usually will have less weight with so-called practical men than simple, common sense reasoning.

The importance of clear expression and convincing argument in the work of a mechanical engineer will appear forcibly under the sharp and not always considerate criticism of superiors, and opinions put in the form of reports of investigation must stand criticism if they are to become precedents for practice. A reputation for clear and correct reasoning and painstaking search to the bottom of things will be very helpful, and it will pay to prepare in every possible way to get such a name.

The late David L. Barnes once advised a young engineer to acquire, if possible, the reputation for being a "hustler," because, when once so considered, the idea would be permanent among his friends. Rapidity, combined with accuracy and thoroughness, should be sought for. It is surprising to what an extent these may be acquired by practicing intensity of application.

There has been a tendency for technically educated young men to seek work which was congenial and most directly in line with their studies, positions in mechanical engineering being particularly attractive. This is illustrated by the preponderance of applications for mechanical engineering positions by a large number of young men, graduates of technical schools, who have recently expressed their preferences. The railroad mechanical engineer is a very important and useful official, and his position is a highly desirable one, with intensely interesting duties. The demand however, is for a small number of such officers, while a large number of executives are wanted. On the Pennsylvania Railroad proper there are sixteen master mechanics and only one mechanical engineer. This is probably a fair proportion in the opportunities. To one who has studied the situation, it appears that there is a demand for men who can direct departments and undertake minor responsibilities as foremen and general foremen.

Promotion of young men on several railroads is very carefully managed, and whenever possible, the higher position is given in another shop,and not the one in which the advancement has been earned. This is mentioned because it recognizes a feature of human nature which should be understood because of its bearing upon the foundation work of young gradnates, and to this principle earnest attention is invited."

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### SUGAR, SHEEP AND CATTLE.

During the closing days of October last, it was the good fortune of the writer, in company with J. Sterling Morton of Nebraska City, and his son Joy, of the house of Joy Morton & Co., Chicago, Ill., to visit the noted Nebraska industrial and manufacturing plants located at Ames, Dodge Co., Nebraska—the "Standard Cattle Co." and the "Standard Beet Sugar Co.," both under the immediate supervision of that inde fatigable, thoroughly trained and successful manager, Richard M. Allen.

The "Cattle Company" is the older and better established of the two enterprises. Of it I may, in a future paper, deal more in detail.

I purpose at present to write more of the sugar plant, and beet sugar industry, as it is one in which I have ever held an abiding faith, as to its adaptability to Nebraska soil and climatic conditions; that it can and will become of immense value to the state as an agricultural factor.

I may be pardoned for stating in this connection that in the year 1872, I made a direct importation of sugar beet seed, experimented, and induced others to experiment in the culture of beets, and through the chemical department of the Nebraska State University, had analyzed beet products, showing a high per cent. of saccharine yield. From that date until the first sugar beet factory was erected at Grand Island, I both wrote and spoke much to encourage the introduction of this industry in Nebraska.

#### Sugar Making.

The factory at Ames was erected by individual enterprise, without subsidy, or aid other than provided by legislative enactment for the sugar product. For these reasons I confess to a feeling of more anxiety for its success than for the factories at Grand Island and Norfolk. Under these impressions, in so far as I was individually concerned, the visit here indicated was made.

From personal observation, together with a volume of carefully kept record information as to this plant, all was most gratifying. Every process and operation from seed planting, until the finest grade granulated sugar is turned into sacks for commercial use, is of the most systematic, latest improved order, plan and purpose. Every minutia is considered and conducted from this standpoint. The result is, the manager knows at all times exactly the cost, value and profits of both, crude and marketable products. Nothing goes to waste; every particle is utilized; every process is plain even to an untrained eye. One can follow and observe in detail, beets as they come from the cart, wagon, or car, until the pure sugar is reached in the packing room.

#### Cost.

Approximately $900,000 has thus far been expended on this factory and auxiliary buildings. Near or quite $50,000 more will be required to complete the plant. Five hundred tons of beets are worked up each day. Much of the machinery already installed is designed for double the present working capacity.

The aggregate area of beets contracted for this year, for use at the Ames beet sugar factory, is 4,200 acres. Of this the company furnished 2000 acres; tenants 625 acres, and outside growers 1575 acres. From this acreage 50,000 tons of beets were consumed. The minimum sugar content or yield this year was 200 pounds of granulated sugar per ton of beets. The climatic conditions of 1900, for highest per cent. saccharine yield, were not propitious. Too much rainfall when beets should have been maturing.

#### By Water.

During the year 1900, three hundred acres of the company's beets were entirely destroyed for sugar manufacturing purposes. To guard against this in the future, extensive ditching has been done in the valley lands, with best results.

For the month of October, 1900, fifty-three families were employed in the beet fields under cultivation by the company. Their monthly wages ranged from $70 to $254, on average of $105.37 per family. The farm pay roll for the year 1900 was $129,000.

#### People Aided.

The class of people to whom beet culture proves most helpful and beneficial are tenant farmers and farm laborers. It is possible for this class of laborers to obtain from a small farm of say 30 or 40 acres, better returns than would be possible with other crops in open market. From such size small farm, there should be realized, under average favorable conditions, $2,000 to $2,400 a year.

#### Feeding.

The company utilizes to advantage the offal or beet pumice from the factory. It is fed to both cattle and sheep with other ingredient ration factors. Thirty-one thousand head of sheep are being fed this winter.

The largest fatted cattle sale from this farm in one year was $540,000.

#### Dollars.

The total value of the two plants controlled and owned by the company—"Standard Cattle Company" and "Standard Beet Sugar Company"—is, in round numbers $2,000,000.

The beet sugar industry in the United States is only in its infancy. There are but thirty-three successfully operated factories in the United States. Three of these are located in Nebraska. There should be many more. In the humble opinion of the writer, there will be.

ROBT. W. FURNAS.

Brownville, Neb., Dec. 8, 1900.

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A Sad Story.—"My boy," said the great man, "I used to shine shoes myself." "Well, dey's a hull lot of de guys what is led astray."—Philadelphia North American.