

Dr. RICHARDSON then read his lecture on 'Woman as a Sanitary Reformer' (see pages 183 to 202), and was frequently applauded.

On the conclusion of the lecture, a vote of thanks was proposed by the BISHOP of EXETER. He had listened to the lecture with great attention, and he trusted that it would receive the consideration it deserved. It struck him that women were particularly fitted to take part in what the lecturer had called upon them to perform, for they had eyes, in nine cases out of ten, where men had not; and noses in nine cases out of ten where men had not. Women, as they knew, were often led at once to a point at which a man only arrived after careful investigation. Was it not the plague of a man's life that woman not only claimed to be right, but very often was right? They did not know how it happened, but it was a most provoking fact. He took it that the lecturer did not mean that before they commenced anything in the direction indicated they should study all he laid down, but that they should make use of, and cultivate, the knowledge they possessed.

Professor DE CHAUMONT seconded the motion, which was carried by acclamation.

A vote of thanks to the Mayor concluded the proceedings.

LECTURE TO THE CONGRESS.

LECTURE.

Woman as a Sanitary Reformer.

Two of the wisest of men, and by necessity, therefore, both of them Sanitarians, Solomon and Xenophon, have laid down rules bearing on the duties of women who rejoice in being called wives as well as women. 'A good wife,' says Solomon, 'worketh willingly with her hands.' 'She is like the merchants' ships, she bringeth food from afar.' She is an early riser, and sees that everyone has an early breakfast. 'She riseth while it is yet night, and giveth meat to her household and a portion to her maidens.' By exercise she strengthens her limbs. 'She layeth her hands to the spindle and her hands hold the distaff.' She knows that where there is poverty there can be neither health nor happiness. 'She stretcheth out her hands to the poor; yea, she reacheth forth her hand to the needy.' She provides against the cold. 'She is not afraid of the snow for her household; for all her household are clothed in scarlet.' In clothing herself she combines artistic taste with usefulness as every woman is bound to do. 'She maketh herself coverings of tapestry; her clothing is silk and purple.' 'She maketh also fine linen and selleth it.' 'Strength and honour are her clothing.' She combines common sense with gentleness. 'She openeth her mouth with wisdom; and in her tongue is the law of kindness.' She is watchful and busy. 'She looketh well to the ways of her household and eateth not the bread of idleness.'

And these, says this wise Sanitarian, are her rewards: 'She shall rejoice in time to come.' 'The heart of her husband doth safely trust in her.' And, light of perfected human happiness! 'Her children rise up and call her blessed.'

The second of the wise Sanitarians, Xenophon, tells his story of the good wife in somewhat different terms and manner, and indeed with difference also of detail. He, treating of the household and of the economics of it, invents a dialogue. He makes Socrates and Critobulus hold a discussion which comes to this general understanding: that the ordering of a household is the name of a Science, and that the Science becomes the order and the increase of the house. Afterwards, Critobulus asks of the Master why some so use and apply husban-

dry that they have by it plenty and all the good things that they need, including health and all blessings; while others so order themselves that every good thing avails them nothing at all. 'These two things,' says Critobulus, 'would I like to have explained by you, to the intent that I may do that which is good and eschew that which is harmful. Thereupon, Socrates, the Master, recounts to his pupil that he once held a communication with a man who indeed might be called a good and honest man. He had already seen and studied the works of good carpenters, good joiners, good painters, good sculptors, and had seen how they attained to excellence; and so he desired to find out how they who had repute for goodness and honour attained their excellency. He looked for such an one first amongst those who were handsome, but it would not do; for he found that many who had goodly bodies and fair visages had ungracious souls. Then he bethought him to look for a man who by general sentiment was reckoned upon as good, and at last he found Ischomachus who was generally, both of man and of woman, of citizen and of stranger, called 'the good.'

Socrates is made to discover Ischomachus sitting in the porch of a temple, and, discussing with him many subjects, asks him how it is he is called a good and honest man. At this Ischomachus laughs. 'Why,' he replies, 'I am called good when you and others speak of me I cannot say. I only know that when I am required to pay money for taxes, priests or subsidies, they call me Ischomachus; and indeed, Socrates, I do not always bide in my house, for my wife can order well enough whatever is wanted there.' 'And did you yourself bring your wife to this perfection,' asks Socrates, 'or did her father and mother teach her?' 'As she was but fifteen when I married her,' returns Ischomachus, 'she had seen very little, heard very little, and spoken very little of the world; and therefore,—he continues some way further on—'I questioned and then instructed her.'

It is very doubtful whether, in these days of supreme wisdom the first principles of Ischomachus, as he taught them to his beloved, would be at all permitted. I dare not certainly set them forth on my own account, although they bear directly upon the subject of my lecture. I record them, consequently, as I find them, leaving their author, Master Xenophon, who though dead yet speaketh, to assume the responsibility of so flagrant a series of propositions as will follow.

'Methinks, then,' says Ischomachus, 'that for the welfare of every household there are things that must be done abroad, and things that must be done within the house and that require care and discipline.' We shall probably be all of one mind, even now, on that point. The difference of opinion that will rage rests on the succeeding points of argument. 'Methinks, also,' he continues, 'that the God hath caused

nature to show plainly that a woman is born to take heed of all such things as should be done at home, and these are the reasons for the belief. He, the Maker, hath made man of body, heart, and stomach, strong and mighty to suffer and endure heat and cold, or privation, to journey, and to go to the wars. Wherefore, he hath, in a manner, charged and commanded him with those things that be done abroad and not of the house. He, also, remembering that he has ordained the woman to bring up young children, has made her far more tender in love towards her children than the man. And, whereas he has ordained that the woman should keep those things which the man getteth and bringeth home to her, and knowing also that to keep a thing safely it is not the worst point to be doubtful and fearful, he has dealt to her a great deal more fear than he did to man; while to man, who must defend himself and his own, he has dealt out more boldness. But because it behoveth that both man and woman should alike give and receive, he has bestowed on them alike remembrance and diligence, so that it is hard to discern which of them has most of those qualities. He has moreover granted them, indifferently, the power to refrain from doing that which is wrong, so that whatever either of them do better than the other is best for both; and because the natures and dispositions of them both are not equally perfect in all these things, they have so much the more need the one of the other; for that that the one lacketh the other hath. Likewise the law shows, and the God commands, that it is best for each to do their part. It is more correct for a woman to keep house than to walk abroad; and it is more shame for a man to remain skulking at home than to apply his mind to such things as must be done abroad.'

Ischomachus next illustrates to his wife the lessons to be learned from bees in the hive; and, improving still the occasion, he offers certain rules which, with actual reverence, I venture to epitomise. He was, in fact, a grand Sanitarian, this Ischomachus, and I do not think there would have been much sickness now in the world had wives, in general, been after the training of Madam his wife. The million of men of physic might have become reduced to thousands. And the women of physic? Well, I may relieve my mind at once and say it plainly; they might have become housewives of all houses.

Some lessons of economy are first to hand. The wife is to beware that that which should be spent in a twelvemonth be not spent in a month. The wool that is to be brought in is to be carded and spun, that cloth be made of it; and the corn that is brought in must be most carefully examined, that none which is musty and dirty be eaten as food. Above all, the same instruction that Solomon insists on is enforced with special fervour. The wife is to be most

particular, if any of the servants fall sick, that she endeavour herself to do the best she can, not only to cherish them, but also to help that they may have their health restored to them.

A little further on the philosopher touches on the importance of perfect order in the house as connected with the health and wealth of it. He tells how he once went on board a ship of Phœnicia, and wondered that in so small a space such a vast number of things could be stowed away with so much neatness that everything could be found in a moment, even during the confusion of a storm.

From these lessons he teaches his wife, and thereby all wives, matters that are more particularly of a sanitary kind. A house, he says, has an ordination. It is not ordained to be gorgeously painted with divers fair pictures, though these may be excellent, but it is built for this purpose and consideration, that it should be profitable and adaptable for those things that are in it, so that, as it were, it bids the owners to lay up everything that is in it in such place as is most meet for the things to be put. Therewith he disposeth of places for things in due form, and assigns the uses of the various parts of the establishment, in such manner that the woman who presides over the whole shall know the parts in a truly scientific way.

The inner chamber or room, because it stands strongest of all, is to be the strong room in which the jewels, plate, and every precious thing in the belongings of the house must be securely located. The driest places are to be places for wheat; the highest places for such works and things as require light. The parlours and dining places, well trimmed and dressed, are to be cool in summer and in winter warm. The situation of the house is to be towards the south, so that in winter the sun's light may fall favourably upon it, and in summer it may be in goodly shadow. The wearing apparel is to be divided into that intended for daily use and that required for special or grand occasions. Everything belonging to separate service, to the kitchen, the bakehouse, the bathroom, is to be assigned to its own place and use. All instruments which the servants use daily are to be shown to the servants in their right places, and are to be kept there when they are not wanted. Such things as should not be made use of except on holydays and rare occasions are to be left in special charge of an upper servant, who should be instructed beyond the rest of the servants to observe the same rules as the mistress herself would carry out. 'At last, good Socrates,' said Ischomachus, 'I did express to my wife that all these rules availed nothing unless she took diligent heed that everything might remain in perfect order. I taught her how in Commonwealths, and in Cities that were well ruled and ordered, it was not enough for the dwellers

and citizens there to have good laws made for them unless they chose men to have the oversight of those laws. In like manner then the woman should be, as it were, the overseer of the laws of the house as the Senate and the Council of Athens oversee and make proof of the men of arms.'

Finally Ischomachus touches on the mode by which his wife should maintain her own health. He observed about her, as a very strange habit, that upon a time she had painted her face with a certain unguent that she might seem whiter than she was; and with another unguent that she might seem redder than she was; and that she had a pair of high shoes on her feet to make her seem taller than she was. Whereupon, 'tell me, good wife,' said he, 'whether you would judge me worthier or more beloved if I explained to you what we are precisely worth, keeping nothing secret from you, or if I deceived you by declaring I had more than I really had, showing you false money, chains of brass instead of gold, counterfeit precious stones, red instead of scarlet, and false purple instead of pure and good?' She replies: 'The gods forbid that you should be such an one.' He then recalled to her her own deceptions; and when she inquired how she should be fairer in reality and not appear so only, he gave her as counsel, that she should not sit still like a slave or a bondwoman, but go about the house like a mistress and see how the works of the house go forward; look after all the workers and sometimes work with her own hands, by which exercise she would have a better appetite for food, better health and better favoured colour of her face. While likewise the sight of the mistress, more cleanly and far better apparelled, setting her hand to work and, as it were, striving at times with her servants who should do most, would be a great comfort to them by leading them to do their work with a good will instead of doing it against their will. For they that always stand still like queens in their majesty will be only judged of by those women who are triumphantly arrayed. 'And now, good Socrates,' continued Ischomachus, in conclusion, 'be you sure that my wife lives even as I have taught her and as I have told to you.'

Were a modern sanitary scholar, such an one as now speaks to you for example, to presume to lay the basis of sanitary reform, through the influence of woman, on such simple rules as those given above, he might suffer for a trouble, which might, in truth, be called a presumption. Happy, therefore, is it that he finds the basis ready laid by two such masters as Solomon and Xenophon. Their sufferings are over; hidden in the inaccessibility of historical distance. Their words alone remain faithful as ever, and as true for to-day and for to-morrow as on the days when they first went forth. They are the basis of modern sanitary law with women as its administrators. I would not dare to add a syllable to their majestic common sense.

Good wives of the type of the wife of Ischomachus, would, in one decade, make domestic sanitation the useful fashion and order of the nation they purified, beautified and beatified.

I quote this basis of wifely work and duty, because I feel more deeply, day by day, that until it is admitted, and something more built upon it, sanitary progress is a mere conceit, a word and a theory, instead of a thing and a practice. It is in those million centres we call the home that sanitary science must have its true birth. It is from those centres the river of health must rise. We men may hold our Congresses year after year, decade after decade; we may establish our schools; we may whip on our law-givers to action of certain kinds; we may be ever so earnest, ever so persistent, ever so clever; but we shall never move a step in a profitable direction until we carry the women with us heart and soul. Adam had no paradise in Paradise itself, until Eve became the help meet for him. How then, in a world which is anything but a paradise, shall we transform it into anything like one till the Eves lend us a hand, and, combining their invincible power with ours, give us the help that is essential to success? We must go entirely with Xenophon in the belief that the human being is not perfected, either in thought or action, until the two natures are blended in thought and action. The man invents, the woman applies the invention; the man conquers nature, the woman makes useful the victory; the man discovers, the woman turns the discovery to due and faithful account; the man goes forth to labour, the woman stays at home to watch the centre common to them, and tend the helpless there. Yet both have remembrance, both have diligence, both have the power to refrain from doing what is wrong, and whatever either of them does better than the other, is best for both. And, because the natures and dispositions of both are not equally perfect, they have so much the more need the one of the other, since what one lacketh the other hath. In the art of cultivating Sanitary Science, this mutual understanding is necessity itself.

We ought not to blame womankind because it seems that women are behindhand in the work. They are not, in point of fact, behindhand at all; they are rather the forerunners in the race. Long before the word Sanitation was heard of, or any other word that conveyed the idea of a science of health, the good, cleanly, thrifty housewife was a practical sanitary reformer. Nay, if we come to the question of organisation itself, we have in this country, in that admirable Institution, the Ladies' Sanitary Association, the first of the great sanitary societies, which by its publications, its practical aid to mothers, its outdoor recreative parties to the stived-up children

of the metropolis, and by various other means has set an example which will one day be historical as a part of the great movement in the promotion of which we are engaged.

There is not therefore one single difficulty in the way of making the woman the active domestic health-reformer. The only thing that requires to be put forward is the method of bringing her universally into the work, and, if I may so express it, making the work a permanent custom or fashion, to neglect which would be considered a moral defect. There are in England and Wales alone six millions to be influenced. The first suggestion is that the beginning of the crusade shall be a beginning that shall not drive, but lead; that shall not dictate, but patiently suggest.

If what Pope said of man be true:—

Men should be taught as though you taught them not,
And things unknown be told as things forgot.

In respect to the sex still more susceptible and impressionable, especially when those truly feminine duties which are connected with domestic health and happiness form the subject of advancement, it may with equal truth be said:—

Women should ne'er be taught a thing unknown,
It should be credited as all their own.

Nor can any finer or nobler occupation be imagined than is implied under this head of domestic care and nourishment of health. There are women who think it the height of human ambition to be considered curers of human maladies; content at best to take their place with the rank and file of the army of medicine, and not perceiving that the only feature in their career is its singularity, a feature that would itself become lost if the wish of the few became the will of the many. I would not presume to interfere, on this point, even with the wish of the few. At the same time I would with all my strength suggest to women that, to be the practitioners of the *preventive art of medicine*; to hold in their hands the key to health; to stand at the thresholds of their homes and say to disease, 'Into this place you shall not come, it is not fitted to receive you, it is free only to health, a barrier to disease;' to conjoin in this work so effectually as to be able to say to every curative practitioner who invades their cities, 'You may come in if you please, and settle down if you please, but there will be nothing for you to do, except to write up, after a time, as a warning to all practitioners of the curative school: 'Who enters here leaves hope behind;' to exercise practical power in such a manner, would, I venture to indicate, be as much above the exercise of curative art, as the art of making unsinkable ships would be above the toil of working at the pumps of a sinking vessel that was only sinking.

because it had been allowed to fall into a perfectly hopeless state and condition for resisting the strain of the deceitful sea.

I press this office for the prevention of disease on womankind, not simply because they can carry it out; not simply because it pertains to what Xenophon describes as their special attributes, their watchfulness and their love; but because it is an office which man never can carry out; and because the whole work of prevention waits and waits until the woman takes it up and makes it hers. The man is abroad, the disease threatens the home, and the woman is at the threatened spot. Who is to stop it at the door, the man or the woman? What does a man know about a house, about the very house he lives in, if he be a man employed at all? I asked as good a man of business as ever went on Change, how many rooms he had in his house? His reply was: 'What an absurd question.' 'Why absurd; the house is your own?' 'Yes, but I have never thought about it. You should ask my wife if you want to know. She will tell you all about it from the butler's pantry to the cockloft; but as I only go into two or three rooms myself, how should I be likely to remember? It is not my department.' That is so generally. The woman knows all about it, or if she does not she ought; it is in her department to know the whole matter by heart. The house is her citadel.

There probably is not a person who is given to reflect, who will not in the main agree with me in these conclusions. The strongest-minded woman, the woman who would assert to her heart's content the right of womanhood to assume manhood, would, I think, agree with me in the main. She might and possibly would affirm that I do not go far enough; she might feel the position I have assigned to woman as too feminine in its tenderness and as a retrogression from the design of attaining the equality of power which she would consider necessary for the perfect liberty of woman from the bondage imposed by men. At the same time she would agree so far as to admit that if her fellow-sisters everywhere could claim and hold and maintain such a power of practical knowledge and skill as I have pointed out, their mission in this world would be more greatly advanced and more nobly utilised than it is at this time. Nay, perchance, when she has heard me to the end and has well considered the tremendous power which the completed scheme would give to her sex, she might feel that her ambition would be more than satisfied by its accomplishment.

While women in general will, I feel sure, almost think it impossible that so much useful influence could be attainable, the majority will ask: 'By what process of training can we so govern domestic life that diseases may be prevented wholesale; that life in all its innocence and fascination may never, except by the most vulgar accident, be in-

vaded by death; that adolescence in all its beauty and unfolding strength may be equally guarded; that manhood and womanhood may have the same protection; that middle age may be extended in intellectual and physical perfection into the grand decline; and that the grand decline itself may be so gentle, so peaceful, so beautiful,—yes, so beautiful, for there is a beauty in healthful old age that is unsurpassed,—that life shall be but a dream and death but a natural sleep? They will ask, I repeat, the majority of them, by what process of training can we help towards a triumph of science so beneficent?

I devote myself from this point of my discourse to give some answer to that question. I state at once that the training required is simple, beyond simple; that every woman who wills to go through it may go through it and may become mistress by it of the destinies of the world. Not the Fates themselves were more the mistresses of the destinies of the race than the women of an educated Commonwealth who were conversant with the art of the prevention of disease and premature decay.

Ischomachus, content to have his wife taught housewifery pure and simple, would, I think, in this day be not quite so content. He would wish that she should know everything about the house in which she and he and their family dwelt; he would wish also that she should know something of that house of life which belongs to herself and to all hers. He would not desire that she should become a profound anatomist; he would not care for her to enter on the subject of experimental and practical physiology; he would scarcely aspire that she should try to emulate Hippocrates in diagnosis, or Dioscorides in therapeutics. But with our modern knowledge in his possession he would, I venture to suggest, have begged of her to learn a few principles which would help her to understand the reasons for the necessity of her domestic cleanliness and wifely care. As he is gone before these desires could be current, I will, with much respect, take his place, and indicate what every woman who aspires to be a wife, a mother, and a practical Sanitarian ought to learn in this particular direction.

She should master physiology so far as to understand the general construction of the human body. She should know the nine great systems of the body: the digestive, the circulatory, the respiratory, the nervous, the sensory, the absorbent and glandular, the muscular, the osseous or bony, and the membranous. She should be led to comprehend the leading facts bearing on the anatomy and function of these systems. She should understand what part food plays in the economy; the nature of the digestive ferments; the primary and secondary digestions; the method by which the digested aliment finds

its way into the blood; and the specific purpose which is answered by and through the application of foods, proximate and elemental. She should be rendered fully conversant with the different changes of food that are required for the digestive process in different periods of life; the extent to which the digestive powers should be taxed in infancy, childhood, adolescence, maturity, first and second decline, and old age. She should be made aware what substances, taken as food, are of real and what of spurious quality. She should be taught the relationship which solid foods hold to liquid foods or drinks. She should be told what drinks are foods, and she should specially understand what are the particular foods required for the young during the periods of active growth. In illustration of the value of this last-named fact, it may be stated that if women only know what foods were requisite to feed the skeleton or bony framework of the living body while that skeleton is in the course of growth, and if she would act upon her knowledge, as she almost certainly would if she possessed it, there would hardly be one deformed child left in the land in one or two generations. Rickets, with all its attendant miseries of bowed legs, crooked spines, and humped backs, would pass away as if by the spell of an invisible enchantress.

After the understanding of the digestive system, the woman should learn the principal facts relating to the circulation of the blood, the organs of the circulation, the heart, the arteries, the capillaries, the veins, and the blood itself. She should know completely the mechanical construction of the heart, its coverings, its cavities, its lining, its valves and the uses of the parts. She should understand the work of the heart; how it rests when the body reclines; how easily its daily tonnage of work can be increased by perfectly unnecessary strains and stimulation until a day and a quarter of hard work may be compressed into one day, and a fourth of the vital spring of the heart for that day be lost for ever as so much taken from the sum total of life. She should know how the heart is sympathetically moved in its action, and may be weak or strong, regular or irregular, calm or excitable, by the influence of external impressions which, in passing, may seem nothing and yet be everything. She should learn that in early days the whole after-life may be shaped, I may say, by the tone that is given to the heart, and that whether in its pilgrimage a Faintheart or a Greatheart shall occupy the stage on which a young life is to enter shall turn absolutely on this one educational fact, the skill of the trainer of that simple and susceptible mechanism, the human heart, while yet it is susceptible, fashionable, and undetermined.

Nor should she, in respect to the healthy organism, be less informed respecting that breath of life which is ever being breathed into the

living thing by the Eternal Chemist whose constructions and resolutions are the motions visible and invisible of his eternal universe. The complete structure of those breathing lungs should be as plain before her as the outward form of the things she knows best. The course of the blood, like a curve from one side of the heart to its other side through the maze of spongy lung-tissue, should be easily traced. The expansion of the six hundred millions of little vesicles of the lungs, which the air inflates, that it may, over so vast a surface, expose itself to the circulatory blood in its rapid passage through the vesicles; the change that takes place in the blood during the passage; the gas that is robbed from the air by the lungs; the gas that is given up to the air by the lungs; the change in the colour and character of the blood that attends these processes; the course of the changed blood bearing its vital air, or oxygen, in myriads of tiny cells through the arteries to the body at large; the spreading out of this blood over the vast sheet of minute vessels which make up the vital expanse, the vital furnace, the vital foundry of the body; the consumption of vital air there; the unloading of new material or pabulum there; the removal of old and effete structure there; and the recharge of the blood with the gaseous products of animal combustion there;—these things ought to be as familiar to the mind of our scholar as the commonest things in life; the letting in of air to feed the fire, the entrance of the servant with coals, the burning of the fire in the grate, the use of the fire for various domestic purposes, the opening of the ventilator to allow the smoke to ascend the chimney, and the removal of the ashes and debris that more new fuel may be supplied to keep the fire alive.

Equally clear to her should be the leading facts bearing on that receptive system of the body into which the external universe transports itself, and from which, in reflex response, the acts of life, the expressions, the movements, the thoughts, return in wavelike repetition back again, to become themselves external phenomena, linked, as such, with all the visible universe. Those nervous centres, locked up in the skull and spinal cord, to receive and retain and remit; those doubly-acting nervous cords, bearing the impressions to the centres and bringing them back again; those exquisite nerves, so finely set and balanced and distributed for play of reason and volition; and those other sympathetic, nervous centres in the trunk of the body, allied to the viscera, which they serve, and governing the automatic motions on which the volition has but indirect control—centres of emotional and what is commonly understood as instinctive faculties,—these parts, these systems, all, in respect to general function and vital value, should be as familiar as the course of the sun, from whom, in essence, they spring. And with these

nervous organisms the fields of the senses, too, should be made clear; the outline of the plan of an organ of sense being as simply comprehended as the plan of a camera or other well-known human instrument.

Let me interpose one practical illustration here of the value of knowledge bearing on the organs of the senses. Recall how many young people and middle-aged people are going about in spectacles, unable to see any object with the naked eye that is not uncomfortably near! Recall how many of these have also their backs distorted! Why this strange combination of deformity? Mr. Liebreich tells us, 'The greater part of it is induced while acquiring the art of writing. When the body is still being formed and is unconsolidated, the child is permitted to sit with the chest and back bent forward, and with the eyes close to the paper. Thus the natural refraction of the lenses of the eyeball is permanently perverted; the parallel rays of light are brought to a focus before they reach the retina, and there is produced the deformity of *short sight*, for the correction of which an artificial lens or glass is required. At the same time the back abnormally bent retains its abnormality, and short sight and curved spine go together, twin defects of one error which ignorance of the simplest principles permits the devoted and affectionate parent to overlook, as if it were a necessary and therefore irrepressible and irremediable evil. Let us suppose the women of our country trained to a knowledge of the first and elementary truths about visual function, and guided by them, is it not all but certain that another deformity would in a generation become virtually a physical misdemeanour of the past?

To this knowledge of nervous function it would be advisable to add to the store of elementary principles a few facts respecting the great glandular system of the body; that system which produces the digestive and other active secretions, the saliva, the bile, the pancreatic juice; which absorbs the food; which takes up and, as it were, drains the tissues and eliminates those fluids and excretions by which the effete and useless animal material is removed from the body.

Of those little fleshy engines which clothe the skeleton, which are the active organs in animal motion, and which, impelled and directed by the nervous system are the active workers, the night and day labourers of the body, the muscles, the woman should learn sufficient to be made aware of the advantages of so training the muscles to work that they shall be daily exercised, shall not be subjected to overstrain, shall be equally subjected as far as possible to healthful labour, and, by good and simple and systematic culture, form that external build of man and woman which the classic ancients of the classic age would accept as the model of the most powerful, the most symmetrical, the most beautiful of the types of the genus *homo*.

And of the bony skeleton, on which the muscular engines are laid, and which act as the passive framework and levers of the engine, she should gather enough information to be conversant with all its outlines of form and chemical construction. She should ascertain from her teacher that the bone, made up of two parts, an organic gelatinous part for shape and basis of support, and an earthy part for strength and durability, cannot be supplied with material for construction in unequal portions without yielding a deformed skeleton. That, deprived of its organic gelatinous part, it will become brittle and easily broken; that, deprived of its earthy part, it will be distorted, bent under the weight of the body, and yield bended limb, crooked spine, and diminutive form as the result of this one and serious deprivation of constructive material. The educated woman who had seen the exquisite build and symmetry of the skeleton; who had taken measurement of the cavities in which such vital organs as the lungs and heart are placed; who had fixed in her mind's eye the graceful curve of the spinal column; who had gathered the main facts about the sustaining parts of the skeleton; would, moreover, collect from the physical demonstration a series of inferences which would make her turn pale with dread and disgust whenever she detected one of her foolish sisters strangling her body in tight corset and murderous belt, to make it hideous as well as useless, or who was intent on destroying the perfect arch of the foot in a contracted foot-vice elevated on a pegtop.

Lastly, the woman should attain so much instruction in reference to the great membranous expanses as to know them also. She should study with special care that extended membranous expanse—so sensitive to external influences of heat and cold, so grand a breathing surface, giving up from its myriads of little sweat-glands volumes of invisible water, vapour, and gases, which, left in the body, must either be expelled by the lungs or remain to dull the sensorium and weaken the physical activity,—the skin. She should learn from this the necessity of keeping the functions of the skin in due cleanliness and condition for work, so that the bath, seen to be more than a luxury, should be considered as one of the necessities of the daily life, like a daily meal of cleanly substance.

The living house thus generally learned, the Sanitarian helpmate for us who can do so little beyond our suggestion, would be tempted to study until she completely mastered it, the mysterious construction of that deadly-lively house, which until lately the architect and builder have pitchforked into street and square with facile and contented wisdom of wigwam descent. She would require here, like Madam Ischomachus, to grasp all the details with as much precision as the old Phœnician merchant, or the modern yachtsman who knows the details

of his immaculate craft so well, that even in storm, hurricane, fire or disease, all resources are ready at hand. She would require in these days to know this and something more. She would want to learn how the immaculate house is in every room provided with at least moderate ventilation. She would require to find out how most effectively and economically she can maintain in the varying seasons an even and equable temperature. She would aim to consider in what way she could keep the air of the house free of that most objectionable of mischiefs, dust. She would demand to have marked for her on a map or plan the precise position of every drainpipe in the establishment, and would insist, with intelligent skill, on having every drain kept as systematically clean as the china in the housemaid's cupboard or the metal covers that make so many bright and effective pictures over the dresser of the well-arranged kitchen. She would see, not trusting to the mere word of anyone, that those drains were properly ventilated so that sewer air could never enter the domain except as a burglar might enter by special skill and violence, against which there is no absolute protection. She would learn enough of the chemistry of water, to enable her to determine with as much facility, as she could tell whether a looking-glass is clear enough to reflect back without fault the image of her face, whether a water was wholesome and drinkable; and she would have a sufficient amount of skill to direct how an impure water might be purified and made safe for her and hers to drink and use for all domestic requirements. She would see to it that sunlight found its way as freely as possible into every apartment. She would see that damp had no place in any apartment. She would insist that where any living thing that ought not be present in a house exists in it, that house is unclean, and in some way uninhabitable for health; since health will not abide with anything that is uncleanly. She would see to the biennial purification of the dwelling, as though a Passover were still an universal belief and practice. She would make the very act of cleaning and cleansing clean; she would make the very places for cleaning and cleansing—the scullery, the landing, the bath-room, the laundry—the cynosures of the household.

In the art of perfection or towards perfection of health the educated woman would in her domestic sphere, bring her best energies to understand the selection, the purification, the preparation, and the administration of foods and drinks. I have shown by two striking examples how, by a simple application of knowledge, she might prevent two great national disfigurements and disgraces of ignorance. She may go far beyond that advancement, great as it is. As she would keep seeds of certain pestilence from her fold, or vulgar poisons

that kill outright, and proclaim at once with loud voice, 'accident, disease, or murder,' so would she do her best to keep out those refined and subtle poisons which, in and under the name of strong drinks, bring silently more accident, disease, and murder into this inscrutable world than all the other poisons put together, unlicensed though they be and so little liked by the exciseman that he would fly them any distance, the De'il himself in company, rather than so much as touch them with his divining rule.

I think too that in regard to foods, an intelligent study based on a knowledge of the natures and uses of foods would enable her not merely to carry out the best selections and preparations now known, but would lead her to introduce certain new and much improved methods of feeding. That she would acquire a thorough knowledge of the best art of cookery I take for granted; that she would acquire a good knowledge in choosing foods in season I take for granted; that she would become an adept in detecting actual wholesome from actual unwholesome foods I take for granted; that she would find out what foods are most suitable for persons of different age and constitution I take for granted; and that she would distribute food with well-balanced hand, neither feeding over-indulgently nor parsimoniously, that also I take for granted. But I expect she would learn to do more than all these things in relation to food, and would help, perhaps lead, in a work of the future that is in the truest sense universal in its objects. She would be able better than anyone to put to the test the experience whether it is good or necessary to go to the living animal creation at all for human food. I do not wish to introduce any false sentiment into this question. It is unnecessary for me to say that every cultivated mind revolts at the sight of the shambles and an inner consciousness shudders when the veil is lifted which conceals the processes through which the animalised meal passes before it reaches the table. More to the point is it for me to wish to know whether it is philosophical, that is to say, truly physiological, for us to go to the inert and dead to get the best sustinment for the quick and the living. I am in doubt. It does not seem to me that man is constructed to be a carnivorous animal. It does not seem clear putting the anatomical argument altogether aside, that it can be good to go to secondary sources of supply for our food when nature bountifully presents them to us from her prime source. It does not seem reasonable that we should employ millions of living laboratories for our daily food, and take the risks of disease which they in endless forms produce and propagate for us, when we can get all that is necessary without the chance of such production and of such propagation. It does not seem certain, when we know that the vegetable world is the original source of every particle of living food, and that car-

nivorous animals have to depend on the herbivorous for their supplies,—so that carnivorous feeding is an anomaly rather than a basic principle of nature,—it does not, I repeat, knowing these things, seem certain that the cost of the support of the living laboratories is justifiable on any ground except the extravagant process of making work that work may be at hand and employment procurable. In old and barbarous times, when implements were few and animals were plentiful, it is easy to see why men should feed by hunting and by slaying; and it is easy to understand why in a becalmed sea a vigilant captain should set his restless crew to the employment of polishing an anchor. It is not so easy to see why in this day, when the great question of peace is food, cheap food, good food, healthy food, and when means for endless, refined, and ennobling employments are open, we should still maintain the practices of a barbaric era. Still I confess I am in doubt. I am not sure whether the necessity for the secondary supplies of food for man, from the animal world, are or are not necessary, and that doubt it is in the rôle of the educated woman to solve. Her discernment, properly and eagerly directed, would soon settle whether those about her were injured or benefited by an exclusive vegetable and fruit diet. The very timorousness which Xenophon describes would make her study the more watchful and her experience the more definite.

However she might solve this grand enigma, sure I am that in watching carefully over food and feeding, the educated woman would quickly discover a world of facts that would be of unspeakable value. It has been one of the endeavours of my life to show that we living men and women make in our own corporeal structures a refined atmosphere, which I have called a nervous atmosphere, or ether: an atmosphere which, present in due tension, distinguishes life: which absorbed or condensed distinguishes death: an atmosphere through which the external world vibrates and pierces us to the soul: an atmosphere which pure and clear brings us peace and power, and judgment and joy: an atmosphere which impure and clouded brings us unrest and weakness, and instability and misery. A physical atmosphere lying intermediate to the physical and metaphysical life: an atmosphere which our great colleague, William Crookes, might call radiant.

That atmosphere, serene or troublous, light or gross, bright or gloomy, we make in ourselves, not from ourselves, but from what we take into ourselves and transmute there. We make it from foods and drinks, and as we make it it makes us. Go into the wards of a lunatic asylum and notice amongst the most troubled there the odour of the gases and the vapours they emit by the skin and breath. That odour is from their internal atmosphere, their nervous ethereal

emanation. They are mad: mad we say up to suicide or murder or any criminal folly. Can it be otherwise? They have secreted the madness; they are filled with it; it exhales from them. Catch it, condense it, imbibe it, and in like manner it would madden anyone! In one experiment of mine I have shown that a common product, a food if we like to call it so, a thing that can be made from food stuff, an alcohol, will by its mere artificial temporary diffusion through the healthy body bring on, for the time it is acting as a false atmosphere, such awful despair that the experimentalist can barely avoid destroying his own life.

See, from the study of foods, out of which the radiant or deadly atmosphere is made, what fields of discovery open to the mind. A mother, watching the effect of food on her gloomy saturnine child, may detect how she can so feed it that the cloud shall pass away. Happy mother of a child! Far, far happier mother, perchance, of science and hope. In some great establishments for the insane so much gloom is secreted in the nervous recesses of human frames that many times a day, but for excessive vigilance, some terrible hand would raise itself against itself, to kill itself. What if in a wiser day, however far off, the removal of that little cloud from a troubled child should show the way to the removal of those denser, blacker clouds which lower and create storms in human breasts, overpowering altogether the radiant nervous ether! What if from that minor event this greater one should follow! What nobler accomplishment of noble deed could woman perform, save and except when she is the mother of her kind?

Referring back to our friend Ischomachus, and Madam his lady, I said he would probably not wish that she, like Hippocrates, should be learned in diagnosis. Neither in this day should I press that as a part of the education of the sanitary female scholar. I do not say this as if to frighten anyone away from an art too obscure to be thought of, for diagnosis is one of the easiest and most commonplace of human acquirements when the superstitious mystery that is made to surround it is cleared away. But I say it for the reason that the art is not necessary for women except in a limited degree. I would claim, however, that to this extent it should be cultivated by women. They should know the correct names and characters of the more common diseases, and they should know, by sight, the everyday contagious or communicable diseases. To this knowledge of the communicable affections they should add a few facts bearing upon the periods of incubation of these diseases, the periods, that is to say, between the time when they are what is vulgarly called "caught," and the time when they are developed and in turn communicable, or

again, to use a common term, "catchable." Thus to know that scarlet fever may be incubated in a few hours, while small-pox takes twelve days, measles twelve to fourteen days, and so on, is very useful knowledge. It enables the question of isolation of the unaffected or the removal of the sick to be rationally considered; it suggests inquiry as to the origin of the infection or contagion; and it gives reliance to those who are attending to the wants of the affected. In like manner it is well for women to know the critical periods, special dangers, and ordinary modes of termination of diseases. Beyond this, diagnostic skill, on their part, needs little further development.

At the same time all the best known methods of preventing disease should be at their fingers' ends, and the rule of the sick room should be their faithful care. The woman should know everything about registering the temperature of the sick room and degree of humidity; the mode of ventilation; the different special methods of feeding, washing, and changing the sick; the most efficient means of disinfecting, and of removing or destroying the poisons of the communicable diseases. How, in this way, the woman could help the physician none but the physician can understand. I have said many times, and, on the principle that:—

'Truth can never be confirmed enough,
'Though doubt should ever sleep,'

I declare it again, that if, in the management and treatment of any of the acute and of many of the chronic diseases, you gave me, in this climate, absolute control of the fire and the window of the sick room, I could determine the course of the illness. As many as you like of my learned brethren might come and go, and consult and prescribe; let me have exclusive right to those two influences, the fire and the window, and the fate of the sick man is in my hands, the best other efforts all but void and vain. How vital, therefore, the influence of the woman, educated to sanitary work, in the sick room. What an aid to the physician! Nor to the sick alone should this systematic care of the woman be directed. It should extend, more carefully than it has ever yet done, to the very young; to those who are in the first weeks and months of life; so that they be saved pains and impressions, which received and registered, if not remembered, may be penalties of after days. I conceive, in fact, there is no department of practice more neglected, in respect to principles, than the management of offspring in its earliest youth. Love there is plenty of; admiration unbounded; rational systematic training, the poorest that can be described.

I fear I am keeping you too long; let me then be content to

point out but one more lesson for the modern edition of *Madam*, the wife of *Ischomachus*. She should have, in addition to instruction on all the points above-named, a good training also on some subjects which refer to mental as well as physical education, and to some qualities that lie somewhat out of the way of what is purely physical, and which yet obscurely lean towards it. In these directions she should understand the little appreciated law of temperaments; the nervous, the bilious, the sanguine, and the lymphatic. She should study the combinations of these, and she should observe how temperament influences health, taste, activity and disease. From this she would learn how different natures would intermix in work or play, and what work, what play, would suit the nature. The sanguine child, ruddy and red, with blue eyes, red hair, strong muscle, quick movement, restless limb she may set to study at books while she curbs exercise, with no fear that books will kill, for it will outlive any book. The bilious child with dark eyes, dark skin, black hair, stolid expression, thoughtful brow she will not set to the study of books as the work of life; for books may kill; physical exercise may save, but will never be carried voluntarily to injury. The nervous child with fair skin, light hair, blue eye, quick but feeble movement, timid glance, yet perhaps unbounded ambition, she will spirit gently; will balance between physical and mental labour; will apportion excess of neither, and will never urge unduly to any effort. The lymphatic child, large of body, pale, with grey or blue eyes, brown hair, shambling step, watery lip and slow determination she will rouse to action both physical and mental, with the full assurance that neither effort will do anything but good.

Beyond the study of the temperaments and the special dangers connected with them she should devote her mind to the consideration of what the learned D'Espiné has designated the mental contagions. She should study emotional contagion with special care, and on one emotion, that of fear, she should keep the most watchful observation, because she will discover it to be the most common and disastrous of all contagions. She will never excite it for a moment by story of superstition or dread. She will never suggest it. To tell a fainting or feeble person, 'You look weak, you look pale,' is, as she will learn, to add weakness to weakness, pallor to pallor, and ashes to ashes. She will lift up; disperse moral contagions wherever they are found; isolate the susceptible to them, as far as it is possible, from the centres of them; and through the windows of the mind let nothing pass but the sunshine of mirth and strength and beauty.

Finally, in physical psychological training there would stand out for contemplation, and action founded upon it, one more subject, that marvel of the marvellous in living phenomena, heredity of type

and action, extending to health, and extending, alas! to disease in its deepest foundations. A little aid from books of learned men, of *the* learned man of this branch of knowledge especially,—you know I can only mean Darwin,—would help the scholar much; but the aid she will soon be led to find in the yet higher authority of nature will help her most. She will see the descents from good to good, and even, though fortunately with decreasing ratio, from evil to evil. She will see the conquest of death as a natural conquest over evil, and being now in the groove of nature, she will detect how even she may availingly help nature. One effort here as a Sanitarian would call forth all her powers. She will stand to resist with her full persuasive might that process which I have elsewhere called the inter-marriage of disease. She will tell her sisters what that terrible process means. She will tell that diseased heredity, united in marriage, means the continuance of the heredity as certainly as that two and two make four; that madness, consumption, cancer, scrofula, yes, and certain of the contagious diseases too, may be perpetuated from the altar; and that the first responsibilities of parents towards the offspring they expect ought to be, not how to provide for wealth and position over which they have no control, but that preliminary healthy parentage, which is the foundation of health, and without which position and wealth are shadowy legacies indeed. Delicate ground, you may say. I admit the fact. But in a world in which those who study the living and the dead most carefully rarely see a man or woman hereditarily free from disease, even this ground must be entered on by the enlightened scholar. I touch on it here for the best of all reasons, that the subject it includes, affecting deeply the human heart in its sympathies and affections, is one on which the influence of woman the arbitress of the natures that are to be, is all potent for good or for evil.

To know the first principles of animal physics and life; to learn the house and its perfect management; to learn the simpler problems relating to the fatal diseases; to ordain the training of the young; to grasp the elements of the three psycho-physical problems—the human temperaments, the moral contagions with their preventions, and the heredities of disease with their prevention, these, in all respect and earnestness, I set before this Congress as the heads of the educational programme for our modern woman in her sphere of life and duty. Let these studies be hers, and once more may be applied to her the promise of that wisest of men, with whose words I opened this discourse: ‘She shall rejoice in time to come. The heart of her husband doth safely trust in her.’ And—sun and sum of all hopes, ambitions, happiness!—‘Her children shall rise up and call her blessed.’

BENJAMIN WARD RICHARDSON, M.D., F.R.S.

SECTION III.

METEOROLOGY AND GEOLOGY.