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## THE NATIONAL BANK.

Capitalists who, seeing this heading, look to the column below for a financial dissertation on the prospect of a national bank, will be disappointed. We have no such object in view at this writing.

The almost illimitable expanse of country west of the Alleghenies contains in its boundaries the food and the future prospects of thousands on thousands of human beings. It may not inaptly be called a never-failing bank, with no repudiated or protested notes, and no shaky credit. Of the vast capacities of the Western country for growing grain it is unnecessary here to speak; but it may not be amiss to place on record a few figures concerning the amount of food in the shape of breadstuffs, exported from the region in question, as compiled by the *Commercial Bulletin*, from the report of the Chicago Board of Trade:—

"The Upper Mississippi basin, including the nine States lying northwest of the Ohio river, embracing an area of 525,301 square miles, and first colonized in 1788, now contains a population of over 9,000,000, which, on an average, has doubled itself every ten years since the beginning of the present century. This territory, from the adaptability of its physical features to agricultural pursuits, and the uniformity of its climate, soil and productions, may well be called the great food-producing region of the New World. Its industry, thus far, has been almost exclusively devoted to this purpose, and the value of its annual product is upwards of \$350,000,000, notwithstanding that only about 15½ per cent of its area has as yet been brought under cultivation. After supplying the deficiencies of the seaboard States, the Northwest has a surplus of breadstuffs and provisions left for export to foreign countries, which, in four years, has increased in value from \$38,300,000 to \$133,750,000; being more than 70 per cent of the entire exports of the country last year, exclusive of gold.

"Of this immense product, the cereals alone brought into market from 8 of these food-producing States, according to the last census, amounted to 550,000,000 bushels in 1859, when the crops were nearly one-third deficient as compared with those of the two succeeding years. To convey an adequate idea of the motive power required to distribute this prodigious mass in a crude state, it may be stated that it would employ more than 64,400 locomotives, each hauling 8,500 bushels, and, if required to deposit their freight at a given depot, trains must arrive oftener than once in seven minutes, by day and by night, throughout every working day in the year.

"The commerce of the Great Lakes—which are now and must continue, for all future time, whatever may be the political condition of the country, the principal outlet for the productions of this inland region—reaches an annual value of \$450,000,000; more than twice the external commerce of the whole country—and is carried on by a fleet of 1,643 vessels, of an aggregate tonnage of 413,026. It is estimated that before the lapse of another decade, the increase of this branch of commerce will require double this amount of tonnage, and of course a corresponding increase of transportation facilities between the Lakes and the Atlantic seaboard.

"The re-opening of navigation on the Mississippi

can be of no great advantage to the Northwest, unless at the same time the great Southern market for the consumption of its products is also restored. As a channel for exportation, by which the European markets may be reached, it is of but little account to that region, as the very insignificant shipments of Western produce from New Orleans, previous to the war, as compared with those from Atlantic ports, clearly demonstrate. The exports of provisions and breadstuffs from the former, in 1860, were only \$1,200,000 in value, against \$21,200,000 from New York.

"In the early settlement of the West, it is true, the Mississippi was the only outlet for the products of that section, notwithstanding the disadvantage which it involved of a detour of 3,000 miles from the direct Eastern route to Europe, of a malarious climate, and the heated waters of a tropical sea destructive to most articles of food of Northern production. But the opening of the New York and Canadian canals, in addition to five trunk railways between the East and West, has naturally diverted the current of Western trade from the South to the East, and rendered the free navigation of the Mississippi a matter of secondary importance.

"Aside from military and political considerations, what the commercial exigencies of the present day demand, is increased facilities of communication with the West, by the shortest, cheapest and most practical route."

The development of the agricultural resources of the Western empire, for such it is in extent, has been due to wholly natural causes; but they have been aided materially by the artificial outlets provided by various states, and incorporated bodies likely to reap benefit from their outlay. Of these means of transporting the grain to market, and of feeding the hungry in every part of the world, the Erie canal and railroad, the Illinois Central, and, in fact, many other important lines of railway and canals afford examples in point. Another cause of the growing importance of the Great West is the steady stream of immigrants, who, taught frugality and industry by vain efforts to wrest subsistence from the ungenerous soils of the Eastern States, seek the promised land, and find their anticipations fully realized. We believe the Western country affords innumerable opportunities for enterprising and determined young mechanics to settle at various points, and contribute of their skill to make the wilderness hum with the sound of civilized life, to decorate the fertile plains with comfortable homes, to erect mills and factories of all kinds, for which the peculiar locality affords facilities; or in a more humble way assist the immigrant, as he will aid them, to establish a high grade of social and mechanical cultivation. For all of these enterprises there is scope and verge enough; and the new State of Nevada, which we learn is about to petition for admission to the Union, will afford another outlet for the surplus population of our large cities. It is necessary for the moral health of overcrowded towns that they should change their population often; so that the disaffected may reap benefit by a change of scene, and the city derive advantage from their absence. In every large vessel containing liquid, there will be dregs, and continual excitement and shaking brings the turbid element to the surface. So when political agitations upheave all classes of society, riot and mob-law strive very hard to get the upper hand. Let all such be sent to the wilds of the Western country; not among honest settlers, for these would repudiate them, but from the grizzly bear and the wolf let them learn mercy; and from the savages who yet roam the prairie, how to respect those who are helpless. Let the Judges sentence the rioters to a sojourn in the wilderness, and they will do the States more service than anywhere else.

## THUNDER STORMS—LIGHTNING CONDUCTORS.

During the late "heated term" thunder storms were more frequent and the lightning more vivid than usual. Cases of buildings struck by the electric fluid have been numerous; but less damage to life and property has resulted than could have been expected. We have collected a few facts respecting some buildings which were struck, which we think will be interesting and instructive.

In the Eastern District of Brooklyn the house of

Mr. Harris, in Devoe street, was lately struck by electricity, in a storm which took place at midnight. The third building from this is a high brick structure used as a manufactory, and the one next to it is a frame house, like itself, but much higher. A common opinion prevails that lightning always strikes the highest objects in the vicinity of which a storm occurs. This notion was not verified in the present case, as the lowest building in the line of three was the one struck; and the electric fluid, instead of entering by the chimney—the highest point—entered by the corner beam of the upper room. It passed along the ceiling, throwing down the plaster over and around the bed, where two children were asleep, then passed out by the frame of the window, leaving a charred hole, and breaking one pane of glass. The beam by which the lightning entered was reduced to powder; and during a small portion of the course taken by the fluid, it moved on the gas pipe, and bent down the arm of the burner, just before passing out by the side of the window. We would have conjectured that it would have passed down to the earth by the gas pipe; but, upon a visit to the house, we could not learn that even a portion of the charge had taken this course. A sulphurous smell pervaded the atmosphere after the building was struck, and a blue smoke was visible in the room, but none of the inmates were injured, and the property was but slightly damaged. Another house, in the same neighborhood, was struck a few days afterwards, which stood within forty feet of a much higher building, having several lightning conductors upon it. A similar case is related in the *Boston Traveller*, which says:—

"The house of Mrs. George Darling, of Providence, R. I., was struck by lightning during a heavy shower. A daughter of Mrs. Darling was slightly burned on one ear, but beyond this no person was injured. The house was a cottage, surrounded by higher buildings and trees, all of which were spared, in spite of the prevailing idea that lightning always strikes the tallest of contiguous objects."

Electricity discharging from a cloud to the earth, takes the best conductor and the shortest course. We have not heard of a building furnished with a sufficient number of suitable lightning conductors having been struck this season, which is favorable evidence of their utility. High buildings in the vicinity of which a thunder storm takes place, may present a more difficult course for the lightning than lower buildings; in which case the latter is liable to receive a disruptive discharge. The object of a lightning-rod is to conduct the electric fluid silently to the earth; but differences of opinion prevail respecting the area that a conductor will protect. About four hundred square feet of a roof, it is considered, will be protected by a rod ten feet higher than the roof, and extending about two feet above the chimney. According to this rule, one lightning rod should afford protection to most of the houses built on city lots; and it would be well to provide each with such a safeguard. Some persons entertain the notion that metal attracts lightning, and have contended that lightning rods were more dangerous than beneficial. But metal does not attract lightning; it merely acts as a conductor, and copper, which is devoid of magnetic power, is, next to silver, the best material that can be used for a lightning rod. A copper rod of one-eighth the sectional area of an iron one will answer just as well for a lightning conductor. Lake Superior copper makes the best electrical conductor; and should be used in preference to any other metal.

## PISTON SPEEDS OF BEAM ENGINES.

At one period of the science of steam engineering it was the practice to fix the limit of the speed of the piston at so many feet per minute; and from this and the other data usually taken into account—as the area of the piston, pressure of steam, &c.—the horse-power of the engine was calculated. If we are not in error, 250 feet has been set down as a standard speed for pistons; but modern engineers prefer to drive their pistons as fast as they can with safety, and to disregard rules which experience proves the uselessness of. We have, as a result, the performance of the engine of the *Golden City* (a new steamer belonging to the Pacific Mail Steamship Company). It is of the beam variety; the beam weighing upward of eighteen tons. This engine has a