

Correspondence.

Preservation of Iron.

To the Editor of the Scientific American :

The author of the article entitled "The Preservation of Iron and Steel Ships" (which appears in the SCIENTIFIC AMERICAN of December 17, credited to the *Engineer*), in the course of his remarks upon oxidation of iron (and steel), says: "Oxidation engenders further oxidation. Hence the necessity of frequently scaling the surface of iron which is permitted to oxidize at all."

The old-time shipmasters were aware of the fact mentioned in the foregoing quotation. Witness the ancient doggerel, descriptive of a sailor's duties: "Six days shalt thou work, and do all that thou art able; and on the seventh, scrape the anchor and pound the cable." J. M. G.

Dumb Bell Therapeutics.

To the Editor of the Scientific American :

In your issue of January 7, you refer to Dr. Sohli's favorite prescription for habitual constipation. Dose for an adult, one 4 lb. cannon ball to be rolled about upon the abdomen in the morning, say 5 or 10 minutes, or until it produces the desired effect. This is better than medicine, but cannon balls are not easily procured.

Hence, I would suggest that a dumb bell will serve as well or better, and can be obtained at any hardware store. And the dumb bell gets in more work, because, having two butt ends, it kneads in two places at once. Should weigh 6 to 8 lb. The dumb bell—the great blood purifier, mental stimulant, and moral restorative—also gets other exercise out of the man, because he is often tempted to pick it up and go through the dumb bell motions. S. N. STEWART.

Philadelphia, January, 1888.

Prof. Swenson's Sugar Patent.

To the Editor of the Scientific American :

If patent No. 371,528 was granted to Prof. Swenson for the device of neutralizing the organic acids in the juice of the sorghum plant with lime, it might possibly be revoked on other grounds than those mentioned in the United States Senate the other day.

As early as the summer of 1881, H. A. Weber and M. A. Scovell, professors of chemistry at the Illinois State University, made substantially the same discovery, and during the years 1882-83 superintended the construction of factories at Champaign and Hoopston, Ill., and at Sterling, Kan.

The writer was engaged at the Champaign factory in neutralizing the juice, and knows whereof he speaks. The juice was pumped to tanks in the upper part of the factory, where it was treated with sufficient lime water to exactly neutralize the acids present, the tests being made with litmus paper. The invention was a decided success, and several hundred barrels of sugar were produced from each of the factories. The article produced was nearly pure sucrose, and sold readily as C sugar. The reduction of the tariff, however, so reduced the price as to render the business unprofitable, and all the factories were closed.

In the Weber-Scovell process the juice was removed from the cane by means of crushers, but whether this fact has any bearing on the question of priority of invention I know not. Certain it is that the Weber-Scovell process was much discussed at the time, and one man came all the way from Russia to learn it.

H. P. LITTLE.

Sadorus, Ill., January 3, 1888.

[Prof. Swenson's patent, as we understand it, covers the use of lime in the diffusion baths. If this is not original with him, the patent would fall. The use of lime for correcting the acidity of expressed juice has long been practiced, and this is not claimed by Prof. Swenson.—Ed.]

Use of Lime to Neutralize Sorghum Juice.

To the Editor of the Scientific American :

I read in the SCIENTIFIC AMERICAN of December 31, 1887, an article on Prof. Swenson's patent for neutralizing the acid in sorghum cane juice by the use of lime. Have also read numerous articles in different papers on the same subject, but have looked in vain for the statement of a fact which I should think would have found its way into the papers before this. The fact is this, namely, that Prof. Swenson is not the first to use lime to neutralize the sorghum juice. Lime was used for this purpose by Profs. Weber and Scovell at the Champaign (Ill.) sugar factory in 1882, and again by Prof. Scovell at Sterling, Kan., during the fall of 1883. I was night engineer in the Sterling factory, and know whereof I speak.

My recollection is that Profs. Weber and Scovell secured a patent on this very idea of using lime. At any rate, they took out some patent for making sugar from sorghum, and for that reason their connection with the State University at Champaign was severed.

It was quite a surprise to me to learn that Prof. Swenson had patented this five-year-old idea. I think

a little investigation will show that it is valueless, to him as least.

Prof. Weber is now professor of chemistry at the Ohio State University, Columbus, O., and Prof. Scovell occupies a similar position at Nashville, Tenn., I think. A correspondence with either of them will develop whether I am mistaken about their patent covering the ground claimed by Prof. Swenson or not.

About their using lime to neutralize the acid in the juice I am positive, for I have seen it done many times. The juice was always tested afterward with litmus paper.

Whether Profs. Weber and Scovell's patent did or did not cover the use of lime, they and a number of others can testify that they used it long before Prof. Swenson, though not on diffusion juice. But would that make any difference?

I trust that my statement may interest you sufficiently to investigate, and see if I am not right in surmising that Prof. Swenson's patent is invalid.

C. N. ROBERTS.

Jefferson, Cook County, Ill.

[In Professor Swenson's patent, the claim covers the use of lime with the chips in the diffusion bath. If this is not new, the claim falls. As we understand the patent, no claim is made for the broad or general idea of neutralizing sorghum juice with lime.—Eds.]

Six Years' Labor Troubles.

The Boston *Herald* presents the following abstract of Commissioner Carroll D. Wright's third annual report of the Bureau of Labor, which relates entirely to strikes and lockouts for the period of six years ending December 31, 1886. It gives the result of the first general investigation ever made by any nation of the facts concerning strikes and lockouts for any extended period or for any wide extent of territory. The report covers about seven hundred printed pages, and gives the details of each strike and lockout occurring in the United States during the period named. It exhibits the facts belonging to each industrial disturbance for each locality where trouble was found, without attempting to establish or decide upon the connection between them. The following table shows the number of strikes occurring during each of the last six years, the number of establishments involved, and the average number of establishments involved in each strike:

Years.	Strikes.	Establishments involved.	Average no. of establishments involved in each strike.
1881.....	471	2,928	6.2
1882.....	454	2,105	4.6
1883.....	478	2,759	5.8
1884.....	443	2,367	5.3
1885.....	645	2,284	3.5
1886.....	1,412	9,893	7
Totals.....	3,903	22,336	5.7

In 1887 there were, according to the best information obtainable, 853 strikes, details of which are not available. The report shows that during the six years covered by the investigation, New York had the largest number of establishments affected both by strikes and lockouts, there being for the former 9,247 and for the latter 1,528.

The building trades furnished 6,060 of the total number of establishments engaged in strikes. The total number of employes involved in the whole number of strikes for the entire period is shown to have been 1,318,624. The number of employes originating the strikes was 1,020,832. The number of employes in all establishments before the strikes occurred was 1,662,045, while the whole number employed in the establishments involved after the strikes occurred was 1,636,247—a loss of 25,798. There were 103,038 new employes engaged after the strikes, and 37,483 were brought from other places than those in which the strikes occurred.

In 2,182 establishments lockouts were ordered during the period named. In these there were 173,995 employes before the lockouts occurred and 169,436 after, while the number actually locked out was 159,548. There were 13,976 new employes secured at the close of the lockouts, and 5,682 were brought from other places than those in which the lockouts occurred.

"It should be remembered, however," says the report, "that these figures do not represent the actual number of individual establishments or different employes engaged, as in many cases there have been two or more strikes or lockouts affecting the same establishment in the same year. In such cases the establishments and the number of employes engaged are duplicated."

Of the whole number of employes involved in strikes during the six years, 88.56 per cent were males and 11.44 per cent females. Of those in lockouts during the same period, 68.78 per cent were males and 31.22 per cent females.

An examination of the tables appended to the report shows that New York, Pennsylvania, Massachusetts, Ohio, and Illinois represent 74.74 per cent of the whole number of establishments affected by strikes throughout the country and 90.80 per cent of the lockouts. These five States, it is stated, contain 49 per cent of all the manufacturing establishments, and employ 58 per cent of the capital invested in mechanical industries in the United States. Of the 22,336 establishments in

which strikes occurred, in 18,342, or 82.12 per cent of the whole, strikes were ordered by labor organizations, while of the 2,182 establishments in which lockouts occurred, 1,753, or 80.34 per cent, were ordered by combinations of managers. Of the whole number of establishments temporarily closed for business, 13,443, or 60.19 per cent, were on account of strikes; on account of lockouts, 62.60 per cent. The average duration of stoppage on account of strikes was 23.1 days, and for lockouts 28 days.

The results of the strikes, so far as gaining the objects sought are concerned, are shown to be as follows: Success followed in 10,407 cases, or 46.59 per cent of the whole; partial success in 3,004, or 13.45 per cent of the whole; and failure followed in 8,910 cases, or 39.89 per cent of the whole. By lockouts, 564 establishments, or 25.85 per cent of the whole, succeeded in gaining their point; 190, or 8.71 per cent, partly succeeded; and 1,305, or 59.80 per cent, failed.

As to the causes or objects of strikes, it is shown that increase of wages was the principal one, 42.44 per cent. The other leading causes are given as follows: For reduction of hours, 19.45 per cent; against reduction of wages, 7.75 per cent; for increase of wages and reduction of hours, 7.67 per cent; against increase of hours, 6.2 per cent. Total for the five leading causes, 77.83 per cent. All other causes, 22.17 per cent.

Disclaiming absolute accuracy, the report gives the losses of employes and employers resulting from strikes and lockouts as follows: Losses to strikers during the six years, \$51,816,165; loss to employes through lockouts for the same period, \$8,132,717, or a total wage loss to employes of \$59,948,882. This loss occurred for both strikes and lockouts in 24,518 establishments, or an average loss of \$3,445 to each establishment, or nearly \$40 to each striker involved. The assistance given to strikers for the same period, as far as ascertainable, amounted to \$3,325,057; to those suffering from lockouts, \$1,105,538, or a total of \$4,430,595. These amounts, however, the Commissioner says, are undoubtedly too low.

The employers' losses through strikes for the six years amounted to \$30,732,653; through lockouts, \$3,432,261; or a total loss to the establishments involved of \$34,164,914.

The tables also show that the chief burden of strikes was borne by 13 industries, viz.: Boots and shoes, 352 establishments; bricklaying, 478; building trades, 6,060; clothing, 1,728; cooperage, 484; food preparations, 1,419; furniture, 491; lumber, 395; metals and metallic goods, 1,595; mining, 2,060; stone, 468; tobacco, 2,959; transportation, 1,478. These represent 89.35 per cent of the whole number subjected to strikes. In lockouts, five trades bore 80 per cent of the whole burden, as follows: Boots and shoes, 155 establishments; building trades, 531; clothing, 773; metals and metallic goods, 76; and tobacco, 226; or a total of 1,761.

Besides completing the field work for this report and the compilation of the information, the bureau has carried on almost to completion the investigation begun last year concerning the moral, physical, and economical conditions of the workingwomen of great cities, and has continued its investigation into the cost of the distribution of great staple products. It has also undertaken, according to congressional instruction, the collection of statistics of marriage and divorce in the United States, a report of which may be submitted before the close of the present session of Congress.

Myopia.

A very sensible decree has just been issued by the Austrian minister of public instruction, forbidding the use of books printed with small type in public schools, as shortsightedness is so prevalent among school children in Austria. Scientific supervision might very properly be given to school books in this country, attention being especially directed to the size of the type, length of line, and spacing of letters and lines. In the works published by the Clarendon Press no fault can be found in these respects, and speaking generally the school books of this country are well printed. The chief fault in German books is their adherence to the very dazzling Old English shape of the letters, which certainly severely tries the eyes by necessitating very close attention, and the evil effects of this is aided by the paper being coarse and by the light supplied being usually insufficient.—*Lancet*.

THE total wheat crop of the world is about 2,000,000,000 bushels, and at least 1,500,000,000 bushels are consumed in the countries in which it is grown, leaving a balance of 500,000,000 to supply countries growing no wheat or growing less than they consume. Speculation deals only with this balance that goes into general trade, and the speculators of the world in a single year will sell or transfer in their peculiar way forty or fifty times 500,000,000 bushels of wheat. In New York a single day sometimes witnesses a sale or transfer of 30,000,000 bushels of wheat. The damage done by speculation consists in lowering the price of the whole amount of actual wheat by this enormous inflation of "paper wheat," not a bushel in a thousand of which is ever delivered.—*Milling World*.