PART II.

MANUAL OF HYGIENE,

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MANUAL

OF

PERSONAL AND DOMESTIC

HYGIENE.

PART II.

BY

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Dedicated,

BY SPECIAL PERMISSION, TO

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PREFACE.

THE first part of this manual aims at giving an exact knowledge of the construction of the body, and of its condition in health, also of some of the leading elements of sanitation. This second part completes the subject by giving as exact knowledge as possible, for non-professional readers, of the state of the body in common diseases; pointing out also their various causes, symptoms, and all measures that can be undertaken domestically for their cure.

Most of the more ordinary diseases have been spoken of under special heads, while the different departments of the practical application of the laws of hygiene to the person and the house have been considered at length. Special chapters have been devoted to the care of children and sick-nursing, to the treatment of accidents, to visiting amongst the poor, to house-sanitation, and to professional interviews between patient and doctor.

The great difficulty, of course, in this manual, while giving all needful information as thoroughly as possible, has been to avoid trenching on purely medical treatment, or in any way encouraging the domestic use of powerful drugs and professional remedies; and it is to avoid this that the directions will be found to consist rather in the use of hygienic measures than in that of medicines.

This is not a 'domestic medicine,' but simply an endeavour to apply the laws of health and hygiene to the varying cases of ordinary disease; and it is hoped that those who have mastered

the contents of these two parts of this manual will feel they have acquired a clear general insight into the various processes of the body in health, their variation in disease, and the means that can often be effectually taken at home for their prevention or cure. It is also hoped that the sanitary surroundings of the body in health, and the best way of ensuring these, have also been made clear ; and lastly, that some light has been thrown upon the special sanitary dangers of the poor, and some help afforded to giving them practical and helpful counsel.

To the professional mind much in this manual will necessarily appear to be crude, and the treatment of disease especially imperfect, since the teaching is not adapted for those who wish to acquire special hygienic or medical knowledge, but is strictly limited to what may be of practical use in every-day life to all women.

So long, however, as the line that divides sound hygienic knowledge and practice from quackery has not been overstepped, and the manual now completed is found to be a practical and reliable guide in the knowledge of ourselves and our surroundings in health and disease, and in the principles and practice of personal and domestic hygiene, we are content.

A short glossary has been added of the more common medical terms.

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A SHORT MANUAL

OF

PERSONAL AND DOMESTIC HYGIENE.

PART II.

CHAPTER I.

ON THE NATURE OF DISEASE.

Introduction.

In the first part of this manual we considered the body and its surroundings in health; we examined its various organs and their functions in detail, and thus, by a clear understanding of the healthy working of the body, prepared the way for our present subject—the understanding of it in disease, and the best measures for prevention and cure that lie within the reach of unprofessional hands.

The present state of ignorance amongst women—to whose lot most of the domestic hygienic work of the world must necessarily fall—is appalling, and nothing less than an anachronism.

While on the one hand we see amongst some women a burning zeal to become nurses and doctors, and take their share in the curative sciences of the age, on the other we see amongst the vast majority an apathy and an ignorance worthy of mediæval times, that are difficult to rouse or to reach, and that make the present effort to establish the teaching of hygiene to women on a systematic basis partake of the character of a forlorn hope.

If it were a question of a new and fashionable art, or the study of some subject hitherto confined to men, or some new accomplishment or game, we should have more candidates than teachers, though the art or knowledge or accomplishment acquired might be utterly useless in itself. But when it is the question of undoubtedly saving hundreds of lives and preventing thousands of cases of sickness, when it is a question of learning what is of practical use to us almost any hour that we live, what, in short, is of *vital* necessity, the amazing fact is seen that it is only with the utmost difficulty a comparative few are induced to undertake such a study. And it is not as if this study were unsuited or too arduous for women. It is simple, it is easy, it is intensely interesting. Again, it is not only of use to ourselves, but to all amongst whom we may work; the value of such knowledge to those who labour amongst the poor is incalculable, while its value to those who have charge of others is so great, that we hope the time is not far distant when a knowledge of hygiene will be insisted on from every teacher, governess, or nurse.

Value of Hygiene.

It is not perhaps generally known that, according to Dr. Fair (who is the best authority on the subject), the full length of a healthy man's life at the present time may be put down at 100 years. The reasons why all do not reach this age are worth considering. In the first place, the most eminent hygienist of the age has asserted that there is no such thing as a perfectly healthy child in existence; that is to say, that everyone inherits from his parents some weakness or taint of disease. The first thing, therefore, that the spread of hygiene will do is *by improving existing constitutions to lessen the amount of inherited disease*, and so gradually to produce children with less and less of hereditary taint. But this is the smallest evil that arises from our ignorance. When the child is born he is surrounded until he dies with constant dangers, from carelessness or ignorance, that threaten to cut still shorter his already curtailed span of life.

Needless Loss of Life.

Every human being when born has an allotted span of life, dependent for its length upon his ancestry. Its length can be approximately arrived at by adding together the ages of his parents and four grandparents at death and dividing the result by six, and to the result adding a year for every five that it is above sixty and subtracting a year for every five that it is below sixty. This gives the length of life a man may expect to live, and may be taken to average the Scrip-

Allotted Span of Life.

tural span of seventy-five years ; or in other words, we may consider the actual expectation of life as three-fourths of what it should be had we sound ancestry. Now comes the startling fact that only *one in ten* ever even reaches this shortened span. Only one out of ten amongst human clocks is ever allowed to 'run down' from old age. The other nine are stopped prematurely.

Out of 500,000 deaths in this kingdom it is found that only 50,000 reach seventy-five years, and it is calculated that out of the 450,000 who die prematurely 250,000 deaths may be classed as 'preventible'—that is, as due to ignorance or carelessness ; and, taking the ratio of sickness to death as 25 to 1, that 7,000,000 preventible cases of sickness occur annually. It is so important that we should understand the enormity of these figures, and the terrible need there is for every scrap of knowledge of hygiene that can be taught, and that we should feel the shame of such a record in the nineteenth century, that we will present them again in one or two other aspects.

Taking the famous bridge of Mirza, with its hundred arches as representing the span of human life, we find that out of every 1,000 infants who begin the journey *over a quarter* perish before the fifth arch. That these deaths are largely preventible, and are little less than murders, is seen in the fact that under favourable circumstances *less than an eighth* die, while in neglected districts the rate rises to nearly half (460 per thousand in Liverpool). A second quarter die during the next forty years, the deaths being very slow from ten to fifteen, and more rapid up to forty-five. A third quarter die during the next twenty years. By the time the seventy-fifth arch is reached little more than a tenth survive. Only thirty-eight of the 1,000 reach the eighty-fifth arch, and only two the ninety-fifth.

Or take another view. In Norway, England, and the United States three-fourths of the children reach the age of twenty. In France and Ireland only one-half. The average length of life in Norway is forty years, in England thirty-six, in France thirty three, in Ireland twenty-nine. One-third reach seventy in Norway, one-fifth in England, one-eighth in France, and one-eleventh in Ireland. Again, at fifteen a man may expect to live forty-three years ; at twenty-one, thirty-nine; at twenty-five, thirty-seven; at thirty-five, thirty; at forty, twenty-four; at fifty, twenty ; at sixty, fourteen ; at seventy, nine ; at eighty, five ; at ninety, three ; and at a hundred, one and a half.

Death-rates.

Speaking of preventible deaths, Herbert Spencer says :

'If anyone doubts the importance of an acquaintance with the principles of physiology as a means to healthy living, let him look around and see how many men and women he can find in middle or later life who are thoroughly well. Only occasionally do we find vigorous health continued to old age; hourly do we meet with symptoms of acute disorder. Here is a case of heart disease consequent on a rheumatic fever that followed reckless exposure. There is a case of eyes spoiled for life by over-study. Yesterday we heard of one whose lameness was brought on by continuing, in spite of pain, to use a knee slightly injured. Now we hear of an irremediable injury which followed some silly feat of strength.

'Is it not clear that the physical sins which produce this ill-health to a great extent make life a failure and a burden, instead of a benefaction and a pleasure?'

Nevertheless, although the picture is still so black, and though hitherto private sanitary knowledge is so backward, public sanitation has done much. In the seventeenth century the death-rate has been roughly estimated as eighty per 1,000, the average length of life thirteen years; in the eighteenth century fifty per thousand, with an average life of twenty years; and now, in the latter half of the nineteenth century, it is only twenty-four per 1,000, with an average life of thirty-six years. John of Gaunt was an old man at fifty-nine, and Admiral Coligny at fifty-three. Sanitary science has reduced the death-rate in old cities *one-third*, and in newly built districts it will only be *one-half* of what it used to be. It has reduced deaths from lung disease by one-half. If such work can be done by public legislation, what may not be done by private knowledge? Lord Derby says: 'Sanitary instruction is of the two even more essential than sanitary legislation. Nothing can supersede the value of personal and private care.' Let us then earnestly apply ourselves to acquire this knowledge on which our health, and our very lives, may depend.

Sanitary Legislation.

We will first of all consider what we understand by the word 'disease.' Its etymology signifies a 'want of ease'—a disturbance in the health, and unconscious action of some part or organ of the body. Health itself is not a fixed standard, nor is it the same in any two people. Life is a condition of unstable equilibrium, the result of the inter-action between the living cell (of which the body is built up), composed of eight elements, and its surroundings. The progress of life is like the ticking of a clock, the pendulum

Diseases.

ever oscillating between destruction on the one hand and repair on the other. Thus every life-movement represents a tick, and silence and stability are only reached in death and dissolution. Now, an uneven tick in a clock shows something is wrong in its organism; and in the same way the symptoms of disease point to some failure in the balance of life.

The *perfect adaptation* of the body to its environment is its perfect *health*, the *imperfect adaptation* is *disease*, and the *failure* of *adaptation* is *death*. Health does not depend on physique, but on this law of adaptation. The human body has a great power of accommodating itself to its surroundings, and on this our health and lives depend. 'It is nothing when you are used to it' is a maxim of the first importance in this connection. A brawny Highland doctor, coming up to London, was told he would live fifty years, and at the same time a small pallid London doctor was told he would die within the year. The Highlander got consumption and died in a few months; the little Londoner has just been married. The change in the environment stopped the clock in the Scotchman's case.

Value of Environment.

Look at the poor native races of India, who live and thrive where the strong English children die. On the other hand, measles is scarcely dreaded by the English, who have come to regard it as almost a part of their environment; but when it is a new disease, as in Fiji, it is a deadly scourge; while to keep the balance, yellow fever is not dreaded by the natives, while it is fatal to us. The power of balance between life and its surroundings is the real basis of health, hence the danger of suddenly disturbing any habit of life. Let a healthy middle-aged farmer change places with a sallow London bookbinder, and the chances are the change will kill both through want of adaptability to their new surroundings. Here we see the value of entering one's trade or profession when young, so as to form a perfect adaptation with it; and here, too, we get the key to the great and undoubted value of native air in convalescence. Now the failure of adaptation—that is, of health—may be twofold in character. It may be simply a disturbance of equilibrium without destruction of tissue, which we call *functional disease*, or it may be accompanied by destruction of tissue, when we call it '*organic disease*.' If we compare life to a rocking stone, *functional* disease will disturb the rocking as a slight push would do, while *organic* disease would displace the stone as would a heavy push.

Functional and Organic Disease.

Diseases, therefore, are functional or organic disturbances of the right working of the body, and may affect the whole or any part. In all, there are at present some 1,100 named varieties. All that we shall attempt in this manual is to indicate the better known ones, grouped under the different systems of the body which they attack, indicating the best means of their prevention and domestic treatment.

The causes of every disease are at least two in number: there is the soil or the preparation for the disease, or *the preparatory cause;* and there is the seed or the entrance of the disease itself, or *the exciting cause.*

Among the indirect or preparatory causes of disease are *age*, *heredity*, *sex*, *locality*, *and previous disease*, while amongst the direct or exciting causes are *bad air*, *bad food*, *temperature*, *germs and poisons*, *and accidents.*

Indirect Cause of Disease.

AGE.—The liability to each disease varies with the age. In childhood, fevers, acute diseases, and infectious diseases are common. In youth, functional diseases of all sorts, and lung diseases. In middle-age, diseases from errors of diet and organic diseases. In old age, diseases from the failure of the various organs.

HEREDITY.—Hereditary diseases largely arise from improper and injudicious marriages. It is certainly a bounden duty of anyone with a marked hereditary taint not to marry, and especially not to marry anyone similarly afflicted. The way in which this wise rule is perpetually broken (in the East of London especially) tends to deafness, blindness, deformities of every sort, not to mention diseases of all kinds in the children. In fact, the results are awful! The tendency to many diseases, such as gout, consumption, cancer, epilepsy, is mainly perpetuated by such unwise marriages; as well as weakness of various organs, which are preparatory to local diseases affecting them. This head also includes temperament, which determines the liability to various classes of disease.

SEX.—This obviously determines many diseases, amongst others those of a functional or nervous character, which are nearly all more common in the female.

CLIMATE AND LOCALITY.—By the first expression we mean extremes of heat and cold, of dryness and damp, of exposure to east winds and other vicissitudes. Some have the power of choosing and changing the climate they live in according to the season of the year: the greater number, on the contrary,

must be content to live all the year round in our changeable and, to many persons, trying climate. Out of the five most fatal diseases in England, three are chest affections. Carelessness, in many cases, is the reason why people suffer from these. But in other and by far the greater number of cases, people are exposed to all weathers, and have to encounter sudden extreme vicissitudes of heat and cold, which are, perhaps, even more trying, as there is no way of getting hardened to them.

The delicate girl who is failing under the early beginnings of consumption might in many cases be rescued could she be sent to a suitable climate, but amongst the poor this is impossible for want of means.

The value of money is nowhere more clearly shown than in its power to purchase in many cases the means of prolonging life and health by change of climate.

By locality we specially mean town or country. Towns are increasing in size, and the country is getting less populous, in spite of its value for health, on account of the greater facilities for work in towns. The country is still, however, the great sanatorium for townspeople and the overworked, and those who can vary the town life with intervals of country or seaside, are warding off many diseases and spending their money to the best advantage.

Climate and locality are therefore most powerful factors in the indirect causing of disease. Cold and hot climates, dry and moist, country and town life, have indeed each their different dangers and diseases which it would be impossible to enumerate here.

PREVIOUS DISEASE is a serious indirect cause of some future disease of which it lays the foundation. There are few diseases, if any, but what may be, and often are, preparatory to others, or to repetition of the same disease.

BAD AIR.—Though the victims of impure air are few compared with the victims of intoxicating drink, the number in the aggregate is by no means small. It is in the overcrowded parts of large towns and cities that the people are most exposed to the evil effects of impure air. Think of the 150,000 poor work-girls of London alone! Consider those engaged in small laundries—working in the dog-days in a broiling atmosphere of heat and steam, every window tightly closed lest a speck of dirt should soil the shirts or collars. Consider their life, and you will not be

Direct Causes of Disease.

surprised at the ravages of lung disease amongst them. Look at the women and children in the ill-ventilated sweaters' dens in the East End of London. Can we be surprised at their languor and pallor, or ask in wonder what is the cause?

But the evil is in part preventible even amid a population of this sort; and already we have a rapidly increasing number of well-ventilated workshops.

Dirt is matter in the wrong place. It is a question whether we eat or breathe in most dirt. In either case it is distinctly unwholesome. It is a preventible cause of disease, for even the poorest can, as a rule, wash themselves, if not with soap, which is an expensive luxury to some, at any rate with water; and they need not swallow half so much dirt as they do. They have less control over the dirt or dust they breathe in, for this is in the air of their workshops and factories, and no one can help swallowing the germs and decomposing animal matter of close rooms as long as he is forced to remain in them. The carelessness of those scrupulously clean in other ways as to the amount of filth they breathe and swallow in foul air, is only to be accounted for by its being invisible.

Bad or Improper Food (including drink) destroys over 2,000 lives a week, and is the exciting cause of most internal organic diseases, as well as of the self-made poisons of the blood, such as gout, rheumatism, etc.

It is a well-ascertained fact that most people who can afford it eat too much. This is the clearly preventible cause of gout, dyspepsia, apoplexy, and many other maladies. Wholesome food can always be obtained by those who have the means of purchasing it, but people whose means are very limited or quite insufficient, cannot always choose their food. They have just to eat what they can get. Many of the City work-girls, for instance, dine off a halfpenny-worth of cheese and of pickles.

Improper food is a terribly fatal but largely preventible cause of death, especially amongst babies. It is calculated that about three-fourths of the deaths among infants are due to this one cause. It cannot be too often repeated that no child under six months old should have any other food but milk, save by direct medical advice.

Many foods are unwholesome and liable to decomposition, such as dried fish and shell-fish in the summer. Food is often eaten too rapidly, or at irregular intervals. In short, nothing is more important than careful attention to a regular, wholesome, and sufficient dietary.

Special attention should be given to cooking thoroughly all kinds of food, so that if it should turn out to be unwholesome the risk of eating it may be lessened.

The use of improper drink, and the excessive use of intoxicating drinks, are clearly preventible causes of death.

What can we say about this awful subject? It seems vain to repeat that one-tenth of all deaths arise from it, that 120,000 die annually from this cause in one way or another, that its direct victims number 1,000 a week, that it produces a very large percentage of paupers and of hospital patients.

Disease results also from carelessness in the use of other drinks, even of milk and of water. Cholera and typhoid fever are especially often traceable to this cause. All town water should, if possible, be filtered, and most country water boiled as well; milk also is safer when boiled.

Tea is not so injurious as some suppose it to be, if it be taken in moderate quantities and be freshly made.

House cisterns and filters should be carefully cleaned periodically, or water, otherwise wholesome, becomes tainted in passing through them.

TEMPERATURE, including sudden changes in it, is the exciting cause of consumption and most other chest diseases, also of many other organic diseases.

GERMS AND POISONS are of course the direct cause of all infectious diseases, and of an increasing number of others, including probably all varieties of fevers.

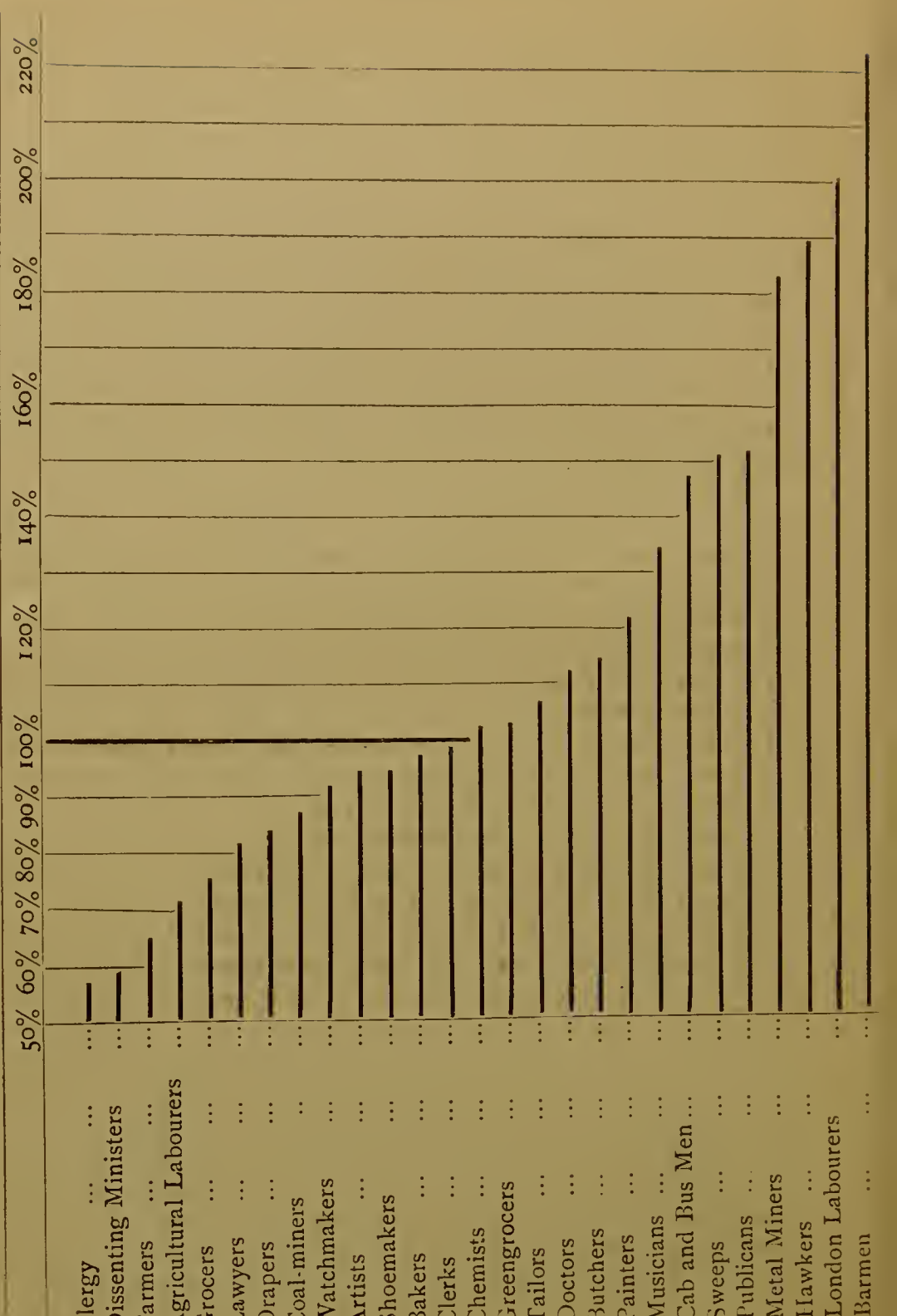
ACCIDENTS may cause disease, or, looking at diseases as including every disturbance of the right function of the body, may themselves, in a general way, be considered as such.

Amongst causes that cannot well be grouped under any of the preceding, and that are both preparatory and exciting, is one that calls for special remark, and that is the bearing of occupation on life. The following short table gives the leading occupations, and is abstracted from a copy of the Registrar-General's table that has appeared in the *Leisure Hour*. (*See next page.*)

Life Value of Occupations.

It will be seen that clerks enjoy the average mortality; that the clergy head the list, being most of them of good stock, temperate habits, and having a small but assured income. Dissenting ministers die a little faster. Farmers show up well, but would show up better if they spent less money in drink. The agricultural labourer's favourable lot in life (only three-fourths of the average death-rate) is all the more striking

AVERAGE DEATH-RATE OF ALL MALES.



when contrasted with that of the town labourer (the last but one), who dies just twice as fast as he should. Grocers owe their higher death-rate to the spirits they consume. Lawyers are well off, but would be better, only it is found that after forty-five they die off more quickly than they used to.

Drapers die largely from consumption, owing to the amount of dust in their trade, which makes it less healthy than that of a grocer. The health of coal-miners, which is surprising, is probably due to only strong men entering the colliery.

Artists owe their higher mortality to the fact that with them are included engravers and sculptors, among whom the death-rate is high.

Bakers die largely from drink and suicide.

Clerks occupy the average, and their death-rate is much lower than it used to be, owing probably to better ventilated offices and increased exercise.

The high death-rate amongst doctors needs no comment; it is obviously inseparable from the nature of their profession. Butchers, on the other hand, die largely from drink. Musicians include all organ-grinders and German bands, hence their high mortality.

The rest of the trades owe their enormous death-rate to special poisons. Amongst cab and bus men, publicans and barmen (who really die like flies), it is due to alcohol; amongst sweeps and metal-miners, it is due to soot and dust; amongst hawkers and London labourers, to exposure, drink, and foul air.

The table thus ranges from the clergymen with a mortality of 55 per 100 to the pot-boy with 220, a difference that needs no words to show the value of hygienic influence. Nevertheless, as a whole, the table (1885) shows an improvement over previous ones that is equivalent to an addition of 2,000,000 years of life to this nation.

There are many other general causes of disease. Amongst the more important are worry, high pressure and overwork, causing every variety of brain and nerve mischief, directly and indirectly predisposing towards many other organic diseases. Idleness and immorality are also constant factors in disease.

General Causes of Disease.

We will now pass in review some of the leading symptoms of disease, with which all should be familiar. They may be

divided into two great classes: those observed by the patient, and those observed by others. The former are called *subjective* and the latter *objective* symptoms. When the person is asked what is the matter with him, he should set to work and describe the former; then the doctor sets to work to observe the latter. The subjective symptoms may be *sensory*, *motor*, *functional*, *mental*, or *phenomenal*.

Subjective Symptoms of Disease.

SENSORY.—The first sign under this head is *pain*. It is of the greatest importance to have the *seat*, *character*, *duration*, and *intensity* of the pain accurately described. It may be boring, darting, cutting, dull throbbing, aching. It may be general or local. It may be fixed or shooting. It may be constant or intermittent. It may be severe or slight. It may be superficial or deep. It may be associated with tenderness in the part, or pressure may relieve it. All these points should be noted and described by the patient. There may be no pain, but uneasiness, nausea, sensation of cold with shivering (most important), or of heat, general or local. Or there may be various other sensations—a ball in the throat or stomach, irritation, aching, fulness, or a general sensation of malaise, or of weakness, or giddiness, or loss of sensation, partial or complete.

MOTOR.—Amongst motor symptoms we notice paralysis, partial or complete, generally one sided or local, stiffness, weakness, lassitude, involuntary, spasmodic, and painful movements.

FUNCTIONAL.—This includes every irregular or imperfect action of any organ or special sense. The ears or eyes may be deaf or blind. There may be loss of smell or taste. The breathing may be laboured, short, hurried. The heart may palpitate or beat irregularly; and so on with every organ.

MENTAL.—There may be delirium, mania, monomania, confusion, loss of memory, unconsciousness, excitability, apathy, despondency, etc.

PHENOMENAL.—Under this head we group definite states or acts that cannot otherwise be classed, such as cough, sickness, blood-spitting, running from the ears, formation of boils, tumours, or states such as 'bilious.'

Objective Symptoms of Disease.

Objective symptoms or those observed by others may be also classed under five heads. Those observed by *sight*, *hearing*, *touch*, *smell*, and by *experiment*.

SIGHT.—The habit of accurate observation is here of all

importance. We learn a great deal by the general aspect, the colour of the skin, the presence and character of any rashes, the expression of the face, the position and movements of the patient, the character of breathing, the appearance of the eyes, tongue, etc., the general size, shape, and aspect of any diseased part, the condition as to being stout or thin, sanguine or bloodless, etc.

HEARING.—We note the character of the voice, the breathing, the cough, etc.

TOUCH.—By this we notice the temperature still more accurately with a clinical thermometer, the moistness or dryness, the shape, the smoothness or roughness, the state of the pulse, the tenderness, softness or hardness, or sense of fluid in any part.

SMELL.—The general odour guides us in small-pox, rheumatism, typhus fever; that of the breath in poisoning by alcohol, opium, and other drugs.

EXPERIMENTAL.—This includes weighing and measuring, making the patient do certain acts, examining various secretions, etc.

Respecting symptoms generally, we must clearly understand that they are but signs of the disease that produces them.

Value of Symptoms.

Indeed, we may go further back still, and say that in most cases the disease itself is but a sign of some injury or poison received by the system. Regarded in this broad way, diseases may be described as Nature's efforts to get rid of the intruder, or to repair the damage. As, for instance, in the case of all the infectious fevers, which each owe their existence and special train of symptoms to the particular poison received, and which they try to get rid of. Cutting short or checking a disease (sometimes called 'taking it in time') may not, therefore, always be a wise process. But it is not so foolish as the course pursued by the ignorant, of attacking and checking symptoms. Let us fully grasp the fact that, painful and trying as they may be, *symptoms are, as a rule, beneficial*, and represent Nature's effort either to get rid of the disease or to lessen its evil effects upon the system; and then they will be treated with more respect, and no longer be regarded as so many evils to be repressed. Take, first of all, the cough of lung diseases. To stop the cough is the first thought of ignorance. To correct such ideas is one of the designs of this manual. In lung disease life depends to a great extent upon the cough and expectoration, the sole means by

which the lungs can rid themselves of the poison that has attacked them, as in inflammation or consumption; or by which they can repair the injury they have received, as in bronchitis.

In a cold the rapid breathing, the thirst, the running from the nose or eyes, is all beneficial, and should not be directly stopped.

Nature is ever in disease seeking to adapt the disturbed balance of life to the environment, and hence the symptoms. Take a case of rheumatic fever, which is Nature's effort to get rid of a powerful blood poison brought on by indigestion, bad air, and cold and damp. In doing so, one of the valves of the heart gets thickened and ceases to act perfectly. Nature, therefore, gradually enlarges the heart to meet the extra strain upon it, and the man suffers from a hypertrophied or enlarged heart, a symptom which, so far from being hurtful, actually keeps him alive. If he is wise, he helps Nature by giving her less work to do, by henceforth only eating to live, instead of living to eat, and all goes well. If not, and the heart is overloaded, Nature makes another effort and produces dropsy to relieve the heart, another symptom beneficial in itself, but pointing, of course, to a grave danger. And then, if the man persists in his folly, Nature, having failed to adapt the life to its surroundings, has nothing left but to cease its efforts in the silence and stable equilibrium of death.

While, therefore, we cannot observe too keenly and accurately the subjective symptoms in ourselves or the objective symptoms in others, we cannot be trained to interfere too little. The extent to which any interference is wise in domestic life will be considered in connection with the various diseases.

Let us now consider generally the nature and variety of the remedies at our disposal. As we have considered most subjects under five heads, we may group the various remedies under the same number: those that produce the most congenial and suitable environment; those that remove the exciting cause of the disease; those that control and counteract the preparatory cause; those that deal with such symptoms as are needed; those that aim, after the disease is subdued, at restoring the patient to perfect health.

Remedies for Disease.

Environment.—These remedies consist in pure air, light, suited temperature, general sanitary surroundings, suited positions (as in bed, etc.), suited society, skilled nursing and

care, suited food and drink, periods of rest, etc. The remedies under this head are, perhaps, the most important of any, and are mostly of a domestic and common-sense character. The knowledge of them is invaluable.

Exciting Cause.—The treatment under this head will necessarily be as varied as the cause. First of all, we seek as far as possible to prevent further injury. If it be *bad air*, *bad* or *improper food*, these are at once replaced by good. If it be sudden change of temperature, this is made regular and suitable. If it be some germ or poison, further exposure to it is at once prevented. And if it be accident or occupation, the latter is at once given up. In the next place, the doctor has recourse to drugs to undo the mischief that is already there. All remedies may be classed as ordinary or natural, and extra-ordinary or medicinal; and the latter again act only in one or two days, either through the blood current, as do all active drugs, or through the nervous system, as do electricity, inert medicines, massage, etc.

With regard to drugs, let us remember that no medicines are foods, that they act on every part of the body, that it is very easy to do more harm than good with them, that the best advice obtainable should be had in selecting them, and that the risk in giving them without such advice is generally great. On the other hand, it is equally foolish to despise them, for, rightly used, they have the power either to moderate or cure the disease, by aiding Nature in her efforts to remove the poison or repair the injury. It will generally be found that consulting physicians are far more sceptical on the use of drugs than general practitioners. This does not really arise from their superior knowledge, but from the fact that they seldom see diseases till they are incurable, while the general practitioner has to face all the slighter diseases that yield easily to wise treatment, or graver ones in their earlier stages when drugs are still of use.

Preparatory Cause.—In this cause the removal is beyond our power if it consists in the age or sex of the patient, or previous disease, or hereditary tendency. But if it is again occupation or locality, we take care that this, too, is changed for the better, though the danger we have already pointed out of suddenly changing any fixed habit or occupation has its own risks that may prove worse than the disease.

Symptoms.—The great desire of ignorance is always to check these, that of wisdom is more frequently to aid them. If it be perspiration, for instance, to increase it. If it be cough or

expectoration, to loosen it and make it more abundant. If it be loss of appetite, to give little food. If it be constant sleep, to indulge it. If it be thirst, to satisfy it. If it be a rash, to bring it out still more. On the other hand, there are many symptoms that are injurious to the body generally; their effects must be checked or moderated. Lives are often saved by bringing down too high temperature, by controlling violent spasms, and relieving unbearable pain. It is both possible and desirable for those at home to understand in a general way the significance of many symptoms, to know which require special noting and watching, which are dangerous, and which are harmless; and then, by intelligent co-operation with the doctor, greatly to assist him in the struggle with the disease. These symptoms we will specially consider under the various diseases.

CONVALESCENCE.—The treatment of convalescence is of the utmost importance to the future welfare of the patient, and as it is largely of a domestic nature, and consists mainly of natural remedies, it is of the utmost interest to us in this manual. To a slight extent only are drugs of use now, and these mainly are tonics. The regulation of rest and exercise, of environment in the shape of rooms, climate, scenery, and society, are all of far more importance than drugs in convalescence, and are matters in which all should have certain principles to guide them, generally known as the laws of health.

Laws of Health.

The laws of health are, in brief: *cleanliness*, *good and pure air*, *good and suitable food*, *suited exercise and rest*, and *proper clothing*.

In *cleanliness* we include the absence of all personal or domestic dirt from any source, whether it be the skin, the clothes, the furniture, or the drains. Cleanliness all round is an essential law of health. Better have a burglar in the house than sewer gas. Such is the neglect of this law that it is yet largely true that amongst the poor many become first acquainted with it within the walls of a model prison.

By *good and pure air*, we mean fresh air that has not been repeatedly breathed, free from animal matter or carbonic acid gas, and charged with oxygen; not saturated with moisture, not too hot or too cold.

Under the head of *good and suitable food* we include quantity, quality, variety, time of eating, number of meals, cooking. By food we mean all we drink as well as eat, the careful and

moderate use of alcohol, or in many cases entire abstinence from it, the absence of all excess. These points are, perhaps, of the greatest importance of all with regard to health.

Suited exercise and rest is also of the highest value. It includes the occupation, the amount of sleep, the amount of holidays and of recreation. On the due regulation of exercise and rest depends the development of the individual, whether he shall have a faint heart or a great heart, weak or strong lungs, well knit and well developed or dwarfed and distorted frame.

Proper clothing means, of course, sanitary and suited clothing, clothing that in make and texture fulfils the requirements of health, and is at the same time in quantity rightly adapted to the surrounding temperature.

With regard to these five laws of health, the first four, at any rate, are equally important for the mind as well as the body, for this great question of health concerns the entire man, and it is useless for us to care for the body and neglect the mind, or *vice versâ*. We must always consider the man as a whole, and see that all his surroundings, physical, mental, and moral, conform with the above laws. We will now pass on to consider the various parts of the body in detail.

CHAPTER II.

ON THE CARE OF THE OUTWARD MAN.

On the care of the skin not only our appearance but our very health depends. Its general structure and its uses have already received full consideration in the first part of this manual. All skins are not, however, alike, and a good deal of the health of the skin depends upon its quality, although far more depends upon the care bestowed upon it. As a rule, a fine thin and perspiring skin is a sign of more delicate health than a common and thick one, and is itself also more liable to injury and disease. A skin that readily tans or freckles is generally a sound and healthy one.

The Care of the Skin.

The first duty we owe to the skin is to keep it clean. Not only is it perpetually covered with fresh layers of dead cells that are continually being pushed up from the deeper layers, but the deposit from the oil and sweat glands (or pores), together with the dirt and particles from our clothing, form a layer of material that hinders to a very large extent the use of the skin as an excreting organ. This is mostly the case amongst what may be termed the lower middle class. The labouring man, in spite of infrequent ablutions, excites by his active labours such an amount of profuse perspiration, that the pores, to a certain extent, keep themselves open by their vigorous action, though the action of the dirt in other ways is still injurious. The upper classes, again, have abundant conveniences for bathing; but the lower middle class has, as a rule, neither such conveniences nor the hard manual labour of the workman, and the result is, their skins are generally in a most unhealthy condition, and a ready home for any passing disease. Many skin eruptions, many pimples and blotches, are entirely due to want of cleanliness. It is curious to observe, in some instances, how cleanliness decreases as it approaches the body. The collar and cuffs are probably changed daily, the shirt twice a week, the under-shirt once

a week, and the body itself washed perhaps only once a fortnight.

Baths and Washing.

The body should be washed all over with soap in hot water at least once a week. Of course, in a well-appointed bath-room this is a luxury, but in other houses it is equally a necessity, and must be performed in an ordinary sitz-bath. The general establishment of luxurious public baths may lead many to take their weekly bath there; but in this case there is always a risk of taking cold afterwards, unless the bath be finished off with a cold douche to close the pores of the skin. A valuable addition to this weekly 'tub' is a double handful of salt thrown into the water at the close, and the body well sponged with it. It soaks into the skin, and has a most beneficial stimulating effect upon it, especially if the liver be at all sluggish in its action. Either a flannel, a loofah, or a flesh brush or glove, should be used with the soap, but the skin should not be rubbed too hard, either with this or the towel, which should be of a soft Turkey make.

Besides the 'weekly wash,' a daily bath should be taken to keep not only the skin but the body in perfect health. It is a mistake to suppose that a cold bath is always the best, or that a daily plunge into ice-cold water is a safe proceeding. In spite of enthusiastic letters from men who bathe in the Serpentine or sea or river all the year round with impunity, it is a risky feat for the majority of men and women engaged in ordinary home or business life, and still more so if only indulged in at times. The cold water certainly acts as a most powerful stimulant, but it drives the blood in such a current into the internal organs—the heart, liver, stomach, etc.—as to produce often dangerous and sometimes fatal congestion of these organs.

For a person unaccustomed to the use of cold water, the best plan is to get used to it gradually, by always standing in warm water and sponging with tepid water; then the next day with cooler, and at last with cold, the feet still being in hot water, which is a great safeguard to the brain. There is nothing better for children than standing thus in hot water, sponging them in tepid, and then giving them a dash of cold water at the last in winter, the sponging being all cold in summer. The moment the bath is over, the blood should all rush back again to the skin, making it glow as it is dried, and this active circulation has a most bracing and refreshing effect, and, conducted

with due precaution, is of the utmost value. There is no doubt the daily cold sponge is an admirable protection against catching cold. If the skin remain leaden and blue after coming out, it is clear the cold bath does not agree, and the temperature of it should at once be raised.

In river and sea bathing the best time is half way between breakfast and lunch, about 11 a.m., when the stomach is neither full nor empty, and the brain and body are fresh. It is a mistake, however, to suppose that brine is good for all skins. Those that are white, pasty, or inclined to scurf or eruption, are sure to suffer from sea-bathing, and none with any known affection of any internal organ should (from reasons we have already given) bathe without medical advice.

While a cold or cool sponge bath or swim is thus like a stimulant or whip to all the energies of the body, and is most beneficial in the morning when fresh, the hot bath (with or without soap) is a sedative and a help to the body when exhausted, and is best taken at night when tired. After severe brain work or any exhausting entertainment, a hot bath before going to bed will often ensure a night's rest, and greatly refresh and soothe the tired body or mind. We cannot leave the question of baths without one word in earnest protest against the instrument of positive torture that bathing is made to children in so many families. Any bathing that causes terror to the child is fraught with danger, and the blood-curdling screams that haunt our bathing resorts are not signs of benefits received, but of positive injury inflicted.

The Hot Bath.

Having thus provided for the cleanliness of the skin, the next point is to see that it is guarded against sudden changes of temperature by proper clothing. A skin that perspires freely is much more susceptible than a dry skin, and should be more carefully protected. We have already pointed out the special value of flannel next the skin, especially as a protection against chills.

Clothing and Food.

Food has a great effect on the skin. Those with poor, unhealthy skins should specially remember this, and do their best to improve them by careful dieting. Plain, digestible food only should be taken, all beer, spirits, pork, game, rich dishes, pastry, pickles, etc., being avoided. Most fatty food should be avoided; plenty of vegetables and fruit and white meat eaten, and above all plenty of milk, which is a wonderful beautifier of the skin.

The skin should not be unduly irritated or chafed by ill-fitting or too coarse or dirty garments, or by any poisonous dyes, such as are often found in stockings.

Having given these few hints on the general care of the skin, we will consider some of the more common diseases. These may be divided into *constitutional*, or those that depend on the general state of the body, and *local*, or those that depend on the state of the skin itself. Amongst the former we class all *rashes*, *boils*, *carbuncles*, *eczema*, *herpes*, *prurigo*, and *psoriasis*.

General Skin Diseases.

Rashes.—It is a safe domestic rule that any rash accompanied with a temperature over 100° is probably infectious, and the person should at once be isolated till the doctor comes. The rash of *scarlet fever* is a fine red blush on the skin; that of *measles* is in patches, raised and more or less circular; *chicken-pox* is in detached pearl-like pimples; *small-pox* the same, only each pimple is depressed or pitted in the centre. There are many rashes without any fever; these are not infectious, but are generally caused by indigestion. A redness in patches over the body is called *erythema;* a rash in white or red raised patches, as if stung with nettles, is called *nettle-rash*. Both of these disappear after a good purge has carried off the offending cause.

Boils and Carbuncles.—These are still more severe expressions of a bad state of the blood, particularly if there are more than one at a time. A carbuncle is a very large boil with several openings instead of one. You never can do any harm by poulticing these to bring them forward, and rubbing them gently over with belladonna ointment to relieve the pain. No carbuncle, however, should be treated without medical advice. Those on the back of the neck are most dangerous.

Eczema is a 'breaking-out' on the skin in the form of red patches covered with little watery pimples, that burst and produce a sore that soon gets covered with a yellow crust. Or, if of the dry variety, the red patch may be covered with dry scales. It is principally due to disorders of digestion; the tendency to it is frequently inherited, and often depends on the quality of the skin, and local irritation often gives rise to it. It is very common on the face amongst poor and ill-fed children, especially during teething. The treatment of it is threefold:

(1) The proper regulation of the diet and a suitable aperient.

(2) The removal of all scabs or crusts by warm oil or poultices.

(3) The covering of the raw surface with some mild and

simple ointment until the new skin is grown. If the air is once allowed access, a scab forms again, and the whole process has to be repeated.

HERPES, known sometimes as shingles, consists of a painful eruption of a row or cluster of pearl-shaped pimples, either round one side of the body or over part of the face and head. It is caused by irritation of the nerves, and the pimples on the skin follow the track of the nerve underneath. If small, they disappear in a week with simple dieting; if large, they are very apt to form permanent and disfiguring scars, and medical advice should be early sought for.

PRURIGO consists of an eruption of small colourless pimples all over the body that itch intensely. It is caused by some disturbance in the blood, and once more, apart from medical advice, a low bland diet and aperient is best, together with sponging the surface with diluted Goulard water or weak soda and water.

PSORIASIS is a scaly eruption that principally affects the knees and elbows. It is strongly constitutional, and appears in successive generations. No domestic remedies are likely to be of use, and even the most skilled physician often finds it impossible to cure.

Local Skin Diseases.

The other class of skin affections are of local origin, and include *acne*, *molluscum*, and *lupus*, generally on the face; *ringworm*, in the hair; *chilblains*, on the feet and hands; and *scabies*, *warts*, and *chloasma* in any part of the body. We will only speak of the last three at present.

SCABIES is an intense irritation, generally beginning in the hands or arms and spreading over the body, combined with pimples and sores (largely caused by scratching), due to the presence under the skin of a small insect. It is common in grocers and amongst the great unwashed. It is contagious, and when suspected, medical advice should at once be sought for, both to make sure of the disease and to remove it. Sulphur in some form is always used to kill the insect.

WARTS occur in an erratic manner, probably due to some local irritation, generally in the hands of young people. They are best removed by being touched with the glass stopper of a bottle of pure nitric acid, the yellow surface pared away, and the process repeated till the wart is completely removed, care being taken not to touch the sound skin.

CHLOASMA is the name given to a small brown fungus that

grows in erratic patches on the chest or back, giving it the appearance of a map. It is harmless, probably contagious, and largely dependent on the want of proper cleanliness. Scrubbing with a brush and soap and water will often remove it.

We must now pass on to consider the *hair*.

We have already examined its structure in Part I. It may be interesting to note the average number of hairs in a head. If it is black, which is the coarsest, it is about 72,000; if brown, 78,000; if flaxen, 88,000. Round hairs are straight; it is oval hair that curls on its flat side. A hair lives from 2 to 6 years. It grows more slowly after cutting. Incipient baldness can be detected by the shedding of short *pointed* (uncut) hair. This shows that the new growth is falling off, not the old hair. In severe fevers it is better to cut the hair short. It will probably all fall off afterwards in any case.

The Care of the Hair.

There are many common errors respecting the care of the hair, and we will therefore say a few words on this subject.

It is the popular idea that the more often a head is bathed and washed the better. This is a great error. Water swells up and rots the hair. Daily washing of the head is very bad. Men should wet and wash their heads weekly; women once in three weeks. When the hair is washed, the best thing to use is a little quillia bark and hot water; for fair hair a little carbonate of ammonia may be added; for dark hair the yolk of an egg and a little borax is very good. The cooler a head can be kept the better for the hair, hence the evil of the silk hat. All tight twisting or plaiting of the hair is injurious. The hair should therefore be undone each night.

Brushing and combing may be very injurious. The brush should have long bristles, and even then we must remember that we cannot brush the scalp too much or the hair too little. Pointed combs are an abomination, and frequently used are certain to irritate the skin and produce scurf; small-tooth combs are still more injurious to the hair and scalp. The brush should always be soft and the comb blunt. Anything that keeps the head hot weakens the hair, such as fretting or worry, or pads or nightcaps. There is a natural oil supplied to the root of each hair, which by careful brushing of the scalp can be drawn all its length, so as to give the hair polish and lustre. Should, however, anything else be needed, a drop or two of the finest olive oil carefully brushed in is the best addition to Nature.

After washing, the hair should always be dried in a honeycomb, *never* in a Turkey towel, which fills the hair with fluff.

With regard to the colour of hair, it is interesting to know that very fair hair contains magnesia, brown hair sulphur, and black hair principally iron. As a rule, the darker the hair, the sooner it turns gray. The silvery white hair often seen in young people is not due to loss of colour, but to the entrance of air globules into the hair that reflect the light. It is very different from the dull white of extreme old age. Ladies who dye their hair should remember, before doing so, that the hair is growing every day, and an undyed portion rising from the roots continually, so that, once begun, it needs to be perpetually continued.

The cutting of the hair short encourages the fresh young growth, and therefore is beneficial to the hair.

Diseases of the Hair.

The diseases of the hair are not numerous. We may say a word on *ringworm*, *dandruff*, and *baldness*.

Ringworm is not a worm, but, like 'chloasma,' a small fungus that tends to grow like the fairy rings in meadows, in circles. It may be known by the presence of a circular patch covered with stumps of hair broken off short, and fine white scales. It also occurs in rings on the face and body, but while easily cured in these places, it is most difficult to cure in the head, because it penetrates down to the roots of the hair, where it is very hard to reach it. No one can successfully treat it but a medical man, whose advice should at once be sought. Remember it is extremely contagious, and the one who has it should never use brush or comb, or towel or cap, belonging to another, for by these means it is constantly spread.

Dandruff, or scurf, consists of a collection of scales that fly all about when the hair is brushed. It is best cured by rubbing the scalp with a spirit-and-water lotion or a little Bay rum. It must not be confounded with a disease only found in neglected heads of dirty people, and caused by a small insect, the only cure for which is shaving the head, or, in mild cases, the persevering use of a small tooth comb.

Baldness is largely constitutional, though greatly aggravated by careless treatment of the hair. Sometimes. when occurring in ivory-like circular patches in a strong head of hair, it is caused by a tiny fungus, and is best cured by rubbing the places with a little tincture of cantharides or paraffin.

If the hair is generally thin and weak, two teaspoonfuls of

this tincture in four tablespoonfuls of eau de Cologne, used as a lotion, well rubbed into the roots of the hair, acts as an admirable tonic. If the cause of the weakness or baldness is some illness, then tonics may do good; if it is constitutional, they will probably be useless. The habit of plunging the head into cold water and vigorously scrubbing it with a rough towel, common amongst men, may, however, in any such case be left off with advantage.

The Care of the Teeth.

The Teeth next claim our attention. Teeth are, as we have seen, composed internally of dentine or hard bone, and covered with enamel-like porcelain, which again is protected by a very hard glaze. The place where this is thinnest is next the gum. There is nothing in a healthy mouth, however, that can eat away even this thin layer. Bad teeth generally arise (1) from indigestion, by which a powerful acid is formed that can penetrate this glaze; or (2) from the use of too hard brushes and gritty tooth-powder that wears it away; or (3) most commonly from food being allowed to lodge at the base and between the teeth, when it produces various acids and soon leads to decay. The same process penetrating the surface of the double teeth through cracks in the enamel (the glaze being already worn away by use), sets up decay there.

The best preventive is to keep the mouth scrupulously clean by the use of a *soft* tooth-brush used well near the gums to the back and front of the teeth after each meal, if possible, with some fine precipitated camphorated chalk or tooth-paste (tooth-washes are no good), and water containing 5% of carbolic acid. The water not only disinfects the mouth, but the tooth brush, which is of importance. If the taste of carbolic is objected to, a little Condy's fluid can be used in the water instead, only it must be remembered that it stains linen.

Toothache is best cured by a little pure carbolic acid on cotton-wool. Gumboils generally arise from inflammation at the root of some decayed tooth, and the best and immediate cure is to extract the tooth that causes the trouble.

The Care of the Face.

The care of the face is the important subject that next claims our attention. The texture of the skin of the face varies very much, and each variety has its peculiar drawback. If coarse and with open pores, pimples are very common; if fine and thin, rashes of all sorts are frequent. A greasy skin shines unpleasantly; a

dry skin cracks and peels. The best in this, as in all other cases, is a judicious average. The first point about a face is to know how to wash it without injury. The first rule never to be broken by anyone who has the slightest care for personal appearance is *never to use hard water.*

Hard water combines with soap and forms an insoluble stearate of lime that can be seen floating on the surface, and is as injurious a thing as can possibly be applied to the skin. The face can never be properly cleansed, the texture is injured, and the skin becomes hard and looks prematurely old. The *best* water is rain water. If this cannot be procured, soften the water with Maignen's Anti-Calcaire according to the directions on the tin. The water should be hot, and the face, unless the skin be tender or broken or out of health, washed with soap every day. But what soap? For common hard water, in which the hands *may* be washed, pure curd soap is the best ; for the face there is nothing (apart from advertisements) to beat Pears'. It is better to rub off a little in a jar of boiling *soft* water than to rub it on the face or flannel. First of all an abundance of hot, soft water being at hand, the soap being then prepared, and a soft sponge and flannel ready, the face should be well bathed with the sponge in the clean hot water. Then the flannel, covered with the soapy lather, should be persistently rubbed into every part of the face, and laid aside; the sponge should then be used for three or four minutes with the clean hot water to every part of the face, until the last trace of the soap has disappeared. The toilet can then be advantageously concluded by having a mixture ready of equal parts of glycerine and lemon juice, into which the fingers may be dipped and the least quantity rubbed into the wet face (partially contracting the too widely-opened pores), and the face then gently dried on a Turkey towel. A good substitute for the lemon-juice is cucumber-juice, under the form known as milk of cucumber. If the skin be tender or chapped, or the skin otherwise out of health, prepared oatmeal may be substituted for the soap ; but as a rule too little soap is used. The evil of using soap is *not in the soap*, but in the *hard* water. Of course carbolic, tar and all other common soaps must *never* be used to the face. Terrible rashes are produced by the misuse of scouring soaps.

Diet is of great importance to the complexion. As a rule all articles that flush the face when eaten are injurious. All kinds of salt, pickled, or greasy foods, are bad. The more the diet is composed of milk, and fruit, and farinaceous food, the

better. Beer and spirits are very bad. A little claret is harmless. Pastry, rich dishes, and heavy hot dinners, are bad. A useful and tasteless aperient, beneficial to the skin, consists in two teaspoonfuls of flower of sulphur gently stirred in a cup of warm boiled milk, and taken an hour before breakfast.

Gas is bad for the complexion, and all tight lacing is most injurious, and produces flushing of the face, ears, and nose. The general circulation should be good, and the feet and hands always kept warm.

Face powders are so largely and generally used that it is well to point out some of their dangers. The tendency of all powders is to block up the small orifices of the pores of the face, and as any obstruction tends to produce enlargement of these openings, the result is gradually to make the skin coarser. But this process is so slow, and the advantages in appearance supposed to be derived from the practice so great, that this will not probably deter many. If powder is used, of course it will be some innocent form of starch or rice-powder, and not any of the dangerous compounds of lead or bismuth. Enamelling, of course, entirely destroys natural beauty of the skin, and is a practice in every way to be condemned. Steaming the face and rubbing it well with the hand greatly improves the texture of the skin, and helps to clear the orifices of the gland, and prevents pimples, blotches, and wrinkles. It should be persevered in for five minutes at a time two or three times a week.

Disorders of the Face.

We will now consider some of the diseases of the skin of the face. Eczema, which is very common, has already been spoken of, and the cure of every outbreak is certain if the treatment be thoroughly carried out. To keep the ointment, however, constantly applied, a mask is often necessary.

Acne are little pimples, formed very often by the blocking up of the sebaceous or oil glands. They have often black heads, and are erroneously supposed to contain a little worm, which is the pent-up secretion, to which the shape of the gland gives a corkscrew appearance. They are very common on the sides of the nose, and are very disfiguring. Here soap and good rubbing with a flesh-brush (made of a piece of Turkey towel or flannel) every day, or twice a day, will speedily remove them. Any large pimples can be pressed with the end of a watch-key first to remove the contents. Sometimes these pimples are a good deal inflamed, and then the rubbing and

scrubbing is of course not applicable, and medical advice is required.

Acne Rosacea really consists in a chronic redness and roughness of some part of the face, very frequently the nose. Caused originally by alcohol, or by debility, or tight-lacing, it is often very difficult to remove. The persistent use, however, of one drug has great power over it; but the only domestic remedy for it is powder to conceal it.

Molluscum is a form of acne in which the pimples are as large as a hempseed, quite round and pearl-like. These, if pricked, are full of a white ointment. They are painless and harmless, but often come in crops, and are best prevented by the proper care of the face.

Lupus is a serious disease of the face, as it tends to get worse unless promptly and skilfully treated. It begins as a persistent pimple, which gradually spreads, forming a red patch, and lasts for years.

Some faces are always very greasy, from an excess of the oily secretion. This condition, if neglected, is sure to lead to acne. Careful dieting should be combined with local treatment to remove it. The best washes are white or red wine, according as the complexion is fair or dark, such as claret or Rhine wine. If this is objected to, toilet vinegar is good, or equal parts of vinegar and rosewater. A few drops of sal volatile in a little water is excellent.

Eosine, the essential part of red ink, is a harmless face pigment.

Freckles and any superfluous hairs, which are often externally disfiguring, can now be removed, but the process requires great skill, and should be undertaken by a specialist.

We will conclude with a few words on the care of the hands and feet. In washing, the use of soft water is equally advantageous to the hands or face, and indeed to the whole of the skin. To make the skin soft and white, and to heal any chaps, cracks, or fissures, the hands should be well rubbed over when wet with a little lemon-juice and glycerine, and at night, after rubbing this well in, a pair of well-fitting silk or kid gloves should be worn. Rough and red hands are also greatly improved by being washed in oatmeal gruel, with a little starch. The nails should be regularly cut to follow the outline of the finger. The skin at the bone and sides should be kept back by the towel or an ivory nail-cleaner after washing. No

The Care of the Hands and Feet.

sharp or pointed instrument should ever be used to clean the nails; a soft nail-brush is enough. If the hands or feet perspire too much, a little powdered boracic acid inside the stockings or gloves being dusted on is very good. If it be very persistent, the best cure is to rub a little of the extract of belladonna and glycerine (equal parts) on the palms and soles.

Chilblains on the hands or feet can be cured by aconite liniment, belladonna liniment, or painting them over with flexible collodion. Soaking in very hot water greatly relieves them, and the avoidance of cold feet or hands by maintaining a brisk circulation prevents them.

Bunions on the feet are generally caused by ill-fitting boots, which, instead of allowing the big toe to lie in a straight line with the inside of the foot, bend it outwards, and thereby a painful swelling is formed at the joint. Rest and cold application will reduce the inflammation, and a properly made boot will probably cure them. The boot should follow the shape of the foot. Some feet are more or less square at the end, and should have square toes. In others the toes are of more unequal length, and the boots are better pointed. This, however, matters little. The two great points in a hygienic boot are that the tread of the boot (across the roots of the toes) is the full width of the foot, and that the inner edge of the boot is very nearly a straight line.

Corns are best treated with Russian paint (or corn solvent), which can be procured at any respectable chemist's, and is applied with a small brush until the corn comes off.

CHAPTER III.

ON THE CARE OF INFANTS AND CHILDREN.

FEW parents have any idea of the immense value of intelligent physical, mental, and moral training, on the character of which it is not too much to say the future of the child mainly depends. The force of training is far greater than that of heredity, for Herbert Spencer tells us that a man is far more like the company he keeps than that from which he may be descended.

Value of Training.

Two children may be born into this world with equal physical, mental, and moral capacities; the one simply neglected and uncared for, save that it is early put to the drudgery of life; the other carefully trained in all three parts of its being, and the result will be that physically the latter will at eighteen be one stone heavier, three inches taller, and three inches more round the chest, straight in limb and sound in wind, while intellectually and morally there will be no comparison between the two.

Parents have to a certain extent to build the human houses of the next generation. They are given twenty years to do it in. It is true that if they do nothing at all, the house will get built somehow, and if they abstain from hindering the proper design they will do a great deal; but if, having intelligently understood the plan of the great Architect, they do their best to carry out His designs to perfection, they will do much more.

The bodily powers—the lungs, heart, etc.—very much depend on the size and shape of the case that contains them, which may be dwarfed and narrowed or expanded and widened, so as to produce a faint-hearted and weak-lunged child, or a stout-hearted and strong-chested child respectively. We are learning now the value of physical culture for other objects than strength. We find that health depends upon it, and to a large extent the development of the brain.

A sound mind s intimately connected with a sound body,

and without the latter the former can never find its fullest expression. The spiritual health, too, is more or less affected by the bodily condition. Let us then consider the subject of child-culture in relation to mental and spiritual as well as bodily health.

The waste of child-life is very great; the number of those that grow up imperfectly developed is also enormous. We see clearly that this may be prevented when we know that at Müller's Orphan Home, at Bristol, in spite of about three-fourths being children of consumptive parents, the death-rate is only 10 per 1,000, while amongst the neglected poor 500 out of 1,000 die, a considerable number being, as Mr. Waugh has so clearly shown, put to death for the sake of the insurance-money on their lives. The deaths that occur are in no way justified by the somewhat unmeaning phrase, 'The survival of the fittest.'

Were children *all* body, and our work only to try and rear the biggest and finest, just as we grow potatoes or pineapples, it might have some meaning; but seeing that after all a man is judged by his brain power and moral qualities, there can be no doubt that it is not necessarily the fittest that survive. Over-development of body is often associated with dwarfing of mental power, rather than its excess, and if we put the physical side of the question forward somewhat prominently, it must be quite understood that all for which we plead is its due consideration in conjunction with the rest of a child's nature.

The only training that can be good and solid must be cubical or threefold in character, and include the body, mind, and spirit. Just as a circle is the most perfect figure in nature, so an all-round training is the only safe one. Excessive physical or mental training only, as seen in athletes and some students, are alike bad, being one-sided. Child-life has been called the seedtime of health. We have already said that there is no such thing as a perfectly healthy child; that all are born with some imperfection or weakness derived from their ancestry; nevertheless careful training will do wonders. It will avert and actually stamp out threatened disease; it will brighten dull faculties and ennoble sordid spirits.

Circular Training.

Mrs. Meredith, of the Prison Gate Mission, has wonderful evidence to give on this subject. She says: 'The whole tendency of heredity can be conquered. Children of abandoned women, taken in earliest infancy from the mother

in prison, and possessing all their mother's qualities, can be prevented from using any of them in the same way the mother has, by education. They lead lives free from vice, their conduct comes up to an exceptionally high standard. Education, in short, protects them against the tyranny of their organization.' So much for moral education; the results of physical training are not less marked.

Being thus assured of the importance of our subject, let us consider how first of all we can best care for children in health, and secondly, look at some of their more common diseases and their remedies.

Rules for Infants.

In the care of infants there are six important points to remember—*cleanliness*, *proper food*, *clothing*, *air*, *rest*, and *exercise*.

Cleanliness.

All infants should be bathed at first in warm water, about bloodheat, or 96°, gradually reduced to 70° by the end of the first month. The water should be soft (rain-water is best), and curd or Pears' soap should be used, a soft flannel for the soap, and, when it can be procured, a Turkey sponge for the water. Very little soap should be used to a baby's skin, as it destroys the secretion of the oil glands, and renders the body liable to cold. The baby should be bathed before his breakfast. After the first fortnight he can be put in the bath, instead of being washed on the knee. He should not remain in it long, and be quickly dried with a warm soft towel, and then rubbed all over with the warm hand, puffed with a little rice starch (violet powder), and dressed.

Cold baths should not, as a rule, be given to infants till they are eighteen months old. The best way of giving them is to put them in a warm bath, and finish up with a sponging of cold water. As they get used to this, they can stand in warm water, and be sponged more freely with cold, and in hot weather the bath can then be taken cold altogether.

Great care should be taken never to frighten children at their bath, by plunging them overhead, or with too much roughness, and especially in sea-bathing.

A tepid salt-water bath is very invigorating.

The child should never be allowed to play about and get cool before the morning bath, but should be taken straight to its bath out of bed. Great care should be taken thoroughly to dry children after their bath, or sores and chaps soon appear. When quite dry, the parts liable to friction can be powdered.

All the little folds of the body, between the toes, etc., should

be dried just as carefully as the more accessible parts, and always kept clean.

A baby requires nothing but milk at first (*no butter or sugar*) and no laxatives. It should in every case be put to the mother's breast as soon as possible, and nursed at any rate for the first month, even if it be impossible to nurse it longer.

Food.

There is nothing in the world to equal mother's milk as a food for a newly-born child. It is from one-third to one-half less rich than cow's milk, and, for this reason, so much the more digestible. The best food for the mother is milk, the next best is, perhaps, cocoa. Nothing that tastes very strongly, such as onions, should be eaten; all rich food should be avoided.

With regard to the times of feeding the child, it should, in the first place, be fed regularly, and not always when it cries. This is of the utmost importance to both parent and child. For the first three months, every two hours in the daytime, and every four at night, is quite enough; and after then, if the child be strong and well, every three hours in the day and every six hours at night. The amount of milk that is yielded by a good nurse is about four tablespoonfuls in each breast every two hours. At first a child exhausts one breast only, later on, both. A child should, as a rule, be allowed to suck until it shows it has had enough. A child would then, if under three months, drink about a pint a day, and about a pint and a half, over this age.

When a child has sucked, its mouth should always be washed to prevent the formation of thrush, which is a small white plant that grows about the tongue and sides of the mouth. The nipples should also be well washed, and then hardened by sponging them with brandy. Of course, nursing is a great tie to a mother, who must be in at the regular hours, if she would do justice to her child; for if the food be given at too long intervals, the child takes it too quickly, and all sorts of stomach disturbances, often really dangerous at that tender age, are caused.

Occasionally, through worry or overwork, the mother's milk is too poor, or some sudden shock or other cause may stop it altogether, or it may become scanty and insufficient. In these cases it is better partly to suckle a child than not at all. There is absolutely no foundation for the popular idea that it is wrong to give the cow's milk and the mother's milk together. If the

milk be scanty, a better plan than giving the breast in the day and the bottle at night, is to give them alternately, or the breast twice and then the bottle once, according to the amount of milk.

Setting aside wet-nurses for the time as being, though far the best, too difficult to find readily when wanted, the great question, on the failure of the natural supply, is, what should be put in the bottle? In the first place, the bottle itself should always be kept perfectly clean. A boat-shaped bottle, with a calf's teat, is kept more easily clean, though inconvenient in other respects, and hence it is completely driven out of the field by other shapes. The bottles with long indiarubber tubes can be placed in almost any position without being upset, hence the mother can leave the child to suck by itself. This, though a convenience to busy mothers, is not a good plan, as too often it leads to the child gulping down quantities of air through sucking at the bottle when empty. If the long-tubed bottles are used, they must at once be emptied each time, well rinsed, and kept in soda and water. The milk—which is better if it is always, as a rule, obtained from the same cow—should be perfectly fresh and sweet; the least sourness is very bad for the child. It should not be kept in the bedroom, and the jug should be scalded and made perfectly clean. The least dirt, or drop of sour milk, will soon turn a whole quart. All the milk used should be boiled first. The proportion of water should be one-third, and if the milk be rich, a little more at first; and a small quantity of white sugar may be added. It should be given at blood heat.

It is very dangerous to keep the milk warm at night by a small light; the milk in this case constantly turns sour. It should be kept quite cold, and warmed only when needed. Nothing whatever but milk and water should be given to the child, if possible. After the first three months, only one-third of water is needed to two-thirds of milk. Should the milk disagree with the child, and heavy curds be brought up, then a little lime-water may be added, which may be increased, if necessary, until nothing but lime-water instead of water is added. Sometimes, when the milk is 'on the turn,' a pinch of bicarbonate of soda will put it right. The quantity of cow's milk to be given is from one to two pints a day during the first six months. If it be found to be too heavy, as is shown by curds being brought up or passed, some change must be made. Condensed milk is lighter than cow's milk, but generally

contains such a quantity of sugar that it often produces skin eruptions, and makes the child fat rather than strong; nevertheless, with some it agrees fairly well. Unsweetened condensed milk is four times as strong as cow's milk; it should therefore be diluted with water to six times its bulk. Barley water (two teaspoonfuls of pearl barley to a pint of water; simmer slowly to $\frac{3}{4}$-pint, and strain) and cream is very light. The artificial human milk prepared by the great London dairies is most highly to be recommended, and will nearly always agree with the babies.

If the child appears starved and hungry, and needs something more, some approved prepared *malted* food can be safely tried, and the full directions given with it implicitly followed.

Ridge's food, biscuits of any sort, and other milk foods must *not* be given till after the child is nearly six months old, since before that age it is absolutely incapable of digesting any sort of flour. More deaths occur from feeding young children on bread and flour foods than from any other single cause. It is calculated that 90,000 children die annually from improper feeding. One constantly hears, 'Oh! yes, poor little dear, it seemed hungry, so I gave it a little bread and milk,' or 'a little biscuit.' Sometimes, even worse. In the East End and elsewhere, young and ignorant mothers show the kindness of their hearts by giving their offspring a taste of everything, including a drop of beer, till one wonders that any survive the process at all; while cases are not infrequent where the infant's diet is varied with such succulent food as periwinkles, or a little cheese, and a drop of gin! Can we wonder that among the working classes in crowded cities 500 out of every 1,000 children die before they are five years old? After feeding, there should be no tossing or violent rocking of the child, or it is sure to be sick. Do not on any account feed the baby too frequently; it is a great and common mistake. After the first six months the child will go at night, from eleven to five, without food. Let me again, before leaving this subject, warn mothers against drinking spirits whilst nursing. It is found, on excellent authority, to be a frequent cause of convulsions in children, owing to the alcohol getting into their system; and it is also a cause of emaciation. Indeed, considering the freedom with which such materials pass to the infant, through the milk, it is cruel to the child if the mother drinks freely of stimulants.

If possible, a child should not be weaned in summer, but about

the sixth month the amount of nursing should be decreased; and, after the first teeth are well through, about the seventh or eighth month, the child may be weaned. It is a great mistake for mothers, for any reason, to continue suckling as long as fifteen or eighteen months.

After the sixth month a child can take Ridge's food, and plain flour foods, rusk, and biscuit. Rusks and tops-and-bottoms are very good at first; bread should not be given at first, until the child is well accustomed to the finer food. At eight or nine months the child can begin to take a little broth or beef-tea. Milk should always be the child's mainstay for the first few years of its life. Sugar is good for children, *with* their meals, and after one year a little meat may be given once a day. Oatmeal is very fattening, but rather heating. The diet should be light and nourishing. Light-boiled eggs are very suitable, and there is no objection to a little *ripe* fruit.

The great danger a careful mother is apt to fall into, when her child is between six months and two years old, is giving the baby too much farinaceous and too little animal food. We are apt to think flour foods can take the place of milk, but though they present somewhat the same appearance they are in reality very different from it. Milk is a truly animal food, and contains plenty of material for building up the child's body. Now a child requires, seeing it is growing rapidly, far more animal food in proportion to its size than a man, and this is most conveniently given in the form of milk. At eight or nine months, however, a baby may have a little beef-tea, and at fifteen months, a little underdone meat scraped into fine pulp, and moistened with beef-tea. A suitable dietary for a child of two years old is as follows: A breakfast of bread and milk, porridge and milk, or an egg; a dinner of meat, fish, or chicken, with a little mashed potato, and a light milk or egg pudding; a tea of bread and butter and milk, with a little treacle; and for supper, bread and milk. The child should continue to take at least 1½ pints of milk in the day.

We will consider now the way in which a child should be clothed. There is no doubt that there is room for a greater reform in infant clothing than even in that of adults. As much as possible of it should be flannel. A flannel binder round the body is very useful during the first few months. Napkins should only be worn when the

Clothing.

child is being carried about; at other times its legs should be quite free; no waterproof should be worn over the legs. A fine cambric should be next the skin, as we have no flannel yet quite fine enough for an infant's skin. A flannel garment should then be worn all over this and long enough to cover the feet. The cruelty in infant clothing is the enormous amount of material they are compelled to drag about. Starched frills, long trailing skirts, a ponderous hood, quilted and lined, tightly tied round the child's throat, a huge cloak with an equally huge cape hanging from its neck, too frequently completely smother and choke the baby, which forms the innermost core of the vast roll of clothing.

A baby indoors wants nothing but the binder, the cambric shirt, the flannel gown, and, if needed, a warm shawl. No tight-fitting linen or cloth dress, with its dangerous strings or pins, is required at all. For out of doors an extra soft woollen gown, and on the head a soft light woollen hood. The child's face should always be uncovered, and no thick veil or handkerchief to keep the flies off ever allowed. As a rule, save perhaps on Sundays, the working man's baby is far more sensibly clad than the rich man's.

At the age of four months, the child's clothes should be short. The change, however, should not be made in wintry weather.

These should also be flannel, and the sleeves loose, the neck high, but not tight. The sleeves must not be short. The legs should now be protected with woollen gaiters, and no infant should be allowed to go about with bare legs and arms, with the ridiculous idea of hardening them. At night, they should be all in flannel. As to shoes, a baby should wear soft woollen socks: no stiff boots or shoes should be allowed excepting when absolutely needed out of doors. Indoors the shoes should be the softest possible.

Air.

An infant requires an immense amount of light and air. Fresh air and sunshine not only invigorate and promote the growth of their young bodies, but they also check and destroy all germs of disease. Light is a great factor in forming good blood. No infant can thrive, even with every care, in a dull and sunless room, while on the other hand they do thrive wonderfully when they have plenty of light and air, and are often grossly neglected in other ways.

No infant should be brought up in a cellar, or on the ground

floors, if possible, in towns. The room should be on the first floor or higher, and should be sunny; whenever practicable, it should have a fireplace, and plenty of access for fresh air at night. The room should be as bare as possible, and be kept scrupulously clean. Young infants should not be taken out of doors during the first month; and for the first time a fine warm day should be chosen. Of course, if it is winter time, they should not go out until they are older. Long exercise in a perambulator soon chills a child; the nurse's arms are far better and warmer, and the continual exercise for the child as she walks about is very good for it.

Older children should be kept out of doors as much as possible, and, well wrapped up, they can endure most weathers, excepting east winds and rain. In summer, a child should be kept indoors in the middle of the day, and let out morning and evening.

Rest.

During the first few months of its existence a baby cannot sleep too much; it should sleep eighteen hours out of the twenty-four. It should be laid down to sleep at regular hours, and should not be rocked. Up to three years of age a sleep in the middle of the day is good, and is much more refreshing if the child is undressed for it. No soothing syrups or cordials for sleep should be given, save by special order of a doctor. A wet compress round the child's body will often soothe a fretful child to sleep.

Exercise.

This greatly depends on the clothing being loose and free enough to allow the infants full and free use of any limb. During the first year infants grow faster than at any other time, and gain about eight inches; so that if twenty at birth, they will measure twenty-eight. They also nearly treble their weight. If seven pounds at birth, they will weigh about nineteen at the end of the first year.

During the second year they will only grow half this height, and gain about as many pounds as they do inches, though in these matters children differ widely.

Children begin to walk between twelve and eighteen months. Heavy weak children should be kept off their legs as long as possible. Children begin to talk about the second year.

Disorders of Infancy.

We will now briefly consider one or two of the more common disorders of infants. The commencement of dribbling is always an interesting event in the nursery, being a pretty sure forerunner of the cutting of the first tooth. The milk teeth are

twenty in number, and the first that should arrive are the two middle teeth on the lower jaw; these are generally cut about the seventh month, the two front teeth of the upper jaw about the ninth, and the other two front teeth of the same jaw just afterwards. The remaining two front teeth generally come at the close of the first year; at the same time the first four double teeth appear, so this is a troublesome period in child history. The last four double teeth appear about the twenty-fourth month.

If teeth are cut out of their proper order, it is of no importance, provided they are not too long delayed.

If they are backward, a little phosphate of lime given with white sugar will soon bring them on.

During teething, infants are specially liable to convulsions, bronchitis, diarrhœa, and general nervousness. It is the later teeth that give the most trouble. It is a good practice to give the children a hard substance to gnaw at, but lancing the gum is not generally required, or beneficial.

Easy cutting of teeth is a good indication of general good health.

The ailments of infants spring, in nine cases out of ten, from the stomach, and from errors of diet. Diarrhœa is a very common sign, but is generally thought to be a disease in itself. It should never be allowed to go on, and if there be any evidence that the food is not being digested, an appropriate change will at once cure it. Medical advice in any case should be sought at once. Diarrhœa is frequently combined with flatulence, which is very common amongst children, and particularly those that are bottle-fed. This arises either from the decomposition of undigested food in the stomach, or, as is very frequently the case, from the positive swallowing of air in sucking an empty bottle, or in other ways.

Constipation is not uncommon, but should never be relieved with strong drugs. A little cold water is an excellent purgative; combined with a little glycerine, it is stronger. Domestic remedies should not go beyond simple medicines, such as castor oil or liquorice powder. The bowels in children can easily be regulated by food. A little oatmeal water when young, or a little porridge when older, will soon cure constipation.

Fits of screaming in the night often occur during teething, but should not be soothed with elixirs or sleeping draughts.

Vaccination is best done before the teething sets in, and should always be carried out thoroughly, as small-pox is very fatal in children. Care should be taken that the lymph is obtained from a healthy child, or fresh from the calf. This latter is, however, uncertain in its action, and the former, when it can be relied on, is best. A child ought not to sleep alone during the first few months of its life, but afterwards it should always sleep in a cot, and not in a bed. When in bed with its mother, its face should always be turned away, for fear of being overlaid, and the face ought on no account ever to be covered.

Rules for Children.

Turning now to children, we may consider their needs under the same six heads :

Cleanliness.

A child in good health should always have a cold bath in the morning in summer, and a tepid one in winter. He should always feel warm after it, and should not have it when very hot or very cold, or just after a meal. Cold baths should not be taken at night. Sea bathing is very good when the child comes out of the water warm. Timid children should never be forced to go into the sea. It is astonishing the amount of cruelty that is practised on children by otherwise affectionate parents through mistaken ideas of one sort or another.

For washing purposes, a warm bath at night, a flannel instead of a sponge, and plain curd soap, is best. If this is followed by cold sponging, the benefit of it is greatly increased, and especially if a tablespoonful of salt has been dissolved in water first (say a quart).

If young, the child should then be well dried, and afterwards briskly rubbed with the hand all over. There should be no dawdling, but the entire operation should be conducted smartly and briskly, the feet standing on cork or carpet, not on oil-cloth.

Food and Growth.

Good food is absolutely essential for proper growth. Few people are aware that a growing boy of ten or twelve requires as much food as a labourer through a long day's work. Growth is not so much a matter of caprice as is generally thought.

The ordinary rule of growth is that a child should increase 2 lb. in weight for every inch in height between 3 and 4 feet, and 2½ lb. for every inch between 4 and 5 feet. The following table is of value :

Height and Weight of Boys				Age.	and Girls.	
Working Classes.		Upper Classes.			All Classes.	
Inches.	lb.	Inches.	lb.		Inches.	lb.
41	50	—	—	5	41	40
43	54	—	—	6	43½	44
45	57	—	—	7	45½	48
47	59	—	—	8	47½	52
49	62	—	—	9	49½	56
50	66	53	67	10	51½	60
51½	70	54½	73	11	53½	66
53½	74	56½	80	12	56	76
55½	78	58½	88	13	58	88
58	84	61	98	14	60	96
60½	94	63½	110	15	61	104
63	106	66½	126	16	61½	110
64½	116	68	140	17	62	112
65½	122	68½	146	18	62	114
66	128	68¾	150	19	—	—
66¼	132	69	152	20	—	—

A child should increase in weight 2 lb. for every inch in height between 3 and 4 feet, and 2½ lb. for every inch between 4 and 5 feet. Children more than 7 lb. below the above standards should be examined medically.

If 5 feet is passed at 15 ... ... = short stature.
,, ,, between 13 and 14 = medium stature.
,, ,, ,, 10 and 11 = tall stature.

(*From Dr. Roberts' Tables.*)

Height is dependent to a large extent on birth and surroundings, and is closely connected with weight. In these respects the more favoured classes have the advantage over the less favoured to an enormous degree. The reasons are that they spring from tall and better developed parents, and they are better fed, less worked, and more exercised. That is, less indoor work, and more games and field sports. Those who are referred to as the more favoured classes are the boys in the great public schools and universities; the less favoured are from board schools, apprentices, and young workmen. Before twelve years of age boys average 1 inch taller than girls. From twelve to fourteen the girls grow rapidly, and pass the boys at fourteen by 1 inch. After fourteen the boys slowly pass the girls again. Girls need most watching from twelve to fourteen.

The growing time is a very trying time for health and

strength. A child should grow from 2 to 3 inches every year; if it is much more or less, it is suspicious. All sudden growth should be watched, and lessons relaxed, and especially when there is increase in height without increase of weight, which often leads to extreme delicacy.

Children, therefore, to grow well, should be well fed. Of course, some are over-fed, but far more are under-fed. Children do not require so much meat in proportion as adults, but a great abundance of wholesome farinaceous food. They should not be fed on pastry and rich dishes, but on abundance of bread, milk, eggs, and cereals (rice, barley, oatmeal, etc.) in every form. As a rule, a child should be allowed to eat as much as he will of plain nourishing food. Parents have some very curious notions on the subject of eating.

It is as cruel a thing to compel a child always to clear his plate, as it is at other times to refuse him more when he wants it. If you think the child is simply greedy, give him dry bread, but give him something. How often a child sickening in some fever has, by refusing food, even when sorely pressed, taught the mother wisdom.

Again, children often have a hatred and sometimes even a horror of certain articles of food. Fat, underdone meat, eggs, pork, liver, and other things are often hated by children, but a certain amount of fat or butter is desirable. In such cases it is unwise to press them beyond a certain point. Food eaten with aversion or under threats is pretty sure to disagree; and often, as we have seen, a child really knows far better what is suited for him than the too conceited and obstinate parent.

Children should not be allowed to go too long without food, especially in the middle of the day. If they cannot come home to dinner, make sure they have a good substantial lunch, and see that it is eaten, and that money that may be given to get it is not spent in other ways.

Another mistaken idea is that sugar is bad for children. It is, on the contrary, one of the nourishing articles of diet, and, taken pure with food, is quite wholesome. Not so, however, in the form of sweets eaten at all hours of the day, and of more than doubtful composition.

Three good meals a day are best for children, and early dinner.

Children should eat slowly, and use their teeth well. All raw foods and starch foods should be very well masticated. Watercress and lettuces are good for children.

For drink, pure water at dinner; at other meals, plain or flavoured with tea, coffee, cocoa or milk, as wished.

The clothing of all children should allow the freest motion of every limb and the full action of the lungs. It should be of uniform warmth, and not leave vital parts exposed. Unfortunately this is too often forgotten, and children are dressed in a fashion that their parents would not endure for a moment if applied to themselves.

Clothing.

For all children, flannel next the skin, loose over the body, but well fitting round ankles and arms, is a needful protection against disease caused by exposure; and money is much better invested in good underclothing than in trying to make children like fashion-plates.

For boys, first of all, flannel next the skin, then knicker bockers and a blouse form an admirably healthy dress, which can be followed by a sailor's suit later on. Of course, the woollen stockings are held up by suspenders, the garter being now practically abolished. A straw hat or a cap, and a pair of strong broad boots with low heels, complete the outfit, and are in every way suitable.

Boys' Dress.

The less of collar and buttoning up about the neck the better chance of developing a well-formed chest. In cold weather, however, the chest must be protected in children, not by mufflers or comforters, but by the clothes, for it cannot be too much insisted on that children require more warmth than adults, not less.

Again, there can be no doubt that a combination woollen under-garment is the most comfortable and healthy arrangement for girls. The legs ought especially to be thus protected, and not left bare, or with a single covering of cotton. Over this there should be a stout quilted bodice, on which the lower garments can be buttoned, and then a plain dress over all. The stockings, of course, are suspended. A sailor costume is a capital one for girls, and most healthy. We have seen the reason why woollen clothing or flannel is so good in Part I. Fine flannel does not irritate the skin, and even the tenderest children can get used to the stockingette flannel now so much used, which, moreover, shrinks far less in washing than the ordinary sort. In our English climate especially all the protection that flannel can give is needed, and it is far better to spend the money in warm clothes than in large fires.

Girls' Dress.

With regard to little girls especially, the absurd practice of

leaving the arms and legs bare in cold weather cannot be too strongly condemned. It has carried off hundreds to early graves, and predisposes to many varieties of disease, and especially to early consumption. It retards the circulation and digestion, lessens the vital heat, and is therefore a most cruel and pernicious practice. You will often see the parents comfortably clothed, while with blue legs and purple arms the little children trot by their side in their muslin frocks, often cut low, and exposed in such a way that unless they were little furnaces, it would be impossible to maintain their bodily heat; as it is, many fall victims to the senseless way in which they are turned out.

Warm woollen stockings are invaluable, and woollen mittens tend greatly to keep the hands warm. Flannel night-dresses in winter are also very good.

Light-coloured clothes are cooler in summer and warmer in winter than dark; dark colours absorb heat from the sun in summer, and from the body in winter.

Nothing tight should be worn round a girl's body, and, above all, no tight corsets, no tight boots, or collars, or tapes should be used.

Naturally, girls have no marked waists, and to attempt to form one by forcibly compressing the lower ribs is a cruel practice. A well-fitting bodice is all that is needed for the figure. Corsets on growing girls are a great evil in another way. They confine and restrain the growth of all the muscles of the back, and, by thus seriously weakening it, produce curved spines, round shoulders, and weak backs. No girl can have a graceful figure who has a flat or crooked back. The true secret of a beautiful figure is in a strong spine and well-developed muscles. This gives a poise to the head and an easy carriage of the figure. A capital exercise to produce this is to teach girls to march about carrying a light vessel of water on the head without spilling it.

The hair should be kept short in both sexes in childhood, though the head need not be shaved, as is sometimes done.

General Hints.

The eyes of children should be carefully watched, and no reading or sewing by twilight or by a bad light allowed. The proper position for reading is with the back to the light, so that it falls full on the page. Near-sightedness is often caused by over-study, bad print, and imperfect light. It is seldom found in children before their education begins, but often becomes rapidly developed after-

wards. The desks are often badly placed for reading, the book being far too low. The result of near-sightedness in children is generally a squint, which tends to become worse and worse, until at last, if neglected, the eyesight goes altogether in the bad eye.

Any child, therefore, that is suspected of being short-sighted, or that squints, however little, should at once be fitted with suitable glasses; and it is a curious fact, however careless children are in other respects, their glasses hardly ever get broken.

Another matter of great importance with children is their hearing. The ears of children are a constant source of trouble. Beware of neglected colds in the head in children, as they often lay the foundation of permanent deafness. Omitting to dry the hair after washing it is a common cause of this. Deafness is a frequent result of measles or of scarlatina. It may arise from a 'box' on the ears, or from a constant discharge which has gradually eaten away the inside of the ear. Children's ears, again, are often injured by putting peas, slate pencils, and other articles into them, and still more by attempting to get the peas, etc., out with hairpins and other instruments of domestic surgery. If there is any discharge from the ears, a doctor should be consulted at once.

The teeth are matters of great importance to children. A child with bad teeth has a bad digestion, poor appetite, and is in constant pain.

Children from their earliest years should be taught always to brush their teeth with a soft brush, night and morning, with plain water or a little soap.

Sweets and hot cakes are great enemies of good teeth. So are nuts, penholders, and string. The Americans, who are very fond of the injurious eatables mentioned, have the worst teeth and the best dentists. It is a great mistake to suppose the care of the milk teeth is of no importance. If they are lost early, the jaw contracts, and when the permanent teeth appear, they are too crowded, and soon decay in consequence. The first four permanent double teeth are peculiarly liable to decay, and should be examined early in all cases that they may be saved in time.

We have already mentioned that the hair should be kept short. This is most important for cleanliness and for the consequent avoidance of the many troublesome diseases that are prone to affect the heads of children. The hair-brush

should be soft, so as not to irritate the scalp, but not too soft, and should be freely used.

This is of the greatest importance, not only in keeping the hair in good order, but glossy; for constant brushing draws down the natural oil that is at the roots into the fibre of the hair and gives it a bright lustre. If the hair is very crisp and harsh, a little of the finest olive oil is the best pomade. Curl-papers and curling-tongs are both injurious to the hair, the latter being by far the most so.

Long heavy fringes are bad for the head, besides being ugly. As a girl grows up, the hair is best kept in a long loose plait down the back, and not twisted on the head till absolutely demanded by her age.

Shoes.—One word about children's shoes. They should be shoes and not boots, for two reasons. They give full freedom to the growth of the ankle joint, instead of restraining it in stiff leather; and they do not stop the circulation, as boots too often do, forming, as it were, garters round the ankle. Of course, no child should ever wear a shoe that pinches him. See, in the first place, that his stocking is broad and long enough, and then let the shoe be broad-toed and long enough when he stands up to stamp in it. They should be flexible, and always made to measure. The inner side of each shoe should form a straight line. The heels should not be high, and should be carefully watched that they are not worn down at one *side*.

It is impossible to over-estimate the value of these. On good air depends good blood, and on good blood the good building of the whole body and brain. Exercise increases the chest capacity by expanding its walls while still flexible, strengthens the heart and brain, develops the muscles, circulates the blood briskly, makes the skin act freely, and is of the highest value to the whole growing body. Before ten, children should do little else but play. From ten to sixteen they should have a minimum of two hours' active exercise each day; after thirteen to sixteen one hour. The best way to divide the day in early youth is nine hours for sleep, three for meals, six for mental, and six for physical exercise.

Air, Exercise, Rest.

Without exercise the best of food, care, and clothing is thrown away. Indoors, let the children's room be as bare of furniture as possible, and let them play and romp as much as they like. Do not keep children prim and quiet; the time for that will come all too soon. Let there be as much active out-

door life as possible. Here is the inestimable value of the country for children. The great evil in towns is not so much the air as the enforced indoor life. A short run is better than a long walk before breakfast. Children are too dependent on food to be able to take a long walk on an empty stomach. Long straightforward walks are indeed not so good for children as varied exercise, such as playing about the fields or garden in their own way. Walks are too monotonous, and hence often too tiring. In playing about, children can sit down when tired. A pony is, of course, admirable for children, and a donkey is not to be despised; riding increases the growth and circulation. Skipping, rowing, lawn tennis, rounders, and fives are of the very greatest value for girls; and next comes cricket, skating, swimming, riding, and golf. Cricket is better and safer than football for boys. Bicycling and tricycling are good for boys, but the latter should only be used in moderation by girls, for whom rowing is very much better. It is good to let children make a noise while playing, shouting and laughter being capital exercises for growing lungs, however trying for bystanders. Swimming is a fine exercise for both boys and girls. Encourage the girls especially in every possible form of outdoor life and recreation, only taking particular care in their cases against over-fatigue, and especially against emulating the feats of their stronger brothers.

Gymnastics are not always very safe; it is a remarkable fact that a large number of those who excel in gymnastics are found to have over-strained their heart. Drill is most valuable for boys and girls, and gives a good figure, while gymnastics almost invariably produce rounded shoulders, unless properly directed. Calisthenics, however, are most useful, and answer a different purpose from games. The latter constantly exercise the same parts of the body (generally the two legs and an arm), which often need it least. Proper calisthenics are specially directed to develop the body all round, and particularly the weaker parts.

Children especially need regular and sufficient sleep, a point of absolute necessity to the growing brain. The hour of retiring to rest must be regular and early, and to ensure refreshing rest the bedroom should be cool and airy (at least 10 × 8 × 10 feet), and all active brain work should be stopped at least half an hour before bedtime.

Education.—We now turn from the bodily to consider briefly the mental training of children. Let us see first what this means and involves. A child's brain is an epitome of its

ancestors'. If you teach it nothing at all, it will, nevertheless, develop a distinct character of its own, with peculiarities derived from its parentage. You have therefore no virgin plot to cultivate, but a soil already thickly sown, and your duty is quite as much to cultivate the natural good already there and to repress the evil, as to introduce fresh seed.

No age is too young to begin it at. From the earliest year the good should be developed, the evil repressed, and, above all, the will, if with bad tendencies, broken before the child is old enough to feel embittered by the process. Love should be the main-spring in everything, but unfaltering firmness as well. Few orders should be given, but those few always carried out. A child can be thoroughly trained in obedience by the time it is three years old, so that the after work is only light.

Again, the parents should themselves set an example of all they teach, whether it be love, truth, or justice, for children are keen observers. No child should be punished in anger or unjustly, but the cause of the punishment explained and clearly understood by the child. Orders should never be accompanied by threats of what you will do if the child does not obey you. You assume that it will obey you. Punishment is better than threats of inflicting it. Do not teach children to think you are perfection, otherwise it will be a great shock when they find you are not. In this, as in every other thing, teach the children nothing but what is true. I do not say it is good or wise for children to know all the truth about everything, but never allow yourself to teach or tell them anything that is not true.

Before regular school life begins, draw out your children's minds to think, exercise them in every way as you would their bodies. Never, however, try to make them clever or precocious. If you have a showy child, do, as you value that child's future, keep it back in every way; a premature bloom only means early decay. Do not lament if your child is not a genius; remember that for any undue development in one direction a corresponding weakness exists in another, and it is far better to have a good all-round character, free from any vicious tendencies. As far as possible, let the early lives of your children be passed in the country, and draw out all their faculties to observe and, as far as possible, understand the works of God. Answer all their childish questions as freely as possible, and encourage them to ask more.

Remember that the brain is the last organ to be developed in the human body. Let then the education proper not be

begun too early or too vigorously, and let it be only continued as the child is able to bear it. Look out for nature's red flags of danger. Sudden sleeplessness, continued headaches, sudden growth, or sudden stupidity—in short, any sudden change is a time for great caution. Little should be done in the way of formal teaching under seven years of age. Be sure the schoolroom is light and airy, the teacher just and kind. Try and make your child in every way as far as possible lead a happy and enjoyable life, and do not drive it into a premature old age. A healthy, happy childhood is the best preparation for a long and useful life.

All education should be a 'leading out' of the mind, a teaching to think and reason correctly. Teach your child as far as it can be taught common-sense, and suit his studies to his future in life. While they are children, too, the elementary facts of physiology should be universally taught. It is a disgrace for a man to understand a steam-engine, and yet to be ignorant of the simplest facts in his own body. As far as possible, make instruction interesting or even amusing.

With all your care, however, of the bodily and mental culture of your children, you will yet fail if you neglect their spiritual welfare. Even a child longs and yearns for something above and beyond material things, and here it is a joy to know that we have absolute truth to teach our children. 'Thy Word is truth,' only be sure it is God's Word you teach, and not your own thoughts about it. You cannot begin too young to teach your children 'God is love,' and then a little later on, 'God is light,' the first to awaken their hearts, the second their consciences.

Children's Diseases.

With regard to children's diseases, the following domestic remedies should always be at hand:

Fluid magnesia, ipecacuanha wine, German liquorice powder, castor oil and glycerine (equal parts), spongiopiline, lint, oiled silk, carbolic lotion (1 in 50), limewater and belladonna liniment, some adhesive plaster, a clinical thermometer, and a glass syringe.

The magnesia is for acidity and slight indigestion; the wine for croup or bronchitis, when the phlegm accumulates and can be relieved by vomiting; the German liquorice powder for constipation that cannot be relieved by dieting, as brown bread, porridge and treacle, etc., or by fruit raw or cooked (which is a good laxative); the castor oil and glycerine in small doses check a diarrhœa arising from indigestion, and in larger doses

form a safe aperient; spongiopiline makes a cleanly poultice for children, soaked in hot water; the carbolic lotion makes an antiseptic wash; the belladonna is good for sprains and strains. Water itself is a good aperient for babies, and a tepid enema is a safe remedy for young children.

We have already remarked that children are peculiarly liable to infectious fevers of all sorts. The special treatment of these, as well as of other common diseases, will be best considered when we speak of them in connection with adults, as in both cases the domestic treatment will be similar.

CHAPTER IV.

ON ORDINARY AND INFECTIOUS HOME-NURSING.

We have already shown that about seven millions of preventible cases of sickness take place in this kingdom every year; but, whether preventible or not, they all require nursing. We therefore shall endeavour in this chapter to give a few hints to amateurs on ordinary and infectious home sick-nursing.

The Room and Furniture.

First of all the sick-room. Too often there is no choice as to this. As far as possible, however, where there is, the following points should be borne in mind. For infectious cases, it should be at the top of the house, if possible; for all others, the quietest room there is, but never one on the ground-floor or basement.

The best aspect is south-west, so as to get the afternoon, but not the morning sun. The room must be light and cheerful; the paper of the same character. A glazed paper that can be wiped without injury with a damp cloth is the best. There should be as little furniture in the room as possible, especially if the case be at all infectious or very severe.

The bed should be placed between the fireplace and the door. A good wash-handstand, a table, and a chest of drawers, with an easy-chair for the nurse, a couch for the invalid when better, and a hard, uncomfortable chair for the garrulous friend, is all the furniture that is absolutely necessary.

A square piece or strips of carpet are best, with the boards varnished round, and nothing under the bed. A folding-screen is most useful.

A few glazed pictures can hang on the walls. A good plan is to have one in a good light near the foot of the bed, and change it from time to time.

Flowers, if not strong-scented, are not injurious in the sick-room, unless they are kept till they become stale.

The room should have a fireplace, and a free draught up the

chimney; fatal results have ensued from putting patients in rooms with a blocked chimney and no ventilation.

The Fireplace.

If the sickness be at all infectious or bad, a fire should be lighted and kept burning, in summer as well as winter, not on account of the heat, but because of its purifying effect in burning up the exhausted air and drawing in fresh.

A fire is of the greatest value in this respect, besides being somewhat of a companion, and always giving a cheerful air to the sick-room.

Care should be taken, especially in any brain cases, that no unnecessary noise be made with the fire. No fire-irons are needed; a piece of wood makes the quietest poker, and the coals are best wrapped up in small bundles in paper and put on by hand; or old gloves can be slipped on and the coal put on with them.

The bed should not be more than three feet six inches wide. If the illness is a very long one, two three-foot beds are best, side by side, so that the patient can lie on one one day and on the other the next; or a double bed, when the two sides can be used in the same way. The objection to a double bed is, of course, the difficulty of lifting the patient when needed, and of changing the large bedclothes.

The Bed and Bedding.

The bed should stand with its head against the wall, but never its side, or in the corner of the room.

A good spring-bed, with hair mattress, is perhaps the best and cleanest. If a hair mattress is not available, a flock or wool one should be used. If there is no spring-bed (and they are made very cheaply now), and there *is* a feather-bed, then put the feather-bed underneath, with the mattress on the top, but on no account should you let the patient lie upon the feather-bed itself.

On the bed should be a waterproof, then a blanket, next a sheet smoothly stretched out and well tucked in. Then, if the case be at all a long one, a sheet folded in half and laid cross-ways underneath the patient, and called a draw-sheet.

Two or three pillows in pillow-cases, and not rolled up in the sheet, the top one, at any rate, being of fine down or feathers, should be provided. The patient can generally arrange them best. They are most comfortable when they well support the shoulders.

The upper bedclothes should always be light—a sheet, a

blanket or two, and a light quilt, and, if needed, an eider-down or ordinary quilted coverlet over all.

For use on the bed, if it is a long case, a small light table with very short legs, six inches long, should be provided for meals, and a bed-rest; or a short wooden chair, turned upside down, and placed with its back supporting the pillows, will do instead.

In the sick-room ventilation is of the very first importance. The air must be kept perfectly fresh, and always at the same temperature. A thermometer should be hung on the wall on a level with the patient's mouth, and should not rise above 65°. The coldest time is two o'clock in the morning, the hottest three o'clock in the afternoon, and care should be taken particularly at these times that the thermometer does not fall or rise much.

Ventilation.

The top of the window should be kept open, with a little of the blind let down to prevent a draught. If the blind be a Venetian one, its laths should be turned up so as to direct the air upwards.

Three times a day the patient's head should be covered, and the window thrown widely open, top and bottom, for two or three minutes.

A little gauze should be stretched across the top of the open window to keep the dirt out, if in town, and insects out, if in the country.

The room must never be allowed to get at all close; whenever it smells or feels stuffy, the window must be opened more widely.

The door should usually be kept shut, as the air from the house is never as good as the air from out of doors.

The room should be kept clean and tidy. It should not be dusted, but wiped with a damp cloth, and all dirty articles put outside at once, and especial care taken that dishes, plates, cups and saucers, and bits of food do not accumulate on the table.

And now we come to the nurse herself, who, most probably, is the very person who is reading this chapter. What is required in a sick-room is knowledge without fuss, and sympathy without sentiment.

The Nurse.

Let us observe the following points in a good nurse: She should be always bright; not giddy and given to noisy laughter, but cheerful and hopeful. She should be quiet in her manner, but decided and firm in all she says, and quick and neat in all

she does. She should be gentle, too, in voice and touch, and speak quietly but distinctly. She should not whisper. She should not rush or rustle about the room. On the other hand, she should not glide about like a snake, and suddenly appear, to the patient's terror, in unexpected parts of the chamber. She should walk firmly and naturally. She must not, on any account, wear creaking boots. She should be scrupulously clean in her hair, face, hands, and nails, and in her dress.

This should be of washing material, but not much starched. An apron promotes cleanliness; a cap is a matter of taste merely. She must take a real interest in the patient, which she need not try to conceal, but at the same time *no anxiety* must be shown, whatever is felt. On this account near relatives, unless gifted with great self-control, make bad nurses. She must faithfully and loyally carry out the doctor's orders, which she must be sure she clearly understands. She must not worry or fuss the patient with over-care or over-attention. No change of treatment should ever be suggested before the patient. All she does ought to be done naturally and quietly, and without making anything of it. Food must be given at regular intervals; as a rule, not oftener than every four hours, and the patient must not constantly be worried to take a drop of this or a bit of that. In handling the patient, especially in dressing a wound or any painful operation, she must be firm, but very gentle and kind, and never show any disgust or reluctance to do whatever is needed. Medicines must be given regularly, exactly as ordered, only, as a rule, the patient is never to be waked up to take them. She should write down all orders and all notes, and *never* trust to her memory.

She must be very careful, smart, and clean in putting on and taking off any application or poultice, fomentation, etc., and most careful to remove at once from the patient and from the room anything soiled or offensive.

When not wanted she should sit down quietly and read or work, and not keep wandering about the room, or always watching her patient. The heat of the room and the ventilation must be attended to. If special food is not ordered, she must not keep asking, 'Would you like this?' or 'that?' but either use her own judgment, and bring up clean and well-cooked what she thinks will suit, or find out in conversation what the patient's tastes are. Only as much as the patient can eat at one time should be brought up.

Unless the food is specially ordered, if the patient objects

to it, she should not press it, but take it away, and substitute something else. If the nurse sleeps in a separate room, the best means for communication with her from the patient's room is by a flexible tube to her bed with a whistle, and an air-ball at the patient's end, which only requires a squeeze.

Visitors.

Do not let friends or visitors come at meal-times, and when they do come (the afternoon is the best time) put them in full view of the patient (not by his head) so that he can see them without fatigue, and set the chair, especially in any cases that are serious or possibly infectious, between the door and the bed, and not between the bed and the fireplace. In the first position the current of air is from the door to the bed, and the visitor thus gets nothing from the patient; in the latter it is from the bed to the fireplace, laden with all that comes off the bed and patient.

Arrangement of Patient.

Always take the greatest possible pains to make and keep the patient thoroughly comfortable. Settle the pillows and the head, if needed, every five minutes till the patient is thoroughly satisfied. However wearisome, unreasonable, or exacting the patient may become, never, under any circumstances, lose your temper. Do not pile the pillows directly one on the other, but let the lower pillow or pillows be more forward than the upper. Regulate the height and number of the pillows carefully, according to the wishes of the patient and the directions of the doctor. As a rule, in chest complaints and in heart complaints, the head should be high, while in many surgical cases and in some head troubles the head should be laid perfectly flat.

Bed Sores.

Be sure and keep the lower sheet well stretched, perfectly flat, and free from all crumbs. A little carelessness in this respect, in a prolonged illness, and the consequences are frightful. First of all the skin, where the greatest pressure is on the back, becomes red, then dark-looking, and then gives way, and a deep bedsore is formed—the worst feature of which is that, being often painless, its existence is not even suspected by an untrained nurse until it is well ormed. You should therefore, to prevent this calamity, which is regarded as a reproach on nursing, not only attend most scrupulously to the dryness and smoothness of the under sheet, but rub the patient's back night and morning with spirit and water in equal parts to harden the skin.

In any prolonged case you are again most strongly advised *not* to trust to your memory, but to keep a memorandum-book on the table. Head each page with the day of the month, and then each day note down everything of importance. This will include the temperature, morning and evening, the times and quantities of food, the hours for medicine, etc. Any peculiarities about the patient should also be noted.

Notes of the Case.

You must train yourself carefully to observe, and accustom yourself to note little things. For instance, notice whether the patient is restless or quiet; in pain or not, and where the pain is, and its character; the expression of the face; the state of the tongue, whether dry or moist; the state of the head, whether it aches; whether the patient suffers from nausea or not; the amount and character of sleep, whether it is calm and refreshing, or restless and disturbed. Observe the way the patient lies in bed; whether naturally or curled up; or very low, as if sinking through it. In the case of fits, mark their length and character, and the parts affected most. Notice the breathing, whether regular or irregular, slow or quick, quiet or noisy, easy or difficult. In bronchitis and lung diseases, observe the amount and the character of the expectoration. It is a favourable sign, especially in female patients, when they become anxious about their personal appearance. The moment you begin to see a woman tidy herself and begin to do up her hair, you may be sure she is better. Not long ago a distinguished physician, on his morning visit to a lady of title, stopped as soon as he entered the room, and turning to the anxious friends in waiting around, said, 'She's better!' He then went to the bed and examined her, and came out. He was naturally asked how he so quickly knew her state when he entered the room. 'Simply because,' said he, 'she had a ribbon in her hair.'

Little Things to be Observed.

These, then, are a few of the lesser things to note about a patient. Of course, all these small details need not be inserted in your memorandum-book, but the more important ones certainly should. It not only saves your poor head, but when the doctor comes, shows him at a glance the state of the case, and saves all that whispered question and answer, and talking in undertones, that is so trying to the patient, and which he always interprets unfavourably to himself.

Keep your patient perfectly clean. Wash his face and

hands as often as may be needed in the day, and the body all over every morning, if he is able to bear it; in others, half one morning and half the next; but the doctor's opinion should be asked for on this point. In doing this, much water should not be used, lest the bed should be wetted; a small part of the body only should be exposed at a time, but every bit of it should be scrupulously gone over. A little piece of mackintosh will save any danger of wetting the bed. The body should be well dried.

Washing the Patient.

As this is necessarily somewhat exhausting to the patient, food should be given either just before or just afterwards.

Changing Sheets, etc.

One of the chief things to learn is how to change the bedclothes without disturbing the patient.

The upper sheet is changed very simply. If the weather is warm you lay the clean sheet over the soiled one, having first taken off the blanket, and then draw the latter away. If the weather is cold, and you cannot take off the blankets, you join the top of the soiled sheet to the bottom of the clean one with the three safety pins, and then, drawing the soiled one down out of the bed at the foot from under the blanket, leave the clean one in its place.

To change the draw sheet, you gently turn the patient on to his side, and roll up the soiled draw sheet as far as the patient's back. You then half roll up the clean one and place the roll close against the soiled one, and then turn the patient gently over the rolls on to the clean draw sheet. The soiled sheet can now be withdrawn and the rest of the clean one unrolled, and the whole thing is done.

If there be no draw sheet, and you require to change the lower sheet, it can be done in two ways. If the patient can raise himself up at all, it can be done by rolling it from above downwards; if not, from one side to the other lengthways.

In the first case the fresh sheet is half rolled up across the bed, and the patient made to sit up rather low down in the bed. The soiled sheet is then rolled up across in the same way down to where he is sitting, and the roll of the clean sheet laid close beside at the upper part, being, of course, spread out, and the pillows replaced over it. The patient then just sits up a little higher in the bed, so as to get on to the clean sheet, and then he may lie down while the soiled one is being removed

from his legs, and the clean one unrolled in its place to the bottom of the bed.

In any prolonged case, the mattress should be turned both over and upside down every day or so. Of course this can only be done if the patient can get up at all, or if there is a second bed. If there be a double bed instead of two single, a capital plan is to put on it two single mattresses, so that when the patient is lying on one side the other mattress can be aired and turned.

As a rule, the doctor gives definite instructions as to this, but a few hints will make them more readily understood.

Food, and How to Give it.

Where there is fever, and in all typhoid cases, the diet must be liquid only. In all cases milk is the best food, cold or warm, plain or diluted, with soda or lime water. A quart in the twenty-four hours is the average quantity that ought to be taken, and is sufficient in itself to keep a person alive.

Beef-tea is a very deceptive article of food; it is expensive, and not very nutritious. To make it really life-supporting, a little prepared food (Ridge's, Mellin's, etc.) should be added to it. Strong beef-tea is a pound of lean meat to a pint of water (weak, to two pints), cut small, and gently simmered for four hours.

Three-meat tea is good, made from equal parts of veal, beef, and mutton. Chicken-broth is stronger than any other meat tea. There are various forms of beef essences, all best made at home, if possible. Brand's essence is nourishing, and good for very weak cases. Liebig's is useless as a food, though a capital stimulant, like a cup of tea. Where there is no fever, plain freshly-cooked and digestible food can be given. There is very little nourishment in jellies made with gelatine, but a good deal if made with isinglass. Ripe fruit, free from core, pips, and rind, can generally be given, and plenty of liquids to quench thirst. Toast and water, lemon and water, barley or oatmeal water, are all very good thirst-quenchers, so is weak claret and water. Ice, of course, in fever, is invaluable. If the patient is at all exhausted, he should be fed patiently and slowly by the nurse, and not too much at a time. A patient inclined to be sick should not be allowed to drink, but only to sip, or to take his liquid in teaspoonfuls. With children, especially, no cakes or sweets left by visitors should be eaten without permission.

The great point in making a poultice is to see that every-

thing is very hot. The basin should be scalded out first, and placed on a table near the fire; the water should be boiling, and poured on a small handful of crushed linseed-meal (of which all poultices are made, unless otherwise ordered) in the basin, stirring being continued vigorously in one direction all the time, until the whole is evenly blended into a soft mass. This should then be gently tipped on to the folded linen, lint, tow, or cotton-wool that is to form the basis, and quickly spread till it is about an inch thick; the edges should be squared off, leaving a margin of backing an inch broad all round. This should then be folded over the edges of the poultice, the surface of which may be quickly oiled over to prevent it adhering, and then applied directly to the skin of the patient. If the skin is very sensitive, a layer of net or gauze can be placed on the meal, so that it does not actually touch it. In no case should the meal adhere to the skin when the poultice is changed, which should be every two hours, unless otherwise ordered. The old poultice should never be taken off till the new one is prepared. Always remember the danger in poulticing is, not in putting them on, but in taking them off; for there is great danger then of the patient taking cold. When the last one is taken off, a layer of cotton-wadding should always be put in its place. If the poultice be covered on the outside with oiled silk, it retains its heat longer.

Poultices and Fomentation.

Fomentations consist of flannel wrung out of *boiling* water in a towel till nearly dry, and then placed on the part and covered with oiled silk, and changed about every five minutes. Properly applied, they are one of the most powerful ways of relieving pain that we possess.

Sometimes the poultice is ordered half mustard, which is then mixed with the meal.

If all mustard, the mustard is mixed with cold water and spread on brown paper, and kept on for twenty minutes or half an hour. In poulticing babies for bronchitis, it is always better to put the poultices on the back of the chest, which does not impede the breathing, than on the front of the chest, which embarrasses it very much.

Cold sponging is a most powerful means of reducing high temperatures, and often of saving the patient's life.

Sponging in Fever.

The water should be cold (or, if this is objected to, just chilled), sometimes iced, the sponge small, a small part of the

patient exposed at a time, and sponged over and over again till it is quite cool, then continued on another part, and so over the whole body. The process should take about twenty minutes. No drying, as a rule, is needed, as the burning skin dries itself as quickly as it is wet. Before sponging, and after sponging, the temperature should be taken, and always in these cases in the mouth, as the cold sponging of the arm-pits often makes the patient appear cooler than he is.

Baths. Baths vary in heat as follows :—

A hot bath is 100°,	and should be used for		10 minutes.
A warm bath is 95°	,,	,,	15 minutes or more.
A tepid bath is 85°	,,	,,	15 minutes.
A cold bath is 65°	,,	,,	5 minutes.

The first is a great restorative and sedative instead of sleep; the second is suitable for prolonged use and for cleansing; the last is a powerful tonic for those who are strong enough to bear it. No sick person should take a bath except under direct medical advice. If children are afraid of the water, they can be carried in a blanket and immersed in it.

Baths can be given in bed. A dozen soda-water bottles filled with boiling water, and well corked and covered with stockings wrung out of boiling water, and laid round the patient stripped, under the bed-clothes, make a capital vapour bath. The bed-clothes can be raised on wicker cradles, or by a couple of corkscrews, screwed right into them, and hung from above. Simple apparatus are made for giving hot-air baths in bed, which cannot be described here. There are also blanket baths, with a thin blanket wrung out of boiling water and wrapped tightly round the patient, which are very good for children, and 'packs' of all sorts.

In bronchitis, croup, asthma, etc., steam in steam-tents is invaluable. The latter you can make in five minutes. You want four long broom-handles, some string, two sheets, and a dozen large pins. You tie the broom-handles firmly to the four corners of the bed. You throw one sheet lengthwise over them to form the roof and two ends of the tent. You pin the other sheet round, leaving about three-quarters of the side open next the fire.

You then let your bronchitis kettle with a long spout, placed either on the fire or on a spirit-lamp, discharge the steam on a level with, or below (not above), the patient's mouth.

The proper heat of the body is 98½°. In taking the

patient's temperature, you must first shake the mercury in the thermometer till the top of it is down to this, and then insert it *under* the patient's tongue for three minutes, making him close his lips and breathe through his nose. If for any reason you cannot do this, put the bulb in the arm-pit for five minutes, with the arm closely pressed to the side.

Temperature, etc.

Give all stimulants exactly as ordered. If a patient seems suddenly failing, slow sips of cold water will often restore him. In extreme emergencies, there is nothing to rely on like brandy in small doses. Be very careful your patients do not lie with their arms and shoulders uncovered. Patients before now, in bed, perhaps, for a broken leg, have got inflammation of the lungs from carelessness as to this.

We now pass on briefly to consider the home-nursing in infectious sick cases. In towns it is getting more and more common to send such cases to special hospitals. In London every case of small-pox, cholera, diphtheria, erysipelas, scarlatina, typhus, or typhoid fever has to be notified to the medical officer of health for the district, on penalty of a fine. Unless there is a spare room well isolated from the rest of the house, a nurse entirely given up to the patient, and every precaution taken under the doctor's orders, the patient is better in a hospital. Before, however, ever allowing one to be removed, *be quite sure* that he has an infectious disease. Better wait a day, if the doctor is in doubt, than hurry off, as has often been done, a patient suffering from some form of nettle or other harmless rash to a fever hospital, there assuredly to catch what he had not when he went there. This point is of *great* and *real* importance.

Infectious Nursing.

Infectious diseases are those that can be transferred by air, clothes, etc., without contact with the patient. Contagious diseases depend on touch, but this distinction is not of much real value. All infectious diseases are caused by small germs, or vegetable spores, of which we will speak more particularly in another place. They are transmitted by the following means: by air, water, milk, clothes, the skin, the hair, flies, saliva, and excretions.

They enter the body at any part of the mucous membrane, or lining skin of the lungs, stomach, mouth, etc., or through any sore or broken skin. They take from three days to three

weeks before any symptoms of their presence are seen or felt.

Signs of Infection.

The first sign is generally a feeling of illness and a rise of temperature, followed, in scarlet fever, the next day by a fine rose rash; or in two days by scattered pimples, if small-pox; or in three days by crops of smaller pimples, if it is measles.

Whenever a person, child or adult, complains of feeling generally ill, take his temperature. To do this, every head of a family should possess a clinical thermometer, and know how to use it. The possessor of this simple instrument often foretells an illness in time, often saves a nurse, always helps the doctor, and never can hurt the patient. The ordinary way of taking the temperature is, first of all, to shake the mercury down below 98°, and then place the bulb in the patient's armpit, with the arm close against the side, for five minutes. It is more accurately taken in the mouth, under the tongue, with the lips closed, especially if the arms are thin. In infants and young children it is best to place the bulb in the bowel. Always make a practice of washing the thermometer *before the patient*, both before and after use each time.

If you find the temperature above 100°, put the patient at once to bed and search the body for a rash every few hours. The moment it appears, isolate the patient in a room. Of course, if a doctor is within call, you will have already sent for him.

Arrangement of Room.

When you have decided to nurse a patient in the house, you strip the room he is going in of all curtains, carpets, and decorations, the bed of all valances and hangings. You take all chests of drawers and clothes, etc., out of the room; in short, you leave nothing in the room but what can be washed or burnt.

The nurse has on a cotton dress. A sheet, *kept well wet* with a solution of carbolic acid, 1 part in 40, is hung across the door. The floor is sprinkled and wiped with the same lotion. No one besides the nurse ever enters the room but the doctor. When the nurse leaves it for exercise, she slips off her dress at the door and puts on another outside. She avoids speaking to people, and just takes her exercise alone and comes back. Every utensil, and all plates, cups, etc., are plunged in a tub of the same carbolic lotion, and pushed in it outside the door, whence they are taken out and dried. *No food* that enters the room ever leaves it again. The window is kept open as much as possible

night and day ; and yet, with all these precautions, the room is always infectious in a high degree, and no disinfectants known can disinfect a room while the infectious sick person remains in it.

All we can do is to prevent infection spreading. Handkerchiefs should not be used, but pieces of linen which can be burnt. All chamber utensils should be well disinfected with carbolic lotion before leaving the room.

In scarlet fever, when the dry scales begin to appear, the body should be well oiled with carbolic oil to disinfect them, and washed every night.

If the smell of carbolic is objected to, sanitas can be used instead.

The disinfecting of the room itself, after the patient has been removed, is generally carried out by the sanitary authorities, and consists in burning sulphur in the room, with closed doors and windows, in an iron shovel over a bucket of water, at the rate of 2 lb. to every 1,000 cubic feet, and then after 24 hours the room can be entered, the windows opened, the walls fresh papered, the ceiling whitened, and all paints and floor scrubbed with strong carbolic soap. All bedding, clothes, etc., must be sent to be baked by the disinfecters.

The nurse should not go nearer the patient than is necessary, and especially at meal-times. The dreadful thirst in high fever is best relieved by copious draughts of common water, not distilled or bottled.

Never forget the three duties you have to discharge in all infectious cases: the first to the patient, the second to those in the house, and the third to the public; and this will often guide you aright when in doubt. Remember, with regard to servants, that you cannot send one away home from your house if suffering from an infectious disease without being liable to prosecution. If, unfortunately, death should supervene, the body should be covered with a sheet wrung out of strong carbolic lotion, 1 in 20.

We append a few further notes on the various infectious diseases.

Details of Infectious Diseases.

Scarlet Fever is one of the most catching of all fevers, and in its case all the above directions must be most faithfully carried out. The signs are a sore throat, a fever, and a rash on the chest, of small red points close together.

If you cannot give the person a separate room and all the

above care, he had far better go away to the hospital than infect all the rest of the house and neighbours. The disease is very infectious after the rash has gone for a period of three or four weeks, or even more, when the old skin is peeling off. During this time the person should be well rubbed all over with carbolic oil. A person who has had scarlet fever is not safe to mix with other people sooner than from six weeks to two months.

SMALL-POX is very fatal, but, thanks to continued vaccination, is now quite a rare disease. The person feels a pain in the back, and spots appear on the face and arms like small shot. All people in the house should be vaccinated immediately, and the person should be at once removed to the small-pox hospital, if there is one; if not, nursed as directed in a separate room, and with every precaution.

TYPHOID FEVER is an infectious disease of quite another character. The disease is not carried directly from the person; all the germs pass away in the discharges, which are highly infectious. The great point in this disease, therefore, is to have them thoroughly disinfected before leaving the room, and to be sure that all milk and water is boiled before use; for, curiously enough, this disease is generally received through food or drink. All w.c.'s and drains should be washed down with carbolic solution or chloride of lime. There is not here the same need for personal isolation, but the greatest possible need for the perfect disinfection of all articles used in any way by the sick person.

TYPHUS FEVER is like scarlet fever, and requires the same precautions. It is highly infectious. The eruption is in purple blotches, and the person is generally more or less delirious.

A person infected with MEASLES is not generally, but should be, isolated like those we have named. It is most infectious before the rash appears at all, and hence the infection has generally already spread to some extent before the disease is recognised. After the rash goes, the disease is not nearly so infectious as scarlet fever.

CHICKEN-POX is a trivial disease as a rule, save for the danger of marking the face if the eruption is very deep.

GERMAN MEASLES is usually a slight complaint.

There are, however, other serious infectious diseases without a marked skin-eruption, such as cholera, diphtheria, and whooping-cough.

CHOLERA is frequently conveyed by water or milk. If at all prevalent, both should be boiled, and the greatest cleanliness in person and home should be observed most scrupulously.

Beware of bad drains, of bad fish, fruit, or vegetables. Anything that sets up even simple diarrhœa at such times is to be dreaded, and a doctor should be seen at once.

DIPHTHERIA is a dangerous disease; here the poison-germs fasten on the throat. The person should be isolated as directed in fever, and the doctor at once sent for.

In conclusion, we may once more say that in all infectious cases the neglect of any practicable precaution to prevent the spread of the disease, or the paying of needless visits to the patients, is morally wrong and worthy of severe condemnation.

CHAPTER V.

ON FOOD AND DRINK.

Varieties of Food.

THERE are four great varieties of human food, two of which are mainly animal, one vegetable, and one mineral. The four magic letters C,O,H,N, represent the four leading elements in all four varieties.

C—Carbon (the main ingredient in coal)—is the fuel of the body, and preserves its heat and does its work. Two of the foods especially contain this letter; one is animal, the other vegetable. The one includes all fat, butter and cream, which contain carbon in large quantities and keep up the heat of the body; hence in arctic regions enormous quantities of fat are eaten to keep the lamp of life burning. The other form of carbon is found in all flours, starches, and sugars. These, which form a large proportion of our food, carry on the work of the body, giving out as they are used up the necessary force for the purpose.

O—Oxygen—is the breath of life and though this really enters into all that we eat, we mainly receive it direct from the air by the lungs instead of by the stomach.

H—Hydrogen—again, though also forming a part of starches, sugars, fats, etc., is one constituent of water, of which by far the greater part of the body is composed. *Without water* there can be no life; any tissue that becomes dried dies at once. Hydrogen (in combination with oxygen) may be taken to represent the fluid of the body.

N—Nitrogen—is an essential element of all animal life. It forms a great part of the body-cells themselves, and hence serves as food to repair such waste of these cells as is perpetually going on. This substance is found principally in animal food, whether meat, fish, flesh, or fowl. It also occurs in smaller quantities in grain, corn, beans, peas, etc. Speaking, therefore, roughly and generally, we may say:

C, Carbon, such as fat, butter, etc., is for the heat of the body.

Carbon, such as sugar and starch, is for the work of the body.

O, Oxygen, is for the breath of life.

H, Hydrogen, contained in water and all fluids, is for the liquids of the body.

N, Nitrogen, contained in meat, some cereals, and peas and beans, is for the repair of the body itself.

In addition, a small quantity of some mineral is required in food, such as salt.

VEGETARIANISM.—One most important point must be here noted. Before 1838 it was believed nitrogen could only be supplied to the body by meat, and hence all vegetables occupied only a secondary place as food; but since then it has been discovered that many sorts of grain supply it to the body in large quantities, and hence it is perfectly possible to keep the body in health on vegetable food only. There is therefore now *no ground* for the great prejudice that still exists against vegetable food in the minds of Englishmen; and although it is probable we were never intended to be exclusively vegetarians, the fact remains that the introduction of proper vegetable food and cooking into the working homes of England would deal a great blow at the curse of drunkenness, and introduce a powerful element not only of health, but domestic happiness.

The four great varieties of food, therefore, are meats, or *proteids;* fats, or *hydro carbons;* sugar and starch, or *carbo-hydrates;* and *mineral* food, such as salt, etc. Of these four foods man requires each 24 hours $\frac{1}{4}$ lb. proteids, $\frac{1}{8}$ lb. hydro-carbons, $\frac{1}{2}$ lb. carbo-hydrates, $\frac{1}{2}$ oz. salts, and 2 quarts of water, which is fairly represented by $\frac{3}{4}$ lb. each of beefsteak, bread, and potatoes, 2 oz. of butter, nearly a pint of milk, and a quart of water.

The old division of these foods into two great classes still holds goods. The *flesh-formers* include the meats and salts; the *body-warmers* the starches and fats. Both of these latter owe their heat to the *carbon*, which *is the essential body-warmer*, just as *nitrogen is the essential flesh-former*. If we eat too few flesh-formers and too many body-warmers, we get fat and feeble. If we eat too few body-warmers and too many flesh-formers, we get lean and lively.

Flesh-formers and Body-warmers.

We have classed the fats and starches together, but they are

a little different in their uses. The carbo-hydrates, or sugars and starches, give out heat by combustion of the carbon alone, and are principally used to supply energy in the form of work-muscle, motion, etc., whereas the oils and fats (the hydro-carbons) burn both the carbon and hydrogen as well, and produce great heat, and are hence used principally for this purpose. Fat is worth double as much for warming purposes, weight for weight, as sugar; but, as those who have read the first part of this manual will know, it is ever so much harder to digest. It is easiest in the form of cream or butter. The salts have the power of dissolving albumen, the essential part of meat; hence salt is always eaten with eggs, which are nearly all albumen, and with meat. The water, of course, is a great solvent.

Of tissue food, or flesh-formers, a baby at birth requires daily 30 grains per lb. of body weight; or if 18 lb., 540 grains of albumen, or $1\frac{1}{2}$ pints of cow's milk or 2 pints of mother's milk.

This decreases down to 15 grains per lb. of body weight in old age; or for an old man of 11 stone, 5 oz. of albumen or 6 pints of milk daily.

Excess of any food is useless waste, and not only does not nourish the body, but seriously taxes the liver and kidneys, and especially an excess of animal food.

The fluid part of the blood is the storehouse for digested proteids, or meat food; the liver for digested carbo-hydrates, or starch and sugar; and the body fat for digested hydro-carbons, or fats and oils.

The amount of body-warmers required decreases only slightly from birth to death, in proportion to body weight, but varies greatly according to the work done and the health to be kept up. Any excess is much more easily stored in the body than in the case of proteids. In hard work double the amount of body-warmers are required than in idleness.

Articles of Food.

We will now consider the value of some of our leading articles of diet.

Milk.—This is an absolutely perfect food. It contains all the four letters C,O,H,N, and in their proper proportions, and it can repair and carry on any function of life perfectly. It can now be obtained perfectly pure in our large towns, thanks to our excellent sanitary laws, but is not nearly so much used by adults as it should be. It can be taken in about fifty different ways. It can be drunk hot or cold, plain or flavoured. It can be largely used with tea, coffee, and cocoa, and not merely a few

drops put in. It makes a large variety of capital soups. It can be eaten solid in the form of curd by letting it go sour, or by curdling it with rennet, and the whey that is left is also nourishing. Buttermilk and skim-milk contain, perhaps, the most nourishment for the money of any food. Skim-milk is a most powerful flesh-former, and contains all the nourishment of the food except the fat, and is very cheap. I have kept a person living for months on skim-milk alone, without a crumb of bread.

Condensed milk is a most valuable article of food, and is highly nutritious.

Butter and Cheese.—These are nourishing and palatable forms of fat, or body-warmers; but the poor might spend their money to greater advantage, as they are not very cheap or digestible. Cold bacon, dripping, and treacle are all cheap and nourishing substitutes for butter. Cheese is made from the flesh-forming parts of milk; butter from the body-warming parts, or that containing C. Cheese is a highly nutritious article of food. One pound of double Gloucester cheese contains as much nourishment as three pounds of lean beef, veal, or bacon, as nine quart bottles of Bass's pale ale, or six quart bottles of Guinness's stout. Rich cheeses, such as Cheddar, contain a large amount of fat as well. Cheese of moderate richness is easier to digest than that made of curds alone. We must distinguish between great nutrition and easy digestion. The two do not always go together, and, though cheese is so highly nutritious, many cannot digest it at all. Toasting it makes it still harder to digest.

Eggs.—These, like milk, contain all the different foods the body requires, the white being principally N, or flesh-forming, the yolk mainly C, or body-warming. When new-laid eggs are not more than a penny each, they are a most economical food. The ways of cooking them are unlimited.

Meat contains a large amount of N in its lean parts, which is thus the most powerful flesh-former known, and C in its fat or body-warming parts. In England more meat is eaten than in any other country, except perhaps America. Too much or exclusive meat-food leads to many serious diseases. The Americans, rich and poor, eat as much meat as they like, and suffer greatly from stomach complaints.

English meat is, of course, the best; but New Zealand mutton and American beef, though of less flavour, are quite wholesome. Beef is the most strengthening, but requires a

good digestion. Mutton is the most generally useful, and can be cooked in every possible way. Pork is indigestible; veal and lamb are less so. Few amongst the English working population have any idea of the value of bones; and, indeed, they cannot well utilize them until they establish on their hobs that capital institution—a *pot-au-feu*, or common stock-pot. This, made best of earthenware, contains much that would be otherwise entirely wasted, such as the stalks of vegetables, cold potatoes, scraps of meat, and all the bones and a little oatmeal. Slowly simmered down on the hob or by means of an oil-lamp, these form a capital stock for nourishing soup—an article of food almost unknown to the British working-man, like the art of stewing, by which it is prepared. The French labourer is far ahead of us here.

Fish.—This forms an important and an economical article of diet. It is principally a flesh-former, owing to the N it contains. Of white fish, the most digestible and the most nourishing are brill and turbot; next follow soles, whiting, and plaice. Fresh haddocks are a good and nutritious fish. Salmon is still more nourishing, and not so indigestible as is generally assumed. Fresh herring and mackerel are very nourishing, though, being oily, they are harder to digest. Dried fish should be carefully chosen, as it is frequently decomposed. Shell-fish, excepting oysters, are more indigestible than other kinds.

Bread.—Coming now to vegetable food, bread still holds the first rank, and is veritably the staff of life. It contains a large amount of N, or the flesh-former, and a still larger amount of C, or the body-warmer. Whole-meal bread is more nutritious than white, which is only formed of the inside of the corn; but much brown bread is only flour mixed with bran, and is not so nutritious as the genuine whole-meal. Oatmeal cannot be made into bread like flour, but is even more nourishing, and its use as porridge, so common in Scotland and Ireland, should be widely extended in England. Two lb. of bread contain 3 oz. of flesh-former and 20 oz. of body-warmer, and cost 5d.; while 2 lb. of oatmeal contain 4 oz. of flesh-former and 24 oz. of body-warmer, and cost 6d. Against this, 2 lb. of beef contain 7 oz. of flesh-former and only 4 oz. of body-warmer, and cost 1s. 10d. A full-grown man requires daily 5 oz. of flesh-former and 20 oz. of body-warmer. Consider these figures, for here we come to one of the greatest objects of this chapter, and that is to enforce the value and economy of a vegetable dietary. Dr. Parkes fed a labourer on 1¾ lb. of oatmeal and a quart of

milk a day at a cost of 5s. 3d. a week, and kept him in perfect health. Remember, 1 lb. of oatmeal costing 3d. gives as much strength as 3 lb. of meat costing 2s. 6d., or 6 quarts of stout costing 5s.

The most economical and best working food for a hard labouring man is a combination of this vegetable food with animal fat. Bacon and beans, or bacon and greens, oatmeal and bacon, bread and dripping, are all good foods. Any working-man can get a good savoury dinner, and as much as he can eat, for 4d. or 5d., and anyone who wants to know how, has only to go to one of the numerous and admirably conducted vegetable restaurants to learn the way. Haricot beans and broad beans are both extremely nourishing. Indian corn is cheap and nutritious, and might be far more largely used than it is ; but it will not make bread. Rice is not nearly so nutritious as corn. Lentils and dried peas, or pea-flour, are both very nourishing.

VEGETABLES.—Potatoes are principally valuable on account of the C they contain. They are thus body-warmers; but it must be remembered that at least three-fourths of them are water. The very best way of cooking them is by steaming them in their skins. Cooking by steam is excellent also for preserving the juices of meat, fish, etc., and, once a proper steamer is bought, the whole dinner can be cooked with less watching and at less cost than in any other way.

Green vegetables are very valuable for the potash and the salts they contain, which are very necessary for purifying the blood. Watercress is very wholesome in the spring. Most ripe fruits are wholesome, and generally contain a good deal of C, or body-warmer. Sago, tapioca, and arrowroot are light, but not very nourishing.

Sugar is of the utmost value as a food, and is easily digested. Eaten in excess as food, it produces acidity and indigestion.

As regards the comparative cost and value of food, it may be noticed that, of flesh-formers, one egg, costing 1d., contains as much as fifteen oysters, costing 3s. ; and ¼ lb. of rumpsteak, costing 4d., contains as much as five dozen, costing 12s. 6d., or as much as half a gallon of beef-tea made from 4 lb. of steak, costing over 5s.

How and What to Eat.

We will now consider how this food is best eaten, and what sorts are suitable under different circumstances.

It is a good rule to take three meals a day, and it is

exceedingly foolish to let the stomach fast above six hours at a time while working. After the principal meal, in order to ensure proper digestion, some leisure should be allowed. One of the best signs of robust health is the ability to eat a hearty breakfast. Every effort ought to be made to eat a sufficiency of nourishing food. It is lamentable to think how many, amongst young women especially, fall victims to diseases which attack them in a half-starved condition, brought on voluntarily by foolish dislike to meat, and by not taking a sufficiency of good vegetable food to supply its place. No human being can exist on weak boiled tea and a little white bread and butter.

Soup is good food for all ages, just because it is warm, and hot food is more nourishing than cold, and also because, properly made, it contains C,O,H,N.

An immense number of soups can be made of animal and vegetable food, without butcher's meat. Dripping, bacon, milk, or eggs will do as well, and they are all animal foods. We give two recipes for good soup for the poor, one with meat and one without.

With Meat.—Cut some meat into pieces, and stew for two hours. Then add to the meat and broth flour of any kind to thicken it, and as much milk as you can spare. Let it stew another hour, and flavour with salt.

Without Meat.—One quart of water, $\frac{1}{4}$ pint of green or split peas, 2 potatoes, 1 onion, 1 lettuce. Mix $\frac{1}{2}$ teaspoonful of sugar, 1 oz. of dripping, 1 tablespoonful of flour or oatmeal, and pepper and salt. Simmer till all is quite tender, and add $\frac{1}{4}$ pint of milk.

Soup is more digestible if bread be eaten with it.

Children should never be forced to eat what they do not like; the appetite and taste are fairly safe guides, as a rule. Girls, however, between fourteen and twenty, are often very fanciful, and take greatly to tea and slops. They should have at least one good meat meal a day, and if at work two. Sugar is a very good food for all ages; it is very nourishing and easily digested. It does not decay the teeth, but the acids of indigestion do. No work should ever be done on an empty stomach. Abundant green vegetables and fat in some form is most important. A good meat meal greatly increases mental vigour when digested, but many people cannot digest a cut off the joint as well as a long dinner of many courses.

Food varies very much in different countries. The Esqui-

maux near the pole eat little but fat and oil; the Mexicans near the tropics eat corn cakes and no meat. The South Americans eat horseflesh and no bread; the Chinese eat rats, cats, snakes, monkeys, and eggs when bad, but never taste milk.

In sickness we must remember that disease always hinders nutrition; we therefore diminish the food as the temperature rises—up to 101° semi-solid; above that it should be fluid. As the cell-tissue wastes too rapidly in fever, articles that arrest this, such as alcohol, tea, etc., are good. If the heat is under 104, milk, eggs, thin soups, and plenty of water can be given; if much over, water only, or ice, or whey, and alcohol in small and repeated doses.

Food in Sickness.

Certain diseases are due to deficient food of the right sort—some forms of dyspepsia, consumption, etc. The remedy is: alter the diet to suit, with plenty of air and as much exercise as possible.

Other diseases are due to excess of food, such as obesity, gout, rheumatism, biliousness, acute and chronic dyspepsia.

For obesity we stop all carbon diet and live on the proteids.

For gout and severe dyspepsia we take very little food at first, but lots of fluid, somewhat as follows: 7.30, half-pint hot water; 8.0, weak tea and milk, one slice fat bacon (no lean), bread, fresh butter; 1.0, milk pudding, biscuit and butter, and half-pint hot water; 4.0, half-pint hot water; 6.0, fish or fowl, greens (no potatoes), one-third pint claret; 9.0, half-pint hot water; 11.0, half-pint hot water. When better, we still carefully avoid all alcoholic excess, all hot or baked fats, all partly-cooked starch, all soups and pastry.

Turning to beverages, we need not say much about coffee and tea, which properly made, and taken in moderation, are free from harm. Cocoa, except when made clear from nibs, is not a beverage, but a food, so is milk, and it is a mistake to give these as beverages for thirst or to dilute food. Considering, however, the national importance of the right use of one particular beverage, alcohol, we will now enter fully into a consideration of it.

The importance of the right understanding of the value of alcohol is beyond all dispute, and must be an excuse for the space we devote to it. An industry using one hundred millions of capital in the United Kingdom alone, employing over two millions of people and two millions of acres, while in France it absorbs one-tenth of the whole land, and in Italy and Spain one-sixth, must be of enormous importance for good or evil to

the human race. It is calculated that, one with another, the population of Europe consumes an average of *four gallons of proof spirit per man per annum.*

All are agreed that alcohol is a poison, taken in sufficient quantities, and no other poison is taken so invariably as a food and as an article of everyday use. In this, indeed, constitutes its danger, for where the dose that is poisonous begins and the dose that is harmless ends no man can define.

Our own country is a great sufferer from the excessive use of alcohol. It causes deaths at the rate of 120,000 per annum, while, on the highest authority, it supplies seven out of ten of all patients at our largest London hospital. It is the commonest cause of grave accidents. Out of twenty-five severe cases admitted one Christmas Eve into this hospital, twenty-four were through drink. It forms eighty per cent. of our paupers. It is a common cause of fires, robberies, murders, and all sorts of crimes, many of which could not possibly be committed save under its influence. The misery and ruin it has caused, and the way it has sapped the health and wealth of our country, are alike incalculable. It is quite possible, alas! even probable, that there is not a single reader of this chapter but has suffered in his family, directly or indirectly, from this cause.

Present Results of Alcohol Drinking.

Why, then, has this evil attained such gigantic proportions? The answer is, Alcohol claims to be a stimulant, a narcotic, and a food. Let us first examine these claims.

Alcohol is a spirit distilled from sugar, and of the four elements—C, H, O, N: carbon, hydrogen, oxygen, nitrogen—necessary for the maintenance of life and work, it contains three—C, H, O, nitrogen, the essential element in the formation of all living tissue, being entirely absent.

Alcohol as a Stimulant and a Narcotic.

Now, what is a stimulant, and who are the class of people likely to have recourse to it?

A stimulant is a substance that increases mental and bodily pleasure, increases vital activity, and our connections with the external world. And seeing that all the world is after pleasure, all the world likes stimulants. It suits, however, more particularly those whose capacity for enjoyment is dulled either by too much indulgence or by exhaustion of mind or body. It suits all those who have the leisure and the means to obtain pleasure, and only lack the stimulating power to enjoy it, and especially, therefore, the rich.

What is a narcotic?

The opposite of all this. It is a substance that diminishes bodily and mental pain, decreases vital activity, and our connections with the external world. It is, therefore, suited to those who are in pain or distress of mind and body; those who have nothing to gain, but everything to lose, by fresh intercourse with the world; those who have no chance of sharing its pleasures, and to whose lot fall only its sorrows. Such are the poor, those who are stranded on the shores of life.

Alcohol is thus adapted, if it has these two properties, to the needs of both rich and poor.

We freely admit that alcohol is a stimulant and a narcotic of great power, but we assert it is a most pernicious one. Like another deadly drug, opium, which is as surely doing its fell work in the East as alcohol in the West, it is a stimulant in moderate doses, a narcotic in larger. There are other stimulants, such as tea, coffee, beef-tea, food, heat, oxygen. And there are other narcotics, as opium, chloral, tobacco, cold, carbonic acid gas.

Pure alcohol is double the strength of spirits, four times as strong as wine, and eight times the strength of strong beer. If spirit poured on gunpowder will explode it, it is said to be above proof; if not, it is below.

Now, food is a stimulant as well as alcohol; but food stimulates by giving fresh vigour and strength to every part of the body: alcohol stimulates exactly as a whip stimulates a horse, not as a feed of corn does. And unfortunately the human animal keeps whipping himself with it when he can ill bear it, when he is jaded and tired; and he obtains from it a fictitious strength that lasts a brief moment, only to be followed by greater exhaustion. It not only does not give the strength of food, but it does worse—it destroys the appetite for it. As long as a man can eat heartily his three meals a day, you may be sure he has not gone very far in alcoholic excess.

Action of Alcohol as a Stimulant.

Its power as a stimulant is due to paralysis. Each part of our bodies has an escapement action to prevent it going too fast, notably the heart. Take the escapement off a clock or watch, and see how merrily the wheels and hands will go round. It is great fun as long as it lasts, but, unfortunately, this is not very long. So with alcohol. It increases the action of the heart from 5,000 to 25,000 extra beats a day, and the effect of this on an already tired organ can be well imagined.

As a narcotic, it owes its power to increased paralysis. It is no longer the escapement only that is paralyzed, but the nerve-power of the organs themselves.

Alcohol as a Food.

Let us now consider alcohol as a food. There are four kinds of food, as we have seen: meats and salts, or flesh-formers; starches (or sugars) and fats, or body-warmers. Meats all contain N, or nitrogen, and as alcohol has not a trace, all are agreed it can play no part in building up the body. Starches, sugars, and fats all contain C, or carbon, by which the work of the body is done and the heat of the body is maintained; and inasmuch as alcohol gives increased activity and apparently increased heat, and contains carbon, it was long taken for granted that it was a sort of food of this class. We must remember we are speaking now of spirits only. Beer is a food; it has been proved that one part in every 1,666 is nutritious. Wine is a food to some extent, owing to the acids and sugars it contains, but it is extremely doubtful whether, in any sense of the word, pure alcohol is a food.

Alcohol is made from sugar, and sugar is a food, because it can be burnt up in the body. Alcohol is *said* to be burnt up in the body, too, like a swift coal. Sugar certainly carries on body work and maintains heat, though it will not do for body repair, having no N. At first it was assumed that alcohol was burnt up in the body, but it was observed that, if it were, it stopped the burning of other substances, for it decreased vital action and prevented the using up of other food materials. Like sulphur, it will burst into a flame, but it puts out the fire. Lately, however, scientists have begun to wonder whether, after all, it did burn. The clinical thermometer was used. It had long been known that when a man was drinking he felt hotter; but now the thermometer was put under his arm or tongue, it was found he was really colder. The man took more alcohol, and, strange to say, got colder still. Drunken men were tried, and their temperature was found to be very low, and warmth was found to revive them the quickest. It was shown that the burning up of a quart of wine artificially produced enough heat to keep the body at its proper temperature for eight hours. But the body heat is lowered when alcohol is taken. This, then, was the first great blow at alcohol as a heat-producer.

Next, it was found that, in proportion as all other foods were burnt up in the body, the amount of carbonic acid gas

given out (by the breath) increased in a fixed ratio. It was found, however, that, in proportion as alcohol was drunk, such was not the case—the carbonic acid was decreased. It is therefore decided, from this and other reasons, that alcohol does not burn in the body. It neither gives strength nor heat. It certainly does prevent the burning up of other food, and, what is worse, of the used-up products of the body. Like sewer gas, it preserves them instead of letting them burn, as they would in pure air. Hence the blood, laden with this unburnt refuse, darkens as alcohol is drunk. Alcohol, indeed, seems to check all the vital processes. This, which gives it its value after death as a preservative of animal tissues (in the form of spirits of wine), is a great evil during life, when incessant change should ever be going on.

Why does Alcohol Cause Warmth?

But, it may be asked, why does one feel warm after a glass of spirits and water? In the answer to this question we come upon one of the worst of its effects on the human body.

The bloodvessels in the skin are all under the control of a specially adjusted compensating and regulating centre that preserves the heat of the body, to which we have alluded. This centre closes all the capillaries if the weather is cold and the heat is to be preserved, and keeps the blood warm in the interior of the body; while, on the other hand, if the weather is hot and the blood requires cooling, it opens them up, and bringing the blood all to the surface, it rapidly lowers in temperature. Now this, which this centre does just when it is needed, alcohol does, whether it is needed or not, by simply paralyzing it; and hence the body, though the skin feels hotter, must get cooler. All feeling is in the skin, and it follows that when the blood is all brought there, and the skin flushed, that we feel hotter though becoming cooler. The skin is the damper of the fire, the ventilator of the body.

Those who are exposed to real cold weather soon find that alcohol cools the body. The Canadian woodcutters, for instance, though drunk in the cities a great part of the summer-time, are quite sober when out in the forests at their work in the winter, and little mercy is shown to any man who brings a keg of whisky there. Some time ago a party of twenty-six young men, crossing the Sierra Nevada, were compelled to camp out all night. They were all in good health and had two blankets apiece, but the cold was very severe. Unfortunately,

they had an abundant supply of whisky, which was dealt round liberally 'to keep the cold out.' Next morning showed the results. Three who went to sleep dead-drunk were now dead. Three men, who were not quite so far gone, were dying; seven men, who had drank heavily, had very severe frostbites; seven more, who had drank less, only lost some toes or fingers; three, who had only taken a little, suffered intensely from the cold; while the only three who abstained entirely were perfectly well. It is, therefore, always bad, and often dangerous, to drink alcohol in going from heat into the cold, and thus suddenly opening some seven million pores. It is beneficial sometimes in coming in from extreme cold to take alcohol, as it at once relieves congestion; but hot tea, coffee, or ginger does quite as well. The value of alcohol as a medicine is indisputable, but it is certainly not a safe article of daily food.

It is said that, for a strong man, half a wine-glass of spirits well diluted, three glasses of wine, or one pint of beer, taken with food, is harmless. More can doubtless be taken with impunity if there be plenty of pure air and exercise, but not in towns.

We will now briefly consider the effect of drink on the stomach and digestive organs. We have seen it is not a food; what, then, is its effect when taken into the human stomach? Its *only* good effect on the stomach is that sometimes, in the aged, taken in small quantities, it aids digestion—say in the form of a spoonful of old whisky in a little water. But what are its general effects when taken for pleasure? It dries up the mouth as it goes down, and a sufficient quantity causes a slow inflammation in the throat, producing a continual thirst. Arrived in the stomach, it first reddens it, bringing the blood to the surface. In health, the alcohol leaves the stomach in one minute; but if more be taken, and especially if the very fatal habit of dram-drinking between meals and in the morning be indulged in, the stomach gradually gets covered over with small painless ulcers, of which the man is therefore perfectly unconscious. Vomiting very likely comes on. The digestive fluid is destroyed and digestion stopped. Not only so, but the coats of the stomach, being irritated, become so enormously thickened that even if the food is digested it cannot soak through, but remains in the stomach indefinitely, so that food ejected may be that eaten several days before.

Effects on the Stomach.

On the liver its progressive effects are still worse, especially

in long-continued so-called 'moderate' drinking—for there is no habit more fatal than that of always drinking and never getting drunk. The liver is the great storehouse of digested food. It contains one-fourth of all the blood in the body. It also discharges many other important functions, as the manufacture of bile, etc. The effect of alcohol, first of all, is to enlarge the liver by the deposit of fat, which it has hindered being burnt up; but after awhile the continual irritation of the spirit causes the liver to contract and to get smaller and smaller; this brings on incurable dropsy and death. The liver in this case is easily recognised. It is a quarter of its right size, hard, like a nutmeg, and studded with lumps like hobnails—so that it is called the 'hob-nailed' or 'drunkard's' liver. Specimens can be seen in every medical museum. It is a common cause of death.

Effects on the Liver, etc.

As a rule, alcohol does not kill quickly. On the heart its effect has already been noted. It whips it up to such an extent that one single ounce of alcohol will make it give 8,000 extra beats in a day. At length it leads to the deposit of fat in the walls of the heart, so weakening it and leading to rupture. More broken hearts occur at the bar of the public-house than at the death-beds of the dearest friends.

Its effect on the bloodvessels is very marked, and peculiarly dangerous. It thickens them very much, and at the same time renders them brittle, which in the brain is very fatal. It inflames the eyes, and causes cataract. It produces numerous skin diseases, as all know.

In the brain its effects are well marked. At first acting as a stimulant, it produces a noisy state of semi-consciousness described as 'jolly'; as more of the poison is taken, the paralysis deepens and the person falls down helpless, unable to move hand or foot, but still breathing. If more spirits be given him in this state he dies. Taken continually in smaller does, it often sets up general inflammation of the brain. It produces high pressure in the bloodvessels, leading to apoplexy and paralysis. The effects on the mind are permanent and progressive. It deteriorates it in every way. A small quantity quickens thought just as it quickens the pulse, but it does not improve its quality. Weakness follows, and with prolonged drinking all the successive stages of life are passed through backwards: the man becomes a youth, the youth a child, the child an infant, the infant unconscious.

Effects on the Brain.

Drunkards are great liars, partly owing to defective memories. They are absurdly positive at the same time, and that about the merest trifle. Their body gets more and more from under the control of the will, which gets itself weaker and weaker. They then constantly perform involuntary acts and movements, while at the same time they find increasing difficulty in doing what they wish. They cannot even control the hand. Drink, then, weakens will and strengthens obstinacy. It weakens morality, also, terribly, and leads to crime. It is also transmitted to the offspring, so that children are born with the fatal love of alcohol in their blood. For all such total abstinence is absolutely imperative. The offspring, too, are often epileptic or hysterical.

Brandy in large quantities has caused sudden death by paralysis, but alcohol more generally produces the lifelong misery of a living death. Every progressive change carries its warning with it, but such is the fatal infatuation of this terrible poison, that it passes unheeded, and the course is generally from bad to worse.

Alcoholism a Disease.

It is a great mistake to look on drunkenness primarily as a crime. It is far more generally a disease, and in too many cases the causes are so sad that nothing but pity can be felt for the poor victim. Men who are drunkards are by no means generally the worst of men. They are often clever, kind-hearted, and generous. The women who drink are often brilliant and free from other vice. Human life is a twisted thread of three great strands—labour, joy, and sorrow. The poor have a superabundance of the first and last, and none can wonder if they seek a false joy in alcohol.

Climate and race are great causes of drunkenness. The warmer and more sunny the climate, the less this vice flourishes. This is a cause we cannot alter, and yet it is undoubtedly a very powerful one in England.

Poverty is probably both a cause and an effect. When we hear of three houses in Marylebone inhabited by seventy people, and paying £700 a year to one public-house, or £15 a week, one sees what an expensive vice this is. At some large mines near Knockmahon 1,000 miners who adopted temperance saved in one year £6,000, besides doing for their master £5,000 more work.

Occupation is a great cause. Night workers, commercial travellers, all public-house servants, are peculiarly liable to temptation, and as a result die very fast.

Bad homes are a great and preventible cause of drink among the poor. An untidy, dirty room, a careless, slovenly wife, bad cookery, and noisy children will often drive the best man, who has not sufficient principle to keep him straight, to the public-house.

Here lies a great field for practical reform. If ladies who are anxious to benefit others would consider this question, and set about forming large classes in towns for instructing young girls, who have otherwise no means of learning them, in the art of good vegetable-cooking, and household economy, they would do untold good to the homes and husbands of England. And so far from it costing more to cook well and keep the house clean and tidy, it costs less ; and it is those who have the most comfortable homes who will be found to have the most money in the savings bank, and yet to have no greater income than their poorer neighbours.

Unnecessary temptation is another great cause of drunkenness. There are too many facilities for drinking. At every corner a public-house ; all omnibus stations and cab ranks at public-houses. These are warm, bright and lighted, and always open. Sick clubs have their meetings there. In most cases it is the only working man's club in the place. To remedy this, legislation is needed. The sale of spirits especially should be greatly restricted or stopped. Wines are not much used in England. The beer should not be brewed above a certain strength ; all publicans should sell tea and coffee, and if they are called licensed victuallers, they should at least sell victuals as well. Stimulants are far less injurious if taken with food at the same time. In addition, there can be no doubt that more counter-attractions to the corner public-house might easily be offered ; but, after all, to reach the great bulk of men, the real reform must be in the place itself. Drinking is no longer either so fashionable or so common as it was, and social habits are certainly gradually improving. If women were to set their faces against drinking, they could soon reform England, and they can be but little aware of the enormous power that is in their hands, or they surely would wield it to better advantage than they do.

Many people call themselves moderate drinkers. A moderate and a safe drinker drinks *only* a small and stated quantity at meal times. Men who drink at public-houses, on the sly, in the morning, between meals, to ease pain or to give sleep, are not moderate, but mortal drinkers.

This brings us to another common cause—*ill-health.* We may also fly to drink as a remedy in weakness, in pain, in indigestion, and other troubles. It is a false friend, and is soon found to be far worse than the disease for which it was first taken.

Excitement and *depression of spirits* are great causes of drink. In England we drink most at weddings, in Ireland at funerals.

Worry and *pressure of business* cause drunkenness. People drink to forget themselves; they wish to die, and they go to the public-house and deliberately commit temporary suicide. *Idleness* is an opposite cause.

Heredity is a dreadful cause. In such cases there is no safety but in total abstinence for the children. The love of drink may persist through as many as four generations. The best thing that can be done is to encourage bands of hope and temperance amongst children. No child ought ever to touch stimulants.

Our survey of this one article of food has been prolonged beyond its due limits, but we trust that we have succeeded in setting the value of alcohol in its true light.

CHAPTER VI.

ON THE ORDINARY DISEASES OF DIGESTION AND CIRCULATION.

Diseases of the Stomach.

We now proceed to consider some of the more common diseases of the digestive organs and of circulation, as concisely as possible.

Dyspepsia.—This simply means indigestion. The symptoms of it are a coated tongue (the tongue being the mirror of the stomach), a weight or pain after food, loss of appetite, dark rings under the eyes, and sometimes vomiting or purging. Dyspepsia arises from four great causes:

First, and common amongst all who can afford it, *too much food.* Up to twenty, a person can hardly eat too much; from twenty to forty he should eat meat only twice a day; and after forty only once, as a rule, and begin generally to live sparingly. A terrible excess of meat is eaten in England, which is specially dangerous. Few who have not tried it have any idea of the comfort of living sparsely on plain foods.

Second, *improper food;* that is, indigestible in itself, or badly or too richly prepared.

Third, *too rapid eating*—another common error. Time at meals is one great secret of good digestion. Conversation and leisure at meals, and rest afterwards, are great aids to weak stomachs.

Fourth, *weakness of stomach* from some poison, from poor blood, from want of nerve force, or from debility.

All that can be done domestically is to regulate the diet, leaving off whatever causes pain, eat slowly and leisurely, and attend to the functions daily. An early consultation with a doctor will prevent much trouble later on.

Biliousness is another form of indigestion, not, however, generally in the stomach, but a little lower down, in the duodenum and liver. It is also produced by shocks of cold, tight-lacing, and want of exercise. The chief causes are excess

of fat or animal food. We remember that fat is always more or less hard to digest. The cause of the feeling of illness and headache has been supposed to be due to the presence of some bile in the blood. Such is not the case, for we do not get these symptoms even in jaundice, where the blood is full of bile. It is due to congestion of the liver, which is always present, so that a good deal of the poisonous, half-digested products of the stomach pass directly into the blood instead of being purified in the liver, and thus the body is self-poisoned. The symptoms are a feeling of nausea, intense frontal headache, coated tongue, and dull, yellowish complexion. The remedy is starvation, strong tea, and a brisk purge.

Ulcer of Stomach.—This arises from weakness in young people, and from alcohol in more advanced life. It is three times as common in women as in men. The symptoms are acute pain after food in one fixed spot, that can be covered with the point of the forefinger, under the breast-bone. Blood is also vomited up quite suddenly, and in considerable quantities. If a fixed pain is there (and sometimes felt right through to the back), a doctor should be consulted; but as the attacks of vomiting are very sudden, you must know what it is safe to do until he comes. Let the patient sit partly propped up in bed, quite still. Give nothing but a little ice to suck, unless the attack is bad, in which case give at once a small teaspoonful of turpentine or a tablespoonful of milk.

This disease must never be trifled with, and the doctor's directions must be most implicitly followed, particularly as to diet.

Vomiting.—This occurs from innumerable causes. If repeated and uncontrollable, send for the doctor. Meanwhile, let nothing be drunk, but only taken in teaspoonfuls; no solid food for some hours, and then very cautiously. Drop doses of spirits of chloroform in a teaspoonful of water every half-hour will often stop it. When it is impossible to stop at all, it is a grave sign.

Neuralgia of Stomach.—The most agonizing pain is often felt in the stomach proper, aggravated by the least food, and often accompanied by neuralgia elsewhere. It often causes vomiting, but little or no food, and no blood, is brought up. It occurs in overstrained and nervous people. It is not dangerous, though the agony may cause the person to writhe on the bed. The best remedy is a little hot ginger-brandy, or a few drops of chlorodyne in a little water.

Liver Diseases, etc.

Liver diseases are most common in tropical countries. That most frequent in England is contraction or atrophy of the liver from drinking, causing incurable dropsy and death. In the earlier stages we get great enlargement of the liver from the same cause. Congestion, overloading, and sluggishness of the liver, are very common, and all result in biliousness. Any dull pain over the liver may be safely treated with a hot poultice over the place, and a brisk purge is always beneficial.

Colic.—This is intense pain over the whole abdomen, and can easily be recognised by the temperature being normal, by its movement from place to place, and by its generally being relieved by steady pressure. It is agonizing, but not dangerous. It is generally caused by flatulence, a product of indigestion; and the best domestic remedies are hot ginger-brandy or peppermint cordial, chlorodyne, and a good purge.

Inflammation (Internal).—This may be of any of the organs in the abdomen, and is distinguished from the preceding by the temperature being raised, and by the pain being quite fixed and gradually getting worse, and by no pressure being borne, sometimes not even the weight of the bed-clothes. It is much more dangerous, and requires perfect rest and immediate medical advice.

Typhoid Fever.—This disease is situated principally on the right side of the abdomen, and consists of numerous small ulcers arising from the particular poison, and formed inside the intestine. The danger in the disease is their perforating through the bowel, in which case death ensues. They take ten days to form, are ten days at their height, and take ten days to heal. The poison is always taken in some liquid food, generally water or milk. There are a few scattered red pimples over the abdomen. The patient seems generally ill two or three weeks before the real attack, which always begins with diarrhœa. The temperature is generally about 101° at first. The doctor's advice here as to food must be carried out to the letter, as the least particle of solid food, even an orange-pip or grape-stone, might cause sudden death. Numbers have been killed by injudicious friends in this way. The disease does not infect people directly, but only through the excretions. These, then, must be carefully disinfected with carbolic acid.

The disease lasts about five weeks, and the most critical time, when most deaths occur from perforation or exhaustion, is the third week.

Congestion (Internal).—This is nearly always (if general) the result of a chill. Exposure to the cold drives the blood in such dangerous quantities from the surface capillaries of the skin into the internal organs that they become congested. The symptoms are a feeling of dull pain and general illness after exposure to cold, and the best relief is hot liquid food, such as soup or very hot spirits and water, the alcohol at once bringing the blood back to the skin. If the cold be severe, and yawning or dizziness occur, the feet should also be placed in hot mustard and water.

We now turn to some affections of the bloodvessels themselves. It will be clearly understood that these are a system of closed pipes, and if anywhere they allow any of the fluid (the blood) to escape, the consequences are dangerous.

Diseases of Blood-vessels.

Atheroma is a hardening and thickening of the artery that is dangerous, the tube being then much in the condition of an old indiarubber pipe when the indiarubber has got quite hard, and partly 'perished.' The symptoms are: the arteries feel and look like hard knotted cords, and the circulation is defective. A doctor should, of course, be consulted. The most frequent cause is alcoholic poisoning. The danger here is the artery bursting, through sudden strain. All such people should therefore lead perfectly regular and tranquil lives, free from all hurry or excitement. If the vessel should break in the brain, we have an apoplectic fit; if on the lungs, sudden difficulty of breathing or apoplexy of the lungs.

Varicose Veins.—This is a weakness in the veins, generally of the leg—brought on, as a rule, by prolonged standing (not walking). It may be caused by any weakening disease as well. The veins form knots under the skin just where each pair of valves is placed inside. The blood gets stagnant and bulges out the vessel sometimes to an enormous size, so that the leg almost looks as if a row or a bunch of grapes had grown under the skin. The danger of such a condition is twofold. It is the commonest cause of large ulcers of the leg that are hard to heal and very unpleasant; or part of the clotted blood may get broken off inside the vein and carried away by the blood stream. It drifts on until it reaches some small capillary, too small to pass, which it instantly blocks, generally either in the brain or lung, again producing apoplexy. Such veins should therefore never be handled or rubbed. Gentle firm pressure is, however, safe, and can be best applied by an elastic bandage,

which is better than an elastic stocking, as any desired pressure can be applied with the same bandage. It should be worn all day and taken off at night, and is the best cure for these veins. Of course, the prolonged standing which probably caused them should be discontinued.

ANEURISM.—This is a giving way in parts of the wall of some large artery, so as to bulge out and form a large round swelling, which, of course, beats like the heart as the blood is pumped through it. Wherever anything of the sort is suspected, the best medical advice should be sought, as the affection is dangerous and requires immediate attention. Meanwhile, the diet should be dry and little fluid taken, and the life and movements of the body very tranquil and slow.

We will now consider various poisons and disorders of the blood:

Blood Poisons.

ALCOHOLIC POISONING.—Although we have already spoken of this in the chapter on food and drink, yet it is such a common and fatal blood poison that once more we will briefly point out its effects on the system.

The *immediate* effects of the excessive use of alcohol, the extra beating of the heart, the flushing of the face, the heat and sweating of the skin, the confusion of the mind, and the subsequent loss of consciousness—all these and many more are due to progressive nervous paralysis. On the other hand, nearly all the *permanent* effects which bring in so many sorts of disease and suffering, and may eventually end in a miserable death, are due to its irritating effects on the different structures of the body. The distinction between its direct and indirect results is important. The poison is carried all over the body by the blood very rapidly after being received into the stomach. One of its properties is that it is a great preservative. Any animal substance placed in spirits of wine is preserved from decomposition. This appears at first sight a good quality, but is really a very bad one for us; for our bodies are alive, and they do not want preserving as if they were dead, but to be continually rebuilt and renewed, and the old material burnt up. Now, alcohol hinders this, and hence the blood becomes darker from the amount of dead material which is preserved instead of being burnt up. The parts that suffer most from its secondary or hardening effects are the digestive organs. Alcohol hardens animal tissue not only on account of its irritating qualities, but on account of its love for water, which it

draws out of any damp substance near, thus making this substance so much harder. In this way, after a time, the stomach of a drunkard becomes like a piece of very thick wash-leather, and loses by degrees nearly all of its digestive powers; and, if the spirit be taken neat, it may eventually be ulcerated as well. Most serious changes take place also in the liver, which shrinks up until the greater part of its functions is hopelessly destroyed. In this condition death invariably ensues from incurable dropsy. The bloodvessels themselves suffer greatly from having to convey this poison about the body. They are all thickened, rendering it more difficult, by giving less room, for the blood to flow, which, in the case of the brain, is especially serious. It is the cause of many internal inflammations, and produces an unhealthy condition of all the tissues.

Anæmia.—This is a great deficiency of the red corpuscles (or air-carriers) of the blood. The causes are insufficient food, bad close air, and weakening diseases. It is common in towns and amongst young girls. The symptoms are great pallor of the lips and gums, white face and skin, palpitation of the heart, and, owing to the want of air-carriers to the cells all over the body, great breathlessness, as if there were lung disease. This state is a dangerous one, as it renders the person liable to take fatally any disease that is about. It is cured by fresh country air, good meat diet, plenty of exercise, and some form of iron taken regularly for not less than a month.

Pernicious Anæmia.—This is a still worse form, and is not only caused by too few red corpuscles, but by too many white. It shows a thorough disorganization of nutrition. The patient is of a greenish white, very weak and very nervous. A doctor's advice must be sought for at once, as it may end fatally.

Jaundice.—This consists in bile circulating in the blood. The symptoms are great yellowness of the skin and the whites of the eyes, with a feeling of illness and constipation. The cause is anything that prevents the proper flow of bile into the duodenum. It may be a gall-stone that blocks the passage, in which case there is also agonizing pain on the right side, best relieved by hot baths and opium; or it may be from congestion, etc. In any case medical advice must be sought. A brisk purge is safe, and will do good. The disease, as a rule, is not as dangerous as it looks.

Gout.—The poison that produces gout is uric acid and

urate of soda, which is a substance composed of innumerable very sharp crystals like bits of glass. It is caused by too much rich, sugary, or animal food, such as old port, beef, and general rich living. It also occurs in a wasted and badly nourished state of the body, when it is known as poor man's gout. In these cases, however, the cause is more frequently the amount of beer that is taken. This crystalline substance, uric acid, is then being formed in the body itself from urea (which is generally excreted by the kidneys) by the failure of the action of the liver, is partly excreted as a sort of red sand, and the rest is carried round by the blood, and by it left generally in that part of the body farthest from the heart, namely, the great toe. As the blood here gets rid of it, and it is poured into the flesh, the pain is of course excessive, the toe gets red and swollen, and an attack of gout comes on. More and more of this urate of soda continues to circulate, and possibly the finger gets affected or some other part of the body. Not only, however, does gout attack the joints, but, like alcohol, these particles have an extremely irritating effect, and thicken the walls of all the tubes themselves very much, so that it is now much more difficult for the heart to pump the blood through. This strains the heart and injures it. The lungs, too, get their share of this poison, and the breath often gets short and difficult.

There can, I think, be no doubt that if less beer or wine were drunk, and less beef eaten, gout would soon become a rare disease; although, as it is strongly hereditary, it would take a generation or two to get it out of the blood altogether. Once an attack occurs, it is very apt to recur, and is eventually the cause of incurable disease. Like most real blood poisons, it affects more or less every organ of the body. In gout all the symptoms are really beneficial. The kidneys try and carry off part of the poison. We help them by copious draughts of water. The uric acid, as it is formed into urate of soda, takes the soda from the blood; hence we drink alkalis, soda water, etc.: the poison is deposited out of the way in different joints. These we rest, and, if hot, increase the heating poultices, while at the same time we avoid eating what produces uric acid—meat food and sugars.

Rheumatic Fever.—The poison in this dread disease is supposed to be lactic acid, but we are by no means so sure of this as we are of the poison of gout. Anyhow, animals fed with lactic acid get rheumatism, so that this poison will produce it.

This acid is largely formed by imperfect digestion; but in order that the disease may be developed, it seems necessary there should be exposure to damp and cold as well. Damp produces it even more than cold. We call it a dread disease, because when it attacks the young, as it so often does, it very frequently flies to the heart, and by forming deposits upon the edges of the beautifully made valves, prevents them from closing properly ever afterwards. The result is as follows: The heart propels at every beat, say, four tablespoonfuls of blood. Now, if one of these leaks back again because the valve does not shut close, it is evident, to get the right amount of blood properly round the body, the heart must beat more frequently or send more at a time. Owing to the beautiful principle of compensation in nature, this accident, which would at once otherwise lead to fatal results, is met in this very way. The heart does get both larger and stronger, and a person with heart-disease of this nature may thus live on to his full term; but he will never be perfectly strong.

It is therefore a dread disease, because it is a disease of youth, and as a rule the results are lifelong. Besides its effects on the heart, it of course attacks the limbs, differing from gout, however, in showing a preference for the larger joints of the body, such as the knee. As in gout, there is intense pain, and general fever occurs all over the body, with profuse sweats, by which it is believed that Nature is endeavouring to get rid of the poison through the skin. Every joint of the body may in turn be attacked by rheumatism, for here, again, it differs from gout, in moving from one part to another, instead of keeping generally to the one spot. The older a person is when he has the first attack of rheumatism, the less danger is there of heart disease. One bad feature of rheumatic fever is that it tends to return again and again, and each time weakens the person more and more. The patient should at once be put to bed in blankets, and medical advice obtained.

So far we have only spoken of one sort of rheumatism—rheumatic fever, but there are many other sorts scarcely less formidable.

Rheumatic Gout.—This disease, instead of attacking a joint and leaving it at the close just as it was before, deforms it more or less, producing curious thickenings of the finger-joints and elsewhere, and in the end making the joint quite stiff, and creaking like a new boot. Then, again, there is simple chronic rheumatism, constant weary pain in some joint or joints, or in

the bones of the body, often worse at night in bed than in the daytime. Then there is muscular rheumatism, that does not touch the joints or bones at all, but lays hold of the muscles, especially those of the back, when it is called lumbago.

The great feature of all sorts of rheumatism is the pain attaching to it. Fortunately an antidote to this poison is now found, and one that can speedily relieve the pain, though as yet no way has been discovered of preventing the disease from reaching the heart, where its ravages are generally painless, and hence all the more dangerous; for pain is one of our greatest safeguards, calling our attention to any injury that is being inflicted on us. Heat and rubbing with warm oil is a safe and good remedy for all rheumatic pains.

RICKETS is also believed by most to be due to a poison circulating in the blood of children through an excess of starchy or floury food and a deficiency of animal diet.

We must remember we are born flesh-eaters, and not vegetarians. Milk is an animal, and not a vegetable food, and contains a great quantity of nitrogen, that material which mainly builds up the growing body; hence children need, strictly speaking, more animal food than adults, only not necessarily in the form of meat.

If a child when weaned is kept too exclusively on flour and babies' foods of different sorts, and does not continue to take a large amount of milk in the day, which may be supplemented with porridge, beef-tea, or broth, and later on with pounded meat, it is likely to develop rickets, which can be recognised by some of the following signs: The child's wrists and ankles will be much thickened, as if there were bracelets round them beneath the skin. This is caused by the irritation produced at the growing ends of the bone. A row of knobs may be felt down each side of the breast-bone in front, from the same cause. The head will be found to perspire profusely at night, and the child will probably kick the clothes off. As the disease goes on, a little cold in the chest may be developed; and the bones being soft, the legs will bend and the child become bow-legged or knock-kneed, and perhaps walk on the side of the foot. The ribs may bulge outwards and the child becomes pigeon-breasted, and its forehead will be square. This disease is common, through mistaken feeding, amongst both rich and poor; and the best cure, in addition to the needed medicine, is a properly varied animal diet, with plenty of milk and oatmeal

as well, and, in addition, salt water baths to harden the soft limbs ; and very likely the child will be required to be kept off its feet altogether for awhile to let the bones straighten. This disease is all the more serious as the deformities it produces are permanent and likely to produce, especially in women, serious difficulties and dangers in after-life.

ing up of the air-cells—has similar symptoms, but all of a milder character. The patient must at once be put to bed, with the head a little raised. Nothing but liquid food given, and poultices applied. After a day or two the expectoration will begin: at first scanty and of a reddish hue, or even streaked with blood. On the tenth day the change for the better generally occurs. Careful and generally trained nursing is needed in all severe cares, and of course the best medical advice all through. This disease does not tend to return like bronchitis, nor does it become chronic—it is sharp and short.

PHTHISIS, or consumption, is the most dread and fatal disease in our land. Its ravages are terrible: 60,000 young people die of it in this country every year. It advances on the patient with noiseless tread, and deceives him with hopes of recovery to the last day of his life. It does not kill all at once, but gives us plenty of time to feel how weak and helpless we are in its grasp. Let us look it in the face. A burglar is not half so fearful if we tear his mask off. Let us see what this phthisis really is. It begins at first like a slight inflammation of the lungs, but before long the cloven foot is shown. It spreads, gets worse instead of better, and destroys the lung, by dissolving it, inch by inch. This dissolved lung is brought up in the expectoration, when it can plainly be seen by the microscope. When only a few inches of tissue are gone, the patient is said popularly to have 'lost a lung.'

There are three causes: *the soil*, *the sower*, *and the seed.*

The soil is inherited weakness of any tissue, giving a tendency to the disease. It is well to know, however, that more children of consumptive parents escape it than catch it.

The sower is the reception of disease by ill-health, or special exposure to cold or to germ-laden air.

The seed is the germ that enters, known by the name of Bacillus tuberculosis. This is a small vegetable rod, of which 600,000,000 can lie in a square inch, which, if placed in one continuous line, would reach ten miles. They multiply at the moderate rate of 1,000,000 an hour. They are coughed up in countless myriads, and as they dry are blown about as dust, ready to infect our friends. We will hear more about them by-and-by. Consumption can be, but rarely is, caught direct.

The treatment for consumption is, when its presence is really ascertained, or there be even strong grounds for apprehending it, to move to a dry climate of even temperature. Dryness is far more important than anything else. The great remedy is

a pure open-air life as long as it is possible, with plenty of nourishing food, exercise, and good warm clothing. Close rooms are death-warrants. Such air as Davos Platz in the winter can be borne out of doors by consumptives in an early stage, and the greatest benefits result. The air of the bedroom must be pure and dry. Fat, cream, butter, cod-liver oil are all good foods. The great thing in this disease beyond all else is to take it in time, and children of known consumptive parents should be carefully examined by a skilled doctor periodically.

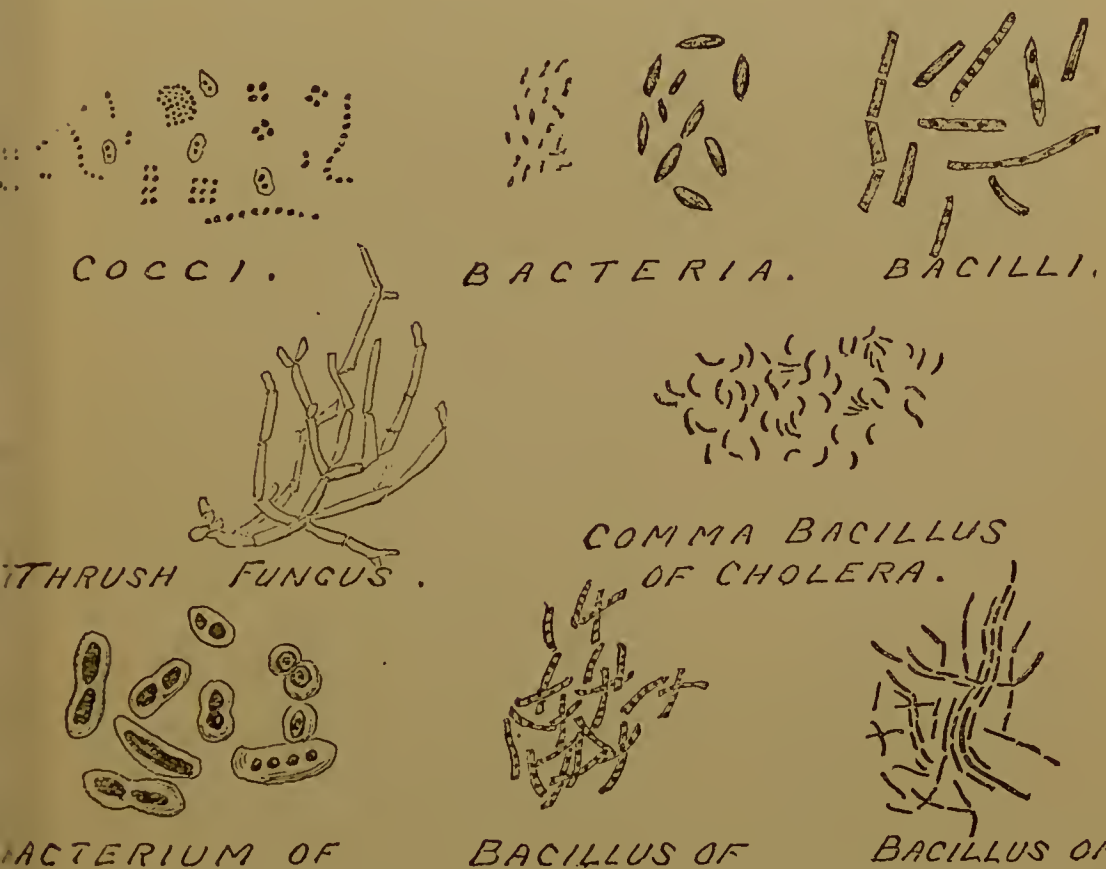
ASTHMA.—This troublesome disease is a spasm of the wind-pipe, giving the greatest difficulty in breathing, coming on suddenly, and generally in the middle of the night. It is hereditary and very chronic. It is best relieved by plenty of fresh air and standing at the open window, or by burning 'Himrod's Powder' and inhaling the fumes, by strong coffee, and by a very moist steam-laden air. Certain atmospheres will cure it as long as the patient lives in them. Often it is the close air of cities that does the most good.

EMPHYSEMA.—This disease consists in the bursting of many of the air-cells and the air getting into the lung tissues. The chest is very much expanded and the patient soon breathless. It is a chronic disease and comes on often with chronic bronchitis. It can be relieved, but not cured.

PLEURISY is not a disease of the lungs, but is an inflammation of the closed bag, called the pleura, that lies between the lung and the chest-wall. This bag is lined with a fine skin, called a serous membrane, and this gets inflamed with cold, or often from inflammation of the lungs inside, and as the pleura is always moving as we breathe, the first sign is a sharp pain (or stitch in the side) where the inflamed surfaces rub together. This pain differs from a neuralgia or pain in the ribs, for it only comes on when a breath is drawn and the pleura moved, and is not constant. The cure is twofold: one part is to draw out the inflammation by putting a mustard poultice or leaf on the spot, and the other to stop the movement by binding up the ribs tightly. Of course, a doctor must be sent for, as, if it is not cured in this stage, it goes on to pour out water, and as the bag is closed and the fluid cannot be coughed up, it is very troublesome, interferes with the breathing, and has often to be drawn off by 'tapping' through the chest-wall.

WHOOPING-COUGH.—This is another disease that comes on in paroxysms, and lasts about six weeks, and is most common in children. It is very contagious, and is caused by some

infectious germ. Try and teach the child that has it, to manage its cough, if old enough, and to restrain it as much as possible. The doctor has many remedies that moderate it and cut it short. The best you can use is gas-tar in some form or other. The blocks of fuel sold are soaked with it, and are better than coal if you have whooping-cough in the house. A little alum in milk is a very good remedy. As a rule, the doctor will allow the patient to take plenty of fresh air while this disease lasts.



GERMS.—We now propose briefly to state what at present know of this obscure yet fascinating subject. First of all as to the existence of these germs. In numbers they are formidable. Every pound of surface soil is said to contain the matter of some 500,000,000 of them, more or less. Every article of food, clothing, furniture, the walls, ceilings, floors, streets, houses—everything, in short, is thickly covered with them, including this very paper on which their secrets are now partially revealed. The air,

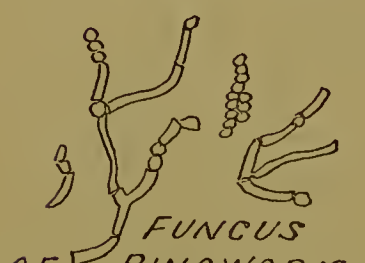
What are Germs?

indeed, is not so crowded; town air—real town air—averaging, the West with the East End, about 5,000 per cubic yard, while real country air only contains about 100. They are not found at the depth of one yard in the solid earth, nor at a height of 10,000 feet.

Now, what are these beings? Are they mere ideas, or are they animal, vegetable, or mineral? A common notion is that they are animals of some sort; the reality being that these and all other germs are vegetables, and not animals at all. They are also very lowly and humble vegetables—principally varieties of fungi, and consisting of the plant itself and the seeds or spores, of which some varieties are here portrayed.

Some of them never move at all, while others are always moving about, some with a smoothly gliding, others, again, with a tremulous, motion. These more active ones (still vegetables) are seen to avoid obstacles, and to free themselves from objects with which they may come in contact.

SPIRILLI.



FUNGUS OF RINGWORM.

BACILLUS OF LEPROSY.

The means by which they thus progress are not easily discerned, as they themselves are rather small, 20,000 being required to reach an inch, but it is believed to be by a lashing movement, produced by a small whip at either end.

These germs are not only numerous, but they are capable of increasing rapidly, being said to multiply at the rate of 1,000,000 an hour.

In the Royal Institution, on October 23rd, 1875, thirty small test-tubes, containing clear water, in which hay had been steeped, were exposed to the air. On the 26th they looked mouldy, on the 27th cloudy, and on the 29th muddy; and it was computed that 1,000,000 germs a day had fallen into each of these thirty tubes.

There are many varieties of these germs. Of the *dots*, or Cocci, there are at present eighty known and named varieties. Of the *oval* bodies, or Bacteria, there are fifty varieties. Of the *rods*, or Bacilli, there are forty

varieties. Of the *spirals* and irregular shapes, there are thirty varieties.

Source of all Decomposition.

The history of these beings is interesting. Their discovery gave us the secret of all decomposition, and at the same time told strongly against spontaneous generation. This quality of matter had been always asserted, and seemed incapable of refutation.

The labours of Pasteur tended in the same direction. He placed the most easily decomposed fluids—strong beef-tea, etc. —in tubes with very long, narrow necks, well boiled the fluid, and then, keeping the neck red-hot by a spirit-lamp, allowed the germ-laden air to have free access; when, all the germs being burnt up as they passed through, the liquid remained sweet. He did more: he drew out the long neck still further, and bent it round and round like a corkscrew; then kept decomposable fluids for months in the tubes, freely exposed to the common air. The germs could not traverse all the curves of the neck, and were deposited *en route*, leaving nothing but pure air to pass on. He then at the end of months broke the neck off short, and in twenty-four hours the beef-tea swarmed with life. In another he merely tilted the fluid up to reach some of the dust in the curves of the neck, and it soon decomposed. By these simple yet brilliant experiments, he showed that all microscopic life and decomposition were due to germs.

In 1850 the germ of splenic fever was discovered, and the researches of Pasteur and others on yeast, on the silkworm disease, and infectious diseases in cattle, made the study popular; while Koch only a few years ago showed how easily in certain fluids these germs could be cultivated at will in glass tubes, and their whole life-history studied. Pasteur has gone further, for he has shown how the wildest of these germs (if germs they be), that of hydrophobia, can not only be tamed and rendered harmless, but how they can in their turn be made, like a tame elephant, to capture and subdue their untamed fellows.

Professor Tyndall's celebrated discovery — that liquids, otherwise soon turbid and filled with animal life, would keep clear and free from life if every germ were killed by boiling, and all germ-laden air excluded by cotton-wool plugs, or the liquids taken to a pure Alpine air, where no germs are found at high altitudes—has long since passed into history.

Such are these innumerable beings which we can neither see, hear, taste, nor smell, but whose labours are so gigantic that

they slay hundreds of thousands of our race every year; and, having killed them, proceed to devour not only them, but every dead or dying thing, animal or vegetable, on the face of the whole world.

For it is true that but for their presence thousands would be alive who are now dead, but it is also true that but for their presence we could not live at all. Consider what would happen if every dead thing were preserved for ever. Imagine our England alone. Besides mountains of dead vegetable matter, the earth would be covered with the imperishable carcases of antediluvian monsters, concealed from view by innumerable bodies of later animals, to say nothing of the layers of dead Britons, Romans, Saxons, and Danes, with an upper crust of Normans, all, however, covered by myriads of English of later years.

The imagination, indeed, refuses to picture what this earth's surface would resemble were it not for these destructive and devouring agents aiding the decomposing powers of chemistry.

It is now found that the moment that mysterious antiseptic called 'life' is out of the body, or out of any part of it, legions of germs, like an army of navvies, set to work on every part and fairly carry it away, getting, however, none the larger by so doing, but dissipating the solid flesh into its component gases.

On the towers of silence of the Parsees in India, bodies exposed are picked clean in twenty-four hours by vultures, and in the same way, though unseen, these germ-vultures will leave, in only a short time longer, nothing but a bleached skeleton, which in its turn will eventually fall a prey to their insatiable appetites.

Interesting observations have been made on the tails of tadpoles, the gradual disappearance of which during the transformation of their owners into frogs is now found to be due to exceptionally ferocious and voracious germs termed 'phagocytes,' who devour them piecemeal.

How to Treat Them.

Germs may, indeed, be divided into two great classes: those which feed only on dead or dying tissues, and are unable or unwilling to attack others; and those which attack living bodies, and cause in most, if not all, specific diseases in both vegetables and animals.

The best mode of treating them is still hotly disputed. On their first discovery a surgeon stepped into the lists to do battle with these daring foes—with his carbolic sprays to kill them in the air, his carbolic sponges to kill them in the skin, his carbolic

water and oil to kill them on the very instruments used, and his carbolic dressings to prevent their subsequent formation in the wound, to say nothing of his well-carbolized wards, surgeons and nurses. These mystic rites are still solemnly performed by legions of his followers, and have doubtless caused the greatest consternation among the germ-hosts. Mortality has been largely decreased, and decomposition arrested, and the foe everywhere vanquished.

But, as usual, the pendulum has swung, and now we find surgeons, not, we trust, in league with these hidden powers of darkness, and certainly not less skilful and renowned, not destroying, but defying, and even ridiculing these unseen powers. This last-named school use no spray, or water, or oil, but boldly undertake the gravest operations with undisinfected knives and hands; and not only wash out tremendous wounds with warm water from the tap, in which something like thirty-seven species of germs are known to flourish, but boldly declare that if they could only get enough of them they would make their packings and dressings of germs, so harmless do they hold them. Such temerity is awful, and yet, it seems, is apparently justified by results.

In Lucerne, I remember being told by the intelligent surgeon in charge of the Cantonal Hospital, where many severe operations are done, what good results he had from disinfectants, from corrosive sublimate, and other lotions and dressings; but how, when at last he used undisinfected plain warm water, he had just as good.

This is doubtless somewhat distracting, but all seem to agree that the more cleanliness in every detail, the better are the results; and the general caution the discovery of germs has inspired has certainly greatly reduced the mortality in all surgical operations. A few more particulars may be of interest.

Germs are said to multiply in two ways; by fissure or breaking-off, and by spores or egg-like bodies.

These latter have wonderful vital power. Those found, for instance, in consumption, remain alive for months after being dried, and if moistened and inoculated will then produce the disease. Some germs, again, must have air to breathe; others, again, can do entirely without it. Some can live on vegetable food; others, again, must be supplied with animal or nitrogenous food.

Life History.

Most can resist cold better than heat, which is very fatal, except to these hardy young spores.

Boiling for half an hour kills all germs of any sort, and real drying and freezing kills all but spores.

All germs require water. The difference between germs as living poison, and mere chemical poison, is that the latter is destroyed and rendered harmless by dilution, whereas the former is not.

The germs are supposed to destroy life by their power of manufacturing a certain poison.

There are no germs in clean, healthy people, but wherever there is death, as in decaying teeth, or dirt, or disease, there they swarm.

One attack from them, if recovered from, as a rule protects from future attacks, seemingly by exhausting the particular soil in the body on which the particular species can live.

Exposure to the air greatly decreases the virulence of the more deadly germs. That which, for instance, produces fatal carbuncle was found to be harmless when exposed to the air for eight days.

Inoculation with these enfeebled germs protects against the fresh ones of the same species.

Experiment of Pasteur.

At Melun, in 1881, before an enormous and incredulous mob of professors, officials, and farmers, Pasteur demonstrated this fact. The occasion was so interesting, and marked such an epoch in germ history, that, as it may be new to many of our readers, we will give a brief description of it:

'It was on February 28th, 1881, that Pasteur communicated to the Academy of Sciences, in his own name, and in those of his two fellow-workers, the exposition of the great discovery (*i.e.*, of the possibility of vaccinating with germs weakened by exposure to the air, and thus protecting against the real disease).

'Hardly had the journals published the *compte-rendu* of this communication when the President of the Society of Agriculture in Melun, M. le Baron de la Rochette, came, in the name of the Society, to invite Pasteur to make a public experiment of splenic fever vaccination.

'Pasteur accepted. On April 28th a sort of convention was entered into between himself and the Society. The Society agreed to place at the disposal of Pasteur and his two young assistants sixty sheep. Ten of these sheep were not to receive any treatment; twenty-five were to be subjected to two vaccinal inoculations at intervals of from twelve to fifteen days, by two vaccines of unequal strength. Some days later these twenty-

five sheep, as well as the twenty-five remaining ones, were to be inoculated with the virus of virulent splenic fever. A similar experiment was to be made upon ten cows. Six were to be vaccinated, four not vaccinated; and the cows were afterwards, on the same day as the fifty sheep, to receive inoculation from a very virulent virus.

'Pasteur affirmed that the twenty-five sheep which had not been vaccinated would perish, while the twenty-five vaccinated ones would resist the very virulent virus; and that the six vaccinated cows would not take the disease, while the four which had not been vaccinated, even if they did not die, would at least be extremely ill.

'The experiment began May 5th, 1881, at four kilomètres distance from Melun, in a farm of the commune of Poully-le-Fort, belonging to a veterinary doctor, M. Rossignol, secretary-general of the Society at Melun. At the desire of the Society of Agriculture a goat had been substituted for one of the twenty-five sheep of the first lot. On the 5th of May they inoculated, by means of the little syringe of Pravaz—that which is used in all hypodermic injections—twenty-four sheep, the goat, and six cows, with five drops of an attenuated splenic virus. Twelve days after, on May 17th, they re-inoculated these thirty-one animals with an attenuated virus, which was, however, stronger than the preceding one.

'On May 31st very virulent inoculation was effected. Veterinary doctors, inquisitive people, and agriculturists formed a crowd round this little flock. The thirty-one vaccinated subjects awaiting the terrible trial stood side by side with the twenty-five sheep and the four cows, which awaited also their first turn of virulent inoculation.

'Upon the proposal of a veterinary doctor, who disguised his scepticism under the expressed desire to render the trial more comparative, they inoculated alternately a vaccinated and a non-vaccinated animal.

'A meeting was then arranged by Pasteur and all other persons present for Thursday, June 2nd, thus allowing an interval of forty-eight hours after the virulent inoculation.

'More than two hundred persons met that day at Melun. The Prefect of Seine et Marne, M. Patenot, senators, general councillors, journalists, a great number of doctors, of veterinary surgeons, and farmers, those who believed, and those who doubted, came, impatient for the result. On their arrival at the farm of Pouilly-le-Fort they found that out of the twenty-five

sheep which had not been vaccinated twenty-one were dead; The goat was also dead; two other sheep were dying, and the last, already smitten, was certain to die that very evening.

'The non-vaccinated cows had all voluminous swellings at the point of inoculation, behind the shoulder. The fever was intense, and they had no longer strength to eat. The vaccinated sheep were in full health and gaiety. The vaccinated cows showed no tumour, they had not even suffered an elevation of temperature, and they continued to eat quietly.'

An extraordinary movement was everywhere produced in favour of vaccination. In 1882 the number of animals vaccinated amounted to 399,102, which included 47,000 oxen and 2,000 horses. In 1883, 100,000 animals were added to the total of 1882.

Some germs behave peculiarly, that of erysipelas, for instance. If pigeons be inoculated with this germ, and then other animals inoculated with their poisoned blood, it is found that the germ has become more deadly, whereas if passed in the same way through rabbits it gets weaker and less deadly. The poison of hydrophobia again, as Pasteur shows, if passed through monkeys diminishes in power, while through rabbits it increases. Constitutions, too, differ. Field mice inoculated give no result, while town mice inoculated with the same germs die of blood-poisoning.

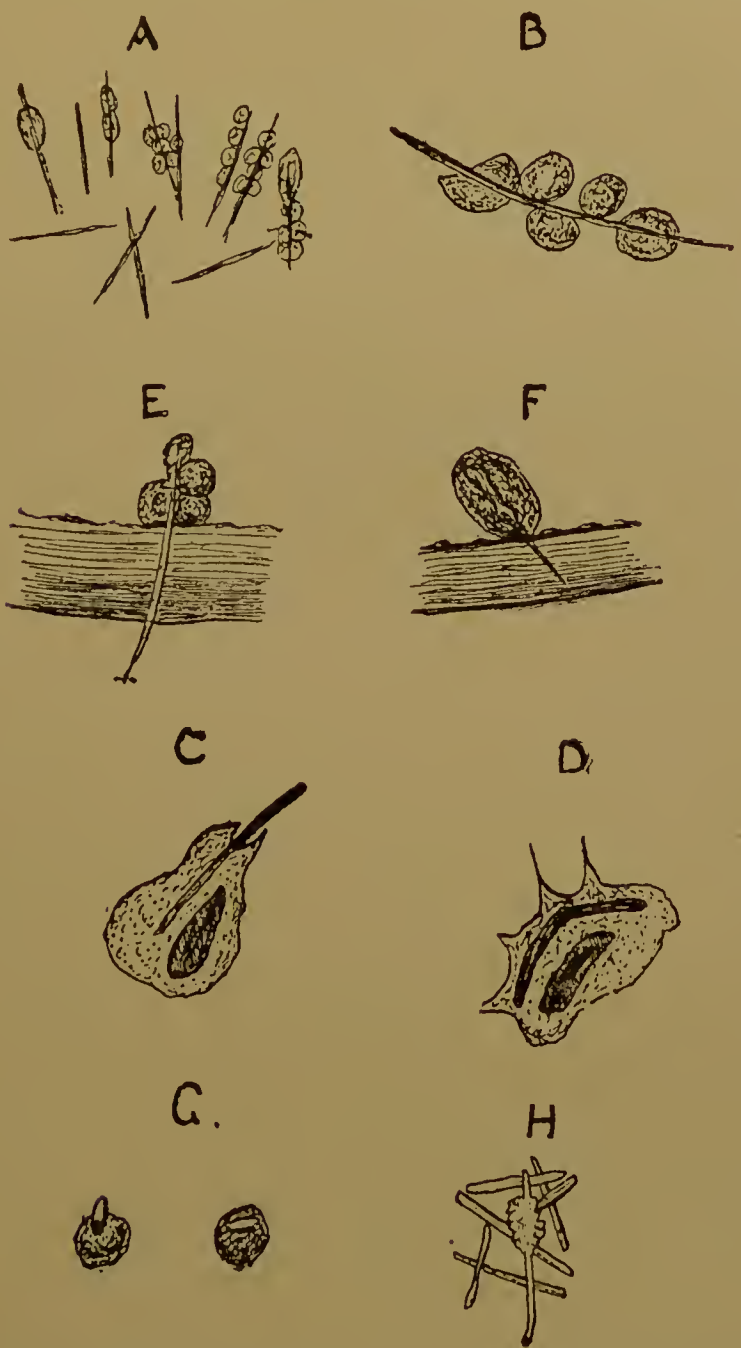
At first, in the twilight days of germ-study, it was supposed that all germs were deadly. No germ is now, however, deemed worth fighting against unless four points have been proved with regard to it: 1. It must be found in the blood of the person who has the disease. 2. It must be isolated and cultivated through several generations. 3. It must produce the same disease in animals. 4. It must be found in the blood of these animals. Then, and not till then, is the germ credited with producing the disease.

Germs and Disease.

The presumed methods by which germs kill living beings open up wide fields for the imagination. It must, of course, in the first place, be understood that the human body is composed of an infinite number of living, working, eating, drinking, breathing, and moving cells, getting on very well providing they are left alone.

One theory represents these germs swallowed with the food, inhaled by the breath, gathering their forces like an invading army, and entering into free fights all over the body with the

legitimate inhabitants, on whom they fasten in ever-increasing numbers (think of propagating at the rate of one hundred thou-



A. Bacilli attacked by small white blood-cells. B. Five blood-cells attacking a Bacillus. C. Large blood-cell eating Bacillus. D. The result. E, F. Bacillus entering blood-vessel attacked by blood-cells. G. Spores eaten by blood-cells. H. Several Bacilli destroying a blood-cell.

sand an hour !) and finally do to death. This, indeed, is more than a theory. A recent observer, rejoicing in the name of

Metschnikoff, has absolutely seen the germs attacked and eaten up by the healthy blood-cells. The accompanying remarkable diagrams are copied from drawings of his investigations, and represent the germs being actually swallowed and *digested* by the blood-cells. We also see these cells eating the spores of the germs; and finally we see a group of germs surrounding and overcoming our valiant defenders. Such is the view of one of our most distinguished investigators, which has since been fully confirmed by others.

Another theory, doubtless true in part, represents them as stealing in imperceptibly to every part of the body, swarming into the blood, and there seizing on the liquid food it contains intended for the sustenance of the cells, and compelling these to surrender by sheer starvation.

Yet another theory, also founded on fact. These germs enter as before, congregate silently in the blood, and then proceed to wage war against the human cells by calmly breathing up all their air—or, in other words, absorbing all the oxygen the blood is striving to convey to them.

And yet another theory, still weirder. That all the previous theories do not represent what generally happens; that the germs do not, as a rule, destroy by any such means, but, on the contrary, under the guise of harmless inhabitants, live at peace with the cells, while all the while they are ceaselessly though secretly manufacturing a subtle poison, which slowly but surely saps the life out of their entertainers. In any case the germs are uninvited guests, and may be compared to a marauding party of invaders quartered on an unwilling family, who lay hands on all their unwilling host possesses, tap his choicest wines, revel in his best rooms, and fatten while he starves.

Things are, however, not so bad after all. No enormous increase or devastating outbursts of disease have followed the alarming discoveries of the latter half of the nineteenth century, for as a matter of fact the discovery of these obscure vegetables did not create them. We have always had our germs with us, for good or ill. The death-rate improves in spite of them.

Then, again, the vast majority of them are harmless, and a cleanly and healthy man can safely breathe them, smile at them, and defy them, knowing that if they enter his body it is death to them, not to him.

Amongst the minority are the germs which have been convicted by the four tests we have mentioned of the following

offences : Of causing pneumonia (or inflammation of the lungs), of causing Asiatic cholera, of causing thrush, of causing a chloasma (brown skin disease), of causing ringworm, of causing fatal carbuncle, of causing consumption, of causing leprosy, of causing intermittent fever, and of causing general blood-poisoning. Other individuals are under careful surveillance on suspicion of being concerned in the production of erysipelas, diphtheria, typhoid fever, and malaria ; while those that produce hydrophobia, scarlet fever, measles, small-pox, and chicken-pox are still at large, but much 'wanted' by their pursuers.

Known Varieties.

Various artificial weapons have been forged to fight these minute malevolent microspores internally, but with indifferent results. It is true they can be killed by antiseptics, but they die hard, and before a person well impregnated with them could be considered germless, the amount of carbolic acid, of corrosive sublimate, or other deadly drugs he would have swallowed would in all probability have killed him. So, though the cure might be effectual, it would have the slight drawback of killing the patient first.

The wisest way is to kill as many as we can of the more deadly ones outside of us, and to run away from the rest—in other words, to use disinfectants (real ones) freely in all contagious diseases, and then to avoid the air or vicinity where such are known to exist.

One point is never to approach possible infection with an empty stomach, but always after a meal, and to keep in extra good health and extra cleanliness when the enemy is on the war-path.

In the first place, for any infectious disease to lay hold of a man, there must be a combination of three distinct elements of causation, as in consumption. There must be the soil in which the germ is to grow or flourish. A tendency, an inherited weakness, must, as a rule, exist first. But this is not all. Besides the *soil*, or certain delicacy of constitution, or susceptibility, as it is called, there must be the *sower* and the *seed*. The seed is of course 'the germ'; the sower is that special act of imprudence that gave it its long-looked-for opportunity of dropping into the congenial soil awaiting it.

But there must be this threefold combination. Supposing the soil unfit—that is, too healthy—the seed is barren ; it may be dropped in thousands, but it never germinates. Again, the soil may be suitable, the patient have a consumptive tendency, and

yet never get consumption, by virtue of living in some pure dry air where the germs do not come, or, if they come, are so enfeebled as to produce no injury.

Again, the soil may be ready, the seed there, and yet the opportunity or sower is wanting. The patient, forewarned and forearmed—not, on the one hand, ignoring a susceptible state in foolhardiness, nor, on the other, brooding over it in despair, but laying the lines of defence like a careful strategist—avoids all occasion of catching cold; all sudden changes of temperature; all close and prolonged proximity to consumptive people; all damp and depressing climates; all extremes of fashionable clothing, such as fur cloaks, boas, and capes one moment, low dresses and ivory shoulders the next; attends to the general health and food; and by these and other means keeps bravely and successfully at bay the deadly foe.

That this is no imaginary or impractical sketch thousands are now alive to prove.

Two girls came to town only a short time ago, and, seeing a wise physician, were by him warned of a constitutional delicacy of lung. One scoffed, the other heeded; the scoffer is dead, the other is still alive.

Special Precautions.

We would like to bring this chapter to a practical conclusion by indicating such of the general lines of defence as can be adopted by a non-professional reader against the list of diseases we have already given as believed to be due to germs

And we are the more free to do this in that private medical practice can hardly yet be said to have reached the preventive stage, for seldom or never is the doctor consulted until the opportunity is past and the disease already at work, and this for reasons which we cannot now discuss.

Anyhow, it remains a fact that 1890 sees us with a carefully elaborated system of public hygiene, and numerous officers enforcing it, while we are still without an efficient preventive service; and large reforms are needed before our present medical men can be expected to discharge these duties, or will even be thanked, much less paid, for doing them.

We have already indicated the lines of defence in *consumption*, and need not do more.

To guard against cholera, we must avoid all contact with any sufferer in every way down to the minutest particular, and never drink, while it is about, any *unboiled* water (not filtered only), or any unboiled liquid of any kind.

Thrush is readily killed by borax in any form, which, indeed, is a deadly foe to most germs. It is prevented by antiseptic mouth lotions and great cleanliness, such as rinsing the child's mouth out after feeding with pure water. Chloasma, the brown skin disease which has not a popular name, occurring in patches on the chest and back, is cured by vigorous scrubbing of the germs bodily away with soft or carbolic soap, and is prevented by daily and thorough skin ablutions.

Ringworm is prevented, when about, by washing the head with carbolic soap at intervals.

Carbuncle of a deadly kind generally comes from old skins or hides, and, if exposed to the dust from them, is best prevented by wearing a good respirator, and keeping in thorough good health.

Leprosy need not be spoken of in England, nor relapsing fever.

Blood-poisoning always arises from dirt, either breathed, swallowed, or received through some open wound. If we keep clear of dirt, we shall never get blood-poisoning—only let us remember that the word 'dirt' is here universal, and not only includes solid, but liquid and gaseous dirt, the latter, being invisible, often *inodorous* and unsuspected, being the common cause of this disease.

Erysipelas, again, may be prevented by the avoidance of the exposure of any wound, however minute, to the air. In this case, however, the trouble is perhaps greater than the risk.

Diphtheria is prevented by avoiding all possible contagion, and the strictest isolation of known cases, by keeping the mouth and throat guarded by antiseptic lotions and gargles, and by robust health.

Typhoid fever requires similar precautions to cholera.

Malaria can be steered clear of, as it only exists in known localities.

CHAPTER VIII.

ON COMMON ACCIDENTS.

Introduction.

It is well known that the next best thing to absence of body in a railway accident is presence of mind. Failure of presence of mind at a critical moment may be followed by disastrous consequences. Knowledge, however, is one great source of presence of mind, for here distinctly knowledge is power.

The hints given here will be extremely simple and practical; no attempt will be made to teach medicine or surgery, our aim being simply to impart sufficient knowledge to prevent that miserable paralysis that is often felt when we are longing to do something, but for the life of us cannot think what to do.

The only thing, perhaps, that stops us is the too prevalent idea that 'A little knowledge is a dangerous thing,' which has so often proved a real stumbling-block in the way. It is not true in these matters, at any rate. It is a little conceit that is a dangerous thing. All knowledge is useful, and we are of use in times of sudden need just in proportion to the amount of our knowledge; and, provided we do not undertake to do more than we know, we shall not find it dangerous to use the stock at our command. So far, then, from our wishing to add a new element of danger in imparting a little knowledge on the subject, we believe, that although these notes are necessarily brief, no one will read them through carefully and master them without finding himself very much cooler and more useful when the next emergency arises.

General Directions.

We will give a few general directions first, and then take up the leading emergencies one by one.

When any accident occurs, let the patient lie down or sit.

If the person be at all faint or insensible, keep him lying down flat, loosen the things round his neck, and do not let

people crowd round him, but keep them away so as to give him plenty of air.

Do not move him at all till you have quite understood his injury.

Have a good look, if possible, at the affected part before doing anything.

Be as quick as possible in finding out what is the matter.

Until the patient is removed to his home or to a suitable place, let your aim be only to stop any bleeding for the time and to prevent injury in moving.

Avoid needless questions and pulling about.

Unless the case be plainly trivial, send for a doctor at once.

Do not *drag* clothes off an injured part, but carefully rip them up or cut them off to examine it.

When you have to remove the clothes, take them off the injured side last. Always begin on the sound side.

If the patient appear very low, give two teaspoonfuls of brandy, or a little plain water with a few drops of sal volatile.

Get the person removed home, or to a hospital, or some suitable place as quickly as possible.

We will now consider the most common emergencies one by one. In hæmorrhage, if the blood be bluish and dark it is from a vein, if bright red and coming in spurts it is from an artery. The latter is far more profuse and dangerous than the former. In all cases you must act decidedly and quickly.

How to Stop Bleeding.

The first thing is to see where the blood is really coming from, and at once to fold up a bit of rag, handkerchief, or any other cloth, and press on the spot with your thumb steadily until you can get a bandage ready.

Pressure on the spot where the blood comes from is always the first thing. Never stand and look at it, or hold a basin to catch the blood, but make at once a determined effort to stop it.

In most cases in a minute or two the blood will cease to flow, and will clot. The pressure must not be taken off, but another neat pad must be made by folding up a piece of rag, and then placed over the first, and a bandage put round the part.

If, however, the blood still flows round your thumb and from under the pad, if venous, look out for garters or tight strings above the wound anywhere, and cut them. Always also raise the limb and expose the part freely to the air; by these means you lessen the flow of blood, and make it clot

quicker. Should it, however, continue to flow in jerks, you must, in addition, at once press on the artery higher up from which the blood comes.

If the blood comes *from the head*, firm pressure against the skull with a piece of cork in the pad is generally enough, if well secured.

If *from the face*, the bloodvessel should be held tight between one of the fingers (inside the mouth) and the thumb (outside).

If *from the neck*, as in cut throat, press the artery you feel beating below the cut firmly against the back of the neck.

If *from the arm*, press the artery above the wound with the fingers against the bone till the bleeding stops; or knot a handkerchief loosely round the limb, and then with a stick twist the handkerchief round and round till it squeezes the artery tight.

If *from the forearm*, press in the same way on the arm artery; or put a pad in front of the elbow, and bend the arm up firmly on it.

If *from the thigh*, press the artery in the centre of the groin firmly down with both thumbs on to the bone.

If *from the leg*, put a pad under the knee, and bend the leg forcibly on it.

An indiarubber band, tube, belt, or brace stretched firmly round the arm or leg above the wound stops the bleeding at once.

Avoid using those remedies for stopping hæmorrhage which are so often stuffed into bleeding wounds—both those got from the chemist, such as perchloride of iron, lint, etc., and more popular remedies, such as spider's web. It is possible by such means to arrest trifling hæmorrhages, but properly-applied pressure attains this end much better, and the danger of letting any impurity come in contact with a wound is so great that such means are generally hurtful, and must in any case prevent the speedy healing of a wound by *primary* union.

Internal Bleeding.

Bleeding may come on suddenly from the nose or mouth. If from the nose, and not excessive, it may do good rather than harm, and relieve headache and congestion. If, however, it continues and is severe, do not allow the person to hold his head down over a basin, but make him sit up with his head erect, and hold his own nose firmly for five or ten minutes, while you slip a cold

door-key down his back. This attitude and slight shock is often enough to stop it. Should bleeding continue, or blood run down the throat behind, soak a handkerchief in common turpentine and let the fumes be sniffed up. The arm raised above the head also stops it. If it still persist, send for the doctor at once.

The blood may come from the mouth. If in any quantity, its source is probably either the stomach or lungs.

If it is from the stomach, it will be rather dark, mixed with food in large quantities, and vomited up after a severe pain.

If from the lungs, it will be very light, mixed with froth, and coughed up, and in lesser quantity.

In either case, all you have to do is to lay the person down under an open window, loosen all about his neck, keep him quite quiet; and to stop the bleeding—supposing the doctor is not at hand—give him a teaspoonful of turpentine in a little milk, and let him breathe in turpentine from a soaked handkerchief.

Bruises.

Bruises are injuries caused by falls or blows which may result in internal lacerations, particularly of the smallest bloodvessels.

The results are: effusion of blood under the skin, almost immediate painful swelling and discoloration of the injured part (first, blue-red; later, brown-green, etc.), due to the colouring matter of the blood. If there has been a bad fall and, besides the outer skin, important internal organs (brain, spine, lungs, liver, intestines) have suffered, bad symptoms at once become apparent. In concussion of the brain you have fainting, insensibility, vomiting. In injuries to lungs you have blood-spitting; in those to the abdomen, violent pain, sickness, great pallor, fainting, and sometimes sudden death. The liver, spleen, or bowel may be so injured that blood or the contents of the bowel may be effused into the cavity of the abdomen. In such cases death results very quickly.

We must, therefore: 1. Send at once for the doctor. 2. Loosen all tight articles of clothing. 3. Place the injured person in a comfortable position—with his head low if he look pale or be faint. 4. Sprinkle him with cold water. 5. If the doctor should live at a distance and cannot be got, then carefully transport the patient to him.

In slight cases apply hot fomentations, or spirit and water lotion to the bruise to prevent discoloration.

These may be clean-cut, torn, bruised, stabbed, poisoned, or gunshot.

Wounds.

The danger of a wound depends on its depth and size, and, above all, on the importance of the deeper parts involved (veins, arteries, nerves, bones, lungs, heart, brain, intestines, etc.). Stabs and gunshot wounds are generally far more dangerous than from the size of the wound they may appear, because deep-lying important parts are so often injured by the point of the sword, or by the bullet, and also because portions of a foreign body may have remained in the wound (bits of sword-blade, bullet, bone-splinters, pieces of the clothes).

In bad contusions or crushes, the internal parts injured are generally so crushed and lacerated that death speedily follows. If it is a limb which has been injured, amputation will probably be necessary.

Wounds heal in two ways.

I. Quickly, by primary union (union by the first intention) without suppuration, and leaving only a very fine scar. This mode of healing should always be tried for, but can be got only under the following conditions:—1. When the sides of the wound can be accurately brought together. 2. When the sides of the wound are not displaced by bleeding or exudation of matter. 3. When the wound is left quiet and protected from outward injury. 4. When the wound is kept perfectly free from impurity.

II. The second mode of healing takes place slowly, with suppuration, and the formation of granulations, and leaves a large red scar.

This result occurs when the more favourable conditions are absent:—1. When so much skin has been destroyed that the edges of the wound cannot be brought together—as in scalp wounds, etc.; or when the edges of the wound are so lacerated and bruised that life is destroyed in them. 2. When the edges of the wound are separated by blood or exudation of matter. 3. When the injured parts have been disturbed (the leg, by standing or walking; the hand or the arm, by working; or if the wounded person has been carelessly moved). 4. When the wound was dirty and has not been properly cleaned and disinfected. Want of cleanliness leads to putrefaction and the formation of matter.

It is the matter formed in the process of suppuration which separates the sides of the wounds. When the wound begins to

heal, granulations form, which are often called 'proud flesh.' These granulations by degrees, and with constant suppuration, fill up the wound, and are finally covered by a large scar, which remains red for a long time.

Suppuration and putrefaction open the door to other dangerous surgical ailments, of which many people die after wounds and operations.

Modern surgery has made wonderful progress in the treatment of wounds, chiefly because a more accurate knowledge of the causes of suppuration and putrefaction has taught us how to prevent these processes and how to guard against many of the dangers to which they give rise.

The first thing in a wound is to stop the bleeding as already directed.

The next is to cleanse the wound gently, as far as possible without disturbing any blood-clot that may have formed.

The next is to bring the edges of the wound as closely as possible together, and secure them there by little strips of plaster, the skin being well dried first.

Then apply the dressing of a pad and bandage.

Then support and keep the injured part at perfect rest.

And then attend to the person's general comfort.

Clean-cut wounds heal quickly and easily if all dirt is removed, and the edges are brought *close* together. The pad should be dry, or soaked in a little olive or carbolic oil, and if the wound does not become unpleasant the dressing may be left for three days.

Torn wounds cannot be closed up, but require cleansing, and the pad must be constantly soaked in plain cold water.

Crushed wounds and stabs are to be treated in the same way.

Poisoned wounds are caused by the bites of mad dogs, poisonous snakes, and by poisoned weapons. The danger of these is, that the poison from the wound may by means of the lymphatics be carried to the heart and so poison the whole blood.

To prevent this diffusion of the poison, you should, without loss of time, bind the limb round tightly above the wound: this is best done with an elastic belt or a strap, or string, or a handkerchief made tight by means of a stick twisted round in it. When this has been done, you should try to get rid of the poison from the wound. This may be done by sucking it out (if the lips be not sore), by burning with hot coal, hot knife or

knitting-needle, or by caustic (carbolic acid, nitric acid, etc.). In cases of snake-bite ammonia is used externally, and brandy or other stimulant is also given internally. Send at once for the doctor, and if the wound has been caused by the bite of a dog, shut up and watch the suspected animal. If you destroy a dog supposed to be mad, the wounded individual will always be in fear of hydrophobia, whereas by preserving the animal time may prove that he is not mad, and the patient be thus relieved from his fears.

In gunshot, and all other *serious* wounds, all you must do is at once to arrest the bleeding and send for a surgeon.

Fractures.

Bones are hard but brittle, and break like glass or porcelain by outward force (blow, fall, jump, etc.), often with a snap or crack which may be heard and felt.

Fractures are divided into two kinds—simple and compound. We call a fracture *simple* when the skin is not injured. We call it *compound* when it is accompanied by a wound, caused either by the same force which produced the fracture (a bullet, for instance) or by the ends of the broken bone protruding through the skin.

Compound fractures are much more dangerous than simple ones, because the skin and muscles are always much bruised at the same time, and because dirt may get into the wound and be with difficulty removed.

How do we know when a bone is broken? 1. The limb is bent or shortened. 2. There is an unnatural degree of movement at the seat of the fracture. 3. There is violent pain. 4. When the limb is moved, the broken ends of the bone may be felt grating against each other. How does a fracture heal? New bone-substance (callus) is formed at the broken ends of the bone and knits them together. This new substance is at first soft, but hardens gradually into bone. The time necessary for the completion of this process varies from two to six weeks, according to the size and strength of the bone. If during this time the broken ends of the bone have remained perfectly quiet in their proper position, the bone joins so perfectly as to leave no outward sign of the injury. If this has not been the case, the bone joins crookedly, or is shortened; or it may perhaps retain mobility at the injured place, forming what we call a 'false joint.'

How does the surgeon assist the healing process?

1. He sets the fracture; *i.e.*, by means of pulling and manipulation he brings the broken ends of the bone into their

proper position. The pulling he may allow his assistants to do, but the manipulation he does with his own hands.

2. He then adopts measures to keep the broken ends of the bone fixed in their right position till the fracture has healed. This perfect rest he attains either by means of splints (made of wood, tin, pasteboard, etc.), which keep the limb extended, and which are secured by bandages or handkerchiefs; or by some material such as plaster of Paris, starch, etc., which stiffens round the limb and forms a sort of casing.

In no case do persons receive more injury from the well-meant ignorance of bystanders and friends than in broken bones. They are probably made to try and stand, and perhaps to try and walk a few steps, or the broken arm is pulled out of the coat sleeve. Let us try to understand what we ought to do. In the first place, remember, simple fractures, when there is no wound, are not serious, and soon heal; but compound fractures, *i.e.*, when there is a wound leading to the broken bone, are dangerous to life. Now, careless and ignorant handling generally makes what was a simple fracture into a compound one.

In all cases, therefore, when you have any reason to suspect broken bones, from the pain or the helplessness of the limb, be very gentle and make the person keep quite still. Cut the clothes off the part. See where the fracture is, but move the bones only so as to place the limb in a straight line in its natural position, and then put splints on the inside and outside and back of the limb, and secure them firmly round it by bandages above and below, so that the broken part is fixed and quite immovable. Splints can be formed out of umbrellas, boards, cardboard, sticks, rolls of newspapers, cricket stumps, rolls of rushes, bark of trees, and can be tied on with anything.

Thus secured, the patient can be moved with safety on a board, stretcher, or even carried in the arms.

When a jaw is broken, tie it firmly up by a bandage under it, and to the top of the head.

When ribs are broken, put a broad roll of flannel or linen round the part, and let the patient sit up till the surgeon comes.

When a collar-bone is broken, tie the arm to the side, with a large pad in the arm-pit, till the surgeon comes.

In the case of any other fracture, apply splints as directed, and be sure that they are secured above and below the broken part.

Treat any case when you *think* the bone is broken like this;

and even if you are wrong you have done no harm, and have certainly made a mistake on the right side.

A surgeon must of course always be sent for at once.

Dislocation.

In this case, some limb is suddenly put out of joint by over-use or by an accident. At first you probably think it is a broken bone, because the limb is fixed, and cannot be moved without pain. But then you remember that though when the bone is broken the limb is helpless, it is not fixed, but very movable at the broken place, and that it is your business to fix it up in splints.

This is evidently something different. Bear in mind that a breakage may occur anywhere in the bone, but that dislocation can only occur *at a joint*, and you will soon find the joint where the pain is most complained of distorted and enlarged. You do not need splints here. If it be the shoulder you can support the arm in a sling. In any case you keep the person at rest, and send at once for a surgeon to set it.

Always, if in doubt as to whether it is a broken bone or only a dislocation, act as if it were broken, and put on splints. Do not try to set the bone yourself.

Sprains and Strains.

A sprain is a wrench to a joint; a strain is over-exertion of a muscle. In a sprain, which happens most frequently to the ankle, if at all severe, always send for the surgeon. Neglect of this precaution may lead to serious results.

Not long ago, a lady, alighting from a cab at a London exhibition, twisted her foot. She was at once seen by some who had passed ambulance examinations and were on duty there, and they pronounced it a sprain, and ordered the proper treatment. The only thing they neglected was, to tell the lady to consult a surgeon as soon as possible. When at last it got so bad that she did send for one, he told her that the achilles tendon was ruptured, and that she would be lame for life. Please therefore remember that in every serious injury the surgeon must be sent for, and you are in no way to think that any hints here given are intended as substitutes for professional aid. The treatment is only '*until* the doctor comes.'

In the case of sprains, therefore, you let the part have complete rest, laying it on a pillow. You elevate the leg (if it be the ankle), and you apply cold either in the form of ice (broken in pieces in a sponge bag and resting on the joint), or sponge with cold water or with spirits and water. If the pain is still very bad, very hot fomentations may relieve it.

In a case of strain or cramp of the muscles, rub them steadily with warm oil.

Burns and Scalds.

Both burns and scalds are burns, but the one kind is caused by dry heat, the other by moist.

If a person's clothes are on fire, the one thing to do is to lay him flat down on the floor with more or less gentleness, but in any case let him lie down at once; then roll him over on to the burning part of his clothes, and cover him as he lies with a thick rug; and lastly, if needed, drench him with cold water. On no account should a person on fire be allowed to run about for a single instant.

With regard to treatment in slight cases, a little flour dusted on the part at once, so as to form a crust, is very good.

In more severe cases, any burnt parts of dress, etc., should all be cut off first, and the wounds dressed with strips of rag soaked in sweet oil and then covered with cotton wool. The blisters that form so quickly should never be broken, but if large pricked at the lowest part, and the shrivelled skin left, never cut away. The surgeon, of course, must be sent for at once. The person must be kept warm, and be given some hot drink.

Scalds require the same treatment, only as much of the scalding liquid should be washed off at once as possible.

Burns from strong acids or alkalies, such as vitriol, or spirits of salt, or caustic soda, potash, or lime, should first be drenched with water, and then, if it be an acid, bathed with soda and water; if an alkali, with vinegar and water.

Burns of the face are best treated by painting with olive-oil with a feather or brush.

Poisons.

In all cases of poisoning you of course send at once for the doctor, but as he is sometimes a long time coming, and promptness of action is often a matter of life or death, a few very definite instructions are absolutely necessary.

Find out at once (if possible) what the person has taken.

If it is a strong acid, as vitriol, spirits of salt, etc., give soap-suds, plaster from the wall or ceiling, chalk or soda in water.

If it is a strong alkali, such as soap lees, caustic soda, lime, or potash, give a glass of vinegar and water. Afterwards give in either case a tablespoonful of olive-oil.

If it is any other form of poison give two teaspoonfuls of mustard in a cup of warm water, or any other emetic that may be handy; or get half a teaspoonful of sulphate of zinc and give it in water. Carefully preserve all bottles and all vomited matter, as the case may be one for legal investigation.

When anyone is stung, apply ammonia (sal volatile) to the part, and extract the sting if left in.

Injuries to the Eye and Ear.

If something gets into the eye suddenly, keep it quietly shut a short time that the tears may wash the particle away, but on no account rub the ball round and round.

If the substance is still there, take firm hold of the lashes of the upper lid and draw them over the lashes of the lower one two or three times.

If this does not remove the speck, draw the upper lid well down and press down on it with a pencil till it is turned inside out, when if the black speck is seen it can be brushed off. If this does not suffice send for a surgeon.

Rubbing the sound eye well, will often remove the trouble from the injured one.

A black eye is best cured by hot fomentations.

Foreign bodies in the ear, if firmly fixed, should be removed by a surgeon. On no account syringe, if it be a pea or a bean, or it will swell up. If an insect, pour warm oil into the ear.

Fits and Insensibility.

Fits are of two sorts: epileptic and hysterical. In epileptic cases the person often gets injured in falling, bites his tongue, and the fit often occurs when alone. Excitable young women are most liable to hysterical fits; the subjects of them neither hurt themselves nor bite their tongues, and the fits generally occur in company. In both cases, the worst possible thing is to wrestle or struggle with the persons attacked, as is usually done. Leave them quite alone flat on the floor or bed, and do not attempt to raise them.

In epileptic cases, just see that the person does not injure himself, hold a bit of indiarubber or cork between the teeth; in hysteria, dash a little water on the face, or let them sniff up smelling salts.

Loss of Consciousness.

The chief causes of loss of consciousness are: 1. Injuries to the brain, with or without fractures of the skull. 2. Diseases of the brain, apoplexy, epilepsy, etc. 3. Poisoning by narcotics, opium, morphia, alcohol, ether, and chloroform; and by retention of urine, the result of kidney disease. 4. Fainting, paralysis of the heart through fright, pain, exhaustion, loss of blood, etc.

As it is often very difficult for the best medical man to determine at once with what form of unconsciousness he has to deal, it would be useless for me to tell you how to distinguish between and recognise these conditions. But you can:

1. Obtain all information possible as to the cause of the accident, whether the injured person has had a fall or blow, been wounded, or has been drinking.

2. Note the position of the body and its surroundings, as the case might possibly be brought before a magistrate, and a minute account of it be required.

3. Observe whether the breath smells of spirits. If this be the case, it shows that he has been drinking. But too much importance is not to be attached to this; as other and more serious conditions—paralysis, injury to the brain, etc.—may co-exist with intoxication. Moreover, the smell of spirits does not necessarily indicate intoxication.

4. Remove all tight clothing from about the neck—necktie, collar, shirt-studs, etc.—as these interfere with the flow of blood from the head.

5. Give free access to fresh air round the patient, and send all useless bystanders away.

6. Place the body on the back, with the head low if the face is pale, as in faintness after great loss of blood. If the face, however, is red, the head must be raised. If sickness sets in, the head should at once be turned on one side, so that the vomited matters should not be drawn into the lungs.

7. If the patient no longer breathes, which can be ascertained by holding a looking-glass or flat piece of metal or a feather before the mouth and nose, then we should at once have recourse to artificial respiration.

8. Send as quickly as possible for medical aid, or transport the patient to the hospital.

Insensibility may occur without a fit. You may have to decide before the doctor can come whether a man is drunk or dying, and it is exceedingly difficult. Open the person's eyes, and if both pupils are very small he is very likely asleep. Wet a towel, and gently slap his cheeks; you will suddenly see the pupils enlarge. This shows he is now awake, though possibly still insensible. If they dilate very much, and there are general signs of drink, he is probably drunk; if one pupil remains small, and the other large, it is probably an injury to the brain. If both remain small and cannot be altered, he is probably drugged.

Of course, these rules do not always hold good. Your duty is clear: send for the doctor in all cases at once.

In an apoplectic fit the person falls down suddenly and is always more or less paralyzed. Send for the doctor at once.

Give the person fresh air, let him lie quietly with his head a little raised; loosen all tight clothing, put hot bottles to his feet, keep the room quiet, and give nothing by the mouth.

Fainting is a common and an alarming occurrence. If you see a person turning deadly pale and about to 'go off,' you may prevent him doing so by steadily pressing his head down between his knees, till his face is quite red. If he has fainted, let him lie flat on the floor. On no account allow him to be raised. Loosen all round the neck, and let him have plenty of fresh air, a little cold water in the face, and smelling salts. A teaspoonful of brandy and water may be given if the face is very pale.

Drowning, etc.

In drowning the action must be very prompt, and you must have a clear idea what to do at once. First turn the body over on the face, and let any water escape by the mouth. Then wipe the mouth and nose dry; apply ammonia to the nose, or put a feather down the throat, rub the chest with hot cloths or beat the chest well with the end of a wet towel. If in a short time breathing does not commence, adopt immediately the following method:

Place the patient on his back with a firm cushion under the shoulders. Draw his tongue out of the mouth and fix it with an elastic band over it, and under the chin, or a piece of tape. Take off the braces and all tight clothing, kneel or stand behind the person, grasp his arms above the elbow and draw both arms well back over the head, and keep them at full stretch so as to expand the chest while you count ten rapidly; then bring the arms forward and downwards, and press the elbows well into the sides of the chest, and hold them there counting ten again. Then repeat this slowly, about fifteen times a minute, until a natural breath is drawn, when you at once proceed to warm the patient, and rub his legs and arms up towards his heart. Put him in blankets, if possible, during this treatment. When he can breathe, give him a little brandy.

Be sure his tongue is well stretched out during your efforts, and that people do not crowd round. As in every other serious case, this is only 'until the doctor comes.'

If a person is choking, seize his nose at once with one hand and push the finger of the other hand right down the throat and try to hook up or push down the obstruction. If unsuccessful, slap the back vigorously, or tickle the throat and try to bring on vomiting.

CHAPTER IX.

ON ORDINARY DISEASES OF THE NERVOUS AND LOCOMOTORY SYSTEMS AND SPECIAL SENSES.

HEADACHES are of numerous varieties; one writer enumerates some five-and-twenty varieties. Headaches fall naturally into two great classes—those inside and those outside the skull. We will first of all consider the causes and varieties of 'external headaches'—that is, headaches due to something wrong between the skull and the skin. In every case this 'something wrong' is a nerve or nerves. A regular series of nerves runs towards the top of the head, all round the forehead and the crown, and unfortunately for us their arrangement renders them liable to pain. The nerves, for instance, that supply the forehead emerge from the brain beneath the upper lid of each eye, and reach the forehead by passing through a small notch in the bone. In a direct line below this again, beneath the lower lid, the nerve that supplies the face passes through a similar hole. If the nerve gets thickened by cold or inflammation as it passes through this hole it will get severely pinched; the pain, however, of the pinching not being felt where it occurs only, but all along the course of every branch of the nerve over the forehead, just as when the funny-bone (or nerve) is touched on the inner side of the elbow, the thrill is felt in the little finger, to which it goes.

Headaches.

All external headaches are therefore essentially neuralgias, or nerve-pains. Frequently they are across the forehead, less often they are at the back of the head; sometimes, again, they may include 'tic,' or faceache, and involve the nerves of the face that issue through the lower notch. Sometimes, again, they seem to start from the ear as a centre, and play more round the side of the head.

Neuralgic Headaches.

These headaches are not generally caused directly through

study, but are due either to general ill-health, which leaves the nervous system ill-nourished and prone to disorders, or to some local chill or inflammation. A tight hat, pressing as it does severely on all these scalp nerves, is often the cause; great bunches of hair coiled up behind is another; a cold east wind beating on the forehead is another. They may spread from other nerves; toothache or earache, for instance, may cause this headache.

These are the headaches where local applications are very good, such as menthol crystal and ointment, cold and heat, many liniments, and, if the ear be affected, a single drop of chloroform on cotton-wool.

One particular form of this headache seems to take exactly half of the head or face, commencing with a disturbance of the eyesight, and going on to violent sickness, and often accompanied with a terrible pressure. The eyesight becomes dim for a few minutes, and then a little aching is felt in the head on the side opposite. It increases with a boring pain, and has been described as if a gimlet, slowly increasing in size, were being forced into the temples. From here the pain spreads over half the head, which soon throbs, and sickness, which does *not* relieve the headache, begins.

In headaches of this intensity sleep is a panacea, and it can generally be obtained naturally or artificially, the former being of course best. We will consider means of best producing this later on.

Let us always remember that in these neuralgic headaches heat, properly applied, will always subdue surface pain. For instance, for a neuralgic headache that will not yield to other remedies, put the kettle on the fire and a basin on the table, with two squares of flannel. Pour the boiling water on them, and then nip one up by the corner and drop it in a towel fixed by one corner round the leg of the table, or anything else, and then twist away at the other, wringing the flannel dry. Put this on the head, and immediately seize the second piece, wring it, and, now taking off the first piece and dropping it in the water (kept boiling), put it on the head. Now take the first piece out of the water again, wring it, and place it instead of No. 2, and so on without ceasing for one moment, and in a few minutes the pain will be subdued. Another cure is by putting some cotton-wool in a wide-mouthed bottle, and pouring on it half an ounce of bisulphide of carbon, and holding the mouth of the bottle for five minutes firmly against

the aching part. These bad sick-headaches are caused by hot rooms, great anxiety, or over-fatigue in people liable to nerve disorders. One other form of external headache consists in rheumatism of the scalp. This causes severe pain, and does not yield to ordinary remedies.

Internal Headaches.

Let us now consider the larger subject of true internal headaches, or pains arising from disturbances of nerves or circulation within the skull itself. First as to errors of circulation. Headaches commonly arise from too little or too much blood circulating in the brain.

Some people have very little and poor blood in the body—not enough to be everywhere at once; so if they study, it goes to the head, and leaves the feet cold; while if they eat, it goes to the stomach, and leaves the brain bare, and brings on a headache. It is indeed difficult for anyone effectually to use body and brain at the same time.

Headache from deficiency of blood in the brain may be recognised by its being at the top of the head, by pallor, by dizziness, and frequently by noises in the ears. These are the headaches benefited by slight stimulants—strong tea or coffee, hot soup, anything, in short, which increases the circulation; also by lying down with the head low. Such people should also sleep with the head low.

The opposite state is when the head is too full of blood, the face flushed, the temples throbbing, the pain excruciating, and the patient unable to bear a strong light or much noise. This is a splitting headache, and seems to be all over the head. It is brought on in those who have plenty of blood by worry, by too much study, by irregular or too rich living, by gout, and is often accompanied by palpitation of the heart and dyspepsia. Mustard footbaths are very good in these cases.

We all recognise a bilious headache, with its weight across the forehead, its spots before the eyes, its feeling of nausea, and the intense and instant relief when at length sickness comes on. Of course, such a headache in a weak or sickly person is much intensified.

But, again, there is another sort of headache. These we have been considering are those arising respectively from too little blood, too much blood, and poisoned blood in the brain.

A fourth variety arises from pressure or disturbance of the nerve substance of the brain itself. It is a dull heavy pain, sometimes splitting in character, and sometimes with dim sight

It generally reaches from the forehead right on to the top of the head.

Here, again, strong light and noise are much disliked.

Amongst other causes, it is brought on by a long railway journey, the vibration of which has produced innumerable slight concussions of the brain, and altogether shaken it pretty considerably, much more so, indeed, in a third than in a first-class carriage.

A good meal will sometimes relieve it, sleep at other times, or the mustard footbath again; but in many cases nothing will do but medical advice.

Yet another headache seems to spring from sheer exhaustion. It is a headache all over the head, and is relieved by a good meal and cessation of all brain work. Strong coffee with a biscuit will relieve it.

Just a word now about the headaches of old people and children.

In the aged headaches are common from defective circulation in the brain arising from changes in the bloodvessels consequent on age. They are hard to cure, and hard to bear, or to be borne with. Sleep also is hard to obtain in advanced age, and probably the best remedies are gentle stimulants; if too strong they become dangerous.

Children's Headaches.

Headaches in children need the greatest care of any, and are too often neglected, to the parents' sorrow.

The increased premium put on intellect readily accounts for the way in which teachers force the poor into their sixth standard and the rich into their sixth form, regardless of any possible risks. Stimulated in one case by large grants of money, and in the other by a desire to keep up a long-established prestige, teachers urge on their pupils to cram in yet more and more. These in their turn, if of quick nervous temperament, catch the excitement, and slave with hot and burning heads till overpowering sleep mercifully intervenes. The infection is too often caught by the infatuated parents, determined their offspring shall outshine all others, and that the tree of knowledge in their family, at any rate, shall blossom and fruit before it should have budded.

What becomes of all the precocious sixth standard boys? Where do our young prodigies go? Let us learn from analogy. All forced fruits are wanting in flavour, and in the sweetness the long summer days alone can give. All forced plants are

delicate. All colts worked before their time are ruined as horses; indeed, all premature development is bad.

We are not unaware that an excuse can be thus made for laziness, and that though many alleged cases of overwork turn out to be true, the work was not school-work. Nevertheless, the evil is sufficiently great (and it is growing) to justify these lines.

In learning to sing no good teacher will allow the voice to be fully exercised till after eighteen, giving the tender young vocal cords time to strengthen and consolidate.

Is the brain substance, then, of a coarser nature, and of a less important character than the windpipe, and are we to allow our children to strain their young brains to cracking-point, while we pride ourselves on carefully avoiding strain elsewhere?

The following newspaper paragraph seems to come in appropriately here:

'Death from Over-Study.—A pupil-teacher, named D——, aged seventeen years, who, it is stated, had been worrying about his examination, fell dead on Wednesday night at Y——. Another teacher at the same school, supposed to have been over-studying, has been lying unconscious since Sunday.'

We need not speak here of the loss of life by inflammation of the brain and other nervous diseases this false system has occasioned, or dwell upon the lifelong misery it has caused in others by laying the seeds of hysteria and other non-mortal nerve affections, or enlarge upon the final stunting of the intellect this premature overtaxing invariably brings, but just confine ourselves to the one subject of headaches.

Whenever a child complains continuously of a fixed pain in the head, and he is studying hard, those studies must in every case be given up until the pain be removed.

Of course, children are subject to all the varieties of headache we have already enumerated, but the headache of over-study, so often met with in these days, with their increasing number of competitive examinations, is the most dangerous, and it should always be relieved at once by removing the cause.

Children, if devoid of conscience, might skilfully feign this particular headache whenever a lazy fit came over them. To guard against this, therefore, in any suspicious cases always send for the doctor.

Good food, absence of study, outdoor amusements, and lots of sleep are the best domestic remedies.

Sleeplessness.

Sleep, indeed, is such a cure for most head troubles, that one or two hints as to how best to obtain it may fittingly close our remarks on this painful subject.

A cold bed is often a great hindrance to sleep. Cotton sheets instead of linen, and in cold weather a warming-pan first, will frequently make all the difference between a good and a bad night.

Cold feet, again, are another fertile cause. These can be best cured by having, just before going to bed, two basins, one of very hot and the other of cold water, and putting a foot in each, then crossing them and putting the warm foot into the cold water, and *vice versâ*. The constant change violently stimulates the circulation. If, then, a pair of fleecy sleeping-socks be drawn on, no sleeping draught will probably be needed.

If you wake in the night, and lie awake, getting up in the cold and taking a turn and then back to the warm bed will often produce sleep.

If the body is too hot, an arm or leg left outside the clothes will lower the temperature sufficiently.

Fresh air is a truer and better soporific than poisoning with carbonic acid gas, therefore sleep with the window open (more or less) and the door shut.

If the head be hot or throbbing, lie with the head high, and, if necessary, wrap the legs round with wet cloths covered with waterproof. This is an excellent plan.

Hunger is a common and unsuspected cause of sleeplessness and also of headache. People dine at six or seven, and have nothing more till nine next morning. Others dine at one or two, and have a cup of tea and a slice of bread-and-butter at seven, and nothing till next morning. These people go to bed hungry and lie awake. A sufficient supper at a reasonable hour—a chop, or a bowl of hot bread-and-milk, or a plate of oatmeal porridge—will make all the difference, and in drawing the blood to the stomach will enable the brain to rest.

Another cause of sleeplessness is brain excitement late at night. The brain gets so full of blood that it cannot rest. Here the remedy is obvious; to let the brain lie fallow after dinner. If this cannot be done, and there is sleeplessness, a mustard footbath or a general hot bath will often cure it.

Nerve Disorders Generally.

Nerve Disorders Generally.—Most nervous sufferers, particularly from some form of hysteria, that rapidly increasing disease, meet with but little sympathy.

Listen to the usual treatment of a nervous case. 'When one of these victims to hypochondria, who are commonly called *malades imaginaires*, has recourse to medicine for the relief of pain, or some other disturbance, he is usually told it is of no importance; that he is fanciful, and some anodyne is carelessly prescribed. The patient, who is really suffering the pain he has suggested to himself, feels convinced that his malady is not known, and that nothing can be done for him. The idea that his complaint is incurable becomes intense in proportion to his high opinion of the physician's skill; and thus the patient, who was suffering from the painful affection suggested by his mind, often goes away not only uncured, but incurable.'

A disease due to the imagination is not necessarily an imaginary disease, but may produce various functional and even organic disturbances. A wise physician once said: 'If a man is so ill as to say he is ill when he is not ill, he must be very ill indeed.' The diseases grouped under the heads of nervousness, hysteria, etc., are real in origin and effects, and formidable in their nature; and it is high time that the ridicule, the offspring of ignorance, with which they have been so long surrounded, be entirely done away with. These unhappy sufferers have been greatly wronged and often cruelly treated. A nervous invalid is a far greater sufferer than a man with a broken leg; but we are content to dismiss the former as 'only hysterical,' and more sympathy and less contempt is often felt for a drunkard than for a hypochondriac.

Nervous people are the very salt of the earth, and the leading men in every profession are drawn from their ranks. They are men with brains that thrill, that feel, that are quick in action, firm, clear, and of high organization. It is the nervous men that rule the world, and it is the children of these people who, inheriting the nervous organization of their parents without having their safety-valve of hard work, form the bulk of our nervous sufferers. At the same time, just as a man can get gout from too little food as well as too much, so we have a large class who are ill from too much work and worry, instead of too little. The nervous diseases among this class far outnumber all others.

The nervous constitution often skips a generation, generally gives some immunity from inflammatory diseases, and is always much aggravated by any excesses, bodily, mental, or moral.

Nervous structures may be divided into six varieties. 1. The

organs of special sense, including the nerves of hearing, sight, touch, taste, and smell; and, with regard to these, let us observe that mere irritation of them will produce their phenomena. A blow on the eye in the dark will produce the appearance of light. Sounds of all sorts are heard when there are none, if the nerve of hearing be irritated by disease. Smells and tastes are also clearly perceived and described when none actually exist. The important bearing of this on nervous disease is perhaps apparent. 2. *Nerves of sensation*, that bring intelligence to the brain from every part of the body. 3. *Terminal nerve centres*, that receive and transmit all nerve messages, being under control of the will. 4. *Nerves of motion*, that carry nerve force from the brain to every muscle. 5. *Automatic nerve centres*, that carry out vital processes apart from exercise of will, such as the beating of the heart, the processes of respiration, digestion, etc. 6. *Ideal nerve centres*, the seat of thoughts only.

The nerve molecule is said to contain one thousand atoms, and all nerve action is believed to be by vibration of these atoms, all force being ultimately caused by the same means. If I *think*, certain changes take place in my ideal nerve cells; if I *feel* or *act*, in my terminal nerve cells. Both are cell actions, and most closely allied, the cells often being probably side by side, and thus an action commencing in one nerve centre may readily be transferred to another. An instance will suffice.

The fact of the teeth being set on edge by the scraping of a slate pencil on a slate is too well known to need description. But what is the cause? We *hear* the scrape, and as the unpleasant sound is composed of air-waves of irregular lengths, it jars the auditory nerve, and communicates a special vibration to its particles. It happens that in part of its course this nerve lies alongside the nerve going to the teeth and tongue. The jarring is communicated to the latter by contiguity, and the brain receives the sensation of the teeth being set on edge shortly after the disagreeable sound is heard.

It has been well said, 'We think as we feel, or think we feel, and we feel as we think. If we feel a pain, we think we are ill; and if we think we are ill we feel ill.' If my ideal centre vibrates with the thought of crossing the Channel in rough weather, and pictures the nausea that would then be felt, the vibrations are transmitted to the terminal centres of the sensory nerves running from the stomach, and I actually feel sick, and

possibly, if of a highly nervous organization, may actually be sick.

Real feelings and real acts can be started in entirely ideal centres. If we *think* intensely of any part of the body long enough, we *feel* sensations in that part. If we think of a good dinner our mouth waters. We shiver whether we only think of cold or actually feel cold. The sensation of pain can be produced as really and vividly by thoughts or ideas alone, as light in the eye by striking it. In short, every sensation of the body ordinarily produced from without, can also be produced from within.

Let us now, bearing this in mind, briefly consider some of the phenomena of nerves in disorder.

Neuralgia simply means pain in a nerve, and hence actually includes all pain; for all pain, or indeed sensation of any sort, arises solely from nerve irritation, and from no other cause whatever; whether the irritant be gout, rheumatism, heat, cold, or violence, or anything else. It is clear that the pain or painful irritation may be communicated to the nerve particles at the body end of the nerves, as when a finger is pinched; or in the course of the nerve, as when the nerve is itself inflamed; or at the brain end of the nerve, in the terminal centres, from some brain disease or congestion, or, as we have suggested, from the irritation of some neighbouring ideal centre: the pain, though caused in any of these four ways, being nearly always referred to the body end of the nerve. For instance, if I irritate the nerve of sensation in my little finger by pricking it, I feel the pain in my little finger; if I irritate the nerve by pressing it at the elbow (where it is called the funny-bone) I also feel the pain in my little finger, and should do so (in imagination) even if the hand were cut off; if, again, it is irritated in the brain by disease, or even *by thought*, the pain is equally felt in the little finger; as in hip-joint disease the nerve running to the knee, though irritated at the hip, causes intense pain only in the knee. Pain, after all, is only a sensation, and to the patient the cause matters little; to the physician who has to remove it, it means everything. In neuralgia proper, however, we have only to do with pain arising in the nerve or nerve cells, for this alone is a nerve disease. The most acute pains arise from the pressure of a swollen, tender, inflamed vein against its sheath, or worse still, against some hard confining walls, as in its passage through bone, as we have seen in frontal headache.

Neuralgia.

Nervousness is the general result of overstrain of the nervous temperament, and is said to be on the increase, the growing tension of life being quite a sufficient cause. Constant brain irritants in the ideal centres, in the shape of small but perpetual worries, render the other nerve centres as morbidly sensitive as a constant succession of slight needle-pricks all over the body would the terminal sensory nerves. The manifestations of nervousness are numerous. Physically they may include constant movement of body and face, sharp cough, hoarseness, quick breath, starting, and palpitation. Mentally: timidity, irritability, melancholy, and a dread of being alone, or in a crowd. If neglected it may end in hysteria, or organic disease. Referring to the three divisions of the brain, the cause may be said to be largely the result of want of control by the upper over the middle district, which may be due to inherent weakness or to exhaustion from overwork or worry. The constant movement characteristic of this condition is in itself a sign of weakness in the higher centres. A baby is always in motion. As we grow older we get quieter, and the man with the strong brain only moves for a definite purpose. Repose, not movement, is a sign of brain power.

Nervousness.

Nervous debility is a still worse disorder. It is the manifestation of nerve exhaustion rather than irritation, and is often a further stage of nervousness. It is the frequent result of excesses of all kinds. It is characterized by physical weakness, mental lassitude and apathy, occasionally varied by a false and capricious but evanescent energy. It is often combined in varying degrees, as would naturally be supposed, with nervousness. In both of these disorders the first step in treatment is to seek out, and if possible, remove the cause.

Hysteria is a nerve disease of a different nature altogether, though it may be the result of the preceding disease, or may arise from any sudden mental or physical shock, or may spring from hereditary causes as we have already shown. The disease is most common in the spring, when the nerve system is least balanced. It consists in the distinct manifestation, or perfect simulation of disease; not merely in irregular bodily or mental action. In hysteria proper there is no intent whatever to deceive, and it must carefully be distinguished from malingering, which is a direct attempt at fraud, and for which no contempt and ridicule can be too severe.

Hysteria.

Hysteria is, on the contrary, a real and most distressing disease. It is common in the under and over worked, in the badly trained and imperfectly educated; in boys from ten to fourteen, in girls from sixteen to twenty-five. Over-education, and subsequent idleness combined, are fertile causes. It is often found in people otherwise strong-minded and clever. The mental character found in these sufferers is thus described by Dr. Buzzard:

'Intelligence good, apprehension quick, memory good, judgment weak, no ability of concentration of thought for any length of time. Accuracy and perseverance are deficient. Emotions too easily excited and incapable of control. The expression of emotion is incongruous; tears at ridiculous subjects and laughter at tragic. There is great desire for the sympathy and attention of others. Sometimes there is deception in varying degree, which, however, is probably a part of the disease.'

The seat of this disease in every case is really in the brain, where it either actually originates or is caused by irritation from some part of the body that may be slightly diseased. This real seat of the disease is, however, seldom suspected by the patient or friends, who are constantly misled, as indeed the physician may be as well, by the remarkable appearances of disease which it produces in various parts of the body. There may, of course, be real organic disease as well, and the two may be combined in any proportions.

Hysteria is so common that in many classes of ailments it is the general cause, organic disease being the exception. Sir B. Brodie states that four-fifths of joint disease among the upper classes are hysterical, and one-fifth amongst the lower. These used to fill our watering-places with invalids in bath-chairs, who are, however, now comparatively rarely seen, the cause of the disease being more generally known.

Hysteria may produce pain, having the character of distinct disease—as in the chest resembling pleurisy, in the heart resembling a form of heart disease, in the spine resembling spinal disease, in the knee resembling rheumatic gout, or elsewhere. In such cases even the skin is tender, and a slight touch hurts as much as a heavy one. Or, on the other hand, any part of the body may be insensible to pain, and be pricked without it being felt. This pain differs in its origin from all other, being neither neuralgia (or pain arising in the nerve itself), nor caused by any organic disease; but, arising in the ideal centres of which

we have spoken, it is probably transferred by vibration to any neighbouring nerve to the termination of which in some part of the body it is referred, where the pain is said to be felt, and the disease supposed to exist. A simple illustration may explain this. A housemaid, sweeping down a wall, may very well jar the front-door bell, and make it ring. Hearing this in the dining-room, you at once say there is someone at the front door. Indeed, you are sure of it, for you heard the front-door bell. Nevertheless, you are wrong. The cause of the ringing is a vibration communicated to the bell inside the house (or brain), and you are quite wrong in referring the cause to outside the house (or the body). It is in this way that if a nerve 'rings' in the brain the cause is believed to be in that part of the body that the nerve comes from; and if nothing is wrong there we say, 'The bell did not ring,' forgetting it may have been set vibrating from an ideal centre within the head.

Amongst other symptoms of hysteria may be included sharp cough, spasms, convulsions, and choking, from a ball rising in the throat. The spasms may be of any muscle; as of the chest, producing difficulty of breathing; or of the arm, or leg, or finger, or toe, producing temporary or permanent contraction of the part. The convulsions or hysterical fits are violent, and are greatly aggravated by any notice or sympathy. The patient falls without hurting herself, and the fit rarely occurs when there are no bystanders. Nevertheless, the hysterical convulsion is not a sham. It is generally preceded by the feeling of a swelling in the throat.

Hysteria also simulates every known disease, including tumours, deafness, blindness, dumbness, paralysis, St. Vitus' dance, etc., and is capable of producing, curiously enough, the highest temperatures of fever. In every case, though so various in their manifestations, it is probable that the cause is the same; and that the disease is first pictured in the ideal centres, either without any known reason, or from some slight pain or symptom in the body suggesting the disease; and that in this ideal centre the impression is so profound that the disease is not only believed by the sufferer to exist in the body, but that its symptoms are absolutely but unconsciously reproduced by transference from ideal to acting nerve centres, with such amazing accuracy as often to deceive physicians themselves.

With regard to its cure, it is most important that it be undertaken as soon as the disease is clearly recognised, for we

must remember there is always a danger of the want of use of any part leading to real organic disease of that part, often in a very short time. The mode of treatment must, of course, vary with the character and gravity of the disease; certain general principles, however, can be safely laid down. But, first of all, it may be broadly stated that no one can successfully undertake such cure unless he fully recognise the origin of the disease, its gravity, its real nature, and its distressing character. He should be full of sympathy, but, except in rare instances, show none.

The first thing, of course, is to ascertain that the disease is hysteria only. Now, this is a most difficult thing to verify in these patients, and nothing is more common than to find a disorder of the mind treated as a disease of the body. If there is, however, clearly no organic disease at the bottom, then the case must be one arising from nerve disorder, the cause of the nerve disorder being either physical or mental, or often a combination of both, the brain being, of course, wholly dependent for healthy action on good blood.

A vicious circle is often kept up in these cases which it is absolutely essential to break. They begin, it may be, with loss of appetite from some slight cause. This, in these cases, leads to disordered thoughts, and the idea of disease begins. This, again, makes the appetite still more capricious; the thoughts, therefore, get still worse, and so the body starves the brain, and the brain the body; and the emaciated patient, having, probably enough, first of all worn out her friends, sinks at last into her grave from sheer starvation.

The pernicious practice of sending such patients to travel here and there in search of health cannot be too strongly condemned, and, in my experience, has led to most disastrous results. The Continent is full of these miserable parties of pale-faced sufferers, with their anxious relations and friends wandering despondently about in search of what they will never find there. The worst cases we meet with are of this order, and such cases are often sent abroad as a last resource by physicians who have never really grappled with the question as to how such diseases can alone be cured.

The first thing, obviously, is to remake, as far as possible, the vitiated body and brain with fresh flesh and blood and nerve; and then, when we have put the patient into the best possible bodily health, we shall have cured the physical cause of the nerve disorder, at any rate. Then, or even simul-

taneously, any mental, and possibly moral, cause must be deliberately, scientifically, and systematically attacked by the careful substitution of good habits of thought and action for bad. This is done mainly by suggestion, but without any of the doubtful and unpleasant accompaniments of hypnotism.

It is important to remember that when the brain is restored to health by good nerve tissue and healthy blood, it can be made by suggestion to exercise as healthy an influence over the body as previously it exercised a harmful one. If ideal centres can produce ideal diseases, surely the rational cure is by first bringing these ideal centres into a healthy condition, and then making them the means of curing the ideal disease. Mental disease requires, and can ultimately only be cured by, mental medicine. When will this be understood? And when will nauseous drugs cease to be ministered to a mind diseased? Of the usual remedies given, Dr. Russell Reynolds says:

'The whole list of anti-hysteric remedies—musk, castor, valerian, and the like—appear to have this one property in common: that they do no good, and delay the real treatment of the case, which is not one to be cured by nauseous drugs, but largely by mental, moral, and social management.'

Tonics, in helping to build up the new flesh and blood, are, of course, valuable.

Electricity, properly applied, is also a therapeutic we can seldom wholly dispense with, and the reason of its value is obvious when we consider it is the most powerful agent that we possess for direct action on the nerves.

If the case be a severe one, it must be withdrawn from all its surroundings during the cure; and afterwards, if these were bad, it must *never return to them again.*

Enough has perhaps now been said to rescue nervous sufferers from the undeserved contempt with which their diseases are so often treated, not only by their friends, but even by their doctors, to show the real character of the disease, and further indicate the lines of rational treatment by which, from experience, we find that cases of any gravity can alone be cured.

Paralysis, etc.

Paralysis.—This depends on some disorder of the brain or spinal cord. The great point in domestic treatment is to avoid the formation of bed-sores, which occur very readily in emaciated people. Nothing but good medical advice is of use in these serious cases.

The Eye.—*Squinting* is often caused in children by short-sight, and can often be remedied if treated early enough. If

neglected, the eye tends to get blind. A surgeon should be consulted in any case; and the operation, if required, is easy and safe.

A *stye* is an inflammation of the roots of the eyelashes. It can sometimes be cut short by pulling out the inflamed lash, and touching the part with caustic. Fomenting with hot water is also good.

Cold in the Eye.—If severe, a doctor should be consulted. In any case the patient should remain indoors, and bathe the eye with warm water, in which alum has been dissolved in the proportion of half a teaspoonful to a large jugful. It is very dangerous in these cases to use any old eye lotion, and incurable blindness may result.

The ophthalmia in inflamed eyes of children is fearfully contagious, and should be cured at once.

For a *black-eye* hot fomentations or bathing with spirit and water, tincture of arnica or hazeline is best.

If anything gets in the eye, rub the sound eye well, and the dust will often fall out of the other. *Never rub the injured eye.* Drawing the upper eyelashes over the lower often wipes the dust out; or it can be seen by a friend, and gently wiped away.

Myopia.—This is short sight from the eyeball being too long, so that the rays of light, instead of coming to a focus or point at the retina or back of the eye, come to a focus in front of it, and by the time they reach the retina have separated again and produced a blurred image. This is corrected by concave glasses, which, by separating the rays of light, prevent their converging so soon and brings them to a point on the retina, giving a sharp, clear image.

Hypermetropia.—This is short sight from exactly the opposite condition. It is very common amongst children, and leads to bad squints. In this case the eyeball is too short, and the rays of light have not time to get to a focus on the retina, but would come to a focus behind it. The image in this case is also blurred.

Owing to the power we have of making the lens in the eye rounder, we can make the focus the right length by a strong muscular effort. This, however, not only tires us, but as the same nerve that supplies the muscle of the lens also supplies the muscle that moves the eyeball inwards, this gets contracted also; and thus, in the effort to obtain clear sight, children produce an internal squint.

The proper way to treat this condition is evidently to wear

convex glasses, which, by bringing the rays of light together more quickly, enable them to get to a focus in the short eyeball without any strain.

Cataract.—This is an opacity of the lens of the eye. It is one of the most curable of serious eye diseases, and in China and India the operation is often performed successfully many times each week by young English lady students and others. It consists in making a small slit in the side of the cornea, through which the opaque lens is slipped out. Of course, to see properly afterwards glasses of proper convexity must be worn to take the place of the missing lens.

Presbyopia.—This is a hardening of the lens from old age, and generally begins to come on at forty-five or fifty; so that for reading and any use of the eyes that require us to alter the shape of the lens, which has become difficult, great relief is found in wearing slightly convex glasses, which save us the trouble.

The Ear.—Deafness is generally the result of repeated and neglected colds. Beware of putting drops in the ear without medical advice, or of using sharp instruments. Medical advice is always required in these cases, and also in all discharges from the ear, which, however, may be gently washed away with a syringe and a little Condy's fluid.

The Throat.—Loss of voice can often be easily cured. The best way to avoid it is not to overstrain the throat by prolonged speaking; and to strengthen it by never wearing comforters or wraps, and by gargling well with cold water each morning.

CHAPTER X.

ON VISITING AND SANITATION AMONGST THE POOR.

NOTHING is more difficult than to know how to help the poor without injuring them. Nothing is worse than the indiscriminate giving of money, and nothing often more resented than any advice for their good. Certain of the poor will always be poor, whatever is done for them, and their surroundings will always be as unsanitary as they are allowed to make them. Fortunately, sanitary laws are being daily more stringently applied, so that there is less scope for this natural development of filth. All we can do in this chapter is to point out the most valuable sanitary hints that can be given to those of the poor who are willing to listen, and the best way of giving it. Let none, however, be discouraged if their first efforts at helping others are not crowned with success. It is a mistake to go amongst the poor in any patronizing spirit; it is soon found out, and defeats itself. We must *sympathize* with those we would help—that is, come down by their side and feel they are, after all, our own flesh and blood—if we would do them good. Half the good counsel given is worthless on account of the way it is offered, and any hints, in sanitary matters especially, require to be given with great tact. The poor do not like being interfered with any more than ourselves—even by Lady Bountifuls. As, however, these hints are rather for the use of those who are already working amongst the poor than for novices, we need not say much more on this head.

Difficulty of Visiting.

One thing at once strikes all who work in this way, and that is, that the poor pay very dearly for all they have, and are often very extravagant. (To this day the Irish peasants do not care to drink any tea under 3s. 6d. a pound.) Their house-rent is always high in towns; their coals are dear; their marketing often represents

Waste of Money.

the maximum of outlay with the minimum of result. The poor believe they cannot live without meat, and are completely nonplussed when the country is invaded by hordes of foreigners who live and thrive on wages on which they starve, simply through superior knowledge of economy in these matters.

Infant Feeding.

One or two facts with regard to food may be here pointed out. The way infants are fed is terrible amongst the poor. No wonder that 500 out of 1,000 die. A hundred years ago 23 out of every 24 infants used to die in the London workhouses, largely through being fed with bread and flour from infancy. A Parliamentary inquiry reduced the deaths from 2,600 to 480 in one year. Even now every tenth child dies in the first month. In the Dublin Foundling Hospital, out of 10,272 sick infants, only 45 recovered, the deaths being due to disease, laudanum, and *bread*. It cannot be impressed too strongly on the poor that up to six months bread is a bad and generally fatal food, and that nothing is safe but milk in some form. The bottles used are often filthy, and, in short, nothing repays better in visiting than first of all seeing the infants are fed with clean warm milk.

How to Live Cheaply.

With adults the principal sin is extravagance from ignorance. Parke's celebrated labourer lived and worked well on $1\frac{3}{4}$ lb. of oatmeal and a quart of milk a day, costing in all 5s. 3d. a week. One pound of oatmeal, flour, or cheese contains as much strength-giving food as 3 lb. of meat or 6 quarts of stout. Porridge and milk is excellent food, and so is oatmeal and bacon. When cheese is 9d. per lb. it is cheap, when it is 10d. it is dear. Eggs are nearly always a very cheap food. Treacle at 2d. a lb. is a cheap and good food. If potatoes are 1d. per lb. and bread 6d. a quartern loaf, bread is the cheaper, for 1 lb. of bread equals 3 lb. of potatoes. Where our countrymen are most deficient is in the knowledge of the cooking of vegetables and the making of nourishing soups. If the English instead of the French had been shut up in Paris during the Prussian war, thousands would have died of starvation for want of knowledge how to make the best use of what little food they possessed.

It is impossible to exaggerate the importance of teaching economical cookery to the poor.

There is little doubt that amongst all classes, and especially those who are hard-worked, bad cookery is one great cause of

drunkenness. It might be supposed that if a man married a cook he would be sure to get good cooking. Most good cooks, however, require plenty of materials to cook with, and find it is one thing to serve up a dinner in a large house with an unlimited amount of everything at hand, and quite another to learn to keep themselves and their husbands in sufficient appetizing food well cooked, besides paying for rent and other things, out of the wages of ordinary working-men. It is certain that no greater kindness could be shown to young women than to teach them plain cooking, and especially the use of vegetables of all sorts.

It is quite a revelation to most to see potato or milk soup made, to learn how easily tasty pasties may be made with a little flour and dripping, and a little potato, onions and sweet herbs inside; how far a pennyworth of oatmeal will go in porridge for the children; what can be done with turnip-peelings, bits of carrot, small bones, and bacon-rind in making good broth; what is the value of dripping and treacle, and how, with a pennyworth of currants, they will make the best of family puddings; or how a little flour with nothing but baking-powder and cold water can make large light dumplings, which, with treacle or hot dripping, form a delightful supper.

The value of haricot beans is still almost unknown. Nothing can be better for children for dinner than soup and a little bread—only, of course, the soup should be properly made. One poor woman, who makes it for all her family, gets up very early, cuts a little beef into small pieces, and stews it slowly for four hours. Then she adds milk, flour, and vegetables, and stews very gently for four hours more, by which time the soup is beautifully made. But it is impossible in this chapter to give any details on cooking amongst the poor. All we can do is to point out the need of such teaching, and that no lady can do more good than by opening small simple cookery classes, and even superintending occasionally the ordering of the family dinner. With tact and kindness, much may be done in this way.

We will now consider the sanitary arrangement of a home amongst the poor, and, in order that our remarks may apply to all, we will consider that the visitor is desirous of instructing the very poorest how to live with health in a single room. The remarks that apply to this will, of course, be equally useful for those who have two or three rooms.

There can be no doubt those who have to live in one room

are at a great disadvantage; for it is far easier to preserve the health of a family in two rooms than in one; in four than in two; and in a small house than in four rooms. For the four to six shillings a week which are paid for a single room in any great city, one can in small towns get a whole cottage and garden; but, unfortunately, men must live near their work.

Value of Health.

But though it is harder to live healthily in one room than in more, it is of far greater importance to those who have to do so than to those who can afford to live in a whole house. Their health is their only fortune, and one they *cannot afford* to lose. A rich man can pay a doctor's bill and take a change to the seaside if he or his family be ill, but they cannot.

To live healthily anywhere, we must have pure air, pure water, sufficient warmth, and cleanliness. Let us consider these points in reference to these unfortunate one-room dwellers. The following is the best advice you can give:

If the man is fortunate enough to afford a flat in a model dwelling, he should, if he is young and active, and able to climb the stairs, choose the highest one, as having the best and purest air. If he has two rooms, he should *choose the larger of the two* for the bedroom, and the smaller for the sitting-room, as he spends more time in the bedroom than in the other room, and it is all the more important that this room should not be overcrowded.

Choice of Room.

If he has but one room, remember this, that in order to have the best ventilation, the smallest amount of space necessary for each person is 5 ft. square of flooring, providing the room be 10 ft. high; or 6 ft. square if it be 8 ft. 6 in. high. Thus a room 10 ft. square might contain husband and wife and two children. This is, however, the closest packing that is advisable, and he will have much better health if he allows 6 ft. square in a room 10 ft. high, and 7 ft. square in an 8 ft. 6 in. room. The extra 6d. or 3d. rent for the larger room will be saved in health as well as in comfort.

In taking a room in an ordinary tenement house, he should, if possible, choose one on the first or second floor front; or, if he cannot afford this, let him choose the second-floor back, rather than the first floor, as being further removed from the closet.

Respecting underground bedrooms, he should know that 'the penalty on the landlord for letting or suffering to be occupied any vault, cellar, or underground room occupied as a

separate tenement in which any person passes the night is £1 per day or less, after warning.'

Point out to the man that in taking the room he should particularly notice if there is any nuisance in the house for which the landlord is liable, in which is included 'any state of the premises injurious to health, any w.c. in a foul state or injurious to health, any accumulation (ashpit, etc.) injurious to health, or any of the rooms so overcrowded as to be injurious to health.' If there be any such, he ought to give notice to the inspector of nuisances at the town-hall or vestry-hall, and the room will be cleaned or repaired, the w.c. cleaned or renewed, the filth removed, and the nuisances taken away by the landlord, *without a penny of expense to himself.*

Sanitary Hints.

If there are bad smells, and the drains are out of order, or any typhoid fever about, he should at once let the sanitary officer know, and he will attend to the matter.

He ought to see particularly that the cistern he gets his water from is clean, and in good order, and that the overflow pipe from it (and from his sink, if he has one) does not run into the drain, but into the open air. He has a right to insist on the water being pure as well as the air. It is far better not to have a sink waste-pipe at all than to have one that runs into the drain, however well it may trapped. Sinks are a common source of blood-poisoning by sewer gas.

We will now suppose that the man has got a clean, light room not less than 12 ft. square in which he and his wife and two children are to live (of course, if there are no children, a smaller one will do, and if there are more a larger one is needed). The next thing then, is to furnish and, as far as it is in his power, to decorate it. It is best to use two colours in distempering the walls—say a dark brown below, a light blue, yellow, or pink above. He can do this himself at a very small cost. Then a pattern may be cut out of a piece of stiff brown paper for a dado or border (you can show him how), and this gives a finish to the room if painted on in a dark colour about four feet from the floor, just where the darker shade of the wash below joins the lighter one above; the colour should match or contrast with the darker wash. This method is cheap, and also durable, if the wash is mixed so as not to come off on the clothes when it is dry. Any plasterer will tell him how. The ceiling should be whitewashed. All old paper, of course, should be stripped off

Walls and Floor.

the walls first, even if they are going to be papered again. If it is decided to do this, instead of having colour wash, he ought to try and get a glazed paper that will stand wiping with a damp cloth—glazed colour or enamel paint still better. The cost of either of these is very moderate. Wall-paper (unglazed) can be had at a farthing or a halfpenny a yard. If unglazed paper is used the walls must be swept down regularly, instead of wiped, for it is astonishing how much dirt settles on them. Any very bright colours, especially green, should be avoided, for fear of poisonous materials, though the paper should be light and pretty.

Now about the floor. A capital plan, in the first place, to preserve health and keep out the dirt, after first stopping up all the rat and mice holes by the fire and in the wainscoting with plaster and powdered glass, and seeing that all rotten bits in the floor are replaced with sound wood, is to caulk up all the seams between the boards with oakum carefully. Oakum is old tarred rope, which can probably be got for little or nothing. It should be stuffed tightly in with a blunt knife, so as to fill up all the cracks level with the wood, that no dirt may ever get into them. These little points are *most important*, as when there is only one room no dirt must be allowed to lodge in any place that can be got at.

If the boards are at all good and smooth, the best plan is to rub turpentine and beeswax well into them ; or to size, stain, and varnish them, which is a little more expensive. If he does this, he will save the constant scrubbing of the boards, with the damp rising all up the children's legs, as well as all the hard work on the wife, who will only have to wipe them with a damp cloth to keep them clean.

If a bit of oilcloth can be afforded, get a square that will just reach to the edge of the bed, not under it, and another strip to the door to save the polished boards. On no account let them put down old bits of carpet, which are simply receptacles for dirt.

You can have no idea of the value to the poor of making them attend to these simple matters first, before occupying their room.

Now what about furniture? Well, if it can be got good and second-hand it is best ; only it must be clean and free from insects. Strong chairs costing no more than four shillings and sixpence each, new, in the country (arm-chair, six shillings and sixpence) are known to have lasted

Furniture.

forty years, but it is not easy to get London-made goods that will wear so well. Let them do with as little furniture as you can, for every bit of furniture *takes away so much air-space from the room.*

They must have a bedstead. Never let them sleep on the floor, however poor they may be. Let them sell the bedding rather than the bedstead. An iron bedstead is the most suitable (not a wooden one), and the iron laths should be covered with a piece of canvas rather than with oilcloth, as it lets the air through. Then they want a good mattress (no bed) of hair, fibre, or even straw, but not of woollen flocks, which harbour too much dirt. If possible, let them get a wire-spring mattress or one of wood laths that also spring. The cost is moderate. They are very comfortable, healthy, and clean, but require a thin second mattress over them.

There should be no hangings round the bed: they collect dirt; or, if they are liked for the sake of appearance, let them be of washing-chintz that can be kept clean.

A coloured counterpane or a striped Austrian blanket makes the best bed-covering. If they cannot afford a pair of good blankets underneath, let them have one, and instead of another let them paste together sheets of brown paper, till they equal a blanket in size, but perforated for ventilation, and they will find that it will keep them wonderfully warm. The sheets should be of soft twilled unbleached cotton.

The bed, if possible, should not stand with its side against the wall, but with its head against the wall out into the room. Before we leave it, give them a word about making it. A moment's reflection will show that the bedclothes we sleep in for hours must be thoroughly well aired; therefore, let the wife throw all the clothes down on the foot of the bed in the morning; open wide the window, and let them be aired well for at least an hour before remaking the bed for the day. Let them wash themselves and the children at night rather than in the morning, so as to leave the day's dirt in the tub rather than between the sheets. But we must finish furnishing the room before we talk of washing.

If they can afford it, a couch is of great use, and can be turned into a nice children's bed at night. They will want, besides, a good chest of drawers, a strong deal table with a washing top that will do to cook on; the legs can easily be stained and varnished, and then, with a small table-cover to slip on, it will look quite smart. If possible, the washstand should

be one with a hinged lid that can be put down during the day, and serve as a second table. They must have one or two cupboards either ready fixed (clean and without holes) or bought to fit any recess near the fire. We have now nearly finished. The fire-grate should, if possible, have a fire-brick at the back to throw the heat into the room, instead of being made of iron to absorb it. And then when they have three shillings to spare they can invest it in an 'economizer' that will save the coal bill wonderfully. It is simply a piece of sheet-iron made to hook on the bottom of the grate, and fill up all the space down to the hearthstone; so that no air can enter through the bottom bars, but all must come into the fire through the front bars. This saves coal by making less draught. The ashes, too, make no mess, falling behind it, and they need only clear them away *once a week*, as they are not unwholesome, and keep the grate warm. Of course, they should sift them well with a little wire cinder-sifter, and burn all the cinders. Another plan for making a slow fire is to slip a bit of sheet iron, or even cardboard, in the bottom of the grate so as to block up the bottom bars. Another is to fill the grate with fresh coal, then put the paper on the top, sticks, and a few cinders, and light it, and it will slowly burn *downwards*, and last a long time. The blocks made of coal-dust and tar, and sold for a halfpenny, are a cheap, healthy, and slow-burning fuel.

With reference to the decoration of the room: encourage them to have as many pictures as they can afford, but all in frames which can be washed; and if they have any texts or mottoes up, let them be varnished over; and let none be hung too high to be easily wiped with a damp cloth. Remind them that a damp cloth is the best duster. With a damp cloth the walls can be wiped (if of glazed paper), the pictures, the furniture, the floor, and the square of oilcloth, which, by the way, should be strong and thin, and is much better than carpet in a single room. If this is too cold for the feet in winter, a strip of clean drugget can be laid over it. The oilcloth should not be nailed down. If it can be afforded, let them put a pole, with a pair of glazed chintz curtains, which are easily kept clean and look cheerful, across the window. It is not necessary for health, but it improves the appearance of the room. The best blind by far is a venetian; the next best is a green holland one. Outside the window let them have a flower-box, and look after it well. All through the summer, with the window open, the sweet smell of the flowers will be wafted in.

Decoration.

Two more very useful articles of furniture that are hardly ever seen in London are worth getting. They will complete the general furnishing. One is a folding screen. They can make one, or buy one for a few shillings plain, and let the children paste pictures on it. This screen can be put round the washstand, and thus make a separate room for them to wash in. It can be placed round the fire, and hung over with clothes, as a clothes horse; it can keep all draughts off the children while they are being washed. In very close days it can be put near the door, and the door set wide open without making the room public. In short, it has many uses; therefore, if possible, let them get one.

The other contrivance is a frame of wood, four feet square, and hung near the fireplace, a foot from the ceiling, by its four corners to four hooks. This frame has a piece of thin cord stretched from side to side every six inches, and forms the best and most convenient place for drying and airing clothes they can possibly have. It is overhead, out of the way, and yet just within reach. It costs little, and is of great use, especially if the wife has to wash at home.

As regards the larder: the dry stores, sugar, tea, flour, etc., should be kept in one of the cupboards by the fire, or on a shelf above them; but the meat, and milk, and fish, etc., should, if it can possibly be afforded, be kept in a small lock-up safe just outside the door, if it is a respectable house, or hanging outside the window, fixed as high as can be reached, and not inside the room at all.

And now that we have seen how the room should be furnished, a few general remarks may be added.

Light and Heat.

The light ought never to be gas. Gas takes as much air to keep it alight as five men can breathe, besides being expensive. The best and cheapest light is a *safety* lamp.

If they cannot cook on their fireplace, and the wife is always grumbling, they must buy a small American cooking-stove that will stand just in front of the fireplace, burn any sort of slack coal, and cook capital little dinners. Then, again, if they have saved up a little, let them buy a Rippingille oil-stove for summer cooking, and save all firing. These delightful little oil-stoves will cook away on a chest of drawers, or on a shelf just outside the door, a nice little dinner with about a pennyworth of oil, heat an iron on washing days, and boil water, and are the handiest things in the world. Only mind they get Rippingille's.

A flat-topped kitchen fender is useful, and makes a seat for the children in winter, and a stand for dishes, etc., during cooking.

General Cleanliness.

Now just a word about pure air, pure water, and cleanliness, and then you will have given all the advice possible to our 'one room' friends.

Your nose is your own sanitary inspector, therefore use it. When you go in observe if there be any unpleasant smell, or if the room be stuffy. If so, open the window more. The top of the window should be kept open, and then, if they have a venetian blind, keep this let down six inches, with the woods turned so as to direct the air upwards as it enters, and they will feel no draught; or, if they have not got one, let them nail a board across the window-frame, in the same way as one of the laths of the blind, slanting outwards and upwards, so as to serve the same purpose. With this they need not fear getting cold by having the window open at the top at night.

The room should never smell stuffy. If they want to be thoroughly refreshed by their sleep, and kept in health, let them keep the window open, as we have said, a little all night. It is true—very true—that night air is dreadfully injurious, but then it is the night air of the bedroom that is meant, not the air out of doors. Why, some air at night must be breathed, surely? And what air is there at night but night air?

Let them keep the window, therefore, always a little open at the top, and widely open at the bottom as well whenever they can.

Teach them to keep the window-panes always bright and clean; and it is to be hoped they have chosen a room into which the sun shines. This is most important for health, and it is not too late to mention it now. Children, as well as window plants, want the sun to make them grow — besides which, sunlight destroys countless numbers of those germs of disease that are always floating about in the air. Let them pay sixpence a week more rent if necessary to get the sunny side of the street.

The next thing is how they are to get pure water. Well, unless they are fortunate enough to have a tap right on to the main, they have to get it out of a cistern. They must see themselves that the overflow pipe of this cistern discharges into the open air over a trap, or they will probably get blood-poisoning some time or other. The cistern must have a cover, and should be emptied and well cleaned every three months.

The water they drink should be kept in a covered vessel in the room, and should never be used after standing all night, as it absorbs all sorts of impurities.

If it can be afforded, let them buy a little glass charcoal filter; it is a nice ornament, and a great protection against impurities. Boiling the water first is of course still safer; and if they have a charcoal filter, the charcoal itself should be washed and scraped from time to time to keep it sweet and clean.

Without general cleanliness the trouble and expense with the room and furniture will be in vain.

Every alternate morning, the piece of oilcloth should be wiped over with a damp cloth, while the boards should be wiped all over with the same, together with the walls as high as the dado, if they will stand damp; if not, with a dry cloth. On the other mornings the floor and carpet should be merely swept. All fluff and dust will be burnt in the fire. Once a week all the walls should be brushed down, and everything that will bear it scrubbed with Sapolio or some such soap.

Nothing less than this will keep the place clean, and it is infinitely better than only having a scrubbing-day once a fortnight. The health and sweetness of the room will be greatly increased if they keep a bottle of Sanitas in the house, and on the alternate days put a little in the water when they damp the cloth.

Bear in mind that from the bodies of four people, in the course of a year, nearly 36 lb. of dead animal material comes either from the breath or skin, and all this falls about the room, and that is the reason why the furniture must constantly be wiped, and the picture-frames, and the tops of the cupboards, doors, and window-frames, with a damp cloth, as the dust that settles when a family live in one room is far, far more injurious than that in an ordinary house. If they possibly can do their washing out of the room, it is a great advantage. If not, it should be done as early in the week as possible.

All the dirt and kitchen refuse should be burnt in the fire, or, if too damp—if there be cabbage-stalks, for instance—they should be thrown in under the grate till dry, and then burnt. If a stock-pot of earthenware is kept on the hob, not only bones and bits of meat, otherwise wasted, can be thrown into it, but cabbage-stalks and other bits of fresh vegetable, and a capital nourishing soup got without expense. They should never be put in the dustbin or ashpit.

They should hang the wearing apparel up as much as possible

on hooks and pegs, with a cover over it to keep the dust off, instead of packing it away in drawers, so as to get well purified.

Everything about the firegrate should be kept well blackened, whitened, and cleaned. Nothing makes a room look better than a bright, clean hearth, and the 'economizer' is a great blessing. Of course, whenever a very brisk fire is wanted, it can be unhooked for a time. Perhaps now we have said enough to show what can be done even in such a limited sphere as one room.

CHAPTER XI.

ON HOUSE SANITATION.

Introduction.

We are all by this time getting fairly familiar with our friend (or enemy) the sanitary engineer, with his plans and mess, and, above all, his bills. We have all heard of germs and their history, and yet in this chapter we are going once more to speak of sanitation. And what is more, we mean to continue speaking about it until what we say is not only heard, but believed; until it is not only believed, but acted upon.

Not that we would cast the slightest reflection upon the principles or practice of any of our readers; but as it is possible they may still have some friends who do not know the difference between an S and D trap, and who positively cannot say whether the overflow of the 'safe' attached to the bath, or the waste of the housemaid's sink, discharges into a properly constructed gully trap or not, we will proceed without further apology to plunge into the subject.

General Apathy.

It is amazing how apathetic people are about preventible disease. One would imagine, if one did not know, that if simple means of prolonging our lives could be pointed out to us, whereby we could avoid mortal poisons, no hall in London could contain the throngs that would flock to hear about it. In the great cholera year 35,000 died, but in the same year 40,000 died from typhoid fever, and no one thought of *them*.

Take the well-known case of Bagshot Park, for instance. The deadly fever the Duchess of Connaught took was entirely owing to her sofa being placed in the draught from the door to the fireplace, and to the fact that the air causing that draught came from the house, which was laden with sewer gas, instead of from the open air.

We have already, in the first part of this manual, considered

the question of heat, light, and ventilation in the dwelling-house.

Purity of Air.

The following short table of the comparative impurity of different atmospheres may, however, be interesting, and has not been given before.

Amount of oxygen in the air:

On the open sea, mountain, or heath .	21%.
In a small room with a lamp . .	20·8%.
In the pit of a theatre . . .	20·7%.
In the Court of Queen's Bench . .	20·6%.
In foul air when a candle will not burn	18·5%.

Amount of carbonic acid gas in the air:

In the air of Scotch hills . . .	·03%.
In Oxford Street	·03%.
In the New Cut	·04%.
In the gallery of a theatre . . .	·1%.
In the boxes of a theatre . . .	·2%.
In the pit of a theatre . . .	·3%.
On the Metropolitan Railway . .	·15%.

We must not forget that this carbonic acid gas contains carbon or charcoal, of which we produce by breathing alone no less than half a pound a day. If this amount be powdered, and then blown all about a room, it will be seen how it settles everywhere, and how much impurity it causes.

Solid Information.

We will now consider the question of the other solid impurities in our houses that defile the air. They arise from dustbins, general dust, and poisonous decorations. The question of sewer gas we will discuss under the head of 'Water.'

Dustbins or bags ought to be universal, and ashpits done away with finally. By dustbins I mean galvanized iron receptacles for dry ashes, with covers. Bags may be similarly slung up under shelter (as recommended by Mrs. Priestley), and can be easily removed. By ashpits I mean dark, noisome brick buildings, where all refuse is indiscriminately cast, wet or dry. We are, I suppose, all aware that no vegetable or animal matter should be placed in the dustbin, but dried and burnt; or if in great quantities kept separately, and constantly fetched away, a department the cook is only too ready to look after.

If, unfortunately, in an absent moment, the cook should have thrown organic matter into the dustbin, carbolic acid or chloride of lime will correct the oversight.

Respecting general dirt, it is always with us. We may do what we like in London, but as long as we have our thick nailed-down carpets, our heavy curtains and portières, our cretonne or chintz-covered walls and beds, our heavy, high, immovable furniture, we cannot be clean. We can, indeed, prevent some of the dirt from entering. If we adopt direct ventilation with the external air, it is always well to strain the air through fine invisible wire-gauze or muslin as it enters, and it will be surprising how much dirt this arrests en route.

Hints on Cleanliness.

To facilitate cleanliness, all heavy furniture must be mounted on castors, all unnecessary hangings done away with. Some of us know how old hangings absorb poison, and can remember the story of a well-known West-End physician, who bought a house, and got fearfully ill with diphtheria in a lovely boudoir, wainscotted in blue velvet and gold; and how the fever ran higher, and he got worse and worse, until at last he was removed to a comparatively comfortless apartment with bare but clean walls, and he soon got well. Here, indeed, we have to strike a balance between luxury and health, and if we do have velvet hangings and heavy tapestry, at least see that they are kept as clean as it is possible to keep them, and also that our rooms generally are properly and efficiently dusted, and that the dirt collected on the duster is always shaken out of the window, and not inside the room.

Another important matter is always to see that the parts of the house out of sight (and mind) are kept well whitewashed and scrupulously clean—kitchens, cellars, pantries, closets of all sorts, and all other subterraneous regions.

So much for dirt; now for poisonous decorations.

Arsenic.

Here arsenic is our great foe. This deadly and subtle poison exists still on every hand in our dwellings. It is found plentifully in all sorts of coloured wall-papers that contain no bright green, or even bright colour; it is found in playing cards, children's toys, chromo-lithographs, painted and distempered walls, the large variety of japanned tin goods, Venetian blinds, American cloth, lampshades, curtain linings, cheap cretonnes, dress material, gloves, both silk and kid, artificial flowers, and other articles too numerous to mention.

It may be objected that none of these things are ordinary articles of food, except among children, who are often found grazing on their toys, or on the tops of their gloves.

The answer is that, nevertheless, the impalpable arsenic-laden dust that comes off these articles is not only breathed, but swallowed freely; but there is still worse. This arsenic is, indeed, a solid, but it is capable of being vaporized and inhaled as vapour when heated. Hence the danger of green lamp-shades. But besides this, the moist air of a room full of people is capable of combining with the arsenic in the wall-paper, and producing a most poisonous gas, called arseniuretted hydrogen, the unfortunate discoverer of which deadly compound, Galen, was killed by breathing a single bubble of the pure gas.

In various ways, therefore, does the arsenic which is still such a common ingredient in colour find its way into our systems.

The symptoms are: loss of appetite, sore eyes, depression of spirits, headache, and sore-throat. From a handkerchief poisoned with antimony in the manufacture, one lady got bad hay fever. Girls making artificial flowers with arsenic suffer acutely. Indeed, it may be said that if a person is suffering from unaccountable ill-health in a certain house, that it probably arises from sewer-gas or arsenic.

In one case the cause was a zealous nursemaid, who determined to 'sweep clean;' and so vigorously swept the arsenic-laden walls of the nursery, with the result of bringing on a violent epidemic of arsenic-poisoning among the children—one of whom, I believe, was still suffering from the effects seven years afterwards.

All paper should be really free from arsenic, and should be glazed, if possible, so as to be wiped with a damp cloth without injury.

And now we turn to the delightful topics of water, pipes, drains, and sewer-gas.

The first problem is to keep water out of the house; this mainly concerns fools, for we are told fools build houses for wise men to live in. Those, therefore, that are likely to become fools in this sense, should observe that damp, and more or less bad air, is ever rising out of the ground, and hence that inasmuch as a warm house above acts more or less as a sucker, its foundations must, first of all, consist of impenetrable concrete, and that as soon as the walls rise above the ground a layer of slates or other material must be laid on them, to prevent the damp ever rising in the walls. The house, I need hardly say, should face the sun, and stand on the slope of a hill, with trees not too near;

House-building.

for trees, as is well known, dry the ground, but moisten the air.

If the house be on a clay soil, or on 'made' or artificial soil, these hints should more particularly be attended to.

It has been found by the researches of Mrs. Priestley that in ancient times these matters were not always attended to, at any rate, by the Vestal Virgins; for their temple, built against a hill, had a very damp wall, which compelled them not only to build one or two additional walls in front, but to construct an out-drain of Roman vases to carry the water off.

But the majority of us after all are living in houses built by others.

Drains and Traps.

In this case the lasting bugbear is an article called 'the drain,' supposed to exist, in a general sort of way, somewhere downstairs, but which no one has ever seen, and of which no definite idea really exists. This drain is to smells what the cat is to breakages in a house, only with more reason.

What is a drain?

I'll tell you what it is—or was, at least—in my house, and hundreds of others in the West-End. A leaky brick channel running under the house, riddled with rat-holes, and supposed to carry away the refuse of the house into the common sewer, but in reality discharging as much of it as had not already leaked out on the way, into an old cesspool under the kitchen floor, whence a pipe took the overflow to the sewer; and this in a house where I had already spent a large sum on what was euphoniously termed 'putting the drains in order.' It has been well said that a man cannot be a good rider until he has had a few tumbles, and it is certain that many of our best sanitarians are so by force of circumstances.

A Sanitary Drain.

Let us see what a drain ought to be. A watertight and airtight tube of well-jointed, glazed, earthenware pipes, about four inches in diameter, running in as straight a line as possible to the sewer, consistently with its not running, if it can be avoided, under the house.

This drain should be disconnected from the sewer by a good syphon trap, and should be ventilated by a pipe running from the trap right up above the roof of the house. It is best to have a special pipe as large as the drain, *not* the rain-water pipe, and the drain itself, if it does run under the house, should be bedded in concrete, so that the pipes may never be moved out of position.

The following pipes must *on no account* run into this drain :

1. No cistern overflow pipe.

2. No lavatory, bath or sink pipes, or any pipes connected with the safes under them, as the lead trays are called that catch the overflow water.

All these pipes must be led down to the basement, carried through the wall about a foot above the ground, or preferably carried outside all the way, and then discharge their contents into the open air, so as to fall on a gully trap underneath, which conveys them into the drain ; and there being thus no direct connection, any sewer-gas is absolutely prevented from ever entering the house by these channels.

Some time ago Sir R. Rawlinson mentioned this at a lecture. An attentive and intelligent hearer went home, where her husband had just recovered from diphtheria, to find that the overflow pipe of her drinking cistern did run into the drain. Fortunately, all the family had been kept away, or the consequences might have been dangerous. She at once had the pipes disconnected, and also the drain ventilated as we have described.

Bear in mind, when being consulted about traps, first of all to remember that they are traps, and always dangerous things ; and, next, that the D trap means the Death trap, and the Bell trap the Death-bell trap, while the S and P traps are comparatively quite reliable.

Respecting the cistern itself, if you multiply its cubic contents in feet by six you get the number of gallons it contains ; if you divide them by five you get the number of people it will supply, baths included. Galvanized iron is the best material, and as good for the purpose (so Mr. Turner tells us) as gold or Dresden china.

Water Supply.

Unless the water be very hard, lead is not good, as soft water soon eats it away, and $\frac{1}{10}$ grain of lead per gallon is poisonous. A lead cistern may be washed and flushed, but not scrubbed.

We trust what has been written may prevent any necessity for saying much about sewer-gas. Let us remember, however, should occasion arise, that it is well not to conceal bad smells by disinfectants, but rather to remove their cause. Particular attention should be given to the larder, as food is a ready absorbent of sewer-gas.

We trust these few hints will be of practical value to every reader of these pages.

CHAPTER XII.

THE PATIENT AND THE DOCTOR.

How to Answer a Doctor.

THE time has surely arrived, in the last decade of the nineteenth century, when an intelligent person should be able to explain clearly and lucidly to a doctor why she has called him in, and to answer any questions he may put.

The first thing clearly a doctor requires to know is exactly what you are suffering from. In the first place, then, even though you are nearly sure the disease is rheumatic fever or measles from which you or the patient is suffering, never give a name to the disease yourself; that, after all, is the doctor's province, and even in the simplest cases you may be wrong, and then it makes it difficult for the doctor to contradict you. Instead, therefore, when the doctor asks you what is the matter, of giving the disease a name, and saying 'Bronchitis,' or foolishly replying, 'That is what I want you to tell me, doctor,' just describe shortly and simply, and in as simple and exact language as you can, the leading symptoms in the order that they appear most important to yourself.

There are few diseases unaccompanied by pain, and when this is present it is generally what the patient thinks of first; therefore begin with pain. Say whether severe or slight, describe briefly its character—constant, intermittent, dull, throbbing, shooting, darting, boring, stabbing, grinding, aching, etc. Give its site by description, aided, if possible, by demonstration; state if fixed or movable; give its duration; and then if you wish really to shine in the doctor's eyes, and make him think you a perfect paragon of intelligence, say if there is any tenderness as well as pain—pain meaning the sensation independently of touch, tenderness the sensation of pain only on pressure. Let me illustrate the above. Supposing you have a stitch in the side that you are

Subjective Symptoms.

sure is pleurisy. You send for the doctor, but you don't tell him 'Pleurisy' when he asks, 'What is the matter?' No; you say, 'I have had a sharp stabbing pain whenever I draw a breath ever since last night. It is just here' (or on the right side of the chest, here); '*but there is no tenderness.*' Just watch the doctor's face as you utter these last five words. Or the same in a headache. You may say, 'I have had a bad pain at the back of my head for two days, and *the skin is very tender as well.*'

But there may be more than pain to describe. If so, the doctor will gently say, 'Yes?' and you can go on again. Perhaps you first give further details about the pain, and especially as to its onset, which is always important. 'It began quite suddenly, when I was feeling well,' or, 'It began with a fit of shivering' (always mention any fits of shivering to the doctor, for they are of great meaning, and especially at the beginning of a disease). The pain may have gradually got worse, or it may have begun in one part and be now in another.

You may have a cough. Describe the sort—hard, dry, loose, constant, fits of coughing. Say whether much or little expectoration, and briefly describe its character to save further questions. In every answer, get in as many facts as possible; give no theories and no ideas, and always use the plainest and most forcible language you can to describe your symptoms.

There may be a swelling. State its situation and character briefly, the length of time you have observed it, its rate of growth, pain, etc. Remember swellings near the groin are often very dangerous.

It may be a headache. Describe the pain, situation, duration, anything that makes it worse or better. Don't be surprised if, when the doctor has heard your description, he fastens on the symptom that appears to you of little importance. His standpoint is quite a different one from yours: he has not got to feel the pain, which, after all, may mean nothing. He may plunge at once into your family history. Try and answer concisely and clearly, and don't launch out into long family yarns. You may then be asked as to the probable cause. First of all, in answer, you give, if you can, the exciting cause, and then, if there is any, the preparatory cause. For instance, if it is rheumatic fever you say, 'I got a severe chill on Tuesday,' and then you add, 'but was feeling very weak and poorly some days before that.'

When you have quite finished your subjective symptoms you

must not then ask, 'What is it, doctor?' for before he can answer that question he has next to consider the objective symptoms, or the physical signs connected with the case. Let us, then, consider these next. Some of them the doctor finds out by questioning you, the others by direct examination. You will often see no apparent reason for these questions or for this examination. Nevertheless, if you have confidence in your doctor, just answer and do as he tells you; he knows what he is about, or ought to. For instance, you may rightly enough have been describing some palpitation of the heart; when you have done he may say, 'Shut your mouth and show me your gums,' or he may step up to you and draw down the lower lid of the eye. In this case he thinks your palpitation is due to poverty of blood. He does not, therefore, go to the heart, as you wish him to, but looks to see in the gums and eyelid if the blood is of the right colour.

Physical Signs.

He may ask to see your hand. The shape of the finger-ends tells him if you have consumption; the nails and palm of the hand may show the disease is gout, the joints that it is chronic rheumatism, or rheumatic gout. Or he may tell you to hold your hand out and stretch the fingers. By the position insensibly assumed by hand and wrist he can judge of your strength, temperament, and nerve force—he can detect drinking habits; or he may carefully examine the ball of the thumb and find evidence of spinal disease there; or, saying nothing, he may just glance at your hand as it lies, and in its natural position may see written the form of paralysis you are suffering from. Again, he may look at the teeth: signs of various diseases are often engraven on them; or in the gums he may see evidence of lead-poisoning in the thin blue line at the edge. The tongue is, of course, a perfect mirror of information, and, indeed, many would feel slighted and neglected if it were overlooked, and say reproachfully, 'But, doctor, you haven't seen my tongue!'

The way it is put out may show partial paralysis. The surface of it, the colour of it, the fur on it, the marks and cracks on it, all speak volumes; and books have been written on this one subject. All you have to do is to put it out well: not as most young ladies—just show the tip beyond your lips, as if it were a strawberry—but, regardless of appearances, put it right out and show the back, which is the most important part, and earn the hearty 'Thank you' of the doctor.

In the eye the doctor may see much. The difference of size of pupils may speak to him of internal acute or chronic brain disease. A squint may decide the diagnosis of a case; the size of the pupils may point to poisoning by various drugs or alcohol; the eyelids to kidney disease or to paralysis. The ear is searched for gout-stones, so common there.

The doctor may ask to look at the throat, and as the tongue is an unruly member, and even its owner cannot control it, you must let him hold it down with a spatula or spoon. Open your jaws at once to the widest possible extent, but don't gasp and get black in the face by holding your breath. This is not required; you can go on breathing tranquilly all the time. It is a great comfort to know this. He may take you to a very good light and ask you to say 'Ah.' This is not a joke on his part, but is because that sound clearly uttered raises the soft palate and gives a clear view of the back of the throat. Never when you open your mouth put your tongue out unless told.

The doctor, especially if there is any hoarseness, wishes to see the larynx. This he cannot do save as reflected in a little mirror which he will hold at the back of the throat. He will warm the glass first to prevent your breath from condensing on its cold surface, and then, as he must get a good view, he will take hold of your tongue with a towel and pull it right out, while you open your mouth to its widest extent, and say 'Ah' when he tells you, *breathing quietly meanwhile.* He may feel all round your head and ears and neck and throat. He is looking for enlarged glands under the skin.

He may wish to examine your chest. In a rough and somewhat unsatisfactory way this can be done over the vest; but if there is any real lung trouble, or the examination is to be thorough, the vest must be slipped down and the bare chest examined back and front. There are four ways of examining the chest, which the doctor calls *inspection*, *palpation*, *percussion*, and *auscultation.*

The first consists in observation only—seeing the movements of the chest in breathing. Perhaps one side does not move at all, perhaps the upper part only moves, and so on—all this speaks volumes. When the chest is being examined, sit squarely, and, above all, do not breathe as if it were your last gasp, or as if you were panting like a dog. Try and breathe full, regular, noiseless, steady breaths.

Palpation means feeling the chest with the hands. At this stage you may be asked to say 1, 2, 3, or 999. If so, say it

clearly, and in a loud sonorous voice. It is not a game. The doctor on one side of the chest may feel the waves of air striking against his hand through the chest-wall; on the other side he may feel nothing, and hence knows that side is full of water.

Percussion consists in resting two fingers on the chest and striking them with two others so as to elicit a note. This, again, tells him a great deal.

The last, auscultation, is conducted with the ear to the chest-wall, or through a stethoscope; all the internal breath sounds are now heard, and their meaning interpreted. As the stethoscope approaches the lower part of the left side you may be told to hold your breath. This is that the beating of the heart may be clearly heard without breath sounds.

Swellings must be handled by the doctor, and you must not flinch. He has to find out if they are fluid or solid, and hence taps them, and the little wave striking against his finger shows the fluid, if it is there. And now having patiently gone through all this, you must not at the end be disappointed if the doctor does not at a first visit at once say what is the matter with you. The difficulty of diagnosis is so great, the danger of giving a wrong one—which means wrong treatment—so real, and his desire to get and give a right one so strong, that it is better not to press him, for you may be assured that as soon as he is sure he will tell you. The prognosis—that is, the duration and cause of a disease—is even still harder to give, and as a rule that had better be deferred to a second visit.

What you have to do now is to pay the closest attention to the directions he gives, and see that you understand them. About diet: this is most important, and varies immensely. The poor and thin require fat; the nervous, fish; the dyspeptic, plain food and slops; the gouty, vegetables; the feverish, liquids; the stout, meat diet only; and so on. The amount of air, exercise, etc., must be understood; any applications to be made, noted; and, finally, the medicines are to be carefully measured and taken at the right hours. If further treatment, such as an operation, is needed, get clearly to understand why it is suggested; find out the risk involved if it is done, and if it is not done; quietly talk the matter over with the doctor and your friends, and seek to come to a really rational decision. Then in convalescence, and after cure, find where to go for change, and what tonics to take.

Leaving now the doctor and the patient, before we conclude

this chapter let us consider very briefly the question of work and recreation. Recreation and work are largely matters of sentiment in old and young. It is quite possible for a young man at Cambridge, in training for the boat race, to find that that is his work, and his lecture his principal recreation. In Greece there was no division between work and play, or business and recreation—the one *was* the other. A great step towards health is to seek as far as possible to enjoy our work, and to remove the barrier between labour and pleasure, and to unite them. The unequal struggle for existence in our poor climate largely prevents this—for body or muscle workers, at any rate. A brain-worker, *free from worry and care*, is the happiest and healthiest of mankind. The average length of life of 500 of the greatest brain-workers in ancient times was 64 years; in modern, 70; that of others, less than 50. To the happy brain-worker life is all recreation. Not so to the tired muscle-worker. Unpaid muscle-workers cease work; unpaid brain-workers often continue it for pleasure. Eight hours a day is long enough for the average worker where the faculties are kept continually on the strain. Where the work is very monotonous, or when it is excessively hard, it should never exceed this limit. Where the work is not arduous, or the strain continuous, the hours may be longer. One day of rest in seven is a natural as well as a Divine law, and the change of occupation and of surroundings should be as complete as possible. The intervals of labour, too, in the week should be used for rest as far as one can.

Recreation.

Here in England we doubtless need definite recreation, or remaking (re-creation), by changes of occupation. The moment recreation, as games of any sort, is made an object to excel in, it ceases to be recreation, and becomes work. Those need recreation most who are engaged in any sort of monotonous mechanical labour, whether of brain or body. This description of work kills quickly. The average life in it is about 15 years. Even if too great interest is excited in a game, as in gambling of any sort, it ceases to be a recreation. If life is all recreation, it ceases to be so at all; recreation is only such when it alternates with work.

And now, in conclusion, let us consider what a grand sphere has been opened up to women by this brief consideration of hygiene. There is no valid reason why each and all should not become intelligent practitioners of preventive medicine. All men's efforts in private life in this

Conclusion.

direction are useless until the women act, and there is one great consolation, that, as a rule, when a woman knows and understands a thing she does act upon it. Remember that knowledge merely stored up is just so much intellectual fat; only as it is carried out in action does it become intellectual bone and muscle. Knowledge, however, must come first, and there is no reason whatever why every woman should not have the leading outlines of the physiology of the body at her fingers' ends, the details of child growth and child management well known and digested, and the laws of preventive science in house and home clearly understood. Many are looking askance at the rapid progress of women in some fields of knowledge, and inquiring somewhat jealously in what way they are benefited by becoming senior wranglers or first classics; but none can question the use of hygienic knowledge to a woman, and none can fail to wish all God-speed who thus seek to equip themselves better for the battle of life, whether for their own sakes or that of others.

GLOSSARY OF SOME COMMON MEDICAL TERMS THAT SHOULD BE GENERALLY UNDERSTOOD.

Abscess.—A collection of matter anywhere in the body.
Acne.—An eruption of pimples, generally on the face.
Addison's Disease.—A gradual bronzing of the whole skin.
Anæmia.—A disease dependent on poverty of blood.
Anæsthesia.—Loss of consciousness.
Anæsthetics.—Agents that produce loss of consciousness, such as chloroform and ether.
Aneurism.—A blood-tumour, formed by an enlargement of an artery.
Angina pectoris.—A disease of painful spasms of the heart.
Anodynes.—Agents that destroy pain, such as opium.
Anorexia.—Want of appetite.
Anthrax.—A carbuncle.
Apnœa.—Cessation of respiration : *a form of death.*
Aorta.—The large artery that leaves the left side of the heart.
Ascites.—Dropsy of the abdomen.
Assimilation.—Converting digested food into body tissue.
Asthenia.—Weakness.
Atheroma.—A disease of the arteries.
Atrophy.—Wasting.
Auscultation.—Listening to the chest sounds.
Autopsy.—A post-mortem examination.

Bacteria.—Germs.
Bicuspids.—The two teeth beyond the eye-teeth on each side.
Bronchus (*i*).—The smaller windpipes.
Bronchitis.—Inflammation of the bronchi.

Canines.—The two eye-teeth in each jaw.
Carcinoma.—Cancer.
Cardiac.—Belonging to the heart.
Caries.—Ulcerating bone disease.
Carotid.—A large artery in the neck.
Carron Oil.—Equal parts linseed-oil and lime-water (for burns).
Cataplasm.—A poultice.
Cataract.—An opacity of the lens of the eye.
Catarrh.—A cold in the head.
Cephalic.—Belonging to the head.
Cerebrum.—The brain.
Cerebellum.—The little brain.
Cervix.—The neck or narrow part of anything.
Chloasma.—A brown skin disease.

Chlorosis.—Green sickness: a bad form of *anæmia.*
Chorea.—St. Vitus' dance.
Chyle.—Digested fat food.
Chyme.—Partially digested food as it enters the duodenum.
Cicatrix.—A scar.
Cilium (*ia*).—Eyelash.
Cirrhosis.—Disease of liver (generally alcoholic).
Clavicle.—The collar-bone.
Clinical.—Actual investigation by the bedside.
Collapse.—Complete prostration.
Colon.—The large intestine.
Coma.—Insensibility from loss of nerve power: *a form of death.*
Congenital.—Belonging to birth; applied to infantile defects or diseases.
Conjunctiva.—The lining membrane of the eyelids and protecting membrane of the eye.
Connective-tissue.—The tissue that binds all the cells and tissues together, as mortar unites bricks.
Contagion (*-ious*).—Reception of infection by contact or touch.
Cornea.—The transparent part of the eyeball.
Coryza.—A cold in the head.
Cranium.—The skull.
Cuticle.—The outer layer of the skin.
Cutis.—The inner layer, or true skin.

Dementia.—Loss of intellect.
Diabetes.—Excessive formation of sugar in the body, constituting a very serious disease.
Dropsy.—Escape of fluid from the bloodvessels into the tissues of any part of the body.
Duodenum.—The first part of the intestine next to the stomach.
Dyspepsia.—Indigestion. The prefix 'dys' means 'difficulty.'
Dyspnœa.—Difficulty of breathing.

Eczema.—A very common skin eruption.
Embolism.—A tiny clot blocking up an artery or vein.
Emphysema.—A disease where air escapes from the lung air-cells into the lung tissue.
Empyema.—'Matter' in the pleural cavity.
Endemic.—Peculiar to certain places; applied to disease.
Enteric Fever.—Another name for typhoid fever.
Enteritis.—Inflammation of the intestines (*entera*, the intestines; and *itis*, which always means inflammation).
Epidemic.—General, wide spreading disease, due to some special causes.
Epidermis.—The outer or scarf skin.
Epiglottis.—The flap that closes the top of the larnyx.
Epistaxis.—Bleeding from the nose.
Epithelioma.—A form of cancer that begins in the skin.
Epithelium.—The superficial layer of the mucous membrane.
Erythema.—Redness: the name of a skin affection with red patches.
Eustachian Tube.—The tube leading from the throat to the middle ear.
Femur.—The thigh-bone.
Fibrin.—The substance that makes the blood clot.
Fibula.—The small bone of the leg.
Fistula.—A small opening that will not close, through which some fluid discharges.

Fluctuation.—The movement of fluid under the skin when pressed by the finger.
Foramen.—A hole.

Gallstones.—Concretions of bile formed in the gall-bladder.
Ganglion.—A nerve-centre.
Gangrene.—Mortification.
Gastric Fever.—Typhoid fever (*gasteer* means the stomach).
Gastritis.—Inflammation of the stomach.
Gastralgia.—Pain in the stomach (*algos* means pain).
Glaucoma.—A painful eye disease caused by congestion of the eyeball.
Globus.—A ball rising in the throat.

Hæmatemesis.—Vomiting of blood (*hæma* means blood).
Hæmoptysis.—Spitting of blood from the lungs.
Hæmorrhage.—Bleeding.
Hæmoglobin.—Colouring matter of the blood.
Hemiplegia.—Paralysis of one side of the body.
Hepatic.—Belonging to the liver.
Hernia.—A protrusion of any of the contents of the abdomen (generally the intestines).
Herpes.—Shingles : a skin eruption.
Housemaid's Knee.—A swelling and inflammation over the knee-cap.
Humerus.—The arm-bone.
Hypertrophy.—Enlargement or overgrowth of any part.
Hypnotic.—A drug causing sleep.
Hypnotism.—The power of causing sleep.
Hypermetropia.—Short sight from too short a focal distance.
Hypodermic.—Under the skin.

Incisors.—The four front cutting teeth in each jaw.
Infection.—The carrying of disease by the air or by other means.
Inflammation.—A state characterized by heat, redness, pain, and swelling when situated externally. It may affect any part or organ.
Insolation.—Sunstroke.
Insomnia.—Sleeplessness.
Integument.—The skin.
Intermittent.—A recurring disease with intervals of health.
Iris.—The coloured margin of the pupil of the eye.

Laryngitis.—Inflammation of the windpipe.
Leucocyte.—A white corpuscle of the blood.
Lichen.—An eruption on the skin of small red pimples.
Lumbago.—Rheumatism of the muscles of the small of the back.
Lymph.—The colourless coagulable fluid that fills the lymphatic glands and vessels.

Malaria.—Fever derived from marshy places.
Malingering.—Shamming.
Malignant Disease.—Dangerous and generally fatal disease, such as cancer.
Mania.—Madness.
Maxilla.—The jawbone.
Medulla.—Marrow.
Meningitis.—Inflammation of the membranes of the brain.
Molars.—The three last teeth on each side of the jaw.
Monomania.—Madness on one subject.

Mucus.—The fluid secreted by the mucous membrane.
Mumps.—Inflammation of the salivary glands of the cheek.
Myopia.—Near sight from too long a focal distance.

Nævus.—A red patch formed from birth.
Narcotic.—A drug causing sleep.
Nares.—The nostrils
Necrosis.—Mortification of bone.
Nephritis.—Inflammation of the kidney.
Neuritis.—Inflammation of the nerves.
Neuralgia.—Pain in the nerves.
Node.—A swelling on the bone.
Nucleus.—The darker central portion of a body cell.

Occiput.—The back part of the head.
Œsophagus.—The gullet.
Onychia.—Inflammation of the nails.
Ophthalmia.—Inflammation of the eye.
Orbit.—The cavity in which the eye moves.
Ostitis.—Inflammation of bone.
Otitis.—Inflammation of the ear.

Pancreas.—A digestive gland (the sweetbread, in animals).
Papule.—A pimple.
Paralysis.—Loss of motion, or sensation, or both.
Paraplegia.—Loss of motion of lower half of body.
Parotid gland.—The large salivary gland in the cheek.
Patella.—The knee-cap.
Pathology.—The practical investigation of disease.
Pelvis.—The large bony cavity formed by the two haunch-bones.
Pepsin.—The digestive principle of the gastric juice.
Peptones.—Digested meat or nitrogenous food.
Pericardium.—The membrane round the heart.
Pericranium.—The skin covering the skull.
Periosteum.—The skin covering bone.
Peritoneum.—The lining membrane of the abdomen.
Pharynx.—The throat.
Phlebitis.—Inflammation of the veins.
Phthisis.—Consumption.
Pleura.—Covering membrane of the lungs.
Pleurisy.—Inflammation of the pleura.
Pneumonia.—Inflammation of the lungs.
Prognosis.—The foretelling of the course of the disease.
Prolapse.—A falling down of any part.
Pronation.—Turning the palm of the hand downwards.
Protoplasm.—The viscid transparent substance forming a body cell.
Pulmonic.—Belonging to the lungs.
Ptyalin.—The digestive principle of the saliva.
Pulse.—The beating of any artery (generally the wrist).
Pus.—Yellow matter.
Pustule.—A pimple containing matter.
Pyemia.—General blood-poisoning.
Pyrexia.—Fever.
Pyrosis.—Water-brash.

Quinsy.—Inflammation of the tonsil.

Rabies.—Hydrophobia.
Radius.—The small arm-bone.
Retina.—The surface of the optic nerve at the back of the eyeball.
Rickets.—A bone disease due to malnutrition of children.

Sacrum.—The last bone but one in the spine.
Sarcoma.—A form of cancer.
Scabies.—A skin disease caused by the itch-insect.
Scapula.—The shoulder-blade.
Scarlatina.—Scarlet fever.

Sciatica.—Inflammation of the sciatic nerve.
Sebaceous.—Secreting fatty matter.
Septic.—Containing germs, and tending to putrefaction.
Septum.—A division.
Serum.—The liquid part that is left after the blood has clotted.
Sinus.—A canal formed in bone-disease through which the dead bone is discharged.
Sordes.—A deposit on the teeth in fevers, etc.
Spores.—The seeds of the germs.
Sternum.—The breast-bone.
Stricture.—A contraction of any part.
Struma.—Scrofula.
Styptics.—Drugs which stop bleeding.
Supination.—Turning the palm of the hand upward.
Suppuration.—Forming of matter.
Syncope.—Fainting, also stoppage of the heart : *a form of death.*
Synovia.—The lubricating fluid in joints.

Tendon.—The fibrous cord at the end of a muscle.
Tetanus.—Lockjaw.
Thorax.—The chest.
Thrush.—A white fungus that grows in the mouths of infants.
Thyroid Gland.—The gland in front of the neck that occasions goitre.
Tibia.—The large bone of the leg.
Trachea.—Windpipe.
Tumour.—A swelling or growth, generally without inflammation.
Tympanum.—The ear-drum.

Ulcer.—An open sore.
Ulna.—The large bone of the forearm.
Uvula.—The little tongue between the tonsils.

Varicella.—Chicken-pox.
Variola.—Small-pox.
Vascular.—Containing blood.
Vertigo.—Giddiness.
Villus (*-i*).—The absorbents of fat in the duodenum.

Whitlow.—An inflammation of the finger.

Zymotic.—Diseases dependent on germs.

THE END.

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