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AGRICULTURAL IMPROVEMENTS.

EVERY department of American industry has been greatly improved within a very few years, and this is especially the case with agriculture. This affords cause for gratitude, because all those who are engaged in the professions, commerce and the common arts are dependent upon the surplus products of agriculture for sustenance. The present year has been unexampled in productiveness; the fields have yielded abundant harvests, and the orchards have been bowed down with heavy loads of golden fruit. "These blessings," as one said to us recently, "have put our farmers in good heart," and we judge from the cheerful tone of several discussions which have lately been held at agricultural society gatherings, that prosperity is acting as a wise stimulant to further enterprising action. With the great amount of intelligence which is now widely disseminated on agricultural subjects, old defects and new wants are becoming more generally known. This may surprise many persons who have imagined that the field for agricultural inventions was almost fenced in. Owing to the great number of patents which have been issued of late years for farmers' implements and machinery, many inventors have considered that the range for their efforts in this department was very circumscribed. We assure them such is not the fact, and the past affords us good grounds for this opinion. Fourteen years ago, the yearly issue of agricultural patents was 78; in 1859, it was 664, which is an increase of eight and a half times in these few years. When there were only 78 patents granted in one year, many persons thought that the end of improvements had arrived—that the plow had surely attained to perfection. In his report for 1846, Examiner Dr. Page indulges in a sort of lamentation over the paucity of agricultural inventions for that year, and he concludes with the mournful apothegm, "farming is up-hill work." Perfection cannot be attained without severe toil, and "there is no royal road to knowledge." Farming may be "up-hill work," but the toil of ascending the mountain peak is all forgotten when the summit is gained and the world seems spread out before our vision. Similar results have animated those who have devoted themselves to agricultural improvements. No field for the inventor's exploration has brought so many rich rewards for new discoveries; and yet we think it is just about as inviting as it was fourteen years ago. Although the McCormicks, Mannys, Peelers, Pitts and others have become rich as Crœsus by their patent harvesters, plows and grain separators, they have not exhausted the subject, and it is to this particular point we wish to direct attention.

On page 266 of the present volume of the SCIENTIFIC AMERICAN, we quoted the opinions of a writer in the New York *World*, respecting the defects of common plows and the benefits which would result from an entire revolution in the mode of preparing the soil for planting. A machine which would dig up and thoroughly pulverize the soil was recommended as a superior substitute for the common plows, which merely turn it over in furrows. This subject was also brought up at the meeting of the Farmers' Club, held in this city on the 22d ult., at which the secretary stated that, as there was to be another World's Fair in London in 1862, he "hoped some ingenious American citizen would invent a practical tilling machine which would rapidly pulverize the soil and put it in good condition for planting, and present it at the international exhibition." "There is now," he said, "no machine in existence capable of performing this labor, but I trust one will be brought out at the exhibition which will reflect credit upon American genius and industry." Here is a new want which inventors are called upon to supply by those specially devoted to agriculture. And if this is the case with such a venerable operation as that of plowing, it is reasonable to infer that many other operations in farming, as commonly practised, may also be greatly improved by a new class of machines, which will produce a revolution in the modes of executing them.

LIGHTING MANUFACTORIES BY WATER POWER.

The experiments with Way's electric light have demonstrated that a brilliant and constant light may be maintained without any other expenditure than that of mechanical power; but if the power is obtained by a steam engine, the cost of the fuel makes the light expensive. As our cotton and woolen manufactories that are driven by water power, almost all have a surplus of power in the winter months, the only reason during which they are lighted, would not the owners find this the best and cheapest plan for lighting their establishments?

An hour glass, containing a supply of mercury, would be placed in the middle of each room, just under the ceiling, and insulated wires, passing perfectly air-tight through the glass, would lead to a magneto-electric machine in any convenient part of the establishment. The wires would connect with the mercury in each end of the glass, and when the magneto-electric machine was turned by the water wheel, the current of electricity passing along the wires, would run through the slender stream of mercury flowing down from the upper chamber of the hour glass to the lower, the light being given out by the electric current as it darted from drop to drop of the mercurial stream. When the mercury had nearly all run down from the upper bulb of the glass to the lower, it would be necessary to turn the glass over, for which purpose it might be connected to simple clockwork, and the wires would be brought out of it through the axle on which it was hung. A separate machine would probably be required for each light, and the power demanded would be considerable, but the room would be filled with such a flood of light as was never yet seen in a manufacturing establishment, and all the current expense would be the very trifling outlay required to keep the apparatus in repair.

We expect to see before long the Lowell and Manchester manufactories illuminated at night as brilliantly as by day by the use of electricity in some manner, and most probably by the magneto-electrical machine and mercury light of Professor Way.

MOROCCO LEATHER DRESSING.

Although enameled oilcloth, having its surface finished to imitate morocco leather, has come into very extensive use during the past five years, still it does not seem to have injured the manufacture of the genuine article. Morocco dressing establishments are still increasing in number and extent. Real morocco leather is made of tanned goatskin; but the term is now, in a general manner, also applied to tanned sheepskin, which is colored and dressed with a polished and corded surface in imitation of morocco. Having been informed that the manufacture of sheepskin into colored leather was carried on extensively, and in a superior manner, in Albany, N. Y., by the firm of A. Williamson & Sons —old and experienced leather dressers—we recently embraced an opportunity of visiting their establishment, while briefly sojourning in the capital of the empire State. It is situated near the upper extremity of a street called Broadway, and although this street is very unlike its great namesake in New York, it can boast of a good morocco factory, in which some new and improved processes are carried on. Colored sheepskin is principally used for shoe bindings, and, in this establishment, the majority of the pelts are obtained green from sheep and lambs slaughtered in the vicinity. About 100,000 skins are dressed annually in it, and from these about half a million pounds of wool are obtained and sold.

The first process through which they are made to pass is that of soaking and softening by water, to fit them for receiving the unhairing preparation. Formerly hydrate of lime was sprinkled in the inside of each pelt; it was then folded over with the wool side out and laid down on the floor, sometimes called "the pit." In this manner a whole pile or heap was made, and a heating action was engendered by which the roots of the wool were loosened, so that the fleece could be easily pulled or scraped off on a table afterwards. This method of loosening the roots of the wool was tedious, occupying several days to complete, and the skins required constant watching, as they were liable to overheat and injury both to the wool and the gelatinous tissue. This was especially the case in warm weather; but a remedy for this trouble and these ills was lately introduced by the senior member of the firm, and is one of the most important improvements made, for many years, in this art. This is effected by a calcium orpiment compound, which they import and have also introduced among other manufacturers. It is made up into a thick creamy consistency, then applied to the inside of the skins which are folded over, wool side out, and laid in a heap, as before described. In twenty-four hours afterwards the skins can be deprived of their wool, and if they have to lie longer, no injury will result. In all cases the depilatory action is certain without injury to wool or skin tissue.

The next operation is that of washing the skins prior to unwooling them. This latter manipulation is executed by placing them upon an inclined bench, and rubbing off the wool with a blunt tool. The flesh side of the skins is also scraped to remove slime and loose flesh, after which they are ready for the liming operation. They are now placed in vats containing milk of lime (slacked lime mixed with water), in which they are treated for about two weeks. The office of the lime appears to be that of a corrosive agent for the removal of grease in the skins, as it would prevent the action of the tannic acid afterwards. The lime does not act upon the gelatinous tissue, which alone forms the leather when combined with a tanning agent. A new discovery to shorten and cheapen this part of the process would be invaluable.

The next operation consists in passing the skins through a bath of hen or pigeon manure, mixed with water, which softens them. After this they are washed and passed through a sour of dilute sulphuric acid, which neutralizes all the lime that may remain in the pores of the skin, converting it into a sulphate, which is easily removed by a good washing in moderately warm water. After this they are dipped into a solution of common salt, sewed up at the edges with the grain side out, to form bags partly filled with tanning liquor, inflated and tied. They are now placed in a tub containing an extract of Sicily sumac, in which they float and are kept in constant motion for several hours; and when they have absorbed a sufficient amount of the tannic acid in the sumac to convert the skin into leather, they are taken out, drained and rinsed; and if not to be colored, they are ripped out and dried in the atmosphere in sheds constructed for the purpose. They are stretched on boards, rubbed out to render them smooth, and tacked down so as to dry without wrinkling. These skins are generally filled three times with fresh liquor to tan them fully.

The next operation is that of coloring. If the color is to be applied topically by putting it on the surface with a sponge, the skins are first dried. If they are to be dyed in liquors, they are sewed so as to have the grain side out, then mordanted, and afterwards handled in a tub containing the coloring agents. Prussian blue colors are imparted by handling the skins first in a dilute solution of nitrate of iron for about an hour, then in a warm bath containing the cyanide of potash and a little sulphuric acid. A beautiful blue is thus dyed. A scarlet is prepared with a mordant of the muriate of tin and cream of tartar; the red color is afterwards obtained by handling them in an extract liquor of cochineal. Purple is dyed by applying a cochineal color on the top of a Prussian blue. Bronze is obtained from a strong extract of logwood and alum. After being dyed, the skins are rinsed, stretched on boards, rubbed smoothly down, tacked around their edges and dried.

Topical applications of color are given to the grain surfaces in many instances. They simply consist of a strong extract applied with a sponge or a piece of cotton