Correspondence.

Some Suggestions in Civil Engineering.

To the Editor of the SCIENTIFIC AMERICAN:

The engineering projects outlined below may embody some patentable features, but the writer has decided to offer them to the public for what they are worth.

The first is a new method of constructing tunnels under deep harbors or straits, so as to avoid the heavy grades, and also reduce the cost; the second provides a means of retaining the high-water level in harbors, subjected to the action of heavy tides, and with large rivers flowing into them, as in the case of the harbor of this city (St. John, N. B.); the third is a more extended application of the latter scheme, so as to render rivers, with elevated banks, navigable without the aid of canals, where rapids and shallows must be passed; and the fourth shows how to use glaciers, easily accessible, like the Great Glacier on the C. P. Railway, for cold storage purposes. The last is very simple, and need not be described at length, as it would only be necessary to dig a tunnel into the glacier, and storage chambers on either side of it, with a branch track running into the tunnel, to convey the goods. British Columbia salmon and other products could be stored for any length of time, for convenient shipment to eastern markets. Other glaciers could, of course, also be used—possibly one could be found on the Labrador or Greenland shores, not far from trade routes.

The tunnel project involves the construction of a submarine embankment, preferably of clay mixed with rock ballast, to within about 30 feet of the surface of the water, which would allow a sufficient depth for shipping, and afterward excavating the tunnel through the embankment. The material removed for the approaches to the tunnel could be used for the embankment, the width or height of which could be increased, if necessary, by using the material excavated from its interior. In building railway embankments, it is found, that such material will force its way through enormous depths of boggy deposits, and it therefore seems probable that this could also be done in building these tunnel embankments, where a heavy layer of silt is encountered, as on the bottom of the harbor of New York.

The avoidance of blasting operations would greatly reduce the cost of construction, the moderate character of which is shown by the fact that thousands of acres of real estate have been built out into the harbors of San Francisco and Boston. The work would be of precisely the same nature, where the embankments are built above the surface of the water for a short distance from either shore, and the material for the central portion could be distributed by self-dumping scows. These shore sections of the embankment would afford valuable wharfage, and cheapen the cost of the approaches. At the Strait of Canso, N. S., where the water is very deep, and one of the shores considerably elevated, the comparison as to cost, with the usual methods of tunnel construction, would be most favorable. On the elevated shore of the strait, the grade could be greatly modified, as well as the cost of construction, by extending the embankment for a considerable distance above the surface of the water. Either a bridge or an ordinary tunnel at this point is considered a serious engineering problem.

Similar engineering skill would be required in carrying out the proposed plan for the harbor of this city. Bay of Fundy tides are well known for their unusual height, and have a range in this harbor of about 30 feet, leaving the smaller shipping stranded at the docks, when the tide is out, and greatly aggravating the difficulty of providing the larger shipping, to which such methods are dangerous, with adequate wharfage. The entrance channel to the harbor is very narrow, with a small rocky island and breakwater on one side, and about three miles of shallow rock flats on the other, which also extend over a large area of the harbor, and render it worthless to shipping except at high tides.

Beginning at the opposite shore and working out toward the entrance channel, an embankment of clay and rock ballast, say 50 or 100 yards wide, could be constructed at a moderate cost, and when completed would only leave an outlet at the entrance channel equal in capacity to the volume of the river water entering the harbor, which would then maintain the high water level. A lock would be required near the outlet to accommodate ships entering the harbor at low tide, but of course the outlet could be used at all other times. Some engineering difficulties might be encountered during the course of construction, but they could doubtless all be overcome. By providing drawbridges at the lock and outlet, traffic across the embankment could be accommodated, but such equipment would be of more value at a point farther up the harbor, where a ferry service to Carlton is established, across a narrow arm (the river channel) of the harbor, which could be crossed in the same way, by a bridge and embankment, through which only a channel (not graduated) would be necessary. The embankment at the entrance of the harbor could, of course, be abandoned, and the whole equipment located here, but the capacity of the harbor would be greatly reduced, and shipping still exposed to the dangers of the long narrow entrance channel. This plan of harbor improvement, unlike some others proposed, would not complicate the sewage problem, on interference with the passage of silt and rubbish, brought down by the river.

Embankments of this description could be built out from the shores of rivers obstructed by shoals and rapids, where the banks have sufficient elevation to retain the water, making them into a succession of elongated lakes, which could be entered, in both directions, by means of locks and graduated outlets, as previously described. Provision would have to be made for floods, but this could be done by paving portions of the embankments with stone or brick, over which the water would flow at the proper elevation. The cost would surely be far less than would be necessitated by a system of canals. An embankment subjected to somewhat similar conditions has long been in use at Holyhead, Wales, over which the Chester and Holyhead railway passes. It is three-fourths of a mile in length, with a gap at the center through which the tide rushes with great violence.

One of the best opportunities for putting this project into successful operation is afforded by the St. Lawrence and Ottawa rivers, and a small tributary of the latter, almost completing the connection with Lake Nipissing and thence to Georgian Bay by the French River. Only about twenty-five miles of canal would have to be excavated, and if no greater obstructions stand in the way, the opening of this route to large vessels would prove an inestimable boon to Canadian and Western commerce.

W. F. CLEVELAND.

Royal Hotel, St. John, N. B., Canada.

Oil Well Fires in Texas.

To the Editor of the SCIENTIFIC AMERICAN:

We note with pleasure the extensive space you have devoted in your issue of January 10 to the Southwestern oil fields and to the fires which have occurred in these fields in the last six or seven months. It is hard for people in the East to realize the entire significance of this great oil belt, extending across Texas and Louisiana, which has been tapped in the last two years at a half-dozen places. We believe the Texas and Louisiana oil fields are worthy of more attention by the Eastern papers in the way of legitimate treatment, such as you have given the subject in your recent issue.

We regret, however, that your correspondent has misstated the facts in several particulars, and we take the liberty of suggesting that you make a correction of these mistakes, if this is consistent with your editorial policy.

To begin with: The statement that one of the largest wells in the Jennings region caught fire and blazed for several weeks, is incorrect. This well was ignited from an oil tank which was set on fire by a stroke of lightning, July 15, and burned continuously until July 21—about six days. It was extinguished in one half minute by the use of steam and water. The well in question is the property of Heywood Brothers, and after the fire it was put into service and has yielded more than 30,000 barrels of oil a month, producing a net revenue exceeding $7,600 a month.

Regarding the Spindle Top fire, your correspondent states that one of the fires destroyed property covering ten acres of the Hogg-Swayne tract and raged for two weeks. He states that this fire occurred in September, and that at one time fifty wells were on fire and that twenty workmen lost their lives before they had time to escape. He probably refers to the first fire on Spindle Top Hill, which occurred in September, and was confined to the Keith-Ward subdivision and a portion of the Higgins tract. Only one well burned continuously in this fire, although ten or twelve were ignited at intervals, but were extinguished without difficulty. This fire lasted three days. There was no loss of life in this fire. In October a fire occurred in the Hogg-Swayne tract, destroying about fifty derricks, and in this fire one workman was burned so badly that he died. In this case the fire lasted only eight hours.

The statement made by your correspondent that water has proved ineffective in extinguishing the Southwestern oil fires is also incorrect. In the Beaumont fires, water was relied upon, as it was at Jennings, and combined with steam, it had the desired effect. It must be remembered that when a stream of water is turned upon a red-hot pipe or tank, it is immediately converted into steam, and this has the same effect as if steam were sprayed upon the fire from pipes.

We trust that you will make these corrections, because we believe they are essential facts and deserve to be properly stated. Considerable prejudice has been raised against the Texas oil fields on account of the fires, and sensational newspapers have seized upon every possible excuse for printing glaring accounts of the few fires that have occurred. We believe that the loss of life and property through fires has been remarkably small.

HOLLAND S. REAVIS.

Jennings, La., January 13, 1903.

Natural Growth of Mushrooms in a Circle.

To the Editor of the SCIENTIFIC AMERICAN:

In SCIENTIFIC AMERICAN of January 3 an article accounting for mushrooms growing in the form of a ring on account of the exhaustion of the organic matter is misleading and incorrect.

Mushrooms do not come from seed or spores directly. The spores produce mycelium under favorable conditions; and this mycelium will produce mushrooms if the conditions are favorable. Otherwise mycelium will reproduce mycelium, and if conditions remain unfavorable during the first two generations, then there are seldom, if ever, any mushrooms produced until the sixth or seventh generation, when some mushrooms may develop, otherwise the ring and time are extended to about ten or eleven generations. If Prof. F. S. Lamar will take some soil that was inside the ring, or soil upon which mushrooms have grown the previous season, and will plant some first generation mycelium, making the conditions favorable, he will find that it will produce mushrooms and prove his theory wrong. Mushrooms are not particular about the kind of soil they grow in, organic matter sufficient is produced annually, but they are very dependent upon suitable moisture and temperature. Mycelium is more dependent upon the kind of organic matter and less upon moisture and temperature. Fairy rings of fungous growth can be produced by design by controlling the conditions, and thus prove the correctness of my theory.

A. B. LECKENBY.

Eastern Oregon Experiment Station, Union, Oregon, January 28, 1903.

A Tidal Wave in the Pacific.

On February 9 the Low Islands in the South Sea suffered much damage from a tidal wave. Of the hundreds of islands to be found in the Pacific, many of them located in lagoons surrounded by coral reefs, the Low Islands are perhaps the most exposed. The islands take their name from the peculiar classification of the inhabitants of the South Sea. Islands are divided into high and low. Thus it comes that the Paumotu Islands are often named on the maps the Low Islands. Like many of the South Sea islands, the Paumotu or Low Islands are of coral formation, rising not more than 20 or 30 feet above the level of the sea, and therefore particularly exposed to tidal waves. The High Islands, on the other hand, are of volcanic origin, and sometimes project their heads to a height of 8,000 feet. In the Hawaiian group still higher elevations are attained. The Paumotu Islands have an area of about 400,000 square miles, which is about half as large again as the State of Texas. Fortunately, in view of the recent disaster, their population is small. Had the calamity occurred in the High Islands, which are more thickly populated, the fatalities would perhaps have been appalling.

A Scarlet Fever Serum.

The announcement was made at Berlin, February 2, that a scarlet fever serum had been discovered which seemed full of medical promise. Experiments were said to have been conducted by Dr. Aronson, which were quite successful. The result of these experiments was announced by no less a person than Prof. Baginsky, the head of Emperor and Empress Frederick Children's Hospital of Berlin. He is, therefore, in a measure responsible for the announcement of the therapeutic value of the Aronson serum.

The Current Supplement.

The current SUPPLEMENT, No. 1416, opens with a most elaborately illustrated article on "Electric Traction at Cape Town." Henry R. Lordly discusses exhaustively the subject of anti-friction bearings, illustrating his text by many telling diagrams. Two articles on calculating machines, one on a mechanical cashier, and the other on an automatic adder, subtractor, divider, and multiplier, should be read with interest. The English correspondent of the SCIENTIFIC AMERICAN begins his account of the Water Supply of London. C. F. Saylor presents in an interesting article the progress of the beet-sugar industry in the United States. "The Universe as an Organism" is the title of a semi-philosophical paper which contains much food for reflection. Prof. Bedell, who recently announced a method of using one wire for transmitting alternating and direct currents, discusses the subject in a popular paper.