Steam vs. Water Power.

The minimum capacity and height of fall of some of the leading water powers of the United States is as follows:

Holyoke, fifty feet, 17,000 horse power.

Cohoes, No. 3, one hundred and five feet, 14,000 horse power.

Lewiston, fifty feet, 11,000 horse power.

Lowell, thirty-five feet, 10,000 horse power.

Lawrence, twenty-eight feet, 10,000 horse power.

Turner's Falls, thirty-five feet, 10,000 horse power.

Manchester, fifty-two feet, 10,000 horse power.

Paterson, thirty-five feet, 1,100 horse power.

Passaic, N. J., twenty-two feet, 900 horse power.

Birmingham, twenty-two feet, 1,000 horse power.

Fall River, with at least 500,000 more cotton spindles than any other town or city in the United States, is operated wholly by steam power.

Manufacturers have been heard to say they would not move across the street for the sake of substituting water for steam, considering the irregularity of most water powers. A more moderate statement is that of the manager of a prominent woolen mill on the seaboard, whom the writer asked if it would not be cheaper to run his mill by steam than by water. The answer was: "For a mill located as mine is, steam is the cheaper. I use half anthracite screenings and half culm coal from Nova Scotia. The average cost of both kinds of fuel landed on our wharf is $3.25 per ton, and at that figure steam is cheaper than water."—*Textile Gazette.*

Estimating the Value of Tanning Substances.

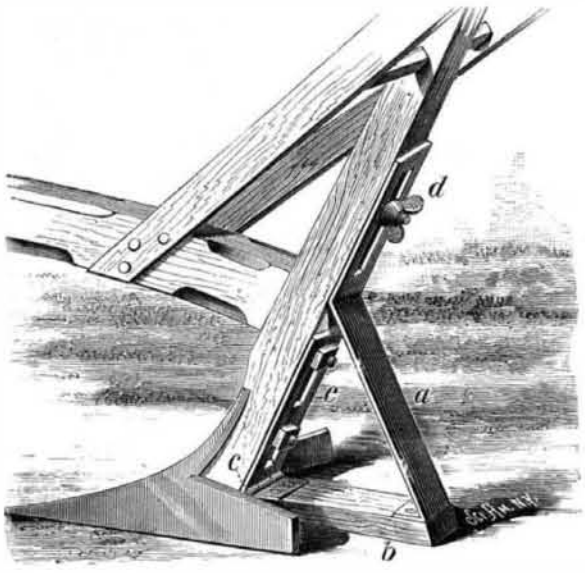
Prof. A. Vogel estimates the tannin in the following manner: 1 gramme of glue (gelatine) is dissolved in 100 c. c. of a solution of sal ammoniac, saturated in the cold, by the aid of heat. When cold it is standardized with tannin in such a way that 100 c. c. of the solution corresponds to 1 gramme of tannin.

Four grammes of the material to be assayed are cut up fine and moistened with water, left standing for 24 hours exposed to the air, then boiled in water, which is to be renewed three times, so that the total quantity of liquid will equal about 300 c. c. The previous moistening renders the extraction much more complete than when it is boiled at first.

When cold 20 c. c. of this solution is mixed with 20 c. c. of the cold saturated sal ammoniac solution, and into this mixture the glue solution is run from a burette, until on taking out a drop on a watch glass and adding a solution of tannin, a slight turbidity is noticeable. The precipitate settles so as to leave a clear solution above.—*Landw. Ver. Bayern.*

PLOW GAUGE.

The plowshare or cultivator shovel is attached to the foot of the stock by a bolt, so that the shovel fits in a recess in the stock, forming a shoulder that takes the thrust of the work. To the back of the stock is an apertured plate, *e*. Back of the plate is a block having a projection fitting in the aperture of the plate so as to form guides in which slides the plate. This projection is slightly thicker than the plate, so that the bolt may be tightened without binding the plate fast to the stock, to which the plate may be tightened by an upper bolt to secure the forward end of the shoe, *b*, at a proper level to suit the style of plowshare. The gauge shoe, *b*, is wedge shape or vertically thinner at the front where it



HOLT'S PLOW GAUGE.

is connected to the plate by a hinge joint, thus allowing a free swing to the rear end, which is connected to the stock by a bent bar, *a*, held to the stock adjustably by a bolt passing through the stock and a block for guiding the plate. The bar is locked by the nut, *d*. The gauge may be adjusted as desired without loosening the connection of the share with the stock, and when it becomes necessary to change the stock it may be readily done by running off the nut, *d*, and swinging the bar and shoe forward on the hinge entirely free from the bolt connections of the plowshare.

This invention has been patented by Mr. Theodore Holt, of Lexington, Texas.

SHEEP GATE.

The design of this invention is to facilitate the feeding of sheep. The gate is constructed with journals upon the projecting ends of the upper bar, which work in slots in the upper ends of the gate posts, and is provided with a lever handle by which it may be raised. To the handle is secured a catch hook, B, which is placed over the pin, C, when it is expedient to keep the gate up. One end of the upper bar of the gate is extended, and from the end of the extension is hung the weighted box, E, so that the weight of the gate is counterbalanced; and as the upper part of the post swivels at A, the gate can be swung open to admit teams or large animals

SCOTT'S SHEEP GATE.

if necessary. The forward part of the slotted upper end of the post, D, is shortened, so that the longer rear part will serve as a stop for the journal of the bar to strike against when the gate is swung shut, thus preventing the journal from swinging over.

This invention has been recently patented by Mr. James W. Scott, of Uhrichsville, Ohio.

Death of a Japanese Student.

Prof. Max Müller, in the London *Times* of Sept. 25, gives the following interesting account of the exemplary life of a Japanese student at Oxford University, whose death is chronicled from his home in Japan.

Kenjin Kasawara was a young Buddhist priest who, with his friend Bunyia Nanjio, was sent by his monastery in the year 1876 from Japan to England to learn English in London, and afterward to study Sanskrit at Oxford. They both came to me in 1879, and, in spite of many difficulties they had to encounter, they succeeded, by dint of hard, honest work, in mastering that language, or at least so much of it as was necessary for enabling them to read the canonical books of Buddhism in the original—that is, in Sanskrit. At first they could hardly explain to me what their real object was in coming all the way from Japan to Oxford, and their progress was so slow that I sometimes despaired of their success.

But they themselves did not, and at last they had their reward. Kasawara's life at Oxford was very monotonous. He allowed himself no pleasures of any kind, and took little exercise; he did not smoke, or drink, or read novels or newspapers. He worked on day after day, often for weeks seeing no one and talking to no one but to me and his fellow worker, Mr. Bunyia Nanjio. He spoke and wrote English correctly, he learned some Latin, also a little French, and studied some of the classical English books on history and philosophy.

He might have been a most useful man after his return to Japan, for he was not only able to appreciate all that was good in European civilization, but he retained a certain national pride, and would never have become a mere imitator of the West. His manners were perfect—they were the natural manners of an unselfish man. As to his character, all I can say is that, though I watched him for a long time, I never found any guile in him, and I doubt whether, during the last four years, Oxford possessed a purer and nobler soul among her students than this poor Buddhist priest. Buddhism may, indeed, be proud of such a man. During the last year of his stay at Oxford I observed signs of depression in him, though he never complained. I persuaded him to see a doctor, and the doctor at once declared that my young friend was in an advanced stage of consumption and advised him to go home. He never flinched, and I still hear the quiet tone in which he said: "Yes, many of my countrymen die of consumption." However, he was well enough to travel and to spend some time in Ceylon, seeing some of the learned Buddhist priests there and discussing with them the differences which so widely separate Southern from Northern Buddhism. But after his return to Japan his illness made rapid strides. He sent me several dear letters, complaining of nothing but his inability to work. His control over his feelings was most remarkable.

When he took leave of me his sallow face remained as calm as ever, and I could hardly read what passed within. But I know that after he had left he paced for a long time up and down the road, looking again and again at my house, where, as he told me, he had passed the happiest hours of his life. Once only, in his last letter, he complained of his loneliness in his own country. "To a sick man," he wrote, "very few remain as friends." Soon after writing this he died, and the funeral ceremonies were performed at Tokio on the 18th of July. He has left some manuscripts behind, which I hope I shall be able to prepare for publication, particularly the "Dharma saugraha," a glossary of Buddhist technical terms ascribed to Nagârguna.

But it is hard to think of the years of work which are to bear no fruit; still harder to feel how much good that one good and enlightened Buddhist priest might have done among the 32,000,000 of Buddhists in Japan. *Have, pia anima!* I well remember how last year we watched together a glorious sunset from the Malvern Hills, and how, when the western sky was like a golden curtain, covering we knew not what, he said to me, "That is what we call the eastern gate of our Sukhavati, the Land of Bliss." He looked forward to it, and he trusted he should meet there all who had loved him, and whom he had loved, and he should gaze on the Buddha Amitabha—*i. e.*, "Infinite Light."

Bisulphide of Carbon a Cause of Insanity.

California physicians who have attended various cases of trouble arising from the poisonous properties of bisulphide of carbon, have become satisfied that the inhalation of the vapor of this substance will produce insanity. The bisulphide is used in Los Angeles County to prevent the spread of the grape disease, phylloxera. Several strong and healthy men who have been exposed to the fumes of the vile stuff have become insane. It may be a subject worthy of investigation whether other deleterious gases may not in like manner affect the human brain.

FENCE.

The fence shown in the accompanying engraving is cheap, yet strong and substantial, requires but little ground space, offers little or no obstruction to the clearing away of weeds from about it, and can be quickly and easily set up, removed, or repaired. The posts have the general form of a ∧ connected at top and bottom by brace bars, and are set in sockets of earthen tiles. The rails rest upon the upper brace bars, the overhang of the inner edges of the tops of the posts serving to lock the overlapped ends of the rails, thus doing away with special fastenings for this purpose. Around the overlapped ends of the top rails a wire is wound, and at regular distances the wire is bent upon itself so as to form eyes in which the clip wires for securing the ends of the lower rails are fastened. The wire hangers are provided for each side of the post, and the ends of the lower rails are kept apart, thereby saving the material that would be necessary if they overlapped, and also facilitating the removal of any particular panel. The ends of adjacent lower rails may

READ'S IMPROVED FENCE.

be connected by splice bars held in place by the clip wires, and in localities visited by violent winds the fence may be anchored by strong galvanized wires passed around the splice bars and fastened to plates firmly embedded in the ground. The fence may be constructed with only one hanger at each panel joint by attaching a double number of clip wires. The panels may be strengthened by crossed wooden or metallic braces. The metallic post shown at the left of the engraving leaning against the fence, may be substituted for the wood.

This invention has been patented by M. John W. Read, of West Salem, Ohio.