# PURE AIR: WHAT IT CAN DO.

By MEDICUS.

FROM my morning mail-bag one day, about two years ago, there tumbled a letter, in a handwriting that, though well-known, I had not set eyes on for months. This missive was placed, in company with one or two others, beside my plate, the rest were bundled into the bag again, and banished to the study, there to wait my convenience; for friends' letters I invariably look upon as essentially breakfast luxuries, to be perused, thought about, and talked over during the intervals of sipping tea and eating toast. Business letters on the other hand, unless deemed urgent, should never be read till after the matutinal meal.

This particular letter was from an old friend of mine who had spent many years of his life in India, Captain C———. He *had* had two of a family, but, alas! one was not; for his son, some time before this, had fallen a victim to that scourge of our English climate—consumption. The father had hardly been the same man since; his letters, once upon a time, used to arrive regularly every fortnight, but of late they had all but ceased.

"Could I run up to town, and dine, and stay the night?" this was the tenor of the letter; "he saw so little of me now, and it would be quite like old times to see me in the easy chair again. Besides he wanted to talk to me on a matter that concerned his only child's health."

I did not wait to send a letter in reply, I simply telegraphed to say I was coming up to town that night. Then in the afternoon I packed my travelling portmanteau and followed my message.

My friend looked a little older than I expected to see him, grief does age one so; but both he and his wife were unfeignedly glad to see me. And so, too, was Constance, who presently came in, though she, I noticed, was looking much paler than I had ever seen her before.

My host came into my room himself, as I was preparing for dinner, to see if I had everything I wanted.

"Hullo!" he said, seeing the window down as far as ever it could be pulled. "You're not afraid of catching cold then?"

"No," I replied, laughing, "fresh air and I are old friends, so old indeed that I don't think I could live without it."

"Ah! well," he said; "you and I always held somewhat different ideas on that subject. We won't discuss it just now, though. Soup will be on the table in ten minutes. That will be as good for us as fresh air."

My friend prided himself on the management of his *cuisine*, and, indeed, when he happened to have a new cook, he did not think it beneath his dignity to descend into the kitchen and personally superintend the preparation of the curry.

"If a man gets good curry and good coffee," he used to say, "he has little else in this life to grumble about."

But then my friend was to all intents and purposes an East Indian.

"We'll have coffee to-day," he said, "outside among the flowers."

So we retired to the verandah, a part of his home which he had succeeded in making quite like a little corner cut from some fair tropical garden. It was summer-time, and the flowers were in bloom, and every creeper and blossom about this beautiful verandah carried one's thoughts away to the golden orient. The splendidly-plumaged, but somewhat assertive, macaw on his perch in the warmest nook did not tend to dispel the delightful delusiveness of the idea that we really were sipping our coffee in front of a bungalow thousands of miles away from noisy matter-of-fact London. And some time after this, when the sun had gone down, I half expected to see fireflies dancing among the rhododendrons on the lawn.

"We can talk without fear of interruption here," said my friend. "Now you have seen Constance, what do you think of her? But I know what you will say almost before you speak. She is going like my poor boy; I will soon be a lonely, childless man."

"Not so fast, Frank," I replied; "not so fast, my dear friend; while there is life there is hope."

He groaned. "Oh! it is as I thought then," he cried, "a case of life and death."

"In the midst of life we are in death, Frank, so don't augur ill from my words. Here is how the case stands. Constance is not what people call ill; she suffers at present from no acute, no organic disease."

"I'm glad to hear *that*," the father said, brightening visibly.

"Stay," I said, "it is worse, as it happens to be. She is chronically ill—she is being poisoned."

"What?" he cried, jumping up.

"Sit down," I continued, calmly. "The kind of poisoning I refer to is not a criminal one. The poor girl is being poisoned by breathing impure air. Her blood is not sufficiently ventilated, so to speak. Her blood is just as impure as the air she breathes in this house—nicely furnished and all as it is, pleasantly and artistically laid out and all as the grounds are."

"Humph! and that is only another way" (this from Captain C——) "of telling me that the London air is not good and wholesome. I always thought so, and I do my best to keep it out of the house."

I could not resist a smile.

"No," I replied, "the London air is not so very bad as thousands imagine. London is a very healthy city with a low death-rate, and although its atmosphere is far from free from pollution, you are doing about the worst thing you could do for your daughter's health and hopes of long life by keeping it out of the house as you call it. You never studied physiology did you?"

"No, nor I don't want to, or any other 'ology."

"Well," I said, "at all events on this particular 'ology, you and the macaw yonder, if he likes to listen, will both be a little wiser before you leave the verandah. Another cup of coffee, Frank, please. Thanks. Now, little though you pride yourself in your knowledge of physiology, you are no doubt aware that human beings have blood?"

"I have been disagreeably aware of the fact before now," said my friend, laughing grimly.

"Well, that blood is kept in a constant circuit of motion by means of the double force pump called the heart. It is a double pump this way, one part of it is fed from pure blood received from the lungs, this pure blood is pumped to the remotest nerve and fibre of the body, by means of millions and millions of arteries. The fibres of the body receive nutriment from this pure blood, and at the same time they take occasion to exchange used up and effete matters for the good blood they receive. In this process of exchange heat is evolved, but the blood has now become so impure that it is far darker in colour, and in this state it returns to the heart by means of the veins. Now, what does the heart do with this impure blood, my friend?"

"Pumps it out again, I suppose."

"Yes, but not to the tissues of the body; it would be no more use to them in its present condition. It is black and dark with carbon; it contains plenty of nutrition, mind, but it is poisoned with this carbon; so the heart, by means of one half of its double action, pumps it outwards to the lungs, and there—mark this, Frank—it receives the oxygen from the air we breathe, and here a very simple chemical process takes place, which results in the purification of the blood and also in the manufacture of heat. May I explain the simple process?

"Go on," said my friend; "this is getting interesting."

"Well," I continued, "the blood loaded with carbon, or soot, if you choose to call it so, or charcoal, if you want finer English, is spread out in the lungs in a network of capillaries so fine in their construction, so thin in their walls, that they permit gases to permeate. Now, here is what Nature accomplishes by the process of breathing. She changes the carbon that darkens that venous blood into carbonic acid gas. The carbon itself could not escape from the lungs, but the carbonic acid does, being a gas. This gas is composed of carbon and oxygen, the air breathed is composed of oxygen and nitrogen; the oxygen gas of the air finds its way into the blood and changes the carbon into carbonic acid gas, which thus escapes, and the blood thus purified finds its way back to the heart by another road and by another set of blood vessels, and is received by that organ and pumped back again to supply the body. You see, then, how the blood is purified. About the nutrition of the blood I need tell you little, except that the best portion of the food we eat, after undergoing several purifying processes, is fluidified and poured directly into a large vein, and thus mingles with the circulation of the blood."

"I have read something like this in books," said my friend, "but seem to have forgotten what I did read; but from what you say, it seems that Nature, who can do nothing wrong, makes a point of being very particular about the purification of the blood."

"Yes," I said; "and so important is this, that if a suspension of this purifying process took place for only one minute or two, life would become extinct. The blood would have to retain its impurities, and during that short space of time would be poisoned to death. This happens when a person is plunged beneath the water, or into a tank where no air exists, and only carbonic acid."

"I think I know what you are coming to," said Captain C———, smiling. "You are going to tell me that if the complete suspension of the purifying process of the blood for even a minute or two means death, the continued imperfect purification of our blood must result in deteriorated health."

"That," said I, "is precisely what I was coming to; and I am really obliged to you and the macaw for listening so attentively to what I have been saying. No human being in the world who does not breathe, not now and then only, but always, and constantly, pure, wholesome air and plenty of it, can be in a state of perfect health, for the simple reason that the poisons generated in the blood by the constant changes of tissue that are going on in the fibres of the body are retained there."

"You mean to say, then, that a person who does not constantly breathe fresh, pure air is in reality suffering from the effect of chronic poisoning."

"That is indeed what I want to infer."

"And this is what poor Constance is suffering from?"

"I have spoken to her mother," I replied; "I have examined the child's chest. The

lungs are all right, and so are the other organs, but all are enfeebled."

"We feed her on the best we can think of, though."

"Granted," I said. "You cannot tell me anything I do not already know. She has been getting everything she can think of, and you have been giving her tonics as well, and even cod liver oil because she had a little tickling cough?"

"Yes," said the father, "what is the meaning of that cough? It has been frightening us very much indeed."

"It is what is erroneously called a stomach cough, but it depends on an over-sensitiveness of the nerves of the lungs and windpipe, caused by want of proper nutrition, that is, from their being supplied with blood insufficiently purified. For this same reason the heart is weak and the liver inactive, and the brain languid and not full of life and joy. The two always go together. No wonder the poor girl has chills, no wonder she is languishing in every way. You have come home from India with an idea that cold kills, that this climate of ours is the most wretched one in the world. You have been closing your doors and windows against the climate, and keeping out the fresh air that alone could give life, and comfort, and happiness to your child."

"There is no actual disease then?"

"Wait a minute. Do not buoy yourself up with false hopes. There is, I grant you, no actual disease at present; but let me again remind you that in the midst of life we are in death—that there are a thousand evil influences around us, ready to attack and destroy us if we leave an opening unguarded to admit them. It is the weak, not the strong, they attack. The healthy man or woman can walk unscathed through fever and pestilence, but the weakly fall in the attempt. No actual disease? No; but how long shall I or any other medical man be able to say so? In your daughter's case, Frank, I must tell you candidly the ground is all ready for the seed to be sown, let whatever wind will bring it along on its wings."

"You frighten me," said my friend.

"I meant to do so," I replied.

"What would you have me do?" he asked after a pause.

"Send your daughter down to the country, to begin with," I said, "for two or three months. I know you have friends who will gladly receive her. While there, let her have all the exercise she can take in the open air and sleep at night in a well-ventilated bedroom. Let her leave her medicines at home—she won't want them. Meanwhile, do something towards the reconstruction of this bungalow of yours; I'll assist you with my advice, and, if you were a poor man, I'd take off my coat and assist you with my hands as well.

"And you really think——" he began.

"I don't *think* anything about it," I interrupted him, talking in that dogmatic way doctors do speak sometimes. "I don't think, Frank, I'm sure. You asked my advice, and you've got it. I pronounce sentence—not of death, as you have imagined I would, but of transportation on your daughter—transportation to the country for the period of three lunar months."

"My dear friend," cried Captain C——, "I'll be transported if Constance gets better—transported with joy!"

About a week after this I was back again at my friend's place, and we were going over the house together, from basement to attic—I with a note-book and pencil in my hand, my friend with a candle. Captain C—— had lit this candle to light us over the cellar; but so interested was he with everything I said, that when we were upstairs in the best bedroom, and the sun shining brightly in through the window, he still kept firm hold of it.

"Not much amiss here, is there?" he said, when we stood together in the cellar.

"Not much amiss?" I repeated; "why, everything is amiss."

"When," I continued, making a memo. in my book, "will people find out that the evil air and evil odours, poisoned and bred in the dank, damp darkness of a cellar permeate up through all the house? You want light here; you want ventilation, and you want disinfection; and I'm not at all sure the drains do not want seeing to. Come on; I've taken notes. I would not grow mushrooms nor keep a hedgehog in a place like that. And pray, observe, your pantry is in direct communication with the cellar and the scullery, and sink with that, and the water tank above with all three. Butter and milk are excellent disinfectants—they contaminate themselves with the impurities that are contained in the air around them; they thus tend to purify the air, *but* who is going to eat the butter? Into that sink of yours the kitchen slops are emptied, and unless you disinfect it by pouring boiling water and carbolic acid or green vitriol down the pipe once or twice a week the air in the house cannot be sweet and pure.

"You have the windows of the drawing-room opened only a little now and then, because you are afraid of a draught; but the danger of a draught lies in its power to absorb heat from the body, and if the window is not opened very wide you court a cold strong current, instead of a safe and healthful mingling of the outside pure air with the confined and unwholesome atmosphere of the room. Open windows wide or do not open them at all.

"Here we are at the bedrooms. What! you have a ventilator in the door?"

"Yes, did that since you were here."

"Right; but remember this, the air in the passage must itself be pure and fresh else the ventilator will do more harm than good. In fact, the only way of having pure air in any one room is to have it circulating freely through all the house. No need to have a current on the back stairs strong enough to blow out that candle you seem to think so necessary an aid to our peregrinations. How easy it is to have fresh air without a current. Why, by having a frame made to fit the window filled in with perforated zinc we can safely have our windows open all the live-long night, and how fresh one awakes in the morning after a good night's sleep in pure air. But if you object to this style of airing a room, there are ventilators now made so pretty that they are quite ornamental. On the whole even a draught is less dangerous than breathing impure air, but by simple means we prevent draughts.

"And now, dear Frank, you may blow the candle out. I'll undertake to have your bungalow ventilated safely and scientifically from cellar to garret; you must see that the air is not poisoned after it gets inside the house, and in addition to the means I shall adopt for ventilation, I advise you to throw windows open wide every forenoon all the year round. Grow flowers on the window-sills too, and let the air blow over them into the room; but, Frank, pay many a visit, yourself and your candle, to that cellar of yours, and do not forget that though disinfectants are good in their way, fresh air is a thousand times better. I've only one more word to say, and that is this: some of the most learned medical authorities of the day have given it as their opinion that rebreathing air that has already passed through the lungs is not unlikely to sow the seeds of that terrible disease consumption."

My friend, Captain C——, writes to me much more frequently now than he used to. There is not a sweeter or more healthy dwelling than his bungalow in all London, nor a sweeter and more healthy-looking girl than Constance.

## VARIETIES.

How Judgments are Formed.—A duchess was obliged to pay a visit to the neighbouring convent on a winter's day. The convent was poor, there was no wood, and the monks had nothing but their discipline and the ardour of their prayers to keep out the cold. The duchess, who was shivering with cold, returned home, greatly pitying the poor monks. Whilst they were taking off her cloak, and adding two more logs to her fire, she called for her steward, whom she ordered to send some wood to the convent immediately. She then had her couch moved close to the fireside, the warmth of which soon revived her. The recollection of what she had just suffered was speedily lost in her present comfort, when the steward came in again to ask how many loads of wood he was to send. "Oh! you may wait," said the great lady carelessly, "the weather is very much milder."—*Souvestre.*

Five Arab Maxims.

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| More than | He knows | He can do | He hears | He can afford | He sees |
| Often | Tells | Attempts | Believes | Lays out | Decides upon |
| Everything | He knows | He can do | He hears | He can afford | He sees |
| For he who | Tells | Attempts | Believes | Lays out | Decides upon |
| All | You may know, | You can do, | You may hear, | You can afford, | You may see |
| Never | Tell | Attempt | Believe | Lay out | Decide upon |

Read the first and second lines alternately. "Never tell all you may know, for he who tells everything he knows often tells more than he knows." Then the first and third, first and fourth, and so on.

Answer to Double Acrostic (p. 459).

L A N F R A N C (*a*)
E D I T H (*b*)
A L S A C E
M I C H A E L
I N N O C E N T (*c*)
N I V O S E
G O R G O N
T R U T H
O D E S S A
N or M (*d*)

Leamington. Cheltenham.

(*a*) Archbishop of Canterbury from 1070 to 1089.

(*b*) Daughter of Malcolm Canmore, King of Scotland; she assumed the name of "Matilda" on marrying Henry I.

(*c*) Thirteen popes took this name on their elevation to the papacy.

(*d*) As "N." would stand for "Nomen," *one name;* so "N.N." would signify "Nomina," *names:* and the careless copyist, writing one "N." into the other, would make them appear like the single letter "M."