

season. The cause of this is to be accounted for in several ways:—(1.) All waters contain certain impurities, and in dry seasons, when the sources of water are very much lessened, the water as a consequence is more impure, as almost the same impurities are concentrated into a smaller volume of water. (2.) The subsoil water itself has great influence, and when subsiding from the surface will carry the impurities from thence with it, and in light, pervious soil, this will have a decided effect for quite a distance. This is the case more especially where the places are supplied from well and spring water. Here if the soil be pure and uncontaminated, the water will also be pure; but as soon as impurities are introduced by the subsoil water, sickness is likely to follow the use of the well. (3.) The purities of these wells will be effected by their position, if they are placed so that the natural fall of the level will convey these impurities away instead of to them; and it is well known that when there is a gradual slope to the sea that levels correspond, and the well should, if practicable, be placed so as to take advantage of this fact. T. DRUMMOND (2nd year).

(2.) How would you secure the utmost economy of water for drainage purposes?

Ans. The utmost economy of water for drainage purposes can only be obtained when the sewer has a sufficient slope to carry off the sewage without the introduction of surface water to flush the sewer.

R. W. WADDELL (2nd year).

(3.) Describe, with a sketch, some method by which the water from an excessive rainfall may be excluded from the ordinary sewers.

Ans. This method is based on the principle that a certain momentum is acquired by the water flowing through the rainfall sewer. If there be but a small quantity of water in this sewer, its momentum will not be sufficient to carry it over the opening A, which is constructed of such a width as to receive the rainfall up to a certain quantity and no more; and it will consequently fall into the intercepting sewer below and pass off with the sewerage. But, should it exceed the quantity intended to be received into the lower sewer, and upon which the width of the opening A is determined, its momentum will carry it over that opening, and it will run off into the river or water course. The rainfall sewer, being constructed and connected with the intercepted sewer, as in the sketch, should also have an inclination of from 1 in 300 to 1 in 600, to produce a sufficient current in the water; and should be of a size varying with the circumstances of the case. J. S. O'DWYER (3rd year).

(4.) How is the expense of sewerage works affected by "pumping"?

Ans. Very materially, by making the works more expensive in first cost, and also by increasing their annual expense of maintenance. Cost of pumping and lifting 1,000,000 gallons through a height of 50 feet will be at least \$2,000 per annum. F. MORKILL (Partial).

The expense of raising water is not as great as is generally supposed, when the vast amount of water raised is compared with the expense of the power; but the cost of sewage works would be much increased if pumping had to be resorted to. Statements from experiments show that from 22,000 to 80,000 gallons of water can be raised 100 feet high for \$.02; but it is also shown that at a single pumping station the machinery for raising the sewage cost \$700,000, besides the expense of working it. This alone would greatly increase the expense of the sewerage works. F. F. BUSTEED (2nd year).

(5.) Give a brief statement of the main features of "water supply."

Ans. The water supply constitutes one of the principal elements to be taken into consideration for the general maintenance of the health and comfort of the inhabitants of all cities. The means of obtaining, and when obtained, of economising as much water as possible, is therefore of much importance, and we have to be guided to a great extent by the natural advantages which any locality may possess. In this way the physical outline of the country will have to be taken into the calculations as to the cost of obtaining this supply. We shall also require to look at the distance from which it will be conveyed. The sources are lakes, rivers, streams, springs, wells and rain. Then there is the quantity necessary for the annual consumption, not only for the present time, but also for the increasing wants in the future of the growing place. It has been found from statistics of cities that, on an average, thirty gallons per head per day is a sufficient supply. This would include water used for domestic purposes, baths, public gardens, manufactories, extinction of fires, &c., and as there are about five people on an average in each house it would be easy to calculate the quantity required for the city, and by taking the increase for a number of years back, we can judge from that the ordinary increase for the same time in the future. Another use to which it is put is in watering and cleansing the streets, and the quantity required can also be very easily determined on. The next consideration is the purity of the water. Rain-water in its natural condition is the purest, but in towns could hardly be utilized on account of the impurities it would gather up. The general sources are therefore lakes, streams, springs and wells, and the quality of the water will be very much effected by the formation of the rocks and soils through which these streams may pass, and when there is more than one source of supply they should be carefully examined so as to judge which may be the best. T. DRUMMOND (2nd year).

HILLSIDE GLEANINGS.

There is nothing more depressing than a dull, lowering Sabbath day, when the skies seem ready to drop rain, and the effect upon one's mental faculties is equally sombre. In this frame of mind I entered the village church one October Sunday, and listened to a sermon on what I should call the penance of giving. And the refrain was only "give," "give," and your reward shall be in heaven. I wondered as I listened why money was thus placed so high, why so much stress was put upon it as the one gift required. So many people have a diversity of gifts to use in the Master's service, and yet these are not taken into consideration. Then, when giving was called charity, I remembered the verse which says—"though I bestow all my goods to feed the poor and have not charity"—so it is not all gold and silver that is required in the Book of Books. Do not misjudge me. I believe in free giving for every benevolent

object and church need, but I despise the *bribe* held out sometimes from the pulpit to coerce people into opening their pocket-books. It savors too much of the teaching of that large body of worshippers we are trying to evangelize, when we are told to give all our worldly goods for the benefit of the Church, and *thereby* secure a reward in heaven. I thought of the thousands of families in city and country, who deny themselves pleasures and luxuries, to give their time and money to the cause of Christ, and the many ways in which they aid the Church, of those who sing at concerts called for, and attend to bazaars, of the children who send to the missionary societies their few hoarded pence, and the hard-working farmer who, perhaps, overwhelmed with a mortgage, or a bequeathed debt, struggles to give his pittance to the good cause, and I wondered if the minister from his elevated position understood these things. A dreary, drizzling rain overshadowed the Hillside, the autumn flowers were drenched; there were no happy birds to sing, all nature seemed wrapped in gloom, but as a help to my thoughts I gleaned from the Book that "in a great house there are not only vessels of gold and silver, but also of wood and of earth, and some to honor, and some to dishonor." A. L. J.

WITTICISMS.

Rare compound of oddity, frolic, and fun,
To relish a joke, and rejoice in a pun.—GOLDSMITH.

The best time on record—lunch time.—*Cincinnati Breakfast Table*.

Heaven gave women tongues to ask questions with, and eyes to give answers with.

A bachelor merchant's advice in selecting a wife: "Get hold of a piece of calico that will wash."

A Western lawyer included in his bill against his client: "To waking up in the night and thinking about your case, five dollars."

A Frenchman was recently heard to remark of a Senior: "There stands Mr. B. wrapt in the originality of his own conceptions."—*Argosy*.

TRUTH:—

"When by night the frogs are croaking, kindle but a torch's fire;
Ha! how soon they all are silent, thus Truth silences the liar."

"Suppose I should work myself up to the interrogation point?" said a beau to his sweetheart. "I should respond with an exclamation," was the reply.

Professor to late student: "You, gentlemen, should come in a body and not be straggling in in this way." Thoughtful student: "I did come in in the body, sir."—*Argosy*.

Jeannette: "Ma, are you going to give me another piece of pie?" Ma: "What do you want to know for?" Jeannette: "Because, if you ain't, I want to eat this piece slowly."

THE HIGHER EDUCATION OF WOMEN.—Gent (literary conversation): "After all, I prefer the 'Vicar of Wakefield.'" Lady: "Dear me, you surprise me. I never read religious books."

Square umbrellas are reported as the latest things in Paris. That's nothing. We have been using square umbrellas a long time. At least, they are never round—when wanted.—*Rome Sentinel*.

Mrs. A.: "Now, Mrs. B., will you come and see our apiary?" Mrs. B. (who has been putting it off all the afternoon): "Well, Mrs. A., the thing is, you know, I'm—rather afraid of monkeys."

"There are seventeen sculptors and painters from the United States now residing in Rome," read Mrs. Bemis from the newspaper. "H'm!" grunted Mr. Bemis. "No wonder I couldn't get a painter to whitewash that shed."

A commander was inspecting an English yeomanry regiment on outpost duty. "What are you doing here, my man?" he asked a vidette. "Makin' a fule o' mysel', sir." "How so?" "Why, I should be at hame, carryin' hay."

Sophomore (shouting from lower floor): "What fellow do those feet, at the top of the stairs, belong to?" Professor (from top of stairs): "Gentlemen, have you forgotten the rules about noises in the halls during recitation hours?"

"Sam," observed the magistrate, "have you hooked any chickens and geese lately?" "No, sah!" replied Sam, promptly. But when he got home he threw down a bundle and remarked; "Ef he'd a-said duck, Dinah, he'd a-had me."

At a young ladies' seminary, a few days since, during an examination in history, one of the not most promising pupils was interrogated:—"Mary, did Martin Luther die a natural death?" "No," was the prompt reply; "he was excommunicated by a bull!"

BY A PARAGRAPHIST.—"Par" writing is, *par excellence*, par-t and par-cel of a journalist's qualification. Always judge him by his "par" excellence. If he can't write a "par" don't par-se his work, but send him home to his mar and his par. A "par" here and there is the editor's par-adise. The French translate here and there, as *par ici et par la*. That shows what they think about it *à Par-is*. But we must not translate a "blue" par as *par bleu*.—*Old Parr*.

Lines addressed to Sir John Bowring (the celebrated linguist) by Thomas Hood:—

To BOWRING, man of many tongues,
All over tongues, like rumour,
This tributary verse belongs,
To suit his learned humour.

All kinds of gabs he knows, I wis,
Servian, Slavonian, Scottish,
As fluent as a parrot is
But far more *Polly-glottish*.

No language too obscure he meets,
However dark and verby,
He gabbles Greek about the streets,
And often "*Rus(s) in urbe*."

Strange tongues, whate'er men may them call:
In short, the man is able
To tell you "What's o'clock" in all
The *dialects* of Babel.

He talks them all with equal ease,
The German and the Spanish,
The Magyar, Polish, Portuguese,
Bohemian, Tuscan, Spanish.

Try him with these and twenty such,
His skill will not diminish,
Although you should begin with Dutch,
And end like me with *Finn-ish*.