GEOLOGICAL CHANGES IN PROGRESS.

In the *Popular Science Monthly* Prof. J. S. Newberry told us lately that various facts indicate that the coast of New Jersey and Long Island is gradually sinking. From the marshes of New Jersey are taken the trunks of trees which could not have grown there except when it was drier ground, and on the shore stumps are seen now under waters of trees which must have grown on land. So, too, the sea throws up in storms portions of turfy soil, once covered only by the air, and similar soil has been reached below the sea level, in pits dug through drifted sand along its margin. The land boundaries have been changed and farms diminished, even where the wash of the shore waves produced no effect. The rate of this subsidence is very slow—only a few inches in a century—and it may at any time be arrested and reversed; but should it continue, as it may, for some thousands of years it would result in a submerging of land now valued at hundreds of millions of dollars and a complete change of position in the seats of commerce and industry, which must always center about this harbor. This possible catastrophe is, however, so uncertain and remote, that it seems hardly sufficient to disturb the equanimity of at least the present generation of inhabitants.

Dr. Gessner in a late letter to the London Geological Society, alluding to the same class of phenomena, states that in New Brunswick, at St. John's, the land has been elevated, at the Grand Manan Island and the Great Tantamar Marsh, there has been subsidence; at Bathurst, and on the opposite coast of Lower Canada, the land seems to be rising; in Nova Scotia, near the Bay of Fundy and Mines Basin, there is subsidence; but, on the southern side, there are signs of elevation, the sea also rapidly encroaches on Louisberg, in Cape Breton, and in Prince Edward Island, likewise submergence of the land is seen to be taking place at Nantucket, Martha's Vineyard, and Portland, submergence of the land is proceeding, locally, at the rate, probably, of four feet in 60 years.

Powders Solidified by Pressure.—A Belgian scientific journal describes some interesting experiments lately made by M. Spring, who has subjected a number of finely-divided substances to a pressure calculated to be equivalent to 20,000 atmospheres. Potassium nitrate and sodium nitrate were generally converted into a perfectly homogeneous mass, which was harder and denser than the fused salt, and was translucent like porcelain. Sawdust exhibited a "slatey" cleavage and had a density more than three times that of the wood from which it was made. The author points to these experiments as having established the possibility of causing cohesion of solid bodies by the application of great pressure, unmindful of the fact that what are called dusttiles are largely manufactured by this very method. How far the effects of simple pressure are taken into consideration by geologists in their study of the solid layers of the earth's crust is open to question.

Geological Puzzles.—Prof. L. E. Hicks has discovered a boulder of hard, gritty sandstone, ten inches in diameter, in a seam of coal at New Straitsville, Ohio. Two other similar geological puzzles are on record. Prof. E. B. Andrews notices a quartzite boulder, which had been turned up from the Nelsonville seam at Zaleski, Vinton county. He attributes its transportation from the margin of the sort of sea in which the coal was formed to the position it occupied at the time it was excavated to floating ice. Prof. J. S. Newbury speaking of the talcose slate boulder found in a coal seam in Wyoming county, Pa., thinks it was brought there by being entangled in the roots of trees, and thus floated and dropped.

Orville Grant, brother of the General, is in Washington, partially insane, and in a pitiful condition.

NEW INSTRUMENT TO DETERMINE THE PRESENCE OF METALS IN ORES.

At a recent meeting of the Philadelphia Academy of Natural Sciences, Prof. George A. Koenig, of the University of Pennsylvania, exhibited his recently invented "chromometer," an instrument designed for the purpose of making exquisitely delicate determinations of the presence of certain metals in ores. It is based upon the optical fact that complimentary colors will extinguish each other if mingled in proper proportions; for instance, if to a green solution a red solution be added, the liquid, if the proper conditions be complied with, will become colorless. The speaker had applied this principle to the colors which certain metals, as iron, manganese, copper, etc., produce when fused with borax, which is the only chemical used in this method of analysis. He prepares such glasses or beads containing known quantities of a metal in one hundred parts, and observes how thick a glass of the complimentary color must be to produce extinction. To accomplish this the instrument is furnished with a glass wedge of a green or red color, cut at an angle of about one degree. By moving this wedge before the glass bead, with the help of a suitable rack movement, a scale moves at the same time, and when the point of extinction of color is arrived at, the reading of the scale refers to a table showing the percentage of metal contained in the examined substance. By this method of analysis a correct determination of manganese in an iron ore can be made in 15 minutes, which is not more than one-third the time required by the usual methods of analysis.

Paper vs. Iron Car Wheels.—According to the Chicago *Railway Review*, the average running capacity of an ordinary iron car wheel is about 75,000 miles; while that of a paper wheel, with a steel tire, is from 450,000 to 550,000 miles. In order to get this wear, it is necessary to give the tire from three to four turnings. The first cost of the paper wheel is $65, and of the best quality of cast iron wheel $14. The mileage of the latter is usually guaranteed at 50,000 miles. The cost of turning the steel tire is $35, which may safely be estimated as equal to the cost of the more frequent renewals of cast iron wheels with the attendant expenses of transportation in each case. The paper wheel costs $65, and runs 450,000 miles in 2.8 years. For convenience in reckoning, and at a disadvantage to the paper wheel, on account of the interest money, call this period three years. At the end of this time the original cost, with 7% compound interest, amounts to not quite $80. But during this period nine cast iron wheels have been used, costing $14 each. Allowing a rebate of $5 each for the worn out wheels, and calculating on simple interest at 7%, the cost of the wheels for this service amounts to $91.50, showing a saving in the case of paper wheels of $11.50, and were compound interest computed, as in the case of the paper wheels, the saving indicated would be a much larger amount. In computing the cost for the second period of three years a much greater saving would be shown, since a renewal of the tire only, at a cost of $35 is necessary, instead of a first cost of $65 for a new paper wheel. The data from which this conclusion is reached are vouched for by the Pullman Company. The *Review* adds that the experience of the railway companies which have used the paper steel tired wheels bears out the records of the Pullman Company. As engine truck wheels the paper wheels seem to be especially successful, the experience on some roads warranting the conclusion that they will make 800,000 miles before the tire requires renewal.

There is now nearly $1,000,000 in silver coins stored away in the vaults of the U. S. Mint in Carson City.

The Canadian government favors reciprocity of tariff and trade with the United States.

President Grevy has signed a decree pardoning 151 communists.

THE TELECTROSCOPE.

M. Senlecq, of Ardres, has recently submitted to the examination of M. Du Moncel and Hallez d'Arros a plan of an apparatus intended to reproduce telegraphically at a distance the images obtained in the camera obscura. This apparatus will be based on the property possessed by selenium of offering a variable and very sensitive electrical resistance according to the different gradations of light. The apparatus will consist of an ordinary camera obscura, containing at the focus an unpolished glass, and any system of autographic telegraphic transmission; the tracing point of the transmitter intended to traverse the surface of the unpolished glass will be formed of a small piece of selenium held by two springs acting as pincers, insulated and connected, one with a pile, the other with the line. The point of selenium will form the circuit. In gliding over the circuit, more or less lightened up, of the unpolished glass, this point will communicate, in different degrees and with great sensitiveness, the vibrations of the light. The receiver will also be a tracing point of black lead or pencil for drawing very finely, connected with a very thin plate of soft iron, held almost as in the Bell telephone, and vibrating before an electro-magnet, governed by the irregular current emitted in the line. This pencil, supporting a sheet of paper so as to receive the impression of the image produced in the camera obscura, will translate the vibrations of the metallic plate by a more or less pronounced pressure on that sheet of paper. Should the selenium tracing point run over a light surface, the current will increase in intensity, the electromagnet of the receiver will attract to it with greater force the vibrating plate, and the pencil will exert less pressure on the paper. The line thus formed will be scarcely, if at all visible; the contrary will be the case if the surface be obscure, for the resistance of the current increasing, the attraction of the magnet will diminish, and the pencil, pressing more on the paper, will leave upon it a darker line. M. Senlecq thinks he will succeed in simplifying this apparatus by suppressing the electro-magnet, and collecting directly on the paper by means of a particular composition the different gradations of tints proportional to the intensity of the electric current.—*London Times.*

Motive Power from the Condensation of Steam.—The water from a lodge is, according to the invention of Mr. Robert Wortley, of Oldham, England, conveyed by pipes into a well about 20 feet below the level of the lodge, into which is inserted the lower end of a pipe 32 feet high, equal to the pressure of one atmosphere, the upper end of which pipe is placed in a cistern; this cistern is in communication above and below by pipes and valves with a second cistern, in which is a float. The lid of the second cistern is in communication with the cylinder of a steam engine. The lower end of the second cistern is in communication through a valve with the hot well and with the lodge. When the water from the first cistern enters the second cistern the float rises, and the water from the lodge keeps the well at the same level. When the steam from the cylinder of the steam engine enters the second cistern it lowers the float and drives the water into the hot well and back into the lodge; the steam from the second cistern then passes through the top valve into the first cistern and is there condensed; the partial vacuum thus formed then raises more water from the well, and the operations are repeated as before. In the lid of the first cistern is a pump to draw off the air, and this pump is used to fill both the cisterns with water on commencing work. Between the lodge and the well is a turbin, or a water wheel, or other hydraulic engine, to make use of the fall of water between the two levels.

The German Tariff Commission has determined to shut out of the Empire American cattle and British coal.