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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

the world. One who wishes to invent an exclusive mark needs to be careful that any words which enter into it are employed in an entirely arbitrary and fanciful sense. In one case reported during the winter, the mark was the phrase "Rye and Rock," applied to a composition of whisky and candy. A very entertaining argument, which, for its humor and literary brilliancy, attracted a good deal of attention among lawyers, was made to show that this was an arbitrary phrase; but the court considered that it was somewhat descriptive of the components used—rye whisky and rock candy; and that whoever used those elements in a similar beverage, had the right to use the same descriptive phrase. Similar was the decision where a clothing merchant called his store the "Tower Palace." The court said that the phrase was in its nature descriptive of the peculiar architecture of the building; it might be exaggerated, but it was of descriptive tendency, and therefore that when the clothier moved away from the building to another stand, he could not object to his successor's continuing to use the name. So the letters "I XL" have been pronounced no trade mark, for the reason that their sound gives them a meaning, and they have been widely used upon various goods. But a cigar dealer who styled his cigars the "Pride Cigars," was sustained in his exclusive claim, because "pride" has no natural proper meaning in such connection. There have been one or two decisions that an arbitrary number—such as "523"—distinctively or fancifully printed, may be protected. There are two English decisions giving considerable support to the idea that a peculiarly woven, party-colored border or selvage of calicoes, woolen cloth, etc., may be a trade mark. The names "Family Salve," and "National System of Penmanship," have received protection to a certain extent.

Within a few years past there have been two or three attempts on the part of manufacturers whose patents had expired, to sustain or continue to control the article, by asserting the exclusive right to the name as a trade mark, but such attempts have not been successful in the courts. Another decision of this class has just been made relative to the Singer sewing machine. As every one knows, the Singer Manufacturing Company had, for a term of years, the monopoly of making the Singer machines, by virtue of the patents; but, when the patent expired, rivals entered upon the business, and, naturally, advertised theirs as Singer machines. One of them was sued by the old company, which claimed that it had the exclusive right to the name Singer as a trade mark. But the court decided that the word "Singer," as applied to sewing machines, is in the nature of a description of their kind and character; hence, whoever has the right to manufacture machines of that kind has the right to advertise and sell them under the designation common in the market. After the patents expired, any person who chose might lawfully make these machines, and, as a consequence, the descriptive name became common property.

A person need not conduct the manufacture himself in order to enjoy an exclusive trade mark on the goods. Such at least is a decision by the New York Court of Appeals. A chemist, who had devised a serviceable composition, sent the recipe to Paris, where the article was manufactured, and he imported it in quantities from time to time, and arranged for its sale by various druggists throughout the country. He had an interest in these sales. As soon as it became popular others commenced making and selling it, and they used his peculiar name for it. He sued; and the infringers contended that, as he was not the manufacturer nor the seller, he could not complain. But the court decided in his favor, saying that the advantage of a trade mark does not necessarily consist in indicating the manufacturer. It may be useful as identifying the quality of the article; and when this is the case, it may be of value to any person interested in putting the commodity upon the market, and he may be the rightful owner of it.

DEAFNESS AS A CAUSE OF RAILWAY RISKS.

Dr. Lawrence Turnbull, of Philadelphia, lately read a paper before the Pennsylvania Medical Society, calling attention to the hazards to life and property due to deafness on the part of railroad men. Locomotive engineers, firemen, and conductors, he said, are liable to affections of the ear, with decrease of hearing, such deafness appearing to be, in his estimation, more dangerous than color blindness as regards the signal code, because the latter is usually a congenital defect which can be defined precisely before the individuals are placed on active duty, while the deafness is an acquired disease, but slow in its approach and sometimes unknown to the person affected; and a cold or injury diminishes the hearing more and more, or destroys it completely, if it is not properly and promptly treated.

After citing cases which had come under his personal notice, and referring to the reports of Professor S. Moos, of Heidelberg, with respect to cases of railway accidents through deafness, Dr. Turnbull dwelt at length upon the evidence collected by Ludwig Hirt.

In order to gain an unprejudiced opinion, Hirt traveled repeatedly on the locomotive. His longest uninterrupted journey covered 325 English miles. He notes the following causes which act on engineers and firemen when traveling: First, the violent concussion; second, the uninterrupted straining of the eye and ear; third, the cutting air (less noticeable on the engines provided with a protecting roof); fourth, the continuous erect position; fifth, the frequent change of temperature. The occasional troublesome or nox-

ious influences are dust and irrespirable and poisonous gases. Hirt observed on himself and young firemen an increased frequency of pulse and respiration, pain in the knees and the calves of the legs, exhaustion, weariness, and excessive thirst and nausea, which, however, soon disappear. Whenever he traveled thirty-five to fifty miles without a stop, vertigo was perceived, associated with violent roaring in the ears, and he felt the urgent need of something to cling to. In addition to these symptoms, we have in the case of engineers and firemen the mental exertion of the most careful watchfulness and uninterrupted exertion of the higher organs of sense. Regarding the results of long years of traveling on the engine, Hirt says that, taking all in all, an engineer who averages seventy-five miles daily, or, in round numbers, 25,000 miles a year, may be as sound and robust after twenty years' service as he was in the beginning, providing he was then healthy and that he has met with no accidents. If we examine, says Hirt, a large number of engineers who have been long in the service we find that a majority of them are robust, sunburnt men, with well developed faculties, good digestion, and in an excellent state of health. The minority, however, in whom we see the disastrous results of their calling, must not be forgotten.

Dr. Turnbull recommended that all candidates for railway service should be examined by a competent physician, who should test them with special reference to their hearing. He also advised that the company's physician should report to the superintendent of the road every case of deafness discovered in trainmen, provision being made for the transference of men of impaired hearing to other positions where perfect hearing is less vitally important.

DANGERS OF DENTISTRY.

Usually dental surgeons take great care to keep their implements clean. Sometimes, however, the patient is disgusted with the sight of more or less ancient blood stains on forceps and other implements which are to go in his mouth.

A correspondent in Maine submits a local newspaper report of an accident to a Bangor dentist which suggests the query whether there may not be danger of blood poisoning to the hazard of the patient's life when the surgeon is not careful with respect to the cleanliness of his implements. In the case reported the accidental pricking of a finger with a sharp instrument used by the dentist while filling a tooth, resulted in a serious case of pyæmia. In this instance the dentist was the sufferer. Suppose the poisoned tool had pricked the gum of the patient? Whether the poison came from the diseased tooth then being operated on, or was due to some previous operation, does not appear, and would not much matter to a patient who should be poisoned in that way. In either case the injury might be fatal. From a moral point of view, however, it would make a great difference whether the patient furnished the poison or the dentist. It goes without saying that uncleanliness in the dentist's chair is dangerous as well as disgusting, and should not be tolerated.

A MUSHROOM FARM IN MAMMOTH CAVE.

BY H. C. HOVEY.

A novel proposal has lately been laid before the trustees of Mammoth Cave, Kentucky, and is now held under consideration by them with some prospect of a favorable answer. An enterprising Frenchman, who has already had experience in mushroom culture in the vicinity of New York city, complains that he finds no cellars sufficiently large for his increasing business, and also that the conditions of temperature and moisture are not uniform enough to insure the best results; and therefore seriously offers to rent a portion of the cave for the purpose of raising such varieties of edible fungi as may be found best suited to the locality.

This will not in the least interfere with the exhibition of the wonders of the great cavern to visitors. Many square miles of it are never seen by tourists at all, for the reason that their time is usually limited, and they have enough to do to follow the guides through the selected routes. The portion mentioned as possibly to be devoted to mushroom beds is what is known as "Audubon's Avenue," the first passage to the right after entering the cave, and therefore quite convenient of access. This avenue is said to be about half a mile long, and formerly cottages stood at its entrance, built for the use of consumptive patients, under the erroneous impression that the chemically pure air and the uniformity of temperature would more than compensate for the absence of sunlight and the cheerful sights and sounds of the upper world. The cottages are now forsaken and most of them demolished, and the long tunnel beyond contains little of special interest, unless it be the swarms of bats that hibernate in what is for that reason called "The Great Bat Room." The rich deposits of bat guano, that have been accumulating for centuries, lie as yet undisturbed, and if properly mixed with other fertilizers, might no doubt be used to facilitate the propagation of fungi.

The soil, which at present is extremely dry, might be easily moistened to any desired degree, as was done in working the saltpeter mines in former days, by conducting water through pipes from the cascade at the mouth of the cave.

The idea of thus turning caverns to profitable account for the cultivation of mushrooms, though new in America, has long been a familiar one in France, and has been demonstrated to be entirely practicable. One of these caves, at Montrouge, is said to have six or seven miles' run of mushroom beds, and the daily yield of marketable fungi is about 400 pounds weight. Another such cave, near Frepillon, is reported as sending, on favorable days, as many as 3,000

pounds of mushrooms to the Paris market, from beds aggregating sixteen miles in length. Still another, at Mery, and belonging to M. Renaudot, is said to have had under cultivation in 1869, over twenty-one miles at once, and afforded employment to a large class of laborers, who devoted themselves wholly to the business of raising mushrooms, not only for the French markets, but also for exportation. One house alone reports 14,000 boxes of preserved mushrooms as sent to England in a year.

The special advantage of subterranean over open air culture lies in the fact that, owing to the uniformity of temperature, which in Mammoth Cave hardly varies from 56° Fah. either winter or summer, the business can be pursued with equal success at all seasons of the year and in all kinds of weather.

It is the supposition that when choice mushrooms are known to be raised by responsible parties, and with every guarantee of freedom from the admixture of poisonous fungi, they would find a ready market in Louisville, Cincinnati, and other Western and Southern cities; or, if not, they could be hermetically sealed or made into catchup and easily sent to more distant markets, where such esculents are appreciated. The business has become highly remunerative in England as well as France; a fact brought out lately in the trial of the Metropolitan Railway Company, for taking possession of a mushroom nursery, showing that this curious branch of horticulture yields from 150 to 200 per cent. One witness is quoted as saying that, "if \$250 were expended, in twelve, or possibly in six months, the sum of \$1,000 would be realized."

It is probably an error to regard the economic value of fungi as of unimportant character; and it is worth considering, in these days, when so much has been said on the importance of multiplying the materials of cheap and wholesome food, whether such immense quantities of nutritious fungi ought to be annually lost, either by reason of ignorance of their excellent esculent qualities, or through fear of serious consequences arising from eating those kinds that are unfit for food. Caution should not degenerate into prejudice. And really the difficulty of telling edible from poisonous fungi is no greater than that of discriminating between the poison ivy and harmless ampelopsis, or between the wild and cultivated parsnip. A very little attention to the subject will enable any one to tell at sight a few of the best and most common varieties as readily as he now tells the vegetables from the weeds in his garden. It may be added that, in fact, the cultivation of the mushroom has been mainly restricted to a single species, so that most people who are fond of it, will hardly recognize any other as fit for food; while there are many varieties of esculent agarics known to the mycophagists, some of which, no doubt, might be found by experiment to be as suitable for cultivation as the common *Agaricus campestris*.

Our knowledge of American fungi is known to be extremely meager, being mainly limited to the results of researches in the Carolinas, Texas, and Cuba, made by Curtis and Ravenel; and a wide field of investigation is open to any competent person who will specially devote himself to this branch of botany.

Increased Importance of Iridium.

Mr. Holland's process for fusing and moulding iridium enormously widens the scope of the useful applications of iridium, and gives increased importance to any natural sources of the metal that may be discovered. The *Standard*, of Portland, Oregon, states that certain heavy black particles associated with gold in that State, and hitherto supposed to be iron, have been found to be iridium. The *Standard* says that the iridium appears as a black shiny sand in the gold washings, in particles a little coarser than blasting powder, and adds: "There are portions of this State and the adjoining Territory where this metal may be found in abundance. So that we have in our midst an undeveloped source of wealth that may outshine anything ever before known."

Moth Preventive.

A correspondent of the *Furniture Gazette* recommends the following remedy for exterminating moths in carpets and furniture: After some years of experience with the troublesome pests, says the writer, I found a sure preventive of moths in pitch paper, the same as roofers use. The moth will live and grow on cayenne pepper and tobacco, while I never could see that the use of these articles kept the moth miller out. The plan for the furniture dealer or housewife is to cut the paper in slips and place about the room, under and behind sofas, chairs, etc.; this should be done as early as the middle of April, and in warm climates earlier. If the dealer wishes to make parlor suits moth proof, he should place on the inside of backs of chairs and seats, small strips of the pitch paper, and rest assured that the miller will not select these places to deposit eggs. It is the miller that is the foundation of all the mischief.

A Heavy Mississippi Tow.

The towboat Oakland left St. Louis for New Orleans May 15, with the heaviest tow yet taken seaward that way, namely, eight barges carrying freight as follows: 160,000 bushels of wheat, 140,000 bushels of corn, 5,000 barrels of flour, 3,000 sacks of bran, 6,000 sacks of oats, 5,000 packages of general freight. The total tonnage exceeded 10,000 tons. Most of the grain was for export.