

Madras School Series.

AN
ADVANCED TEXT-BOOK
ON
DOMESTIC ECONOMY.

BY
MISS
Superintendent, Doveton Girls' School, Madras.

PUBLISHED BY ORDER OF THE DIRECTOR OF PUBLIC INSTRUCTION.

FIRST EDITION.—2,000 COPIES.

M A D R A S :
PRINTED AT THE S. P. C. K. PRESS,
18, CHURCH ROAD, VEPERY.
1889.

(The Copy-right of this book belongs to Government.)

PRICE 4½ Annas.

CONTENTS.

	PAGE
A HEALTHY AND A HAPPY HOME	1
What is it? How to have it?	
HOW TO TAKE CARE OF OUR HEALTH	3
The Functions of Life. Structure of the body. Organs. Respiration. Mechanism of Respiration. Circulation of the blood. Alimentation. Motion, Voluntary and Involuntary. Air and Exercise.	
THE HOUSE WE LIVE IN	14
How to choose it. Rent, Locality, Aspect. Size. Drainage. Furniture, how to choose it. Suit- ability, details.	
AIR	27
The Air we breathe. Quantity, Composition. Oxygen, Nitrogen, Carbonic Acid gas. Ozone, Water, Organic Matter. Sources of impurity. Adaptation of the system to a vitiated atmos- phere. Ventilation, Air movements.	
LIGHT	38
Necessity of light to a healthy life. An enemy to evil, a friend to cleanliness. Nature's gift. The Sun, The morning sun in India, children's early morning walks, Tropical sun. Glare.	
WATER	45
The water we drink. Composition, pure water. Substances found in good water. What makes water impure. How to purify water, Filters. To test water. Water supply. Temperature of water. Rain water, River water, Lake water, Well water. Water from a reservoir. Water for washing.	
FOOD	51
The food we eat. Kinds of food. Breathing food, flesh-making food. Constituents of food. Com- parative nutritive value of different kinds of	

	PAGE
food, the necessity of proper quantity of food containing sufficient nourishment. Work of the human body. Choice of food. The Vegetable Kingdom, the cereals, preparations made from different kinds of grain. Indian grain, sago, tapioca. Green Vegetables, Anti-Scorbutic. French appreciation of vegetables, fresh fruits.	
ANIMAL FOOD	61
Fish, how to choose it. Oysters, Prawns, &c.	
Poultry, how to choose it. Hares, Rabbits, &c. Beef, juice of beef, Kreatin, Cow or heifer beef. Mutton, how to choose it, flesh of a goat. Starving the young animals, Economy in feeding them well.	
PREPARATION OF FOOD	66
Effect of cooking on grain. Modes of cooking, economical joints for families. Pork, how to make it a wholesome food, how to feed a pig. Regularity of feeding necessary for all animals. To cook poultry, eggs, vegetables, potatoes, how to clean Vegetables.	
WASTE	81
How to avoid it	
Kitchen furniture, cooking utensils, a Bain-Marie, death in the Pot. A clean Kitchen, plenty of hot water in a kitchen, dusters, cooks' towels, jelly bags, pudding cloths.	84
BEVERAGES	90
Self-indulgence in water-drinking. Self-restraint necessary. Tea, Coffee, Chocolate, Cocoa. Restorative properties, &c.	
CLEANLINESS. PERSONAL	97
Necessity of frequent ablutions. The teeth. The hair. The skin, hands and feet. Number of perspiratory glands. Death caused by the closing of the pores. The way to be clean, Bathing, Warm baths, Public baths, Soap. House cleanliness, removal of dust, Carpets, Disposal of dust and waste matter. The use of dust and waste matter, lime washing.	

	PAGE
WASHING CLOTHES	109
How to do it. Machine for washing. White clothes, colored clothes, bleaching, drying, pulling out and folding, Mangling, ironing, receipts for washing laces, fine muslins, flannels.	
THE CHILDREN. HOW TO FEED THEM	115
Nature's food; the best substitutes; Scrupulous cleanliness in preparing children's food. Older children's food. Variety, vegetables, salt and sugar. Diet for children with diarrhœa, regularity of feeding always necessary. No food to be taken between meals. Children's illnesses often the result of stupid ignorance, or stupid indulgence; plenty of sleep necessary.	
THE CHILDREN. HOW TO CLOTHE THEM	119
Why clothing is worn. Fashion, Beauty, Cost, how to make their garments, Sewing machine, hand sewing. New material, how to make children's clothes of the left off garments of their parents or grown up brothers and sisters. Neatness important, how to avoid singularity; mending, patching. Boots, shoes, stockings; Tidiness.	
THE CHILDREN. HOW TO TRAIN THEM	127
Infant training, crying, the hand of love should be a firm hand. Punishment when necessary. Truth, courtesy, behaviour to servants. Children's feelings to be considered, good examples set by the elders. Training little girls in little household duties. Self-help, perseverance.	
THE GIRL-NURSE	133
Her duties, how to alleviate pain. Lotions, How to keep ice from melting in the hot weather. Hot applications. Fomentations, Poultices, how to make them.	
SLIGHT ILLNESSES	139
How to treat them. Colds, cold in the head. Diarrhœa, Sore throats, Headaches. Fainting, Hysteria, Convulsions, Croup. Children eating	

	PAGE
poisonous fruit, emetics, castor-oil, poison from a bite, how to prevent the blood if it is poisoned from passing to the heart. Snake poisoning.	
ACCIDENTS	147
Presence of mind, Fright or panic. Alarm of fire, dress, catching fire, Exclusion of air. Fire in a room, calmness in danger. Helping the feeble. Burns, scalds, sprains, bruises, dislocations, cuts, bleeding from the nose. Sun-stroke, ear-ache	
INFECTION AND DISINFECTION	153
How to avoid infection. Vaccination, carelessness in using means to prevent the spread of disease. List of Infectious diseases, showing the time required for disinfection, and also for the disease to show itself. Necessity of disinfection, how to do it. Condy's Fluid and other disinfectants.	
MONEY	158
Thrift and saving. A girl's first lessons in the management of money, how to buy, what to buy, calculation and planning. Investments, Savings Banks, convenience for investing small sums, Interest, Security, Advantage. How to earn it. Prejudice against a girl earning her own living. Change for the better in this respect. Lady doctors, Hospital nurses. Girl clerks, Shop attendants, Millinery and Drapery, Domestic service. Thoroughness in all.	
THE POWER OF A PENNY A DAY	170
What a penny can do.	

DOMESTIC ECONOMY.

INTRODUCTORY.

A 'HEALTHY AND A HAPPY HOME.

It was formerly thought that illness and disease were the gifts of the Supreme Being and that to try to remove them would be impious as well as useless. Plagues, fevers, and other disorders were considered as judgments, and beyond the power of human knowledge to explain, or human skill to prevent, while even an attempt at either would be considered an act of daring impiety. All this, however has been changed. Men *have* dared to investigate, the causes and origin of disease and have discovered the means of curing many of the ailments that disturb the happiness of life, and going farther still, have found out that they have the power by observing certain conditions to prevent those ailments, and to secure the preservation of health.

Without Health, there cannot be happiness, illness causes suffering not only to the individual but to those around him; we ought then to know those conditions and to observe them, if we would have a healthy and a happy home.

organs of the body, such as Breathing or Respiration, Circulation of the Blood, Digestion of Food, Sensation, namely seeing, hearing, smelling, tasting and touch, Muscular Motion, and the getting rid of waste matter.

We ought to know something of this, lest in our ignorance we might interfere with or hinder the proper performance of those functions. When we consider that on their proper performance our very life depends, we cannot help seeing how important it is that we should have some knowledge of the matter. Recognizing this necessity Miss Nightingale remarks how extraordinary it is, "that whereas what we might call the coxcombries of education, for example, the elements of astronomy, are taught to school-girls, neither mothers of families of any class, nor school mistresses of any class, nor nurses of children, nor nurses in hospitals are taught anything about those laws which God has assigned to the relations of our bodies with the world in which He has put them; in other words, the laws which make these bodies, in which He has put our minds, healthy or unhealthy organs of those minds are all but unlearned. Not but that these laws, the laws of life, are in a certain measure understood, but not even mothers think it worth their while to study them; to study how to give their children healthy existences; they call it medical or physiological knowledge only fit for doctors." The knowledge that we need is *not* medical knowledge, which teaches the way to *cure* diseases, but that which teaches the way to *prevent* diseases, or to keep the

body in health : we want to know as much of the science of physiology as will show "how in the natural condition of things the healthy frame performs its labours."

Frame or structure of the body.—The framework of the body is made of the hard substance called bone, this is covered by soft flesh and overlaid by the skin. The bone frame-work is called the *skeleton*, and the flesh is spoken of generally as *muscle* ; the muscles are joined by cords or bands called *tendons* ; the whole body is supported by a strong bony pillar called the *vertebræ* or back-bone.

The Trunk is a kind of box containing the *vital organs* or *viscera* as they are called ; it consists of two chambers, separated from each other by a fleshy membranous partition called the *diaphragm* ; the upper chamber is called the *Thorax* or *Chest*, and the lower one the *Abdomen*.

Structure of the Chest.—The chest is strengthened by walls which are, in part, firm and hard made of either bone, or of a gristly substance, called *cartilage*, which is not so hard as bone, but much harder and firmer than muscle. These walls are the *ribs*, which are long slender bones, fastened to the back bone behind, and in front to a firm part called the *sternum*, or chest bone, which is however, not all bone, but partly cartilage, the gristly substance just mentioned.

The Abdomen.—The lower part of the trunk called the *Abdomen* has not got any bony support except the back-bone, the sides and front being formed of muscle only, and covered with skin.

The *vertebræ* is a chain of small bones, held together by ligaments in such a way that they may be moved upon each other; they are piled in the form of a column.

The *Skull*.—On the summit of this column is fixed the *Skull*, so joined that it may be turned round every way, and up and down.

The *Ribs*.—At the upper part of the back-bone, those long slender bones are attached which curving round meet in front in the *sternum*, and form the walls of the upper chamber of the *trunk*, or the *Thorax*.

The *Limbs*.—The upper limbs or arms are attached to the body by a wonderful mechanism, which especially adapts them to the performance of free movement. The lower limbs or legs are moulded upon a similar plan adapting them for locomotion and strength. The mechanism of the hand and foot is a perfect study in itself, and cannot be gone into now; nor will it be necessary to learn the names of all the bones; for our present purpose, it will be sufficient to know something of the *Functions* of the body, leaving *Anatomy*, as the study of the *structure* of the body is called to a future period. The first of these that we will mention is Respiration or breathing, the organs of which are contained in the upper chamber spoken of.

The *Chest* or *Thorax* contains the *Lungs* and *Heart*. There are two lungs, one on each side meeting in the front. They are enveloped in a kind of double bag which is called the *Pleura*. They are formed of a spongy substance full of little pipes or

cells. The *Lungs* are the true respiratory organs. The lungs are bladders in the form somewhat of a short thick bush or tree, with trunk, branches and leaves, all hollow : when they are filled with air, they present this appearance, but when they are emptied they shrink and collapse. Their hollow branches are called *Bronchial tubes*, and what we say looked like leaves are small elastic bladders, and are called *Air-cells*. They are all covered with a fine network of *Capillaries*, which are the smallest veins or blood passages. Through these tiny channels runs the dark purple blood, and as it passes, the carbonic acid with which the blood is made impure, escapes through the thin membrane into the air, and oxygen passes from the air into the blood, which from being dark, purple and impure, becomes by the loss of carbonic acid, and the gain of oxygen, the bright scarlet pure blood of the *Pulmonary veins*.

What has done this ? The act of *Respiration*.

Respiration means the drawing into and expelling air from the lungs, or *Inspiration* and *Expiration*. The lungs are therefore the organs of respiration, the air drawn into the lungs by inspiration has brought from the outer air a supply of oxygen, and the air forced out by expiration has carried with it carbonic acid gas.

Mechanism of Respiration.—The chest, as has been said, is a closed box, shut in at the sides by the ribs, and at the lower part by the Diaphragm, which separates it from the Abdomen, forming as it were the floor of the one chamber and the roof of the other. The Diaphragm and the muscles of the ribs

have the power of contracting, which, making the chest cavity smaller, forces out the air, as in expiration, and of dilating when the outer air enters, as in inspiration ; in addition to this the texture of the lungs is so elastic that they give way at first to the air as it comes in, but afterwards reacting they force it out.

This is the mechanism of breathing, and we see that the great breathing machine is the lungs. Every breath is made by an inspiration and an expiration ; we breathe seventeen times in every minute of our lives, and at every breath a certain quantity of air goes in and out of the chest. How important it is then that the air which is to purify the blood, must contain the purifying element, that is, it must be air not breathed before, outer air. This brings us to

The Circulation of the Blood.—We have seen that with every respiration the blood is brought into contact with the external air, which takes from it the hurtful carbonic acid gas, and supplies it with the life-giving oxygen. Does this affect the blood which is in the lungs only ? Every drop of blood in the body is thus acted on ; the blood is always moving and at a rapid rate flying along the great arteries or large passages, at the rate of about ten inches in a second while it moves a little more slowly through the capillaries. The blood moves from the heart, which is the great reservoir, through all the blood passages, namely arteries, veins and capillaries, back into the heart again. This is called the *Circulation*, because the blood *circulates*, or

flows round and round within the body. The heart contracts four thousand times in one hour, and in every four minutes the whole mass of blood passes through the heart and through the whole body.

The Heart is in the centre of the Thoracic cavity or chest, and it, like the lungs, is wrapped as it were in a double bag called the *Pericardium*. It is the circulating organ ; when it contracts, it drives the blood into the various vessels, and distributes it through all the tissues of the body, conveying the necessary food for their support.

But we have already seen that *the blood circulates through the lungs also for purification*. There are then *two* distinct circulations of the blood, one for supplying food and support, materials for building and repairing all the parts of the body, and the other through the lungs for purification, that is, the getting rid of carbonic acid gas, and the acquisition of oxygen. It will not be possible in the small space allowed for this subject in our study of Domestic Economy to explain the mechanism of the circulation of the blood, or the action of the heart. We can however draw a very useful practical lesson from what we have said on the subject, viz., the evil of tight-lacing. The vital organs, the lungs and the heart being situated in the upper chamber of the body or the chest, and their respective work being carried on by means of *Muscular Contraction* and *Expansion*, it follows that there must be *no outward pressure*, that would diminish the space, or limit the power of expansion.

Tight-lacing, or a close fitting garment of an unyielding texture worn on this part of the body is therefore highly injurious, and if persisted in, will cause disease and death. Girls and women are fond of compressing their bodies in order to have a "small waist," their ideas of beauty being formed after a false model, they fancy that their naturally well-formed figures require improving. To this foolish and ignorant notion which has given rise to the practise of tight-lacing, may be traced much, if not all, the delicacy which unfits girls for many of the active duties of life, often resulting in confirmed ill-health at a time of life when they should be in their prime, and even entailing on their children the same constitutional weakness. In the natural structure of the body, there is plenty of room provided for the full play of the heart and lungs, and it is a species of suicide to lessen that space, and thus to hinder the proper performance of those functions which are absolutely necessary to life, namely *Respiration and the Circulation of the Blood*.

Digestion of Food or Alimentation is the next important function, the principal organs of which are contained in the *abdomen*, the lower chamber or cavity of the body. Each of these organs, the *stomach*, the *liver*, the *kidneys*, the *intestines*, &c., has its own particular duties. What we have to notice now is the process of turning the food into the body tissues. In this work most of the organs and all the juices of the body assist. The work of alimentation or nourishing the body begins at

the mouth, and is not finished until the refuse or waste is cast forth as useless.

When the food is taken into the mouth, it is mixed with the saliva, ground down by the teeth and passes by the act of swallowing, into a tube called the *œsophagus*, the muscular action of which forces it into the stomach; it is there acted on by what are called the *Gastric Glands*; these are small bags placed in the walls or coats of the stomach, containing a liquid or juice called *Gastric juice*; the way in which this juice works is to pull to pieces the food until it makes it into a kind of pulp; the juices of which are absorbed, or sucked in by the blood vessels in the tissues of the stomach, and thus they pass into the general circulation to be turned into muscles and other body tissues. It will not be necessary to follow the whole process; we see that the tissues or substance of the body must be supplied with materials in the form of food, that the proper kinds of food must be provided, and that nothing should be allowed to hinder, or interfere with the process while the blood and the different organs perform their respective functions. Thus all the various kinds of food which are thrown into the blood, are acted on by the different organs and their juices until the necessary parts are absorbed, and the refuse or waste expelled.

Waste matters got rid of.—This is effected by means of secreting or separating organs. The lungs get rid of a quantity of waste matter in the act of expiration; the skin, by means of perspira-

tion ; others are carried off from the kidneys and the intestines. *If these waste matters are not got rid of, disease and death will ensue.*

The organs of motion are the muscles ; it is by means of the muscles that the head and limbs are moved, and that the whole body can move from place to place. The most rapid and most energetic movements that we can perform, as well as the closing of an eyelid, or the winking of an eye, are all done by the aid of the muscles. This is effected by the alternate contraction and relaxation of one or more of the muscles, acting either singly or together. All the motions of the body, both voluntary and involuntary are made by muscular contraction and dilatation. The way in which this is done is fully explained and illustrated in your Primer of Physiology ; we cannot enter on it here ; what we have to notice is the necessity of exercising the different muscles so as to keep them in the most perfect state : this of course, only refers to voluntary motion ; the involuntary working of the muscles goes on without one second's cessation. The motion of the heart, for instance, goes on unceasingly night and day for a long lifetime ; sometimes eighty years and even more without once stopping ; the same with the other involuntary movements. Voluntary motions, however, such as the movements of the limbs, &c., are made by an effort of the will, and if the will is not exerted, the motion is not made, and the result of continued inaction would be a want of power. Every part of the frame has been made for use, and unless

every part is properly and regularly used, "the purpose of the organization is thwarted," and the unused organ will be unable to perform any work when called on. The muscles must be duly exercised if we would have them continue to be in good order and fit for use.

Exercise necessary for health and for growth.—Exercise is absolutely necessary in order to keep the body in health, and to keep all the powers of the body ready to perform the duties allotted to them. Growth depends on activity too, the muscles of the blacksmith's "brawny arm," would not be "as strong as iron bands," if it were not for his daily toil. Brisk exercise in the open air adds an additional impulse to the play of the lungs, to the circulation of the blood and its more perfect purification, and to the healthy action of the skin. A good walk in the open air, with agreeable company and pleasant thoughts will do more to preserve the body in a healthy state, than all the tonics that have ever been prescribed. *Plain food*, partaken of at regular intervals, moderate and *regular exercise*, a certain amount of work both physical and mental and plenty of *fresh pure air* will keep both mind and body in a state of perfect health and consequently happiness.

Now if you have learned from this to assist Nature, rather than thwart her in her work of keeping your body, *so beautiful in its structure, so perfect in its mechanism*, as beautiful and as perfect as the wear and tear of life, and the ravages of time will permit; if you have found out mistakes in your

daily practice, with regard to your food, your clothing or your habits of life, if you have been able to see the necessity of air and exercise, and if when you know all this, you are determined to work out the knowledge you have acquired, you have learned all that this short lesson can teach you.

THE HOUSE WE LIVE IN.

THE house we live in, ought to be the best kind of house we can get, and it must have what makes a house, a healthy, and pleasant place to reside in.

How to choose a house, is therefore a very important thing. A house ought not to be taken in a hurry, as moving is expensive, not only in the actual cost, but also the wear and tear on the furniture. It is said that "three removals are as bad as a fire." In looking for a house one ought to know exactly what is wanted, and if it is not possible to get all that is desirable, at least one should endeavour to get all that is necessary.

Rent.—You must know what rent you can give before you can choose a house, as this must be in proportion to the income; the usual scale is about $\frac{1}{8}$, or as you have it in your "Lessons" $\frac{3}{20}$ of the whole income, but there can be no strict rule for this, as other things must be considered, and it is sometimes necessary in order to meet them, to allow a little more for house rent. In some places, house rent is very high, and this is because the

ground on which the houses are built costs so much money. It is said that in London and Manchester, one thousand pounds (how many rupees would that be ?) is often paid for one square yard of ground. Why should this be ? Because so many want the ground to build their manufactories, places of business, such as offices, warehouses, shops, &c., and these people must have houses to reside in, so the great demand raises the value of the land even to the almost fabulous price just mentioned. This brings us to the next thing to consider.

The Locality or neighbourhood.—The first thought of this ought to be, that it is respectable, the houses around inhabited by respectable, and well-behaved people ; there is no need that our neighbours should be rich ; rich people live in fine houses paying high rent, but we ought not to choose a house in a neighbourhood, where there are disreputable people, whose children run about the streets, using bad language, and who live riotously, drinking and fighting.

A great convenience too, to be thought of in choosing a house is, that it should not be far from the place or places to which the different members of the family have to go for their daily work, the father and elder brothers to their office, or their workshop, and the children to school. As, however, it would be difficult to meet all these, especially in Madras, and as most people keep either a carriage or a perambulator, we need not dwell on it as a very necessary point here.

Aspect.—In considering the locality of the house, we may mention that the situation with regard

to the sun and the prevailing wind ought not to be overlooked or forgotten. It is not always possible to get just what is preferable in this particular, but it is well to know what is best, so as to be able to choose it when available. If the house is one of a row, that is in a street, choose that side on which is the morning sun, or as much as possible of the morning's sun, as streets do not always run due east and west or north and south. The whole strength of the afternoon sun is very exhausting, while on the contrary, the morning sun is exhilarating. The northern aspect is not considered the best, and the south winds are dreaded by many as being damp, relaxing and rheumatism-giving.

Light in the dwelling.—Do not choose a dark house; see that the sun's rays enter, purifying, strengthening, enlivening. Miss Nightingale says, "a dark house is always an unhealthy house, always an ill-aired house, always a dirty house."

"*Want of light* stops growth and promotes scrofula and rickets among children. People lose their health in a dark house, and if they get ill, they cannot get well again in it."

Avoid close proximity to a cemetery or any place, where an offensive trade is carried on, or where water stands, such as a stagnant pool.

Elevation.—Choose a house built some feet from the ground, not on a level with the road or streets, it is better to ascend to it by several steps. This will prevent the floors from being damp, and will make the house much more healthy, as neither the

drainage, nor superfluous water, which sometimes overflows the streets in the time of much rain, can enter the houses, as you know water runs down, not up.

The size.—The size of a house where there is a large family is an important consideration, and will of course affect the rent, as a large house will naturally fetch a higher rent than a small one. Bedrooms are the great necessity; one sitting room may be sufficient, but when the family consists of boys and girls, there must be at least three bedrooms, one for the father and mother, one for the boys, and one for the girls. The practice of sleeping about in verandahs and halls is highly objectionable and should be avoided. The great heat during part of the year in Madras is given as a reason for this, but if all the doors and windows of a house are left open, there will be free access to the outdoor air, and a reasonable amount of coolness may be expected. Besides, habit is a wonderful help to endurance. If you make up your mind to keep to your bedroom, at night, and on your cot, not making too much fuss about the heat, you will be surprised, how well you can bear it. In this matter as in all things relating to a household, *regularity and a strict adherence to rule* will be found to make easy a great deal that would otherwise seem hardships.

Drainage.—Examine a house thoroughly as to the drainage, that is, the way in which the refuse matter is disposed of. The best way is to separate the water from the solid matter, and to use the solid matter for manuring the land. This is making

the very best use of it, and turning an evil into a good. There will be little difficulty in this in a detached house with a garden, but in a town, the drainage is not so easy. The refuse matter must be carried away either by underground drains or passages, or by *open drains*, as is the case in Madras. These are very shocking at first to an English eye, but experience has shown that they are far better than those underground, as they are under the influence of that powerful purifier, the sun, and no hidden gases working diseases and death, lurk as in closed passages.

Drains should never be *under* a house, all drains should be *outside* the walls of the house. They should be made to slope slightly, so that the water may run, as it will not do if the ground be level.

In a future chapter we shall see what is the best way to get rid of the refuse matters of a house.

The doors and fastenings, windows, &c.—Examine well, the doors and windows of a house, before you take it. See that all are in order, that the windows have got proper fastenings. It will not do, when heavy rain comes, to find that the windows will not close properly, and when a high wind blows, that the doors cannot be secured. All these things should be looked at, and carefully adjusted, before you agree to take the house, as, if not done before, it is hardly likely the owner of the house will do it after you take possession.

A clean house.—The house should undergo a thorough cleaning also before you enter and for the same reason. It should be done at your landlord's

expense. An additional reason for having the cleaning done before you go into the house is, that it is much easier and more likely to be done efficiently when the house is empty, than when the mats are laid, the pictures hung, and the heavy furniture fixed. *Be sure then that the house is perfectly clean before you go into it.*

The Furniture of the house.—It is not the house that is the home; the house is but the walls that enclose and the roof that covers the true home. The surroundings, the furniture though ever so simple, if arranged with taste, will give a home-like aspect to rooms that in themselves are bare and strange. The touch of a loving hand, the care of a thoughtful heart, will fill a house with an atmosphere of love and make it a true home, The hand must, however, know what to do, and how to do it, and the thoughtfulness must be turned in the direction of practical usefulness, before such a result is effected. Girls must not forget the good advice of that friend to the young, “Do noble things, not dream them,” and not the least of the noble things that girls have to set themselves to, is *to make the house a true home.*

Choice of furniture.—In choosing furniture, one must consider the size of the rooms, so as not to crowd them; it is better to provide only what are absolutely necessary, remembering that every article of furniture in a room, lessens the space for air. In a bedroom, this is a most important consideration.

• **Suitability.**—The furniture ought to be consistent

with the position and means of the family occupying the house, and ought to be good of its kind and well made. It is better to pay a good price in the beginning and to purchase from a respectable house, so as to ensure strong and durable furniture. Things may sometimes be had to look well, but a little wear shows them to be flimsy, and not worth the price, though that may have seemed trifling at the time; there is nothing more trying than to have broken, useless furniture filling up the lumber room. If things are broken, have them mended, if they are not worth mending, burn them, but don't store them. If your purse is but slender, content yourselves with bare necessities until you can afford to buy what you would like to have.

The bedrooms should be your first care. You will probably want only one bedroom at first, furnish it plainly, but well if possible. You will want a large bedstead, or two cots, (as in this country,) iron or brass are the best kind, but are expensive, so perhaps those made of wood must do until you can get the others, which are in every way preferable; rattan or cane-bottomed cots are better than those with flat boards laid across, as the latter are apt to fall out of their places and get broken, besides, with the rattan bottom you do not need more than one mattress; let this mattress be a good one, hair is much the best, but a coir mattress if well made with a layer of cotton on the outside, will be found very comfortable, and is very much cheaper. Provide a strong chest of drawers for your linen and smaller articles of dress;

for your skirts, coats, &c., a wardrobe will be necessary ; as these are very expensive, however, a good plan is to make one yourself. This may be done in a recess in the room, if there should be one, if not, you may still manage it, though it will not be quite so complete ; get a plank of deal or any common wood, have it the length of the recess, or if you have no recess, the plank may be about five feet long, fix this up as a shelf with a piece of board at the back, put some brass hooks in this board, and round the edge of the shelf hang curtains made of a cheap but pretty chintz, which must reach the floor, finish the top with a bit of fringe or a narrow flounce, and you have a place to hang up your dresses, while the curtains will keep them from dust, &c. If you do not place it too high, the top will be useful as a shelf on which you can put small boxes or books or even ornaments.

Very pretty dressing tables are now used in England, combining toilet glass, washing stand and drawers for small articles. These are most useful, taking up as they do so little space. I am afraid, they cannot be had in India, however, except at a very high price, but you can have an ordinary toilet table with a wooden top, which you can make very pretty with a nice, white, toilet cover, and embroidered or fancy d'oylys. • Of course, a washing stand with a marble top would be just the thing, in India particularly, but here again, the expense is an objection and you will find a plain wooden top covered with white oil cloth, by no means unsightly, the oil cloth must be kept

scrupulously clean, and when worn, should be replaced ; torn or rubbed covers should never be permitted ; it will not, however, be difficult to manage this, as oil cloth is comparatively cheap.

You will want a box for *boots and shoes* ; and for your slippers, you can make a nice holland case which you can fasten to the wall ; another, which you can make more ornamental, may be fixed on the wall, near your toilet table, it will hold odds and ends of your toilet.

You must not forget a book shelf ;—you need not go to the cabinet makers for one, make it with three slabs of wood, joined together by picture cord, red or blue, having spaces between, deep enough for your books, finish the edges with a little fringe or narrow lace and hang the shelves on the wall, this with two or three brackets (of your own making too) will make your bedroom, a lady's bower.

You will want a couple of chairs in your bedroom, these may be of light wood with cane or rattan bottom. Very pretty straw-chairs may be had in Madras at a very low price ; they can be bought in the bazaar or may be had from the makers or dealers who carry them about for sale.

If the house is not large enough to allow a dressing room, it would be a nice arrangement to have a screen in the bed room ; screens are very easily made, you can have a frame made by a carpenter, or if you have a clothes horse that you are not using, it will answer the purpose ; cover the frame with pretty chintz, tightly stretched on

it, or with unbleached long cloth, which you can make to look very pretty, by pasting on, pictures, Christmas cards, &c. This, however, is not of so much importance as in England, the bathrooms which are so necessary in India, affording sufficient privacy.

Much drapery, such as curtains, &c., will not be found desirable in bedrooms in India, as things hanging about rooms harbour musquitoes; care must be taken therefore, to have every thing well shaken and, if possible, well brushed every morning, to dislodge these little plagues; they will come nevertheless, but you will find that the more frequently you shake and brush the surroundings in your bedroom, the fewer will be your unwelcome visitors.

Objection has been made to the rattan-bottomed cots, on the same ground that the crevices in the cane work are receptacles for still more objectionable insects; but this need not be the case. If the first approach of the enemy be met by a repulse, that is, if you never permit *one* of these creatures to settle itself, you need not fear a visitation. I speak from experience, I have used one of these cots for many years and have never been troubled with any thing of the kind.

The wood, that you will want for the shelves, brackets, &c., you can get at any of the large shops in the form of packing cases, they cost very little.

The Dining room.—In furnishing a dining room, the first thing of course is the table. Do not get one with a handsome mahogany, or other ex-

pensive top ; choose a good strong well made table without varnish, except on the legs ; you can have a plain neat colored cloth, to cover it, when the white cloth is removed. You will not want a large table, but it is better not to have one too small. An oval is most convenient, but not so easy to be had ; you will probably meet with a suitable one, at an auction ; you must know exactly what you want, and take nothing else. An oval or oblong table to dine eight would be the most useful perhaps : this would be about five feet long, and would not be too large for an ordinary-sized room.

Let the chairs be plain but strong. There is nothing so unpleasant as to have to sit on a fragile, creaking chair, on which one is afraid to lean back or be at ease, lest it should collapse suddenly. Comfort is indispensable when one is at dinner, and you would not have your friends' digestion spoiled by your uneasy chair. Teak-wood chairs with rattan bottoms and backs are the best ; they need not be arm chairs, though some prefer them, and as the difference in price is not much, you may as well, if you can afford it, have them for those who like them ; you do not require a side board ; a couple of dinner wagons will be sufficient, on which to place your glass and crockery, of which you need not have a large stock at first. A couple of cupboards are very convenient if not absolutely necessary in this room ; if there are no wall cupboards you can make one or two of packing cases, by making them stand on end, and fixing them to the wall with

large hooks ; you can line them with a bit of wall paper, or cheap white calico. Put in shelves and make a door of the lid of the box, by putting on hinges. The outside may be made quite ornamental by covering it with thick white paper or a white sateen on which you could do a bouquet in splash work. This is the way to do it.

When you have put on the paper or sateen, perfectly smooth, and tight, get some dried ferns, and fix them on according to your taste, fastening them with very fine pins ; every point of the fronds must be secure ; you then prepare your paint or colouring ; if you wish to have a dark ground, rub some Indian ink on a saucer mixing it with water, until you have got what you think will be a sufficient quantity ; then get a nail brush and a fine comb ; dip the brush into the coloring matter, and rub it gently with the comb ; try it on some paper lest it should come in too heavy drops and so spoil your work ; when you find it descending in a fine spray, hold it over the piece you want to color, beginning in the middle, and going lighter towards the edges ; when the surface is completely covered, leave it to dry. When it is perfectly dry take out the pins very carefully, remove the ferns or dried leaves, and you will have a beautiful bouquet in white on a dark ground work. You can use for the coloring matter, common ink as well as Indian ink, or if color is preferred, any of Judson's dyes : do not choose a bright color, however, as you must remember, the color is the ground work, and the pattern will

always be white or the color of the cloth or paper. You can make your bouquet very elegant and tasteful ; if you arrange some sprays for a back ground over the bouquet, provided those in the latter are not too close ; after your first sprinkling, remove the last sprays, taking care that the ink or coloring is dry before you touch them, then go on sprinkling until the whole is as dark as you would have it ; this will give a pretty picture with lights and shadows, and it is very easily done, only requiring neatness and care.

The Sitting room.—The furniture of a sitting room or drawing room, depends much on the money available or what can be afforded to be laid out on it. The same rule given for furnishing the diningroom is applicable here, that is, whatever you buy let it be good of its kind, neither gaudy, nor flimsy. If you cannot afford to give a large price for an article of furniture, do not purchase an inferior one, but wait, until you can get the better, above all things, do not go into debt for it. Indeed as in every thing else, we find that it is not what costs most, that is the most satisfactory. Your drawing room should be light, airy and pretty ; the walls may be plain white or if you wish, colored a pretty light green or pale pink ; a smooth painted wall is the most conducive to health, as dust will not adhere to a smooth surface, but can be readily brushed off. Hang a few good prints or pictures, but avoid much gilding and many mirrors. The great charm of a drawing room, is its home look, the appearance of use,

not of being kept for show. Your friends will be the better pleased to visit you, if you receive them in the room in which you are accustomed to sit, and the furniture of which is neither too ornamental or too costly for everyday use. As this book is not intended for those who give grand and stately receptions, we shall speak only of the useful and used drawing room, where the mistress of the house spends her leisure hours, busied with pleasant womanly occupation, reading, sewing, or if she is musical, practising on the piano, where she receives her friends and entertains her husband after he returns from his daily avocations. There ought to be a nice, easy chair for him, three or four low chairs, of different make and fashion, a couch or two, and a few tepoys or small tables, which can be made pretty and ornamental with fancy covers, embroidered by the busy and tasteful hands of the mistress. These with a few trifles, albums, and photographs which may be put in frames made by the same skilful hands, the work basket, a few books, and if possible a piano, will make a pleasant room to which one may *withdraw* from the cares and business of the day, and enjoy a happy hour of leisure.

A I R .

The air we breathe necessary to life.—Though food and water are necessary to continued existence, yet life may be prolonged for days without either;

deprivation of air, however, means instant death. Impure air too, causes death, if breathed for a time. The effects of breathing impure air are indisposition to exertion, relaxation of strength and ultimately disease, the germs of which are contained in impure air. Pure air then is a condition on which depend our health and our life.

Quantity of air required.—It has been proved by exact calculation that the amount of impure air that can be breathed without danger, must not exceed 2 parts in the 10,000. According to this calculation, each individual will require about 3,000 cubic feet of air per hour, certainly not less than 2,000 cubic feet of fresh pure air every hour to maintain a healthy atmosphere around him. Fortunately there is an abundant supply of this vital necessity.

The atmosphere that surrounds our globe is this very air that we need. It is our duty to use it in the pure state, in which it is provided for us and not to contaminate it by poisonous or hurtful exhalations.

Essential composition of pure air.—Pure air consists of two gases, oxygen and nitrogen. These are the essential components of pure atmospheric air; they are not however, found in equal quantities, there being nearly four times as much nitrogen as oxygen.

Other substances existing in air.—There are other matters which are found in air, but are regarded as accidental components; though they are nearly always found in it, they are called accidental, perhaps because they are not essential, and are liable

to be increased, to an extent which may be fatal to animal life.

The chief of these is **Carbonic acid gas**.—This gas is present in very small quantities in pure air. Air that may be considered pure, contains only 4 parts or four parts of carbonic acid gas in 10,000 volumes. If this quantity, trifling as it seems, be increased by ever so little, the effect would be to render the air impure and unwholesome.

Water, etc., a part of air.—The other matters contained in atmospheric air, are watery vapour, ozone, ammonia, and organic matter.

Watery vapour.—The air is more or less moist according to the amount of watery vapour it contains.

Ozone.—Ozone is a condensed and more active form of oxygen.

Ammonia arising from the decomposition of animal matter, is only to be found in mere traces in pure air; the same may be said of **organic matter**, which consists of the worn out particles of the bodies of animals and plants. These last are in the highest degree injurious, and where they exist, the air may be said to be in a state of dangerous impurity.

Air, a mixture, not a chemical compound.—The two gases, oxygen and nitrogen, that are the essential components of air, are merely mixed together and not chemically united. The gases have not been changed in any way, as they would if united by chemical action. (See Elementary Science Reader, page 52). They have no taste when taken apart and no taste when mixed.

Oxygen is essential to the support of animal life, and on this account was termed *vital air*. It enters the lungs at every breath, purifying the blood, and leaving a small quantity which is absorbed, it passes out with the nitrogen, carbonic acid gas, watery vapour, &c., by ordinary expiration.

It keeps up the natural warmth of the body, by acting on the materials supplied by the food, which may be said to be the fuel.

It is very active in its operations, and cannot be breathed with impunity for any length of time, though an animal will live in a confined space filled with oxygen, for a longer time than in an equal bulk of air.

The following experiment was made by Dr. B. W. Richardson. He kept a rabbit in a stream of pure oxygen for three weeks at a temperature of 75° F. during which time, it ate voraciously, but as it was not able to eat sufficient to supply the waste, it became so emaciated that he had to discontinue the experiment. (See Miller's Elements of Chemistry, page 42.) This shows the activity of oxygen.

Oxygen supports combustion, that is, it makes things burn. Nothing can burn without this gas as no life can exist without it.

Ozone.—Ozone, which is a condensed form of oxygen, is still more active and powerful. It has a peculiar odour, and possesses a remarkable power, of speedily destroying organic matters. It is thus a wonderful purifier.

The following from Dr. Fox, shows this: "Take

for example," he says, "a little blood, and keep it in a warm place for months until it putrifies. When the odour is some thing horrible, sufficient indeed to create nausea or sickness, send a stream of ozone over it, and its freshness, purity and sweetness will be restored."

Ozone is found in sea and mountain air, hence the fact that people in search of health go to the hills or the sea side. It is present during thunderstorms and its presence is regarded as a test of the purity of the air. It is a common saying, "the thunderstorm has cleared the air."

Nitrogen.—As we have seen that oxygen is too powerful and stimulating to be breathed for any length of time without injury, another gas, nitrogen, is mixed with the air, diluting it, or diminishing its activity, so that breathing is performed with ease. Nitrogen also moderates the rapidity of combustion. Nothing can burn in pure nitrogen,—animals cannot live in it, not because it is poisonous, but because it suffocates them. These gases, however, though hurtful apart, when mixed together, form the atmosphere that surrounds us, the air that we breathe. It has been said that the chief of the extraneous or additional matter is carbonic acid gas.

It is this gas which is the chief source of impurity in the air we breathe. We breathe about sixteen times a minute, and we take in nearly a pint of air at each breath, or two gallons a minute. In each pint of fresh air we take in .008 oz. of •carbonic acid mixed with 15.8 oz. of nitrogen and

4.19 oz. of oxygen. In the act of breathing we give out .94 oz. of carbonic acid with the nitrogen undiminished, and 3.26 of oxygen. Thus we see that we have used up part of the oxygen, and we have fouled the surrounding air by the addition of .03 of carbonic acid gas. This in every minute, would in an hour make the air, unless renewed and purified, impossible to live in.

Air which has been breathed once is poisonous, and in a room hermetically sealed, that is (closed against any admission of air), animal life could not exist.

Organic Matter.—Besides carbonic acid, expired air, that is air that has been breathed, contains in addition, organic matters, which are decomposed particles from the lungs. It has been estimated that about thirty grains of organic matter are exhaled from the lungs every twenty-four hours. These with the watery vapour expelled in breathing may be recognised in the "smell of humanity" which is always found in crowded rooms, or closed bed rooms, that have been slept in.

Thus we see respiration itself is fraught with serious danger to health; each human being is in this light a source of danger to himself. He breathes out what would be death to him to draw in again; if he can not, therefore, have other air than that which he expels from his lungs, death will very soon ensue.

Our breath needs constant dilution with fresh air, and it is calculated that about 100 pints of

fresh air must be had for every breath that is drawn by one person, or about 1200 gallons an hour.

The air of an apartment is vitiated or made unwholesome by the breath of each human being or animal that inhabits.

But this is not all; every lamp, candle, or artificial light in the room with the exception of the electric light, consumes a portion of the life-giving oxygen and gives out carbonic acid gas.

Every artificial light therefore is a source of impurity, contaminating the air in the room; add to all this the organic impurities which are thrown off in the process of decomposition from every decayed or decaying matter, or exhaled from uncleanness of any kind, and see what an amount of foul air will accumulate in a room in a very short time.

The remedy is as vast as the need is pressing. Open air is what is needed, outside air. To quote again from Dr. Poore's pamphlet, "The open air of even the most crowded streets in London, is always infinitely more pure than the air of even well ventilated rooms. The reason is that the volume of our atmosphere is, as compared with the volume of foul air that escapes from our houses, almost infinite. The foul air is lost as it escapes from our houses. It is diffused, mixed and blown away."

"The amount of fouling of the atmosphere by the whole animal life of the world is but as the most microscopic drop in the bucket."

Here we have the secret of wholesome, healthy dwellings, admit the air ! the open air ! the outside air ! make a way for the foul air to go out, and the fresh pure air to come in, and respiration will not be fraught with danger, but will be life, health, enjoyment and happiness.

Reason why we should know these facts.

Is a knowledge of all this necessary for Domestic Economy ? Does not nature itself tell us, we must open our doors, windows, &c., without going into the composition of air and other scientific matters ? Yes, nature would be a very good guide, if we always listened to her suggestions and obeyed her laws, but if we habitually neglect them, we acquire, as it were, an artificial nature, which directs us to follow our inclinations, that have been turned aside by habits, contrary to our true nature.

It is a remarkable fact that the whole being after a time spent in a vitiated atmosphere becomes so adapted to it, that no inconvenience is felt from breathing it, although at first it seemed intolerable.

This adaptation, however, can only take place at the expense of a *depression of all the vital functions*, which must be injurious, if long continued.

If the fact that breathing the same air over again is hurtful and sometimes even fatal, be known and understood on scientific grounds, there must be more solicitude on the subject of ventilation and greater care taken to provide a proper quantity of good and pure air.

This is the reason why some scientific knowledge is necessary.

Ventilation.—We have observed that foul air when it escapes from rooms or houses is diffused, mixed with the atmosphere and blown away.

Wind.—The chief agent which moves the air causing the mixing of, and finally blowing away the foul air, is the wind. Our dwellings are purified by allowing the wind to enter and pass through, in other words opening the house to a thorough “draught” as it is called.

This is undoubtedly a means of purification, but is not always practicable, nor would it be always wise to use it, as there are cases in which it is to be avoided from considerations of personal comfort and safety.

Other movements of air.—Besides the wind, however, the air has other movements that are highly important in ventilation. These movements are the expansion of the gases according to temperature.

Expansion and contraction of air.—Air expands when heated and contracts on cooling. The air in a room becomes heated by being mixed with the warm air that has been breathed by those in the room, warm air is lighter than cold, and so the warm air ascends. As it passes upwards, it cools by contact with the walls, &c., of the room, it then descends, and meeting the warm air which is forced upwards by the colder air beneath, an interchange takes place and the warm air finds its way out, if there are any openings by which it can pass.

Ventilation then may be said to be providing those openings, making a way for the air to get

out. In "Lessons on Domestic Economy," it is noticed that the houses in this country, that is, in Madras, are, on account of the great heat prevailing, made with so many doors and windows that there is no want of ventilation. This remark, however, refers to the houses of Europeans and Eurasians and the more wealthy natives who have adopted the European style of living. The houses, or rather huts, to be seen in the native villages, have for the most part no windows; the only way for air to enter or to go out is by the door, and this is most frequently shut. Fortunately the houses are not air tight; if they were, no creature could exist in them; as however the natives of this country live mostly out of doors, eating, cooking, and even, except in very rainy weather, sleeping in the open air, the injury is not so great as might be expected. The evil effects, however, are seen when an epidemic breaks out, though the work may have been silently going on for perhaps a long time, and the impure air thus accumulated may be the very cause of the outbreak. Habitual residence in an impure atmosphere, tends to induce apparent indifference to the evil, but it exists nevertheless, and sooner or later, it will show itself either in disease of a decided nature, or by weakening the system and so rendering it unable to resist an attack of ordinary illness.

Modes of ventilation.—Ventilation is not a new subject to which attention is being drawn. In ancient times, the Greeks and Romans recognised its importance, and used fans and fires as a means of ven-

tilating their houses. The Chinese have long made the subject a study, and it is an interesting and a curious fact that in a bee-hive ventilation is practically carried out by the bees, one of which at the entrance of the hive keeps up a continual flapping of its wings, forming a sort of natural punkah.

The modes of ventilation are numerous and may be complicated, but the principles are comparatively simple. It will not be necessary now to particularize ventilating apparatus, our attention may be confined to those means which may be used in ordinary houses and every day life. Doors and windows as mentioned before, are the first, but need not be the only means ; when the wind is too high or the air too cold to have these open, there ought to be another way to admit pure air, and to allow the free passage out, of the used up air of the room. For this purpose there ought to be openings in the walls of the rooms, and care should be taken that these openings should not be near the floor, as too great a draught might be caused, and dust and foreign matter might enter ; the openings ought to be higher than the heads of the persons in the rooms, and yet not too high or too near the ceiling, as in the latter case, the incoming air soon becomes of the same temperature as the atmosphere of the room, so will not descend.

Punkahs, so much used in this country, though not exactly ventilators, yet may be said to be purifiers, as by making movements in the air, the air currents are set in motion by which the warm air

of a room is propelled outwards and the colder outside air rushes inwards ; thus a gradual mingling of the fresh air with the room atmosphere takes place.

The modes of ventilation then are doors and windows, openings in the walls, fans or punkahs.

LIGHT.

Light a necessity of health and happiness—The doors and windows of a house are not only to admit air, but also light which is a necessity too, if not of life, at least, of well-being. It is possible to exist without light ; we have read sad and dismal stories of persons living for years in dungeons and cellars, but it is not possible to have a *healthy, vigorous existence* without it and the sun which is the source of light. Of course the case of blind people proves nothing contrary to this, because they too are under the influence of light, though they cannot see it.

Plants need light.—Plants need light in order to perfect their being ; they grow, it is true, without it, but it is a sickly, unhealthy growth. To show the effect of withholding light from a plant, take a saucer, put water in it and a piece of flannel, strew some mustard seed on the flannel, and put the saucer under an inverted tub, that will cover it completely and keep out the light ; look at it from time to time to see that sufficient water remains in the saucer to keep the flannel

moist, the seeds will grow, but the little plants will be quite white: try the same experiment, leaving the saucer where the light can get at it, and the result will be strong, healthy plants of nature's own color, bright green.

Light, an enemy to evil.—Light is an enemy to most noxious things; it is in deep jungles, when the light never penetrates that reptiles are found in the greatest abundance. All that is hurtful lurks and hides itself in the dark and although the heat of the sun generates or at least fosters the growth of reptile life, yet the light of the sun banishes it and sends it into dark corners, where alone it flourishes. Thus, light is pre-eminently the friend and fosterer of beautiful and wholesome life, but an enemy to all that is baneful or loathsome.

Light, nature's gift.—We must have light then, plenty of light, the children must have light, all the young must have light, young plants, young animals, young children; they cannot enjoy all that is so sweet and enjoyable in youth without light; plants struggle to reach light as in the story of the potato in your "Lessons on Domestic Economy." Children rush out of a darkened room at the first opportunity, nature gives light and says "Enjoy it," and we are doing violence to our nature if we love darkness rather than light; all that is cheerful and happy within us demands light, therefore our houses must admit the light, or they will not be healthy.

• *Light, a friend to cleanliness.*—They will not

be clean houses either. How can we tell what dust, particles of evil things, lie hid in the corners and behind furniture, if we cannot see those places; if light is excluded an accumulation of dust if nothing worse, must take place. The light discloses what darkness or semi-darkness hides, and if we would be clean, we must admit the light.

The sun.—The sun, which is the source of natural light, must be allowed to dart his bright beams into our houses, cleansing and purifying every corner. It is as necessary for children as the light, and old people bask under the sun's genial rays, not only because it warms them, but from a feeling that it is strengthening and reviving, which it undoubtedly is. "Man goeth mourning without the sun, but becometh green, (that is fresh and youthful) before it;" and I have read that it has been found most efficacious in cases of nervous debility and even paralysis to allow the sun's direct rays to play on the naked body. "It is of great importance to health, especially to that of young children that they should have plenty of morning sun. The morning is the time, when children benefit most by its rays," and a good run or game of play in the morning sun, renders them cheerful and happy for the day. Mr. Walsh, F. B., C. S., who wrote an excellent manual of Domestic Economy from which I have just quoted goes on to say, "I have often proved this fact by observing and comparing a number of young families, living on the two sides of a street running east and west; those which had the full sun upon their rooms '

have looked full of life and health, while those on the opposite side appeared pale and dejected."

The morning sun in India.—What has just been quoted from Mr. Walsh's book refers of course to England, and to climates in the temperate zone. Even in India, however, the same truth may be exemplified in the fact, that children, who are allowed to play and romp about the garden in the mornings are on the whole stronger, and have better health than those who are kept in rooms, which although they are open to the air, yet have every ray of sunshine excluded. Mr. Hull, who had considerable experience of Indian life, and whose book, "The European in India," contains much valuable advice, says, "A mistake is sometimes," (I should say frequently) "made of almost totally secluding children in India from the light of day."

Children's early morning walks.—"Some parents seem to argue, that if much exposure to the sun is injurious, even a little can hardly be beneficial. And what is the course they adopt in consequence of so illogical a conclusion?" Aware that their children should have at least some open air and exercise, they insist on the little unfortunates being taken out of their beds at dawn, and hurried out of doors, often into a foggy atmosphere loaded with unhealthy gases, which the sun has not yet risen to dissipate. Colds, fevers, and dysenteric affections are the not uncommon result, while the general appearance of such children is wan, sickly, and spiritless. Often scarcely half awake, they are walked up and down for an hour or so and then

taken indoors to be confined in carefully shaded rooms and verandahs till sunset, when again they are taken forth for the slight remnant of daylight out of doors." He adds, "This is very injudicious management." No child should be taken out of doors *until after sunrise* and then not without first partaking of some nourishment, such as a bowl of bread and milk, some weak tea and "appas," or something equally light and refreshing."

Children in the plains so pale and colorless.—This kind of treatment is probably partly the reason why children, that live in the plains, are so white and washed out looking; the same children after a short stay at the Hills, where they are allowed to be so much out of doors, become rosy and healthy looking. It would be well then, if even in Madras, children were allowed a little of the morning sun and light which is found so beneficial in other places, and is so productive of activity and cheerfulness. They would not then show that languor in the day which is sometimes to be seen and which fond mothers attribute to the heat, but which may perhaps be traced to a want of the health-giving influence of the morning sun.

Exposure to a tropical sun dangerous.—But we must not forget that in the tropics the sun's rays on the head or the back are always dangerous, frequently fatal. Care is therefore necessary in walking or driving during the day to protect the head and back; and it is advised as a wise precaution to be taken by those whose occupations are in the open air, to wear a light quilted pad down the

centre of the back, beneath the outer garment, in order to protect the spinal cord, which is as much in need of protection as the head; a light topee or sun hat, and an umbrella will be found a sufficient safeguard for the head, and thus prepared, occupations may be carried on even under a tropical sun in perfect safety.

The sun in the house.—Though the sun's rays are cleansing and purifying as well as vivifying, so much so that even in a country where exposure to its direct rays is as dangerous as it is in this country, it was said by the wisest of men, "a pleasant thing it is for the eyes to behold the sun" Eccl. xi. 7.—yet we find we cannot always admit the sun into our rooms. The morning sun is always *refreshing, invigorating, cleansing, purifying*. In the morning, then, let us open all the doors and windows, and let the sun's rays stream in, let them penetrate every cranny and crevice of the room, while the mats, the clothes, the beds and their coverings are exposed to the healthy influence. In the great heat of the day and especially in the afternoon, the *sun must be shut out*, if we would preserve the furniture in the rooms from being spoiled and almost scorched, so intense is the burning heat of the afternoon sun.

The glare.—The great heat of the sun's rays is intensified by reflection from the ground, especially sandy ground; grassy places near a house are, therefore, most agreeable and refreshing to the eye, a dusty road on the contrary is very trying. This is another reason why it is well to close the doors

and windows during the time when the glare is greatest, taking care, however, that air is freely admitted.

In walking or driving, the eyes are said to be best protected from the glare by the use of blue spectacles; the yellow of the sunlight, as it passes through the atmosphere blending with the blue glass, becomes green which, as before mentioned, is the most refreshing and pleasing color to the eye. Long blinds or chicks as they are called, round a house, lined with blue, have the same agreeable effect.

What this chapter teaches:

The importance of light, strengthening what is good and disclosing and frequently destroying what is evil.

That the sun's rays are healthful, invigorating and inspiring.

That the morning sun is most productive of these effects.

That every one, especially children, ought to have as much of the early morning's sun as possible.

That light and the sun's rays should be freely admitted into our dwellings.

That the morning hours are the best for this.

That the direct rays of the sun, on the head or back, are dangerous.

That proper precautions should be taken against them.

That the glare or reflection of the sun from the

ground is unpleasant and sometimes even dangerous.

That blue glasses and blue-lined blinds are the best means by which the annoyance or unpleasantness arising from the glare may be prevented.

General summing up.

That the sun with its morning light and healthful influence is most salutary, but that an undue exposure to it may be most dangerous.

WATER.

The water we drink.—We must all drink water; no matter what we call the beverage, or how it is flavoured, it is still water; “water is the basis of all beverages.” It is the water in all drinks that supplies the want that we call thirst. We may drink tea, it is true, but a tea-cupful of tea, as poured from the teapot, is almost wholly water, the solid matter drawn from the leaves of the tea, though so powerful and so stimulating is yet so trifling with regard to quantity, that it would hardly be made to cover, with a thin wafer-covering, the surface of an eight anna piece. In the very best milk too, that has just been drawn from the cow, we find that half a pint contains water in the proportion of seven-eighths of its bulk, that all but one table-spoonful is water.

• Composition of water.—*The water we drink must be pure and wholesome.*—Pure water is com-

posed of two gases, oxygen and hydrogen, in proportions that never vary. They are, two volumes of hydrogen to one of oxygen, by bulk; by weight one grain of hydrogen to eight grains of oxygen; in other terms, nine tons of water are composed of one ton hydrogen and eight tons, oxygen. This is pure water, but as you have read in your "Lessons," water in this pure state is not to be had for drinking or other purposes; probably no person has ever drunk a singly half pint of really pure water, that is, water consisting of only the gases of which it is composed.

The purest water exposed to the air becomes charged with the gases of the air; these are not necessarily impurities, that is, in the sense of being injurious; water trickling through the soil becomes charged with certain small quantities of harmless, possibly useful, saline, and earthy substances. All or any of these give it a certain character, without which, it will be flat and insipid.

Substances found in wholesome water.—The principal of these are calcarious substances, the chief forms of which are chalk and gypsum. The chemical name of chalk is carbonate of lime, and of gypsum, sulphate of lime. It is said that these contribute to the formation of bone in the animals drinking the water, but sufficient material for bone-making exists in the food, and the quantity contained in the water drunk seems too insignificant to produce any obvious effect.

Inorganic Impurities.—Other substances are *magnesia, salt and nitre*, which are each in their

way useful to animals and plants. *Traces of iron* are also to be found in good water. All these are called inorganic impurities and can easily be removed by distillation or evaporation.

Substances which make water impure or unwholesome.—These are chiefly organic, that is decaying animal or vegetable matter which come from sewage, &c. These impurities are most hurtful and cause diphtheria, diarrhœa, fever, especially typhoid. If you would have your drinking water free from such impurities you must filter it.

Filter for drinking water or for water used in Cooking.—There is perhaps no filter better adapted for household purposes than those which are in general use in this country. These are three chatties or earthenware pitchers placed one above the other, with a space between, each resting on a frame of bamboo; the two upper vessels are perforated at the bottom on which is a layer of charcoal and sand; through this the water percolates and passes into the lowest, cleansed, and purified in a great degree, the impurities remaining behind in the filtering medium. It must on no account be forgotten, that a filter is merely a kind of dust receiver, retaining the foreign matters it separates from the water. It requires therefore to be thoroughly and frequently cleansed; a dirty filter is much worse than none.

All water used for drinking or preparing food, should be carefully filtered. In some cases it is well to boil it too, as boiling frees it from many, though not all disease germs.

How water is purified.—Alum is sometimes used to purify water, but as it makes it harder it would not do for all purposes. Condry's Fluid, a solution of permanganate of potash, is a purifier of water. It is also a test for the presence of organic matter in water.

How water is tested.—A little "Condry's fluid" poured into water, will, if the water be pure, form a beautiful purple solution. If, on the contrary, the water contains organic impurities, the purple tint is lost, the water looks brown and discolored and cannot regain the purple hue until the organic matter, has been thoroughly oxidised. In cleansing filters, &c. Condry's fluid is invaluable.

Temperature of water.—At 212° F., water is boiling; at 100° it is warm; from 86° to 90° it is tepid, and it feels cold to the hand at 80° . Water, drunk at a temperature below 45° is said to act as an astringent, at 60° it is considered good for removing indigestion, and if taken at a temperature of from 70° to 80° , the first thing in the morning, it is found to be an excellent antibilious dose.

Water then at various degrees of temperature is important in a sanitary point of view.

Water supply.—*Rain water.*—The purest water, of course, is rain water, if we could get it as it falls from the clouds, the great storehouse of the cleansed and purified water, drawn from the earth and sea by evaporation. But in large towns even rain water is not pure, it is very much mixed with soot and dust from the roofs of the houses besides being liable to contamination from the substances

held in suspension in the atmosphere. It is, however, the very best perhaps for washing and cooking purposes, and when filtered and exposed to a pure atmosphere, it is excellent for drinking too, though not as pleasant as some other. Rain water after boiling, may be made bright and sparkling as well as agreeable, by pouring it, at as great a height as you can, from one jug or vessel to another six or seven times.

River water.—The water of rivers and lakes, though from its “softness” very good for washing and cleansing purposes, is not always fit for drinking, as a river in a town is often made to receive the sewage, and lakes are found to have the water frequently charged with vegetable and peaty matters; when no other than river water is procurable, it may be rendered comparatively harmless by boiling and filtering.

Lake water.—Lake water, though unattractive from the presence of the peaty or vegetable matter generally found in it, giving it a faint color, and a slightly bitter taste, yet is comparatively wholesome as a drink, being free from any suspicion of sewage contamination.

Well water.—The water drawn from wells may be wholesome, or not according to the situation of the well or its depth. That from a very deep well is, other things considered, perhaps the purest and the most pleasant to drink, and if the well is covered and the water drawn up by a pump, the latter will be free from atmospheric impurities. Pumps are, however, very little used in this country,

if at all, and the wells are for the most part open. This fact necessitates, or at least makes desirable, the filtering of even well water.

*If a well is situated near a cemetery or drains or any place where sewage can percolate into the soil,—*the water it contains is highly pernicious, and may, probably will, be the cause of disease, epidemics and death.

Water from a reservoir.—The water that supplies a city, stored in a reservoir situated on a higher level, as it must be from the fact we mentioned before, that water flows down, will be free from sewage contamination, and if conveyed in imporous pipes, must be found wholesome. This is the reason why there has been so little cholera since Madras has received its water supply from the Red Hills, instead of depending on the tanks and wells of the city. At first it was not so evident, as a strong prejudice against the Red Hills water prevented it from being generally used; the danger now seems to be, that the supply will be exhausted, so freely is it drawn from the fountains. A great deal is allowed to run to waste, in the usual reckless way, that people use what they have in abundance; taps are opened and let to flow without hindrance until sometimes the road or street is in a slush. This ought not to be permitted, as the supply, though abundant is not inexhaustible.

Water for washing.—The water used for washing must be “soft,” that is must readily combine with the soap so as to make that frothy substance called a lather. If hard water must be used, there

will be much more soap needed, so the use of soft water is more economical. Hard water may, however, be made soft by boiling it, or by putting soda into it. The presence of lime in water makes it hard; rain water, river water, or tank water, is the best for washing clothes, provided that the tank or river is not used as a public washing place, where clothes worn by people suffering from infectious or contagious diseases may have been washed. Instances are known of diseases of the most malignant kind, spreading over a district or neighbourhood, from the clothes of diseased persons having been washed with other clothes, or washed in a tank, the water of which is used for other washing.

Summing up.—*Water for drinking* must be

Pure,—that is not mixed with anything injurious.

Wholesome,—that is, containing only those substances that make it healthful as well as pleasant to the taste.

Filtered.—It must be filtered carefully, and if procured from a doubtful source, should be boiled after filtering, and then filtered again.

A filter must be kept scrupulously *clean*,

A DIRTY FILTER IS WORSE THAN NO FILTER.

THE FOOD WE EAT.

“We must eat to live.”—This is a fact with which we are all well acquainted. We have seen in a former lesson that the blood furnishes the body

with matter that builds it up and repairs it, that the necessary materials are supplied to the blood by the food, and that different kinds of food are necessary to provide the different materials that are needed according to the work to be done.

What the food must do.—It must supply fuel for the heating apparatus in the body, which must be of the same or nearly the same temperature, no matter in what climate it is found. This is called heat-making or carbonaceous food ; carbonaceous on account of the carbon contained in it.

The respiratory machine, must also be supplied with the same kind of food, hence it is also called *Respiratory*, or breathing food. It must also provide materials for forming new tissue or repairing the old. We shall take first the *carbonaceous foods*. These are fats and oils, sugar and starch. If food containing fat is not supplied to the body, the process of breathing will use up the carbon which supplies the animal heat, and all that is contained in the tissues and general substance, causing a loss so great that all the blood is not able to replace it. As soon as the stomach of an animal is empty, it begins to feed on itself, that is to make use of the very material of the body as fuel for the fire that warms and gives oxygen, without which it would be impossible to breathe. If no food is provided, this supply would in a short time be exhausted and death by starvation would be the result.

Building up the body.—Besides the food that is necessary for respiratory purposes or carbonaceous

food, we must have what will build up the body in the young and repair the waste of the body in the old. This is called nitrogenous food, as nitrogen is the most important element in its constitution.

NITROGENOUS FOOD.

The most important nitrogenous substances are, *albumen*, *casein*, *fibrin*, *legumin*, *gelatin*, and *gluten*. These are found in our common food; *albumen* is contained in white of egg, milk and vegetables; *casein* in milk and cheese, the curd formed by the addition of an acid to milk is casein; *fibrin* is present in animal substances, and some vegetables, such as corn, &c.; *legumin* abounds in peas and beans and many vegetables; *gelatin* is found in animal matter, such as bones, skin and cartilage; and *gluten* is contained in most of the grains.

The two chief constituents of food are the carbonaceous part and the nitrogenous part. Our food must contain a certain quantity of each of these. It has been ascertained that a grown man will require about $4\frac{1}{2}$ pounds of carbon every week, and about a quarter of a pound of nitrogen; women and children less in proportion. Most articles of food contain both of these necessary constituents, some in greater and some in less proportion.

Food containing both carbon and nitrogen.—The following articles of food contain both carbon and nitrogen: Bread, potatoes, rice, Indian meal, barley meal, oatmeal, cheese, meat, fish, vegetables. Of these cheese is the richest in both carbon and

nitrogen. Indian meal comes next, and then oatmeal. Butter, lard, suet, dripping, sugar and treacle, contain no nitrogen, but are rich in carbon. Life could not be sustained very long on these, because there is no nitrogen in them, but they make a wholesome food, when mixed with bread or meal or any of the foods containing nitrogen.

Food is made agreeable and wholesome, by mixing together what is poor in one of the necessary constituents with another that contains a sufficient quantity, thus, fowl is eaten with bacon, fish is fried in oil or ghee, boiled fish requires melted butter; liver and bacon go together; butter with bread; milk, treacle or sugar with oatmeal, porridge or sugree; rice in whatever form it is used, needs milk, butter or ghee, treacle or sugar; potatoes are best eaten with meat, potatoes containing a small proportion of nitrogen, (it is ascertained about 22 grains in the pound) and meat being rich in both carbon and nitrogen.

Food that contains the greatest quantity of nitrogen is the most nutritious.

The following table will give an idea of the nutritious value of the foods used in this country.

In one pound of each of the following there is contained so much carbon and so much nitrogen.

		<i>Carbon</i>	<i>Nitrogen.</i>	
		GRAINS.	GRAINS.	
Cheese	...	3344	306	
Pear		2699	248	

		<i>Carbon</i>	<i>Nitrogen.</i>
		GRAINS.	GRAINS.
Fish	...	871	195
Mutton	...	1900	189
Beef	...	1854	184
Oatmeal	...	2831	136
Rice	...	2732	68
Potatoes	...	769	22
Green vegetables	...	420	14
Butter	...	4585	"
Ghee	about the same.		

These are arranged in the order in which nitrogenous or nutritious matter is contained. Treacle, sugar, dripping, suet and lard contain no nitrogen and are about the same value for articles of diet as butter and ghee mentioned in the table, which are also destitute of nitrogen. Peas and cheese contain the greatest amount, and rice and potatoes the least. This shows how badly nourished those who would feed on rice and potatoes alone, must be.

The following facts mentioned in Dr. Anderson Wilson's Lecture on the Digestion of Food, shows the necessity of a proper quantity of food containing sufficient nourishment: "It has been calculated that a little more than 8 lbs. of matter are received by and given off from the adult body every day."

When the work of the human body in its entirety is summed up, we discover the curious and astonishing, but at the same time fully proved, fact that a power of about 3400 foot tons, that is, a

power that would lift 3400 tons one foot high is represented in our daily actions and life. Of this, the internal work, that is the work done by the heart, and generally automatic labour (that is the work of the muscles) is estimated at as high a figure as 260 foot tons, the external work of course varies very much. This is what the food must do, supply the nourishment, that will give this amount of strength or force and make up for the waste.

Choice of Food.—We have already seen what are the essential elements in the constitution of the human body, viz., carbon, oxygen, nitrogen, hydrogen and that all these are found in the vegetable kingdom as well as the other elements which combining with these form the bases of animal tissues.

The vegetable kingdom comprehends corn and all edible grains, (the cereals) roots, starches, sugar, herbs and fruits. A *vegetarian* (that is one who eats only vegetables) can extract from these all that is necessary for support, growth and even strength, provided he selects vegetables which contain all the essential elements; but if he depends altogether on vegetables for sustenance, he must eat the best cereals or make his food of peas, beans or lentils, (these are called legumes, and as you have read, contain next to cheese the greatest amount of nutriment), or he must swallow and digest a large quantity of matter of less nutritive value, in order to obtain all that is needed for sustenance, thus making up in quantity what was wanted in quality, but taxing the stomach and the

digestive organs with an amount of solid matter, which causes the *expenditure* of *extra force* in order to assimilate it to the body tissues.

On the other hand, cheese which is rich in all the elements, holds them in such a *concentrated form* that, to some stomachs, would entail an equal amount of work on the digestive organs.

Perfect food.—Milk, eggs, and butter, which belong to the animal kingdom, are valuable additions to vegetable food, “milk and eggs being said to be perfect foods,” because all the necessary compounds, even fatty and mineral matters, are contained in them.

The cereals or grains or cultivated grasses.—These come first in the order of good and wholesome food. The principal are, wheat, oats, barley, maize, rice, millet, &c.

This last mentioned grain has many varieties and is cultivated largely in the southern parts of Europe as well as in India, China, Arabia and Africa. It is very valuable as a food, and a very good authority says, that the natives of all places where the principal food is cholum (one of the millets) are a stout healthy people, stronger and of a larger size than those who live chiefly on rice.

Varieties of Wheat.—From wheat, we have vermicilli, macaroni, semolina, which are valuable as forming the varieties of preparing the nutritious grain.

Rollong which is simply half ground wheat, is a very wholesome article of food; boiled in water and eaten with milk and sugar, it makes an

lent breakfast dish, or made into a pudding it is an agreeable addition to the dinner.

Rice too is valuable as containing an abundance of starch, though comparatively little nitrogen, (see Table) fat or mineral constituents.

Other Indian grains are varieties of *millet*, called by the names of *raggy*, *cumboo* and *cholum*. *Cumboo* is a small grain which is excellent when boiled whole as rice, or made into cakes, it makes a sweet, palatable flour. *Raggy* is considered the most wholesome food for working people in India and raggy straw is reckoned superior to that of rice for all cattle.

We may add to these other preparations which though not made from grain are very similar. These are, sago, Tapioca and arrow root: of these *arrow root* is the least nourishing. It is, however, very easily digested, and when made with milk and flavoured with sugar, it is invaluable in some cases of sickness, when the patient can retain no other food. It soothes the digestive organs and helps to fit them for hard work, and supplies as much nourishment as is necessary for the time; it is a starch only, and is obtained from the roots of many plants. *Sago* is the pith of an Indian palm; that it is nourishing we may learn from the fact that the name sago, in the language of the Papuans, signifies *bread*, and it constitutes the principal article of food of the inhabitants of the places where the plant that yields it, grows. *Tapioca* is also the pith of a tree and a great quantity is imported annually into Europe from

Brazil. It is produced in Travancore and has been manufactured in Rajahmundry. Tapioca is very nutritious and easy of digestion; boiled in milk, or with fruit, or as a pudding, or in soup, it is excellent and nourishing.

Green vegetables which are some times eaten cooked and sometimes uncooked are excellent adjuncts of food. Though they have not much nutritive property, yet on account of the salts they contain, which considerably help digestion and also for the agreeable appetizing flavour, they ought to be included in the daily provision. The quantity of Potash contained in fresh vegetables, helps to keep the blood in a healthy state. Sailors and people on board ship on a long voyage often suffered from scurvy on account of not being able to get fresh vegetables, and as these are found to keep that unpleasant disease away, they are called *anti-scorbutics*. India is rich in vegetable productions; though the English cabbage, lettuce, cauliflower, &c., must be objects of care to the cultivator, yet the abundance of native vegetables will enable a good house-keeper to furnish her table with those accessories, at trifling cost.

The French, who have the reputation of being excellent cooks, know how to value vegetables. Not only do they always include them in their daily diet, but even the very water in which they are boiled is used to add to soup or for helping to prepare vegetable sauces. Cabbage water which is always thrown away with characteristic wastefulness by the English cook, is made into soup

with, of course, flavouring and additions, and is one of the most ordinary dishes in a French kitchen; it is considered as an act of common civility, among the peasants in France, for a woman to offer cabbage water to her neighbour, if she has no immediate use for it herself.

Between vegetables and fruit almost as much of the latter as the former, we must place the delicious TOMATO. This is one of the most wholesome, as well the most universally liked of all vegetables. It grows so easily in India that any one who has a little bit of ground can cultivate it. It is an annual, but in this country it is self-sowing and hardly requires new seed for a couple of years or perhaps longer; it is better, however, to attend to it, as the plants may degenerate, if suffered to go on self-propagating. The healthful qualities of the tomato do not depend on any mode of preparation for the table. It may be eaten twice or three times a day, hot or cold, raw or cooked, with salt, or pepper, or vinegar, with all together, or without anything, and in the utmost quantity that can be taken with an appetite; it will not disagree with the most delicate stomach. It is a delicious flavouring for sauces. Its wholesome quality, as well as its pleasant flavour, arises from its slight acidity which makes it excellent for invalids.

Pumpkin and *vegetable marrow* are good and wholesome, and may be made very appetizing by cooking. The Americans make an excellent pie of pumpkin; there is no reason why it should not be done here too.

Fresh fruits.—All fresh fruits contain a mixture of vegetable acids, with more or less sugar and mucilage. They are cooling, refreshing and wholesome, and as Dr. Cameron says, are used as a staple food in some countries.

ANIMAL FOOD.

Hitherto we have seen that all that is necessary to the human body under certain conditions can be supplied by the vegetable kingdom solely, but that a large quantity must be consumed in order to obtain the proper amount of nutritive matter. We can, however, procure this amount ready prepared for the purpose of assimilation, in other words, the materials of flesh, sinew and bone ready for immediate use by using as food the flesh of animals which are vegetable feeders and have extracted from their food, the precious compounds of carbon, hydrogen and oxygen, with nitrogen which are necessary for the maintenance of our life. The animals we use for this purpose are, fish which draw their nourishment from marine plants, rich in nitrogen; poultry, feeding mostly on grain; sheep and cattle also grain or grass-feeding animals.

Fish.—This is an important article of food, very nourishing and more easily digested than meat, especially the white kind as having least fat. It is richer in fibrin or flesh-forming matter than poultry or butcher's meat and contains large quantities of mineral matter, as phosphates of lime, potash and soda.

How to choose fish.—Fish should never be eaten out of season, as they are then unwholesome. When they are in condition, the flesh is solid and opaque, and when cooked, they have a better flavour. The flesh of fish should not have a bluish tinge nor look watery; when this is the case, the fish is inferior or out of condition. Besides the color and consistence of the flesh, we must notice that the eyes should be bright, gills a fine clear red, body stiff, smell not unpleasant. One ought to be careful in the choice of fish, in this country especially, as many cases of cholera and other illness resulting in death have been traced to the eating of fish, which at the time was unfit for food. *Lobsters* and *crabs* may be judged by their weight and stiffness; if light and limp they are bad. *Oysters* must be eaten fresh; the shell should close forcibly on the knife in the act of opening; if it should gape in the least, or even open with too much ease when the knife is inserted, the oyster is no longer fresh, and ought not to be eaten. *Prawns* ought to be bought alive and boiled at home; if prawns are flat and extended after cooking, they are not good to eat, as that is caused by the prawn having been dead before it was boiled. Prawns make delicious curry, but sometimes they are found to be indigestible and unwholesome, probably from the reason just mentioned.

Poultry.—Fowls and the white meat of rabbits are not of themselves the most nourishing food; they contain plenty of nitrogenous matter, but too little carbon, it is on this account as we have read

before, that fowl is best when eaten with bacon or ham, the latter supplies the fat wanting in the former. *To choose Poultry.*—Young fowls have smooth legs and the vent is closed and firm; don't choose a cock if it has a long spur as it is sure to be old. Ducks and geese when young will have the feet and bill yellow and free from hair; when fresh killed, the feet are pliable.

Hares and Rabbits.—*Hares* are excellent food; if very young they are good for roasting; at any age they make excellent soup, and jugged hare is both good and wholesome. Rabbits, too, with the addition of a little bacon make a delicious pie or stew. In choosing *rabbits* turn the claws sideways and if they crack the animal is young. The same test will do with hares, but in addition, the cleft in the lip should be narrow; the bodies of either animals should be stiff and the claws smooth and sharp, if they are young.

Squirrels are eaten in America and are considered good food; there is no reason why they should not be good food, as they are clean feeders living only on vegetables. They are split and skinned, and then broiled, fried, or stewed; my authority states that they are best broiled.

Beef, mutton, &c.—The best *beef* is the flesh of the ox, but here in India we have to be content with cow beef and even the flesh of the bull which in England is considered the least valuable. The English are said to be a beef-eating nation, and "English roast beef" is proverbial. There is no food more satisfying than beef when properly

cooked ; it contains a large proportion of nitrogen and more iron, than the other kinds of animal food. It has no starch, but the fat, (and beef to be good must be fat) makes up for this. The juice of beef, when extracted, contains a substance which has an exhilarating effect on the human system ; it is something like the *theine* in tea and coffee, and is rich in nitrogen ; it is called *Kreatin*, and it is this which makes beef tea so good for invalids and so supporting.

An English ox is said to be in its prime for killing, when it is about five or six years old ; it ought then to have one-third of its whole dead weight of fat, which should be white and not yellow, (yellow fat is not good) ; the lean should be marbled with fat, otherwise the meat will be dry and tough, when the water, that it contains evaporates in cooking. Cow or heifer beef is paler and closer grained than ox beef, the fat a little whiter and the bones smaller ; while bull beef is of a dark, sometimes purply red color, coarse grained, with little fat, and having a strong meaty smell. Many will recognize this last as the beef generally to be had in Madras ; the cow beef may sometimes be purchased, but the flesh of the ox is probably never seen here.

The best *mutton* is the flesh of a sheep which has attained the age of four years. It should have an abundance of fat, the fatter the mutton, the better flavoured the lean meat is. The color of the flesh or lean part of the mutton indicates the age of the animal, the more mature being darker ; it is not so

well flavoured when the flesh is white. Mutton is very nutritious, easily digested, and, in this country, very cheap. It can be cooked in various ways and may be said to be the principal animal food used in Madras, though some of what is sold for mutton in the markets here, never formed part of a sheep but is the flesh of a goat, and there is such a resemblance between it and the lean sheep of this country that many do not detect the cheat put upon them; a good housekeeper ought to be able to distinguish between them. The flesh of a goat is coarser in its fibre, and less juicy than that of a sheep; there is little or no fat, and the leg bone is much longer. The flesh of a young goat, a kid, is good if the animal has been fed on milk; it is not very nourishing, but when stewed in a good broth and flavoured, it makes a dish by no means to be despised.

Here it must be noticed that the prevailing fault in this country, a fault which may be said to be the cause of the inferior meat which is so much complained of, is *the way in which the young animals are fed, or rather NOT fed*; it is a piteous sight to see the poor young calves, following their mothers, and starving by the side of plenty, their sides nearly meeting from the emptiness of their stomachs, and their poor mouths being muzzled ~~lest~~ they should partake of the food that God provided for them. It seems the greatest cruelty and it is the worst economy too as the animal that is starved in its infancy, (as it were) can never, by any amount of after feeding, be made a perfect

specimen of its kind. It would not of course be expected that the calf should have all its mother's milk, but it should be allowed a fair proportion, and other food, such as rice, or raggy conjee added to make up the deficiency. Such a mode of treatment would abundantly repay the owner, as the animal would grow into a fine, healthy creature, able to fulfil in the best manner all the requirements of its nature. We should see calves reared in this way become, if heifers, valuable cows giving milk not to be measured by pints or even quarts but by gallons, while young^d bullocks would be stronger for their work and burdens. It is always short-sighted economy to stint the young in food. We have read in the beginning of this chapter, that food is necessary to provide force for the internal working of the body, and materials to build it up. If this is not sufficiently abundant during the time of growth the fact is evident that there cannot be the proper growth and development, any more than a tailor can make a coat out of the material only sufficient for a sleeve. If the animals in this country were better fed, better tended, the young especially, we should have better milk, better beef, better mutton, and perhaps too we might be able to have now and then some good *veal* and *lamb*.

PREPARATION OF FOOD.

Food, in order to supply all this, must be in a state to assimilate with the body tissues. Raw pease, meat and vegetables, though in the highest

degree nutritious, must undergo a change before they can become flesh, blood and bones. This change is effected by the process of digestion, and it may be begun by a certain amount of preparation before the food is taken; that preparation is COOKING.

It is true that men in an uncivilized state subsisted without troubling much about cooking their food, but then we must remember that their mode of life was that of the lower animals, mostly in the open air, and with a great deal of violent exercise.

All grains swell when cooked, the granules are opened or broken, and their constituents are ready to be acted on by the digestive juices. The texture of meat and the tissues of vegetables are loosened, separated and softened by the process of cooking and are thus partly prepared for the digestive operations and when we remember that in the process of digestion, meat and vegetables must be taken to pieces, before they can assimilate with the tissues of the body, and thus really become food, we cannot help seeing what immense aid to easy assimilation proper cooking must afford.

When meat comes from the butchers it ought to be wiped with a dry cloth, and again just before cooking, the kernels if there are any, should be removed, and in loins, the long pipe that runs by the bone should be taken out; meat should not be washed with water before cooking unless there is a suspicion of even the slightest possible taint. In that case, the meat may be washed in pyroligne-

ous acid, (a vinegar distilled from wood) or it may be made perfectly fresh and pure by sprinkling powdered charcoal over it, first wiping the meat carefully with a dry cloth. The acid has the same property as the charcoal, that of combining with or destroying or neutralizing the putrescent particles. A piece of charcoal may be put into the water, when meat or fowl that may be a little high, as it is called, is boiled; this will restore the freshness or sweetness. Meat may be made tender by soaking it in vinegar and water for six or seven hours, the quantity of vinegar to be in the proportion of $\frac{3}{4}$ of a pint to three quarts of water. There is another reason for cooking our food besides converting it into more easily digested matter, that is, it makes the necessary nourishment more agreeable to the taste.

Modes of Cooking.—There are different modes of cooking meat, roasting, boiling and stewing; to these may be added baking, broiling and frying.

You have learned in your Lessons on Domestic Economy, something of each of these modes of cooking. Roasting stands first as being the earliest mode adopted, and perhaps, as being generally the most liked.

Roast meat has generally a better flavour than boiled, and is more usually preferred. The reason is that osmazome, the flavouring matter contained in more or less quantity in all flesh, is, under the influence of dry heat, as in the case of roasting, more perfectly brought out and acquires higher properties. Meat should be roasted by a *quick*

strong fire; a quick heat in roasting causes the meat fibres to contract and close up the pores, and thus retain the whole internal juice; the meat will then be tender and full of gravy. Roast meat should be frequently *basted with its own dripping*, that is the fat which drops or drips from it; meat cannot be basted too much.

Loss of weight in cooking.—Meat in cooking loses some of its weight; more in roasting than either baking or boiling. Beef loses on an average, in 4 lbs. about 1 lb 5 oz. when roasted, and about 1 lb when boiled.

Time required for roasting.—The usual time required for a joint to be perfectly roasted, is one quarter of an hour or twenty minutes to every lb, when the piece of meat weighs more than 5 lbs. This rule will not always answer; fresh killed meat takes a longer time to roast, than meat that has been kept for a while; according to that, it will take longer to roast a joint in this country than in England, as the meat is always fresh killed here. On the other hand it takes less time in warm weather than in cold, so that about the same time may be allowed. Mutton does not take quite so long a time as beef to roast.

Meat ought to be roasted before a brisk fire, for the reason already mentioned. It ought to be thoroughly cooked, yet all the juices must be retained, a dried up piece of meat is as unpalatable as it is wanting in nutritious qualities.

When the meat is perfectly roasted and taken from the fire, the fat which has dripped from it

while roasting, part of which has been used in basting, should be taken from the pan and poured into a basin and left to stand ; a little boiling water may be poured into the pan, stirred briskly, a little salt added, and it will be a very tolerable gravy to put on the dish with the roast meat, or to serve in a small tureen by itself. It is better however to put it on the dish, as the piece that runs out when the meat is cut, mixes with it, and a good rich gravy is the result.

Gravy for the children.—In some families, where there are small children, a quantity of gravy is required, and a good housekeeper would do well to make some, by boiling or rather simmering in a small saucepan while the meat is roasting, some crushed bones or scraps of meat with an onion and a little salt. This should be carefully strained on account of the crushed bones, poured on the pan instead of the boiling water just mentioned and served in a small tureen. A little of this gravy with mashed potato or with bread is very nice for children.

Boiling.—One of the most important things to notice with regard to boiling is, on no account let the water boil quickly, or violently, or hard as some cooks say. On the other hand the gentle boil or *simmer* must never stop ; a slow but steady boil with the pot or sauce pan, close covered, will cook the meat perfectly, making it tender and full of juice. Mrs. Rice in her valuable little book says, “ It is one of the most difficult lessons for young cooks to learn, that boiling is not good for meat. They

seem to think that they are making good progress when the water is boiling fast, while as a matter of fact, the meat is being almost spoiled by the process." Meat should be wiped dry, and put into cold water, covering it well; the fire must not be too strong, and it must not boil too soon; just before the water boils, a scum will rise to the top, which must be *immediately* skimmed off, or the meat will look dirty and discolored. This may be noticed often, as the cooks here do not seem to realize the necessity. Indeed the most difficult cooking operation in this country is boiling; the difficulties seem to be, this very one of not removing the scum, and another, that of carelessness or inattention to the way in which the water boils. If it bubbles up all is supposed to be right. *A good cook will hardly allow a bubble, only a gentle boil, but that should never stop for a moment. As said before, the lid should be kept closely down, except when it has to be raised to take off the scum, that ought to be removed whenever it appears. The boiling point of water is 212° F., and a temperature of 180° is the proper degree of heat for simmering meat; it should however never go below this, or the meat will be sodden and spoiled. About the same time will be required for boiling, as for roasting.

Stewing.—This is the most economical mode of cooking, as all the juices as well as the solid part of the meat are used, and very little fuel is needed. The stewpan must never boil, but must be kept very gently simmering for several hours, (with the

lid shut closely and never removed) until the meat is perfectly tender. There will be no scum, if there is no ebullition. An excellent dish is made by stewing the meat in a jar, closed at the mouth with a paste, and boiled in a pan of water; no water being put in the jar, so that the meat is cooked in its own juices, and sent up with a pure gravy unmixed with water. If this stewing continues, until all the juices are extracted from the meat, and the fibre only remains, the liquid is meat tea, or an extract of meat, and the solid part is not used. This is an excellent restorative for invalids, when the fat is taken off the top. If made of beef, it is called beef-tea, if of mutton, mutton-tea. The last is not so commonly used, but will be found an agreeable change from beef-tea.

Broiling.—Broiling is really roasting, roasting a small piece of meat; this mode of cooking is very convenient, when the piece is not large enough to roast, and for invalids it is invaluable, as the flavour and juice of a steak or chop are preserved if the meat is properly broiled, and the dish made more appetizing. To do this properly, the whole attention of the cook must be given to it, the gridiron must never be left, as the fat falling into the fire may cause a blaze that will blacken and spoil the grill completely. A good clear fire is necessary to broil meat, a red fire without any blaze; charcoal makes just the kind needed. There must be no fresh wood near the gridiron, which should be kept in a slanting direction towards the cook, so that the fat may not fall into the fire, but may be carried into the little

trough, which is in the handle by the grooves in the bars. The gridiron must be scrupulously clean, and the bars well rubbed with a little fat before the meat is put on it. The meat must not be perforated with a fork, but should be turned with a tongs, a small one for the purpose should be one of the articles provided with the kitchen furniture. The gridiron should be cleaned immediately after using it.

Frying.—Frying is boiling in fat, and if done as it ought to be, the meat or fish will be by no means the sodden lump we sometimes see it; nor need it be greasy either. In order to boil anything in fat, it must be covered with the boiling fat, which hardens the albumen immediately so that no fat can penetrate; the result is that the meat or fish is perfectly cooked after it has been a sufficient time in the high temperature. An experiment was made to cook a leg of mutton in boiling fat. It was put into the fat at a temperature of 400 degrees and in an hour and a half it was thoroughly done; and was found to taste and look just like roast mutton. The weight of the mutton is not mentioned, but it was probably an ordinary leg of English mutton, weighing about eight or nine pounds. This, of course, was merely an experiment, as it would be rather an extravagant way to roast, or boil. It is, however, practicable when the pieces of meat or fish are small; it is not only practicable, but absolutely necessary that the boiling fat should cover the pieces to be cooked. For this purpose a deep frying pan, or frying kettle as it is called, will be

needed ; the usual shallow pan is useful for frying pan cakes, bacon, or small fish, and for warming vegetables, &c. ; a small wire basket to hold the fish, so that it can be lifted in and out without risk of breaking is generally an accompaniment to the frying kettle. If not, it can be easily made by any girl with deft fingers, who will use up for that purpose, pieces of wire off soda water bottles or packages which she will find probably in the store room ; if there are none a few yards of wire will not cost much. The little basket must be made to fit into the kettle, and there should be a handle across to lift it out. Objections have been made to this mode of frying on the score of economy, as it takes so much fat or oil ; but in the hands of a careful cook, the fat used will be much less than in the ordinary way, as the same fat will do over and over again if it is not let to be burnt ; only of course the fat in which fish has been fried, will not do for meat or anything else.

How to do it.—Get a deep frying pan, or frying kettle, fit it with a wirebasket ; put as much oil or fat in the pan as will *completely* cover whatever is to be cooked, let the fat or oil boil, taking care that it does not burn, and when it comes to the proper temperature, put in your meat or fish ; you can ascertain the proper temperature by dipping a piece of bread into the fat, if it browns immediately, you may put in your meat or fish at once. When it is cooked, lift up the wire basket, and the fish will be unbroken and of a beautiful rich brown. The time that will be required to cook thoroughly

in this way is about eight to ten or twelve minutes according to the thickness of the pieces. As soon as the cooking is done, take the fat out of the pan or kettle, put it into a delft bowl and do not mix it with any other fat; it will then be ready for use again and again, provided it is not burnt.

Thus there is a considerable amount of saving in this process, but it involves a little trouble, and careless people do not, or will not see the advantage of the thrift in small matters, which often turns out a large gain.

Economical joints for families.—In England, families as a rule consume about half a pound of meat on an average every day for each person. This in a large family would make the butcher's bill no inconsiderable item in the weekly or monthly expenditure. A good housekeeper will then buy the most economical pieces or joints, that is, the pieces containing the most solid meat. The price of meat in this country is much less than that in England, but the meat is much less nutritious, although when well cooked, it contains a sufficient amount of nutriment. The beef of this country, as has been mentioned, is always inferior, but now and then a tolerably good joint may be had for roasting, and the poorest will make a stew or soup, with sufficient vegetables. Large joints of beef would be most wasteful here, as meat so soon spoils in Madras, and ribs of beef are extravagant joints from the quantity of bone, which must be paid for at the same rate per pound as the solid meat. The want of fat in the meat

here, hinders us from roasting parts of the beef that in England would be good for that purpose. On the whole, beef except for stewing or for soup is the most unprofitable meat for a family here.

The leg of mutton is undoubtedly the most profitable as it is the most palatable of Indian meats; it contains more solid meat than other joints. It is most frequently roasted here, perhaps because the Indian cooks cannot be induced to boil it properly; a boiled leg of mutton, however, will be found a very agreeable change, if it is boiled in the way that has been recommended.

Necks of mutton are considered rather wasteful or extravagant in England for a small family as there is so much fat and bone. Of the former we certainly cannot complain here, and the neck of mutton is found to be a convenient part for cutlets, stews and curries, &c.

The shoulder, which in England is a luxurious joint, is here nothing but a piece of skin covering a bone; it is sold at a low price generally, and it is sometimes boned, spiced, rolled and baked by the native cooks; it is liked by some, but is neither a favourite, nor a particularly profitable dish.

Breasts of mutton are priced low too, and make a nice dish, either boiled with a nice parsley and butter sauce, or capers, if preferred, or else baked or braised; the native cooks prepare this dish as a rule very well.

Pork, which in England is both a useful and an agreeable animal food, is here, partly from the fault already mentioned—the prevailing neglect of the

proper rearing and feeding of animals, neither a favorite nor a wholesome meat. Pigs are allowed to forage for themselves, to eat anything and everything. And as when not provided with proper food they are by no means dainty animals, the very thought of what they eat would make the flesh the least kind of meat to be desired. The want of outward cleanliness too is another objection, and a very proper one, to the use of pork; but this need not be; pigs, with very little trouble or expense may be kept clean and properly fed, and the flesh will then be as good as English pork, not so fat perhaps, nor need it be in this hot climate, but well tasted and wholesome.

Ducks, too, are permitted to shift for themselves, and to eat anything that they can find. Ducks bought in the bazaar or market, are often found to cause illness, probably from this reason; it is a good plan to buy ducks and feed them for a week at least before they are used.

Pork should be very well cooked; the lean white and well grained, and the fat white and firm.

In Warner's *Every Day Cookery*, there is the following paragraph with reference to pigs: "A pig is one of the most profitable animals to keep, and will repay any care and attention bestowed on it. Every part of it is used and good for food. It should be kept scrupulously clean, the sty carefully cleaned out very often, and the pig itself washed and scrubbed. The food should be always cooked for it; skim milk, potatoes and meat are its best food."

Pigs fed in this country on skim milk, potatoes, and meat would be rather expensive luxuries; they could, however, be kept clean, and their food might be all the refuse of meat, bones, &c., from the table boiled with any kind of edible vegetables, tops of roots, outside leaves of cabbage, cauliflowers, stalks, pea-pods, &c. A careful housekeeper will, if a pig is kept, see that everything of the kind is washed and put into a vessel reserved for the purpose, all these with the liquid in which they are boiled, should be given at regular hours and the pig will be found to be in tolerable condition and the flesh will be good and wholesome.

Regularity of feeding an essential.—The experiment has been tried in the feeding of pigs especially and I suppose would be as successful with other animals,—giving a certain quantity of food at stated hours, and giving a larger quantity at irregular times, and it was found that the smaller quantity when given regularly was much more satisfactory in its results, than the larger given at irregular intervals. Horses are known to thrive better and are better able to work, if they have their gram, at the same time every day. The keeping of a pig in the way just mentioned would be thrifty in another way, as using up what would be refuse or waste matter and using it to advantage too.

Eggs can be cooked in a great many ways and are good every way. They contain much nutriment, indeed it has been said that there is as much nourishment in one egg as in half a pound of meat. This certainly will not apply to

the Madras eggs ; here we must again, to account for the smallness of the eggs, refer to the neglect of feeding before spoken of ; the breed of fowls is not improved, nor in any way is there an attempt made by the native population to feed the fowls with food of a proper kind or in sufficient quantity, or to give them the amount of attention that would in the end amply repay them, by the superiority not only of the egg, but of the fowl, which is so often complained of as being tasteless and much inferior to home-reared fowls.

Eggs make an excellent currie, are good fried in butter or good ghee, or with bacon. Scrambled eggs make a nice breakfast dish. This is made by putting a small piece of butter into a pan, and while it is heating, breaking the eggs into a cup with a little salt ; as soon as the butter is hot (it must not boil) the eggs must be put in, quickly scrambled about with a fork for a couple of minutes, then served on thin slices of buttered toast or with a few drops of anchovy sauce mixed with the butter if preferred ; the toast may be wetted with a few drops of boiling water, and it then more readily absorbs the butter, or sauce. It is said that eggs can be cooked a hundred ways.

How to cook vegetables.—Vegetables ought to be put into boiling water, with a little salt ; the water should be kept briskly boiling until the vegetables are done ; with green vegetables a pinch of soda should be added, but it should not be put in the water with carrots, potatoes, celery, artichokes, parsnips or turnips, as it would make them black.

spinach although a green vegetable is an exception too. Mrs. Warren in her little book called *My Lady Help* gives directions for cooking spinach ; she lays particular stress on the cleansing, which every one will see is an important matter in preparing vegetables.

“ The stems have first to be picked from the leaves, which must then be washed, a handful at a time in *warm* water, and well tossed, (mind, not more than a *small* handful at a time), the sand and insects will thus readily drop out. Then quickly throw the spinach into cold water ; the pans of hot and cold water must be placed close together. Now, throw away the warm water, fill the pans with cold water, and again lift the spinach from the water into the second pan of cold water.

This is the only way to cleanse all vegetables with certainty. Now you may be sure there is no grit or insects in the spinach, and the latter, far from being made limp by the hot water, is firm and crisp, because the water was not too hot, nor the spinach allowed to remain in it. In ten minutes it is drained and put into a saucepan with two tablespoonfuls of water to prevent burning at the bottom, with a little salt, then covered closely and put on the fire. In ten minutes stir it round and turn it over. In another ten minutes, it will be done ; it is then drained, and the water pressed from it, chopped while in the colander, and again, the water pressed from it ; then turned into a basin, one tea spoonful of moist sugar, two spoonfuls of vinegar, half an ounce of butter, a little salt and

pepper added; then stirred well in the basin, put the latter on a saucepan of boiling water, to re-warm, and serve hot on buttered toast; a round of toast cut into eight sippets, so that one can be helped with each spoonful of spinach."

I have given these directions in detail, on account of the *washing* process, which it would be well to use with all vegetables; spinach must be cooked differently from other vegetables, as it is not plunged into a quantity of water, but the *cleansing* process ought to be the same. Some cook spinach without any water, but put a piece of butter in the saucepan to prevent it from burning, and stew it in its own juice; it is very good that way.

In your Lessons on Domestic Economy, you learned how to boil potatoes; there are other ways of cooking them. In Warne's *Model Housekeeper*, there is a very interesting account of this useful tuber, its varieties and cultivation, with receipts for cooking in *twenty* different ways. (See Warne's *Model Housekeeper*, pp. 155 to 166.)

WASTE.

TO AVOID WASTE will be an important consideration with every thoughtful housekeeper; the good house-mother provides for the wants of her household generously and abundantly, but will not allow anything, that can be used, to be wasted. Economy is the soul of good cookery, and a skilful cook will put everything to good account. It is strange, yet nevertheless true, that there is more

waste in the houses of the poor than in those of the rich ; this may be accounted for, by the fact that the poor have no idea of the true art of cooking and do not know how to use up small pieces, trimming of meat, crusts, cold vegetables, dripping, &c. It is a pity that they are ignorant of what is so necessary to their comfort, but they are often overworked and tired, and do not care to do things nicely for their own eating, content to take any food that can be got the most readily.

How to use pieces of meat, bones, &c.—Pieces of meat, bones, &c., should be put into a saucepan or chatty, with a little salt, an onion or two, and some water ; the onion must be washed, but need not be peeled. This may be left to simmer for some hours ; some more vegetables, that is, green tops of turnips, a leaf or two of cabbage, a few peas or beans, and a handful or two of rice may be added and boiled together, until the liquor is of the consistence of good cream, and good and wholesome soup will be provided. If the bones are small or bruised, the liquor ought to be strained, when all the good of the meat and bones has been extracted before the rice and the vegetables are added ; as cold meat and bones do not keep well in this country, it would be wise if there was any suspicion of either not being perfectly good to wash them before putting them into the saucepan with a little Condyl's Fluid, diluted in water. A piece of charcoal, washed before putting in, may be boiled in the water and both the meat and the broth will be perfectly sweet and wholesome.

Washing meat before cooking it.—It has been mentioned before, that this should not be done, as it takes away the flavour, but that it should be well wiped with a dry cloth. If, however, as has just been said, there is the slightest suspicion of taint, it should be carefully washed; it is better to do this in water mixed with permanganate of potash or Condry's Fluid than in cold water only, as the latter extracts all the flavour.

Pieces of bread, cold rice, &c., may be also used, and should not be thrown away. The rice may be put into the soup or made hot with boiling milk and flavoured. It should be put into the cold milk and allowed to come to a boil, carefully stirring it all the time, or it will stick to the bottom of the saucepan and burn. If a bit of cinnamon is boiled with it and a little sugar added, it will make a nice pudding for the children, or indeed for any one. Pieces of bread that have been left at table may be put into the oven and slightly browned; they are very nice for lunch, and are like rusks; or they may be grated and kept in a bottle for fish, cutlets, &c., or the pieces may be, if small, put into a bowl, some boiling water poured over them and left standing with a saucer or plate, covering them; after some time, the water may be poured off, and the bread squeezed with a spoon until all the moisture has been taken away, some milk and sugar with a little mixed spice may be added, and a well beaten egg, the mixture put into a pie or pudding dish with a bit of butter on the top, and baked for twenty minutes, so that the top may be a nice

brown, but not burnt. This will be liked very much by children, who have been accustomed to puddings and have not had their infant tastes spoiled by the strongly spiced curry and pepper water, so frequently given to little ones, for whom milk ought to be the principal food. Stimulants in the form of food should be no more given to children, than stimulants in the form of drink, and it is more than probable, that liver complaints, dyspepsia and other troublesome illness, have had their origin in the highly seasoned food permitted to children, whose little stomachs soon learn to dislike the simple food, and to long for what is stimulating.

KITCHEN FURNITURE, COOKING UTENSILS.

In order that the cooking should be satisfactory in every respect, the necessary articles for cleansing and preparing the food must be provided. First there must be a good kitchen table; it must be strong with a smooth top, which should be well washed and scrubbed. Deal wood is the best for this, as it is a white wood, looking nice and clean when washed (I never could be quite reconciled to a teak wood table in a kitchen, scrub it as hard as you will, it will never have the clean look of the white wood; but in this country we must use teak, I suppose, as it is the most durable and the best to be had). A wire meat safe is wanted for the provisions that must be kept in the kitchen, and a shelf for the saucepans, &c., another

shelf for the plates, dishes, spoons, ladles, &c., that are used in cooking. There is no need of an English dresser, as there are so few things wanted in an Indian kitchen. A cupboard or two drawers for kitchen cloths would be required. Earthen chatties are perhaps the best for native cooks to use as they know how to clean them, and they are careless about English pots or saucepans. A very good plan is for the mistress of the house to visit the kitchen frequently, if she does not do her own cooking, to look carefully at the chatties, putting her hand inside; if they seem to be, as they will be after a time, impregnated with grease, she should have all broken before her eyes, and a new set procured, and as they are very cheap, this might be done about once a month. A new set ought to be got and used for boiling water, &c., a little while before the old ones are destroyed, as new chatties are apt to give a taste to food cooked in them. If the mistress of the house or one of the daughters, looks after the cooking, English pots and saucepans are better to use and will be less expensive in the end, as they will last. Great care must be taken in the using and cleansing; an enamelled saucepan must be washed immediately after being used, and it must not be allowed to burn. Saucepans that are tinned inside must have the tinning renewed when necessary. The lids of saucepans must fit closely and have a long handle so that they can be easily removed. Two or three large pans or basins will be needed for washing dishes, plates, &c.; two frying pans, one shallow for frying bacon, pan-

cakes, pudding, &c.; one deep (the frying kettle before mentioned), fitted with a wire basket, for frying fish, steak, chops, &c.

A *Bain Marie* is a most useful vessel in a kitchen. It is a large pan in which water is kept boiling, and the pots or saucepans put standing in it, in order to keep the contents hot. Any basin or pan will do that will bear the heat of the fire, so as to keep the water in it boiling, or nearly up to boiling point; *warm* water is of little use. This would be a great advantage here, as sauces, stews, &c., are often smoked, burnt, or rendered perfectly tasteless by being permitted to simmer by the side of the fire after they are done enough, or else allowed to get cold and hastily boiled up again, a process equally destructive of flavour and freshness.

Here is a list of kitchen utensils required in an English middle class kitchen; it is copied from Warne's *Everyday Cookery* and is called a "Medium set;" all of these would not be required in an Indian kitchen, as some of the pots and saucepans may be exchanged for earthenware chatties before mentioned. The cost of the set would be about £10 15s. in England, but as iron and enamelled saucepans are much dearer here, it would be rather an expensive kitchen outfit; even if the articles were procured direct from England at the present rate of exchange, it would still be more costly than absolutely necessary. See Warne's *Everyday Cookery*, p. 18.

1 tea kettle	2 frying pans
1 toasting fork	1 omelet pan
1 bread grater	1 double hanging grid
1 wooden meat screen } and bottle jack }	iron
1 dripping pan and stand	1 salamander
1 meat chopper	2 sets of skewers
1 colander	1 pair of steak tongs
3 block-tin saucepans	1 box of larding pins
5 iron saucepans	2 pudding moulds
1 do. with steamer	2 jelly do.
1 large boiling pot	1 rolling pin
4 enamelled stewpans	1 paste board
1 butter saucepan	1 paste jigger
1 stock pot	12 patty pans
1 fish and egg slice	2 tart pans
2 fish kettles	1 pan for yorkshire pud- ding
1 flour dredge and pep- per and salt kettle	1 Warren's Everybody's cooking pot
	1 do. do. curry pot

To this should be added a pair of scales, with weights.

Cleanliness in the kitchen.—Whatever vessels are used in the kitchen, copper, iron or earthenware, must be kept scrupulously clean. Copper vessels especially require particular care, to be safe they ought to be in daily use, cleaned and well dried before they are put away; if they are left damp, *verdigris*, a poisonous substance, will form; there have been several cases of death resulting from neglecting to clean and dry copper vessels. If broths, soups, or stews are allowed to stand and

cool in copper vessels, there will be literally "death in the pot."

Coppers ought to be cleaned with turpentine, and fine brick dust, rubbed on with a piece of flannel, and polished with leather and a little brick dust. Thus cleaned, they will look like vessels of gold and will be perfectly safe to use. Iron saucepans are lined with tin, they are very easily cleaned, washed with hot water immediately after they have been used, then thoroughly dried; in England before the fire, in India they can be dried in the sun; they must never be put away damp, nor be kept in a damp place as metal rusts so quickly and rust destroys or eats away the metal, besides making whatever cooking is done in a rusty or dirty vessel unwholesome and injurious. When the tinned lining wears off it should be immediately replaced. Soups or gravies must not be let to lie in metal vessels, saucepans, &c., they should be poured into a delft pan or basin.

Plenty of hot water is a necessity in a kitchen, there should always be a kettle or pan of water ready for washing dishes and pots when the cooking is done; nothing should be put away after using, without having been washed.

The kitchen should be kept clean with frequent white-washing of the walls and ceilings. The table should be scrubbed well every day with fine sand and water; the sand should be rubbed on with a small bundle of straw and plenty of "elbow grease," it should be washed off with clean cold water; the table ought not to be cleaned in the

kitchen as the water would slop and dirty the floor, but outside the door, and when cleaned, it may be left for a while to dry, not in the hot sun however, as that would warp and split the wood.

Kitchen towels, dusters, &c.—There should always be a good stock of these, and they should be given out at stated times, no new ones provided until the old ones are produced: even if they are only rags, they must be shown. There ought to be strong towels for wiping pots, saucepans, &c.; these are called in England “dish cloths,” they should be washed every time they are used, and wrung out of the water, with which they have washed the dishes, &c. When all dish and vessel washing is over for the day, the cloths should be washed in clean water, wrung out, and well shaken to take out the marks of the wringing, and dried. They should never be put away with grease on them.

Pudding cloths should be washed, scalded in boiling water directly after using them, and hung up to dry; they must be well aired before they are put away, and kept in a dry place, or they will smell musty and spoil anything that is put in them.

Jelly bags require care, they should be made of thick flannel, cut in the shape of a half handkerchief, the two straight sides joined together with a close strong seam, leaving a point at the bottom and a wide mouth at the top; this should be hemmed round and loops of tape fastened to the hem to hang the bag; some have a hoop run in the hem. It is a good plan to dip the jelly bag into boiling

water before the jelly is poured in, of course the water must be well wrung out. Jelly bags must be washed immediately after using, and well dried, or like the pudding cloths, they will give a bad taste to the jelly.

BEVERAGES.

When one is thirsty, the best drink is water, but it should be taken in moderation, as large quantities weaken the stomach and produce indigestion. Excess in this matter is really intemperance and does physical harm. Children and young people, especially in this country, are liable to this kind of intemperance, drinking water at every opportunity, thus filling their stomachs with fluid, incapacitating them for solid food. This is often only a habit, and should be checked; children ought to be taught self-denial, not to gratify themselves in every inclination, as the habit of self-indulgence grows with years, and children who cannot refrain from drinking large draughts of water may, when grown up, not be contented with water, but look for stimulating drinks, and not having cultivated the power of self-restraint, will find it difficult to conquer the inclination if, indeed, they are not too willing to yield to it.

The quantity of liquid that may be taken with safety or advantage, in one day will vary of course with circumstances, such as climate, particular physical condition, &c.;—moderation in this matter, as well as in everything used as food, is necessary for health, and particularly so for children, whose

young stomachs will be injured if distended by too much liquid, as well for the reason just mentioned, namely, the moral training that a little self-restraint in this matter will give.

After water, (the drink provided for us by nature ready for our use) there are other beverages which we must ourselves prepare, and which from their different properties are more or less favourites. These are Tea, Coffee, Cocoa, and Chocolate, which though different in appearance and taste, yet are somewhat similar in their effects: they, especially tea and coffee, contain little, if any, nourishment, but they have the power of giving energy to brain and nerve, stimulating and refreshing after muscular or mental fatigue. This power is due to the presence in each of a substance possessing the qualities of quinine. Tea contains from two to four per cent of this substance, which is a crystalline alkaloid, and coffee about one per cent. When this substance occurs in tea, it is called *theine*," in coffee, "*caffein*," and in cocoa "*theobromine*." Tea contains the greatest quantity of this restorative, and cocoa, the least; on the other hand cocoa contains more nutriment, and may be considered as a combination of drink and food. Tea and coffee contain also an astringent substance, which makes an insoluble compound with albuminous matter; on this account, they suit "bread and butter meals" better than when meat is eaten. A cup of tea or coffee, though invaluable as a restorative, is likely to produce indigestion when taken with animal

food. An authority on this subject says : "owing to its stimulating and restorative action on the nervous system, tea is very good for travellers and soldiers, and should be preferred to alcoholic stimulants after fatigue."

"It is equally efficacious against heat and cold ; in nervous exhaustion, particularly in hot climates, or consequent on walking in the sun, especially when followed by shortness of breath, it has often proved strikingly beneficial," and again "by its heat, it warms the body when cold ; by promoting the action of the skin, it cools it when hot, and by its astringency it modifies the action of the bowels."

How to prepare tea :—The Chinese who may be taken as an authority on this matter, are very particular about the kind of water, that ought to be used : It must not be hard water, for hard water prevents the extraction of the soluble principles, and too soft water extracts too much of the general matter and so spoils the delicate flavour. Soft water, however, is the best. The Chinese say "take it from a running stream, that from hill-springs is the best, river water is the next, and well water is the worst." The objection, however, made in the chapter on water, to the use of river water in a large town, must be remembered in filling the kettle for tea, viz., water taken from a river, into which any drainage or sewage can percolate, must not be used for any cooking or drinking purposes. The water must be boiling at the moment of infusing the tea ; if it is allowed to cool at all, that is, to go below the boiling point,

the tea will be weak and flavourless. It must be newly boiled too, for "water that has been twice boiled or kept boiling for some minutes will not make good tea." Tea tasters are particular in this matter, they never use any, but newly boiled water, as that only will bring out the full flavour of the tea. It should not stand long after the water has been poured on, as although the tea will then contain more colouring, or *look strong*, "as tea-drinkers say, yet, it will *taste strong*" too, and the choice flavour and delicate aroma will be lost. The Chinese are so particular to preserve this aroma that they never add anything to the infusion. The Russian flavor it, with the juice of a lemon, the English add sugar and milk, or cream, and in this way make it more of a nourishing drink, than when taken alone.

The best kind of tea pot is silver, or a shining metal, (not copper of course) as bright tea pots retain the heat longer than dark earthenware. White, glazed earthenware or china may be used and should be washed in clean water after using, and carefully dried before being put away. The teapot should be rinsed with boiling water, before tea is put in; by this means the action of the water on the tea leaves, will be more powerful. In pouring out tea, the tea pot should not be emptied, and the infusion drawn off to the last drop, but water should be added while about a cupful remains, and when it has stood for a minute or so, the second tea will be nearly as good as the first.

Coffee.—The art of making good coffee may be said to consist of one or two simple things. A good cup of coffee must have the full flavour and aroma, and be perfectly clear and free from grounds. To make this, the coffee must be fresh roasted and fresh ground. This is generally done here, but in England, where the coffee is roasted when it is bought, good housekeepers put the previously roasted berries into the oven before putting them into the mill, and when they are heated through, grind them. The French who are allowed to be the best coffee makers in the world, give one ounce to each cupful of water. They use two pots; into one they put the ground coffee and pour boiling water over it, this is let to stand for about five minutes, when it is poured off as clear as possible, all that will not pour out clear is left in the pot with the grounds, boiled for a few minutes, and then both are mixed together; half a cupful of cold water is then thrown in, and it descends to the bottom carrying the grounds with it. The coffee can then be poured into the other pot, and will, if it is not shaken, be as clear as wine. Coffee should not be ground too fine, or it will be difficult to get the liquid perfectly clear. The process of roasting requires great care and skill, as the quality of the coffee depends greatly upon the aromatic volatile oil which is developed by the action of heat, and which is shown by the delicious fragrance it gives out in the act of roasting. The berries should not however, be too much roasted, or burned in the slightest, and should never be

allowed to become darker than a light brown. Coffee loses in weight by roasting, but gains in size. In large establishments coffee berries to be roasted are placed in an iron cylinder, which is slowly turned round over a gentle fire, so that all may in turn be exposed to the same heat. The method used in this country, though simple and primitive, is a good one if carefully done; the same may be said of the way in which, coffee, instead of being ground in a mill, is merely bruised in a mortar or "pounded" as it is called. A good authority says "All the virtue is thus soon extracted in the making, and none lost as in the prolonged process of grinding." If coffee is properly made in the way described, it will be perfectly clear without isinglass or egg shells, which can only interfere with the delicate flavour of really good coffee; nor will it need to be strained, a still more objectionable habit.

Cocoa and chocolate as much a food as a drink.—

When the large amount of starchy matter, fat, albumen, &c., is considered, cocoa and chocolate are seen to be as much a food as a drink. In one pound of *Cocoa*, there are no less than fourteen ounces of useful, that is "nourishing matter," while in a pound of coffee, there is not more than $8\frac{3}{4}$ ounces, and a little less in a pound of tea. The peculiar constituents of cocoa are *theobromine* and *cocoa butter*. The first is a crystalline alkaloid, similar to *theine* in tea and *caffein* in coffee, and having the same properties. It is found in cocoa in nearly the same proportion as theine is in tea.

Cocoa butter is a concrete oil having an agreeable taste, it never becomes rancid, however long it is kept. Cocoa is made from the roasted seeds of a tree, which grows in Dæmerara in great abundance, whole forests of it being found there. It is also cultivated in many places, in Central and South America, East and West Indies, and the islands in the Indian Ocean. Cocoa nibs are the bruised and roasted seeds, and flake cocoa is the nibs ground in a peculiar kind of mill. Soluble cocoas are prepared and diluted with sugar, arrow-root, and other starchy substances.

Chocolate is a preparation of cocoa, made by grinding the nibs in a mill which is heated by steam; the heat softens the cocoa butter, and makes the whole into a pasty mass, which is mixed with sugar and flavoured.

CLEANLINESS.

The most powerful means of preventing disease, is cleanliness, and, to begin at the beginning, that is with ourselves. Our first consideration will be, personal cleanliness.

PERSONAL CLEANLINESS, IN ITS RELATIONS TO PERSONAL HEALTH.

As all parts of the body have certain functions to perform, it is necessary that they should be freed from anything and everything that could hinder the proper performance of these functions. For instance, the teeth take an active part in the process of digestion or rather in preparing the food for digestion; they must be kept scrupulously clean. The skin by its action removes the objectionable waste matters, and must not be hindered in its work by shutting the doors, as it were, from whence this matter would make its exit. The hair, the hands, and feet require special care and attention, the whole body must be kept clean, by regular and frequent ablutions, and these ablutions must be more than the simple use of water. We shall see how this ought to be done.

The Teeth.—To prevent decay and to free the teeth from the food particles, which undergoing fermentation *develope acids* that cause tooth destruction as well as make the breath offensive, it is necessary that they should be well cleaned. This is a necessity too for the preservation of health; decayed teeth are sometimes the cause, and sometimes the effect, of careless masti-

cation of food. And food swallowed without being sufficiently masticated, is the beginning of indigestion, and all the evils that indigestion brings with it. A tooth is a living structure, a fact of which those who suffer from toothache are painfully aware. Each tooth consists of a substance, called dentine, covered with enamel on the upper part, and on the lower the roots or fangs as they are called, with a substance named "cement." The interior of the tooth is hollow, and contains the substance, which being supplied with nerves and blood-vessels, serves to nourish the tooth. If particles of food are allowed to decay on or between the teeth, the result must be injurious; the decay will be communicated to the teeth. The teeth should be cleaned every day, night and morning; some people brush their teeth after every meal. I have no doubt, it is a good plan, but it is not always convenient. A brush should be used, and it ought to be moderately hard; as water alone we find is not sufficient to cleanse effectually, tooth powders are used. Powdered charcoal is considered a good cleanser and purifier, and the powder called "camphorated chalk," is a safe and agreeable dentifrice.

The Hair.—Hair, like the teeth and nails, grows from a soft papilla or soft projection, and consists of cells moulded on a shaft, forming the filament. The care of the hair, however important on the score of cleanliness, is not less so on that of beauty and personal appearance. In order to keep the hair clean, frequent washing is not so necessary as

the proper use of the brush. Too soft a brush will be of no use for thick or curly hair ; on the other hand, too hard a brush induces scurf or increases it. The brush should be used carefully, so as not to injure the structure of the skin, which it is sure to do, if driven in a perpendicular direction into the hair. It should be pushed into the hair at an angle with the surface of the skin, and gently passed over it so as to remove any loose particles. The hair should be kept short on children of both sexes. This facilitates the growth by allowing the air free access to the skin of the head, thus cleansing it, and keeping the roots of the hair in health.

The Skin.—Too great stress cannot be laid on the necessity of keeping the skin in a healthy condition by thorough and daily cleansing. The functions of the skin are most important.

First, it is an outer covering for the protection of the deeper tissues ;

second, it is the sensitive organ of touch ;

third, it helps to regulate the temperature of the body ;

fourth, it is the chief medium by which the waste materials of the body are got rid of.

The way in which the last of these functions is performed is what we are to consider, in order to show the necessity of this thorough and daily cleansing.

Excretions.—The waste materials or excretions which are perpetually being expelled from the body are, water, carbonic acid gas, urea, ammonia, minerals and organic matter. Three organs of

excretion are employed in getting rid of these substances, viz., the lungs, the kidneys, and the skin ; and these three are mutually helpful, each performing in case of disease, a share of the work of the diseased organ. But it is with the work of the skin we have to do now, and we find that it gives off its waste, secreted in the glands, in the form which we call sweat or perspiration. This, under ordinary circumstances, amounts to about two pounds per day, and consists of water, mineral matter, of which common salt is the chief, carbonic acid, traces of urea, and ammonia with heat.

Glands.—These are vessels which secrete (or collect from the blood) the matters which are cast off in perspiration. There are two kinds of glands, the sebaceous, and perspiratory.

The sebaceous secrete a fatty or oily substance which is exceedingly useful in tropical climates to keep the outer skin soft, and pliable, and impervious to water. The perspiratory glands are coiled up many times, the ends are tiny twisted pipes about a quarter of an inch long terminating in minute openings which can be seen plainly on the back of the hand, and which are called pores. If these pipes were stretched out in one line, it is said, they would make a drain pipe nearly thirty million miles long, and through this minute channel passes in the form of perspiration, those matters which are not needed for life and health, but which, on the contrary, are poisonous, and if not allowed to escape will get back into the blood and cause ill-

The Hands and Feet.— It seems almost unnecessary to say that the hands must be carefully washed; the fact, however, that little boys and girls are often neglectful of this, shows that it will be well to remind them of it; they sometimes wash their hands in such a way that the fingers, especially the nails, are no cleaner, and under the nails a deposit remains which however, unsightly does not trouble them at all. Some little boys, (I hope not girls,) go to their meals with the soil of their play on their hands. Now, this soil means, as we have often said before, impurity, evil of some kind, perhaps poison. The great Jewish lawgiver particularly enjoined cleanliness in this point, while the traditions of the elders especially forbid "eating with unwashed hands." The hands should be carefully washed by being rubbed together many times with soap and soft water, (rain water is best when procurable) the nails rubbed with a nail brush; they should be made quite dry with a moderately coarse towel, taking care to put back the skin that, if neglected, comes over the nails and covers the *half moon*, as it is called, that ought to be seen at the root of the nails. The nails should never be poked under with a sharp instrument to get rid of the deposit above mentioned. Indeed if the hands are carefully and frequently washed there will be no deposit, except with children, who play with clay and sand; and this should not be allowed to remain, but should be washed away as soon as the play is over.

The *FEET* ought to be attended to, especially the

toe nails, which are sometimes found to grow at the outer edges down into the flesh, causing much pain when they are raised, which must be done or graver consequences may ensue. I have seen great suffering from the large toe nail being permitted to grow into the flesh. Corns may be made less painful too, by careful washing and bathing; soft corns which grow between the toes are often, though not always, caused by neglect when washing the feet, to rub soap between the toes, and after washing to dry carefully the same places.

We have noticed the abundance of perspiratory glands in the skin, and the necessity of keeping the pores open, in order that the contents of these glands may be discharged. The total number of perspiratory glands is estimated by Krouse at 2,381,248, and they are most numerous in the palms of the hands and the soles of the feet, where according to the same authority, they amount to 2736 to the square inch, while Dr. Erasmus Wilson counts as many as 3528. How necessary then must be the cleansing of the hands and feet, in order that there may be no obstruction to the emptying of these little vessels, charged as they are with what is hurtful and injurious to the health.

Death caused by the closing of the pores. — An interesting fact in connection with this is mentioned. At a grand procession in Rome, many years ago, a little boy was made to represent an angel; they covered his body with gold leaf, and fastened a pair of gold wings to his shoulders. The poor little fellow died from the effects of closing the

pores with the gold. Although this could not be a common occurrence, as one is not likely to cover oneself with gold, yet the pores may be as effectually closed or stopped up with dirt. Some people, if their hands and faces are washed and they look clean, do not care about the parts of the body that are covered, and allow dirt to accumulate to a degree which must interfere with the health.

The way to be clean.—The only effectual way is by the use of soap and water. The cold bath is stimulating, delightfully refreshing, but does not thoroughly cleanse. For the purpose of effectually freeing the skin from all impurities, we must use warm (not hot) baths, with plenty of soap. The cold bath favours tissue change and aids the body in casting off effete matters, but it has no detergent properties, that is, it has not the power of cleansing. It is however invaluable for the other properties mentioned, and should be taken every morning, if there is a feeling of warm glow and reaction after the bath and rubbing the body briskly with a towel; if on the contrary a chill is experienced, the cold bath should not be used, but a tepid bath substituted.

Warm baths.—The ordinary warm bath is, as has been noticed, when used with soap, the most effectual cleanser of the skin. It is also a highly refreshing restorative, after much exertion has been undergone. It aids the weary muscles in recovering their tone, and in parting with their waste. It is said of Napoleon I., that after a battle in which his strength was expended by great physical

exertion, or by mental fatigue, he recovered his exhausted powers by the use of a warm bath, which he found as efficacious as sleep.

The use of soap.— There was a popular notion in days gone by, (though it is perhaps still entertained) that soap ruins the complexion and spoils the skin. This idea arose probably from the fact that soap has soda in its composition, and soda is known to have an irritating effect on the skin, but soap is not all soda. Ordinary soap is made by boiling together fats or oils with soda. Soda without the oil or fat, and the latter without the former, will not clean, but together they possess the power of cleansing in a high degree. We have mentioned the sebaceous or oily glands, which discharge fatty matter on the surface of the skin; the soda in the soap uniting with this, dissolves and removes it in a way, that water alone will not do; the fat or oil in the soap, acting as an emollient, prevents the caustic action of soda. The face which is uncovered, and therefore exposed to the dust, certainly requires soap to cleanse it, as much as any other part of the skin, except perhaps the hands. Children generally, though fond of their bath, have an aversion to soap, but this is owing to the rough way in which nurses sometimes apply it, scrubbing the little tender skin and digging the soap into the crevices of ears, nose and eyes, without any mercy; when properly applied soap is not unpleasant to use, and is certainly a necessity in cleansing the skin.

Bathing.—There is much more to be said about

the use of the bath in relation to personal health. The Greeks and Romans recognised the importance of bathing; of this, the number of public baths in their cities and towns is abundant proof. The Roman emperors were most luxurious in the use of the bath. The baths of Caracalla and Domitian were enormous in size and construction, covering a vast area capable of accommodating over three thousand persons.

The Hindoos make bathing a part of their religion, and accompany it with many ceremonies. This fact seems a faint recognition on their part of the wonderfully restorative powers of the bath : strange it is, however, that it was not until of comparatively late years, that the English woke up to the necessity of frequent bathing. Now, all the large towns and cities as well as many smaller, have baths for the use of the public, while most of the modern houses are fitted with, at least, one bath.

House cleanliness, Removal of dust, &c.— Every one sees that houses and rooms must be swept, and it is done everywhere in some sort of way. In this country a sweeper comes into the rooms with a broom, which she lightly passes over the middle of the floor, sometimes even the corners if there is nothing in the way ; she perhaps gathers a little dust in her dust pan, and goes away ; the room is swept ! A careful housekeeper will not be satisfied with this, however ; she will see that the work is thoroughly done, or, if necessary, she will do it herself. In the “ Lessons on Domestic Economy,” the proper way of sweeping a room, to ensure clean-

liness is shown, and the danger of allowing dust, (harmless as it seems) to accumulate, is pointed out. Dust cannot be effectually removed from rooms by sweeping the *floors* only; it accumulates on the walls, and must be removed by frequently sweeping or brushing them down. Every article of furniture too, must be carefully dusted as it is called, that is, the dust must be taken off; for, if it is allowed to remain undisturbed for some time, a crust forms which can only be removed, by scraping or rubbing with sand paper; this necessitates a fresh coat of varnish, and, besides being much more troublesome than daily dusting, costs money. So we find a little care now, saves not only time and trouble in the future, but also expense. I have seen houses in England, where there are young girls in the house, and only one servant is kept, with furniture as bright as mirrors, although no varnish is used;—a vigorous application of “elbow grease” brightens and polishes better than anything else.

Carpets ought to be taken up frequently, and the dust well shaken out of them; large carpets covering the whole room are not in a sanitary point of view good to use either in sitting rooms or bed rooms, more especially not in the latter where rugs or stripes of carpeting are much more conducive to health, and are sufficiently comfortable. The matting on the floors in India are exactly suitable to the needs of the climate; if anything more ornamental is desired, there are Palghat and Kimeddy mats, that look very pretty. When carpets are used they ought not to be fastened down but

laid over the mats, so that they can be removed with ease; rugs placed here and there on the matting have a very pretty effect, and have the advantage of being easily moved and shaken in order to get rid of the dust and organic matters that are apt to lodge in the soft woollen and fluffy parts of a carpet.

Disposal of waste matter and dust, &c.—It is a good plan where dogs and cats are kept in a house to burn the dust that has been swept from the rooms, as these animals are generally accompanied by fleas, and places where they lie or sit, are often found covered with a white dust like small sand; this is really the eggs of the fleas and must be got rid of, which is most effectually done by throwing the dust into the fire. Burning the dust is in most cases the best mode of disposing of it, as the fire destroys all organic impurities.

Dust and all waste matters are not without their use; the proper disposal of them is an important consideration. They may be the source of much that is evil, poisonous or deadly, or they may add to the productiveness of the soil, causing the earth to bring forth grass, the herb yielding seed, and the fruit tree yielding fruit. The waste things, the excretæ of animals, are the food of plants. And if food is not given to them, they become stunted and scanty, or die. There is nothing in the whole economy of nature that is without its use. Animal and plant life depend upon each other; what is of no use to the animal, is life to the plant, and the plant itself forms the food of animals and of man.

Washing, lime washing, &c.—More however is required (if you would have a clean house) than even the regular and daily removal of dust. Washing is necessary. In Holland, the floors of the houses whether of wood or stone are washed and scrubbed almost daily. In England, once a week in summer, and less frequently in winter, the washing and scrubbing take place, when the floors are not covered with carpets. Washing the walls with lime or white washing as it is called is most cleansing and purifying, and here again there is an advantage in this country over the houses in England, where the walls are generally papered and white-washing is not possible. Frequent white-washing in kitchens is a great means of preserving health.

Cleanliness in the house can be attained only by scrupulously removing from it all that is not needed,—all superfluous or waste matter, and the proper use of this waste matter is a means by which much evil may be averted, and much good may be done.

Summing up.

Cleanliness is a necessity for personal health and for the health of a community.

Cleanliness means, the putting away of all that is useless and hurtful to ourselves and to others.

There is a proper use for these things so as to make them profitable and beneficial.

All things have their use.

WASHING.

HOW TO DO IT.

For various reasons, the washing of a family in this country is rarely done at home. There are some, however, who prefer to do it, rather than run the risk of infection and other evils by giving their clothes to a dhoby. Any one who has a large compound in which the drying can be done, and who would not mind the trouble of looking after it, will find a great satisfaction in having all their clothes washed on their own premises. A lady, who has had this done for some time, says, that she would not change, for she finds it so much more satisfactory; she knows her clothes are neither worn by other people, nor mingled with those that have been used in sickness either infectious or otherwise, nor soaked in any deleterious compound, that would rot the texture. Her plan is to engage a dhoby, who comes for one day in the week, and washes all; for this purpose she has a washing machine, which not only washes, but wrings the clothes. The ironing man comes for a day also or two days, if necessary, and does the ironing, and the whole washing is finished, and the clothes put away before the end of the week. If this is done, the mistress of the house should know how it ought to be done.

The great advantages of a machine are, hotter water can be employed and stronger solutions of soda or alkaline lyes may be used, than the hand

could bear, and a greater quantity can be washed at once, ten to fifteen minutes of work for each batch being sufficient. It is necessary that the same description of article should be put into the machine at the same time; white and colored things should not be washed together.

All the white clothes should be soaked in warm water, wrung out and drained in a basket; the machine should be filled with a very hot lather, made of soap jelly and boiling water. (*Soap jelly* is prepared by slicing yellow soap and boiling it in water, in the proportions of one pound of soap to a gallon of water. When the soap is dissolved, a quarter of a pound of soda should be added. When this is cold, it will be a stiff jelly.) Having filled the machine with the lather, the white clothes should be put in, and the handle turned for about ten minutes; after which the clothes may be taken out, and another batch put in quickly before the water cools, if necessary a little more very hot lather may be added. When the finer white things have been washed, then the coarser ones may be put in, a little more lather added, and after these, dusters, kitchen towels, &c.

These last will never be very dirty, if the directions given under that head be carried out. Coloured articles should not be put into the lather that contains soda, with the exception of mauves, violet, or any shade of purple or lilac, colors which are intensified, or if faded, can be restored by the use of soda in washing. Coloured articles should be kept separate from the ordinary washing and

must be washed with a simple lather of soap and water, to which a small piece of alum may be added.

Chloride of lime is used for bleaching, but the best whitener of clothes is the sun aided by moisture; clothes washed in this country have this advantage, they can have plenty of sun. When the clothes are wrung out of the last water,—the rinsing water, they should be *well shaken both ways, so as to take out the marks of the wringing, which if allowed to dry in them, cannot be got out without wetting them again*, and no ironing or mangling will make them perfectly smooth. Mangling is done by subjecting the articles to be mangled to heavy pressure, either by means of weights or rollers. Washing machines have generally an apparatus for mangling also; the old-fashioned mangle was a simple contrivance, consisting of a strong level table, upon which, a large heavy box was moved to and fro on rollers on which the articles to be mangled were folded smoothly round; the weight of the box, pressing on the articles, made them smooth and glossy. In some of the machines now used, the same effect is produced by two rollers, and in turning the machine, the folded clothes are wound off one on to the other. Whether the clothes are to be mangled or ironed, they should be carefully folded, after the creases have been pulled out, and the threads of the stuff made to run the right way, that is, at right angles to each other. Sheets, table linen and all similar articles which are without plaits or folds, are much improved in appearance by being mangled; made up articles require to be ironed.

The washing of laces, and embroidered muslins, or fine things as they are called, is a very nice process, and every young lady ought to know how to do it. They may be washed in the ordinary way, if they are handled with extreme care and delicacy, and not done with other things. They must not be rubbed, but should be soaped with curd soap, and put in a basin with warm water, or a warm soft lather made and the things put in pressed a little and left until the next day. They may then be pressed again, squeezed out, and the same process repeated with fresh warm water, leaving them thus for another day; when, they should be taken out and rinsed in clean cold water, and starched if necessary, with very thin starch. They should then be delicately pulled out, as it is called, that is, the texture drawn softly by the threads; creases or folds smoothed out by the hand, and the edges picked out with the fingers; then folded smoothly and carefully, and ironed while damp. While ironing the first things, the others should be kept folded in a damp cloth, to prevent them from getting dry. This work is not too much for any girl to do, even in this country, and she will find her reward in the elegant appearance of her laces, &c., as well as in the length of time they will last. She should carefully examine lace before washing, and if there are any broken places, mend them, as they will get worse in the washing even with the most careful handling; besides it would crumple and spoil the appearance of the lace to mend it after it has been ironed. Mending lace is a very nice and delicate process; to girls fond of neat work, it is a

very pleasant one ; it is however, by no means, easily or quickly done, and professional lace menders get very high prices for their work. All lace mending should be done with a fine, smooth, linen thread, made and sold for the special purpose. A tear in fine muslin or cambric should be darned with a thread ravelled from the material and not with the twisted sewing thread.

To wash flannels.— Flannels must not be rubbed with soap, or put into very hot water, or allowed to lie in the water. A warm soft lather should be made, and the flannels tossed about in it, not rubbed; then they should be wrung out, and washed in a clean fresh lather, out of which they should be squeezed well so as to leave no soap, then thoroughly rinsed in warm water, and at once hung up to dry. No soda should be used. Baby's boots may be washed in the wash hand basin by making a lather with the soap, as if washing the hands, and then squeezing the boots in it. If soap is rubbed on woollen things, it makes them hard and rough.

To remove stains from silk or cotton.—Grate raw potatoes to a pulp in clean water, and pass the liquid through a coarse sieve into another vessel of water ; let the mixture stand, till the fine white particles of the potatoes have fallen to the bottom ; then pour the liquor off clear, and bottle it for use. Dip a sponge in the liquor and apply it to the stains till they disappear, then wash the material in clean water several times.

To take out grease spots.—Powder a quantity of French chalk, and mix it with lavender water, or

with turpentine, till a paste is produced of about the consistence of table mustard, a little of which is to be applied to the spot ; over which a piece of blotting paper is to be laid and a hot smoothing iron passed over it ; or a little piece of the dry powder may be placed on the greasy part, which is then to be put over a pewter or tin pot filled with boiling water. This will melt the grease, which will be absorbed by the powder and then may be brushed off.

THE CHILDREN.

How to feed them.—Miss Martineau says, “of all the infants born in England, forty per cent die before they are five years old. Yet what creature is so tenacious of life as a baby? Those who know it best say they never despair of any infant’s life while it breathes, and most of us have witnessed some recoveries which are called miraculous. There is also no creature so easily managed as an infant, so easily kept healthy and happy merely by not interfering with the natural course of things.”

What then is the cause of this mortality? It is precisely because the natural course of things is interfered with, and this is often the case with the child’s food. Milk is the food provided by nature for its use. Milk, as has been said, is the most perfect food containing as it does, all the various principles needed, and in the exact proper proportions. It is prepared for the infant as soon as it comes into the world; if unfortunately it is deprived of this, the object aimed at should be to procure for it, as closely as possible, a substitute resembling Nature’s food. Asses’ milk, cows’ milk, goats’ milk, and swiss milk have been each tried and found to be most valuable; when the natural food cannot be had, there is actually no *real* substitute for it, as the chemistry of nature cannot be wholly and successfully imitated. If, however, good pure milk can be obtained, an infant will thrive well on it, and when the appearance of the teeth shows that other food may be given; farinaceous foods such as

corn-flour, rice, baked flour may then be added to the milk, but until a child is five years old, milk ought to be abundantly supplied to it; two, three or four pints daily, according to the age, may be taken with the food. Whatever food is given, must be prepared with the greatest care and cleanliness; failure in this respect causes disorder in the little delicate stomach, which may result in convulsions and perhaps death.

As a child grows older, a little more provision must be made for the growth of the little body, for its support and for the repair of the daily waste. The yolk of an egg either raw or lightly boiled, beef-tea, mutton or chicken broth, with a little bread soaked in it, or a little rice may be given with advantage, but milk must still be the staple food. It must be remembered that it is not what a child swallows, but what is digested and assimilated that does him good. Meat ought not to be given until a child can masticate well and it should be cut up quite small or minced and flavoured slightly with salt, but on no account should it have spices or stimulating flavour of any kind. A child's food should be made agreeable by variety, but not by the addition of high seasoning; variety in kind, as well as variety in cooking; as beef and mutton may be changed for poultry, pigeons, rabbits, hares &c., these must be well grown, for the flesh of young animals, such as veal and lamb is not easily digested; the richer and coarser meats, pork, goose, duck and salted meats are also unfit for children, causing diarrhoea, skin diseases and other unpleasant

A child should always be encouraged to eat vegetables, not only because they make a variety in their food, but as a preventive of skin diseases, especially scurvy ; the child's food should be seasoned with salt, as, besides other advantages, it is excellent in preventing worms, which are often so troublesome to children. A light nourishing pudding ought to form part of their dinner, and it should be made as nice as possible, and sweetened with sugar or Jam ; suet is a valuable addition to food. Cases of obstinate diarrhœa, have been cured by a piece of mutton suet, finely chopped and boiled in the milk, with which the child's food, (arrow-root, tapioca, rice, sago, or corn flour) is made. Fruit puddings may be made better and more wholesome by the addition of suet, and these should be nicely sweetened ; above all, a child's meals should be at regular intervals, and no food should be taken between. The practice of giving children bread at all times is highly objectionable, their appetite should be fully satisfied at each meal, and the stomach and the digestive organs, should then be allowed to exercise their respective functions, without being continually disturbed by fresh food being added, and mixed with that which is partially digested. This is very injurious to the adult stomach and how much more so to the delicate organs of a child ; besides the injury to health, at the time of childhood, the habit of irregularity of feeding is often the foundation of much evil in after years. Very little fluid should be allowed at or before meals, and it should be fresh

pure water or toast and water. Tea and coffee if allowed at all should be very weak and mixed with plenty of milk. Too much attention cannot be paid to the purity of the water drunk by children. It should be most carefully filtered, and frequently tested. Diphtheria, typhoid fever and cholera, have often been the result of negligence in this respect, and we may close this part of our subject with the words of one who himself so well understood child-nature, the late Rev. Charles Kingsley. "Three persons out of four are utterly unaware of the general causes of their own ill-health or of the ill-health of their children,—not only in the lower class, but in the middle class. When one sees an unhealthy family, then in three cases out of four, if one takes time, trouble and care enough, one can, with the help of the doctor who has been attending, run the evil home either to a stupid neglect, a stupid ignorance or what is just as bad, a stupid indulgence."

Sleep.—Children should be required until the age of three or four to spend the full half of their existence in sleep. They ought to sleep all the night and two or three hours in the day. They should never be awakened; if they have slept soundly and well, they wake up of their own accord at the proper time; that is providing they have been put to bed at an early and regular hour; in sleep, as in everything else, regularity is most important; a certain hour to go to bed should be fixed on, and it should be an early hour; it is most injurious to the health of children to allow

them to stay up till a late hour at night, seven or eight o'clock ought to be the latest, and if the children have been engaged in play and exercise during the day with a sufficient amount of open air they will be glad enough to go to bed, and will fall asleep immediately. As soon as they are thoroughly awake in the morning, they should be taken up, washed and dressed. It is not a good plan to allow them to lie in bed awake; the early morning air is full of life and health, and the little ones ought to be permitted to breathe it.

Each child ought, if possible, to have a bed for itself; two sleeping together are apt to disturb each other, as well as to make the bed too hot, causing them to throw off the covering; and when the air cools during the night, they are liable to catch cold. A child should be looked after regularly, and not allowed to get into bad or uncleanly habits; these when once formed are very difficult to overcome, and are as injurious to the child as they are troublesome and unpleasant to those who have the care of him.

How to clothe them.—The object of clothing is to preserve the natural heat of the body, either to prevent too rapid cooling by evaporation, or to protect it from the excessive heat of the sun. The children's clothes then must be made of some material that will not readily permit the drawing off or escape of the natural heat from the body, or on the other hand allow the free passage of external heat to it. Woollen and cotton fabrics are the most used, silk, although even better in some

respects, is not found so suitable in others. It is a mother's duty, to see that her children are clothed in the way most adapted to preserve their health and comfort. Children's dress should be light in weight, so as not to give the little ones more than what is easy for them to carry, loose enough to admit perfect freedom of motion, and simply and plainly made of material that will not easily spoil. It is a piteous sight when little children are made unhappy by a load of clothes, by tight fitting bands round the body, garters on the little limbs, tight boots or shoes, or by anxiety lest "mother should be angry if the delicate frock is soiled or the fine sash crushed." If fond mothers and elder sisters, who have the clothing of the little ones would remember that the little darlings need no ornament, but are in themselves beautiful objects, they would not waste time in elaborate trimmings, making and embroidering frills and flounces, but would make the dresses plainly and simply, which is the perfection of good taste. No matter how wealthy the parents are, the children's clothes should never be extravagant either in material or in fashion. Indeed it is a matter of fact and worth noticing that the children of the higher classes are more simply and less expensively clad, than those of the lower middle classes. When the sons and daughters of our own beloved queen were children, the princesses were dressed in muslins and prints in the summer, and the princes in holland; both wore plain warm clothing in the winter; the judgment and good taste that directed

higher matters were not considered out of place in the comparatively small one of dress, while the influence on the character, of even apparent trifles, was never lost sight of. A child should feel the comfort and convenience of clean well fitting clothing, and must not be taught by its mother's mistaken pride in the beauty or cost of the garment, to attach undue importance to finery.

The providing of the clothing must be the care of the house mother, and economy will be exercised, not in purchasing what is cheapest but what is best. It is worse than waste of time to make children's clothes of bad material. Good calico will look well and wear well, and it is most satisfactory as well as cheapest in the end to purchase at the best shops, and to pay ready money. Underclothing as shirts, chemises, drawers, petticoats and night dresses, ought to be made at home, and a girl who has learned needle-work at school as it is now taught, will find no difficulty in doing this. Sewing machines are a great help, but the neatest underclothing is that made by hand and an infant's clothes should not be sewed in the machine. Even tucks when run, although a little more trouble than when stitched in the machine, look neater and better finished, but this is perhaps a matter of opinion, and when there is a large family the amount of work may be much lessened by the use of a sewing machine. For outside garments it is invaluable, as well as in making up house linen, dusters, &c.

The material for outer garments must be
1; for boys especially it must be strong, or the

hard working mother or sister will be continually employed in mending the knees of the trousers or the sleeves of the coats and jackets. Many thrifty mothers make their children's clothes of left-off garments belonging to the parents or to the elder children, and when this is properly managed, it is a very good plan. Left-off wearing apparel is of little use to dispose of in any other way; and in families of small means every little expense that can be saved is a matter of importance. A little girl's frock can be nicely made from her mother's dress, the skirt will, with proper management, probably make two children's frocks, but care must be taken to avoid joining more than would be necessary in material previously unused. The dress should be taken to pieces, the best parts selected. If it is cashmere or woollen stuff, it should be well brushed, the spots taken out and the stuff ironed, taking care not to scorch it or to take out the color with too hot an iron. Cotton stuffs can of course be washed before making up, and if it is necessary you may have cashmere washed, but fancy stuffs will not bear washing, so if they cannot be turned or cleaned, they will not do to make up for the children. It may be well to bear in mind, when selecting material for the dresses for the elder branches of the family, that small and neat patterns or plain stuffs without any pattern will be profitable for this purpose, when they have served their turn for the grown up people. Conspicuous colors ought to be avoided, so that the metamorphosed dress will not be recognized.

on the little ones by their companions, as children are very sharp as well as sensitive on these points. Garments before being put to this secondary use, might be laid aside for a time, they would then come out quite new. A little boy's coat and trowsers might be made of his father's, when they are worn at the seams or otherwise made unfit for his own wear; there will be found to be enough when the bad parts are cut away to make the smaller garment. The same care should be taken as in making the little girl's frock, that the stuff should be well brushed, cleaned, spots taken out, and the whole well ironed. Some mothers can make their boys' clothes as well as their girls', but in general, it is better that these should be given to a tailor, as badly cut or badly fitting clothes look very bad on boys, besides not giving the wear that they would if properly cut. For a little boy of three or four years old, a jacket, and knicker-bockers can be made out of a pair of trowsers and waistcoat of his father's, of the same pattern of course. They ought to be lined with new stuff, it will give the suit the exact appearance of a new suit, which it will be in one sense; and if the material is good in the first instance, the suit will be equal to one made from stuff just cut off the piece. If the work is to be done at home, it will need a great deal of care and patience; the pattern of the garments that fit the child, should be accurately taken on paper, stiff brown paper is the best, the lining should be cut out by it and then fitted on; when it is made to fit exactly, the

seams that had been tacked together for trying on, should be opened, and the lining laid on the material, taking care that the bad or thin parts, if there are any, should not form part of the new garment, and as there will not be any of the stuff to spare, the greatest management will be required in the cutting out. The clothes though well fitting, should be sufficiently large and long; children grow so rapidly, that what was a comfortable garment a few months ago may be now perfectly unwearable, and as soon as they begin to be tight, they wear out rapidly and tear. The sewing and stitching too, must be good and strong to bear the strain of the continual movement of the restless little bodies. For bigger boys good strong stuff should be used for every day wear; when we remember the amount of exercise that a healthy boy takes, jumping, leaping and running, not to mention cricket and tennis, the strength and durability of the material of which his clothes are made seem the most important points to be considered; neatness, however, must not be dispensed with, and the make of the garments should be according to what is generally worn; boys do not like to be different from their companions. But notwithstanding care, clothes will wear out, and wear out in parts, so that they will have to be mended. No one need be ashamed of a neat patch; the knees of the trowsers or the elbows of the sleeves will wear, and a mother or sister can remedy the evil in such a way that the article looks no worse than before; the seams should be ripped and

the new piece put in, so that there will be no more joinings at the sides, than there were before ; and if the joining of the top and bottom of the worn places, be neatly and strongly made and the seams pressed open with a hot iron, the patch will be far from unsightly. In any case a patch is better than rags, which an unmended break will soon become, and as "a stitch in time saves nine," the mending should be done as soon as it is necessary. Care is needed, in putting on a patch, that all the thin part as well as what is absolutely broken should be removed, as it will be worse than useless to sew a patch on a thin place.

Boys and girls should be well shod,—their boots should be strong and durable, those for boys should have stout thick soles with nails and heel tips ; they must be large enough to allow of growth, yet not loose or slovenly. A girl's boots or shoes ought to be strong without being clumsy and must not be tight.

The stockings must be neat, and well fitting ; darning stockings have always been considered the special work of mother and sisters ; there is no reason why boys should not learn to darn their stockings as well as girls, and sailors have to do it. To some girls, the work is a pleasure, and if pains be taken with it, it is both neat and pretty while a hole in the stocking is as uncomfortable as it is untidy.

The art of knitting should be learned in childhood, and if little girls were accustomed to take up knitting at all odd times of the day when other

work cannot be done, what a quantity they might get through ;—hours, that would be otherwise idle, might thus be occupied, and the knitting of baby's socks or father's stockings be a labour of love.

All girls should be able to make a baby's bonnet or to trim a hat.—These cost so little if done at home, and are a great expense if bought from a milliner. A little bit of silk or pretty colored sateen, with a small piece of lace and a yard of ribbon in the hands of a girl, who has taste, and who has learned the use of her fingers, will become in a short time, a pretty little bonnet for baby or a smart hat for a little toddling sister.

General tidiness.—Children ought not to have too many outside garments ; besides the fact that they outgrow them so quickly, there is the danger of making them careless about soiling or destroying them, thus encouraging a habit of extravagance. The under-clothing should be sufficient and in good order ; it speaks very badly of the mother and sisters, if the little ones' under things are torn or dirty ; strings and buttons should be carefully looked after, and if broken or lost, should be replaced. *A stocking with a hole should never be worn.* Buttoning boots should always have the proper quantity of buttons ; and they should be used ; boys or girls should not be permitted to go about with boots unbuttoned or unlaced. Children, as a rule, dislike to wear gloves ; if, however, the parents wish them to use them, they should be taught to keep them carefully when not in wear, and not to have to search for them just as they are going out, delay-

ing their parents and friends, while they are looking for the missing articles. As boys and girls grow out of early childhood, they ought to be made to look after their clothes a little, to fold them and put them away, when done with, or to brush the dust off when necessary. When they are taught to do this early, they will get the habit of neatness, their clothes will last longer, and they will give less trouble to those who have the care of them.

How to train them.—As soon as an infant can notice, its training begins, and a great deal of the forming of the child's future character is in the hands of the mother, the nurse, or the elder sister. If when a child cries, it is at once fed or given something to pacify it, a foundation is laid of an exacting temper in the child, who, when it sees anything it likes, will at once cry for it, knowing by experience that it will be then sure to get it. Children are not always hungry, in pain, or even uncomfortable when they cry, the lungs need exercise, and crying is the only way in which the little ones can exercise them. One accustomed to children will know, if the cry is one of pain or suffering of any kind, and if not, the best thing is to allow the little one to cry in moderation, and when the outburst is over, it will crow, and laugh and be quite happy again. At the same time, a child should never be left to cry too long or violently, or until it is exhausted; a child's cry should be carefully attended to, and as before said, the mother, nurse or elder sister, will soon learn to

know the kind of cry that expresses pain, discomfort or hunger, and will be able to minister to the child's wants. If children are allowed to cry for a long time unheeded, they become gloomy and peevish, and their temper is soured; while, on the other hand, if they are accustomed to have their own way on all occasions, and are indulged in whatever they want or cry for, they are not only made domineering and violent, but are quite unfitted to bear the disappointments and contradictions they must meet with, sooner or later; for it is not possible for fond parents to bring the world into the same subservience to their children as they choose to be themselves, and it is the part of a wise and loving mother to teach her child, even in its earliest infancy, that the hand of love is a firm hand, and that it is mother that rules, and not the child. Certainly, children, who are accustomed to submit to just authority, escape many of the temptations to irritability, are less liable to fits of passion, and will be happier under the loving rule, which controls the violent temper, than if left to indulge it. Obedience, instant, and unquestioning is due by every child to its parent, and it is the duty of the parent to enforce it, not with violence or threats, but with firmness and gentleness.

" *A mother should never give her child a blow;—if corporal punishment must be resorted to, which should not be, except for very grave offences, it ought to be done in such a manner, as to leave an impression on the mind far deeper than that*

made on the body ; punishments ought to have as near a relation as possible to the nature of the fault committed ; such as, for quarrelling, separation from playmates or an hour's solitude, and, for improper behaviour at table, removal to another where, though still under supervision, he should feel banished as not worthy to sit with his parents ; the reason of this will be easily understood, and the appropriateness of the punishment felt, while good habits will be formed, and the child will have less and less inclination to do what is sure to produce unpleasant consequences. Punishments to be efficacious should be inevitable ; it will not be of much use to punish for a fault on one occasion, and on another, to overlook it altogether ; such a mode of proceeding would completely upset a child's notions of right and wrong ; he must feel that he is governed consistently with justice, a fact that he will intuitively discover long before he can listen to reason. An infant will very soon know the difference between the approval and displeasure of those who are in charge of it, and it should be taught at once to obey ; at the same time, the spirit of resistance usually strong in all children, should not be aroused, if possible, for, if in a struggle for mastery the child gets the victory, advantage is lost which can hardly be regained. A child should not be threatened either to elicit truth or to force obedience. It will be a difficult matter to teach a child the imperative obligation of truth, if the mother or sister be not truthful, or if they threaten to do what they cannot, or will not perform. If they themselves

scorn to practise deceit or to act a lie, the child will naturally be led to do the same; and a sacred regard for truth may be insured, if a child be taught how much nobler it is to confess a fault, and how much happier he will feel when punished for it, than if he should try to hide it by a lie; a child's word should not be doubted without certain evidence, and the words "I am telling the truth," and "truly it is so," should not be permitted, nor would they be thought of, if the child always told truth; a simple assertion ought to be enough.

Courtesy to servants and others.

Children are naturally so imitative, that the behaviour of a child may be taken as a reproduction of that of the elder part of the family, and when these are careless in the small matters of courtesy, we can hardly expect children to be more mindful of them, even although they are told to say, "if you please," or "thank you." Want of training in this respect, or permitting in a child undue notions of self-importance produces in after life that bane to home happiness, a domestic tyrant. It is painful to see the way some children behave to servants, ordering them in an imperious tone, even beating and kicking them; only very young children, of course, will do the latter; but it should not be permitted even in the youngest. Example in this also is better than anything that can be said; the elder branches of the family must treat the servants properly, or the children will not, nor can it be expected. If the younger ones are to grow up amiable, refined and beloved, the elders

must be careful that the example of amiability and refinement may be before them in their home. The feelings of the little ones themselves must be respected, and their susceptibility ought not to be wounded, by harsh rebuke before others; they will thus be taught consideration for those about them, and will not be likely to be rude or ill-mannered.

Children taught to help.—A mother, when training her little girls, must never lose sight of the fact that they will probably be wives, and mothers too, and that in any case, they will have household duties; they ought to be permitted to help as soon as they are able, and a little portion of work might be allotted to them, which they ought to be expected to do, and not allowed to neglect. It should of course be a mere trifle at first, but whatever it is, must be scrupulously performed. Little girls love to busy themselves with a duster or sweeping brush, and they should be encouraged in doing this and praised for their efforts, while the faults are pointed out, and the right way shown. They ought to be allowed to see the carrying out of the household arrangements, and as they grow older, gradually take their own part in it. The work of cooking should not be a mystery to them; children are very fond of doing a little amateur cooking, which their elders call "messaging;" this messaging, however, if properly directed, may be the means of developing a faculty, which is a great power in the hands of the mistress of a house, and which will enable her to direct the machinery that keeps the whole family in health and vigour. Such a

power as this is worth cultivating, and ought to be begun as soon as possible.

Both boys and girls should be early taught the necessity of order and neatness; they should be shown how to keep their drawers tidy, and to be ready at the time arranged for meals, or for walking, or study. They must not be permitted to be late, or to come into the room rushing, or half-dressed; particularity in this respect, may be the foundation of habits of punctuality, which in after years will be invaluable in business, in domestic matters, and in all the concerns of daily life.

Children should be taught to persevere in whatever they begin to do, either work or play, until it is done. The habit of throwing things aside, as soon as a difficulty presents itself, should be discouraged and they should learn quietly and patiently to get over the difficulty. The consciousness of having conquered will add to the enjoyment, if it is play, and, if it is work, will make them like it all the better, as we always like what gives us most trouble. At the same time, children should not be allowed to undertake what is too difficult for them, as it will give them a distrust of their own powers and an unwillingness to try them, while on the contrary the pleasure felt when the little mind has grasped a new idea, or the little fingers accomplished a new work, will be understood by those who have seen the eyes dancing with joy, or heard the delighted exclamation, "I did it, my own self."

THE GIRL-NURSE.

The daughter of the house must, as has been said, be equal to an emergency.—A trained nurse cannot always be had, and will not always be necessary in a house, where there are girls who are able and willing to obey orders, and who have sufficient common sense to understand how to act, if they have to do so, without particular directions from the doctor. They must know how to alleviate pain by the use of lotions or fomentations, to make and apply poultices, to cook tempting little dishes for the convalescent, to make beef tea, broth and other restoratives for the sick, and above all to be loving and gentle, bringing with them into the sick room, a gleam of sunshine and with their youth and health an atmosphere of brightness and cheerfulness, more calculated to enliven the invalid than any other restorative, so dependent is the body upon the mind. The girl-nurse must not, however, be too gay, or weary the patient with stories that however interesting to herself, may not be so to the listener; in this case, kindness, assisted by common sense will be her best guides. *Unselfishness is indispensable* in those who would be useful in a sick room, a patient is often irritable and unreasonable, but a kind nurse will not appear to notice it, certainly will not resent it, but will redouble her efforts to soothe or to relieve.

Lotions and fomentations are often successful in relieving pain. Lotions are used for cooling and

allaying irritation in a heated surface. They may be simply washing or sponging with a certain preparation, or the lotion may be applied by soaking a layer of soft linen with it, and laying it on the part affected, wetting it again as soon as it is dry ; the quickness of the drying shows how high the temperature of the part is, the drying or evaporation cools the heated surface and lessens the pain. This is an evaporating lotion and it may be made by mixing eau-de-cologne or whiskey or gin with water in the proportions of one pint of water to a wine glassful of the spirit.

Sedative lotions.—Other lotions are applied, when evaporation is not required, by laying the linen or lint soaked in it on the surface, and covering it with oil silk or gutta-percha tissue ; this will keep it from drying, and will have a sedative effect. A very simple lotion of this kind is made by boiling half a dozen poppy heads in three pints of water down to a pint and a half. Spongio-pilini may be used for this, as it holds the moisture, but it must not be made too wet, or the lotion will run out, and make the clothes and bed uncomfortable.

Application of ice.—Sometimes ice is recommended to be applied, in cases of inflammation or fever. This may be done conveniently and without danger of wetting the patients's surroundings, by putting a quantity of ice in a bladder having first squeezed out the air, then tying the neck of the bladder very tightly. The water in the bladder will continue at the temperature of the ice until every particle of it is melted.

To keep ice from melting.—It is sometimes difficult to keep ice from melting in the hot weather. The following plan will be found to be a good one to prevent this; make a calico bag, fill it with feathers like a pillow and lay it on the inside top of the box in which the ice is kept, it will keep out the air effectually, of course it must not touch the ice which will be wrapped in the ice cumbly as it is called here, (a flannel or piece of a blanket) the feather bag must not be allowed to get wet. A newspaper is also good for excluding the air, and so keeping the ice from melting.

Application of heat.—In some cases heat is necessary to assuage pain. Dry heat is applied to neuralgia sometimes and is very efficacious. It may be done by filling a strong calico bag with fine sand or salt; the former is preferable. This must be heated, either in an oven or if wanted in a hurry, the sand may be taken out and stirred in an old pan or saucepan over the fire and returned quickly to the bag; this ought to have a clean cover to slip over, before it is put into the bed. The hot bag of sand or salt is a great comfort to any one who suffers from cold, it is better than a hot water bottle or jar, as it is flexible, and so better suited for application to any part of the body, and in the other case, there is danger of the cork coming out of the bottle.

Hot fomentations.—These often give great relief in case of internal pain, or of an inflamed joint. For the former a piece of flannel should be dipped in very hot water, wrung out dry and put on the

part where the pain is, changed every five minutes, and so quickly as to avoid all exposure to the cold air; there should be two pieces of flannel, each sufficiently large to cover the part, one piece should be in the water, while the other is applied; a kettle of boiling water should be beside the basin, in which the flannels are soaked, in order to add to the water and make it hot enough. The flannels must not be wrung out by the hands, for, if the water is cool enough for the hands to bear it, it will be too cold for a fomentation; the flannel should be taken out of the water with a stick, and placed in a coarse kitchen towel, one end of the towel should be held by one person and the other by another; they should then twist the towel, wringing out every drop of moisture, take out the flannel quickly, and apply it as hot as the skin can bear it. The fomentations with hot water may be continued for half an hour or more if they do not fatigue the patient, or if, as is sometimes the case, the patient does not fall asleep under the soothing influence.

When the pain is acute, a little turpentine sprinkled on the flannels, gives relief, but it must be done sparingly as the application is very painful, and cannot be endured for more than ten or fifteen minutes at a time. It may be repeated, however, taking care not to irritate the skin too much, except by express order of the doctor.

Poultices.—How many girls or women know how to make a poultice?—very few, I fear and yet it is a thing most commonly needed and most simple in its preparation.

Bread poultices are made by pouring *boiling* (not warm) water over the inside or crumb part of stale bread; squeeze out the water when the bread is well soaked, and apply it on a piece of linen while it is still hot; this poultice is the basis of some other poultices.

Mustard poultices are sometimes made by sprinkling a little flour of mustard over a bread poultice when the water has been squeezed out. Another way is to mix equal parts of flour and mustard with water enough to make a paste. The most effectual way, and that which acts the most quickly, is to make a thick paste of nothing but the mustard and water, to spread it on stiff brown paper, and cover it with a piece of thin muslin; it must not be kept on longer than ten minutes or a quarter of an hour, according to the tenderness of the skin.

Bread poultices are sometimes mixed with charcoal, bruised or powdered coarsely when they are to be applied to sores emitting offensive odours. Bread poultices have yeast added, when applied to obstinate or sluggish ulcers.

A *Linseed poultice* should be about an inch or three quarters of an inch thick. It should be made with boiling water from the kettle, poured over the linseed in a bowl, which had been previously heated with boiling water. The water must be boiling and poured on with one hand, while with a wooden spoon in the other, the poultice is stirred round and round until it is sufficiently mixed and beaten up quite smooth. It should then be put

into a bag, and laid on the part ; it can be kept hot for a long time, by a piece of flannel being lids over it. This is a great advantage, it will not need to be changed so often, as a cold poultice should not be left on.

For bronchitis, a little mustard is sometimes added to the linseed in making the poultice, in order to have it more stimulating. For whitlows, or boils the poultice is spread on linen, not put in a bag.

ILLNESS.

As we have yet not arrived at the happy condition spoken of in the beginning of this book, when there shall be no sickness, the conditions of health, being so strictly observed that all are well and healthy, we must be prepared to meet much illness and suffering, and to know how to act in cases of simple ailments. We cannot run to a doctor for every trifling indisposition. A cold for instance, may, if properly treated at the very beginning, pass away in a day or two, leaving no trace behind, yet if neglected, it may become a serious illness; in fact it is probable that most illness originate from cold; simple remedies are of course all that should be resorted to, without medical advice. A cold in the head is said to be a "safe" cold, but it is certainly a most unpleasant one, especially when there is inflammation in the mucous membrane of the nose, causing what is called "stuffing in the head." There are few sensations short of positive pain more disagreeable. An excellent remedy when used at an early stage of the cold, is to apply with the finger, a little Barff's Boro Glyceride, to each nostril, snuffing it up well. I have found this most effectual, and when used at the first suspicion of a cold, it will prevent any inflammation. Perspiration should be induced by warm drinks going to bed, bathing the feet in hot water or by a hot bath. Care should be used, however in taking hot baths, or they will increase the cold. All draughts should be shut out from the room, and on leaving

the hot water, the whole body should be enveloped in a blanket, which must not be removed until a profuse perspiration has come on, and then the change must be carefully made, lest there should be a chill.

Colds generally attack the weakest part of the system, some persons are more susceptible to cold in the chest, while with others, the stomach and bowels are most easily affected; colds or chills causing diarrhœa and dysentery. Diarrhœa is not always to be checked; it is sometimes an effort of nature to get rid of what is irritating in character or excessive in quantity. A little castor oil is generally the best thing to be given in the first case, and a careful dietary should be observed. If excessive quantity is the cause, as not unfrequently happens with children, especially at Christmas, when rich cakes and good things tempt them to eat more than the stomach can digest, a day's starvation or partial starvation on slop without solid food, is often sufficient to restore the stomach to its usual tone. In this country where diarrhœa is often the precursor of cholera, even slight attacks ought to be attended to, and though not at first checked, for the reasons mentioned, yet not to be allowed to continue long; a chalk mixture which can be had at any chemists may be given with safety, or a few drops of chlorodyne, according to the age of the child or person; if it continues a doctor ought to be sent for.

Sore throats are troublesome and painful. Gargling with water, in which a small quantity (about

the full of a salt spoon) of Barff's Boro Glyceride has been dissolved, will be found to give great relief, and for a cough caused by throat irritation, a little vinegar and honey mixed with water, or if honey is not to be had, sugar or treacle will soothe the irritation and stop the cough. Cold water gargle is also good, and a warm drink before going to bed, made with black currant jelly or raspberry vinegar and hot water is often perfectly efficacious if the attack is slight. In trifling illness, a little care about diet, rest, with perhaps a little extra warmth, may be all that is necessary, but it will be well to have these, as fatigue, cold and improper food may aggravate a trifling ailment into a serious illness. *Muffling* in warm shawls or wrapping a large woollen comforter round the throat will not be necessary; there is a danger in leaving off mufflers, besides the fact, that wearing them makes one more susceptible to cold. A small silk handkerchief round the throat may be worn, but not habitually, as it is better to leave the throat open to the air. Fur boas and throat wrappings are said by doctors experienced in the matter, to be the cause of more throat troubles than any exposure to the air.

Headaches are common ills, and are caused by so many and different things that it is not always easy to know what to do for them; some as bilious headaches, are better for total abstinence from food for a time, others caused by fatigue of body or mind call for perfect rest or a restorative such as a cup of tea. Sometimes, a headache is a symptom of some severe illness coming on; it is then con-

tinuous, yielding to no remedy, and in such a case a doctor must be consulted, if possible.

Fainting is caused sometimes, by breathing bad air, the air of a close room, contaminated by many breaths; here the obvious remedy is pure fresh air; sometimes tight lacing is the cause, in this case the clothing should be loosened; sometimes it is due to weakness, when some wine or a little weak brandy and water, should be given, and as soon as possible a cup of good beef tea. As it may not be known at first to which of these causes a fainting fit may be owing, it will be well to use each remedy until the desired effect is produced. The patient ought to be placed in a recumbent position with the head on a level with the body unless the face is very much flushed, when the head should be a little raised; this should be in the open air, if possible, if not near a window, and only one or two persons should be in attendance; a crowd round a person in a faint, will retard recovery, doing more harm than good; the face should be sprinkled with a little water, (there is no need to drench the patient,) the lips moistened with water, the dress &c., unfastened, especially about the throat, and across the chest; if insensibility still continues, a wet towel on the face and head will probably be efficacious; as soon as consciousness returns, a good drink of cold water may be taken.

Hysteria is not unusual in young girls and women. It is generally caused by too great self-consciousness acting upon a nervous temperament, is most common

among young people, who have no fixed duties or regular work, and is increased by the kindness, and over anxious sympathy of injudicious friends. A girl who is accustomed to be hysterical may be noticed as not having any violent fits when alone ; plenty of work and out-door exercise will soon remove the tendency to it, except when it is a symptom of some physical derangement, in which case the latter must be dealt with, and the former will then disappear. Children and young persons are sometimes subject to hysterical fits of laughter or crying ; this should not be encouraged, it can easily be put down with children by a calm, decided tone, and manner in their elders, or those who have charge of them ; with grown up people, the application of a sponge with cold water on the head or back of the neck will be found to have a wonderful effect ; a strong will, a determination not to yield to it is however, the best remedy for a hysterical affection, or in the words of one of our great authorities, " they require no treatment save perhaps the wholesome method of neglect." Some children are liable to fits of convulsions when there is the slightest derangement, such as constipation, teething or even a slight cold. The first remedy is a warm bath, the temperature of which should be 98° Fahr. the child should be put in up to the neck, and the temperature should be kept up by gently pouring hot water down the side of the tub farthest from the child ; this must be done very carefully for fear the newly added water should touch the tender little body. For five or at most

ten minutes, the child may be kept in the water, and when taken out wrapped in a warm blanket, and put in a warm bed; above all things avoid the slightest chill. The warm bath judiciously used at the first appearance of that infant scourge, croup, has saved many a child's life. The bath must not be left to the ayahs in this country, they do not, as a rule, understand the management; they are very zealous, but they have not the knowledge. Doors and windows should be shut, and outer air excluded, a large blanket or rug should be held round the tub, so as to keep in the heat and steam. In croup the room in which the child is, must be kept at an even temperature. An emetic should be given, a tea spoonful (or a little more according to age) of ipecacuanha wine every quarter of an hour until vomiting is produced. There should be no delay in sending for a doctor as soon as the symptoms of croup are detected, as in a few hours, assistance may be of no avail. This is one of the cases in which promptness means life, and delay may be death.

In cases of accidental poisoning, the bite of a dog or any venomous bite, there must be immediate action also; it is therefore important to know what ought to be done so that no time is lost. Children are so fond of anything of the fruit or berry kind, that they will eat whatever comes in their way, sometimes they may meet with what is unwholesome or poisonous. If there is any reason to believe that a child has taken poisonous fruit, or food of any kind, the first thing to be done is to empty the stomach; this is done by means of a

stomach pump, but before the medical man can come, an emetic should be given at once ; a dessert spoonful of mustard in a breakfast cup of warm water is an emetic for a grown person ; for a child a tea spoonful will be enough in a tea cupful of warm water. Warm water with salt is also good ; these should be taken repeatedly till vomiting occurs. Drowsiness or sickness after partaking of any fruit or food that is suspicious, may be considered as symptoms of poisoning. The drowsiness must not be given way to, and everything must be done to keep off sleep, while the emetic should be continued until the doctor comes. As soon as the stomach is emptied by emetics, if there is no doctor at hand, some strong coffee or even a little brandy and water may be taken, and after a little while, a good dose of castor oil.

If a corrosive poison has been taken, such as vitriol or other acid, *oil* must be given and *no emetic*, olive oil, cod liver oil, castor oil ; indeed oil may be given in all cases of poisoning, except when phosphorus has been swallowed.

Hydrophobia does not always follow the bite even of a mad dog ; nevertheless it is well to guard against such a painful result, by sharp and proper treatment, and if the wound is promptly and fitly treated, the poison will be prevented from passing through the body. First the circulation of the poisoned blood from the wound to the heart must be stopped by tying a band tightly round the part of the body bitten, between the wound and the heart ; one of two things must then be done ; either

cut all round the wound with a sharp pen knife or a lance, if it is to be had at the moment, and let the blood flow freely *from* the wound, carrying away all that is poisoned, or apply a knitting needle or a skewer or any piece of strong wire, heated to a white heat, to the wound; it must be *white hot*, as the pain will not be so great, and the good done will be more effectual. It will be very hard for any one to do this, but the thought of the fearful evil that it will prevent, may enable one to control the feelings so far as to do what is more than even saving a life. As soon as the wire is taken out of the wound, a few drops of carbolic acid, prepared in the proportion of "1 in 20" should be poured into the wound, and a stimulant given to the poor sufferer.

The poison from the bite of venomous reptiles circulates so rapidly that it is almost impossible that the remedies be applied in time; if they were, they would probably be efficacious.

ACCIDENTS.

Presence of mind.—This means, calmness at a moment of danger, power to think and judge what is best to be done, and promptness in doing it. The mistress of a house ought to be equal to any emergency, like a general, commanding an army; she ought to know what to do when something unforeseen occurs, and she will not be frightened out of her common sense at an accident, when a girl faints, or a child cuts her finger, or even when more startling things occur, such as an alarm of fire. How many instances are known of the fearful consequences of fright or panic, which, with the loss of all self-command, often is the cause of as great or a greater calamity, than that which was dreaded. Presence of mind, though more easy to some than to others, can be cultivated, and if we always remembered the Presence that is ever with us, we would not be so ready to take fright at what may seem very alarming at first, but which perhaps, loses its terrors at a nearer view. If girls wish to cultivate a calm and self-possessed habit, they will not be found screaming at the sight of a mouse or a black beetle, or helplessly crying and wringing their hands, if the little brother should fall, and cut or bruise himself; they will endeavour to be of use, when such an accident occurs, and by thus accustoming themselves to act on simple occasions, they will neither be flurried, nor incapable when greater ones arise. Fire is perhaps the most dreadful of all alarms; it is so fierce

and so rapid, that what is done to extinguish it must be done quickly. If a dress catches fire, the wearer, if she has presence of mind, will throw herself on the ground ; if the carpet on the floor be moveable, she will roll it round her ; a rug, a table cloth or anything with which she can cover herself will do ; it must be rolled as tight as possible round the person, leaving the head uncovered, or the smoke will cause suffocation. If there is nothing at hand, she must not run to get something, but should throw herself down at once, and roll over and over to stamp out the flames, with her own weight, as it were. She must not run for assistance, every movement will draw air, and air will cause the fire to burn more fiercely ; she may scream and call for it, but must not move about to seek it. Screaming in this case is not a sign of want of presence of mind, but the contrary. The same means, namely that of stifling the flames, must be pursued by any one, who answers the call for assistance, a blanket or thick coat should be wrapped round the person who is on fire ; if water is at hand, it will be used of course.

Should a fire break out in a room, all the doors and windows should be at once shut to exclude all draught ; this is the first thing to be thought of, as the slightest current of air, increases the force of the fire. Water or a wet blanket if it can be had in time, or any thick woollen garment should be thrown on the place where the fire shows itself, no one should be permitted to stay near except those who can help to put it out. Here it is that a girl's

presence of mind is invaluable, she will not frighten others by her flurried manner, calmly and quietly though, at the same time quickly, she will take the old people or children to a place of safety, while the absence of fright and trepidation on her part, will reassure other young people, who are not so self-possessed as she. If it is necessary to escape by a window or down a ladder, her hands do not shake so as to make her incapable of tying a secure knot, nor does she falter as she makes the perilous descent, or guides the trembling feet of those who need help. In all cases of accidents, she will be able to do what is needed, if she knows what that is.

Burns, sprains, bruises and cuts are accidents of common occurrence, and if not very severe, are easily treated. Burns which are caused by contact with dry heat, that is of a solid body or of fire, and scalds by hot fluids, such as water, oil, &c., require the same kind of treatment, viz., the exclusion of air from the part affected. A piece of lint or linen or wadding saturated with oil, olive oil if at hand, if not, any pure simple oil, should be at once applied, another piece of lint should be laid over it, which may be removed every day; the inner dressings next the wound should not be taken off, until a new skin is formed, but should have the oil renewed; vaseline is said to be very good. Thickly dredging the parts with soft flour, and covering the whole with cotton, wool or wadding, is also recommended. The object in both cases is to exclude the atmospheric air. Care should be taken in removing the clothes from the injured parts; it

must be done very gently, cutting them if necessary or soaking them in tepid water. In applying the dressings, the natural position should be maintained, as when the hand is burned, the fingers must be straightened, and kept separate by the dressings, and splints, such as a bit of card board, ought to be applied to joints. Neglect of this often causes deformity or renders the part useless.

Dislocations are displacements of a bone from its socket; they require to be at once attended to, as every hour makes the operation of replacing the bone more difficult and more painful.

Sprains are very common and very painful; they are the result of violent stretching of the parts affected, and are best relieved by either hot or cold applications, according to the feelings of the patient. In the case of a sprained ankle, the application of a lotion, such as Goulard's water, with a little spirit added to it, or hot fomentations of poppy water, will give great relief, after which a bandage must be put on, and the limb should have perfect rest. A bandage is a long strip of calico, linen or flannel, which is wound round and round a weak, sprained, or fractured limb to support it. Bandaging as an art or in perfection can only be acquired by practical study and under tuition, but all women ought to know how to put on a common bandage. A sprained ankle will require a bandage of calico, about three inches wide and three or four yards long. In the Ambulance classes which have become so popular of late, bandaging is taught, and there is no reason why it should not be taught in schools

too. Directions as to how it should be done are given in Dr. Wilson's Manual of Health Science, and with the help of the illustrations, girls may be able to put on and take off a bandage, and by practising on each other, may become tolerably expert.

Cuts.—A cut with a sharp instrument, if not very deep may be treated by a sister or mother, who possesses the valuable quality of common sense, and does not scream or faint at the sight of blood ; the edges of the wound should be brought closely together, and sticking plaster applied, or a piece of old linen dipped in cold water ; if the bleeding does not cease, the cold water should be continued, a weak solution of Condyl's Fluid may be used for the dressing or a solution of Barff's Boro Glyceride. In all serious cuts, no time should be lost in taking the patient to the hospital, keeping the air from the wound by cold water dressings, until it can be attended to by the doctor.

If an artery is cut, the bleeding must be stopped, while a doctor is being summoned, or it may be too late when he comes to do anything. When the blood is a bright red, and comes out in spurts, an artery has been severed. Until the doctor comes a tight bandage should be applied between the wound and the heart so as to arrest the flow of blood from the heart ; a handkerchief will do and it may be made tight by inserting a ruler or a piece of stick between the bandage and the limb, and twisting it several times ; this will prevent bleeding to death.

Lacerated or torn wounds, should be bathed in warm water to take away any particle of grit or

dirt; the parts should then be brought together, and kept so by means of sticking plaster or strips of linen well saturated in water. If there is any appearance of inflammation, a bread poultice over the sticking plaster will check it. In all cases of wounds or sprains the part affected must be kept as nearly as possible in one position so as not to retard healing by movement or displacement.

Bruises are sometimes very painful and require local treatment, bathing or fomentations either hot or cold give great relief, and if a teaspoonful of permanganate of potash be added to half a pint of water and used for the fomentation, relief will be instantaneous. This is the same as Condyl's Fluid, and if the latter is at hand it may be used.

Boils are relieved by poultices but they are not banished; the best thing to cure them is a plaster of honey and flour spread on a bit of leather.

Bleeding from the nose when caused by a blow or a fall may be treated like any other bruise; if it comes on, however, without any apparent cause, it ought not to be checked at first, as it may be an effort of nature, to relieve the system from some pressure or excess. If however the bleeding continues too long or returns too frequently it may be necessary to subdue it. The sudden application of cold is often enough to stop it; but when this does not do, a wet towel on the back between the shoulders, a napkin wrung out of cold water on the forehead and nose, or the hands suddenly dipped in cold water, with hot water in a bottle applied to the feet will probably be efficacious. A key suddenly drop-

ped down a child's back between the skin and the clothes has often stopped bleeding at the nose; sometimes a little vinegar and water snuffed up the nostrils, has a good effect.

Sunstroke or heat apoplexy, which is dreaded here as not an uncommon occurrence, should be prepared for by some knowledge of what to do in such a case. Cold water should be at once poured on the head, and the patient should be removed to a cool place. Ice, if possible, should be used, and the whole body sponged with cold water. Mustard plasters might be applied to the soles of the feet and calves of the legs, and this treatment should be continued until the doctor comes.

Ear-ache.—Children sometimes suffer from ear-ache to a degree that amounts to agony; syringing with plenty of water will generally give relief, if not, mustard plasters behind the ears may be tried, a bit of cotton moistened with warm oil, may be put into the ear, but not very far, lest the tender membrane should be hurt.

HOW TO AVOID INFECTION.

Vaccination is made compulsory on all who go in for public examinations, that is, Government has issued an order that all who assemble together from all parts of the presidency, for the purpose of being examined as to qualification for office or other work, should be free from the dreadful disease of small-pox, and that there should be no danger of

infected persons bringing the disease to a place in which it does not exist. What a good thing this is; it would be still better, however, if it could be carried out in all great assemblies, as well as the Examination Halls. Especially beneficial would it be if it were possible that it could be insisted on, where pilgrims congregate, meetings that are the cause of the spread of infectious and contagious diseases and, in some cases, the origin; probably it was this very fact that was the primary cause of the vaccination order. Other diseases, for which vaccination is not used as a preventive, are caught in the same way, either by breathing infected air, or by actual contact with the diseased person or with articles used or touched by him. One would think that such contact would be avoided as much as possible, but it is not so, there is often a carelessness in this respect that seems almost foolhardy or reckless; permitting children to attend school, while any member of the family has an infectious illness, shows a disregard for other people, and an indifference to the public good. A foolish dread, however, ought not to be encouraged; if care and proper precautions are taken, the disease will not be likely to spread. The following table copied from the valuable book so often quoted in this, Dr Wilson's *Manual of Health Science*, will be of use, giving an idea of the length of time, that elapses from the time the disease is caught, so to speak, until it shows itself, as well as the time that must elapse before the danger of infection is past.

<i>Disease.</i>	<i>Period of incubation.</i>	<i>Period of infection.</i>
Cholera ...	1 to 5 days	... 2 or 3 weeks.
Small-pox ...	12 days	... 6 "
Typhoid fever	8 to 14 days	... 6 "
Typhus fever	6 to 14 days	... 4 "
Scarlet fever	1 to 6 days	... 6 "
Diphtheria	1 to 8 days	... 6 "
Measles ...	8 to 20 days	... 4 "
Chicken-pox	10 to 14 days	... 3 "
Whooping Cough...	4 to 14 days	... 8 "
Mumps ...	14 to 22 days	... 3 "

These are the average periods only, and may vary according to circumstances, but they may be taken as a guide, as to the time when it will be safe to visit a friend who has had any of these illnesses, or for one who has suffered to permit the visits of friends. At the beginning or first appearance of any of the above or other infectious diseases, the first duty is to have the patient, and those in attendance, completely isolated from the rest of the household, a room at the top of the house is better than any of the others, partly as that will be the best air for the patient, and partly because there will be less risk of the infection spreading. Nothing should be kept in the room, that cannot be thoroughly cleansed; carpets, curtains, stuffed chairs, must be banished, or if kept in the room, should be burned on being removed. The cups and vessels used should not be allowed to go to the kitchen, or any other part of the house, they should be washed and kept for the patient's use only. No woollen clothes should be worn by the nurse or

attendant; if blankets are used by the patient, they should be burned, while the bed linen and clothes should be disinfected immediately on being removed from the bed or body, and should be well boiled and washed, without coming in contact with other linen.

Disinfecting.—The way to disinfect is to plunge the articles to be disinfected into a disinfecting material. This may be a very strong solution of carbolic acid, Calverts No. 4, in the proportions of $\frac{1}{4}$ pint to a gallon of water. Condly's fluid, which is, as before mentioned, a solution of permanganate of potash is a valuable disinfectant, oxidising all decaying matters; sanitas added in sufficient quantity to a tub of water, is excellent and admirably adapted for purifying clothes. Chloride of zinc, used in the proportions of about eight times its bulk of water, will be found efficacious for all ordinary purposes. There are many others that possess powerful qualities in the destruction of diseased matter, but as they are powerful poisons as well, they need not be included with those for domestic use. Carbolic acid is highly poisonous and should be used with care; the hands must not be put in the disinfecting mixture recommended for the clothes. Dr. Hoch says that "the spores or young germs of splenetic fever, which are most difficult to destroy, are killed after two minutes boiling;" hence we infer that thoroughly boiling all infected clothes and bed linen, has the effect of destroying the poison, and perfectly carrying out the process of disinfection. The room in which

the patient has been ill, must be fumigated, or disinfected. The vapour of chlorine and sulphuric acid gas, are powerful disinfectants; the first, chlorine is made in different ways, one of these and the simplest is, to add one part sulphuric acid to three parts of bleaching powder. A little hydrochloric acid added to Condry's fluid has the same effect. The room should be shut up as closely as possible, stopping every crevice, while the gas is acting. Sulphur left burning in a closely shut room, will be found effectual.

The fact that civilized nations suffer much less from these diseases than the savage races, proves that a knowledge of the laws that govern such diseases, and the manner in which preventives can ward them off, is most valuable, and ought to be acquired.

MONEY.

Thrift and saving.—As this book is intended chiefly for girls, we shall first speak of money in the way that as daughters and wives they will be called on to deal with it, that is, in laying out for the family's comfort, the money provided by the head of the family.

If a girl has learned in her childhood to take care of her clothes, brushing or dusting them when they are taken off, and laying them carefully by, mending her gloves when the smallest hole makes its appearance, understanding that this care is partly that they may last longer than they would otherwise ; if she knows too the cost of the different articles, that all must be paid for in money, and that the money that pays for all, is not an inexhaustible treasury, but is worked for and earned by her father, she will have had early lessons in *Thrift*, and as she grows older, her opportunities multiplying, and her responsibilities increasing, she will be able to lay out each rupee to the greatest advantage, getting as much value for it as possible, not by mean haggling at the prices of things, but by a knowledge of the real worth of what she buys, and a determination, to buy only what will suit her ; she will not be persuaded by the seller to purchase what she does not want, or what is not needed at the time ; knowing the price she ought to give, will enable her to calculate what she can afford, before she decides on making a purchase. All this will be easy enough to a girl who has been

taught thrift in small things. If she has a certain allowance for her clothing and pocket-money, and has learned to keep well within that allowance, she may be trusted to lay out what her father gives for the support of the household, and if she marries she will be a true help to her husband, managing his income in the best possible way.

She must be thrifty in small matters; nothing is too small or too trifling to be noticed by the mistress of a house; an apparently insignificant waste or expenditure may be the small leak that will, if not looked after, sink the ship.

Too much cannot be said on this subject; it must be "line upon line" and "precept upon precept" repetition of what has been said before so often, reiteration over and over again.

1. *Buy what is good and lasting*, not what is cheap or seems to be cheap, but will prove dearer in the end.

2. *Buy what you want now*, not what you may want at a future time, "sufficient unto the day is the evil thereof." This of course will be understood not to refer to the wise and provident laying in of stores, &c., for future use, but the habit of buying what are called bargains, things not needed at the time, but expected to be of use some time, which may not come, so the bargain becomes out of date, and even if used, does not give the same pleasure as if bought when it was wanted, having lost its freshness.

3. *Make a calculation of what you can afford*, how much your purse will permit you to lay out, on

the provision you have to make, either for al wants, as in the case of a girl's allowance for dress and pocket money, or for housekeeping, that is, the food and necessities for the family table, &c., or for the entire maintenance of the household, as many men give their wives the disposal of their whole income. What a responsibility this is, and how much thought and careful planning is needed to do it to advantage. If the young wife is not mindful of every small matter, she will find to her dismay, that what she thought was a large sum has melted away leaving very little to show for it, and she will be at the end of her month's income, before she is aware of it.

4. *Methodical planning and keeping a strict account* of the daily expenditure are the only means by which one will be able, with a limited income, to meet and supply the wants of a household, without stint or pinching. *The food provided must be good, wholesome and abundant*; other expenses must be regulated according to rule, as already seen in the articles on furnishing, clothing, &c., and, at the end of every month, the accounts must be made up and balanced, so that the state of the household finances may be readily seen, and the balance kept on the right side. This balance will have to be put away, not added to the income for the next month; how this ought to be put to use, or laid out advantageously, will come under the head of Investment of Money.

Investment of Money.—Perhaps one of the greatest boons to certain classes of the community, was

the establishment of Savings Bank. To those who could only put by a trifling sum, banks, as before constituted, were quite beyond their means, and things with which they could have nothing to do; but when banks were opened for the receipt of small savings, many were glad to have the opportunity of putting whatever they could spare into safe keeping and of receiving some small interest on it. The establishment of Post Office Savings Banks under the Act passed in 1861 for "affording additional facilities for depositing small savings at interest with the security of the Government for due repayment thereof," has made it still easier for the thrifty one to lay aside a little fund. Small sums from four annas may be invested, and interest is reckoned at the rate of so much per cent. In every town there is a Post Office Savings Bank, the rules of which and full particulars will be given without any charge on application.

The advantage of this is very great; formerly, if any one saved a little money, it was hid in a corner of some old cupboard, or drawer, perhaps in a cup or a teapot, or an old stocking. Stories are told of treasures found that were hidden in old mattresses, cushions of chairs, or secret drawers in a bureau. In this kind of saving, the only advantage was, having a certain sum of money to use in case of need, but there was danger of being robbed, besides the fact that the money lay dead, so to speak, that is, it did not increase except by the addition of more savings. Now a little money in a bank will bring a little more; the money paid into

a bank is money lent, and the depositor is paid for lending it, at a certain rate, so much per cent. The interest given in a Savings Bank is not high, a few pices for every Rupee, but it is sure, both the principal (or the money lodged) and the interest are safe, the Government is responsible for the whole. Besides the security, there is a great convenience in depositing savings in the Savings Bank. You have a small sum which, if you have it by you you will probably lay out perhaps on something not needed particularly; if you put it in the Bank, you place it out of your reach, you are not tempted to spend it, while at the same time, for any real necessity, you can draw it out with the greatest ease. When it is in the bank, you will not be likely to withdraw it, unless there is a necessity; you will thus be kept from little extravagances, and the trifling sums laid by, grow into an amount that will buy a house, or may be invested in a way, that will bring in higher interest, and as "money makes money" a very small beginning may become in time a comfortable provision, a nice little capital, that may be laid out in purchasing an annuity, or the interest of which will be a yearly income.

How to earn money.—On looking over a little book lately published, "What Girls can do" by Phillis Browne, I was struck by the following, which I copy word for word.

"A few years ago, a girl who worked for money, was regarded with a certain scorn by the majority of people, and spoken of as 'a young person,'

while the girl who remained at home, doing nothing particular, but waiting for some young man to be kind enough to come and marry her, was regarded as a "young lady"—!!! The great sting of this is, I know it to be so true. The authoress of the book goes on to say, "Things are not so bad as that now" perhaps not in England, but here I am afraid girls have not come yet to understand fully that work is honorable, praiseworthy, elevating. There is certainly a change for the better. Girls do go in for training as teachers, and even accept appointments, if everything is just to their mind, and there are too, instances of girls in post offices; some undertake the arduous duties of Hospital nursing, while a few have even gone so far as to qualify for Lady doctors.

Lady doctors.—This last requires more advanced education and a longer preparation, and is not within the reach of all.

Hospital nursing.—Hospital nursing also is not suited to every one. A girl cannot even begin to be trained for it, at an early age. It is very hard work too, and one must have a speciality for it, who would make of it a healthy and a happy livelihood.

Girl clerks.—All the young men of this country, who are educated at the colleges, look for employment as clerks, and their mode of life is so simple, and their wants so few, that they are willing to give their time and services for very trifling pay. The consequence is that the supply is greater than the demand, and there is no opening for girls in this branch.

nothing by which they can obtain a livelihood unless it may be a few annas a week at the workshops. Many cannot or will not do even that, and spend their time loitering about the streets and bazaars. To such as these, domestic service would be a lifting from extreme and squalid poverty to comparative comfort, from pinching hunger to plenty, from "unwomanly rags" to decent apparel. But who would be troubled with them as domestic servants? What help would they be in a household, and who could afford the time, or would have the patience to teach these waifs and strays, the orderly ways of a well kept house, make them helps instead of hindrances? Who is to do it but "Our Girls." Those who have no need to earn their own living, might occupy some of the time of their girlhood, before the cares of life absorb their thoughts and interests, in teaching their poor neglected sisters, teaching them not book learning, but the simple duties of every day life. It could be done in many ways, perhaps this would be the easiest; in a family there may be several daughters, the father and brothers earning a comfortable income, there may be no need for the girls to help in this matter, the duties of the house will not occupy them all; one might get permission from her parents, to take a girl, to instruct her in household work, not merely the trifling work done by the young ladies of the house, but all the duties of domestic service; this may seem hard at first to both the teacher and the taught, but if done systematically, beginning with the

lightest and gradually increasing till all is undertaken, the difficulties will disappear, and the result will be a well trained servant and a happy mistress. I can conceive no greater happiness than for a girl to feel, "I have rescued one of my own sex from poverty, misery and perhaps worse, and I have put her in the way of earning a respectable and honest livelihood." It may be said and with truth, "when all is done and the girl is ready for domestic service, who is to employ her?" At first, this does seem a difficulty; native servants are so easily to be had, require so little, either wages or accommodation, that people prefer employing them. To an English lady, however just come from England, especially single ladies, who engage in mission or educational work, a good female servant with a thorough knowledge of the country, able and willing to do the work, would be invaluable, more especially if the lady goes to an up country station. It is a great trial to English ladies to have only men in attendance on them, and though time and necessity may reconcile them to it in a measure, yet a capable conscientious female servant speaking English and with English neatness and cleanliness, will be sure to be employed and appreciated. Then the young mistress herself who has had the trouble of training the girl may employ her, either in her father's house, or in her own home when she marries; here the training may continue, another girl may be brought up, and the good go on spreading until it will be no uncommon thing to find good domestic European and Eurasian serv-

ants, whose service, being hearty, thorough, and reliable is highly appreciated by their employers.

Thoroughness.—Whatever a girl decides on doing, she must determine to do well. She must give her whole mind and heart to it. She must make it her particular object in life, and must not be drawn aside from it. I have read somewhere that the reason why a man is more successful in business than a woman is that a man's business is his life, whereas with a woman it is only a means to live. She does not care for itself, she does it because it is necessary, it has to be done. Yet there cannot be success without heartiness. Girls are generally quick of perception, but they often fall short of the patient perseverance that is needed in order to attain excellence in any particular work. Every kind of work, no matter how simple it appears or how little complicated, needs some special preparation, and certainly some time to be spent in practising it. If a girl wishes to do any kind of work for payment, it must be well done ; people will not pay for inferior work, and the very best work that girls and women can do is not paid for at its full value ; perhaps this is because being women's work it is not considered the best of the kind that can be had ; of course this applies to work that is done by men as well as women. We cannot help acknowledging that men as a rule are more methodical, more accurate, less liable to be swayed by prejudices, than women ; they are therefore more reliable in a business point of view. But this need not be, if girls instead of jumping hastily to

a conclusion, were to carefully weigh and consider the matter, viewing it not from one particular point, but broadly taking it in all round.

But how are these broad views to be gained by girls who do not go out into the world and see what is going on? If they do not see for themselves, they can use the eyes of those who do see and have seen. They can hear the words and learn the minds of men who have not only thought out the great problems of life, but have taken the trouble to write the result of their labors. Books are to be had in which the student may learn all that can be learned of theory ; the study of mathematics will give a habit of exactness or accuracy, and *practice, patient persevering, untiring practice* will do the rest. This is the way in which a girl's work may be made to compare favorably with that of a man. She cannot attempt competition in what requires bodily strength, or the highest intellectual powers, though there are instances of women showing the last. Let a girl find out what she can do and then do it with all her might, always remembering that whatever is worth doing at all is worth doing well.

THE POWER OF A PENNY A DAY.

The following copied from Smiles' "Thrift," will show the advantage of saving in little sums and of small investments, as well as how it may be done. See Chap. IX, p. 170.

"1. For a penny a day, a man or woman of twenty six years of age may secure the sum of ten shillings a week payable during the time of sickness, for the whole of life.

2. For a penny a day (payments ceasing at sixty years of age) a man or woman of thirty-one years of age may secure the sum of £50 payable at death, whenever that event may happen, even though it should be during the week or the month after the assurance has been effected.

3. For a penny a day, a young man or woman of fifteen may secure a sum of £100, the payment of the penny a day continuing during the whole of life, but the £100 being payable whenever death may occur.

4. For a penny a day, a young man or woman of twenty may secure an annuity of £26 per annum, or 10s. per week for the whole of life, after reaching the age of sixty-five.

5. For a penny a day, the payment commencing from the birth of any child,—a parent may secure the sum of £20, payable on such a child reaching the age of fourteen years.

6. For a *penny a day*, continued until the child reaches the age of twenty-one years, the sum of £45 may be secured, to enable him or her to begin business, or to start house-keeping.

7. For a *penny a day*, a young man or woman of twenty-four may secure the sum of £100, payable on reaching the age of sixty, with the right of withdrawing four-fifths of the amount paid in, at any time; the whole of the payments being paid back in the event of death occurring before the age of sixty.

Such is the power of a *penny a day*! Who would have thought it? Yet it is true, as any one can prove by looking at the tables of the best assurance offices. Put the penny in the bank, and it accumulates slowly; even there, however, it is very useful. But with the assurance office it immediately assumes a vast power.

A penny a day.—Paid in by the man of thirty-one, is worth £60, to his wife and family, in the event of his dying next month or next year!

It is the combining of small savings for purposes of mutual assurance by a large number of persons, that gives to the penny its enormous power."

Another interesting fact mentioned in the same book may be noted here.

The mother of Sir Francis Crossley, of the firm of Crossley and sons, Halifax, and representative of the West Riding of Yorkshire, who was herself the daughter of a landed proprietor, went out to service from her father's house. "In her own person

she did the work of kitchen-maid, house-maid and cook; and in addition to that she regularly milked six cows every morning and evening. Besides which she kept the house which was as clean as a little palace. But this was not enough to employ her willing hands. Her mistress took in wool or tops to spin, and she could do what scarcely any in Wasley could have done,—she spun that wool to thirty-six hanks in the pound and thus earned many a guinea for her mistress, besides doing all her other work.” These facts form part of a speech made by Sir Francis Crossley on the occasion of his presenting a splendid piece of ground, which he had purchased, to the Corporation of Halifax, to be used as a People’s Park for ever... He was not ashamed to say that his mother had been a domestic servant.

We are told in another part of the same chapter, that Mrs. Crossley’s wages while she was at service (for nine years) were as low as fifteen pence a week for the first two years, afterwards raised to eighteen pence! after nine years, she had six guineas a year, yet during that time she saved thirty pounds by her thrift.

