MINES AND RAILROADS IN MEXICO.

There is considerable excitement both as regards railroading and mining in Mexico. The mines are mostly discovered and being worked, but the railroads are mainly as yet on paper. It is not probable that the conservative people of that country will view the advent of American miners and railroad men with great rejoicing. Nor is it likely that the new roads will go through the country as cheaply and early as was expected. The inhabitants will in all probability throw every obstacle they can in the way. A dispatch from Tucson, Arizona, on the 16th says that parties in from northeastern Sonora report that the politicians of that State are very much opposed to the extension of the railroad in that direction, believing that it will result in virtually turning the Government over to Americans. The railroad is now replacing its Indian with white labor, and expects to push work much faster than heretofore. The railroad company also find considerable objections to locating the line of the road through Mexican ranches along the river bottom in the neighborhood of Ures.

The cheap labor calculated upon by the railroad contractors is not going to be quite as cheap as expected, since the laborers will soon learn that they are "worthy of their hire." A correspondent of the *Bulletin*, who is at Paso Del Norte, Mexico, writes that wages have advanced there. He says: "Laborers now receive 75 cts. per diem, being just double what they received a few months ago. Out of the 37½ cts. they had to provide their own food, and as the payment was in the copper money of the country, which is valued 10% below Mexican silver, and 20% below United States money, it will be seen that Mexican laborers have heretofore received less remuneration for their toil than the Chinese in California. There is quite a probability of a further advance in the price of labor here, as some Mexicans have been employed by railroad contractors on the American side at $1 per diem and their board, and the contractor of the Texas-Pacific has advertised for 200 laborers at the same rate. As it is understood that grading will be commenced on this side of the river upon the return of the surveying party, a large number of Mexicans will find employment at wages approximating to those given on the American side. For an improvement in their condition, the laboring class of Mexico will be indebted to American enterprise, as under the sway of the European commercial element, which has dominated the country and retared its prosperity, there was no hope for them."—*Mining and Scientific Press.*

Melting and Refining Bullion.—Among those measures passed by Congress in its last session was an Act amending Sec. 3,524 of the Revised Statutes, by striking out the words "for melting and refining when bullion is below the standard," and inserting in lieu of these the words "for melting or refining bullion," making the section read as follows: The charges for converting standard silver into trade dollars, for melting or refining bullion, for toughening when metals are contained in it which render it unfit for coinage, for copper used for alloy when the bullion is above standard, for separating the gold and silver when these metals exist together in the bullion, and for the preparation of bars, shall be fixed from time to time by the Director, with the concurrence of the Secretary of the Treasury, so as to equal, but not exceed, in their judgment, the actual average cost to each mint and assay office of the material, labor, wastage and use of machinery employed in each of the cases aforementioned.

Useful Hornets.—Most persons may not be aware of the fact that there is an old-standing feud between the hornet and fly families. A farmer who was acquainted with this fact recently hung up in his parlor a hornet's nest which he found in the woods, and in a short time the house was thoroughly cleared of flies. Is not the remedy worse than the disease?

TO COAT ARTICLES WITH LEAD.

Professor Emerson Reynolds thus describes one of the best methods of applying his new process of galvanizing, or covering with lead various substances: Take 16 grammes of solid sodic hydrate (NaOH) or an equivalent of other suitable hydrate, dissolve it in 1.75 liters of water, and add to the liquid 17 grammes of lead nitrate ($Pb2NO_3$), or an equivalent of other lead salt, with 250 cubic centimeters of water; raise the temperature of the mixture to 90° C. If sufficient lead salt has been added the liquid will remain somewhat turbic after heating, and must then be rapidly strained or filtered through asbestos, glass-wool, or other suitable material, into a convenient vessel. The filtered liquid is then well mixed with 100 cubic centimeters of hot water containing in solution four grammes of sulpho-urea or thiocarbamide. If the temperature of this mixture be maintained at about 70° C., deposition of galena in the form of a fine adherent film or layer quickly takes place on any object immersed in or covered with the liquid, provided the object be in a perfectly clean condition and suitable for the purpose. When the operation is properly conducted a layer of galena is obtained, which is so strongly adherent that it can be easily polished by means of the usual leather polisher. It is not necessary to deposit the galena from hot liquids, but the deposit iron is more rapid than from cold solutions.

The most convenient solution for deposition on brass is thus prepared: Take a quantity of soda lye containing 1½ ounces of real soda (NaOH); dissolve this, with the aid of heat, three ounces of tartrate of lead, and just before diluting the solution to one gallon of cold water, add five drachms of sulpho-turea previously dissolved in a small quantity of hot water. The articles are to be immediately immersed in this bath, and the temperature raised to boiling. When the desired tint is obtained the articles are to be removed, washed and polished. The above solution can be used for glass or porcelain, hot or cold, if the proportion of alkali be reduced one-third or thereabouts.

Copying Drawings.—By a method patented by M. Joltrain, of Paris, it is claimed that copies of drawings having nearly black strokes on a white ground can be made by the following sensitising mixture: Gum, 25 grammes; chloride of sodium, three grammes; perchloride of iron at 55° B., 10 cubic centimeters; sulphate of peroxide of iron, five grammes; tartaric acid, four grammes; water to fill up to 100 cubic centimeters. The developing bath may be a solution of ferrocyanide of potassium, red or yellow, acid or alkaline. The printing is done in the ordinary way, and the developing in a bath of red or yellow prussiate of potash. After washing the proof is put into an accidulated bath, which darkens the lines to an indigo tint, and is then again washed and dried.

Coloring Glass.—Oxide of gold is employed to impart to glass a beautiful ruby color. Suboxide of copper gives a red color. Silver, in all states of oxidation, gives a variety of beautiful yellow and orange colors of glass. Antimony, lead and silver, in combination, are employed to produce the inferior yellow color. The oxides of iron give to glass various shades of green, yellow, red and black. Oxide of chromium gives a fine green, the oxide of cobalt a splendid blue. The color most valued, next to that produced by gold, is the yellow communicated by oxide of uranium, and which has an appearance resembling shot silk. White glass or enamel is made by adding either arsenic or the oxide of tin to the melted metal. The various metals used in coloring glass are also employed in the manufacture of artificial gems, and by their means the color and general appearance are well imitated.

One gallon of neat's-foot oil mixed with four ounces of lampblack makes a good harness oil.

Manganese Metal in the Arts.—The Germans appear to be making extraordinary efforts to extend the uses of manganese in various forms. As the displays of various works at the Dusseldorf exhibition showed, they are now manufacturing not alone high-grade ferro-manganese, but also almost pure metal and its alloys. The high price, due to the difficulty of reducing manganese from its ores, makes the use of the highest grades of manganese for steel impossible, but the Isabellan-Huette, at Dillenburg is making a material running as high as 94% of manganese for special purposes. They use it in the preparation of various alloys of manganese and copper, used in the refining of copper and the manufacture of manganese, bronze, brass, etc. While phosphor copper and phosphor tin must be added to bronze with great care, in order to prevent an injurious action upon the tenacity and ductility of the metal, and while phosphor bronze does not stand repeated re-melting without parting with its phosphorous, manganese can be added to the extent of 10% and forms a part of the alloy. The manganese copper, generally used for improving the quality of bronzes, brass, etc., contains 30% of manganese. The Isabellen-Huette produce also an alloy of 89% of copper and 11% of manganese, which, cast in sand, shows a high tenacity and ductility, and replaces copper in some respects. No tin whatever is added, and it is believed that this manganese and copper alloy may be used for guns, etc. The pure manganese metal, a mass which crumbles easily, has been tried with much success in the Mansfield copper district for refining, and there are prospects of its adoption for this purpose as soon as the price has been somewhat reduced.

A Leg Amputated by Electricity.—A very interesting operation was performed in the Toronto General Hospital a few weeks ago. It consisted of amputation, by means of electricity, of the left leg at the hip. The patient, a young man, being reduced very much by the sloughing of an open wound on the outside of the leg, it was desirable that he should lose as little blood as possible. Having placed the patient under the influence of ether, the customary flaps were made, and then a platinum wire, attached to the two poles of a galvanic battery, was encircled round the leg under the flaps. In a moment this wire was brought to a white heat, and began to cut its way through the limb. By the great heat the ends of the arteries were contracted, and only the larger ones required to be tied. Many of the leading surgeons of the city and a large number of the students from both schools were present.

Compound Locomotives.—M. Mallet has recently published additional data on the working of compound locomotives. A locomotive built according to his plans was first exhibited at the Paris exhibition, and some time later he read before the English Institution of Mechanical Engineers a paper describing it and giving particulars as to its working on the Bayonne and Bearrity railroad, France. From his latest report it appears that his engines required 3.3 lbs. of fuel per horse power per hour. They weigh full 196 tons, have a small cylinder 9.45 inches in diameter and a large one 15.75 inches in diameter, with a 12.72 inch stroke. The steam pressure is 150 lbs. The quantity of fuel consumed during times of heavy traffic was 13.8 lbs. per train mile. In view of the growing use of high pressure compound stationary engines, these results are of much interest.

Electric Tides.—Mr. Alexander Adams, of the English Postoffice Telegraph Department, reports that he has observed the existence of electric tides in telegraph circuits. By long-continued observations he has determined distinct variations of strength in those earth currents which are invariably present on all telegraphic wires, following the different diurnal positions of the moon with respect to the earth. He read a paper on the subject at a recent meeting of the Society of Telegraph Engineers.