

finely-powdered loaf sugar  $\frac{1}{2}$  lb., essence of lemon 20 drops; mix; 2 or three spoonful make a very pleasant glass of extemporaneous lemonade. Another—Powdered sugar 4 lbs.; citric or tartaric acid 1 oz.; essence of lemon 2 dr.; mix well. As last. Very sweet and agreeable.

**Tinning.**—Plates or vessels of brass or copper, boiled with a solution of stannate of potassa, mixed with turnings of tin, become, in the course of a few minutes, covered with a firmly attached layer of pure tin. A similar effect is produced by boiling the articles with tin filings and caustic alkali, or cream of tartar. In the above way, chemical vessels made of copper or brass may be easily and perfectly tinned.

**New Tinning Process.**—The articles to be tinned are first covered with dilute sulphuric acid, and when quite clean in warm water, then dipped in a solution of muriatic acid, copper and zinc, and then plunged into a tin bath to which a small quantity of zinc has been added. When the tinning is finished, the articles are taken out and plunged into boiling water. The operation is completed by placing them in a very warm sand bath. This last process softens the iron.

**Kustitien's Metal for Tinning.**—Malleable iron 1 lb., heat to whiteness; add 5 ounces regulus of antimony, and Molluca tin 24 pounds.

#### The Water Supply of London.

A London weekly paper says:—Three of the great water companies extend their suction pipes of supply as far as Hampton. Miles and miles into the country we may see great mains a yard in diameter, dipping under the Thames, crossing the deep ditches, and passing along the fields and furzy commons, at certain points intercommunicating with each other, in case either may require temporary help. The far off source is little dreamed of by the thirsty soul, who quaffs from the drinking fountain in the crowded street.

He little fancies that he is sucking from a stream through ten miles of iron pipe, the end of which dips into the Thames close to Wolsey's pleasant palace. The great mains of all the companies are thirty six inches in diameter, and it must be remembered that they are free and fully charged at all times, so that in case of fire the fireman has only to turn the plug to get any quantity of water he requires. In some cases—such as at the great fire in Tooley street—thousands of tons of water are thus abstracted gratuitously without interfering with the supply to the houses.

At the beginning of the present century, the mains, indeed all the pipes, were wooden—the trunk of trees bored out—and in no case of more than one foot in diameter. How the metropolitan giant must have grown, the size of his present iron arteries is a proof. The mains of the eight water companies not only supply London proper, but push far out into the country, invading even the agricultural districts, and supplying its farms. They distribute in the aggregate upwards of 100,000,000 of gallons daily, through 30,000 houses and factories, through capillary pipes upwards of 7,000 miles in length.

If all the water daily used in this great city were collected in one great reservoir, it would cover seventy acres in extent and six feet in depth. As the spectator watched this great expanse of water, he would see it hour by hour drained to the bottom by the collective millions in the metropolis as calmly and noiselessly as a cup is drained by a dusty roadside traveler. The collective iron heart, the steam engines which propel this flood, possesses a force of not less than nine thousand horses.

#### The Art of Agriculture.

The art of agriculture consists in three things—in keeping the soil rich, light, and free from weeds. If this is done any plant will grow vigorously, if it is not done, no plant will grow.

IN MAN, there is but 6 ounces' weight of stomach to 100 lbs. of body, which is one reason why our food must be in a concentrated form, and why, although the potato or other vegetables may keep us in good flesh, yet to sustain the energies of the system, particularly for those who do the most labor, the greater concentration of a meat diet is absolutely essential.



#### Rollers Under Slide Valves.

Messrs. Editors:—A remark on page 47 relating to the large engines for the new fast frigates, explaining that the valves have steel rollers under their bottoms and under their steam faces to relieve the friction, says with justice that rollers for this purpose would seem to be difficult to regulate so as to be beneficial. The apparent or real difficulties have defeated all efforts at improvements in this direction until quite recently.

There are now a large number of government and private vessels and a larger number of locomotives running with such rollers. They are arranged according to a patent issued to Richard C. Bristol, of Chicago (now residing temporarily in New York), dated Nov. 13, 1860. This engineer has with untiring zeal labored on successive improvements in this line since 1858, and deserves the credit of contributing very largely by these improvements to overcome what might otherwise have been fatal difficulties in our new-school war vessels.

The rollers in all cases are less than two inches in diameter. Under the largest valves they are each about  $2\frac{1}{2}$  inches in length and are packed closely together in three lines, one line under each side, and one along a bearing provided in the middle, with liberty in each case to travel back and forward a distance equal to half the greatest travel of the valve. The rollers which take the weight of the valve are slighter and of far less consequence. All are of hardened steel, and hardened steel ways are mounted on the valve and also on the cylinder face to support the stress. They are made at first to take very little or no strain, but are very accurately turned of uniform size. As the face of the valve and of the cylinder rapidly wears off under the great friction the rollers begin to support the load and ultimately take nearly the whole of it without inducing leakage.

The Reading Railroad and the Connecticut River Railroad have each had one or more locomotives thus provided upwards of a year. The New York and New Haven Railroad, the New York and Erie, the Chicago and Fort Wayne, Atlantic and Great Western, Michigan Central, Milwaukee and La Cross, and several other important lines of Railroad have more recently applied the same to some of their locomotives. There are many points of importance to be attended to in carrying out the idea, but they have been successfully mastered.

THOMAS D. STETSON.

New York, Jan. 20, 1865.

[The rollers under the bottom to carry the weight of the valve strike us as being quite as important as the others, for at that point two metallic surfaces of greater or less area, according to the size of the valve, would be in contact, creating immense friction and adding very much to the labor on the connections. The Government seems to doubt the efficiency of the rollers in the case of the frigates, for the engines to these ships have their valves balanced by other means in addition to the rollers.—Ebs.]

#### New York Milk Business.

The milk received in New York comes to the city mostly by rail, and is brought from distances varying from ten to one hundred and fifty miles. The amounts received daily over the principal railroads are: Erie, 88,000 quarts; Harlem, 100,000 quarts; Hudson River, 16,000 quarts. To these amounts must be added 75,000 quarts produced by the city. Although many establishments sell nothing but undiluted milk, still old dealers are honest enough to say that to any calculation concerning the retail business, it is perfectly safe to add twenty per cent for water. The following prices show the increase of rates since 1842. In that year milk was retailed for four cents a quart. In 1854 the price increased to five cents; in 1857 to six cents; in 1862 to seven cents; in 1863 to eight cents, and is now selling for twelve cents. Some idea of the magnitude of the milk business may be gained from the fact that there are over four thousand persons engaged in its distribution in the city. A very spirited rivalry has sprung up between

the retailers of milk in its crude form and those who condense it. Of the latter there are but three companies in the city; but the amount supplied by them is equal to the sale of at least ten companies dealing only in the crude article. It can be said generally that most companies engaged in the sale of milk have within the last five years sought to sustain an honest reputation by the sale of pure milk only.

#### MARKET FOR THE MONTH.

The great feature in the markets during the month of January was the great decline in gold, which fell at one time as low as 197. While gold is falling trade from first hands is almost wholly suspended, as jobbers are afraid that they will not be able to sell their goods at cost. On the 25th of the month gold had rallied a little, and prices of the leading staples compared with those at the close of December are as follows:—

	Price Dec. 20.	Price Jan. 25.
Coal (Anth.) $\frac{1}{2}$ 2,000 lb. . . . .	\$9 50 @ 10 50	\$12 00 @ 12 50
Coffee (Java) $\frac{1}{2}$ lb. . . . .	48 $\frac{1}{2}$ @ 50	47 @ 48
Copper (Am. Ingot) $\frac{1}{2}$ lb. . . . .	48 $\frac{1}{2}$ @ 49	45 @ 46 $\frac{1}{2}$
Cotton (middling) $\frac{1}{2}$ lb. . . . .	1 14 @ 1 15	84 @ 85
Flour (State) $\frac{1}{2}$ bbl. . . . .	\$9 45 @ 10 25	\$9 20 @ 9 70
Wheat $\frac{1}{2}$ bush. . . . .	\$2 12 @ 2 80	Nominal.
Hay $\frac{1}{2}$ 100 lb. . . . .	\$1 50 @ 1 65	\$1 50 @ 1 90
Hemp (Am. drs'd) $\frac{1}{2}$ tun. . . . .	340 00 @ 400 00	\$320 00 @ 390 00
Hides (city slaughter) $\frac{1}{2}$ lb. . . . .	13 @ 13 $\frac{1}{2}$	13 @ 13 $\frac{1}{2}$
India-rubber $\frac{1}{2}$ lb. . . . .	70 @ 1 20	72 @ 1 20
Lead (Am.) $\frac{1}{2}$ 100 lb. . . . .	15 00	13 00
Nails $\frac{1}{2}$ 100 lb. . . . .	\$8 50 @ 9 00	8 50 @ 9 00
Petroleum (crude) $\frac{1}{2}$ gal. . . . .	50 $\frac{1}{2}$ @ 51	45 @ 45 $\frac{1}{2}$
Beef (mess) $\frac{1}{2}$ bbl. . . . .	\$19 00 @ 24 00	19 00 @ 24 00
Salt-peter $\frac{1}{2}$ lb. . . . .	30	30
Steel (Am. cast) $\frac{1}{2}$ lb. . . . .	19 @ 34	19 @ 31
Sugar (brown) $\frac{1}{2}$ lb. . . . .	16 $\frac{1}{2}$ @ 25	16 @ 22
Wool (American Saxony fleeces)		
$\frac{1}{2}$ lb. . . . .	90 @ 1 10	90 @ 1 10
Zinc $\frac{1}{2}$ lb. . . . .	18 @ 19	18 @ 19
Gold . . . . .	2 24	2 05

#### Internal Revenue from New York City.

Besides the duties on imports paid by the City of New York, the entire receipts of the National Government here, from ordinary collections, which to the end of December were \$27,000,000, and from stamps and special collections about \$7,000,000 more, foot up \$34,000,000.

The internal revenue estimates for the ensuing year, including \$30,000,000 from the Assessors' lists, are \$36,000,000. Good judges believe that the aggregate sum which will be returned to the close of the year will not be less than \$40,000,000.

#### RECAPITULATION.

Receipts from Collectors of Internal Revenue in New York to Dec. 1, 1864. . . . .	\$27,000,000
Receipts from sales of revenue stamps. . . . .	6,000,000
Receipts from banks, insurance companies, and other sources. . . . .	1,000,000
<b>Total internal revenue in two years and three months in New York. . . . .</b>	<b>\$34,000,000</b>
<i>Estimates for 1865.</i>	
Receipts from Collectors of Revenue. . . . .	\$30,000,000
Receipts from sales of revenue stamps. . . . .	5,000,000
Receipts from banks and other sources. . . . .	1,000,000
<b>Total estimate of internal revenue in New York from Jan. 1 to Dec. 1, 1865. . . . .</b>	<b>\$36,000,000</b>

#### Newspaper Agency Business.

As an interesting item of news, and in order that our readers may have some idea of the enormous business done in this city, at the present time, by newspaper agents, we will mention the fact that the cash receipts of the American News Company for the eleven months ending with the 31st of December last, reached the sum of \$2,226,872 83. Within that time forty millions of newspapers alone were handled and packed by persons in the employ of the company. Beside newspapers there were shipped to agents in various sections of the States a vast number of magazines, books, stationery, etc. For wrapping paper and twine with which to pack this vast mass of literary matter the company paid twelve thousand dollars. This is the business of one news agency alone. Ten years ago, in 1854, the total sales abroad by newspaper, book and periodical agency in this city did not exceed three-quarters of a million of dollars. These results are most gratifying, as they assure us that intelligence keeps pace with population, and that the general prosperity of the people has not been checked materially by the insurrection now raging in the slave states.

**BINDING.**—Those of our subscribers who wish to preserve their numbers of the SCIENTIFIC AMERICAN for future reference, can have them substantially bound in heavy board sides, covered with marbled paper, and leather backs and tips, for \$1.00 per volume.