

Four Years of Industrial Progress.

The following interesting statistics are taken from a Treasury Department statement of the financial and economic transactions of the United States during the past four years:

	For year ended March 1, 1878.	For year ended March 1, 1879.	For year ended March 1, 1880.	For year ended March 1, 1881.	Total.
Exports of live stock.....	\$4,205,893 00	10,853,241 00	\$12,065,459 00	\$20,681,738 00	\$47,806,331 00
Exports of other food.....	269,752,809 00	326,752,030 00	374,568,342 00	456,244,111 00	1,427,317,292 00
Total exports merchandise.....	639,485,209 00	725,856,296 00	767,875,740 00	915,271,563 00	3,048,488,808 00
Specie.....	47,103,365 00	26,391,143 00	23,722,972 00	16,028,803 00	113,446,283 00
Total imports merchandise.....	475,838,318 00	432,094,129 00	555,569,696 00	703,139,889 00	2,166,642,032 00
Specie.....	25,209,050 00	26,999,280 00	92,714,238 00	98,570,197 00	243,492,765 00
Production of cotton, number of bales..	4,485,423	4,811,265	5,073,531	5,761,252	20,131,471
Production of wool, number of pounds..	207,000,000	211,000,000	232,500,000	264,000,000	914,500,000
Production of wheat, number of bushels..	364,194,146	430,123,400	448,756,630	480,849,723	1,713,922,899
Production of corn, number of bushels..	1,342,558,000	1,388,218,750	1,547,901,790	1,537,535,900	5,816,214,440
Production of pig iron, number of tons..	2,066,594	2,301,215	2,741,853	3,300,000	10,409,662
Production of coal, number of tons....	54,308,250	52,130,554	65,808,398	69,200,934	241,448,136

NEW INVENTIONS.

Mr. J. F. Smiths, of Zionsville, Pa., has patented a fly net for horses, so constructed that the lash cannot slip into the ribs, but will be firmly knotted thereto in a simple and effective manner. The lash of the nettings is attached by passing it through the ribs from the outer to the inner side, then passing it over the lower edge, outer side and upper edge of the rib, and then through the same from the inner to the outer side.

Messrs. John Dimelow and Robert M. Peadro, of Round Rock, Texas, have patented an improvement in the manufacture of hydraulic cement and lime from rotten or decomposed limestone. They first burn the decomposed stone, then subject it to currents of air or steam in a tightly closed receptacle, and finally sift the material either with or without grinding, by which a strong cement is obtained.

Mr. Elisha S. Griffith, of Ghent, Ky., has patented an insect-killer which consists of a bar or rod having a bowl at each end and pivoted in the middle, so that the heavier bowl descends. The device is placed in a tobacco or other field at night, both bowls filled with fuel, and fuel in one of the bowls is ignited. As the fuel burns the bowl containing it rises, and finally assumes a position above the other bowl, whereupon its embers will drop upon and ignite the fuel in the lower bowl. The insects are attracted to the flames and are destroyed.

Mr. Charles Hill, of Sodus Point, N. Y., has patented an apparatus for drying fruit by means of artificial heat. An asbestos lined case is provided with a novel elevating arrangement for carrying trays for holding the articles to be dried. The trays have network bottoms, and the circulation of heated dry air through the case (which latter, by virtue of its asbestos lining, retains the heat) is relied upon for desiccating the fruit.

Mr. Silas M. Bragg, of Hickman, Ky., has patented an adjustable sawing and routing machine for the more rapid manufacture of bed-rails, friezes, etc. The table of the machine has a circular saw and router at each end, with a movable carriage, whereby the piece is presented in such manner as to be operated upon at both ends simultaneously. The table may be shortened or lengthened to operate on different lengths.

Mr. Thomas T. Lotherington, of Houston, Texas, has patented a stencil-brush by which the waste of ink accompanying the use of ordinary stencil brushes is avoided; and whereby the time commonly lost in dipping the brush is also saved. A reservoir for ink is formed in the handle of the brush, and a valve feeds the ink to the bristles at such times and in such quantity as may be desired by the operator.

Mr. William B. Atkinson, of Franklin, Ky., has patented a fish trap of the kind composed of two hollow skeleton or wire jaws hinged together and closed by cords for trapping fish. He has provided improved means for suspending and opening the trap, and holding the jaws at such an angle as will facilitate their closing.

Mr. Edward P. Haff, of Brooklyn, N. Y., has patented a device for putting up cord balls, such as balls of twine, knitting cotton, etc., which protects the balls from soiling when exposed for sale or in use, and controls the unwinding in such manner as to prevent tangling. For this purpose a protective case guard or wrapping constructed of paper or other analogous cheap material is employed.

Mr. Benjamin Slusser, of Sidney, Ohio, has patented an improvement in excavators, which is an improvement upon a self-loading ditching machine or excavator for which letters patent No. 72,098, dated December 10, 1867, were granted to him. The present improvement secures a more perfect co-operation of the apron with the plow, and greater convenience in discharging the contents of the machine when loaded.

Mr. Orlando E. Lewis, of Urbana, Ohio, has patented an improvement in boots and shoes, by which leather is economized, durability is increased, and comfort to the wearer is secured. The front portion of the upper is turned outward at the lower edge and stitched to the sole. The front or wearing part of the sole is made of two pieces of leather of equal dimensions and similar shape, extending backward to form the shank, which latter is stiffened in the usual way.

Mr. George F. Newell, of Greenfield, Mass., has patented an improved feeding mechanism for sewing machines, which relates to that class of feeds in which a longitudinally-reciprocating rod or bar is arranged at right angles to the feed bar and imparts motion to the latter through a bell crank lever. The invention consists in a novel construction and arrangement of mechanism for raising and lowering the feed-bar, pushing it forward and backward, giving it an interval of rest, and for shortening and lengthening the stitch.

Mr. Walden Pickett, of Andover, Ohio, has patented an improved fruit crate, more particularly intended for holding boxes or baskets of small fruit, but which may also be used for peaches and other fruits. The crate is made in two sections and provided with a lid or cover. Each section accommodates a prescribed number of boxes, and is provided with removable bars having rabbeted ends, which permit their easy insertion between the slats of the sides of the sections. When baskets are packed the bars are removed; but when boxes are packed, which require less space than baskets, the bars are placed between the side slats to fill the space. The sections have also slatted bottoms, and are provided with false bottoms with slats made to fit between the slats of the principal bottom, which are used when large fruits are packed.

Mr. David Williams, of Eagleport, Ohio, has patented an improved kettle holder for supporting kettles and other kitchen utensils of different sizes over a fire. It consists of a legged ring and one or more inwardly beveled rings provided with downwardly and vertically projecting pins, the latter rings fitted to rest in and upon the legged ring, the pins serving also to keep the smaller rings in place.

Mr. Thomas F. Darcy, of New York city, has patented a reversible center-plate for furniture, such as the seats and backs of chairs, sofas, and the tops of tables, which permits of one side being upholstered in one style while the opposite side may be upholstered in another style. Devices for holding the plate firmly when reversed are supplied.

Mr. John D. Parker, of Kansas City, Mo., has patented a composing-stick gauge for printers' use, by which instead of setting the composing stick by leads (which often vary in length from imperfect cutting, thus giving trouble in locking forms), it is accurately set. The gauge consists in a metallic plate divided into rectangular sections of different lengths in "em" measurement.

Value of Sawdust.

We should hardly credit so large a story from a less reliable source than the *N. W. Lumberman*, but we presume the editor has the statistics at hand to confirm his assertions:

"In New York there are about 500 venders of sawdust, having a capital of \$200,000 invested, and doing a business amounting to more than \$2,000,000 annually. Forty years ago the mills were glad to have sawdust carted away; twenty-five years ago it could be bought for 50 cents a load, but the price has increased, and now it brings \$3.50 a load at the mills. It is used at the hotels, eating houses, groceries, and other business places. It is wet and spread over floors in order to make the sweeping cleaner work. Plumbers use a great deal about pipes and buildings to deaden walls and floors. Soda-water men and packers of glass and small articles of every kind use it, and dolls and some living creatures are more or less stuffed with it. Yellow pine makes the best sawdust, as it is the least dusty, and has a pungent, healthy smell. But any white wood dust will do. Black walnut sawdust will not sell and is burned."

How to Grind a Glass Plate.

It is sometimes useful to know how to impart a finely-ground surface to glass suitable, say, for a focusing screen. Mr. C. S. de Joux good-naturedly sends us, all the way from Mauritius, a simple method he has practiced, which certainly deserves to be recorded. Finely-ground sand or river mud—or, what is better still, the sediment from a grindstone—is well stirred up in a bowl of water, and after a few minutes the upper half of the liquid decanted off. The decanted liquid contains all the finer particles, and these, after subsiding, are collected in a watch glass. The sheet of glass is laid on a damp cloth spread upon a table, and the watch glass and mud used as a muller, the convex side of the watch glass supplying a good hold for the fingers. In a quarter of an hour a satin-like polish will be obtained, admirably adapted for focusing. A rinse with water will show if the grinding has been uniform.—*Photo. News.*

Cheap Paint.

Three hundred parts washed and sieved white sand, forty parts of precipitated chalk, fifty parts of rosin, and four parts of linseed oil are mixed and boiled in an iron kettle, and then one part of oxide of copper and one part of sulphuric acid are added. This mass is applied with an ordinary paint brush while warm. If it is too thick, it is diluted with linseed oil. This paint dries very rapidly and gets very hard, but protects woodwork excellently.—*Corps. Gras. Ind.*, 7, 13, 151.

Malaria in Italy.

The question whether it is possible to saturate the human system with some substance which, without prejudice to general health, would counteract the germs of malarial infection and enable persons to live in malarial districts with impunity at any time, is being studied by M. Tommasi-Crudeli. In the end of the seventeenth century arsenious acid (commonly called arsenic) was largely employed in the treatment especially of the graver forms of the disease, and though displaced to some extent since the discovery of quinine, is still used as being cheaper and sometimes efficacious where quinine is not. In some cases, too, the system will not bear the dose of quinine necessary. Now, M. Tommasi-Crudeli knows of cases where men had to pass the summer in the most unhealthy districts of the Agro Romano, and who were every year attacked by the fever till the last two years, when by a regular use of Fowler's arsenical liquor they have both enjoyed immunity and regained appetite and vigor. He is about to make experiments on animals to find (1) whether such immunity may be secured in a constant way; (2) what is the *minimum* daily dose of arsenious acid (in proportion to the body weight) which will make the system refractory to the malarial ferment. An extensive distribution of such a poisonous substance among an agricultural population would, no doubt, be attended with danger; and M. Tommasi-Crudeli suggests the use of the arsenic in some such way as that lately adopted at Caserta in the treatment of a grave malarial epidemic. The substance was supplied in the form of gelatine tablets (made by Decian, of Venice), each divided into 50 square pieces, easily detached, and each piece containing so much arsenic (2 mgr.). For the preventive purpose the proportion would be reduced.

The nature of malarial fever has been further elucidated by the researches of MM. Cuboni and Marchiafava. In the former researches by MM. Tommasi-Crudeli and Krebs (1879) it was a curious fact that the characteristic form of the *bacillus* was not found in the circulation of persons who had the fever, though largely in certain parts, the spleen and bone-marrow especially. It now appears that during the ingress of the fever, and also during the last period of the febrile intermittence, the blood of the whole body contains a considerable number of individuals of the parasitic species. These are mostly spore producing; and when, in the second period (up to the crisis) they are all, or nearly all, destroyed, one sees in the blood merely a number, sometimes enormous, of the small spores which have been liberated, and which in favorable conditions produce a new generation of *bacilli* in the same blood.

Think while you Read.

The *Teacher's Journal*, in an article on methods of study, reminds the student that the first essential to successful study is the power of concentration of thought. This power is largely a matter of habit and cultivation. Read five pages of history in a lackadaisical manner. Close the book and write out all you can remember. Then compare your production with the printed matter, and you will be able to judge of your proficiency. Read five pages more with fixed attention and a resolution to retain the subject, and compare as before. You will find a marked improvement. If your memory is treacherous read but very little, and always write out the subject. When you hear a sermon or address, *hear* it, and afterward reduce it to writing. Read no novels, and do not read aloud to please others unless you care (nothing) for the article yourself. A practiced reader can read aloud for hours and carry on an independent train of thought all the time. This ruins the faculty of study as well as the memory. Dismiss all other subjects but the one in hand. Let the ear be deaf to all sounds, and the eye blind to all sights. Let the sense of touch sleep, and smell and taste be as though they were not. A lesson learned in this state of mind will stay with you, and will not need to be "crammed" again the night before examination. It will be like lines carved deep into the rock, or chiseled on the Rosetta stone. The other method is the dim tracing of obscure letters in the sand, which the next wave obliterates.

MEDICAL GYMNASIUM.—A medical gymnasium was lately opened in Paris. It has been built in the Chaussee d'Antin, at an expense of £20,000, by a public company. About seventy mechanical contrivances of different descriptions have been arranged in a series of rooms. The greater number of these are worked by a steam engine, and all of them can be graduated by screws, so that the extent, duration, and velocity of motion can be regulated according to the direction of the physicians.

Photographing Music.

An English paper tells of a gentleman, who, on being asked to sing, produced from his pocket a little case which contained his music, photographed down to the size of note paper. He had duplicate copies of each song, and handed one to the accompanist, singing from the other himself. The expedient saved all the bother of bringing a roll of music, unfolding it, collecting it again, and so forth.

DRYING POTATOES.—Benjamin Wing, of Rochester, has been largely engaged in the business of supplying the Northwestern army, and his practice is to first slice the potatoes, then put them in a steam box three or four minutes to keep the starch in, and then subject them to drying. If not placed in the steam box, the starch would come out. When used, they are soaked, and are then like fresh potatoes.