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The editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

PUBLIC APPROPRIATIONS AND THE BOARD OF ALDERMEN.

We cannot believe that the Board of Aldermen of this city realize the serious consequences which will result from their action in holding up the appropriation of $6,000,000 which is required for building the new Manhattan Bridge. The ostensible reason for their action is the objection which these gentlemen have to a certain type of construction which the Bridge Commissioner proposes to use in this bridge. The question of the merits or demerits of the design, however, is a purely technical one; and in spite of the fact that it has been favorably indorsed by a board consisting of the most eminent bridge engineers of this country, and that the question is so pre-eminently technical that the worthy aldermen through no fault of their own are entirely incapable of passing any intelligent opinion on it, this body of laymen have undertaken to block the bridge for so-called technical reasons. On another page of this issue we discuss at some length the engineering and architectural considerations which favor the eye-bar, as against the chain-cable type; but just now we wish particularly to point out how serious is the responsibility incurred by the Board of Aldermen in their present obstructionist attitude. The new bridge is intended to give immediate relief to the shockingly-overcrowded conditions on the present Brooklyn Bridge, and it is pretty certain that until the former is opened these conditions will grow steadily worse, for the Williamsburg Bridge is too far distant up the river to divert any appreciable proportion of the Brooklyn Bridge travel to itself.

In the presence of the disgraceful, unchivalrous, and altogether unmanly riot that occurs every night at the Manhattan entrance of the Brooklyn Bridge, the mere question of whether eye-bars or wire shall enter into the construction of the bridge which is being built to alleviate these conditions is comparatively trivial. If any of the aldermen who are holding up this appropriation doubt what we say, let him take his stand any evening on the platform above the trolley track loops, and spend the hour from half past five until half past six watching the rough-and-tumble fight of men, women, and children. Let him take note how strong men, as they rush brutally to get the coveted seats on the car, will sweep aside frail women and young girls. Let him see weak men and women thrown down, trampled upon, and dragged from the surging mob with injuries which, in some cases during the last few months, have proved fatal. When he remembers that these people are the representative toilers of the greatest city in a country, which boasts itself upon its advancement in everything that makes for the betterment of the physical and moral conditions of the race, it may, perhaps, begin to dawn upon him that in preventing the construction of the new bridge, he is committing something that approaches a crime against the very citizens who have elected him to his office. But if it is a fact that the Board of Aldermen have held up the appropriation with a full realization of the misery which their action is producing, the New York public will have to take what comfort it can from the reflection that "whom the gods destroy they first make mad," and that the gentlemen of this Board, many of whom would not know a bridge eye-bar from a latchkey, represent the stragglers of an old order of things in city government of which we are shortly to see the last.

THE MERCHANTS' ASSOCIATION AND THE NEW RESERVOIR.

Although we have had occasion to differ with the Merchants' Association of this city in some of their criticisms of recent changes at Croton Dam and Jerome Park Reservoir, we heartily approve of their efforts to make public the slipshod way in which some of these changes appear to have been carried through. Of the wisdom of substituting solid masonry for a core-wall embankment at the Great Croton Dam, we have never had the slightest doubt; and if the new extension is built in the same careful way that has characterized the masonry work of the completed portion, there is no doubt that the city will secure in this great structure one of the most perfect works of its kind ever built. As our readers are well aware, we have also approved of the original proposal of the late chief engineer to substitute here and there at the Jerome Park Reservoir a solid retaining wall carried down to rock in place of an earth-and-core-wall dam in which the core wall rested upon a more or less pervious and unstable material. These changes, however, were originally proposed only for certain limited sections of the perimeter of the reservoir, where the foundation was doubtful; but it now seems that a solid wall has been built, not merely where the foundation was doubtful, but also on long stretches of work where it seems to us there could have been no question of the stability of an earthen core-wall dam had it been built as in the original plan. The question of the expediency of carrying the more costly solid masonry wall continuously along the whole western side of the reservoir, irrespective of the quality of the foundation, is one for expert opinion to decide; but while there may be a division of opinion as to the desirable extent to which the change should be carried, there can be no question as to what quality of wall should be built. It should be of the very finest rubble masonry that first-class rock and the highest grade of cement can produce. First-class cement mortar requires as one of its ingredients sharp river sand, or its equivalent, and it was this material that was called for in the contract specification. The contractors requested to be allowed to crush up the rock that they were excavating and use it in place of this sand, contending that equally good cement mortar could be obtained by its use. Here is another question for expert opinion, and we must confess that for ourselves we would, of the two materials, prefer every time to use sharp river sand. The contractor, however had his way; the wall has been built with its crushed rock mortar; and now it begins to look as though the retaining wall as built is an exceedingly poor and slipshod structure, inasmuch as water which has accumulated from time to time on the outside of the wall has had no difficulty in finding its way through the wall to the interior of the reservoir, and in some cases in considerable quantity. Moreover, in places where the inflow of water through this supposedly impervious wall has been considerable, there has been washed through and deposited at the base of the wall a slime whose solids looked very suspiciously like the crushed gneiss rock which the contractor was permitted to substitute for sharp river sand. It may be that the contractor will be able satisfactorily to explain this condition of things. We sincerely hope for his own sake and for the sake of New York city that he can; for the contractor for the Jerome Park Reservoir is also the contractor for the New York Rapid Transit Subway, and neither he nor the city can afford to have the slightest question of the first-class quality of his work attach to any of the important municipal contracts he has in hand.

INDUSTRIAL CHEMISTRY IN THE SOUTH DURING THE CIVIL WAR.

It is difficult for anyone in the North who was not a participant in the civil war to appreciate thoroughly the great sufferings that were experienced by those who lived in the Southern States at that time. The continual blockade along the water-front on the east and south, the armies on the north, the Mississippi River and the mountains on the west, made it almost impossible for the introduction of materials essential for the proper carrying on of a great war. The heroic struggle waged under these disadvantageous circumstances make the four years' combat one of the most remarkable wars of modern times.

A description of the efforts made in scientific directions has never been satisfactorily written, but within a few weeks, in a pleasant way, under the title of "Applied Chemistry in the South During the Civil War," Prof. John W. Mallett, of the University of Virginia, spoke before the Chemical Society of Washington of some of his experiences.

In beginning, he referred to the great lack of preservatives that were essential, and indeed required, for the preservation of food. Fortunately, the salt deposits in Louisiana were promptly thought of, and advantage taken of their existence for exploitation and production of that every-day essential, so that an ample stock at least of the preservative was soon available. The supplies of coffee and tea were very soon exhausted, and substitutes were introduced. For coffee roasted beans of various kinds, sweet potatoes, and cereals, came into every-day use, and the leaves of various herbs were employed in place of tea. The joy of the first cup of coffee after the close of the war formed a delight that can never be forgotten. The necessity of preserving the cattle, and the employment of horses in the army as well as the demand by the soldiers for shoes, soon exhausted the leather supply. As a result leather became such a rarity that a good pair of boots at the close of the war was worth several hundred dollars in Confederate money. As a substitute, fibers were worked up and coated with a varnish, forming a sort of material similar to oilcloth, which came into use for many purposes. The employment of petroleum oil as an illuminant was at its beginning. Colza and other oils were similarly used at that time, but these soon disappeared, and the old-time candle dip prevailed. For purposes where an oil was absolutely essential, recourse was had to fish oil. Paper was very scarce, and there were but few, if any, mills in the South, and these produced a very inferior quality of paper, so that for writing purposes the blank leaves of old account books were employed, and for printing purposes wall paper, on which many newspapers of the time were printed, was largely used. Only the crudest kinds of ink were to be had, and in most cases they were made by adding water to the refuse in the ink bottle until the writing became so faint as to be scarcely visible.

The great coal deposits of Pennsylvania being no longer available for fuel, recourse was had to the bituminous beds of Virginia, although of course in many cases wood was all that was required. It goes without saying that the supply of paint rapidly disappeared. However, there were numerous deposits of ocher that were available, and crude varieties of paints were soon manufactured in sufficient quantities to supply the demand.

One of the important, indeed necessary, elements in the carrying on of a war is artillery, and to fight without gunpowder is practically impossible. Accordingly, gunpowder mills were established at several localities in the South. The supply of niter was soon exhausted, and search was made for that material in caves and elsewhere throughout the South. These yielded a certain amount, but the future was provided for by the establishment of niter beds. Still, the end came too soon to permit of their being available. There were no sulphur deposits in the South, but fortunately at the beginning of the war there was a large supply of that article in New Orleans, where it had been used in the clarification of sugar. Charcoal was of course more readily obtainable, and after some experiments it was found that the wood from the cotton-wood tree yielded the most satisfactory material.

The manufacture of fulminate of mercury for percussion caps was carried on to a limited extent, and the copper for the caps was obtained from the turpentine stills, which were all collected from North Carolina and used for that purpose.

There were four principal medicines required, namely, quinine, morphine, ether, and chloroform. These were procured, so far as possible, by smuggling, either through the lines or by blockade runners, and numerous substitutes were introduced. For instance, for quinine bitter barks were used wherever possible, especially dogwood, and the dread malaria was by this means held practically in check. Morphine was almost entirely brought in by means of the blockade runners.

At the beginning of the war there were no large metallurgical works in the South, with the single exception of the iron foundries at New Orleans and Richmond. The early capture of New Orleans left in Richmond the only large available foundry, and the Tredegar Iron Works became the principal source for articles made of iron. For ores, recourse was had to the deposits from the South, and it was necessity that led to the exploiting of the deposits of iron in Alabama and elsewhere along the Appalachian Mountain range; indeed, a primitive blast furnace was erected where the city of Birmingham now stands. Copper was had to a limited extent from the Ducktown Works in Tennessee, but more largely from the stills, as previously mentioned, that had been used in the manufacture of turpentine. Lead and zinc were only to be had in limited quantities, and were obtained chiefly from mines in Virginia.

M. Albert Dion, of France, has patented a new navigable balloon construction, in which an attempt is made to overcome the inherent defects of the present types of dirigible aerostats, viz., deficiency of rigidity and liability to distortion, with a tendency to rupture in high winds. In his design, M. Dion has made the gas bag conform more to the shape of a shuttle, terminating in a sharp point at either end. The frame supporting the car below is carried nearly the entire length of the balloon. At the top of the balloon is a curious backbone of light material extending from end to end, from which a light column extends vertically through the envelope of the gas bag, passing through a hole in the lower side fitted with a ring. The ribs of this backbone serve to carry the frame containing the car and motor. The vertical column resembles in an end sectional view the backbone or spinal support of a schoolboy's kite.

A concession to operate two thousand automobile chairs at the World's Fair, St. Louis, has been granted to a company in St. Louis.