SALT MINES OF STASSFURT—A NEW INDUSTRY IN PRUSSIA.—During the last twenty years an industry has grown up in Prussia which is destined to add materially to the wealth of that kingdom. It is the development of the salt mines of Stassfurt. On the 3rd of April, 1839, the first attempts to bore for salt were made at Stassfurt, and in 1851 a depth of 1,951 ft. was reached. The brine obtained from this depth was found to have very nearly the specific gravity of a saturated solution of salt, but upon analysis proved to be nearly worthless for the monufacture of table salt, on account of the large per centage of chloride of magnesium, potassium and sulphate of magnesia which it contained. This result was certainly very discouraging, but the occasional appearance of small pieces of nearly pure salt, and various other indications, led Professor Marchand to the conclusion that there was undoubtedly a deposit of rock salt somewhere, and that the impurities came from the super-incumbent strata. These views having been accepted by scientific men generally, the Prussian government was induced to sink shafts, the same as in an ordinary mine. This enabled the engineers to obtain an accurate geological vertical section of the deposits, and to determine the exact position of the various layers of minerals. The position of the beds was represented by models and diagrams in the Paris Exhibition. According to the vertical section, the depths of the deposits are as follows :—

| | Feet | | Feet |
|---|---|---|---|
| Rock Salt | 989 | Carnalite | 98 |
| Anhydrite | 36 | Oxy-chl. of magnesium | 13 |
| Polyhalite | 13 | | |
| Kieserite | 51 | | |

By comparing the per centage of the constituents of these various minerals we shall have in one hundred parts of the deposit :

| | |
|---|---|
| Chloride of Sodium (salt).....per cent. | 85.82 |
| Sulphate of Lime (gypsum) | 4.88 |
| Sulphate of Magnesia (Epsom salt) | 4.70 |
| Sulphate of Potassa | 0.40 |
| Chloride of Magnesium | 2.53 |
| Chloride of Potassium | 1.67 |

If this result be compared with the product of the evaporation of the salt water of the ocean we shall find the closest similarity. This gives us a clue to the probable origin of the vast deposits at Stassfurt. The regularity of the layers, the order of deposition in accordance with the solubilities of the salt; the grouping according to the chemical affinities of the various elements, seem to indicate that this deposit was once in solution in a mighty ocean, and that in process of time the water has evaporated and left the salts in their natural order.

In the year 1860 attention was first called to the potash contained in the Stassfurt mine, and the Prussian government offered liberal inducements to any one who could discover a practical method for effecting the separation of this constituent. Numerous manufacturers invested money in this enterprise, and the competition became so great that only those who had large capital were able to withstand the pressure. The principal manufacturers are Vorster & Gruneberg. Their process is founded upon the following properties of the salts :

First—That common salt is equally soluble in cold and hot water.

Second—That chloride of potassium is more soluble in hot than in cold water.

Third—That out of a hot saturated solution of chloride of magnesium the whole of the chloride of potassium will be thrown down in the form of the double chloride of potassium and magnesium (carnalite).

The crude material, as it is brought from the mine, consists of from fifty to fifty-five per cent. carnalite, twenty-five to thirty per cent. of common salt, and ten to fifteen per cent. of sulphate of magnesia (kieserite). This is contaminated with sulphate of lime, clay, and other impurities. The mass as it comes from the mine is thrown into iron kettles, less water is added than is necessary to solution, and the whole is heated with steam. The resulting lye contains in solution all of the chloride of magnesium, also the chloride of potassium, and a part of the common salt and sulphate of magnesia, though the larger portion of the latter salts remains undissolved. The chloride of potassium crystallizes out of the lye upon cooling, carrying with it some of the common salt. The mother liquor is evaporated, and a second crop of crystals of chloride of potassium obtained. After further concentration, common salt and a double sulphate of potash and magnesia separates, which is now extensively employed as a manure, and is sent to the U. States under the name of kainite. The balance of the chloride of potassium goes down in the form of carnalite, and the residuum contains chloride of magnesium, sulphate of magnesia, and some common salt. This residuum was formerly wasted, but recently efforts have been made to save the small quantity of bromine which it is found to contain. Thus far no application for the chloride of magnesium has been discovered.

The chloride of potassium is obtained from the above salts by further crystallization, and now constitutes one of the most important products of the Stassfurt mines. Sulphate of potash, sulphate of magnesia, and sulphate of soda are also manufactured in enormous quantities. The commercial products of the Stassfurt mines exhibited in Paris were as follows : 1, Chloride of potassium ; 2, Sulphate of pot ash ; 3, Double sulphate of potash and magnesia, sold as manure ; 4, Sulphate of magnesia, both calcined and crystallized ; 5, Chloride of magnesium ; 6, Sulphate of soda ; 7, Bromine; 8, Boracic acid and borax ; 9, Common salt ; 10, Saltpetre.

The principal minerals found in the mines are as follows : Kainite, carnallite, sylvine, kieserite, polyhalite, boracite, tachhydrite, anhydrite rock salt.

The chemical factory of Vorster & Gruneberg employs four hundred workmen, and sends to market every year the following products : Saltpetre, 5,000,000 pounds ; salt, 4,000,000 pounds ; potash, 4,800,000 pounds ; soda, 800,000 pounds ; chloride of potassium, 5,200,000 pounds ; sulphate of potash, 4,700,000 pounds; potash manure, 5,000,000 pounds ; Glauber salts, 1,500,000 pounds ; Epsom salts, 2,000,000 pounds ; bromine, 10,000 pounds ; super phosphates, 1.500,000 pounds ; mixed manures 2,000,000 pounds ; sulphate of ammonia, 550,000 pounds.

As this is but one of the numerous chemical manufactories which have been established since the discovery of the salt mines at Stassfurt, some estimate may be formed of the immense value to the country of the new industry. The potash salts are as valuable for manures as phosphates, and Prussia will be able to export enough of the former to pay for the latter. The importation of these products into the United States has already begun, and we have therefore dwelt at some length upon the matter for the information of dealers. Where the products are to be employed as manure under the name of kainite, it is well for the purchaser to ascertain the exact amount of sulphate of potash the article contains, as the salt is the one which is chiefly valuable in promoting vegetation. Too much chloride of magnesium, and even chloride of potassium, is injurious to the growth of plants.

GODERICH SALT CO.—This Company has declared a dividend on the half year just ended of 35 per cent. There is a good stock of wood on hand for future operations. The following gentlemen were elected officers for the current year at a recent meeting :—J. V. Detlor, President ; George Rumball, Secretary ; J. V. Detlor, S. Platt, Wm. Campbell, M. C. Cameron, H. Johnston, W. Kay, R. Runciman, R. Gibbons, and A. M. Ross, Directors.

## Railway News.

GREAT WESTERN RAILWAY.—Traffic for the week ending Jan. 10, 1868 :—

| | |
|---|---|
| Passengers | $25,362 88 |
| Freight and live stock | 32,578 94 |
| Mails and sundries | 5,386 06 |
| Total | 63,327 88 |
| Corresponding week, 1866, | 63,099 58 |
| Increase | $228 30 |

NORTHERN RAILWAY.—Traffic receipts for the week ending Jan. 18, 1868 :—

| | |
|---|---|
| Passengers | $1,983 65 |
| Freight | 5,689 55 |
| Mails and sundries | 208 74 |
| Total receipts for week | 7,881 94 |
| Corresponding week, 1867 | 7,406 70 |
| Increase | 473 24 |

DETROIT AND MILWAUKEE RAILWAY.—The following were the earnings of this road in the last two weeks of December and the first two weeks in January :—

| | 1866. | 1867. |
|---|---|---|
| Gross Earnings, Dec., 3rd week | $23,494 | $25,452 |
| " 4th week | 24,865 | 24,558 |
| Jan., 1st week, 1868 | 23,062 | 23,124 |
| " 2nd week " | 22,168 | 19,964 |
| | $93,589 | $93,098 |

RAILWAY TRAFFIC RETURNS
FOR THE MONTH ENDED 31st DECEMBER, 1867.

| NAMES OF THE RAILWAYS. | Passengers. | Mails and Sundries. | Freight. | Total, 1867. | Total, 1866. | Miles in operat'n 1867. | Miles in operat'n 1866. |
|---|---|---|---|---|---|---|---|
| Great Western | $1,521,908 | $192,899 | $2,010,302 | $3,725,109 | $3,264,402 | 349½ | 345 |
| Grand Trunk | 2,341,979 | 261,130 | 3,903,857 | 6,506,966 | 6,639,308 | 1,377 | 1,377 |
| London and Port Stanley | 17,252 | 1,865 | 23,652 | 42,759 | 39,108 | 25 | 25 |
| Welland | 11,919 | 12,177 | 44,519 | 68,615 | 106,946 | 25 | 25 |
| Northern | 136,450 | 20,040 | 400,402 | 562,892 | 512,572 | 94 | 94 |
| Port Hope, Lindsay & Beaverton, Peterboro' Brch. | ..... | ..... | ..... | 21,073 | ..... | 22 | ..... |
| Coburg Peterboro' and Marmora Railway | 265 | 20,808 | 86,711 | 135,772 | 111,086 | 86 | 86 |
| Brockville and Ottawa | 42,028 | 7,083 | 56,711 | 105,415 | 104,429 | 54 | 54 |
| St. Lawrence and Ottawa | 38,582 | 7,271 | 30,562 | 76,415 | 9,969 | 12 | 12 |
| Carillon and Grenville | 8,606 | 357 | 479 | 9,592 | ..... | 54 | 54 |
| Stanstead, Shefford and Chambly Railway | ..... | ..... | ..... | 7,860 | 6,408 | 13 | 13 |
| St. Lawrence and Industry Railway | 2,616 | ..... | 6,254 | 8,870 | 65,330 | ..... | ..... |
| New Brunswick and Canada Railway | 12,894 | 498 | 66,389 | 79,781 | ..... | 107 | 88 |
| European and North American Railway | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Nova Scotia Railway | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Total | $4,154,649 | $530,280 | $6,601,895 | $11,265,824 | $10,859,393 | 2163½ | .... |

RAILWAY PROJECT.—A movement is on foot for a narrow gauge railway from Belleville to the gold regions. For the present, it is only contemplated to construct the line as far as Eldorado or Bannockburn ; but the charter will cover an extension a good deal farther north. Should the northern townships prove as rich in mineral deposits, as the reports of "prospectors" represent them, there can be no doubt that if the line reaches the terminus now proposed, the extension will follow within a very brief period.

The cost of a narrow gauge road to Eldorado would be $500,000 or $600,000, and quite possibly might fall within the smaller figure.

Mr. W. J. Hamilton having resigned his situation, as train despatcher, G. T. R., Point St. Charles, was presented the other day with a beautiful gold watch and chain, on the eve of his departure, by his friends at the Victoria Bridge Hotel, Montreal.