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(Illustrated articles are marked with an asterisk.)

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Detailed table of contents for the supplement, categorized into sections like 'ENGINEERING AND MECHANICS', 'TECHNOLOGY CHEMISTRY, ETC.', 'ELECTRICITY, LIGHT, ETC.', 'ART, ARCHITECTURE, ETC.', 'MEDICINE AND HYGIENE', 'AGRICULTURE, ETC.', 'ASTRONOMY, ETC.', and 'NATURAL HISTORY, ETC.'.

THE PRESERVATION OF GAS SERVICE-PIPES.

The inconclusive discussion of the means employed for preserving gas service-pipes, by the Associated Gas Engineers of New England lately, seems to point to a field of investigation which some thoughtful inventor may find profit in cultivating.

Secretary Neal, who introduced the subject, laid especial stress upon the destructive influence of the salt in the soil of seaboard places. In Charlestown, Mass., the wrought iron (ungalvanized) service-pipes were sometimes found to be so corroded that the least touch would destroy them; they were as thin as paper. He had no doubt that a great many of their service-pipes were badly corroded, but so long as they were not meddled with they continued to hold gas. A process to make them more durable was greatly needed, and he raised the question whether that end might not be attained by dipping the pipes in some substance like tar or asphalt, or by using a different material than iron for pipes.

A member of the association said that he had been able materially to increase the life of service-pipes in soft, muddy ground by dipping them in coal-tar. To do this the services were heated not quite to a red heat; the whole length of the service being placed in a trough filled with thick tar. They were dipped right under, and allowed to remain long enough for the tar to fully cover them; then they were taken out, and the heat of the pipes would set the tar so that it was like pitch upon them. In an hour or so it would harden so that the pipes could be handled.

By another member mention was made of the fact that the Cambridge Company had been forced to abandon the use of plain pipes owing to the rapidity of their rusting in the salty soil of that place. Galvanized iron pipes resisted corrosion much better. The galvanized pipes cost fifty per cent. more than common pipes. An equally good result, it was thought, might be secured by using pipes lined and coated with cement, such as are sometimes used for water service. They would be cheaper, though open to the objection that the capacity of the pipe would be materially diminished by the cement lining. Good results had also been obtained by coating pipes inside and out with a mixture of rosin and tar, in about the proportion of a quarter of a pound of the former to a gallon of the latter. The pipe was dipped hot and stood up to cool, when the mixture hardened. Pipes thus treated had been in use twelve years without giving trouble. Another member had prolonged the life of wrought iron pipes by coating them with red lead; this, however, in soil that was not salt. Another kind of soil, which is found away from the seaboard, was mentioned as giving much trouble, and that was ashes used as filling. Laid in such earth, unprotected pipes rust out rapidly.

The President was satisfied from experience that galvanized pipes were much more durable than naked pipes, especially in soils containing salt. He had also learned from experience that pipes rusted much more rapidly in gravel than in clay. Indeed, when laid in clay impervious to water, pipes were found entirely free from rust, while pipes in gravel were completely destroyed. Corroded pipes answered for the gas so long as they were not disturbed; but when the water men came along and disturbed the ground the gas company had to renew hundreds of service-pipes. He might say that five out of six were set leaking by the disturbance of the earth around them, and by the shoveling of the dirt upon them. While the water men did not go to the gutter, they disturbed the pipes sufficiently to start them leaking underneath the pavement. In putting in renewal pipes they always used galvanized iron; and his experience with them indicated that they would last very much longer.

At the close of the discussion, the Secretary expressed his regret that he had not obtained more information that would aid him in obviating corrosive action of the salty soil he had to deal with. Lead pipes were too expensive.

As observed at the beginning of this article, there would seem to be a good opportunity here for investigation and invention. The interest involved is already a large one, and with the increasing adoption of gas as fuel the demand for protected pipes is likely to increase.

WHERE THE LETTERS ARE WRITTEN.

Last fall an official count was made of the letters mailed at each post office in the United States during one week. From this count an estimate has been made of the amount and distribution of the postal business of the country during fifty-two weeks, or the entire year ending Dec. 31, 1880.

The Post Office Department has just issued a statement of the results of this inquiry, which shows that the number of pieces of all classes mailed during the year was 2,720,234,252. The whole number of letters mailed was 1,053,252,876, or an average of 21 for each man, woman, and child in the United States; 324,556,440 postal cards, 812,032,000 newspapers, 40,148,792 magazines and other periodicals, and 21,515,832 packages of merchandise.

The statement is accompanied by a table giving (in alphabetical order) the several States and Territories, the number of letters mailed in each, and the average number to each

inhabitant. The two extremes are, naturally, Alaska, with its unlettered population, and the District of Columbia, which, as the center of the postal system and the seat of National Government, must necessarily have more than the normal or domestic and business correspondence. In Alaska only one inhabitant in five is credited with one letter a year. In the District of Columbia there are 85 letters mailed for each inhabitant.

At first thought almost any one would mention as the probable regions of most frequent domestic and business letter-writing the States containing the great business centers, the regions of abundant schools and general literary culture, but he would be wide of the mark. The most letters are written where there is proportionally the largest intelligent adult population who are away from home, namely, the newer States and Territories. Colorado heads the list of letter-writing communities, with fifty-five and a fraction to each inhabitant.

The settlers in Arizona write 32 letters each a year; Dakota (omitting the decimal and giving the nearest integer), 30; Montana, 40; Nevada, 32; California, 26; Idaho, 25; Wyoming, 42.

The States which supply most of the letter-writers of the Territories in addition to being the great seats of manufactures, commerce, and general intelligence, come next: New York, with 42 letters to each inhabitant; Massachusetts, with 39; Connecticut, with 38. In the next group we may put the States and Territories which are near the average in letter-writing activity. They are mostly thrifty agricultural and manufacturing States, with an abundant and settled population. They are Illinois, 22; Maine, 20; Michigan, 20; Minnesota, 21; Nebraska, 23; New Hampshire, 22; Oregon, 21; Pennsylvania, 25; Rhode Island, 26; Vermont, 21; Ohio, 19; New Jersey, 18; Missouri, 18; Maryland, 18; Kansas, 18; Iowa, 18; Utah, 19. [The surprisingly low figures of Ohio may be due to the heavy draught upon its writing population to fill Government positions elsewhere.]

It will be noticed that no distinctively Southern State has yet been mentioned; the people of the South are not letter-writers generally, nor are they as much given to migration as the people of the North. They are more apt to spend their lives within hailing distance of their relatives and friends; and besides, those States carry a heavy population of blacks who are illiterate. The result is the contributions of the Southern States to the mail pouches are strikingly meager. The annual average for each inhabitant of Alabama is 7; Arkansas, 8; Florida, 11; Georgia, 9; Kentucky, 9; Mississippi, 6; North Carolina, 6; South Carolina, 7; Tennessee, 7; West Virginia, 8.

The higher rate of Florida is due, no doubt, to the new element which has gone there of recent years. The same may be said of the three or four other Southern States which markedly outrank the rest of the South in the matter of letter-writing, namely, Virginia, 11; Texas, 12; Louisiana, 15; New Mexico, 13. The more northern States which write the fewest letters are: Delaware, 16; Indiana, 13; Wisconsin, 17; Washington Territory, 15.

In the total number of letters posted annually the more populous Northern States naturally lead: New York, with (in round numbers) 211,435,000; Pennsylvania, 105,237,000; Massachusetts, 69,000,000; Illinois, 68,643,000; Ohio, 61,464,000.

TRADE MARK NOTES.

In England, where registration has been made very systematically for a number of years, a question lately arose as to the right to register words of languages not using the English alphabet. In one case the applicant presented a drawing of a Chinese phenix standing on the bough of a tree, having explanatory words in Chinese characters underneath. In another case, a merchant had noticed that his own name, "Tod," bore the same sound with a word in Arabic signifying "a high mountain;" the Arabic word was therefore presented to be registered. The registrar objected to registering such marks, because he did not think the distinction between different words in a foreign character sufficiently clear, and because he said that he could not be expected to know all the foreign alphabets, and be able to decide intelligently upon interferences. But the English courts said that the marks must be registered; the officer must meet these practical difficulties in the best way he could. Apparently the reason for such a decision would be even stronger under our recent law relative to trade marks in foreign commerce; for, no doubt, words which are not in English characters must often be used upon goods exchanged between the United States and some foreign countries.

Many readers have no doubt noticed the solid red triangle which is employed as a distinguishing device on the labels upon the bottles of Bass's ale. A rival firm of brewers applied to register a triangle which was not solid, but drawn by means of three broad stripes meeting at three points, and having a figure of a church edifice printed within. The court said that this device was too much like that of Bass & Company.

Every year a number of cases arise in which the courts are asked, independent of any law for registration, to grant an injunction on the ground that the claimant of the mark was the first person in the trade to adopt it. One principle which governs in these cases appears not to be fully understood; it is that words which are naturally and properly descriptive of an article, its origin, uses, etc., can not be exclusive. No one is allowed to appropriate words in their ordinary and proper meaning; such uses of them are free to all