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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.

THE POLLUTION OF NEW YORK HARBOR.

The incumbency of his distinguished office by Mayor McClellan will be notable for the important public works inaugurated during his administration which have to do with that most important of all civic interests, the health of the inhabitants. The construction of the Catskill water supply is due largely to the wisdom and persistence of the mayor; and we are glad to note that he is now interesting himself in another sanitary question which has long been pressing for serious consideration. We refer to the pollution of New York harbor, which has been allowed to increase to a point at which there is a loud call for thorough investigation, to determine just what the extent of this evil is at the present time. The matter has been under discussion in a more or less desultory way for many years, and for some time there has been in existence what is known as the Metropolitan Sewerage Commission; but so many contrary opinions were held by the members as to the actual extent of the pollution and the proper remedial measures to be undertaken, that the mayor decided upon a change in personnel and a thorough reorganization. New York bay and harbor represent, it is true, a large body of water; but the growth of population around its shores has been so rapid that it is quite a question whether the bay is not receiving more sewage than it can properly dispose of. Moreover, the problem has been rendered more serious by the proposal to discharge into the bay the sewage of the manufacturing towns which lie in the Passaic valley. Ultimately the question is likely to become the subject of litigation; and, in view of this, it is desirable that exact figures should be available as to the amount of sewage now emptied into these waters. The famous litigation between the cities of St. Louis and Chicago over the question of the pollution of the Mississippi by the drainage from the Chicago Canal showed the necessity for the possession of ample statistical data; and it is felt that the exact determination of conditions in New York harbor cannot be too quickly arrived at.

GOOD WORK IN THE RAINY SEASON AT PANAMA.

The bulk of the material which is being excavated at Panama is of a character which renders it particularly susceptible to the disintegrating influences of rainy weather. It loses its consistency and becomes more or less "greasy," with the result that it has been exceedingly difficult to keep the tracks in the Culebra Cut, and those over which the excavated material has to be hauled for many miles to the dumps, in proper line and level. Unless constant vigilance is exercised in maintaining the tracks, trains are liable to derailment, and the whole traffic of the line on which the mishap occurs may be held up for a considerable period. In the earlier attempts to construct the canal, the falling off in the amount of excavation in the rainy season was very great; but under the present excellent administration, and thanks to the highly-skilled corps of engineers and foremen, the difficulties have been mastered. There is, of course, a reduction in the total output of this time of the year, but the rate of excavation per month is still maintained at a high figure. Thus, the total excavation on all the divisions of the canal during the month of May was 2,702,897 cubic yards; and although, compared with the previous month, the total amount of excavation was 593,200 cubic yards less, it must be remembered that the mean rainfall was 12.8 inches greater. The total amount excavated from the canal prism in May was 2,525,887 cubic yards. Comparing this with the amount taken out in May, 1907, the total excavation this year is 1,685,238 cubic yards greater, and this in spite of the

fact that the mean rainfall for May of this year was 14.7 inches, or 7.6 inches greater than during May of last year. Again, the total excavation in the Culebra division during the month was 960,840 cubic yards. This is a decrease of 281,734 cubic yards, as compared with the amount excavated in April; but compared with the work done during May, 1907, the excavation by steam shovels in the Culebra division was 39 per cent greater, and the average output per shovel per day was about 10 per cent greater, and this in spite of the fact that the rainfall in May, 1908, was about 52 per cent greater than in May, 1907.

For the month of June the results are even more creditable, the grand total of excavation being 3,060,307 cubic yards, of which all but 165,316 yards was taken from the canal prism. This is a new record for the rainy season, being 356,384 yards more than the record for May, and only 419,963 yards short of the highest dry season record, that of March, 1908.

MORE DAYLIGHT FOR RECREATION.

It is not often that a measure of such a startling character as the Daylight Saving Bill is introduced into the English House of Commons. The fact that the momentous changes advocated by the bill are proposed by William Willett, a member of the Royal Astronomical Society, suggests that the measure may not be so chimerical as might be supposed. Naturally, the first dispatches relating to the subject were somewhat incomplete, and have led to not a little misunderstanding, both as to the aims of the measure and the manner in which its provisions are to be carried out. Later advices giving fuller particulars show that it is proposed during part of the spring and autumn, and the whole of the summer, to advance the clocks throughout the whole country, moving the working day forward, with a view to including within the working hours a longer stretch of daylight. The change is to be made gradually. At 2 o'clock on the morning of each Sunday in April the clocks would be set forward twenty minutes, the result of which would be that during the first week of April the workingman who usually rose at 6 o'clock would actually rise at 5:40 A. M.; and instead of quitting his work at 5 P. M., he would actually leave at 4:40. During the second week of the month, although he rose by the clock at 6 A. M., by the sun he would rise at 5:20 A. M., leaving his work at 4:20 P. M. During the last week of the month he would rise at 4:40 A. M. by the sun, though still by the clock at 6, and his work would be over by 3:40 P. M. Mr. Willett believes that the change would be sufficiently gradual to prevent its being apparent, or causing any physical or other inconvenience. The total amount of daylight saved in the mean latitude of England would be in April, 23 hours; in May, June, July, and August, 164 hours; and in September, 23 hours—a total for the six months of 210 hours. Among the commercial advantages urged in favor of the change is that railroads, factories, and commercial houses which are large users of gas and other artificial light, would realize a saving by these additional nine whole days of daylight of \$15,000,000; whereas as against the change it is urged that it would completely disorganize the railroad service of the country, besides causing various commercial and other complications of a troublesome character.

To the average individual, however, the most attractive feature of the proposed change is that it would greatly lengthen the spring, fall, and summer evenings, and afford a long stretch of daylight for recreation during the most pleasant period of the twenty-four hours. Visitors who have sojourned for any length of time in England or in continental countries in the same or higher latitudes, have appreciated the long duration of twilight during the summer months, darkness not setting in during the longest days until from 10 o'clock P. M. to midnight. In the more southerly latitude of the United States, the path of the sun across the zone of twilight being less oblique than in the latitude of the British Isles, the period of twilight is much shorter; with the result that even on the longest day of the year, darkness sets in soon after 8 o'clock. Consequently, the period of recreation between dinner and dark is so short, that there are certain forms of outdoor recreation in which it is not worth while to engage. The advancing of the clock by one hour and twenty minutes, however, would render the spring, summer, and autumn evenings the choicest of all periods of recreation, the sun being low and the temperature moderate. It has been suggested that, in view of the delightful conditions which characterize our so-called Indian summer, it would be advisable, should any such change ever be contemplated in this country, to restrict it to the four months from August to November inclusive. The advantage of a long daylight evening for such sports as yachting, rowing, golf, tennis, and automobiling are indisputable.

After all said and done, however, whether the English measure be passed or not, it is unlikely that any daylight bill of this kind will be introduced into the United States, at least for many decades to come. Tra-

dition, habit, and a hundred settled usages, national, commercial, and domestic, will always be ready with a strong protest against any interference with that symbol of unchanging order, the clock.

RELATION OF THE GAS PRODUCER TO LOW-GRADE FUELS.

In a recent letter of the Secretary of the Interior to the Senate, transmitting the results of investigations by the government of the fuels of the United States, certain important facts relating to tests made with low-grade fuels in gas producers are related, which have an important bearing upon the question of the conservation of the mineral resources of the country. The report says that the tests have shown that many fuels of such low grade as to be practically valueless for steam furnace purposes, including slack coal, bone coal, and lignite, may be economically converted into producer gas, and may thus generate sufficient power to render them of high commercial value. Coal as high as 45 per cent ash, and lignites and peats high in moisture, have been successfully converted into producer gas, which has been used in operating gas engines. It has been estimated that on an average there was developed from each coal tested in the gas producer plant two and one-half times the power developed when used in the ordinary steam boiler plant, and that relative efficiencies will probably hold good for the average plant of moderate power capacity, though this ratio may be greatly reduced in large steam plants of most modern type.

It was found that the low-grade lignites of North Dakota developed as much power when converted into producer gas as did the best West Virginia bituminous coals when utilized under the steam boiler. In this way lignite beds underlying from 20,000,000 to 30,000,000 acres of public lands, supposed to have little or no commercial value, are shown to have a large value for power development. This is of importance to the West and makes possible a great industrial development there.

In the fuel-testing plant, with the best Kanawha Valley coal, the steam plant produced 0.28 horse-power per pound of coal per hour, and the gas producer 0.96 horse-power, or 3.43 times the efficiency for the producer gas plant over the steam plant. The remarkable feature in these tests was the comparison between the Kanawha Valley coal under the steam boiler and the lignite in the producer gas plant. The former under the boiler produced 0.28 horse-power per hour, while the lignite produced 0.30 horse-power per hour when operated in the producer gas plant, or 1.07 times the power of the best steam coal burned in a boiler furnace.

It became evident early in the fuel investigations that the greatest possible saving and consequent prolongation of the life of the fuel resources of the country might be had through a more rational utilization of the low-grade fuels. In the bituminous coal fields, especially in the Middle West and Southwest, where the coals are poor, the coal bed may run but 2 or 3 feet of good merchantable steam coal, but to mine this the entries and drifts must be opened to a height of 6 feet. This means that from 2 to 4 feet of material, even containing quite a quantity of medium grade coal, is thrown on the dump heap. Means of burning the whole coal as mined, or of burning the "bone" coal alone, may be devised which will make the entire product mined of value for heating and power purposes.

A NEW PROCESS FOR THE MANUFACTURE OF COPPER WIRE.

A new process for the manufacture of copper wire in one operation from crude copper, such as Bessemerized copper bars, has been perfected by Mr. Sherard Coper-Coles of London. The scope of the invention is the electro-deposition of the copper on a revolving mandrel or drum running at a critical speed, this latter having been determined by rotating a cathode in the form of a cone, that portion which gave the smoothest and toughest deposit being the critical speed for the conditions under which the copper was deposited. Very dense copper is produced by this means, which has a considerably higher tensile strength than that obtained by the orthodox process of annealing and drawing or rolling.

The theory of the process is that each molecule of copper as electro-deposited is burnished or rubbed by the friction of the electrolyte on the mandrel, insuring a more homogeneous metal than is possible by applying great pressure to a large mass of metal by swaging, rolling, or drawing.

Copper so electro-deposited crystallizes at right angles to the surface on which it is deposited; this fact has been turned to account by making a spiral scratch which must be V-shaped on the mandrel, so as to cause the crystals to make a weak line of cleavage. If the scratch is rounded at the base the crystals form radially, and no weak line of cleavage is produced. Four or five miles can be made on a mandrel. The strip is unwound and passed through a set of dies to remove the burr or fin and to form a round section.