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Contributors

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183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
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THE HEALTH OF THE HOUSEHOLD.

A LECTURE

BY HENRY SIMPSON, M.D.,

*Physician to the Manchester Royal Infirmary; Consulting Physician
to the Manchester Southern Hospital for Diseases of
Women and Children.*

As most of those present may already know, the Manchester and Salford Sanitary Association is composed of a number of gentlemen who are endeavouring to improve the health of these two great adjoining towns. They are not connected with the authorities of these towns, but are a band of volunteers, who have for many years sought information on all matters connected with the public health; and who have also done what they could, by means of the press and by such lectures as that which it is my privilege to give this evening, to spread among the people some knowledge of things useful to them in relation to their own individual health, and to that of their families. When asked to deliver one of these lectures, my difficulty was rather because of the number and diversity, than from the paucity, of subjects to choose from. All the world over, communities are made up of individuals grouped together in families; and in this country—whether in the old days of “Merrie England,” or now—when in one way or another we are a nation of “working men,” the family and family life have been looked upon with reverent affection. And we know that the strength and stability of this or any other country, and the happiness of its inhabitants, depends more on the sacredness of family ties than on any other single influence.

Dr. Haddon has spoken to you as individuals on “Health, and how to preserve it;” and I propose this evening to consider some points as they bear on the health of the family group or household.

It may be that I shall seem to be going over ground already

traversed by him, to be telling you what you have already heard ; but even if you have set to work heartily to put in practice the lessons you have learned, you may be quite sure that it will do you no harm to hear those lessons again.

The different rates of mortality in some towns as compared with others, and in country places as compared with large towns, show quite clearly that in some of these places influences are at work which shorten what we call the natural term of life more than they do in other places, and great efforts have been and are being made by the authorities to find out the conditions that are hurtful, and to remove or in some way keep in check their injurious influences. We may, however, for our purposes this evening, adopt a very simple plan to serve as a guide in our endeavours to protect our households from the assaults of disease and death.

Let us take some of our simplest requirements. We need pure air to breathe, pure water to drink, wholesome food to eat, clothing to cover us and protect us from cold, and a house to live in, which the Englishman calls his castle, or, still better, his home.

First, with regard to the air. If the supply of this necessary of life were cut off for a few minutes, man and beast would die, and the same catastrophe would follow if it were to become impure to an extent we might imagine to be easily possible. But the earth, with its myriads of living beings, is provided with an inexhaustible abundance of air, and processes are always at work to maintain its purity, notwithstanding that man, and all other animals, are continually pouring into it carbonic acid gas, a deadly poison, which is given off from the lungs in the act of breathing.

And man, with his civilisation, his manufactures, and his taste for crowding together in large centres of population, can do, and is almost always doing, a great deal to defeat the arrangements originally made for his welfare, and to render his habitation unhealthy.

The composition of the air you have probably had explained to you in previous lectures, and are aware that it is a mixture of two gases ; of twenty parts of oxygen—an active energetic element, so to speak, that is always busy at work, sometimes building up, sometimes destroying, but never quiet—active in life, and without which life could not exist ; always present in death and doing its best to break up and change into new and often simpler bodies all that is old and effete. It is mixed with eighty parts of nitrogen,

a gas which serves to dilute the oxygen, and is marked by very negative properties when it is uncombined chemically with any other body. The air contains likewise small quantities of carbonic acid gas, the vapour of water, a little ammonia, and some other bodies in very small proportions. Naturally the CO_2 , (carbonic acid) is in very small quantity also, but it increases in towns and close buildings. Many years ago a French chemist (Leblanc) examined the air in different places to ascertain the proportion of CO_2 . In the hall of the Military School at Paris he found 1 part in 1,000. In an infant school, the door half open, 3 parts. In a hospital ward, 8 parts. Remember this was in Paris, and more than thirty years since. But if the hospital ward was bad, the Chamber of Deputies was worse, and showed 25 parts in 1,000. But the most vitiated air was in the top gallery of a theatre at the end of a play, where it contained 43 parts to 1,000.

Now this CO_2 is a poison, and a deadly one, and it is often spoken of as if it were the only impurity of the air worth considering; but if you have overcrowding and want of ventilation to such an extent as to bring its amount up to anything like the figures I have quoted, you have other impurities introduced of a still more insidious and deadly nature, to which I shall shortly refer. The impurities in air may, however, be due either to minute particles suspended in it, or to gases. You are all familiar with the appearance which a ray of sunlight presents as you look across it when it passes into a room through a hole in a shutter, or in any similar way. You see how the air in an ordinary room, which seems fresh and sweet perhaps, and free from pollution, is thus shown to contain inconceivable myriads of small bodies, which may most of them be harmless enough, but not perhaps all. We breathe these particles, we swallow them with our food and our drink, and the wonder is not that harm sometimes follows, but that it is so rare. These particles are some of them mineral, as of flint, of various salts of iron and lime, and of every chemical constituent of the soil. In a town like Manchester you have of course in addition minute particles of cotton, wool, and of other things. You have also various animal germs of minute microscopic creatures, and particles of decayed or decaying animal tissues as epithelium and pus-cells, &c. Then there are organic vapours given off from the decomposition of vegetable products in marshes and in sewers.

It is not yet known what is the exact nature of the substances which actually convey disease and constitute their specific poisons;

although arduous and hopeful workers toil on investigating this question with better prospects of success than our fathers had. It is thought by some observers that the poison which causes ague will soon be determined, as well as those of some diseases occurring more frequently in our midst than ague does. Now these minute particles, if particles they be which convey disease, are not to be detected by what we may call coarse chemical tests as CO_2 is, but they are so subtle that we can do very little more in many cases than infer their presence. We know however that CO_2 itself is not a cause of any specific disease, nor is sulphuretted hydrogen, though a foul-smelling dangerous gas, often present in close rooms.

These gases, however, are often valuable guides and tests of the presence of subtle animal poisons given off by animal respiration. Bad smells, as such, are not the special poisonous agents, but they are useful as warnings, and tell us of dangers which our own senses, even though aided by chemical tests, would be unable to protect us against. For the measure of the CO_2 *e.g.* present in the air of a room serves to indicate the degree of over-crowding, and the quantity of organic matter given off from the lungs and bodies of those living in it, and it is this organic matter that is the great source of danger.

I mentioned just now the amount of CO_2 that the French chemist found in various places. The lowest was 1 part in 1,000, and the highest 43 parts in 1,000. But the late Dr. Parkes, a man eminent for his scientific knowledge, beloved and revered by all who knew him for his goodness, and remembered with affection by his pupils, amongst whom I am proud of being enrolled, found that even $\frac{7}{10}$ th part per 1,000 of CO_2 was accompanied by a distinctly perceptible smell from the organic compounds which were present along with it. And this has been found to be so by others. Everyone knows how close and oppressive the air of a bedroom is when it is entered in a morning before the windows have been opened. This is from the organic matters in it.

It has been found by Dr. Angus Smith, of this city, that the air of a soda-water manufactory which was otherwise pure, produced no discomfort though it contained 2 parts per 1,000 of CO_2 . Pettenkofer and Voit too found that exposure to air containing 10 parts per 1,000 could be borne with impunity for a long time if it were pure in other respects. But in occupied rooms many people suffer from headache and giddiness when the CO_2 is any more than $1\frac{1}{2}$ per 1,000, probably in great part from the presence of organic impurities, and also from the diminished proportion of oxygen.

Many of you may know the story of the 146 prisoners—English people—who were confined in the “Black-hole of Calcutta,” and of whom 123 died in one night, while many of those who survived afterwards died of “putrid fever.” No doubt many were suffocated, but the fever which attacked the survivors was caused unquestionably by the exhalations from so many crowded together in this living tomb. The history of our own country even up to quite recent times, shows that the same cause has often been at work.

John Howard, the philanthropist, says that in his day “the malignity of the air in gaols” was such that in his first journey his clothes were so offensive that he could not bear the windows of a post-chaise up and was often obliged to travel on horseback, and the leaves of his note-book were so offensive that he could not use it until it had been open for an hour or two before the fire.

Volumes of similar facts might be given to show the vitiation of the air from over-crowding and bad ventilation.

There is much evidence also to show that consumption has for one of its most efficient causes the breathing of air which has been poisoned by having been breathed before. The same is true of several other diseases—but I must hasten on to another part of my subject—leaving some remarks on the effects of sewer gas to be considered when I come to speak of our dwelling-houses.

Then with regard to water. All living beings, animal and vegetable, need water as food, and all animal or vegetable substances when dried lose weight and shrink in bulk, some substances to a very great degree. For instance, lean beef, which we consider the type of solid food as we call it, contains between 70 and 80 parts of water in 100. So that we see water forms part of our tissues, and by it passing from the blood into the various tissues and organs, and from these back into the blood many of the most important processes of life are carried on. And it not only effects changes in the body itself, but is a great agent in the removal of various matters which are done with out of the body.

No liquid whatever can be used by the body for the purposes we have named but water, and indeed most of those in ordinary use as tea, coffee, beer, wine, and spirits, are water mixed with other things which have to be separated from it before it can form part of our tissues.

Now water, which is absolutely essential for the existence of both animals and vegetables, has the property of dissolving and of carrying along with it very various substances, some of which are

hurtful; thus illustrating the fact that there are few of our blessings which may not be changed into deadly foes.

Probably most of you know how the country has at times been startled by accounts of the outbreak of typhoid fever, in villages or hamlets or certain districts in towns. When the cause of these epidemics has been inquired into, it has in most cases been traced to the pollution of the drinking water with sewage, not merely with sewage as such, but with this further most important and horrible condition, namely, that the sewage has contained the discharges from the bodies of those already suffering from this disease.

In many cases the wells have thus become contaminated in country places; in towns the pipe water has been polluted, and this water has been taken in food or as drink.

In other instances it has been conveyed less directly, but quite as surely, in the milk supplied to certain districts. These cases have naturally caused much alarm, and it was not all at once discovered that the milk supply was to blame. But in several of these outbreaks it has been found that the disease has only attacked those who had their milk from one farm, and that at this farm there was typhoid fever. And, as is too often the case, no care has been taken to prevent the drinking water at the farm from becoming impregnated by the typhoid discharges. The wells at farm houses are often in the close neighbourhood of the cess-pool, and sewage matters easily soak through the porous soil, and through the soft brick-work of the pump well. This water is used to wash the milk cans, and sometimes, of course, dishonest dealers take care that the inside of the cans shall not be too dry when the milk goes in.

The history of some of these outbreaks is very instructive, and I am tempted to give you one or two short narratives.

Ten years ago Dr. Thorne, one of the Health Inspectors of the Privy Council, went down to Winterton, a small town of 1,800 inhabitants in the county of Lincoln. For two years there had been a good deal of typhoid or enteric fever, and it had of late increased alarmingly. The situation was healthy, most of the people belonged to the working classes, but they were comfortably off, and lived in well-built cottages. There was very little intemperance, and there were only two instances of overcrowding. But there were fifty-five deaths in this small place in 1865, and forty-four in 1866, more than a third of which were from typhoid fever. When Dr. Thorne went there in the spring of 1867 fifty-

five cases were under treatment, and six deaths had occurred since the beginning of the year.

Now this village, which had many advantages as to situation and the condition of the people, suffered all the misery which the presence of this pestilence caused, in consequence of its frightful state as regards the privies, ashpits, cesspools, and wells. The former were so arranged that every facility was given for the soaking of sewage matters through the open porous soil into the wells. In most cases these privies and cesspools were close to the houses, and the wells were close by them. Dr. Thorne says, "in one case I found the space between two pig-styes entirely occupied by a well 3ft. in diameter." In this case, though there was fever in the house, the people did not drink this water; but I mention this to show how careless people are as to the purity of the water they drink. But I will give you one instance more from this picture of Winterton as it was then, which I should like you to bear in mind. Behind a group of four cottages there was a small open court which contained a well to supply them with drinking water. Within a circuit of 14ft. round this well Dr. Thorne found a choked-up drain, an ashpit on which the fever evacuations were thrown, two pig-styes, three privies nearly filled with nightsoil, and an open cesspool, into which one of the privies emptied itself. In three of the cottages, where they had had the fever badly, the people drank the water from this well; but those in the fourth got their water from a neighbour's well, and had escaped.

Another epidemic occurred at Guildford in the autumn of 1867, which was investigated for the Privy Council by Dr. Buchanan. Ten cases of typhoid fever occurred in the first twenty-eight days of August in various parts of the town; but in the next thirty-three days the number rose to about 250, confined to one part of the town almost exclusively. And this part of the town received a special water supply, which was of course suspected. Well, it was found that about ten days before the outbreak took place, that part of the town had been supplied with water from a high-standing reservoir which had been filled from a new well. This well had been sunk through the chalk, and close to it were various sewers, one of which was found to be leaking in several places. Professor Miller, who is now dead, found evidence in the water of sewage contamination. In another instance—an epidemic at Terling, in Essex—the same contamination of water was brought about somewhat differently. Here there was a porous subsoil, and the wells were shallow, and the condition of the place,

in some respects, filthy in the extreme. Excrementitious filth was allowed to accumulate in badly constructed privies and manure heaps, or to lie scattered about on the surface of the ground. Out of 900 people about 300 were attacked with fever in two months, and forty-one had died. There had been a long dry season, and the water in the wells had got low, but about ten days before the outbreak the water in these wells rose a good deal higher in consequence of snow and heavy rain which had, of course, carried down the soakings from the collections of filth on the surface.

These three instances of the occurrence of typhoid fever after water pollution are all given in the tenth report of the medical officer of the Privy Council. But there is no absolute proof of the presence of the special poison of typhoid at the commencement of the outbreak.

This proof is however supplied by other cases. There was an outbreak at Ackworth, near Pontefract, in 1870, limited to a part supplied by a certain well. Now the water of this well showed on chemical examination that it must have been contaminated with sewage for some time, but no case of fever occurred till a patient suffering from it was brought to the place, and the discharges of this patient were thrown on loose ground which soaked into the well.

These instances might be multiplied to almost any extent and are to be found in works relating to sanitary matters, and in the various medical journals. Those I have briefly related are given in Dr. Wilson's excellent Hand-book of Hygiene.

The same kind of evidence and quite as strong could be given with regard to the spread of that terrible scourge Asiatic cholera, diarrhoea, dysentery, and some other diseases. Time, however, and the fear of trying your patience too much, urge me to pass on. But before leaving the subject of water I wish to give you a general statement of the way in which water may become so impure as to be the conveyer of disease; and I cannot do better than use the words of Dr. Gairdner, of Glasgow, one of the most eminent of the physicians of Scotland. He says, "Water becomes dangerously impure chiefly under these conditions:—

"1st. When some localities in a town or village are at low levels as compared with others, and are so situated as to receive the drainage of these other localities.

"2nd. When the drainage is radically defective, the drains and common sewers being so constructed as to leak into the

sub-soil, or to become choked, and to overflow from time to time.

"3rd. When the drainage, though well constructed, takes place into a river or stream, and the water supply comes from the same river or stream, and within the poisonous influence of the sewage.

"4th. When there is no system of drainage at all, properly speaking, but a system of cesspools; when impurities are allowed to accumulate superficially in the soil, and the soakage from the cesspools diffuses itself widely through the subsoil, so as to contaminate the wells from which the water supply is derived."

Most of you are probably dwellers in this large town, and obtain your supply of water from the public waterworks. This supply is obtained from enormous collecting grounds away from population, and is on the whole remarkably good and pure. It is also distributed with some liberality as to quantity, which is as regards both cleanliness and health of immense importance. For cleanliness, which is said with a good deal of truth to be next to godliness, is also a great ally of health, and where cleanliness is absent and filth reigns in its stead, we seldom find either of the latter.

Without water in plenty, we cannot be clean in person, food, clothing, or dwelling. The evils and dangers as regards health resulting from a scanty supply of water are great, and I shall notice some of them when a further portion of our subject is reached. But before we leave the impurities of water I must not forget to mention one common source of danger always more or less present, which is, that water will take up a certain quantity of mineral poisons as, *e.g.*, lead. This metal is from its convenience largely used for cisterns in which it is stored; it is also almost always used for the pipes which convey it to the various parts of our houses. When the family of Louis Philippe, ex-King of France, resided in this country at Claremont, they suffered from lead poisoning, and it was found that the amount of lead did not exceed one grain in a gallon; and probably one-tenth or even less per gallon is sufficient to be dangerous. Lead colic was formerly very prevalent in Devonshire, and it was found to be due to the presence of lead in the cider, which is the common drink of that country. This arose from its being used in the construction of the cider troughs.

Now, the purer the water, that is, the freer it is from earthy salts which impart hardness to it, the more easily does it become impregnated with the metal. This is especially interesting to us,

because the Manchester water is of this character, and so soft that it can be used for washing purposes, and is very liable to become charged with lead. Especial care must therefore be used, and lead cisterns must be avoided. You must always remember likewise to allow the water that has been undisturbed in the lead pipes all night to run from the tap before drinking any of it in the morning, or before filling up the kettle; for boiling does not get rid of the lead or render it less hurtful, as it does, no doubt, some organic impurities.

Most of you in this town have only to go to the tap for water when you want it, but in some cases it has to be kept for a time. If so, never leave it about in open vessels, for dust will fall into it, and it will absorb various substances from the air. To illustrate this, I need only mention the common practice of putting buckets of water into a newly painted room to take the smell of the paint away. It certainly does that to a great extent, and if you examine the water you find that it soon smells strongly of the paint, showing how absorbent water is. Think, too, what is meant by the dust of an inhabited room. It is composed of minute particles—I was going to say of everything—but certainly of everything that can be rubbed off our clothing, and from the walls of the room and the furniture, and also from our own bodies.

Keep it covered, therefore, not in metal vessels of any kind, nor in wood, but in glazed earthenware or stoneware jars with lids to them. And empty these now and then, and thoroughly cleanse them. Use iron utensils for cooking, and never have them repaired with lead solder, as the lead will poison the water to some extent. Supposing that the supply of town's water has been stopped for a time, run a good deal of it off before using it, and see that it is bright and clear. This brightness is by no means always a proof of its purity, but all good water is bright and clear, so that if it should be muddy or turbid you know it is not fit to drink.

Water should be free from all smell, and should have no definite taste; but you should always, however bright it may look, use a filter, which separates at any rate all mechanical impurities. The blocks of compressed charcoal form excellent filters, and they are cheap, and by brushing or scraping the surface when they are clogged they will last a long time. If even the cost of one of these charcoal blocks is too great, a very good filter can be made as Dr. Parkes suggests. He says: "Get a common flower pot, cover the hole with a bit of zinc gauze or a bit of clean washed

flannel, which should be changed from time to time; then get some rather small gravel, wash it very well and put it into the pot to the height of 3in.; then get some white sand and wash it very clean, and put that on the gravel to the height of 3in.; then buy 2lb. of animal charcoal, wash that also by putting it into a jug and pouring boiling water on it, then, when the charcoal has subsided, pour off the water, and put some more on for three or four times. When the charcoal has been well washed put it on the sand and press it well down. Have 4in. of charcoal if possible. The filter is now ready, pour water into the pot, and let it run through the whole into a large glass bottle."

When the charcoal is clogged scrape a little off the top and boil it two or three times, then spread it out and dry it before the fire, and it will be as good as ever.

Our next division—that of food—would serve for several lectures. A family is never complete without children, and we must briefly consider what is the best kind of food for them. Childhood is the period of growth, and while the food of the grown-up person is chiefly used for the maintenance of the body at an almost fixed standard, that of the child must also serve for its increase and development. The processes of digestion are more quickly carried on in the young than the old, and so they require more food and at more frequent intervals. Now, I fear it is a fact that the food of children is not so nutritious as it was in the days of our forefathers.

Instead of good oatmeal porridge and milk, the children not only of the poor but of the middle classes are fed far too much on tea and white bread and butter. Previous lecturers have told you of the division of our food into nitrogenous, fatty, and saccharine substances. All are needed and should be judiciously combined. We are too apt to think that animal food—butchers' meat, as we call it—is the only source worth speaking of for our supply of nitrogenous food. But in these days meat is dear, notwithstanding all the very excellent supplies now sent from America, to be supplemented in all probability before long by meat from other parts of the world; and there seems no great probability of its becoming very cheap in our day. It would be fortunate then if working people of all classes would only remember that many vegetable foods are just as rich in nitrogen as meat, and milk, and eggs. The gluten of wheat is rich in nitrogen. Barley, oatmeal, maize or Indian corn, rice, peas and beans, are all rich in nitrogen, and are all most valuable as food. I do not say, of course, that

those who can afford it should not eat meat, but I do say that where there is a large family to bring up and the means are small, it is a most fortunate circumstance that they may live well and grow up strong without knowing the taste of meat. In the north of England and in Scotland—where were to be found perhaps the strongest and finest men this island could show—generation after generation lived on oatmeal and milk. And this might happen again. In Northern India, barley, wheat, millet and rice form the principal foods. In Southern India and in Africa it is pretty much the same. And in Europe the Roman soldier, in ancient times, lived in campaigns on corn which he ground and then boiled in water, and, I was going to say, conquered the world. In our own country there are people whom you have heard of as vegetarians—who take no animal food except eggs and milk—important exceptions I grant—and who are as well and strong as their meat eating neighbours. Dr. Parkes says, and you may put full confidence in any statement he makes, that “a labouring man by ringing the changes on oatmeal, maize, peas and beans, rice and macaroni (which is made from corn), to which may be added cheese and bacon occasionally, may bring up his children as well nourished as those of the richest people, and at a small cost.” Then there are the fatty foods which are also important. Fat exists in most of the vegetable foods we have mentioned—less abundantly, however, in peas and beans than in the others. We take it too in butter and milk and in the fat of meat, and might take it more than we do in the form of vegetable oil—as many do as a luxury along with fresh vegetables in the form of dressed salad. The starchy or saccharine matters are also found abundantly in all the vegetable foods we have spoken of. Maize is especially rich in fat likewise, and might be used along with wheat, flour, or oatmeal. Potatoes, which everyone eats, consist mainly of starch, and they are besides most valuable as a protection against scurvy. You have all heard how the men suffered from scurvy in the late Arctic expedition. And it is pretty clear that the reason was the want of lime-juice on the long heavy journeys with the sledges. Now what the lime-juice ought to have been to these brave men the potato is to most of us. It is a popular notion that scurvy is a disease confined to those who go down to the sea in ships. But this is incorrect. If I had control of his diet I could produce scurvy in any man in this room. I daresay you will admit that though Lancashire people are very shrewd and clever, there are some in this county who do not know everything.

Now, I once had a patient of this kind in the Manchester Infirmary, who, partly from circumstances and partly I think because he was queer in his ways, never took vegetables except a potato or two on Sundays ; so he contrived to give himself scurvy and had a sharp attack. It is a very rare disease in this part of the country, and many of the students had never seen a case and did not know what it was. He recovered his health under appropriate treatment, and went away having had a severe lesson as to the value of fresh vegetable food.

Now, in the period of growth, mineral substances, such as the phosphates of lime and magnesia, are needed especially for building up the bony framework of the body. Oatmeal, wheat, and maize contain these phosphates ; but fine wheat flour has a great part removed, so that what is called the best is not the best for the growth of the body. The browner flour is more nutritious, and if it were only ground fine enough, the best and most nutritious would be the whole grain ground down together.

Speaking generally therefore as to the food of your children. In infancy nature indicates and provides the very best of all foods—the only single article which contains the proper variety in the ingredients and their admixture in the proportions required for the sustenance of the body. In this town, as in most others, however, the children, as a rule, are not fed judiciously, and hence a frightful per centage die before infancy has been passed. Among the commonest of the errors is that of giving starchy food such as bread, potatoes, arrowroot, &c., before the flow of saliva shows that it can be digested ; for as you have been told in a previous lecture, the saliva plays a most important part in the digestion of starchy or farinaceous food. Milk is the proper food for infants, and if the natural supply is insufficient it ought to be supplemented by cows', or goats', or asses' milk diluted and sweetened in various ways, which you can readily ascertain so as best to suit the individual case. It will be quite time to give the child a "bit of what is going" when it can digest it, for which you must wait till the saliva flows and the teeth begin to show themselves, for the old woman's fears as to the mixing of milk are groundless. During the whole period of childhood and growth you could scarcely have food better suited to the wants of the body than good well-cooked oatmeal porridge with milk. But it is most important that oatmeal and all farinaceous food should be thoroughly well cooked. It should be boiled for a good half-hour or more. And as children like sweets, they seldom refuse some good treacle with it.

They may, of course, have meat if it can be got for them. You may often also get good wholesome fresh fish cheaply, and for those who like it, it helps to vary the diet. Fresh fruit and fresh vegetables are, as a rule, wholesome and agreeable, and it is desirable that there should be a fair amount of variety in the food.

As to drink—pure water is the best at dinner. Tea, coffee, and cocoa may be taken in moderation, with plenty of milk. But never let a child taste beer or spirits. It is not necessary for them, and will almost certainly do harm; but on this subject I will say a few words shortly. The food of the grown-up man or woman need not differ much from that of the period of youth. The body has ceased to grow in bulk, and the processes by which food is digested, taken into the blood, and then deposited in the tissues, forming part of themselves, are slower than in early life; the changes of tissues are less rapid, and the waste diminished, so that the quantity of food is or ought to be somewhat less, and the need for it is not felt quite so soon again.

Most mothers know that the children much more frequently ask when dinner will be ready than the father—if he should chance to be at home at that time of the day. The meals should be taken as regularly as possible, and at the times customary in this country for working people; for this regularity has a great deal to do with good digestion. I say nothing about quantity, because in every day life you do not and cannot weigh out your food into ounces, and because, moreover, each one of you has a very fair dealing internal guide in your natural appetite, which will not lead you wrong, if your reason is also just allowed to put a word in. This is especially true if you eat slowly and chew your food well, both which precepts are of great importance, and both of which are far too often neglected. The due mastication of starchy food is of especial consequence.

And now I must say a few words on the subject of alcoholic drinks, a subject which has given rise to much heated controversy, and on which people are very apt to dogmatise. The knowledge of fermentation and of the effect of fermented drinks in producing intoxication is several thousands of years old, as proved by the record in the oldest book existing in the world. In the time of Christ and of His Apostles wine was a common beverage, and Paul counselled Timothy to take a little wine for his stomach's sake. There are in the Bible admonitions against its abuse, and precepts to guide those who think proper to take it. These are facts. There is no doubt that in all ages, and almost all over the

world, alcoholic drinks have been used by man, which fact speaks strongly in favour of their serving some purpose or satisfying some craving deeply implanted in our natures.

On the other hand, you will all admit that alcohol is not only often abused, to the injury of the man who takes it, but also to the injury of society. Words would fail me if I were to try to picture the misery produced by drink, and I will not attempt it. The greater part of the crime of this country, with all its accompanying train of wretchedness and degradation, is traced to drink. A vast amount of sickness is due to it, and the evils it produces are simply appalling. You know, I dare say, the enormous sum spent annually in this country for drink, amounting, it is said, to more than 140 millions, with which money incalculable good might be done. Your presence here to-night I take as a proof that you want to be guided aright as to the use of beer, wine, and spirits, and that you do not wish to play the selfish game of reckless personal indulgence, to drink your wages away to your own ruin both of body and soul, while you leave your wives and little ones starving and wretched, till almost every stick of furniture and every rag of clothing is gone from the home, and the children with haggard faces, pinched and white, cry in vain for bread.

But leaving this painful aspect of the question, which may unfortunately be illustrated in hundreds of families in this great city, let us ask if this sword of the destroying angel can ever be used for a beneficent purpose?

All medical men are agreed that the habitual excessive use of alcohol, even when actual intemperance cannot be charged to a man, is decidedly hurtful. The nervous system becomes exhausted, as shown by the trembling of the hands and muscles, and especially by the feebleness of the will, which is in the end powerless to resist the cravings for more, which drink produces. Moreover, distinct changes, showing degeneration and decay in many of the internal organs, take place, which inevitably shorten life. Many a so-called temperate man hears of the gin-drinker's liver, little suspecting that already, changes have begun which will end in his own case furnishing one more instance.

But do we know how much we may take without risk to health? I am afraid we do not; for it is almost certain that what seems to be harmless to one man may be hurtful to another.

Can men who labour hard sustain their strength without it? Most certainly they can, and not only so but it is proved beyond

doubt that while undergoing fatigue, stimulants are actually injurious and diminish the capability for work.

Is it proved, however, that very moderate quantities of alcohol are injurious? First of all, what is a moderate quantity? The late Dr. Parkes fixed it at one and a half ounces of pure alcohol in the twenty-four hours, which would be equal to about a pint and half of moderately strong ale or porter, to three-quarters of a pint of light claret or Burgundy, to less than half a pint of port or sherry, and to about three ounces of spirits.

Now Dr. Parkes, who was a careful and competent observer, believed that this quantity would do a man no harm. But he guards even this opinion very carefully, "and would strongly advise him to take it only with meals, so that it may not act too strongly on the stomach, and be not too rapidly absorbed." He also says—"Spirits are dangerous, unless mixed with a large quantity of water. Raw spirits act very injuriously on the lining membrane of the stomach, irritating and inflaming it; also, deleterious substances are often produced during the distillation, as fusil oil. I would strongly advise all to abstain from spirits, and to keep to weak beers and light wines." Now, I must say that in these counsels and warnings I agree. Some physicians and physiologists go so far as to say that any, even the smallest quantity of, alcoholic drink is injurious. They say in effect that it is never a food, but always a poison. Now, I do not myself think that they have proved their point. I name this because I am anxious to deal fairly with you; and, while conscious of the frightful harm done by drink, I am wishful to be just and not to over-state the case against it. With all this, however, I have been able to say very little in favour of it; and the practical question arises, is it worth while in so doubtful a matter to run any risk and to take drink at all? For a large percentage of men, I should say, do not touch it. It is a fearful temptation to many, and it is certain that the healthy do not need it. There are others who think, or fancy they think, that a glass of beer helps them to eat their dinner, and who are not tempted to take more. This may be so, and they may take no harm; but it is questionable if they get very much good from it. On the side of abstinence there is safety, while even the temperate man may be in danger.

There is, too, the economical argument on the side of abstinence that your own good sense will enable you to appreciate. The money saved may be well laid out in food, clothing, or a healthier dwelling. Dr. Parkes says for hard work "the best drink is thin

oatmeal and water with a little sugar." Boil a quarter of a pound of oatmeal to two or three quarts of water and put some sugar to it, and shake it up when you drink it. "It quenches thirst and will give you more strength and endurance than any other drink." Weak coffee with a little sugar is also good for quenching thirst. Many people, even those who like what is called good living (which, by the way, means, as a rule, early dying), have found out all about these things for themselves. I know one gentleman, who though a strong man, used to say that his day's shooting was spoiled if he had a single glass of sherry only, with his lunch. Another friend, who is not a hermit, takes a flask of cold tea with him on the moors in August; and I have read of a great violinist who was sometimes very nervous when about to play before an audience, who refused a glass of wine, saying that it would spoil his playing; he should blurr the notes.*

Though I have omitted much I should like to say on the subjects that have occupied our attention so far, but little time is left for the consideration of *our clothing and our dwellings*.

For young children and old people the clothing should be warm, but loose and light. It is folly and cruelty to leave an infant's arms and legs uncovered by clothing, as is too often the custom.

During the period of growth the same rule as to the clothing being loose, should be borne in mind. The limbs ought to be free to move and unfettered. No bands confining the movements of the ribs ought to be allowed either in the case of boys or girls. It is as important for her health and comfort in after years that a girl should breathe freely as that a boy should, and if when she arrives at the so-called years of discretion, she chooses to distort by tight-lacing the form that God made beautiful, it will be her own fault and not that of her parents.

When exercise is taken the circulation is quickened, and the skin becomes warm and perspiring. Then, when it is over, the skin soon loses heat and becomes very susceptible of cold, and a chill is easily caught. You ought, therefore, during exercise or when at work, to wear light clothing, and when it ceases something of a woollen material in addition.

* In what is said above as to alcohol, no reference has been made to its use in disease. In the face of modern experiments, and of its unqualified condemnation by some authorities, I firmly believe that I have seen life saved by it, and consider that alcohol has its uses. The whole question is a difficult one, but we know that in health no risk accompanies abstinence. There has been rather too much tendency among experimenters to treat man more as if he were a bottle in a laboratory, than a complex being with mind and nervous system.

Frequent changes, especially of the underclothing, and great cleanliness are both conducive to health. For as you have already been told, the perspiration, though consisting chiefly of water, contains saline matter, and animal matters already decomposed are prone to pass rapidly into putrefaction. These matters, along with the oily substance given off from the glands of the skin, are retained by the clothing, along with minute particles of the outer cuticle or scarf skin. And if unwashed such clothing acquires a foul, disgusting, and sickening smell. I am sorry to add that far too little attention is paid by the poor generally to cleanliness of person and clothing. Where the wives have household matters only to attend to and do not work in factories, there is not much excuse for dirty clothing, dirty children, and dirty houses; and in a vast number of cases the money spent by the husband, and too often by the wife, in drink, would go far towards enabling the latter to make the home clean, bright, and inviting.

But if the wife has to work all day in the factory or elsewhere in order to eke out her husband's wages, she has of course a double burden to bear if she has to do the work of her house and the washing, and cannot be expected to have the home as bright and neat as it should be. In a great many cases, however, the money spent by the husband in his own self-indulgence would allow the wife to remain at home and look after her proper work. Then, if she were not a slattern or a gossip, spending her time in what I believe is often called "neighbouring," a clean hearth, clean, well-kept children, and a happy cheerful wife would present attractions which would do much to counteract those of the beer-house or the gin-shop.

I have hastily sketched out some of the subjects I wished to bring before you to-night, dealing with them in a slight and incomplete manner, but the time tells me that one most important matter—the consideration of the dwelling, must not now be attempted. Perhaps this may form the subject of a future lecture.

And now I will give you in one word the substance of all I have told you to-night, and the word is cleanliness. Cleanliness in the air we breathe, in the water we drink, in the food we eat, and in the clothing we wear. If we are cleanly in these matters it follows that we shall be cleanly in our persons and in our dwellings, and shall live in accord with the principal laws of health.