and dam. It conveyed at once a good, general idea of the location, and gave some suggestions as to the possibilities of the scheme.

A sketch book and camera are almost as necessary to the engineer to-day as the chain and compass.

EDITORIAL NOTES.

Last week the report of the Dominion Railway Board was laid on the table of the House of Commons by the Minister of Railways and Canals. In referring to accidents on Canadian railways, it gives a list of 438 persons killed and 1,201 injured during the year ending March 31st, 1909. Of the killed, 26 were passengers, 191 employees. The balance—almost one-half of the total—were trespassers. Truly, the public must be protected against their own folly. And yet when the railways prosecute, in the public interest, the trespasser, long and loud is the protest.

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The fearful, and, we trust, truly accidental catastrophe that occurred on a British Columbia electric railway recently is sure to raise the whole question of the operation of trains of cars on roads with very steep grades. We have Canadian electric roads hauling two, three or four cars of freight on grades as high as 10 per cent. and all the train crew located on the motor car. A following car breaks away, and there is no one to check it until much damage has been done. Ordinary good sense prevents the motorman following such a train from approaching very closely, yet there are many situations where his caution will not protect. Long grades, curves, obstructed view, and darkness, make it impossible for him to ward off all danger from runaway cars. Legislation should require efficient brakes and sufficient and properly located crews on all trains, whether the lines be trunk, urban, suburban or interurban. Only a kind Providence delayed so long such a fearful accident as that of last week. Let the warning be heeded.

THE TRAINING OF AN ENGINEER.*

"Once we fully grasp the fact that it is impossible in any university course to accomplish more than a part of the preliminary training of the engineer, and that the work of the university school is not to make engineers, but to fit men in the best way possible to become engineers, we find stress should be laid, in a college course, on principle and not on the innumerable details in engineering practice."

The text I have quoted is, I believe, a correct one; but the application thereof will lead to a wide variance of opinion. I think the engineering student should know his

Arithmetic, Algebra, Geometry and Trigonometry, Analytical Geometry and Elementary Calculus, Applied Mechanics and Strength of Materials, Physics, Chemistry, Mineralogy and Geology, the rudiments of Metallurgy, Biology and Silviculture. He should have a sufficiently thorough acquaintance with English Literature and Language to be able to keep in touch with the best thought of the age. To this same end he should read Ethics and Natural Law, Psychology and First Principles of Knowledge, Political Economy, and have a rudimentary knowledge of Latin and Greek, and of at least one foreign language, preferably French. A knowledge of the Law of Corporations and Contracts and Real Property is also essential.

So far I have not dealt with much of a technical nature. His fourth year might be specifically devoted to Stresses in Structure, Design, etc. But the summer is the best time in which to familiarize him with practical work; the college cannot teach it, and ought not to try, in my view of the best course.

Of course, technical books are in use which cover the ground fully. Too much reliance should not be placed upon the formal lecture. I should require the student to get up his text and "quiz" him upon the work; the teacher would merely explain difficult points. The "quiz" not only brings out the student's ability to answer questions, but serves the more important object of training him to express correctly what he means. Incidentally, a "quiz" puts the entire class on the qui vive, and is the best means of impressing principles on the mind.

I think the teacher should select actual cases from time to time and place them before the class, requiring each student to work out his own solutions. In practice the problem, when it arises, is never before the practical man as a problem in Mathematics, Physics, or some other subject with a well-recognized source for solution, as is usual in the examples in the back of the text book. The data are all mixed up. Where am I to look for inspiration, to what branch of my studies does the matter belong? The thing needed is the educated mind. If I were to say there is too much instruction and not enough education, I should express about what I mean.

COMING MEETINGS.

American Society of Refrigerating Engineers.—December 6. Annual meeting in New York City. Secretary, Wm. H. Ross, 154 Nassau Street, New York City.

New Jersey Sanitary Association.—December 3-4. Annual meeting at Laurel-in-the-Pines, Lakewood, N.J. Secretary, J. A. Extón, 75 Beech Street, Arlington, N.J.

Montana Society of Engineers.—January 6-8. Annual meeting at Butte, Mont. Secretary, Clinton H. Moore, Butte, Mont.

American Institute of Chemical Engineers.—December 8-10. Annual meeting at Philadelphia, Pa. Secretary, J. C. Olsen, Polytechnic Institute, Brooklyn, N.Y.

American Association for the Advancement of Science.—December 27. Annual meeting at Boston, Mass. Secretary, L. O. Howard, Smithsonian Institution, Washington, D.C.

American Society of Agricultural Engineers.—December 28-29. Annual meeting at Ames, Iowa. Secretary, L. W. Chase, University of Nebraska, Lincoln, Neb.

Association of American Portland Cement Manufacturers.—December 14-15. Annual meeting at New York City. Secretary, Percy H. Wilson, Land Title Building, Philadelphia, Pa.

* M. J. Butler, Deputy Minister of Railways and Canals and chairman of the Intercolonial Railway Commission, in "The University Monthly."