Those of our readers who may desire further information concerning any of the above described inventions, can obtain the same by communicating with the inventors at the addresses named.

SCIENTIFIC AND PRACTICAL INFORMATION.

BY MR. T. C. PLELSEY, OF IQUIQUE, PERU.

NEW SOURCES OF SUPPLY FOR TANNING MATERIAL.

The Liverpool Chamber of Commerce recently stated that the supply of material for tanning leather was falling short in England, and called for information as to where fresh sources of supply might be discovered. In the province of Baldivia, in Chili, there exists almost impenetrable forests of trees of considerable variety, among which there are not only such (as the "lorontilla" and the "ulma") as would make a splendid addition to the beauty of English—and other moist temperate climates—parks and gardens, but great numbers of a fine large tree, the "luigue," considered to be a species of oak, the bark of which is used for tanning leather at a German tannery of some importance, long established on the river bank opposite the city of Baldivia. It might be profitable to search in that locality for the required supply of tanning material, as there is a good prospect of success, and the certainty of finding other elements both of utility and ornamentation. Inducements are held out by the government for colonization, and labor at present is not dear.

PREPARATION OF BROMIDE OF AMMONIA.

Place in a good sized bowl containing some liquid ammonia a teacup containing bromine, covering all with a sheet of glass. The bromine vapors first settle down, and are followed by the more expansive ammonia; they become rapidly converted into the bromide, whose pure white crystals form round the edges of the bromine. The whole operation only occupies a few minutes.

PYROXYLIN.

Finding, after taking every precaution to rid my gun cotton of acid, that the sensitizers employed with the collodion I made with it underwent slow decomposition, I resolved to boil it, when I found that after the acid flavor disappeared an intense bitter principle became extracted by the operation. Washing well then, between each boiling, I continued the latter until the bitterness gradually diminished, and after some twenty odd boilings disappeared. The collodion made with this was always stable, it did not discolor, even by exposure to the light, and worked well to the last drop, even after being kept for years. Pyroxylin made with mixed acids only, I presume, would not require this treatment. I made mine with a mixture of sulphuric acid and nitrate of potash, and am persuaded that the source of the annoyance was the resulting sulphate of potash which formed in the fiber of the cotton. The cotton thus prepared has the advantage of so high a degree of solubility that it is possible to make and sensitize collodion and take a good negative with it within an hour.

QUICK CAMERA PRINTING.

Photographs for subsequent painting on in oil may be prepared by floating the prepared and sensitized surfaces with a pyrogallic and acetic acid developer before exposure. The operator is thus enabled to see his pictures coming out, and stop them at the right stage for fixing. This has been attended with the most satisfactory results. It is only necessary to have a lighted candle in the room, stationed behind the canvas, and, covering up the mouth of the camera, approach it occasionally to note progress. Life-sized pictures, or thereabouts, from ½ plate negatives, require about 30 seconds to print suitably.

DURABLE AND STEADY QUICKSTUFF FOR DAGUERREOTYPING.

Slake quicklime with water until it is so completely hydrated as to remain quite damp—as far, in fact, as possible, just to avoid actual coherence between the particles—and saturate with bromine charged with a sixteenth part of pure iodine, when it will be found to coat, after iodizing the silver plate to a light rose, in from ten to twenty seconds in the mild temperature required in a daguerreotype gallery; work with great steadiness, in spite of considerable variations in temperature and frequency of drafts during the day upon the vapor; give beautiful, delicate, bright, clear, vigorous impressions, allowing of a full strength solution of hyposulphite of gold to fix; and work equally well for months without the necessity of renovation. The plates thus prepared require about one fourth the time over the iodine bath, for the second as compared with that occupied by the first coating. This method admits of considerable latitude to the operator, so as to modify, without prejudice to success, the character of the results obtained, the proportion of the iodine to that of the bromine, may be varied, or chloride of iodine even used instead, for mixture with the bromine (though with the latter I was not quite as well satisfied); but the hydrate of lime must be as stated in order to obtain the full benefit of the process.

AN ICE MONOPOLY.

The high degree of temperature experienced throughout a great portion of the year in Chili and Peru would seem to point them out as good fields for the exportation of such machines. It is well, therefore, they should be advised that such restrictions are placed on the trade in ice or frozen snow, which have been made the subjects of a monopoly by the municipalities that no one is permitted to supply the articles except with the consent of these bodies, and after paying very heavy demands, according to the importance of the locality, for the privilege.

SOFTENING STONE.

I have seen some ingenious laborers on the Oroga railway, who had made a contract for excavation in very hard ground, make a good thing of it by digging a narrow trench and leading water on to it. There are certain kinds of metallic ores which, from their hardness or toughness, are tedious and troublesome to pulverize, yet which, from the fact of their containing saline or other more or less soluble or easily softened constituents, might be advantageously treated by immersion for a time in water, previous to grinding. It is known that the stones in the old palace of the Incas in Cuzco fit so closely together, without any binding material, as not to admit a knife edge between them; and it has been supposed that they were possessed of the secret of softening the surface of stone preparatory to working it. A circumstance which has come to my knowledge gives a coloring to this supposition. A friend of mine, travelling a long way into the interior to the north of Peru, came across an Indian who was engaged in making a preparation for the purpose of softening some silver ores he was working. It consisted of urine, the juices of the leaves and stalks of three kinds of plants, and those extracted from the roots of two others. The leaves of one of the plants were about a foot long, and resembled those of the common dock leaf. This was all he was able to ascertain, as the Indian was chary of communication, and took pains to conceal the elements of his preparation.

THE IQUIQUE EARTHQUAKE.

Iquique was not "destroyed" by the earthquake of May 9th last, and succession of tidal waves which occurred, commencing about a quarter of an hour or twenty minues afterwards, and continuing until late in the day on the 10th. At about half past five P.M. of the 9th, or three hours before the earthquake, the pivoted reflector employed in the office of the Submarine Telegraph Company in this city turned suddenly round, and persisted in such a manner in maintaining this reverse position that the operator at work at the time had to reverse it (by turning the little hollow metallic plug it is swung in on its center) to be able to continue his communications.

The highest of the waves here did not exceed twenty feet, its mark having been left at about that height above the level of the water in a salt water well close to the beach; but it is said to have reached the height of sixty feet at Pabellon de Pica, and also, I believe, the port of Megillones, in Bolivia. I do not, however, place perfect reliance on these reports.

New Agricultural Devices.

An improved Baling Press for baling cotton, hay, and similar articles, devised by Mr. Solomon S. Laird, of San Obispo Cal., embodies a powerful mechanical arrangement. Upper and lower pawls actuated by levers alternately engage ratchet bars and cause a follower to move forward. Then, when the bale is sufficiently compressed, it is tied and forced out at the end of the press by continuing the movement of the levers.

A new Farm Gate, by Mr. Malcom J. McPherson, of West Campbell, Mich., may be raised vertically before being turned on its hinges, to clear it from snow or other obstructions. It also may be raised and fastened without turning, so as to allow small animals to pass under it, while the escape of large cattle is prevented. Useful for pasture lots.

A Roof and Stock Pen for Platform Scales, by Mr. Adam E. Karsner, of Florida, Ohio, includes a structure which covers the platform scales and protects it from the weather. The pen may be arranged to receive stock when being weighed, and it may be turned back when loads of hay, etc., are put upon the scales.

A new Cotton Harvester has been invented by Mr. William J. Powell, of Marshfield, Mass. As the machine is drawn forward over a row of cotton plants, aprons are rotated and wire teeth thereon remove the ripe cotton and deliver it to boxes. One set of aprons work on the sides, another on the top of the plants, and they may be adjusted as desired There is great demand for machines of this description, and the present device will, we think, be found well worthy of examination and trial by planters.

Mr. Mastin C. Randol, of Huntington, Tenn., has invented a novel Corn Planter, which may be adjusted to plant the seeds at any desired distance apart, and any desired amount in a hill. It opens the furrow, drops the seed, cultivates the soil on both sides of the furrow, covers the seed, and rolls the ground.

For Stretching Wire Fence, Mr. Hubert Schülgen, of New York city, attaches a U-shaped clamp to each wire. In connection with this there is a winding up roller, turned by a key and locked by recesses in the clamp binding on an inclined projecting tooth of the roller. This is a simple and effective contrivance for extending wires of trellises for vines.

A very convenient form of Butter Package, which may be commended to the notice of dairymen, has been devised by Mr. George Kater, of Northville, Mich. It consists of a cylindrical wrapper of wood with overlapping edges, which is prevented from opening by detachable top and bottom covers. Within is a loose partition wall for separating the prints.

A new Harness for Breaking Horses, which is so constructed as to enable the operator completely to control the horse without being liable to injury himself, is the invention of Mr. Charles H. Bowin, of Rocheport, Mo. Ropes are connected with the fore and hind legs, and so arranged that the animal may be easily thrown upon his belly. The harness prevents the horse from running, rearing, or kicking, and admits of his easy control.

The new feature in an ingenious Corn Planter devised by Mr. Alfred F. Hammond, of Berlin (Loramies P. O.), Ohio, is an arrangement whereby the same devices that press down and flatten the loose earth above the seed also act upon buffing and friction wheels that are pivoted to rods, by which the said slides are vibrated. Said rods are connected with the seed slide levers. The marking devices, transporting wheels, and hoppers are arranged in line.

Mr. William H. Mellon, of Fern Valley, Iowa, has devised a new Rotary Cutter for plows, which is so constructed that the sand cannot get into or wear its journal. An ingenious device is added for bending down weeds, grass, etc., so that they will be turned under and fully covered by the furrow slice.

Mr. Joseph P. Terry, of Lake City, Florida, has devised a new Plow and Cultivator, the novel features in which are as follows: The shanks of the curved iron standards are bent upward and laterally at right angles, and also provided with a lateral flange to adapt them to be secured to the beams. The beams are three in number, and one of them is hinged to adapt it to be set at an angle to the others.

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Manganese Bronze.

Manganese bronze, the new alloy, has been found to greatly exceed in tensile strength both Muntz or yellow metal and gun metal. At recent experiments made at the Royal Gun Factories, England, a cold rolled rod was found to have remarkable strength, sustaining a strain of 34 tons before stretching, with an ultimate strength of nearly 40 tons per square inch, and an elongation of 11·6 per cent, of its length places it on a level, and, in respect of its elastic limit. above the best steel used for constructive purposes. The weakest quality is 50 per cent stronger than Muntz metal, and at the same time sufficiently ductile to be rivetted cold. It has been successfully converted into sheets and plates, wire and tubes, in all of which forms it possesses a great superiority over brass, being twice as hard and twice as strong. The *Engineer* says that the greatest heat it is likely to be subjected to in a locomotive, or other high pressure boiler, does not in the least reduce either its strength, toughness, or hardness, so that it would appear particularly suitable for boiler and condenser tubes.

Damages of Illuminating by Gas.

Professor A. H. Church states, in the *Chemical News*, that the injurious influence of the products of combustion of coal gas upon the leather bindings of books is only too well known. Vellum seems unaffected; morocco suffers least; calf is much injured, and Russia still more so. The disintegration is most rapid with books on the upper shelves of a library, whither the heated products of combustion ascend, and where they are absorbed and condensed. By comparing specimens of old leather with specimens of new it is quite clear that the destructive influence of gas is due mainly to its sulphur. True there are traces of sulphates in the dye and size of new leather bindings, but the quantity is insignificant, and there is practically no free sulphuric acid. That leather may be destroyed by the oil of vitriol produced by the burning of gas in a library is proved by the following observations and analysis:

The librarian of one of our public libraries forwarded to me the backs of several volumes which had been "shed" by the books on the upper shelves in an apartment lighted by gas. The leather of one of these backs (a volume of the "Archæologia") was carefully scraped off so as to avoid removing any paper or size from beneath. Thistask of scraping was easy enough, for the leather was reduced to the consistence of Scotch snuff. On analysis of the watery extract of this leather the following figures were obtained: Free sulphuric acid in decayed leather, 6·21 p. c.; combined sulphuric acid in decayed leather, 2·21 p. c.; total, 8·42 p. c.

Iodide of Starch.

The iodide of starch is a definite compound, its composition being represented by the formula $(C_{12}H_{10}O_{10})_3I$. It is decomposed, with regeneration of the original starch, by all sources of nascent hydrogen, and is again produced by the limited action of oxidizing agents in the cold, even by the mere action of the atmosphere. Except when present in excess, iodine is not eliminated by its solvents, such as potassium iodide, benzol, carbon bisulphide, etc., except alcohol, whilst these solvents separate it from the red compound which it forms with dextrin *a*. If kept suspended in water for a year it is slightly decomposed; a portion becomes soluble in water, which then contains dextrin *a*, colored red by iodine, and hydriodic acid, but no glucose. The insoluble portion retains the same composition.—*M. Bondonneau.*

Solidification of Carbon Bisulphide.

M. Mercier finds that if bisulphide of carbon be added to a mixture of a drying oil and protochloride of sulphur at the moment of mixing, it is entangled in the jelly formed by the oil and protochloride. With boiled linseed oil and ten per cent of the protochloride a transparent elastic mixture can be obtained containing 70 per cent of bisulphide of carbon. The substance ignites only with difficulty, and loses the contained bisulphide but slowly.