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BREATHING BAD AIR.

BY DR. WM. A. ALCOTT,

Author of the Young Husband, Young Wife, Young Housekeeper, Young Mother,
House I Live in, Young Man's Guide, &c.

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BREATHING BAD AIR.

DR. FRANKLIN, in his usual humorous manner, but with his accustomed gravity, relates, in one of his essays, the following anecdote ; a principal object of which, no doubt was, to show the influence which pure air has upon human health, happiness and longevity.

“ It is recorded of Methusalem, who, being the longest liver, may be supposed to have best preserved his health, that he slept always in the open air ; for when he had lived five hundred years, an angel said to him—Arise, Methusalem, and build thee a house, for thou shalt live yet five hundred years longer. But Methusalem answered and said—If I am to live but five hundred years longer, it is not worth while to build me a house—I will sleep in the air as I have been accustomed to do.”

But Dr. Franklin insists, still more strongly, on the importance of breathing pure air. He says—Confined air, when saturated with perspirable matter, will not receive more ; and that matter must remain in our bodies and occasion diseases. And again, in telling us what he means by perspirable matter—for the doctor was very much in the habit of explaining his own terms—he says, we generally eat about twice as much as nature requires ; and the superabundant matter, in a healthy state of the body, and amid free air, amounting, as he appears to estimate it, to about *five eighths*, or rather more than one half

of what we eat, passes out of the body through the pores of the skin, and through the fine thin membrane which lines the inside of the lungs. This moisture, if confined in the body, for want of free air to be applied to the surface of the body, and to be inhaled or drawn into the lungs, becomes putrid, as he supposes. "Living bodies do not putrify," he says, "if the particles, as fast as they become putrid, can be thrown off; but in a close room, we receive them again and again, though they become more and more corrupt. A single person is said to spoil only a gallon of air a minute; and therefore it requires a longer time to spoil a chamber full. It is done, however; and many putrid disorders have hence their origin."

Now although the physiology of the human system is somewhat better understood now than it was in Franklin's time, yet there is much of truth in what he says; and had mankind been wise enough to heed his cautions, the consequences would have been most happy. Whether the sad accidents, and the sudden and protracted diseases, and the pale faces, which are so often seen and known among us, are caused exactly in the way he supposes or not, no one now doubts their frequent existence. Nor will any one, who has the least claim to philosophy, doubt the importance of pure air, and the deleterious and often fatal consequences which result from the want of it.

One single glance at the world we live in—at least with the eye of plain common sense—will show, in some good degree, the importance of the truth we are now trying to inculcate. Look at our farmers and other laborers who are almost always in the open air. Notwithstanding their ignorant abuse of their constitutions in a thousand ways—some of them among the more flagrant which can be found—their constant exposure to the open air gives them that "firmness of nerve" (muscle, rather,) "and energy of thought," for which, other things being equal, we look

in vain elsewhere. We will not say that the average duration of their lives, or the rapidity of their thoughts, is quite equal to that of a few other classes of society; for, according to the calculations of Dr. Caspar of Berlin, clergymen and merchants live a little longer in Europe than farmers; and we know that, as a general rule, they think faster. Yet we know also that true length of life is not to be measured by mere length of days. We doubt much if the average amount of immunity from suffering be not in favor of laborers, notwithstanding their gross errors and abuses; and we attribute it, in a very large degree, to their exposure to the open air. It is not the smell of the earth, as has sometimes been vainly supposed, for the effluvia of decomposing vegetation are rather injurious than healthy; and the breathing of so much dirt as farmers and other laborers are sometimes liable to breathe, is decidedly hurtful. Nor is it their great amount of exercise, for many persons who are employed within doors have quite as much exercise, and of a kind too which is calculated to bring into play, nearly as well, all the moving powers of the system, and yet they have not such hard and firm muscles as the former have. No; it is the air principally, though we will not say entirely. It is in some degree, we must confess, their freedom from that "wear and tear," and "vexation" of mind and soul, to which men of almost all other occupations are more subject than they, and their general if not uniform cheerfulness.

But we must enter a little into detail in regard to the structure of the human lungs and skin, and the philosophy of the atmosphere, before we can well understand the nature of the wonderful relation which subsists between them.

The atmosphere, in which we live and move and breathe, surrounds our globe, as a belt, to the height of about forty-five miles. If the earth be supposed to contain

200,000,000 of square miles, and 800,000,000 of inhabitants, this would give a dividend to each human individual of about eleven cubic miles of air. We say to each human individual, because other animals breathe it as well as men—even, to some extent, the tenants of the great deep. If we should take it for granted, that the animals use, in the whole, ten times as much as man, there would still be left to each person at least one cubic mile, which, at an average of half a pint of fresh air at each inspiration or drawing in of the breath, would last us many years, provided even that no changes were going on to renew it. We shall see presently, however, that such is not the fact, but that there are processes in nature constantly going on to renovate it; so that were the population of the earth to become a hundred or a thousand times as large as it now is, there could never fail to be a full supply for every individual, could he be induced to use it.

This atmospheric air, in which we are immersed all our lives long, is not a simple gas, as the chemists would say, but a compound one. It is made up of two gases or airs, called oxygen gas and nitrogen gas, in very different proportions. The former seems to be the vital or principal part of the atmosphere; for the other part—the nitrogen or azote—is added to dilute it, as we would dilute, with water, a liquid which would otherwise be too strong for us, and injure us. In fact, the analogy here alluded to is pretty close; for oxygen, though it is the part of the air which supports life, would be quite too strong for us to breathe by itself. We might feel exhilarated and happy a short time; but after a little while we should be exhausted. We should *live too fast*, and should, in consequence, in a little time, be completely worn out and perish. But by mixing about four fifths of nitrogen, or innutritious air, with one fifth of the vital or nutritious air, the Creator has formed a mixture for our use, which,

if kept always in a perfectly pure state, and if there were no other causes of human disease, would enable us to last to old age, and to enjoy health as long as life.

Of this mixture we draw in or inhale from half a gill to half a pint—the quantity varying according to age and other circumstances—at every breath, all our lives long. As soon as it is drawn in, if the lungs are in a perfectly healthy state, and are not compressed or crowded by too tight a dress, too full a stomach, or by a cramped position of the body, it is diffused or spread over all the hollow cavities or cells with which the lungs so wonderfully abound, to come in close contact with the blood, and to form it and purify it. In order however to understand this part of our subject, we must say something of the blood itself, as well as of its circulation.

This fluid, in quantity amounting to at least five or six gallons in the adult, goes from the heart to the extremities of the system, and returns again, in less than four minutes. It goes out comparatively pure; and after having its finer and more perfect particles taken out to promote our growth, or to supply the constant “wear and tear,” or waste of the various parts through which it passes, comes back more or less impure. It goes out also highly endowed with vitality, (for the blood may be said to have life as much as the solid parts of the body,) but it comes back with a considerable loss of that vitality. It is somewhat cooler, and would freeze sooner than when it set out on its journey. Were there no means of restoring its heat, and life, and purity, it would go the round of the circulation but a very few times before it would not only be unfit for circulation, and for the nourishment of the body, but actually poisonous to it. Either the carbon with which it becomes loaded, and which gives it a very dark color, or something else in it, would spoil it for the purposes of sustaining life, and we should soon perish.

Nor is this all. The chyle which is formed from our food, which is at first either milky or pearly in its appearance, and which is ultimately to become blood, cannot become so by merely circulating in the veins into which it is poured, nor by going every four minutes the whole round of the circulation, including the heart and the arteries. There must be some process or processes both for forming the blood and for *reforming* it.

This twofold work is accomplished in the lungs. The whole mass of the blood not only goes out to all parts of the body and back again every three or four minutes, but as soon as this grand general tour is finished, it makes a shorter, but more special journey, through the lungs, whence it returns again to the heart. In this journey it is that the work of forming as well as of renovating the blood is accomplished.

We have spoken of air cells in the lungs. Now it would be difficult to describe the inside of the lungs in such a way as to make the subject intelligible, in a short article like this, especially without the aid of plates. We are compelled, therefore, to the mere statement, that the windpipe, through which the air passes from the throat to the lungs, divides and subdivides almost without end, till at last these minute subdivisions end in little globular cells. Now the numerous passages formed by the divisions of the windpipe of which we have spoken, together with the almost innumerable little cells at their extremities, are all lined with a thin membrane, not unlike the skin and the lining of the intestines, only vastly thinner and more delicate than either. The extent of this membrane thus lining the internal surface of the lungs, has been usually estimated, in an adult, at about fifteen square feet—equal to the extent of the skin itself. These cells are always filled with air, in the living, healthy adult individual, amounting probably to one hundred cubic inches,

or from three to four pints. The difference of different individuals, in this respect, is, however, extremely great.

But be the quantity of air contained in the lungs what it may, it is not all expelled in expiration, that is, in throwing out our breath ;—nay, only a very small part of it—probably, in ordinary cases, not more than half a pint. This is replaced, at the drawing in of the next breath, by an equal quantity, so that the lungs are always kept full.

We have said that the atmosphere, in its most perfect state, consists of about one fifth oxygen and four fifths nitrogen. It is indeed supposed by some, that a small quantity of carbonic acid gas enters also into its composition—say one or two parts in a hundred ; but whether this is so or not, we cannot determine. In a world where 800,000,000 human beings, and perhaps a hundred, or a thousand, or a million times as many other animals are continually forming this gas by breathing—where it is almost constantly formed, too, by the process of combustion, and perhaps by many causes unknown to us—it would be difficult to say whether it is in the atmosphere constitutionally or accidentally, or both. We are certain of one thing, however, which is, that the less of it we inhale, the better, under all circumstances, is it for our health.

When we breathe, the air we receive into the lungs is forthwith conducted into all the little cells we have spoken of ; and so diffused, every where, that more or less of this fresh air is present—if the lungs are in a healthy state—in each cell. At the same time, a greater or smaller proportion of the dark, impure blood, sent by the heart to be renovated, is also present in the little arteries and veins which abound in the mucous membrane with which these cells are lined. In this way, the blood and the air are brought into very close contact with each other ; and it is

in these circumstances that the chyle sent hither, mixed with the blood, takes its red color, and that the impure blood sent here is also renovated.

Of the philosophy of the change which is effected in either case, it is not necessary we should now speak; something more, however, must be added respecting the particular character, or rather the results of this change.

The oxygen or vital part of the air which is inhaled, always diminishes by traversing the air cells of the lungs, and the proportion of nitrogen gas and carbonic acid gas increases. While, therefore, the blood is purified by respiration, the air which is inhaled and used for that purpose, is rendered impure; and in the same proportion, unfit either for respiration or combustion. It is remarkable too, that the process of *combustion*, so common in civilized society, is continually effecting a similar change in atmospheric air; and in the same way and in a like proportion, rendering it unfit for the support either of combustion or respiration.

It is indeed wisely ordered by the Divine Author of both these processes, that heated air should always ascend, and its place be supplied by that which is cooler; so that the heated but contaminated air of fires goes up the chimney, if there is one; and if not, ascends towards the upper part of the room. In like manner, the impure air thrown out by the lungs at first, ascends; so that if we are alone in a large room or in any other portion of free space, we are not driven to the necessity of breathing it over again. It is also an equally wise institution of Providence, that this contaminated air, which if it were breathed over again would more or less, injure us, is the very life-blood, as it were, of vegetation; and is either immediately consumed by it near the spot where it is formed, or if in the season of winter, is wafted on "the wings of the wind" to those places where it is needed. And to complete, as

it were, the catalogue of this series of wonders, while the vegetable world is consuming as its most nutritious food, that very gas which all animals, by respiration, and the civilized world, by combustion, have rejected, as not only useless, but highly mischievous to them, it is at the same time forming—we might say manufacturing—and sending forth in return, a supply of oxygen gas, which if retained, at least in superabundance, would perhaps prove as annoying, if not as destructive, as carbonic acid gas—its own favorite food—is to animals. Thus the two worlds—the animal and vegetable worlds—are mutually found to sustain each other by the very substances which, if retained, would prove the means of their own destruction.

Not that there are no other known ways of disposing of their rejections—by either the animal or the vegetable world—but these are much the most common and universal; and this mutual interchange of good offices always appears to us one of the most striking provisions of Nature, for the creatures of her care, with which we are acquainted.*

* We have sometimes been led to believe that, in a perfect state of society, carbonic acid gas would be the principal, if not the only manure necessary to our decayed soils. In truth, so far as it goes, we know it to be one of the best, if not the very best form of extra vegetable stimulus, (if indeed it deserves the name of an *extra* stimulus,) which can be found. There is, in any event, no need of resorting to strong, recent manures, to enrich our soils, as most farmers and gardeners are accustomed to do, around our largest and most densely settled towns and cities. Not only are the vegetable products of the earth in this way often rendered more acid than they otherwise would be, and of course in the same proportion unfitted for the best purposes of human health, but even the milk, and butter, and cheese, and flesh, of the animals that feed on them, are also more or less contaminated. We might cite facts almost innumerable, in support of this opinion, but have not room at the present time.

But to return to the more immediate subject of our remarks. From what has been said, we see plainly what must be some of the inevitable consequences of breathing air over again. For though when first thrown out of the lungs its heat causes the carbonic acid gas to ascend, it soon cools, and being naturally heavier at the same temperature than the common air in which it floats, it descends; and if not removed by the motion of the atmosphere, in the form of currents or winds, or by some other cause, is liable to be drawn into the lungs again. But as the latter constantly require the purest air which can be obtained—viz., a combination of about four-fifths of nitrogen, and one-fifth of oxygen, with as little of any other gas as possible—an increased amount of carbonic acid gas, to say nothing of the decrease of oxygen, or the increase of the nitrogen, would not only be negatively, but positively injurious. This injury will be greater or less, in proportion as the air which is breathed departs, in its quality, from the healthy standard, either by the consumption or decrease of its vital part, or by the intermixture of useless or deleterious gases or other substances.

It was said by Dr. Franklin—probably long before his time; and the saying is still repeated—that we spoil a gallon of air a minute. By this we suppose is meant, that we render a gallon of air so exceedingly impure in the space of a minute, as to make it immediately dangerous to life to breathe it any longer. But if the doctrines we have set forth above, are true, a person confined to a gallon of air would begin to suffer in a much less period of time than a minute. Indeed, it is most likely that even the second breath, in such circumstances—and we usually breathe from fifteen to twenty-five times in the course of a minute—would contain a small quantity of carbonic acid gas, which, though it might not and probably would not

cause immediate suffering, would nevertheless be poisonous as far as it went. In fact, we are driven by the severe rules of philosophical, chemical and physiological science, to the tremendous conclusion, that there are very few persons, if any, who do not breathe bad air, more or less, and who do not, of course, injure their health, and shorten their lives, by it, in a greater or less degree.

One very common cause of immediate death from breathing bad air, is in descending into deep wells, caves, mines, &c. It not unfrequently happens that carbonic acid gas accumulates in these cavities to the depth of several feet. It is usually called—in these circumstances—by the name of choke-damp. After breathing it but a few minutes, a person experiences a sense of suffocation; and unless quickly relieved, dies.

Multitudes of persons in going into deep wells, ignorant of any danger, have fallen and expired; and it not unfrequently happens that they who descend to relieve them expire suddenly, in like manner. Did everybody understand the simple fact, that carbonic acid gas often accumulates in these cavities, and that its presence may at once be detected by letting down into it a lighted lamp, candle or torch, how many lives would be annually saved! *

The most fearful casualties of this sort occur—though we confess, more rarely—in deep mines. Great numbers sometimes perish by the sudden accumulation of carbonic acid gas, and by the admission and explosion of other gases, equally dangerous. Great praise has been justly

* The truth is, that if a light, in such cases, continues to burn a person may safely venture down; but if not, let him beware. The gas may be absorbed so that a descent will be perfectly safe, by putting down into the well a sufficient quantity of quicklime; or it may be slowly absorbed by putting down water, and violently agitating it.

awarded to Sir Humphrey Davy, a distinguished chemist, for inventing what has usually been called a safety lamp, for the use of miners. It is so constructed that it will burn amid gases almost as explosive, naturally, as gunpowder. It not only prevents sudden explosions, when a mass of some hurtful gas collects, either slowly or by rushing suddenly upon the miners, but also affords light to enable them to escape, when they perceive the danger approaching.

We have already said that carbonic acid gas, when cool, is heavier than common air. It is hence sometimes found in the bottoms of wells, caves, &c., one, two or three feet only in depth, so that a man can breathe with safety, while a child, or a dog or cat, would suddenly expire. There is a curious instance of this sort in Italy. The dogs which accompany travellers in visiting a certain cave there, have been known, time immemorial, to fall down and die almost as soon as they enter upon the floor of one of the deep apartments of the cavern, while their masters have escaped. Ignorant of the cause, the place has been named Grotto del Cane, or Dog Grotto. The simple explanation of the phenomenon is, that the floor of the cave is always covered, to the depth of two feet or more, with carbonic acid gas.

The accumulation of the same deleterious gas will explain the common and lamentable occurrence of sudden death in very tight chambers, or other rooms without chimneys, where coal or any other combustible has been for some time burnt, with the doors and windows closed. How many deaths do we read or hear of, every year, occasioned in this way? They are often called, in the newspapers, *deaths from charcoal*; but there is nothing in charcoal that should render it peculiarly destructive. The suffocation and death are produced by the carbonic acid gas, which is formed both by combustion and re-

spiration, and which, having no opportunity to escape through chimney, window, door or crevice, accumulates on the floor of the room, and gradually fills it up, till it rises to the mouth and nose of the person or persons occupying the room, who, if not relieved, soon die.

As a person is sooner endangered when sleeping on a bed than when sitting up, or at least standing, those who are lying on their beds, sensible of a commencing suffocation, might save their lives, did they understand a few facts in chemistry, and had they presence of mind enough to use them. It happens, however, that they are usually fast asleep, and know not when the hand of death begins to steal upon them.

We have said it matters not as to the danger, whether charcoal is burnt, or something else. The reason why death, in these cases, is so often attributed to charcoal, is probably owing to the fact, that it is charcoal which is almost always used in this dangerous manner. If people have fire-places or grates with flues, they commonly use in them some other kind of fuel rather than charcoal.

Before we go farther, it may not be amiss to remark, that those who still entertain doubts, whether the mischief in these cases is fairly attributed to combustion and respiration, may satisfy themselves by confining a mouse in a small glass jar. They will soon find the poor animal become less and less active, and it will not be long ere he will droop and die. What other cause of sudden disease and death can there possibly be in this case, than that of which we have spoken ?

The experiment to which we have directed the reader's attention in the last paragraph, is a cruel one ; but it seems to us decisive. Should it not be satisfactory to others, however, we shall ere long, present facts which probably will be so.

We have referred to the cases of sudden death from bad

air, so common in wells, caves, mines, and close rooms ; but we have as yet given no names, dates or places. To those who cannot *believe* without the latter, the following facts may be of some interest—not because we suppose they are the only facts of the kind which the world ever witnessed, but because they *are* facts—terrible ones, too,—and specimens of what has existed hundreds or thousands of times, on a greater or smaller scale, in the various parts of our world.

One of the most striking examples on record, of the danger of breathing bad air, is that of the destruction of a company of Englishmen in the Black Hole, as it is called, at Calcutta, in the East Indies.

This Black Hole is a prison or dungeon, eighteen feet square, partly under ground, with no openings but two small windows.

On the twentieth of June, 1756, Surajah Dowla, Nabob of Bengal, having taken Fort William from the British, 146 of its defenders were thrown into this prison, the narrow dimensions of which would allow to each only a space of twenty-six and a half by twelve inches—a space of course, barely sufficient to hold them while standing erect. In less than an hour, many of the prisoners were attacked with an extreme difficulty of breathing, several were delirious, and the place was filled with incoherent ravings, in which the cry for water was predominant. The sentinel gave the water as fast as he could ; but it wholly failed to allay their thirst. In less than four hours many of them died—some apparently from suffocation—others, of high fever, with violent delirium. At the expiration of five hours, most of them, except a few at the windows, were delirious,—and in six hours, nearly all were sick of putrid fever, and large numbers had died. At the expiration of eleven hours, when the prison was opened, one hundred and twenty-three out of the one

hundred and forty-six were actually dead, and the twenty-three remaining, were all sick of putrid fever. The latter, however, by means of fresh air and proper attention, gradually recovered!

Some may suppose that this dreadful result was hastened by the great heat which must have prevailed in Calcutta, at that season. This may, indeed, have had a slight effect, as the air is more highly rarified in hot weather. Still, however, the difference, in this respect, is not so great as most persons are apt to suppose. The idea is not uncommon, that a heated atmosphere may be impure; but it is not generally believed, at least practically, that a cool one may be. Those who have the care of school rooms, lecture rooms, halls, churches, &c., seem quite satisfied if they do not suffer the temperature of their respective rooms to become too much elevated. As long as a room is cool, it is with the utmost difficulty that they can be made to apprehend danger.* Whereas, the terrible results at Calcutta would have been the same in the middle of a northern winter, except that the work of death would have proceeded a little slower.

In view of the affair at Calcutta, and of facts, Dr. Bell, of Philadelphia, in his work on Health and Beauty, has the following remarks:

“Such an awful example ought not to be lost sight of; nor should it be forgotten, that there is a slow poisoning, perhaps more torturing than the sudden and violent kind. In our school-rooms, churches, hospitals, and places of public evening amusements, and even in our private dormitories, we not unfrequently make near approaches to the summary poisoning process of the Black Hole at Cal-

* On cautioning a teacher, in one of our cities, about the impurity of the air of her school-room, she very *sagely* replied, (it was in midsummer,) that the air could not, by any means, be bad, as the room was one of the *coolest* in the whole city.

cutta. In these places, the pure element of the air (oxygen) is exhausted, and there is an exhalation, both from the skin and the lungs, of the poisonous agent, carbonic acid, which, when breathed awhile, produces necessarily the effects already mentioned; that is, a species of slow poisoning."

Of slow poisoning in our dormitories, and the exhalation from the skin of which Dr. B. speaks, we shall have occasion to say something in another place. Our aim, here, has been principally at school-rooms and other places where large numbers of people are wont to collect and be collected, but in which the health of all, as they are at present managed, is almost sure to suffer.

Another instance little less striking than that at Calcutta, occurred in London, in 1740. Twenty persons were forced, at evening, into a part of St. Martin's Roundhouse, called the Hole, four of whom died before morning, with symptoms not unlike those which have been mentioned in the preceding paragraphs, and two soon afterward; and twelve more suffered very much.

There is also an anecdote of Crabbe, the poet, which may serve as an illustration of our subject. He was once punished at school by being put into a dog-kennel, with several other offenders—so many, in fact, that the hole was literally crammed with them. Crabbe, however, having been put in first, suffered for want of air, much the soonest. After complaining of suffocation for some time to no purpose, he at length bit one of his companions, which so frightened him that he roared out, "Crabbe is dying," upon which the sentinel opened the door; and thus, in all probability, saved the lives of both him and his companions.

It is one of the many evils of war, that those who are taken prisoners are often confined in prisons and prison ships, in low and ill-ventilated apartments, where they

either gradually lose their health, or die from dysenteries or fevers, induced or aggravated by the pestilential air which they inhale. Nor is it the least of the miseries of the slave trade, that the confined air of slave ships often proves the means of the sickness and death of the poor passengers, in very large numbers, and of the protracted ill health of still larger numbers who may chance to escape immediate death.

We have spoken of the bad air of hospitals. These are in a better condition, in most countries, than they formerly were, as may be inferred from the following facts :

In a hospital in Dublin, between the years 1781 and 1785, no less than 2944 children out of 7650 died within a fortnight after their birth. This was more than *one in three*. Dr. Clark, the physician, suspecting the cause to be a want of air, contrived to introduce a full supply of this important element by means of pipes, six inches in diameter, into all the apartments. The consequence was, that during the three succeeding years, only 165 out of 4243 children died within the first two weeks, or less than one in twenty-five. What a surprising difference ! Is there a doubt that of the first number of deaths we have mentioned, about 2650 died for want of pure air ?

When Dr. Buchan, about the year 1750, or a little later, was appointed physician to a foundling hospital, in Yorkshire, England, he found that half the children died annually. By reducing the amount of medicine administered to them, to less than a hundredth part the former quantity, and above all, by having the apartments properly ventilated several times a day, the mortality was very soon reduced to about one in fifty. Here was a change still more surprising, if possible, than the former.

We might mention instances innumerable of the beneficial effects of pure air. We might contrast the condition of prisons and prisoners, in our own times, with what

it was many centuries ago; and even up to the times of the philanthropic Howard. We might speak of the horrors of jail fevers, and of other fevers which have been as fatal as the plague, where the air was confined and bad; and of other prisons which, being well ventilated, have always been healthy. We might mention a well authenticated historical fact, that when the plague actually laid waste the city of Edinburgh, in 1645, it affected none of the prisoners in the Tolbooth, as it was called, because it was well aired. We might mention the present improved condition of the Massachusetts and other American Hospitals, and cite many facts to show the beneficial consequences of such happy changes in these important institutions. We might even speak of the healthy apartments of some of our penitentiaries, particularly that of Philadelphia, which contains more than 1300 cubic feet of space in each cell; while many of our *school room prisoners* have less than an average of 36 cubic feet of space, and some, even in the city of Boston, only about 30. We might, however—and we rejoice in being able to make the statement—cite a few instances of large and healthy school rooms, and state facts to show the blessings they bring with them. By simply carrying your thoughts across the Atlantic, we might refer you to Pestalozzi, Fellenberg, and many other eminent teachers, who not only preserved, but improved the health of their pupils, by due attention to air, bathing, and exercise, particularly the former. Pestalozzi was singularly successful, in this respect; and out of 10,000 pupils, is said never to have lost one.

We have alluded to our school houses. And although we have never read the story of the destruction of one hundred and twenty-three lives, in less than twelve hours, from bad air, in the Black Hole at Calcutta, without shuddering, we verily believe there is as much reason for

shuddering at the condition of the pupils of our schools, especially our common schools. We are not ignorant that there are in our land, many improved school houses, as well as improved teachers; and that in some instances, the subject of ventilation is not wholly overlooked. Still we believe that few, very few, of the best of our school houses, are as large as the real good of the pupils would demand; that the progress of the intellect in them all, however deficient it may be, outstrips the progress of the health; and that in by far the greater part, nearly all the pupils, instead of going forward in this respect, are actually retrograding. We have seldom seen a child, of any age whatever, who had been three months in school, without visible marks of suffering for want of air, light and exercise; but especially air.*

Nor is this state of things confined to the pupils of our schools. We have alluded to the mortality which formerly existed among children at certain hospitals. But each family, in the present state of society, is a species of hospital. Each keeps its store of medicine, and each has its physicians—of whom, however, the mother is usually chief. We verily believe there are many respectable public hospitals in Europe and America, where medical pre-

* No one doubts the importance of air and light to vegetables. Who has not observed the feeble, blanched potato or turnip stem, that grew where the air did not circulate, nor the sun often shine, as in the shade or in the cellar? Now, does not every one who has observed this appearance, know that the plants, in these circumstances, are sickly? Is it not well known that their vital powers, more feeble than when they have air and light, will not enable them to resist so well the extremes either of heat or cold? But is it equally well known—though equally true—that our sons and daughters need air as much as our trees, and plants, and lambs, and colts; nay, much more: and that they must suffer, sooner or later, for being deprived of it as great a part of the time as they usually are, in our school houses?

scriptions are not more frequent than they are in a large proportion of our families. But our principal business, now, is with the *air* of these family hospitals. This is very seldom indeed found as pure, taking the twenty-four hours together, as the air in the Massachusetts hospital. And the consequence of this and other parental errors is just exactly what we ought to expect. Children die, even in our healthiest countries, at a rate which would astonish us were we accustomed to look at facts as they exist.

According to the best information we are able to obtain on the subject, about 40 in every 100 of the deaths annually occurring in Great Britain and the United States, are of children under five years of age. To avoid every possibility of exaggeration, we will, however, place the number in the United States, at 30 in 100. But even at this rate, we lose no less than 150,000 children under five years of age every year.

Now if the mortality of every young infant was reduced in the Dublin hospital from one in three to one in twenty-five, merely by supplying them with an abundance of pure air; that is, if due attention to this single department of health was the means of saving young infants, there, at the rate of 130,000 in 150,000, is it too much to believe that at least 50,000 of those who die annually in the United States under the age of five years, might be saved in the same way? But if so, what is the loss in such a dungeon as that at Calcutta, compared with the loss, in a year, in the United States? It is true there may be no such marks of violence—no such horrors—in the case of dying infants, among us, although they die for want of air, as at Calcutta; but their sufferings are usually more protracted, and probably far greater in the aggregate. Suppose all this suffering could be witnessed at once, how would it affect us?

We do not, of course, mean to affirm that the exact

number of 50,000 children, and no more, actually die annually, in the United States, for want of pure air. It may be more; it may be less. Some thousands—nay, some tens of thousands—however, it must be. But this is not all. Thousands and tens of thousands of others whose lives extend beyond this period, are yet sufferers from the same cause; and though their natural force of constitution may enable them to live on a little longer than those whose constitutions are more feeble, yet are they not even more to be pitied?

A thousand forms of disease, as it manifests itself at every stage of life, either owe their existence, or their severity, to breathing bad air. How many infants are sufferers from rickets, scrofula, and glandular diseases,—not only during infancy, but through life—when a proper attention to the purity of the air of the nursery, and proper motion and exercise out of it, would have rendered them healthy! How many of their eruptive diseases might be prevented in the same way! How many of their fevers, diarrhœas, choleras, dysenteries and lung complaints may be fairly attributed to breathing bad air! How true is it also—to repeat what we have already said—that every disease of subsequent life, is rendered more formidable by the early errors of parents and teachers, on this exceedingly important subject!

Is it asked, what can be done in early infancy, which is not done? We reply, much. The air of a child's nursery need not be so much contaminated as it often is, in the first place. But if fires must be built, or lights burnt in it, as they undoubtedly must be at times, let it be as unfrequently as possible, and let great pains be taken to throw open the windows often, when the weather is tolerable, and thus procure a full supply of fresh air. If the child is very young, and the mother fears the fresh air, and if she has no other apartment to flee to, while the

ventilating process is going on, she can, at least, be covered a few moments in bed, till the danger she fears is over. The demand for ventilating a nursery will be more imperious, in proportion as the sources of impurity, such as burning lamps and candles in the room, entertaining much company, and having in the room domestic animals, are multiplied. The mother and child should generally be alone, as much as the circumstances will admit, and should, as much as they can conveniently, dispense with lights and fires.*

Great care should be taken of infants during the night. A fresh supply of pure air, whether in winter or summer, should be secured for the sleeping rooms of all persons, especially children. If it should be thought unsafe to leave a window open, one or more doors which connect with other and more spacious unoccupied rooms should be left open. In general, however, when the weather is in any way tolerable, and the nursery not exceedingly small, a window may be left open during the night, provided the blinds are closed or something hung before it to prevent a current from falling on the mother or child. If it is said that the night air is not very healthy, we grant it; but we yet insist that it is more healthy than the air of a close room, largely impregnated with carbonic acid gas.

But again; great care should be taken to prevent the child's head from being covered while he sleeps. Not a

* It may be objected to what we say about fires, that they purify the air, instead of rendering it impure. And this might be so, were there a constant supply of fresh air, and were the temperature kept low enough. But if we have fires, especially in stoves, we almost always suffer the temperature to get too high; and this, besides being an evil in itself, rarifies the air, diminishes its oxygen, and forms a sort of nidus to bad gases and other impurities. The carbonic acid gas, especially, not being cooled, does not settle to the floor so readily as it should; and is consequently inhaled more than it would be in a cooler room.

few parents and nurses are exceedingly faulty in this respect, partly, however, through ignorance. They do not know the danger of breathing the air over and over. Adults, in their ignorance, very often sleep with their heads covered, particularly in the winter; it is not therefore at all strange that they should suffer their children to do so. Nor will it be easy to convince those who have slept thus all their lives long, that the practice is attended with any considerable danger. They know indeed that pain and sickness and premature death are in the world—and that, too, in great abundance—but they do not usually know, nor will they believe, that their pains and infirmities, however late in life they arrive, are either caused or aggravated by the bad air which they have breathed at every previous period of their existence.

Before the danger of sleeping with the head covered can be rendered sufficiently plain, it will be necessary to state one fact in Physiology to which we have not yet adverted.

The same change of the blood from bad to good—from pure to impure—which is effected in the lungs, is effected also, in some good degree, on the whole surface of the body. Some of the insects or worms, may be said to breathe entirely on the surface of the body. They have no lungs whatever. As we rise in the scale of existences, to snakes, fishes, &c., we begin to find lungs or gills, in which a part of the change of blood to which we allude, is effected. Rising still further in the scale of being, we find the lungs larger and larger, and the skin less and less concerned in the change, till we come to man, and some few other animals, in whom the change is almost wholly accomplished by the lungs.

Still, we repeat it, the skin, even in man, has some share of the work of renovating the blood to perform, as may be readily shown by a very simple experiment, like the following.

When a person has lain several hours in a bed, closely covered to the neck with thick covering—say with the modern article called a comfortable—let a candle or lamp be introduced under the clothing, and it will soon be extinguished. The oxygen is so much diminished, and the carbonic acid gas so much increased, as to be incapable of supporting combustion; and by the same rule, unfit for respiration. Let it be also distinctly understood, that this change is wholly effected without the agency of the breath; though when the head is covered, it is, of course, accomplished much faster.

This fact, that we breathe, as it were, that is to say, purify the blood and poison the air with the whole surface of our body, as well as by means of the lungs, is of the utmost practical importance. It is of importance to be understood by those on whom we urge the duty of keeping the skin clean; for how can a foul skin—a skin varnished over with dust—perform its delicate but important functions? It is of importance to be understood in order to know how to clothe ourselves; for all those forms and circumstances of our clothing which tend to embarrass or interrupt the action of the skin, in its work of assisting the lungs to purify the blood, are, of course, objectionable. It is, however, of still higher importance, that it should be well understood by mothers, in the management of their infants, not only in regard to cleanliness and dress, but particularly in regard to sleep.

For, in the first place, the bed-clothing ought to be as loose and porous as it can be, and yet at the same time retain a sufficient amount of heat, in order that the carbonic acid gas may have opportunity to escape, and the purer air to find its way through it. Secondly; The clothes ought to be often thrown open, and the air under them thus exchanged for better. Thirdly; The child ought never to be allowed to sleep with its head under the

clothing. Immense is the mischief done in this way, as we have already said, by ignorant parents, and even by those whose fault is more that of carelessness than of ignorance. Fourthly; He should sleep alone as much as possible, either in a bed or a crib, rather than with parents, brothers, sisters, &c. Fifthly; He should never be permitted to have domestic animals, as favorite dogs or cats, sleep in the bed with him—a practice quite too common in our country—especially that of having a puppy in the bed. The child's body poisons the imprisoned air quite fast enough without any aid from dogs and cats, or from other human bodies; and above all, without being aided by his own breath!

What has been said in relation to the management of infants, will be generally applicable—the principles which it involves will at least be so—in the management of childhood and youth, and manhood and old age. Fires without flues, lamps, candles, breathing, the action of the skin, (if not prevented by dirt, improper clothing, &c.) and many more causes, will continue to operate to deteriorate the atmosphere at every period of our existence. There will be no moment of our lives when we shall not need the whole active force of a free, vigorous pair of lungs, and a healthy skin, to *form* and *reform* the blood, and to cast off the poisonous carbonic acid gas which is formed by these important processes. There will be no waking moment of our lives when we shall not need to be constantly on the watch—at least as much as our circumstances and employments will admit—against an agent which will threaten our destruction, and which, after we have done our best, will probably gain, more or less, the dominion over us.

Hence the importance which philosophers, in all periods of the world's history, have attached to pure air, and the concessions which have been made—proud as mankind

have been, and ashamed of and averse to labor—in favor of agricultural employments. The habitual breathing of pure air, with plenty of active exercise, will counteract, in no little degree, the bad tendency of a host of the ordinary physical transgressions.

On this important subject Dr. Clark, in his work on Consumption, has the following remarks:—"Were I to select two circumstances which influence the health, especially during the growth of the body, more than any others, and concerning which the public, ignorant at present, ought to be well informed, they would be the proper adaptation of food to difference of age and constitution, and the constant supply of pure air for respiration." We believe this is the opinion of all medical men who have at all studied the constitution of man, and its relation to outward objects.

Mr. Thackrah, a distinguished surgeon of Leeds, England, and author of a most valuable work on the "Effects of Employments on the Health and Longevity of Mankind," goes somewhat farther in praising pure air, than most of his contemporaries. He says—"Be it remembered, that man subsists more upon air, than upon his food and drink."

But is he not correct? We scarcely receive our food half a dozen times in twenty-four hours, and most of us only three times; whereas we are receiving air every moment of our lives, and our blood—and consequently our whole bodily system, as that is built up from the blood—is being modified by it. In other words, the work of digesting our food takes place usually but three times a day, whereas we are digesting air (digestion it really is) continually; for instead of receiving a fresh supply of it three times a day, as of food, we receive it from twenty to thirty thousand times a day.

We have spoken as if farmers and other laborers in the

open air, obtained this essential and vital fluid in a state of perfect purity. We doubt, however, whether the air which we breathe in cultivated regions of the earth, is often found perfectly pure; or always, even, in those which are uncultivated. Ever since the expulsion of the first pair from Paradise, or at the least, ever since the earth, in any part of it, became thickly peopled, there has been more or less of animal and vegetable decomposition continually going on in the world, and consequently more or less of atmospheric impurity. We have said, indeed, that the superabundance of carbonic acid gas which is formed by breathing and combustion, is taken up in the growth of vegetation; but this change is not of course so instantaneous as to prevent its being more or less mixed with the two principal component parts of the atmosphere, on its passage. It is not carbonic acid gas alone which renders the atmosphere, in civic life, impure. There is another gas, called carburetted hydrogen gas, which is produced in various ways, which is quite impure. Then there is sulphuretted hydrogen gas, which is also exceedingly poisonous to the lungs, and to all parts of the system.*

* Few persons are aware that this agent is as destructive of health and life as it is offensive to our organs of smell. We hope many valuable hints may be derived from the following remarks of Dr. Dunglison, in his "Elements of Hygiene"—in which he is also sustained by other equally eminent writers. We wish it might be remembered, moreover, that a gas which in its pure state is so actively deleterious, cannot but be noxious, more or less so, in its most diluted state. With what care, then, ought we to avoid, not only all external filthiness, but even all flatulence!

"This gas," says Dr. D., "is extremely deleterious. When respired in a pure state, it kills instantly; and its deadly agency is rapidly exerted when put in contact with any of the tissues of the body, through which it penetrates with astonishing rapidity. Even when mixed with a portion of air, it has proved immediately

Even these are very far from being all. There are numerous exhalations, as well as gases, which are poisonous. These exhalations may be animal, vegetable, or mineral. Some of these are more abundant in the night, and about the time of the morning and evening twilight—and hence the importance, to those who are feeble, of avoiding the air at all hours except when the sun is a considerable way above the horizon.

But if the open air is not perfectly pure, it is comparatively so. All should therefore enjoy and inhale it as much as possible, even if they cannot, like Franklin's Methusalem, be always in it. This remark is applicable to every age and condition of life, and to both sexes. Happy will it be for mankind, when the matter shall come, universally, to be so understood!

It will be objected by some, perhaps, that if the views we have expressed are correct, it will be next to impossible to have the air perfectly pure for a single day, or even a single hour of our whole lives. Such a view of things, they will say, is discouraging. Go they where they will, or be they where they may, they must, in all probability,

destructive. Dr. Paris refers to the case of a chemist of his acquaintance, who was suddenly deprived of sense as he stood over a pneumatic trough, in which he was collecting this gas.

“From the experiments of Dupuytren and Thenard, air that contains a thousandth part sulphuretted hydrogen, kills birds immediately. A dog perished in air containing a hundredth part; and a horse in air containing a fiftieth part of it. It is the deleterious agent exhaled from privies, (or vaults,) which has been so fatal, at times, to night men, who have been employed to remove or to cleanse them.

“When this gas is breathed in a more diluted state, it produces powerful sedative effects; the pulse being rendered extremely small and weak, the contractility of the muscular organs considerably enfeebled, with stupor, and more or less suspension of the cerebral functions;—and if the person recovers, he gains his strength very tardily.”

inhale more or less of something besides the due proportion of oxygen and hydrogen; and do what they will, they must, at this rate, be always contracting disease. They shall act wisely, they say, therefore, in not attempting to do any thing at all.

This constant exposure to danger, however, only enhances the necessity of exerting ourselves to the utmost, in order to do the best we can. He justly deserves to starve, who will not raise corn or wheat, or fruit, because at best he shall lose a greater or smaller proportion of it by means of birds, insects, &c. And does not he deserve to suffer the consequences of his neglect, who, in the belief that after he has done all in his power, he may still breathe a little carbonic acid, or some other impure gas—enough perhaps to shorten his life by one day, or diminish his happiness by one thousandth—will not hesitate to run the risk and encounter the danger of breathing every sort of impurity, without measure and without reason?

The world in which we live will never become the happy and glorious world it might be—and which it is destined to be—until we all come to feel that Infinite Wisdom has seen fit to put the well being of our bodies, no less than that of our minds and hearts, mainly in our own hands. Man can as well manufacture health, as he can acquire knowledge, or make moral progress; and he will be held as truly accountable to the Judge of all the earth for the talents which are entrusted to his keeping, in one of these respects, as in another. The time will come, in the history of this world, when an enlightened conscience, formed on the principles of the Bible, will as surely reproach us for bodily disease or debility, as for ignorance or moral perversity. Observe, however, that we do not maintain the doctrine of perfectibility in either of these respects—we have already conceded the contrary—but we do maintain that we may approximate towards it,

in all ; and that it is our duty to do so. And when we come to know that the purer the air is, the better it is for the lungs and for our whole bodily welfare, and that we are answerable to Almighty God, for every impurity which we inhale, unnecessarily, even if it did not diminish our health or shorten our lives, in any very perceptible degree, we shall hardly dare to bury in the earth any talents or powers we possess, be their number ever so few.

The laborer should joyfully avail himself of the opportunities which are afforded him, for breathing the pure air of heaven. His exposures to bad air will be frequent enough when he has done all he can. His dwelling; in the best of its apartments, will probably be but poorly constructed for ventilation ; and as for his sleeping chamber, it will almost certainly be too small, too low, and too seldom aired, especially in cold weather. While the weather is extremely hot, a window or a door may occasionally be thrown open ; but in cold weather he may get fresh air if he can ; that is, if nobody else oppose him in the fear of his catching cold.

The mechanic and manufacturer is usually worse off than the farmer ; though some mechanics are *nearly* as favorably situated as he. Among this class are those whose employments are principally out of doors, or in shops where there is a full and free supply of air ; such as carpenters, joiners, brickmakers, ropemakers, paviors, butchers, teamsters, stage-drivers, coopers, wheelwrights, fishermen, &c. All these have so good a supply of air, that if all their physical habits are correct, they generally enjoy comparatively good health, and last to comparative old age.

Among the class of mechanics who suffer most for the want of pure air, are, of course, those whose occupations are chiefly within doors ; as tailors, shoemakers, milliners, dressmakers, spinners, dressers, weavers, printers, engravers, millers, brewers, bakers, grocers, druggists,

painters, smiths, founders, potters, masons, maltsters, snuff-makers, cooks, and confectioners. Few persons who follow steadily any of these employments, escape disease, and fewer still attain to old age. It is true that many of them suffer from other causes; but were they subject to no other evils than that of breathing bad air, we cannot believe they would often be long lived or healthy.

It is worthy of remark, that, in general, those employments are most unhealthy which could, as such—we mean as separate employments—best be dispensed with. Thus every family in ordinary circumstances, could grind their own grain, make their own bread, spin, weave, and make their own clothing; and the snuff-maker, the brewer, the maltster, and the confectioner, might be wholly dispensed with, to say nothing of the grocer, the druggist, and the painter.

We have classed cooks among those whose employments are hurtful; but we refer here, as we have already intimated, to those who follow cooking exclusively as a profession. As cooking is now pursued by our plain common sense people in New England—saying nothing of fashionable life—and above all, as it should be pursued on christian principles, by our mothers and daughters, it were comparatively a healthy employment; and when to four or six hours a day in housewifery, including two connected with the practice of cooking, and two to four in study, or in taking care of their children or pupils, our females shall have learned to add two in the open air, at some light agricultural or horticultural exercise, this employment, instead of being objectionable, will be one of the most healthy which, in civic life, can be devised for them.

Of all the sufferers, however, which we have seen from bad air, the females of our factories, such as those, for example, in some of our cotton mills, are much the

greatest. There are many thousands in our land who are, in this way—that is, by breathing bad air so large a portion of their time—gradually undermining the vigor of their constitutions, if not sowing the seeds of dangerous diseases. We have seen about 100 in a single room, of whom not one was in perfect health; and we do not believe this was a solitary instance of the kind.

It is not to be denied that the females in our factories are often diseased before they go there. This, however, instead of furnishing an apology for sending them, is the very reason why they should have some other employment—one which will give them a purer air. House work would be almost infinitely better for the tender young girl, of ten, twelve, or fourteen, especially if she has a light or pale complexion, with a long neck and projecting shoulders, indicating feeble or diseased lungs, than a *burial*—for it is little better, and often no better—in a cotton factory. We have witnessed too many *facts* not to know that, though we should seem severe, we do not speak, on this subject, at all unadvisedly.

We believe it to be in the power to carry on our manufactures of every kind, without employing females more than six or eight hours a day in any of them; and we believe it quite possible for them to breathe a tolerably pure air while in actual employ. To venture to predict when an event so important to human happiness will be realized, would be to foretell at what period christianity will have attained its final triumph over the selfishness and the avarice of man, and the love of our neighbor will be co-extensive with the love of ourselves. So long as the public opinion sets him down as a good man who sacrifices the health of his neighbor—to say nothing of his intellect and his heart—to his own cupidity, it is vain, perhaps, to hope for any thing better than the effectual, though it should be gradual, destruction of hundreds and thous-

ands of our fellow beings, in various ways, even by those who profess the name of christian.

Does the word destruction, in this connection, seem to be too harsh an epithet? We wish with all our heart, we had one more appropriate. But what else can it be called? If there is a better name for a flagrant crime, we wish those who have it would furnish us with it.

Let us trace the course of the factory girl, and see if she is not as truly destroyed, although it be a little more slowly, as if she should have the jugular vein of the neck severed, or the heart or the lungs pierced or lacerated.

She is bereft, perhaps early, of one or both parents. She is often left with a scrofulous constitution—the natural and inevitable consequence of a parent's intemperate, dyspeptic or licentious habits. This constitution is one which, above all others, requires plenty of wholesome but plain food, and abundance of exercise in the free open air. If this is not allowed her, a scrofulous constitution becomes a consumptive one. Her chest, naturally rather slender, and made still more so, perhaps, by *her dress*, at length becomes the seat of disease; to which in all probability, is soon joined, disease of the spine and of the whole glandular system. Her fair thin skin and red cheeks give place, first, to a sickly delicacy, and afterwards to a uniform paleness, mingled with blue. She cannot labor at household work, it is thought; she has not strength enough; and her friends and relations—if she has any—unwilling or unable to support her without labor, send her to the factory.

There she is immured from twelve to sixteen hours every day, except Sunday, in that bad atmosphere of which I have spoken. Not only is it wanting in oxygen, the vital principle, and abundant in carbonic acid, a most noxious agent, but it is also filled with fine particles of one substance or another, which is perpetually inhaled,

and is as perpetually a source of irritation to the already tender and delicate internal surface of the lungs.

But not only is she confined above half her twenty-four hours in the bad air of the factory—she is also buried in slumber, in an atmosphere little better, almost all the other half. Ventilation of a sleeping chamber cannot be expected, in a boarding-house, which, without being of extraordinary size, is made to hold—not to accomodate—from fifty to one hundred female boarders. Nor is the air of such a house perfectly pure at any hour, above all, at meal times. The consequence is, that our young factory girl is confined to a poisoned atmosphere, at least twenty hours of every twenty-four; often more. And where is she the rest of the time? Does she breathe as she should? Is she employed in washing, ironing, gardening, or walking? She is indisposed to every species of exertion, except, perhaps, a little lazy gadding in the evening, and a little novel reading at a worse hour still.

Is it to be wondered at, that after a few years—sometimes even before the lapse of six months—our factory girl grows feeble, loses her appetite, becomes emaciated, goes home—if, haply, she has a home—sickens and dies? But is not this, in substance, the history of many a female, even of our own goodly New England? And are not such females slowly, though it be without malicious intent, murdered? If he who loveth not his brother or sister, is in the gospel sense a murderer, is not this murder?

True it is, and the more to be lamented, that females sometimes go to these places voluntarily, or with the consent of respectable but poor parents. All are not orphans who are thus murdered. Still, a large proportion of the victims of our factories, are immured in them against their will; and for the very reasons which should deter us from sending them thither—because they have a feeble or sickly constitution.

If parents, masters, guardians, houses of industry, almshouses, &c., must—that is, *will*—send any of our females to factories, to be denied, in effect, the pure and free light and air of heaven, and either to perish sooner or later themselves, or be the efficient cause of a sickly and miserable progeny, in the name of mercy herself, let them select for this purpose the strongest and most robust. Some of these might, perchance, withstand the evils to which they are doomed, at least till Providence or circumstances release them; but the already debilitated and sickly can hardly hope to escape.

But scrofula, and disease of the spine, and consumption, are not the only evils, terrible as they are, which are induced by inhaling impurity. Examinations into this subject, made by public authority, in Great Britain, have elicited facts which should astonish us; for be it remembered, that the same causes, operating in America, will not fail, in due time, to produce similar effects to those in Great Britain. A factory is a factory, and bad air is bad air, be it where it may, in one country or season, or another.

One of the examinations in Great Britain, to which we have alluded, resulted as follows:—"Of 2,000 individuals, taken *indiscriminately*, from large factory establishments, all were stunted, many had crooked limbs, some had crooked spines—many had small chests; in most of them the arch of the foot was flattened; 90 had marks of rickets; 140 had weak eyes, habitually so; a small number had confirmed diarrhoea; and almost all had diseased action of the stomach, or liver, or bowels, in some form or other."

It is proper to say, that most of the 2,000 individuals above referred to, were placed in factories at a very early age—a much more tender age than is common in the case of our American children, male or female. Still, the in-

mates of our factories are usually admitted young, and a measure of the same long catalogue of diseases awaits them, that awaits those who, in another country, are placed there a little earlier.

Dr. Clark, a British writer, whom we have before mentioned as high authority on this subject, says—"Almost all the children reared in the workhouses of this country, and in similar establishments abroad, become scrofulous—more, I believe, from the impure atmosphere which they breathe, and the want of sufficient exercise, than from the want of defective nourishment."

"Take a child," he goes on to say, "of three or four years of age, in perfect health, having been born without any predisposition to disease, (if any such children there are,) well nursed, and hitherto properly nourished; let it be fed upon improper food; let it be confined to close, ill ventilated apartments, where neither the heat nor light of the sun has free admission, and we shall soon see the healthy blooming child changed into a pale, sickly, leucopneumatic object."

In short, we are assured by those who have the opportunity to know how this matter is, that nearly the whole number of children in British factories, are victims of a train of irregular morbid actions, chiefly indicated by disturbances in the functions of the digestive apparatus, with their consequent effects upon the nervous system, producing melancholy, extreme mental-irritability, and great exhaustion; and that though few acute diseases are found among them, their whole existence is, in reality, but one long disease.

The simple truth in the case is, that the world—the enlightened world, we mean—is but a great factory; consisting, indeed, of different apartments, variously ventilated, but still it is a great factory. Such, however, are the general arrangements of the Creator, in ventilating the

numerous apartments of this great establishment, that the inhabitants maintain so much health, or, rather, *escape so much disease*, as to last, many of them, to what is called old age; though none of them live as long as they might if they cooperated more effectually with the Creator in his general plans for their benefit—in other words, if they but performed their part as well as he does his.

It appears, in fact, that with all the draw backs on account of bad air, human life is not only protracted, often, to what we call age, but it is actually lengthening. All accounts unite in showing, that the average duration of human existence, in civilized states and kingdoms, has been increasing slowly for several centuries. Whether, however, the average amount of health and happiness is increasing, is quite another question. We believe, on the contrary, that it is rapidly diminishing.

We have already seen, that, according to the best authorities, “the whole number of the children in British factories,” are diseased. We do not hesitate, therefore, to say, that we regard every factory as an hospital, and its inmates as sick patients. In like manner do we regard the great factory—the world—as one great hospital, and all its inhabitants as more or less diseased. No one breathes, at all times, a perfectly pure and healthy atmosphere. Every one, therefore, has his blood but imperfectly formed and purified, and in so far as this is the case, every one is more or less diseased—we might even say poisoned.

Does this view of the subject—we repeat the objection, since we fear it will, by many, be made—does this view, we say, impeach the wisdom and goodness of the Creator? Very far from it. Life is a general blessing; a great one too, notwithstanding all its evils. If every individual in the world, impairs his health or diminishes his happiness more or less by breathing bad air, and by numerous other

errors, still, as a general rule, he clings to life and defends it ; giving to the world, in this way, the best evidence of the value he attaches to it. To BE, in almost the worst circumstances, is, by most, regarded as infinitely better than NOT to be. But, then, it should be remembered, that our present condition is, as we trust we have clearly shown, susceptible of improvement, without any assignable limits. Let us study and obey the laws of health. Let us study the laws of the Creator within us and without us ; and especially the relations which exist between our own bodily system, and the framework of nature around. Let us, among the rest, breathe better and purer air. We repeat the sentiment—there is no individual to be found, who cannot, in this respect, improve his condition. There is not a person on the earth's surface, who is capable of action and has his freedom, and yet breathes as good air as he might, or might be made to do, for a single twenty-four hours together : no, not one. Some of the rooms he occupies—his sitting room, his parlor, his bed room, his shop, his school room, the factory where he works, the lecture room or church he frequents, is, at one time or another, during every day of his life, more or less contaminated with an unnecessary amount of carbonic acid gas, or some other gas or injurious agent ; and consequently he inhales, every day, more or less, the seeds of disease and premature death.

Sweeping as these assertions may seem, they are obviously undeniable. We might go even farther, as other writers have done before us. We might apply our remarks to the domestic animals. On this subject, Dr. Clark says as follows :—

“ It is well known that cows confined in close stables, in towns, become tuberculous, and would die consumptive, if not sold to the butcher at the commencement of the disease ; and that rabbits may be rendered tuberculous,

(that is, affected in the lungs, with what might be called the seeds of consumption,) in a few weeks, by confining them in a close, humid place, and feeding them on innutritious food; and they are often as speedily cured by removing them to a well aired, dry situation, and giving them nutritious food."

True it is, that the cows and horses, and other domestic animals of the airy, healthy town or city—and above all, in our healthy country towns of New England—do not suffer so much as in Paris, or in New York or Boston. Yet, even these are sometimes kept in too close stables in the winter, or confined too long in the cow-pen during the night, ere they are driven again to their respective pastures. All this privation, or error, in regard to domestic animals, cannot fail to give a tendency to disease, which, if not forestalled by our fattening them and killing them, breaks out into open violence, and destroys them. Oftener, however, in the case of the cow, the milk "takes the disease," as it is vulgarly called—we know not how; we only know the fact—and quadrupeds or bipeds who eat it, receive the injury, while the cow herself, either partially or wholly, escapes. Still, it is true that the great majority of domestic animals become more or less diseased, not only in their fluids, but in their solids—not only in their milk, but in their flesh—and that those who eat their flesh receive a part of the punishment which civic society deserves, for their want of that attention to them, which, as divinely constituted lords over them, is their just due.

One word, in this place, on the subject of confining animals in cages, whether birds, squirrels, monkeys, or elephants. It is well known that most of the monkeys, apes, &c., which are brought to this country and exhibited in menageries, die tuberculous; in other words, consumptive—doubtless in a very large degree for the want of

pure air. It ought to be equally well understood, that all animals confined in an unnatural manner, suffer more or less from the want of air, natural exercise, &c., and die, more or less, prematurely. We merely hint at this subject, and leave it, without saying much of the moral evils connected with it. Let the considerate—especially the parent and the teacher—reflect on this subject in all its bearings, physical and moral, and beware!

But to return to our subject. Let us not be misunderstood, however. We do not say that every individual among us errs to an extent that will of itself induce what is called acute disease. Society is full of complaints—some of greater, some of less severity—and all these have their causes, in a very great degree, in human disobedience of the laws of life and health. Or if it were not so; if no one of them could be traced, principally, to our errors and physical transgressions, yet, it is still certain, that they are all aggravated by them. No person can have a disease, acute or chronic, severe or mild—so mild, even, as hardly to be considered as a disease—without suffering more severely for his previous physical errors. No person ever breathed bad air for an hour of his life, without having every subsequent disease rendered more severe than it otherwise would have been.*

Is it asked what are the particular diseases which are induced by breathing bad air? To give a full reply to this question, would require a volume. We have room only for a few general remarks.

1. There is hardly a single complaint on the long cat-

* If there is an exception to the truth of this statement, it is in favor of those who are already affected with disease. There are a few consumptive patients, to whom impure air—an air, which, at least, contains less than the usual standard proportion of oxygen, or vital air—seems to afford temporary relief.

alogue of human ills, that may not, in this way, be either induced or aggravated. Most persons are predisposed to one disease, rather than another; that is to say, the causes which tend to disease, produce in them one particular form of disease more readily than any other. Thus, in a person predisposed to consumptive disease, the breathing of bad air will tend to produce the consumption; in one who is strongly predisposed to gout, it will produce the gout; and in one inclined to eruptive diseases, it will produce eruptions.

2. There are, however, a few diseases, which, in all, especially in children, seem to be more readily developed by breathing impure air. Scrofula, rickets, eruptions of the skin of various kinds, and bowel complaints—cholera infantum and diarrhœa, especially—stand at the head of this class. We doubt whether one infant in an hundred, who is subjected for any considerable time to the influence of bad air, wholly escapes all of them.

3. Occupation has some influence in determining what the diseases shall be which affect us, whatever may be their primary causes; and is sometimes so powerful as to overcome the predisposition to another disease. Thus, a person who is strongly predisposed to consumption, may, by laboring at shoemaking and breathing impure air, induce a disease of the heart, which will destroy him before the consumption gets fairly seated.

Some of our readers may be gratified to look at the following facts and details, derived from the extensive observation and experience of medical men, especially Mr. Thackrah, of Leeds, whose name we have already mentioned.

Farmers, from the strong appetite which their employment in the open air gives them, and from abundance of food and drink, and a too frequent carelessness about their health, are subject to liver complaints, disordered bowels,

rheumatism, and fevers. We have already admitted elsewhere, that, though more or less subject to disease, their occupation is comparatively healthy; to which we would now add, that, judiciously conducted, it might be made much more so.

Shoemakers are exposed to diseases of the heart, consumption, bilious affections and bowel complaints in general. Not a few of them, who long follow this employment, are afflicted with vertigo; and a few, of late years, with dyspepsia.

Tailors are not only very subject to consumption, but to disorders of the stomach and bowels. They are also liable to curvatures of the spine, and hemorrhoidal affections. In London, they are so much subject to the latter affection and its consequences, that they sometimes form associations by the name of "Fistula Clubs."

Milliners, dress-makers, and straw-bonnet-makers, are subject to consumption, dyspepsia, diseases of the heart and of the liver; and not unfrequently to diseases of the eyes.

Weavers are very liable to lung diseases of every kind—colds, asthmas, fevers, and consumption—and also to disorders of the stomach and intestines.

Spinners—especially in large factories—are much exposed to pulmonary disease, both from the want of pure air, and proper exercise. Spinning wool and cotton on the common wheel, in the family, can hardly be said to expose to disease at all.

Smiths, though usually healthy, are found not unfrequently to have weak eye-sight; and some who have observed closely their habits, say they are liable to rheumatism. Smiths, however, are believed to suffer more from breathing fine mineral particles, than from the carbonic acid gas of their shops and apartments.

Cooks—those who are professionally so, we mean—are

said by a distinguished medical writer, to die, in many instances, of apoplexy, and in almost all, miserably. Their digestive organs are frequently disordered; they are subject to headaches, and their dispositions are rendered irritable. Fortunately, we have as yet but few professed cooks among us.

Painters are always more or less diseased. Their more ordinary complaints are, dizziness and vomiting. But they are, many of them, very subject to what they call bilious or liver complaints, and not a few to palsy, and a peculiar kind of colic, commonly known by the name of the lead, or painter's colic.

Druggists are subject to dyspepsia, consumption, and palsy.

Millers—flour manufacturers, we mean—often suffer from loss of appetite, indigestion, and asthma, and sometimes from consumption.

Printers are liable to many complaints, not only from impure air, but from too much standing, and from abuse of the eyes. Among these are diseases of the eyes and stomach, and consumption.

Masons are exposed to diseases of the lungs; and if they work much in lime, to diseases of the eyes and skin.

Turners and cabinet-makers are subject to indigestion and diarrhœa.

The principal diseases of bakers, are, affections of the lungs and stomach, rheumatism, and a species of cutaneous disease, not unlike the itch. Every mistress of a family should be, if possible, her own baker.

Glass-makers are subject to colds and coughing, and sometimes to diseases of the digestive organs. They also seem peculiarly exposed to sudden death from causes unknown.

Clerks and students suffer most from diseases of the digestive organs; but the lungs also suffer; and so do the

brain and nervous system. When they become addicted to masturbation, the ills which they suffer become almost innumerable, and quite indescribable.

Physicians are peculiarly exposed to indigestion, and diseases of the lungs and blood-vessels.

Ministers are subject to diseases of the chest, and of the larynx, or upper portion of the windpipe : also to diseases of the digestive organs, and sometimes of the head. The bronchitis is not new, as a disease for ministers, but is much older than any person now living. Nor is it confined to this country.

Lawyers are subject to diseases of the brain and nervous system, of the stomach and bowels, and occasionally of the lungs.

Thus have we presented a few hints—for they are little more—on this great subject. The sum of what we have said in the last three or four pages, is this. There are, in almost every person, constitutional tendencies to particular diseases. But the occupation of almost every individual, has, too, its tendencies ; and these will be more or less strong, in proportion as he confines himself to his profession, to the exclusion of proper exercise, and of every thing else. Breathing bad air, always tends to induce disease, and will be likely to bring on that disease to which we are constitutionally inclined, unless our occupation is developing some new disease so rapidly, as to get quite in advance of it ; in which case, every thing centres, as it were, in the new, or *occupational* disease. We have already illustrated this point at page 41, in the case of the shoemaker predisposed to consumption.

There are other classes—conditions, rather—of persons, who always awake our sympathies, and make us wish the blessings of pure air were far better understood than they usually are.

When we see children shut away from the pure air

which God has given in such healthful abundance, and also find them listless and inactive as the consequence, the pain it gives us is excessive. This is almost universally observed in the case of children at our common schools. Nor do the children of some mothers fare much better at home. The fear that they will catch cold, leads to a course of management which dooms them to suffering, as inevitably as a stone in the air falls to the ground.

When we see females in fashionable society, refuse to expose themselves to the sun's light, or to the open air, for fear they shall be sun-burnt or tanned, or shall take cold, and who become, as the natural consequence, as pale and delicate as the potato-stem growing in a dark cellar, and almost as unfit for the main purposes of their existence, as satin or gauze would be for the canvass of a ship of war, we always wish they understood better the laws of health and life.

When we see ministers making slaves—not servants, merely, for that they should be—of themselves, Sabbath after Sabbath, to a listless, yawning, or sleeping congregation, when we have good reason for believing that their dullness and sleepiness would be, in a good measure, removed by the admission of pure air—when we reflect that through their own ignorance, and that of the sexton, and the people at large, they are wearing out their lungs and their life as unnecessarily as prematurely, we cannot but labor and pray that all classes of mankind may soon have an opportunity to study *Anatomy, Physiology, and Health or Hygiene*.

But there is another class of people still, who are often sufferers in a remarkable degree for want of pure air, and who are the more to be pitied, perhaps, because they are unable to get it for themselves. We refer, of course, to the sick—those who are confined to their rooms, perhaps to their beds; we might, however, include in the same

great class of the helpless--our infants and young children. But we have said enough of them and their sufferings already.

“Frequent *ventilation* or airing of the apartments of the sick,” says Miss Sedgwick, in her “Means and Ends”—though we believe she borrows the thoughts from Combe—“is of the first importance, not only to the invalid, but also to the attendants. Contagious diseases are propagated soon and fatally in close and impure air. The air of a sick room, unless frequently changed, is always unfavorable to the health of those who are well. Self preservation, therefore, as well as benevolence, should lead to constant attention to ventilation.

“The fear of taking cold, is one of the most pernicious superstitions of the sick chamber. Vastly more hurt is done by the absolutely insane precautions taken against it, especially with children, than is to be attributed to the thing itself. Patients are debarred from fresh air, fresh water, clean clothes, and almost from the light of heaven, lest they should take cold. Not that there is no fear of taking cold, to the sick, or that no precautions should be taken against it, but that the danger itself is prodigiously overrated, and the means of obviating it are mistaken.”

We have heard it asserted of the late Prof. Nathan Smith, of Yale College, that in view of the importance of the simple treatment of disease, he used to say in later life—somewhat humorously, indeed, but not without meaning—that he had found out a specific for the cure of typhus fever. When a person is sick, said he, place him on a straw bed in the middle of the room, extinguish the fire, raise the windows, and keep them up, and feed him from day to day on water gruel, and he will not fail to get well.

It is not necessary, in ventilating the rooms of the sick, to expose them to currents. This would be as hurtful

to them as to those who are well. Neither is it necessary to resort to the foolish, nay, even hurtful, practice of burning something to purify the air. In many places, it is quite common to burn vinegar, sugar, &c., in the room; or to scatter strong-scented drugs or herbs, as camphor, wormwood, tanzey, &c. These produce a strong odor, which, indeed, hides any other smell which is unpleasant, but they do not remove it: they do not in the least purify the air.

Were this the only result, it would hardly be worth while to complain of the practice. Whatever inspires the timorous or trembling attendant with confidence or faith, defends him, in the same proportion, against disease. If, however, by strengthening himself in one way, he becomes weakened in another, it may yet be questionable whether, on the whole, any good is done. If the use of camphor, for example, or vinegar, while it inspires the attendant or nurse with confidence, deteriorates the air so much as to increase the danger of the sick patient, rather than to diminish it, it cannot surely be encouraged.

But is it not so? The odor, which it is one object to remove, as we have already said, is *not* removed, but only hidden by a stronger one. Not only is no good done to the air, but the weak lungs of the sick person are called upon to encounter the strong vapor of a drug which is too powerful for the lungs of those even who are in health.

We wish it were distinctly understood, both by the sick and well, that the best defence against contagion, or any other causes of disease, is good health; and that this is to be secured, not by drugs, or the fumes of drugs, or by any other lazy effort, but only by hard study of the laws of life and health, and the conscientious application of our knowledge to our circumstances—attended by the blessing of Almighty God, our heavenly Father.

We have already said, that the habitual breathing of

pure air, with plenty of active exercise, will counteract a host of the ordinary physical transgressions. This is as true as it is that breathing bad air, with the neglect of exercise, will counteract the favorable tendency which might naturally be expected from obedience to almost all the other physical laws.

We question most seriously—we have advanced the sentiment already more than once—whether there is a living individual, not wholly disabled already, who would not be benefitted by going abroad, or being carried abroad, into the open air, several hours every day, whenever the weather is in any good degree tolerable. To those who, owing to ill health, or former timid habits, or some other cause, cannot at first quite endure the open air, the hot sun, or a few drops of rain, or flakes of snow, art tenders the carriage, the umbrella, &c. But there are few of either sex, or of any age or condition, who cannot soon bring themselves—would they but do so—to endure all sorts of weather.

We repeat it once for all, that as a general rule, the more we accustom ourselves to live in and breathe a pure air, like that of the open, unimprisoned, uncontaminated atmosphere, the better for our health, whatever may be our condition or circumstances. Those whose employments are comparatively healthy, and who inherit constitutions of body comparatively sound, may in this way greatly improve their condition, and lay up health, as it were, for those who are to come after them; while those who, by employment or inheritance, or both, are less favorably situated, can, in this way, greatly diminish the sufferings of future life, as well as prolong greatly their existence. Every successful effort at self-improvement in this respect—every breath of air which, without too much sacrifice, we can make purer than it otherwise would have been—will be so much added to our present

stock of happiness, and so much at compound interest for the use and benefit of those who are to succeed us, as actors on life's great theatre. It will—it cannot be otherwise—it will tell upon the future, to the remotest generation.

One thing remains—one duty to be enforced upon parents and teachers—we mean, the correct education of the lungs and skin. For of what use is it that the air is pure, if we cannot use it? In a large proportion of the community, the lungs are too small to use the air in that large measure which seems to have been originally intended by the Creator; and in almost all they are greatly enfeebled. A person with his lungs as large, as strong, and as active as they might be, is not perhaps to be found in the world; but if not, then no person is to be found whose blood is as good as it might be, and who, of consequence, enjoys as vigorous health as he might enjoy.

It must be conceded—we are free to make the concession—that the worse our lungs are, the greater the importance the little air they can receive and “work up,” should be pure and perfect. Yet the future has richer blessings still, in the world of health, to those who not only breathe pure air, but a large amount of it.

Is it asked what we mean by having the lungs too small? We reply, that we mean just what we say; for it is obvious to the most superficial observer of the form of the human chest externally, that there is an amazing difference in the capacity of different human chests for receiving air. Some persons have the chest a third larger than other individuals, who are of similar weight, and in other respects of the same size.

Should it be said that the external appearance might deceive us; and that, after all, it remains to be proved by actual experiment that there is much difference of internal

capacity, we answer, that it *remains* not to make the experiment, for it has already been frequently made.

Some of these experiments are as curious as they are decisive. Dr. Thackrah examined the officers and privates of a regiment of dragoons, to find the capacity of their lungs, which was done by measuring the air thrown out or expired. The average amount at each expiration, for nine officers, was eight and a half pints; for six of the privates, the same; for four musicians, seven and five eighths; for nineteen other privates, about seven and a half. The largest expiration was by a cornet; it was ten and one fourth pints.

This alone shows a great variety of capacity in the lungs. But the variety is still greater among persons of different employments; for whereas in the above experiment on soldiers, the average of the regiment may be supposed to have been at least *seven and a half or eight pints*, the average among the operatives in the large flax mills of Leeds, was found to be about six pints. Among females, in factories, the average was not more than three and a half pints!! The capacity of the chest in the female should be somewhat less than that of the male; but there should not be so much difference.

The practical inference to be made is, that occupation and circumstances—education, in one word—make a great difference in the capacity of the chest. Now if the greater the capacity of the chest, the larger and stronger the lungs; and if the larger and stronger the lungs, the better for health, then it follows that our mode of employment, our dress, all the circumstances of our physical education and management, should be such as to give full expansion to this part of the animal frame. On this subject, however, we shall have much more to say, when we come to treat—in another essay—on the evils of *tight lacing*.

There is one source of bad air, which, in a work like this, designed for the people of the country, no less than for those of the city, it would be unpardonable to pass wholly over. We allude to impure cellars. A large amount of the disease in our community, is induced, and a much larger amount still, rendered more severe, sometimes violent, and sometimes, we have reason to fear, incurable, by the air of damp and neglected cellars.

One evil incessantly operating in most families, is, the absorption of bad air by the food kept in cellars, especially bread. We are not sure of the extent to which other articles of food receive injury in this way, although most cooks and house-keepers are often heard to say, that such or such an article, which has been set away for some time, *tastes of the cellar*, or of the *pantry*; for bad air in pantries, cheese-rooms, closets, &c., is bad air, as much as though it were found in cellars.

That bread, however—raised bread especially—absorbs the air of unhealthy cellars, there can be no doubt. Common sense would teach us this, were we without authority on the subject. But we are not thus destitute. A distinguished writer on this subject, in speaking of the preservation of bread, has the following remarks :

“ When bread is thoroughly baked, let it be taken from the oven and placed on a perfectly clean and sweet shelf, in a perfectly clean and well ventilated pantry. Do not, as you value the character of your bread, put it into a pantry where you set away dishes of cold meat, cold potatoes, and other vegetables, and keep your butter, cheese, and various other table provisions—in a pantry, which, perhaps, is seldom thoroughly cleansed with hot water and soap, and where the pure air of heaven seldom, if ever, has a free circulation. If you will have your bread such as every one ought to desire to have it, you must

pay the strictest attention to the cleanliness and sweetness of the place where you keep it."

This writer, it is true, is not here speaking of cellars, but of pantries; nevertheless, there is no reason why bad air in the former, should not be as injurious as if in the latter, nor why ventilation is not as necessary in the one, as in the other.

There can be no doubt, we repeat it, that bread will absorb the gases which may be present where it is suffered to stand. And that these gases, received into the system through the medium of the stomach, though not so directly efficient, are still really injurious to the powers of life, is equally undoubted. How often may the seeds of disease be thus sown in our families, to spring up into action some five, ten, or twenty years afterwards; or, if other circumstances are favorable, to perform their work of destruction within a few weeks or months! Evil agencies, as well as good ones—at least in a world like this—usually go by the gang, or herd: they are seldom found alone.

But what is there in our cellars, we shall, perhaps, be asked, which can generate the impure gases, or bad air, you speak of? Unless these gases are present, the bread and other food cannot imbibe them; now, what evidence have we that any such are ever present?

The decay of organized bodies, animate or inanimate, necessarily sets free various gases, more or less deleterious to health, according to their nature and the circumstances which exist. It is yet a disputed question among the learned, whether the gases which are evolved from decaying *animal* bodies, are injurious to health; though it is our own opinion that they are. But those which are evolved from vegetable substances, or those of vegetable origin, are universally allowed to be hurtful.

Conceding the point, therefore, for the present, that the

gases produced by animal putrefaction are not injurious, and taking it for granted, that spoiled pork, half putrid fleeces of sheep, dead rats, toads, &c.—all of which, and many other kindred substances, have been seen in these places—are perfectly harmless when found alone in a cellar, still, it is not so with putrid cabbages, turnips, potatoes, apples, and other vegetables; nor with vinegar, the lees of old cider, parcels of yeast, &c. &c.

None of these substances, when kept in cellars, fail to be injurious to health, even in the best circumstances. But if in the best, how much more in the worst? How can they who do not effectually clean their cellars once a year, and who seldom admit the air or the light, expect to escape disease in their families; and that, too, of a severe and fatal kind?

We do not speak, on this subject, without experience. We have been required, in the performance of the duties of our profession, to search for the causes—deemed by friends around inscrutable—why an epidemic disease, such as lung fever, or typhus fever, made such dreadful havoc in certain families to which we were called. And we have always found the severity and mortality of such a disease, to be proportioned, in some degree, to the filthiness of the cellars, pantries, closets, and sick chambers.

This will be a terrible truth, we doubt not, to many a wealthy family, who seem to think themselves privileged, not only to have their houses, their barn-yards, their hog pens, their vaults, their wells, and their cellars, all huddled together on a quarter of an acre of soil, but to neglect, also, to keep them clean. We are sorry if it should be so, but do not perceive any way to help it. If it is *not* a truth, let it be shown; but if it *be* truth, it ought to be told. It is due to the individuals composing these families themselves; it is due to their neighbors; it is due to the world at large—to the sacred cause of humanity.

We should be glad to present facts to illustrate this point, but we have no room for them. Those who require more than our simple statement of the case, will find it in the first and second volumes of the "Moral Reformer," and in the first volume of the "Library of Health."

How far the air is rendered impure by the effluvia of the leaves, blossoms, stems, seeds, &c., of the rank or noxious weeds which grow out of the filth around our dwellings, remains, perhaps, to be determined by future observation and experiment. That these have an influence on health, for good or for evil, cannot be doubted, when it is remembered how readily the aroma of certain flowers bring on an attack of the asthma, in those who are predisposed to it. We have known persons who could not pass a field of rye, in bloom, without its producing a fit of the asthma. Is it not likely, then, that the effluvia or *aroma* of plants and flowers, far less healthy than rye, but more pungent, such as thrive under the hand of the slothful man, if not of the over nice superintendent of the flower garden, may sometimes prove a source of disease through the medium of the lungs? For ourselves, we have little doubt that such is the fact, although it would be difficult to prove it. Still, we believe that however injurious these rank or nauseous vegetable productions may be, the filth, animal, vegetable and mixed, from which they emanate, is much more so.

But after all, we breathe bad air principally as the production of our own bodies. Here is the source of a large share of human wo; and to this point must his attention be particularly directed, who would save himself from disease, and promote in the highest possible degree his health and longevity.

We must avoid breathing over the carbonic acid gas contained in the tight or unventilated rooms in which we labor or remain for a long time, whether parlors, school-

rooms, counting-rooms, bed-rooms, shops or factories. The individual who lives most according to nature—who observes with *most* care the laws of life and health—must necessarily throw off much carbonic acid from his lungs, if not from his skin.

It does not follow, however, that because this gas is formed, we are obliged to inhale it. We may change our position, change our clothing, ventilate our rooms of all sorts, shake up our bed-clothing often and air our bed, and use clean, loose and porous clothing by night and by day. We may thus very effectually guard against injuries from a very injurious agent.

One thing should be remembered in connection with this subject, which is truly encouraging. The more we accustom ourselves to pure air, the more easily will our lungs and nasal organs detect its presence. He who has redeemed his senses and restored his lungs to integrity—like him who has redeemed a conscience once deadened, and even seared over as with a red hot iron—is so alive to every bad impression made upon either or any of these, that he can often,—we will not say always—detect impurity around or within him, and thus learn to avoid it. It will scarcely be possible for such a person long to breathe bad air, or nauseous or unwholesome effluvia, without knowing it, and learning to avoid the causes which produce it. Such a person will not neglect long to remove the impurities which accumulate so readily on the surface of his body, or suffer himself to use food or drink which induces flatulence, and thus exposes either his intestines or his lungs, or the lungs of others, to that most extremely poisonous agent, sulphuretted hydrogen gas. Nor will he be likely to permit the accumulation of filth, liquid or solid, around or in his dwelling. There are those whose senses will detect a very small quantity of stagnant water, or vinegar, or other liquids, or fruit, or changed food, in

the house, or even the presence of those semi-putrid substances, wine and cider.

Some will indeed say—they often do say it—that such integrity of the senses would be an annoyance rather than a blessing. On the same principle, however, would a high degree of conscientiousness in regard to right and wrong in moral conduct, be a curse to us. If it be desirable to have our physical sense of right and wrong benumbed, it is so to have our moral sense benumbed also. Yet, what person of sense ever complained of too tender a conscience, or too perfect a sense of right and wrong in morals?

We close our remarks, not because we have exhausted the subject—for we seem to have hardly begun with it—but because we have already gone beyond the limits we had originally assigned ourselves. We beg those who would lengthen out their lives and see good days, to study those laws of God which we have been attempting briefly to investigate. But this is not quite all. It is not sufficient to know that a law exists, unless we obey it. Let it be yours, then, reader, to KNOW; but, what is of greater importance still, let it be yours to OBEY.

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