

## “IS IT THE WATER, I WONDER?”

BY A FAMILY DOCTOR.



SOME few years ago business demanded my presence almost daily in the City, and from one of the West-End stations I was in the habit of taking the Metropolitan trains to Farringdon Station. It must be premised that the tunnel was not at that time so well supplied with pure air as it now is; besides it was summer, and very hot. My journeys occupied but little over twenty minutes each. Yet they were to me, who have been used all my life to a pure atmosphere, most depressing, and the effects lasted quite an hour after I returned of an evening.

I finally gave the Underground up, and depended on hansom. Greater expense? I grant it, but money that insures health is not thrown away. And, furthermore, I argued thus: If a bracing Turkish bath of twenty minutes' duration has a good effect on those who can stand it, a hot bath of dark, foul, depressing air must mean something quite different. I adduce this experience of mine as a proof that apparently trifling influences may seriously injure one's health if continued for a long time.

It is just the same with the water we drink. To use hard or partially impure water for a few days or a week may not injure one, but to constantly imbibe it must eventually undermine the health to a greater or less extent.

Now the question which forms the title of this short paper is by no means an unimportant one. For I say, if you are ailing and weakly—neither perhaps very ill nor very sick, but lacking your usual energy, and not feeling your wonted will for action—it behoves you to leave no stone unturned to find out the cause.

“Is it the water, I wonder?” People who suffer in the way I have just briefly described are unfortunately too apt to seek for relief in drugs, instead of endeavouring to find out the cause and remove it, or, what is better still, remove themselves from the evil influences, for a time at all events.

But what good can any medicine in the pharmacopœia do if we are swallowing a daily dose of that which is deleterious—might I not use a stronger expression, and say poisonous? It is the constant drop that wears the stone away. It may or it may not be the water you drink, or use for tea or soup, which is causing that feeling of *malaise*, or “only-middlingness,” in your system. It is your duty to yourself and relations to make sure. It should be remembered that, if not remedied in good time, ill-health becomes chronic, and changes take place in important organs that neither medicine, change of air and scene, nor anything else can ever alter.

Be it understood, and that distinctly, that I am not referring, nor do I mean in this paper to refer, to water positively poisoned by disease-germs, by means of

which it is estimated that over 20,000 die annually in these islands by typhoid fever.

Nor do I address exclusively the inhabitants of towns and cities, who have to buy their water as they buy their milk, and actually take what they can get or want. Indeed, with few exceptions, I am happy to say that the water supply in cities is nowadays fairly good. I do not forget while so writing the late unfortunate outbreak of typhoid in some districts of the metropolis, from the presence of dead and decaying eels in the pipes. This was an accident pure and simple, one which in a few months will be remedied, and one which I trust may never occur again. It will no doubt be a lesson and a warning to the water companies to see to the strength and substantiality of their filtering reservoirs, for these ought to be strong enough to resist the greatest possible flood. A water famine, from whatever cause, in a city only a fifth of the size of London, would be a calamity which one cannot think of without pain.

I refer the reader to books if he wishes to study the chemical composition and properties of pure water. Perfectly pure water indeed is never obtained; there must be a mixture of salts in all that comes from wells and rivers, and too often there is a combination of poisonous organic properties that renders it most deleterious to the health of the consumer.

The best and purest of all water, if it could be obtained, would be rain-water.

Where does this come from? A schoolboy would naturally say from the sky, and feel content with his reply. We go further than that. We know that the heat of the sun on the waves of the ocean causes evaporation: an evaporation as invisible perhaps as that of the insensible perspiration from the skin of a healthy man. This heated vapour rises high into the air, and is condensed into mist. Winds catch this mist and bear it far inland, and it floats hither and thither in the sky in the form of clouds at the wind's will. The currents of air at a great elevation are as varied as those of ocean, and even more so. The mists get condensed into rain, and fall earthwards; if in this descent a cold stratum is passed through, hail is the result; but this rain or hail is almost pure. Could it be collected and stored in clean tanks sufficiently large in surface to admit of aërication, we should have a supply of water for drinking and cooking purposes, far more safe than any we can obtain from wells or from reservoirs. Unhappily our rain supply is got from house-tops, themselves often clad in impurities of all kinds; though, on the other hand, we have the silicated carbon filters to, in a great measure, restore its pristine purity.

I cannot dismiss the subject of rain-water, however, without reminding the reader that it is not only from house-tops it may gain its impurities, but from the very air through which it passes; especially is this the case in smoky towns, and in places the atmosphere

of which is impregnated with the vapour from mills, and gases from chemical works.

The purest rain-water would be that which falls in mountainous districts.

Condensed water, such as that which is supplied nowadays to sailors on ships—it is simply distilled sea-water—is pure enough ; its want of sufficient aëration, however, and its want of a certain admixture of saline matter, render it rather unpalatable.

Well, although a certain amount of mineral admixture may be good for the health, too much of it, if used for any length of time, cannot fail to be prejudicial.

“Our water is very hard here.” I have heard that remark over and over again from the heads of families, living in the country, who never suspected that such hardness rendered it injurious to the health of the family. They would, and will—long after this paper is read and forgotten—be content to put an oyster-shell in the tea-kettle, and a pinch of carbonate of soda in the tea-pot, but they make no attempt to soften the water they drink or cook with.

People will tell you that the boiling of water separates the insoluble salts, and renders the water soft. The fact is that boiling softens what is called “temporary hardness,” but not “permanent hardness.” It is the carbonic acid in the water which holds these insoluble earths up, but as soon as the gas is driven off by heat, they are deposited, and form the well-known crust or “fur” of the tea-kettle.

Is hard water really deleterious to the health? It will depend upon the amount of mineral salts or earth it contains. A person may be ailing, and blame the water he consumes, but we are surrounded by so many influences deleterious to the health that it might be unfair to blame the water altogether. At the same time the invalid may rest assured that the use of hard water is one of the abiding causes of his trouble.

We easily know when washing our hands whether the water is hard or not, it being most difficult to form a lather with hard water. This fact led Dr. Clark, of Aberdeen, to adopt what is called the soap test for ascertaining the hardness of water.

This test need not here be described. But the following truths should be borne in mind regarding water which refuses to produce a lather with soap :—

I. Such water is the reverse of beneficial to the skin of either the hands or the face, and is to blame for many blemishes of both, including chapped hands in winter, roughness, scaliness, &c.

II. That, as the main use of the morning tub or bath is to keep the skin in good working order, such a result cannot be obtained if the water be hard. On the contrary, the skin is injured quite as much as it would be by the use of a too alkaline soap.—

N.B. It should be indelibly fixed in the mind that anything which prevents or interferes with the proper action of the skin, paves the way to impurities of the blood, to attacks of cold, to rheumatism, and to dyspepsia and all its attendant evils.

III. If, in addition to bathing and washing in such water, it is also used for drinking purposes, matters are made worse. Many kinds of hard water have a tendency to produce the lithic acid diathesis. If, falling short of so dire a result, hard water merely constipates, or dries the system, surely this is bad enough ; for a continuance of such a state will assuredly end in dyspepsia—the forerunner of a thousand ills. It renders the liver sluggish, and dulls and blunts the sensibilities of brain and nerve, so that one has far less pleasure, if not actual weariness, in living.

IV. Hard water spoils and wastes good tea ; it renders both vegetables and meat difficult of digestion, and even interferes with the proper baking of bread.

Dr. Clark’s plan of softening hard water should be known to all. It is simple enough.

The degree of hardness is first to be determined by the soap test.\* If not inclined to find this out, a chemist could do so for you, and I do sincerely believe that money paid for obtaining such information would be well spent.

Having found out the degree of hardness, to every two gallons of water add an ounce of quicklime for each degree that the water is hard.

But without finding out by analysis the degrees of hardness, the following plan may be adopted :—The hard water gives a yellowish-white precipitate with a solution of nitrate of silver ; add lime-water to that which you want to purify, till on testing with the silver solution in a glass the precipitate becomes brown. Then give up adding the lime-water, and add more hard gradually, until with your silver solution you have no longer the brown tinge.

The organic impurities of water are far more dangerous to the health than permanent hardness, and it is one of the good points of Clark’s softening process that these are also precipitates. The water, after being softened and purified, must stand for twelve hours, to permit of the settling of the precipitate. The supernatant water is to be drawn off.

If now you make use of a large filter, you will have not only soft water, but safe water.

But the well itself should be seen to, and the position it occupies, its nighness to cesspools, and danger of being impregnated with surface water.

To people in towns I may add that the cistern also should be often cleaned out, and while exposed to the air it ought to be defended from dust and insects.

\* *Vide* Dr. Noad’s “Quantitative Analysis.”

