IMPROVING THE MISSISSIPPI--ONE HUNDRED MILLION OF DOLLARS ADDED TO THE VALUE OF THE STATE.

MESSRS. EDITORS:—This is a subject of great importance not only to the people of Louisiana, but to all those who are interested in the trade of the Mississippi. We have in this State over two millions of acres of as fertile land as the sun ever shines upon, which is annually overflowed by water from an outlet of the Mississippi during freshets. This renders it unfit for agricultural purposes, and makes it a grand laboratory of poisonous malaria, destructive to health and life for miles beyond its borders.

For several years I have advocated closing this outlet (Bayou Plaquemine), but have been uniformly opposed by the representatives of those parishes situated below it, who believe it would cause an increased hight of the freshets or floods in the river, and prove injurious to the plantations below the bayou, which is 210 miles above the mouth of the river. After a careful examination of the Mississippi river, I came to the conclusion that, by closing the bayou, we would not only reclaim two millions of acres of land from overflow—which would add directly to the wealth of the State over one hundred millions of dollars, and give homes to one hundred thousand inhabitants—but that we would reduce the extreme hight of the floods in the river.

I will give some of the most important facts relative to the Mississippi river tributaries, pouring their floods into the main stream for a distance of over 1,200 miles from the ocean. These do not increase the width of the river; on the contrary, it becomes narrower below each addition to its volume; and the difference between high and low water is less after each tributary is added. This holds good without exception. The rise of the freshets are diminished without much increase of velocity in the current. The Mississippi attains its greatest volume about 500 miles from the Gulf of Mexico, and has there a flow, in extreme high tides, of 95 millions of cubic feet of water per minute. Each five hundred feet of water contains one foot of solid earth, which, of course, is precipitated wherever the water becomes still for a considerable time. The velocity of the current is within a fraction of five feet per second, which carries this sediment onward with the water towards the ocean.

At the mouth of the Ohio, the elevation of the surface of the Mississippi is nearly 275 feet above the ocean, and its bottom on the shallow bars about 200 feet above the ocean level. The river has an average descent of four inches per mile, but for the last 250 miles its descent is a fraction less than one inch and a half per mile.

Opposite the outlet which I propose to have closed, the river is 2,500 feet wide and 103 feet deep, and has a velocity of current of four feet per second. The surface, in high water, is 30 feet above the ocean, consequently, the bottom is 73 feet below the ocean level. The velocity of the whole volume is two feet greater than the surface current, and the velocity within five feet of the bottom is 10 feet greater than at the surface; consequently, it has the greater carrying force, and can move particles which the current cannot sustain on the surface. These facts are contrary to popular belief. And although the water at the bottom of the river—over 200 miles from the ocean—is 75 feet below the ocean, and has actually to run up hill over three inches per mile, it flows onward with a velocity far greater than the surface current, which flows down a plane of one inch and a half per mile. This proves that there is another cause for velocity of currents in rivers besides the slope of the plane over which they flow, and that the weights of the volume above and behind have a great forcing power. My conclusion is that the larger the volume, or rather the greater the depth—provided there is a volume of considerable weight behind—the greater will be the discharge, and that the dredging power in the bottom is increased in exact ratio with the depth and velocity of the current, and that the permanent effect of an addition to the volume will be to deepen the channel where there are no rocks, and consequently, will really, in time, diminish the hight of the surface.

The outlet which I wish to have closed in high water takes from the river 28,000 cubic feet per second; consequently, if it were closed in high water, and no change took place in velocity of current and depth of channel, the surface would be raised about 10 inches, which would be a serious addition to the hight of the floods. But to sustain my opinion that that would not be the practical effect, we have the experience of 140 years on this river.

The first levee was built in front of New Orleans in 1717. These structures have been gradually extended until nearly the whole extent has been leveed for 1,000 miles on each side of the river, and we have reclaimed 30 millions of acres of land from inundation that was formerly overflowed annually to an average depth of three feet. The water for the last 50 years has not been one inch higher at New Orleans than it had been before a levee was built. This is a well authenticated fact, and besides this, the average hight of the high water mark has really decreased as levees have been extended. All the early maps show the river to have been much wider than it is now.

As to its depth in early times we have no reliable proof, but the first French commander that entered the river reported to his government that he found 13 feet in the deepest part—on the bar. This is about 10 feet less than we now have.

I have omitted to mention one fact that should have caused the river to rise higher at New Orleans than it did when the city was first laid out, all other circumstances being the same, viz., that it extends its delta into the ocean about one mile in 25 years.

Undoubtedly the Mississippi river is governed by the same immutable laws that govern all rivers, when due allowance is made for the variety of circumstances that attend different streams. The Father of Waters has not any rocks or scarcely a pebble an ounce in weight for 1,000 miles from the ocean, and it flows through a basin which has probably been an extension of the Gulf of Mexico. In past ages this filled up with sediment which formed banks as it extended the land into the ocean. Excavations in every portion of this vast region afford evidence of this. We have the same formation and soil in layers, with logs and remains of trees, as deep as it has been penetrated—say 400 feet.

If we can reclaim the territory alluded to, its equal is not to be found in the State, as it is subdivided by numerous natural canals which traverse every portion, and you can scarcely find an acre in the vast area that is not within two miles of a navigable stream. This question involves over a hundred million dollars' worth of land in the best sugar region of Louisiana.

E. W. FULLER.

St. Martinsville, La., Nov. 28, 1860.

PANS FOR BOILING MAPLE SAP.

MESSRS. EDITORS:—We use sheet iron pans almost entirely, for the purpose of making maple sugar, and I suppose no other population, in this nation, of equal numbers, makes as much and as good maple sugar as we do. Our pans are made of sheet iron, five and a half feet long by three feet wide, turned up all around and only six inches deep. The sheets are riveted together with two rows of rivets, and a ⅜-inch round iron rod is put in the upper edge of the rim, for a stiffener. We put two loops of sheet iron, by rivets, inside on the bottom, and a 2 by 4-inch wooden bar across the top of the pan (the narrow way), projecting far enough at each side, as handles to lift it by. We cut two grooves in the bar, one inch deep, to receive the sides of the pan, and then, with a wire through the loops and over the bar several times, we support the bottom of the pan and keep the sides from spreading or collapsing. Such a pan will last, with good care, a long time. Pans made in that fashion, of common stove pipe iron, have been in use in our "bush" fifteen years, and are good pans yet, not being half worn or rusted out. The acidulous action of the sap is (certainly very) slight. The manner of setting the pans, arches, &c., next week, if you wish for it; the pans are made by our tinsmiths.

CARLOS BAKER.

Allegan, Mich., Nov. 17, 1860.

THE number of artificial water works for supplying cities and villages, in the United States, is 82; in the British Provinces, 7. The entire cost of them all is estimated at $71,172,471. Water stock, as a public debt, is held to be very secure, and there are no water shares found in the market.

LICENSING FOR SELLING PATENT RIGHTS, &C.—LAWS OF VIRGINIA.

MESSRS. EDITORS:—I believe the following will be of interest to all inventors and persons interested in the sale of patents. I have copied it from an act passed by the Legislature of Virginia during the past winter—in January, February or March, 1860:—

CHAPTER II.

Section 1. Nor shall any person, without license, sell or offer to sell or barter patent rights, &c.

Sec. 4. Nor shall a license be required to sell articles manufactured by the seller in this State, or provisions, fruit trees, shrubberies and agricultural commodities, the growth and production of this State.

Sec. 8. Any person who shall offer to sell or barter any patent rights, patent, specific, quack medicines, coaches, carriages, buggies or other vehicles without a license therefor, when such license is required by law, shall pay a fine not less than $20 and not more than $500.

Sec. 19. All license to sell patent rights, patent, specific or quack medicines, to persons obtaining subscriptions to newspapers, books, or to sell books or newspapers, or to sell the same by sample, licenses granted to persons to sell coaches, &c., manufactured without this State, shall expire at the end of the year from the date of granting the same, and shall not be granted for a shorter period than one year, or to be subject to any abatement or apportionment of tax if the privilege be exercised for less than a year, and shall not be construed to extend beyond the limits of the county or corporation for which it was granted. A license granted under this section shall be a personal privilege, and shall not be assigned or transferred so as to authorize any person to sell or act under such a license, except the person to whom it was granted.

CHAPTER III.

Sec. 24. On every license to sell or barter patent rights, $25; patent, specific or quack medicines, if by wholesale, $50; if by retail, only $25.

There are about 140 counties in Virginia. The tax, then, upon a patent right in the State of Virginia amounts to $3,500! which is virtually a prohibition. Is this constitutional? A VIRGINIA INVENTOR.

McGaheysville, Va., Nov. 25, 1860.

PICKING ORE BY ELECTRO-MAGNETISM.

Professor Burci, of the Institute of Superior Studies at Florence, director of the iron and copper mines at Traversella, in Piedmont, and one of the most distinguished geologists and mining engineers of Italy, has just published a highly interesting account of the mines above alluded to, containing a description of a new process for separating copper ore from iron ore, invented by M. Sella, an engineer well known to the scientific world by his "Studies on the Mineralogy of Sardinia." In the mines of Traversella, the horizontal development of their galleries measures 47 English miles, and they belong to different proprietors, one of whom—Chev. Riccardi di Netro—remarking that the iron ore obtained was intermingled with a considerable proportion of copper pyrites, requested M. Sella, in 1854, to examine whether copper might not be extracted as well as iron. After much attention to the subject, M. Sella declared that the copper pyrites were much too thinly disseminated among the magnetite, or magnetic iron ore, to be profitably separated by the common process of picking; that the specific gravity of the two ores was so nearly alike, that they could hardly be separated by washing. At length, however, M. Sella hit upon a plan which has been crowned with complete success. We have several times had occasion to describe electro-magnetic machines, the great principle of which consists in this: that a bar of soft iron can be temporarily magnetised by an electric current, and be made to lose its magnetic power instantly by the cessation of the current. M. Sella had recourse to this principle, and invented an apparatus, consisting of a wheel provided with fifty-four electro-magnets, which being turned over the ore, previously triturated by stampers, attract, when magnetised, all the magnetite which they let fall elsewhere on losing their magnetism. By this highly ingenious method all the copper pyrites, which, of course, cannot be attracted, is duly separated, at a very small cost, from the iron ore, among which it was previously as good as lost.—*London Engineer.*

[Such a machine was in operation in America twelve years ago, and was illustrated and described on page 305, Vol. III. (old series), of the SCIENTIFIC AMERICAN. Theoretically, the machine was constructed upon correct principles to effect objects similar to those set forth in the foregoing extract, but we understand it was used only for a very short period. In our opinion, it might be usefully applied in various mines.