

ON THE SANITARY ARRANGEMENTS OF THE HOUSE.

BY A FAMILY DOCTOR.

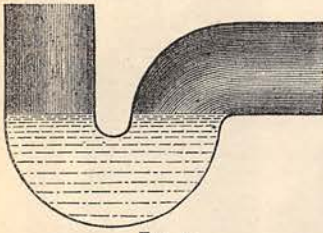


FIG. 1.

WHETHER our lot be cast and our days spent in busy cities, in rural villages, or in the quiet and open country itself, the question of

drainage is one that ought to receive individual attention if health, or life itself, is valued as it ought to be. The man who now-a-days is careless in sanitary matters, who does not trouble himself about the air he breathes or the water he drinks, but is content to live, or "jog on," as he may call it, "as his fathers did before him," is, to say the least of it, very unwise; yes, and culpably so too, for his carelessness affects not himself alone, but the well-being of his family, if he has one, or his neighbour's, if he has not. It is ridiculous for any of us to talk of living as our fathers did, even although the figures on their tombstones prove them to have lived long in the land. With the increase of population in this country existence is becoming every year more precarious, and we have a hundred unseen foes to contend against of which our ancestors knew nothing—dangers are more numerous, cares more complicated, and the struggle for life infinitely harder.

In ancient times, so mythical history tells us, there lived in bogs and fens and flats hideous monsters, who were ever ready to seize upon and devour the unwary or benighted traveller; and even Shakespeare alludes to these when he makes Coriolanus say—

"Though I go alone
Like to a lonely dragon, that his fen
Makes fear'd and talk'd of more than seen."

The name of this fen-fiend is *marsh miasma*, and thousands since Shakespeare's time have fallen victims to his fury. Would, however, that this dragon were content to dwell in his bogs and flats! we might then manage to keep at a safe distance from him. But no; he must follow the fashion of the age; he must have his town as well as his country residence; and though in cities such as London everything is done by the Legislature, by work of honest engineers, and by the advice of officers of health to keep the monster under hatches, he nevertheless frequently escapes—he bathes in the water we drink as pure, and he poisons the air even of our bed-rooms with his pestilential breath. And wherever he comes danger and destruction to life and health follow in his train, babes gasp and die, and older people, if they do not die outright, suffer from all the evil effects of chronic blood-poisoning. Nor is it alone the houses of the poor and middle classes that are invaded by this monster; he creeps into the mansions of the great as well. It is

not yet quite ten years ago since royalty itself, in the person of H.R.H. the Prince of Wales, fell a victim to typhoid fever. Then throughout the length and breadth of the land a panic arose; people all at once seemed to awaken to the fact that an insidious and deadly foe was in the very midst of them, that they might often be more safe in the wilderness itself than in their own luxuriously furnished bed-rooms, and all through defective sanitary arrangements. The illness of His Royal Highness, which was so near to becoming a national calamity, culminated in being a blessing to the country at large, and for a time, at all events, greater attention was directed to the simple laws of health and hygiene, more especially as regards drains and drainage.

I do not hesitate to say, for I firmly believe it, that one-half of the diseases which at present attack the people of England are preventible, and would be prevented if we were one and all of us to follow the dictates of sanitary science, even although that science is only yet in its infancy.

The first duty of every intelligent man who is about to take a house or to build one is to see after the drainage thereof. Having done so to the best of his knowledge and ability, he ought to consider it incumbent upon him to see that the drains at no time get out of order.

If he takes a house without seeing with his own eyes that the drains are scientifically arranged and perfect, or if he erects a house and leaves the matter entirely to chance as long as he dwells therein, he must be living in a state of uncertainty as regards the health of his family or that of himself; and when illness arises how can he be sure that the drains are not in fault, that the trouble which has broken out in his house is not one that a little ordinary care might have kept at bay?

Over the air which a man breathes out of doors he has no control. That of towns and cities is often impure and polluted beyond all belief. To say nothing of its being loaded with sulphurous acid, carbonic acid, and sulphuretted hydrogen gas, it is poisoned by the pollutions on the streets from decaying vegetable matters, by the emanations from slaughter-houses and graveyards, and from the rivers themselves that flow through them; the very earth itself emits obnoxious vapours, while from sewers and cesspools gases are emitted and vapours exhaled that generate the most painful diseases—typhus and typhoid, diarrhoea and dysentery, and even cholera itself. And yet here is a crumb of comfort for the dwellers in such large cities as London, Birmingham, and Manchester: the very smoke from your chim-

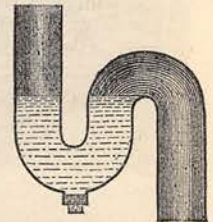


FIG. 2.

neys, of which you so greatly complain, helps to decompose and destroy the malaria in the atmosphere you breathe. The idea of a London of the future, when every householder will consume his own smoke, when smut and soot shall be unknown, and a "fog" a dark dream of the distant past,

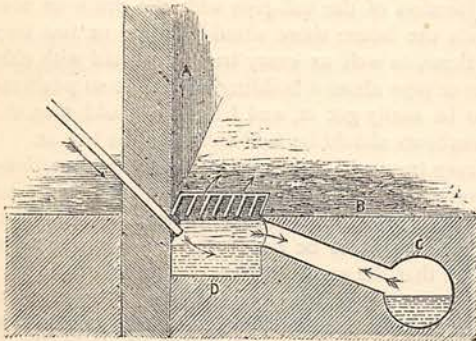


FIG. 3.

when the city's walls shall gleam like frosted silver, when trees shall grow green in all our squares, when our monuments shall rear their alabaster heads in skies of azure-blue, and the river itself, clear and pellucid, glide quietly on to the sparkling sea, is a very beautiful one; but such a London as this would after all be but a white-washed sepulchre, unless thorough and radical reform began first with sewers and sewerage, drains and drainage, and everything else that at present renders many districts of the largest city in the world very hot-beds of fever, plague, and pestilence.

I will now suppose that my reader is a householder—that before he took possession of his dwelling, he was wise enough to obtain a complete map or plan showing the position of every pipe and drain in the house. This may be a somewhat difficult task for any one to accomplish, but depend upon it, it will not be labour lost.

There should be in every properly drained house three separate and distinct systems of overflow and wastewater discharge, and these should, if possible, be not only partially, but entirely apart from each other; and each drain should be protected by a trap, the simplest form of which I shall presently describe. First and foremost, the water from the bath and drinking cistern should have its own outlet; secondly, the slops of different kinds and the kitchen sink; and thirdly, the water from the closet. So much for waste slops and water; but independent of this there is the supply of water to the house to be thought of, and properly looked after. The great and often fatal mistake in the water-supply system, is that of having only *one* cistern from which water is furnished both for drinking and for drainage or sanitary purposes. The veriest tyro can understand how poisonous pollution is certain to occur where such an arrangement is adopted. Not only should the offices *not* be supplied from the drinking cistern, but even the *overflow* pipe from the latter should be kept carefully clear of the soil-pipe. The lavatory water and that

from the cistern's overflow are the least likely to be hurtful unless polluted externally; they may therefore have one and the same outlet into a surface drain protected by a trap. This drain in the country may lead away from the house in any way most convenient and safe; but in towns this water *must* flow at last into the sewer; therefore the thoughtful householder will see that after the pipe leaves the house it shall fall into an open grating-covered gully-pit before it runs away towards the sewer.

But wherever possible even the water from the bath-tub should have a different and separate place of discharge from the cistern overflow, and if its pipe is connected with a house drain it should be protected by a trap. Now the simplest form of trap is what is called, if my memory serves me rightly, a water-seal, of which I append a rough sketch (Fig. 1). The dip of this trap must be perfectly plumb and not distorted in any way; it should be sufficient in depth, and the whole pipe should be large enough.

But there are one or two other things to be thought about in connection with this simple trap, else in the end it may prove a nuisance. It should be made strong and of a lasting material, and a material that will not easily corrode with the action of either water or gases. When not in use it should never be allowed to become empty from evaporation, and it should have at the lower bend (in most cases) a means of communication with the interior (Fig. 2). When in use it should be frequently flushed with pure water, and nothing should ever be allowed to pass down it which is in the least likely to clog it.

If properly attended to, such a trap as this is a great safeguard against the introduction of foul and

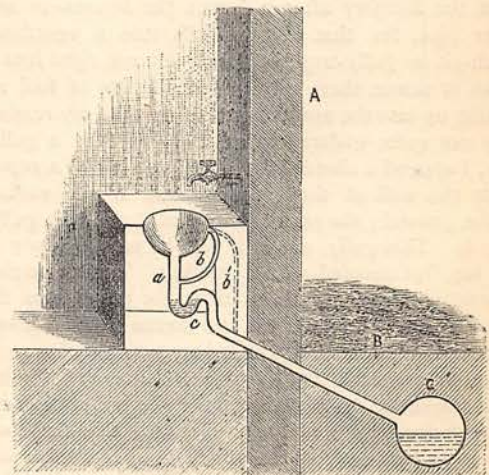


FIG. 4.

poisonous air into our houses or apartments; but of course if it gets out of shape it is worse than useless; it should therefore be properly fastened and supported, and not only the trap itself, but the pipes that lead to it and from it. The time when the water in such a trap is most liable to evaporation, and foul air thus allowed to pour into the house, is when families go

from home during the holidays, and the house is either shut up entirely or left to the tender mercies of servants. Knowing this before going from home, people would do well to plug the end of the pipe that leads into the bath-room, and flush the pipe on their return.

Supposing that the pipe which conducts the water from either the bath-room or bed-room, or the drinking cistern, *must* discharge itself into the same drain which also receives the kitchen-sink slops, or probably even the water from a closet, then we ought to have traps of the very safest, although simplest, sort that sanitary engineering can devise.

It is very unfortunate for householders that some builders and plumbers should think it necessary to keep people so much in the dark as regards not only the mechanism, but even the whereabouts, of the pipes and traps and drains of dwelling-houses. Matters like these, that are so intimately connected with the health and comfort of families, should be made as clear to them as the light of day itself. As matters stand, if anything goes wrong with a pipe or a drain, we send to the builder, and he sends a man, and that man does something; but what the man does do, in addition to turning the whole house topsy-turvy for an hour or two, we, the unhappy inhabitants, know no more than Adam—at least, as a rule.

In every modernised house in the City, or in towns at all events, there are prettily arranged and ornamental lavatories. These are extremely handy, and useful. Over the marble basins are taps, their pipes communicating with a cistern above which may always be kept filled with the purest of water. The whole arrangement viewed externally seems perfection itself, even looked at through sanitary spectacles. But is it so in reality? Let us see. If the pipe that leads from the lavatory after it leaves the house—or any other pipe, for that matter—falls into a ventilated catch-pit or gully-trap, and does not run right into a drain or sewer, there will be less chance of foul air getting up into the apartment. As some of my readers may not quite understand what I mean by a gully-trap, I append a sketch of one (Fig. 3). Here A represents the wall of the building, and B the surface of the ground; the sewer is marked C, and the gully-trap D. This gully, or pit, it will be seen, is open at the top, but covered with a grating. The protection afforded by such a trap is this: the water from the house falls first into the pit, and thence into the sewer, as represented by the downward arrows; the obnoxious gases, represented by the upward arrows, whether from the sewer or the contents of the gully, find vent through the grating into the open air. But there are two pipes leading from the basin in the lavatory: one, the escape-pipe at the bottom, *a* (Fig. 4), and the other the overflow-pipe at the top, *b* or *b'* (Fig. 4). Now, granting that pipe *a* is protected against the egress of a current of foul air by a water-seal trap, *c*, the question which concerns the householder is this: does the overflow-pipe open into the escape-pipe above the trap?—which it ought to do, as seen at *b* in the sketch—or does it open below, as represented by the dotted lines marked *b'*? The reader will easily perceive that,

should the latter be the case, there is nothing to prevent foul air from gaining admission into the house *if* there be no external gully-trap; and I believe I am right in saying that sanitary engineers are agreed that, while moderate in diameter, the soil-pipe should not be too wide, else the flow through it would be slow, and more strength of water would be required to flush it. Near the junction of the soil-pipe with the drain or sewer outside the house there should be one or two traps, and these, as well as every trap connected with either drain or pipe about a building, should be so positioned as to be easily got at, and I need not add that their whereabouts should be well known to the tenant.

Every trap and every drain should be *ventilated*; the ventilating pipe, which need not be a large one, should be placed on the external or sewer end of the trap, and ought to be conducted up along the outer wall, so that the gases may escape into the open air as high up as the chimneys themselves. To prevent all danger from such ventilating pipes, they ought never, under any circumstances, to be allowed to pass *through* any portion of the building.

I do not like drains that pass through the soil beneath the house, for this reason: if from any chance the ground sinks or "gives" under them, they get bent and leaky; if, however, such a route for the drain must be adopted, see that it is laid upon hard, unyielding concrete, and that it is made of well-glazed earthenware. A great many people never feel perfectly well at home, and blame the climate; in some cases it is very likely that it is the drains, and not the climate that is in fault. Now just a few memoranda in conclusion, which may be worth making a note of:—

1. Before you take a house get a plan of pipes and drains, and a sketch of the kind of traps used.
2. There should always be different cisterns for drinking-water and other use.
3. Even the overflow-pipe of the former should have no connection with the latter.
4. Avoid all complicated methods of guiding pipes and placing drains.
5. See that all pipes are properly secured in position.
6. See that all pipes have traps.
7. See that perfect ventilation of pipes and drains is secured.
8. Keep all traps clean, and frequently disinfect both pipes and traps as well as drains.
9. Constantly examine traps in which the water is likely to get low or evaporate. If the water gets low in them, it rushes the foul air.
10. Keep the drinking-water cistern clean and free from dust and all impurities.
11. Be most particular with the purity of the sink and its pipe. Never allow the brass perforated cap to be removed from the top of the pipe; forbid the bedroom pails being emptied in the sink, and pour a pailful of boiling water into it once a week, to get rid of any grease that may cling to the interior of the pipe.
12. Do not have pipes and traps so enclosed that you cannot get at them.