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## THE AMERICAN SOCIETY OF CIVIL ENGINEERS.

The Twelfth Annual Convention of this society was held at St. Louis, Mo., May 25 to 28. Mr. Albert Fink, the president, not being in attendance, Captain James B. Eads was elected chairman. There were present a large number of members and visitors, including leading engineers from all sections of the country. The programme included daily sessions for the reading of papers and the discussion of topics of interest in the engineering profession, together with excursions to allow of the inspection of notable engineering works in St. Louis and its vicinity.

Among the visits made, one was to the St. Charles Bridge over the Missouri, for which a new span of 312 feet length was completed the 1st of April last. The floor of the bridge is of iron beams, thirty inches deep; on each side of the rail is an iron trough, ten inches wide and five inches deep, and outside of this is a timber guard, 12x12 inches, all to prevent damage to the trusses by derailment. Another visit to the St. Louis Water Works was of great interest to the attending engineers. To supply St. Louis the turbid waters of the Mississippi are pumped into four receiving basins, each 600 feet long by 270 feet wide, and about 16 feet deep, where the water is allowed to remain until the sediment settles, which it does at the rate of about one inch of deposit per week. It takes about a week for the water to become clear, when it is supplied to consumers, the high service being supplied from a reservoir into which the water is pumped by four large engines. The deposit in the settling basins is loosened by hard labor and washed out by a powerful stream of water. At the Vulcan Steel Works, in South St. Louis, an inspection was made of an establishment at present capable of turning out 200 tons of steel rails per day, and the furnaces of the Meier Iron Co., operated by the Missouri Furnace Company, were also visited. The latter are in Illinois, opposite Carondelet, and are making an average production of 160 tons of Bessemer pig iron per day.

Among the papers presented to the convention, one was on "The Hudson River Tunnel," by Charles B. Brush, of Spielman & Brush, the engineers in charge of that work, who furnished the plans from which our illustrations of the tunnel were made in the SCIENTIFIC AMERICAN and SUPPLEMENT a few weeks since. The subject of another paper, by O. F. Nichols, was "Peruvian Tunnels." Two papers were read upon cements, a subject which raised considerable discussion. One was by D. J. Whittemore, on "Tensile Tests of Cements, and an Appliance for more Accurate Determination," with illustrations and diagrams giving the results of numerous experiments, and another was by F. O. Norton, on "American Cements." Mr. Whittemore showed that American hydraulic cements varied twenty per cent in weight, and he conceived it possible that in some cases the surfaces of specimens acquired a tenacity not extending throughout the entire mass, and that "a surface hardening had taken place, through some process of crystallization, or by the absorption of carbonic acid, forming subcarbonates." Mr. Norton said that from 1,000,000 to 1,500,000 barrels of Rosendale cement were made each season, and that "when a small amount of water is used in mixing the cement it gives a greater tensile strength than when the dry mixture is used, but only for a period of three months—after that the reverse is true." The discussion on this subject was participated in by Messrs. Francis, Harlow, Schmidt, Norton, Chesbrough, Whittemore, and Hutton, and quite pertinent thereto, but which, from the report of the proceedings, does not appear to have been referred to, is the recent announcement from England of the successful employment of blast furnace slag in making an excellent hydraulic cement. This hitherto waste product has there been made into a cement, which in three days is said to have been stronger than Portland cement at seven days; in seven days it was stronger than Portland cement at three months; in fifteen days it was stronger than Portland cement at three months, and in twenty-eight days it was stronger than Portland cement at seven years. This result, says *Engineering*, was obtained "by mixing the slag sand supplied by the Teet Iron Company with the white chalk of Essex, in the proportion of about one ton of slag sand to one and three-fourths tons of chalk, and subsequently burning the same in an ordinary cement kiln."

Papers were presented on several other subjects, including "Web Stains in Simple Trusses," by E. Sweet, Jr., and "Ultimate Crippling Strength of Wrought Iron Columns," by C. L. Gates, all of which will appear in the published reports of the transactions of the society; but general regret was expressed that there was no report from the Committee on Iron and Steel, on account of the absence in Europe of General William Sooy Smith, its chairman, and it was hoped that every member of the Convention would use his influence to bring about a restoration of the Board for Testing Iron and Steel, a result which not only engineers, but every one engaged in any department of mechanical industry, should endeavor to promote.

## A NEW PLAN FOR SMALL REMITTANCES.

The satisfaction with which the withdrawal of fractional currency in paper was greeted, a few years ago, was measurably tempered by regrets for the loss of a convenient means for remitting small sums. For such purposes coin is not at all suitable, and postal orders are at once inconvenient and relatively very costly for small amounts. Postage stamps of the larger denominations might answer the purpose imperfectly if they were exchangeable for stamps of

smaller value, as it is this method of remitting usually subjects the receiver to inconvenience, if not actual loss, since few people can make use of the larger stamps in any considerable quantity. Several more or less clever devices for overcoming the difficulty have been suggested by correspondents of this paper, but none seem to have received the approbation of the postal authorities. Possibly something more may come from the plan proposed by Mr. Chetwynd, receiver and accountant general to the British post office. It appears from a late report of the postal department that a large part of the 17,000,000 money orders issued in the year ending March, 1879, were issued for sums for which commission was less than three pence; and on all such orders there was an absolute loss to the department, thus compelling a readjustment of the rates. With the withdrawal of the lower rates the money order ceased to be economical to remitters of small sums, and some other cheap and convenient remitting service was urgently called for.

Accordingly Mr. Chetwynd, who for more than forty years has taken a prominent part in the improvement of the postal service, and is particularly known as the author and joint organizer of the system of government savings banks so successful in England, has suggested a system of post office notes. As described by the author of the system, the new note is designed to combine the simplicity of a postage stamp as the subject of an account with the advantages of a small bank post bill, a circular note, and a check issued by what may be called a government bank, and payable at any one of the five thousand Government banks throughout the United Kingdom to the order of any person named by the purchaser of the note in writing on the back of it.

To begin with, it is proposed to issue four classes of these notes—namely, for 2s. 6d., 5s., 10s., and 20s.—at 1d. commission for the former two, and 2d. the latter two amounts, and it is the intention of the post office to issue them in books for use as required, as well as singly.

These notes will differ in character from our abandoned postal or fractional currency in several particulars. They will not be legal tender, and will be limited in their period of currency. Besides, though in the first instance an open note payable to the bearer on demand, a note may be crossed at once, giving it the security of a check similarly dealt with, or it may be localized in the same manner as the money order by the simple insertion of a particular post office, at which alone it will then be payable; while the mention of the payee's name adds further security to the note. But, whether open or otherwise, the postal note will require to be indorsed by the bearer before it will be cashed, so that any fraudulent attempt to get payment of it will thus involve forgery, and be subject to heavy penalties.

A bill to introduce this system was brought before Parliament just before the recent dissolution; and the scheme will doubtless be brought up again at an early date.

## THE PROPORTION OF PATENTS TO POPULATION.

One of the most interesting subjects connected with the growth and development of manufactures in various parts of the country is presented in the yearly reports of the Commissioner of Patents, where the number of patents granted to each State yearly, and the proportion they bear to the population of the State, are presented in tabular form. It is only a few years since that the Patent Office began to issue any large number of patents to the Western States, Massachusetts and Connecticut and New York and Pennsylvania, as being the principal seats of manufacturing industries, standing far ahead in this matter. It is of the last importance, however, in making comparisons of this kind that we proceed from correct data as to the actual population. For the past ten years the growth of the country has been wonderfully rapid, and yet the population as given by the census of 1870 is made the basis on which the Commissioner of Patents figures out the proportionate number of patents to the total population of each State. New York State, for instance, for 1879 was credited with 2,556 patents, which was given as one for every 1,717 inhabitants. Now it is probable that the population of the State by the census being taken this year will show an increase possibly as large as one million. This, of course, would materially change the proportions thus given, and from this kind of reasoning from deficient data, the proportion of patents to population has, for most of the last ten years, been made to appear larger in nearly all of the States than it actually has been.

## CYPRIEN M. TESSIE DU MOTAY.

Mons. C. M. Tessie Du Motay, chemist and inventor, of Paris, France, died in this city, June 4, at the age of sixty-five.

Mons. Du Motay was born in Brittany, France, in 1815. At an early age he went to Paris, and after achieving considerable distinction in literature, he turned his attention to science and invention. His earlier successes were in connection with chemistry. While studying that science in Germany he invented and patented several improvements in the art of bleaching and dyeing, which brought him money as well as reputation. On his return to Paris he became distinguished as a consulting chemist and metallurgist. He invented a method of manufacturing ferromanganese, and introduced notable improvements in the manufacture of glass, in the treatment of beet sugar, in photographic chemistry, and in other departments of technology. He was one of the first experimenters in electric lighting with Jablockhoff, Moncel, and Jamin, and in connection with Maregnac he in-