Modern dress; and clothing in its relation to health and disease / by T. Frederick Pearse.

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CLOTHING

IN ITS RELATION TO

HEALTH AND DISEASE.

BY

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PREFACE.

THE object aimed at in the following pages has been to indicate the principles which should guide us in our method of Dress, and to point out the consequences which follow some of the present fashions. In addition, some of the more important subjects connected with these points have received a passing attention.

HASLEMERE, *June*, 1882.

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MODERN DRESS.

CHAPTER I.

THE FUNCTIONS OF THE SKIN—ANIMAL HEAT.

THE special functions of the skin may be stated to be—

To remove impurities from the blood.

To maintain a proper degree of animal heat.

Besides these two more important functions, the true skin is covered with a protective layer—the scarf-skin—which is capable of being increased under special circumstances to enable certain parts of the body to bear pressure and other special forms of external influences. This layer is thin on the chest, because that part is always covered up, but very thick on the palm of the hand, which is subjected to frequent pressure. Compare the hard hands of a sailor with the glove-protected palm of a young lady. Many children whose arms and legs are exposed naked in all weathers have the skin on those parts rough and thickened, which is an attempt of nature to make up for the mother's neglect of providing proper clothing.

The skin is everywhere freely supplied with nerves, and impressions upon these nerves give us our sense of touch. Hairs grow more or less over the whole body, and although greatly developed in some people, afford but little protection from cold, except on the head.

The sebaceous or oil glands connected with the hair roots keep the hairs supple, and doubtless perform the same service to the skin by discharging their contents on the surface, and thus preventing it becoming too dry.

The most important functions of the skin mentioned above are connected with its blood supply. When the bloodvessels supplying the skin are enlarged, and thus an increased quantity of warm blood is sent to the surface, the skin becomes red, as in the act of blushing or from the effects of violent exercise, but the blood is cooled. When the bloodvessels are made smaller, the amount of heat passing from the body is lessened. Thus by the bloodvessels alone the heat of the body is greatly under control. Besides this arrangement for regulating the body's temperature there is the more powerful one dependent upon the sweat glands. These glands pour out under certain circumstances an enormous quantity of water in the shape of sweat. They are always in action, but under ordinary circumstances the small quantity of sweat which is formed is evaporated as soon as it comes to the surface, and perspiration is then said to be "insensible." Under violent exercise or great heat the perspiration becomes "sensible," and then large quantities of watery fluid may be got rid of. The perspiration is not merely water—it is water holding in solution various salts and animal impurities which are of no further use in the economy. Thus, besides being the means of reducing bodily temperature, these sweat glands also purify the blood. With the knowledge that the skin passes off deleterious substances we can readily understand how checked perspiration proves so injurious to health. If any organ does not perform its functions properly, there must either be an accumulation of poisonous and effete matters in the system, or some supplementary organ must be overworked. By the mutual interdependence of certain

parts of the animal mechanism, the functions of one organ may sometimes be taken up by another. The skin and kidneys act as purifiers to the blood, and these organs can assist each other in case of need. We perspire more freely in warm weather, and thus relieve the kidneys, whereas in cold weather we pass off a large quantity of water through the kidneys and very little by the skin.

These are briefly the chief functions of the skin. It must have struck many as being one of the most wonderful processes of nature that we should keep up such a constant temperature. Whether we go into a very cold country, or into a very warm one, in summer and in winter, at night and by day, the warmth of our bodies is almost exactly the same. Even when we are out in the cold wind, and feel very chilly, our body is almost exactly as warm as when we are in a hot room. This wonderful regulation of temperature depends upon the skin. We shall now see how a constant temperature is maintained, and how clothing protects our bodies under various circumstances against climatic changes.

Animal heat.—Perhaps the greatest function of the skin may be said to be the regulation of animal heat. Our bodies are constantly developing heat, and as constantly losing it. The sources of heat in the animal body are *chemical*, more especially from combustion, *physical*, as the warmth we derive from the sun and from artificial heat, and *mechanical*, arising from friction of the various parts of the body at every movement. The chemical processes involved in the use of our food are the chief agents in the production of heat. Our food as truly undergoes combustion as the coal does in the steam-engine. This combustion is accompanied by the process which chemists term *oxydation*. Instead, however, of the food being consumed, as the coal is in the fire of the steam-engine, it is only prepared and

digested in the alimentary canal, to be carried by the blood to all parts of the body, and to be used by the different parts as necessity requires. The combustion and oxydation of food take place in all the organs of the animal body. Oxygen from the air passes through the lungs into the blood, and is thus carried to all parts of the body. Now this process of oxydation involves the evolution of heat. When a muscle is at work, oxydation is active, and much heat is developed. The heat produced by the body when at work is much greater than when at rest. When the body is at perfect rest, the work requiring to be done is not much more than the mere maintenance of animal heat.

To these sources we owe our warmth: let us now see how we lose it.

A warm and moist body like that of an animal loses heat in *four* different ways. The first way is best illustrated by the warmth given out to us when standing before the fire. We call this "radiant" heat. The radiation of heat is always going on, so long as there is any difference between the temperature of a body and that of the things which surround it. A body is not necessarily "red hot" when it radiates heat. The amount of heat gained under the influence of radiation is proportional to the difference between the temperature of the body and that of the surrounding medium. Bodies absorb heat very differently; they also reflect heat differently. When entering a cave or a deep cellar, it feels very cold because heat is being rapidly radiated from the warm body to surrounding parts. Again, on kindling a fire in cold weather, it takes some time before the room feels warm and comfortable; not, in fact, until the walls get heated, because the first heat developed is spent by radiation in warming them. The room feels cold to us because its walls are absorbing some of our heat also. This radiation of heat can be lessened by putting certain

things round a body so as to intercept the heat. We clothe ourselves partly on this account, and it is upon this principle that a "cosy" is put round a teapot to hinder it getting cold.

The second way in which we lose heat is well shown by the chilliness we feel on standing about wet after we have had a bath. This comes under the head of loss of heat by "evaporation." When we get warm and covered with perspiration, we lose a great deal of heat as it is drying up. Evaporation consists in the production of vapour at the surface of a moist body. By this method wet clothes hung out of doors become dry, and ditches and ponds filled by a shower of rain become emptied. Several causes influence rapidity of evaporation. 1. Temperature: the higher the temperature of the atmosphere the more watery vapour it will contain. 2. Quantity of the same vapour in the surrounding atmosphere. If the air be saturated with moisture, evaporation of sweat cannot take place, and we feel oppressed with heat. The less of the same vapour in the surrounding atmosphere the quicker the evaporation. Notice how quickly dirty roads are got rid of by a dry east wind. 3. Movement of the atmosphere. If this be rapid, evaporation is active, because the air is removed before it has time to become saturated. Every one has experienced the pleasant feeling of a breeze on a hot day. 4. Extent of surface of evaporation. This is obvious. This process of evaporation has a very powerful effect in cooling bodies. In tropical countries, water is kept cool by using porous earthen vessels, which allow the water to percolate through them. When placed in a draught, active evaporation is continually going on. For the same reason wine is cooled by wrapping bottles in wet clothes, and placing them in a draught. Water in changing into vapour absorbs heat. It requires $2\frac{1}{4}$ caloric units (a

caloric unit is that amount of heat which is required to raise the temperature of one pound of pure water one degree Fahrenheit,) to change fifteen drops of water into vapour. As the evaporation of sweat is constantly going on, the body is being constantly cooled, and when we perspire freely we are losing heat in large quantities, although we often feel uncomfortably hot.

The third way in which we lose heat is termed "conduction." This is the giving heat to cooler bodies in contact with us. If we sit on the cold stones, or get into a cold bath, we shall not only feel the sensation of cold, but we shall find that we have given up some of our heat to the stones or to the water, and made them warm. So when one end of the poker is put in the fire, the other end gets hot by conduction of heat along the metal. By constantly having our feet on the cold ground we may lose a great deal of heat. Now, different things conduct heat very differently, and are called *good* and *bad* conductors accordingly. If we put sheets on our bed we are not so warm as if we used blankets, because the sheets do not retain the heat which passes from our bodies, but give it up almost as fast as they receive it. They may therefore be said to be good conductors of heat. On the contrary, wool, hair, and feathers are said to be bad conductors of heat, and therefore, if we want to protect ourselves from the cold we must use clothes made of these substances. In order to keep a body warm, it is frequently surrounded with non-conducting materials. Thus, to prevent the water-pipes from being frozen in winter, they are surrounded with straw. To prevent a body from becoming heated from outside, the same means are employed. Ice is transported in flannel or sawdust, and can be kept a long time in this way without melting. The clothes we wear have no warmth of their own; they only hinder, in various degrees, the body from

losing heat. Double windows are frequently used in cold places to keep rooms warm, on the principle that a layer of air between two materials hinders the passage of heat by breaking the paths of conductivity. For the same reason, two shirts are warmer than one of the same material but double the thickness. The sensations of heat and cold when in contact with certain bodies depend upon their conductivity. Carpets, for example, are much warmer than wooden floors, and these again warmer than stone floors. We must return to this part of our subject in treating of the different materials used for clothing.

The last method by which we lose heat is termed "convection." The air which immediately surrounds our bodies gets warm from being in contact with our warm bodies, and rises as it becomes warmer than other air. This warm air is replaced by cool air, which in its turn is again warmed and replaced, and so the process goes on. Everyone has experienced the heat of a crowded building, even when there is no fire or gas to make it hot, and this is greatly due to the air being heated by convection. When we are standing up, the air heated by the lower part of our bodies passes up over the head and shoulders; whereas when we are lying down, the air which has been heated at one part of the body does not pass over, and thus save the loss of heat at another part of the body. This is one reason why we are so liable to take cold when lying down; the other being that, having a larger surface in actual contact with some cooler body, we lose heat rapidly in that way.

The human body, therefore, is constantly losing heat, by radiation into the atmosphere around, by the drying up or evaporation of sweat, by warming the air immediately around us, and by conduction into the ground through the soles of the feet. By the increased exposure of blood to

the surface, as after exercise, more heat is lost; but there is a beautiful arrangement by which, when we are losing too much heat, the amount of blood going to the skin is cut off, and when we want to be cooled a large amount is brought to the surface. Heat, then, is continually being produced, and as continually being lost. It is lost chiefly through the skin, but also by the lungs. The blood passing from one part of the body to another carries warmth from the tissues where heat is being rapidly developed to those organs or tissues, the skin and the lungs, where heat is lost. In warm-blooded animals the loss and production of heat are so evenly balanced that there is a constant bodily temperature. In man this is about 98·5° F. In health, the variations are so slight that the arrangements for co-ordinating the loss with the production must be exceedingly delicate. When the temperature tends to rise, the regulators of animal heat must either check the production or increase the loss of heat; and on the contrary, when the temperature tends to fall, they must either diminish the loss or increase the production of heat. There is no doubt that more heat is made at one time than at another, as everybody knows the powerful effect of exercise upon the temperature of the body. The temperature of a warm-blooded animal during exposure to cold is maintained more by an increased production of heat than by a diminished loss; on the other hand, during exposure to heat the proper temperature is maintained more by an increased loss than by a diminished production of heat. Variations in loss of heat have to correspond to variations in production of heat, and this regulation is undoubtedly due to the functions of the skin. This structure is so endowed with bloodvessels that their enlargement, causing a larger flow of blood through the skin, will tend to cool the body, and, conversely, when there is a constriction of the bloodvessels

going to the skin it will tend to heat the body. Besides, there are the special nerves regulating the amount of perspiration independently of this vascular supply. Exercise increases for the time the production of heat, but at the same time loss of heat by the lungs is increased, and as the bloodvessels of the skin become enlarged, a greater amount of blood is exposed to the surface. In addition to this, the skin perspires freely. In these ways the increase in the production of heat, consequent on exercise, is counteracted by the increased loss. By regulative mechanisms of this kind the temperature of a warm-blooded animal is kept very equal. The temperature of children is rather higher than that of adults, and they are much more susceptible to its variations. From the above considerations of the losses of heat from the body, it will be obvious that the body loses more heat in cold weather than it does in hot, that when the air is very dry, a large quantity of heat is lost by the drying up of perspiration on the surface, and that when it is windy, the air, as it passes us, carries away with it a large quantity of the warmth of our bodies. The dryness of the air affects us as much in this respect as its temperature—perhaps even more so. Our southerly winds are warm and moist; our northerly are cold and dry; our westerly winds moist, and our easterly dry. The dreaded east wind causes a great deal of disease in man, and sometimes shrivels up the vegetation as if a fire had passed over the country.

CHAPTER II.

ON THE NATURE OF CLOTHING.

THE primary object of clothing is undoubtedly to protect us from the cold, and the human body by clothing can wonderfully adapt itself to extremely varying circumstances. Besides this use of dress, it is employed for concealment and display. Civilisation demands all three of these functions of dress.

In his demand for clothing, man is on a par with the rest of the animal creation. Man, however, is a naked animal, although there is reason to believe that in his original and wild state he was covered with hair. The lower animals, on the contrary, are either born ready clothed or acquire a covering soon after their birth. In tropical countries—probably the seat of man's origin—he is still able to go unclothed, but for the occupation of temperate and colder regions he is obliged to protect himself. Amongst primitive races this was formerly done by the almost unprepared skins of animals. Now, however, the various products of animals and plants are so prepared and altered that the original form and, in many cases, the value of the product are lost. The great object of dress is of necessity adhered to, although we do not make the most of the materials at our disposal. Civilised man wears a great deal more clothing than he really requires, because he does not wear the most natural ones. People surround themselves with clothes that are either so tight, so heavy, or so numerous, that they are unable to move their limbs and bodies freely, as nature intended them to do.

We found in the last chapter that the real function of clothing was to hinder the passage of heat from our bodies. In tropical countries, where the external heat is frequently above 100° F., clothes are not always required to protect from the cold, but are used for the sake of decency, and for decoration. Mature animals are all clothed. It will not be unprofitable if we examine the coverings nature has provided in different forms for the animal world, and we shall, perhaps, be able to learn a lesson to benefit ourselves. The skin in the highest classes of animals is covered with hair, or wool, or feathers. Whatever the covering consists of, it will be found to extend over every part of the animal's body. As summer is coming on it will be noticed that the coat becomes thinner, while with the approach of winter it grows thick and long. Whether the animal is clothed with hair, or wool. or feathers, the advantage of the covering in hindering the loss of heat is equally obtained, and the manner in which the loss of heat is hindered is much the same in each case.

Let us take the fur of animals and see how it keeps an animal warm. Fur consists of fine hairs, which project from the skin in a slanting direction ; they do not stand directly outwards, but overlap each other. The air which is close to the skin becomes warmed, and, consequently, the nearer the skin the warmer the air contained in the fur. When a cold wind strikes the animal's coat, its impact is broken by the close-set arrangement of hairs, and is not able to force itself directly against the surface of the skin. The cold air which is driven in between the hairs composing the fur is warmed before it can reach the skin surface by the warm air which surrounds the roots of the fur. By this arrangement the cold air is prevented from actually striking upon the skin of the animal, although the colder the air and the greater the force of the wind, the

greater will be the quantity of heat extracted from the animal's body. If it were not for this covering the animal would perish with the cold. If certain animals be varnished over, and the cold-protecting nature of their coat destroyed, they die from cold, because their altered covering allows a greatly increased loss of heat to take place from their bodies, out of all proportion to the quantity they are enabled to form.

Connected with the roots of hairs are small muscles, which, under a suitable stimulus, contract and raise the hair from its recumbent position on the surface of the skin. This occurs under the influence of cold, producing the condition known as "goose" skin. It occurs also under the influence of fear, and has given rise to the expression of making the hair "stand on end." Many animals, especially horses, have during cold weather what is termed a "rough" coat—that is, instead of the hairs lying smoothly on the surface, they are made to stick out and give an apparently increased thickness and roughness to the coat.

The covering of animals is further distinguished by being very light. It also fits the body comfortably, and does not interfere with its proper movements. It allows plenty of ventilation, for the air between the fibres of the fur is continually being changed, and it is found by experiment to be a bad conductor of heat.

What inferences can we draw from this examination? That our clothing should cover the whole body except the face and the hands and feet. That it should be warmer in winter than in summer. That it should be made of a light material, which is a bad conductor of heat, but which will allow plenty of ventilation to the surface of the skin. And lastly, that it should not interfere in the slightest degree with the proper movements of the body.

The nearer our clothing imitates the fur of animals the

better. Do not imagine, however, that a leather coat or a sealskin jacket answers the same purpose as the fur on animals. We cannot put hair on our skin like it is on the skins of animals, so we have to take the coverings of animals and make them into the various substances used for our clothes.

The different substances used in clothing answer their purpose very differently. Experiments show that those substances which most freely allow air to pass through them are the warmest. This will appear contrary to many people's ideas, as to them the object of clothing seems to be to keep out the air altogether.

Taking the quantity of air passing through flannel at 100—

Linen allowed	...	...	...	58
Silk „	...	...	...	40
Buckskin allowed	...	...	...	58
Kid „	...	...	...	1
Chamois „	...	...	...	51

If, therefore, our clothing kept us warm according to its power of excluding the air, kid would keep us 100 times as warm as flannel, whereas everyone knows that flannel keeps them warm and kid very cold. These facts prove that woollen materials are the greatest protectors against the cold.

Another point of importance is, whether the material is loose or on the stretch, as it has been proved that any material on the stretch allows more heat to pass through than when it is loose. If our clothes are properly made, therefore, they will keep us warmer when they are loose than when they are drawn tightly round our bodies. If we wear our clothes tight, we shall require more of them to keep us warm. Everyone has experienced how cold tight gloves and boots make the hands and feet. The most effective way of keeping ourselves warm is to have two or more layers of the same light, non-conducting material.

This does not interfere with the proper ventilation of the clothing, although it most powerfully hinders the dissipation of heat. Thus, as before stated, two layers of flannel "keep in" the heat much better than one layer of twice the thickness, and a second shirt will generally be found much warmer and more comfortable than a great-coat.

Another point of the greatest importance to be borne in mind is the effect of moisture upon clothing. All textures lose their ventilating and increase their conducting power when wet. Linen, cotton, and silk very soon become air-tight by wetting, whereas flannel only becomes so after long soaking. This explains why we feel so much colder and take cold more readily with a wet linen than with a wet flannel shirt next to the skin. It must be remembered, also, that clothes are as frequently soaked from excessive perspiration as from getting wet through from without. The danger is as great in the one case as in the other, and all persons who find that their underclothes have got wet through with their own perspiration should as quickly change as if they had got them wet through in a shower of rain. Retained perspiration saturates the garments, produces chilliness of the surface, and checks the action of the skin. Many persons become ill by getting their linen underclothing partially wet and not changing it. It is a frequent practice for people to put damp clothes on in the morning—their clothes having been huddled up into a heap during the night, and not having dried from the soaking with perspiration received on the previous day. This also is a frequent cause of disease.

In the chapter on Animal Heat we referred to what are termed good and bad conductors of heat. By a good conductor, we mean a body which absorbs and gives off heat readily; by a bad conductor, one which absorbs and gives off heat with difficulty. Hence those materials which are

the worst conductors are the warmest, because they preserve the animal heat. The substances used for clothing are either animal or vegetable. Amongst the former may be mentioned wool, fur, silk, and alpaca; and amongst the latter linen, cotton, straw, and bark. Some clothes are made of the combined products of animals and vegetables. The warmth of the dress depends partly on the nature of its substance, and partly upon the way it is manufactured. A material may be improved and lightened in weight by manufacturing it very loosely, so as to enable it to contain a large quantity of air in its meshes. Silk and cotton goods made with large meshes are often very warm. Under the head of flannel is included any woollen material wholly or partially made of wool. Pure wool is sometimes irritating; it is therefore frequently combined with either silk or cotton. The objections against flannel garments are partly because people wear them too long without being washed, considering that because they do not show the dirt and filth so soon as other goods they do not require such frequent cleaning. This is a dirty habit and a great delusion. Flannel clothing requires rather more frequent washing than other kinds of dress, because it absorbs the perspiration and effluvia from the skin so readily.

The uncertainty of our climate really requires that we should thoroughly protect ourselves against all climatic changes. To do this we must wear flannel underclothing reaching from the neck down to the wrists and ankles. It should be thin in summer, and thick or of two layers in winter. For the sudden changes from active exercise to repose, or from the heat of the day to the cool of the evening, which we are all more or less subject to, flannel underclothing will be found the greatest protection, and it will also be found the greatest safeguard against those "coughs" and "colds" which are so frequent in this country.

CHAPTER III.

CIRCUMSTANCES DETERMINING PARTICULAR KINDS OF CLOTHING.

CLOTHES must vary—

According to the season, and the state of the atmosphere.

According to the active or passive state, and age of the wearer.

According to the Season.—This appears at first sight so obvious that it would seem hardly worth mentioning were it not for the fact that so many people break through this rule and run the risk of exposure and disease. According to meteorological data, there is a fall in the mean temperature, commencing in November and extending to the end of February. There is also a short period of cold in May. Corresponding with these climatic changes there are bodily variations. It has been found by physiological experiment that the body becomes heavier during the summer, the gain increasing with the later months, and becomes lighter during the winter months, the loss increasing towards the spring. The changes take place somewhat suddenly about the end of March and the beginning of September. An analysis of the Registrar General's returns demonstrates that during the winter months the diseases due to exposure to cold are most rife, and that in those months also they are particularly fatal. From a consideration of these facts we are led to infer that clothing ought to be warmer in winter than in summer, and warmer than is the general custom for it to be worn. We ought to be able so to regulate our clothing that winter weather and

sudden changes should make no difference to us. Winter clothing. consisting of double layers of flannel underclothing, should be put on at the beginning of October, and worn uninterruptedly until the middle of May. The summer dress may then be put on, and worn until the end of September. The spring time is especially dangerous. A bright day or two makes one think that the summer has come and warm clothing is to be laid aside. Suddenly, however, the weather changes, perhaps to a bitterly cold east wind, and the unfortunate wearer of thin garments is found exposed, and is attacked with a fatal or dangerous disease. We cannot dress by any hard-and-fast rule. If the summer is hot and we wear thin flannel underclothing, we can do with light upper-clothing. If the summer is damp and cold, we shall require thick upper-clothing.

State of the atmosphere.—Against changes from day to day we must guard ourselves by a top-coat or a cloak, by the judicious use of which garments much illness may be avoided. There are some who maintain that to be healthy the body should be hardened by exposure to cold, and that to wrap up and "coddle" is the weakest of all plans. Our judgment must depend to a great extent upon our sensations, but the faults in clothing frequently depend upon the fact that many people feel cold, and know themselves to be insufficiently clad, and yet will not put on more clothes. It is in these cases and in children that so much disease from exposure occurs.

Active or passive state of the wearer.—It is this, perhaps more than anything else, which should determine the amount of clothing people put on. Those who are at hard manual work all day make sufficient heat in their own bodies that they can do with very little clothing, but if they do not wrap themselves up after they leave off work they are particularly liable to take cold. On the other hand,

those who follow a sedentary occupation or who take very little exercise require to be warmly clad. They do not make much heat in their bodies, from want of exercise, and therefore they cannot afford to lose it by exposure to cold. It is well known that if we keep moving about during the cold weather we do not feel cold, whereas if we stand or sit about we soon get very chilly. Old people and very young children do not stand the cold weather well, partly because they cannot take sufficient exercise to keep themselves warm; it is therefore particularly necessary they should be thoroughly well clothed. The man in his office all day during the winter can hardly keep himself warm even with a good fire and warm clothes, whereas the navvy makes more heat than his body requires even in the coldest weather. A sedentary occupation would kill a person lightly clothed.

Age.—The young and old require to be very warmly clad, because they are markedly affected by cold weather. In the aged, the digestive and respiratory systems are languid, and the body makes but little heat. They cannot afford, therefore, to lose much of what they make. It is during the winter that so many old people and young children die. Besides these circumstances which call for special clothing, temperament has great influence. Some persons can naturally stand the cold weather better than others, and it is these very people who generally give the dangerous advice to others about hardening themselves to the cold. As a rule, stout persons, who have a sub-cutaneous non-conducting layer of fat around them, stand the cold better than their leaner brethren. This power of withstanding the cold is most markedly found in those who have a tolerably uniform layer of fat all over their body. Total abstainers, and those who take but a very small quantity of alcoholic drink, can certainly stand the cold

better than those who are only accustomed to take what people might term a moderate amount. It has been found during the Arctic expeditions that extreme cold can best be borne by abstaining from all alcoholic liquors. It has been said that fair-complexioned people are more liable to catch cold than dark-complexioned people; but this difference is certainly not marked. Those who catch cold easily should wear warmer clothing than those who are not so readily influenced by changes in the weather. When driving, persons should be exceedingly cautious and wrap themselves well up, whereas if walking, and while they are at exercise, they can bear comparatively little. The following may be cited as an instance of how improper clothing may cause disease. A person goes to a crowded concert on a cold winter night. On first getting out of doors the air is felt very cold, but after walking briskly for a little way he soon begins to feel warm, and then does not notice it. By-and-by he sits down, surrounded by men and women, and the room is felt very warm. Now, from being in a cold, dry air, and perhaps a windy one, he is in a warm atmosphere, and practically a still one. He soon begins to feel uncomfortably hot. Why? Is it because he is making more heat? No; it is because he is losing less heat. When he was out of doors he gave up some of his warmth by radiation to the atmosphere around, because he was much warmer than things around him, but now he is surrounded by men and women who are as warm as he is. He is not able to lose heat by the process of convection. Thirdly, when he was out of doors, the air being dry, more water passed from the lungs with the breath, and evaporation from the skin was free also. Now he is in a moist atmosphere, and the perspiration, instead of being evaporated, collects on the surface. He not only feels the effect of the retarded evaporation of the sweat, but he can see it

collected in drops upon his skin. He tries to get cool by fanning himself. This causes a large quantity of air to pass over him, and thus enables him to lose more heat by convection and evaporation. The performance over, he steps out of the warm and moist room into the cold night air. His skin is warm, his clothes damp, and the surface of his body covered with a profuse perspiration. What a change for the body to undergo! Just now it was trying to lose heat as fast as possible, now it must try and keep all the heat in. And all this change is demanded within a few seconds. His damp clothes allow his body to lose heat by radiation more quickly, because they conduct the heat more readily to the surface. The cold, windy air carries heat quickly away by the process of convection. Evaporation is also actively going on. Every channel is, therefore, open for losing heat, whereas he wants really to retain it. He soon begins to feel chilly. The nerves, in trying to prevent his losing heat too rapidly, close up the blood-vessels supplying the skin and make it blanched. The blood is sent to the interior of the body, where, by the sudden addition of a large quantity of cooled blood, mischief is set up in the way of bronchitis, inflammation of the lungs, or of the disease, whatever it may be, to which his system is most subject.

Those who have least clothes on, under similar circumstances, would run the greatest risk, and those who had linen, cotton, or silk, would be in greater danger than those who wore flannels.

CHAPTER IV.

ON COLOUR IN DRESS.

IT was found in a preceding chapter that the character of the materials composing clothes made a great deal of difference in their protective values. The colour of our clothes is of importance also. Different colours absorb heat very differently, while different materials of the same colour show very slight differences in their powers of absorption. Experiments made with the object of finding these differences have shown that white textures absorb heat in the following proportions :—

Cotton received	...	...	...	100
Linen ,,	...	...	...	98
Flannel ,,	...	...	...	102
Silk ,,	...	...	...	108

With the same material, but of different colours, the proportions of heat absorbed were :—

White	...	...	...	100
Dark yellow...	...	...	...	140
Dark green ...	...	...	...	168
Light blue ...	...	...	...	198
Black	...	...	...	208

It thus appears that the darker the colour the more heat is absorbed. Green absorbs about one and a half times as much as white, and black about twice as much. In summer, therefore, when we want to lose heat rapidly and not absorb it, we should wear light clothes; whereas, in winter, when we want to take in heat, we must wear black ones, so as to absorb as much heat from the sun as we

possibly can. It has been argued by some that we ought to wear light-coloured clothes in winter, and the argument is supported by the illustration of the white-coloured animals of the Polar regions. It must be remembered, however, that in Polar circles the sun only shines for about three months in the year, and in that season the temperature is, of course, the warmest; whereas, during the whole of the remainder of the year, it is very cold, and the region is in semi-darkness. There being no chance of absorbing the heat of the sun, there would be no advantage in a dark colour. According to the powers of absorption, one might thus at first sight suppose that animals in the Arctic region would be black, while those in the tropics would be light. Practically, the opposite attains, however. The colouring of animals in the different regions seems entirely independent of their powers of absorption of heat. Most animals are coloured by nature to correspond, as far as possible, with the character of their surroundings. Thus birds in the tropics are distinguished by the same richness of colour seen in the foliage around them, whilst in the Arctic region, where everything is white from ice and snow, the native animals are white also. Along with the black pigment in the skin of the negro there is a corresponding profuse development of other more or less dark pigments in all the animal and vegetable life of the tropics. Dark clothes, therefore, should be worn in winter, and lighter ones in summer. Grey is a very serviceable colour, and might be more worn.

Besides the effect of colour upon materials in increasing or diminishing their powers of absorption of heat, it has a marked influence on the appearance of the face. This influence varies with different individuals. Surrounded by a bright blue bonnet, the face will tend to present a jaundiced hue; yellow will tend to make the skin look fair; many reds will give it a greenish hue; while some kinds of

green will cause it to present a deathly pallor. If the colours are too bright, the appearance of the face is seriously injured; but by a clever combination of hues, many faces may be considerably improved.

Colours are divided into Primary, Secondary, Tertiary, &c. The Primary are Red, Blue, and Yellow. They are termed elementary colours. The Secondary are composed of a mixture of primary hues.

Secondary ...
- Purple ... Red. Blue.
- Green ... Blue. Yellow.
- Orange ... Yellow. Red.

The Tertiary arise from a mixture of Secondary hues:—

Tertiary ...
- Citrine ... Green. Orange.
- Russet ... Orange. Purple.
- Olive ... Purple. Green.

Colours are said to be complementary when they mix and produce a neutral grey tint.

In the accompanying diagram the complementary colours will be found opposite to one another.

This is a circle showing the various simple and compound colours, and those which are complemental to each other. The three simple colours are placed at the angles of an equilateral triangle within the circle. The mixed Secondary colours are placed intermediate between the corresponding simple colours. The complementary colours are placed in each case opposite to each other. The circle may thus be supposed to contain every transition of colour between those marked down. Those which, when united,

yield a white or grey, will always be found opposite to each other.

White light may be split up by means of the spectrum into a variety of colours. When the eye is fatigued with looking at a red object, it seems to acquire after a certain

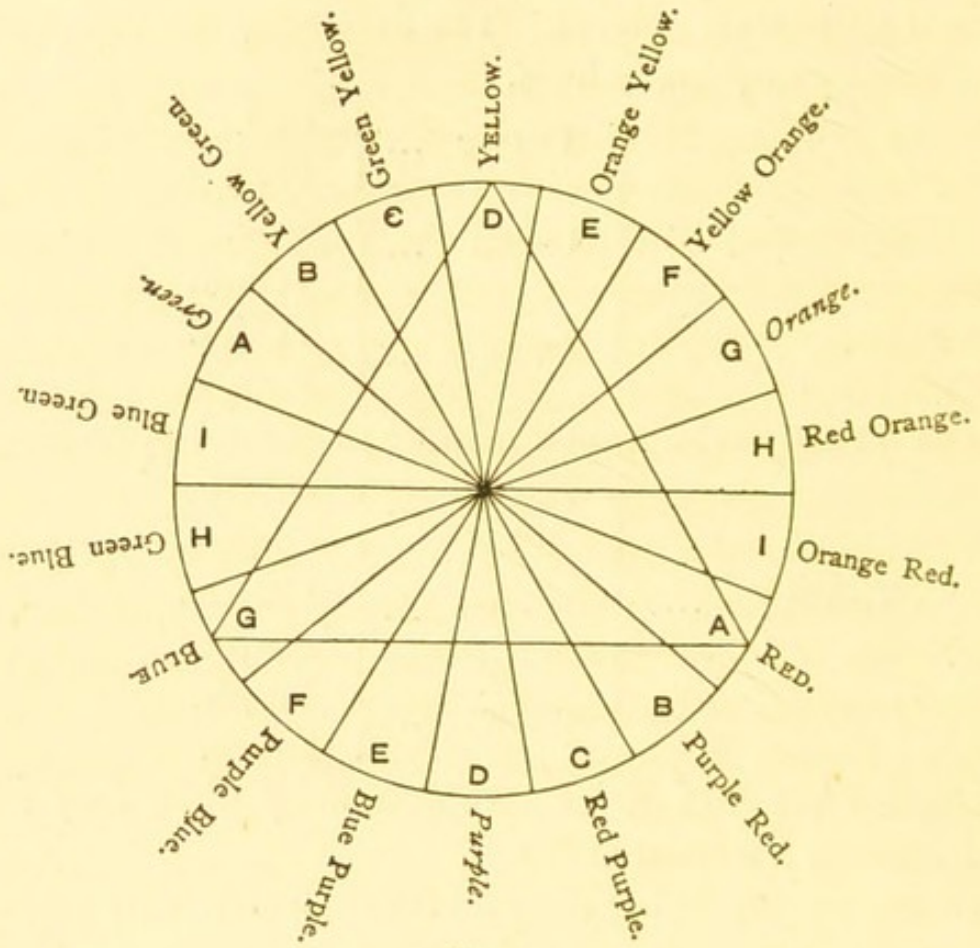

FIG. 1.

time the colour of green. This is the complemental colour to red. Again, the eye, fatigued with yellow rays will, after a time, suppose an object to be violet. The colours which thus reciprocally excite each other are placed at opposite points of the circle.

The secret of harmonising colours—complementaries or not—is that one of the two must be dull, and not too pure. If you have but one colour, it must not be a staring colour,

but what is termed dull in tone. If it be almost indescribable, so that you hardly know whether it is a blue or a green, a brown, a red, or a yellow, it will be so much the better. These mixed ill-defined colours are termed "artistic," and they will go with any other colour of an "artistic" character.

Uneducated persons and persons with a deficient taste are fond of attiring themselves in showy colours. The advantages of an "artistic" appearance may be admitted, but few persons will attire themselves in anything which does not suit their own particular taste. With two or more colours you want contrast, but the contrast must be a pleasant one. Red and green go together when the shades are deep red and dull pale green. Blue and yellow will also go together if the blue is, say, navy blue, and the yellow of the colour of umber; orange and the palest blue that can be made; blue and green when the blue is greenish and the green bluish. It is very important that all colours worn near the face should be very carefully selected. A brilliant colour will spoil the finest complexion. Any colour worn near the face must be soft and "indescribable."

CHAPTER V.

THE CHILD'S DRESS—MEN'S DRESS.

THE CHILD'S DRESS.—Soon after a baby is born it is wrapt up in a variety of articles, so that when completely dressed it looks like a bundle of clothes. At one extremity is a small round protrusion, the only indication that the bundle contains a baby. It is true that this custom is to a certain extent a safeguard against the child's catching cold. The style, however, is not the most beneficial for the child's health in other ways. There are one or two grave faults in this fashion. Instead of the chest and stomach being free to move when the child cries or tosses about, there is generally a broad flannel band bound tightly round the body, which effectually prevents any such free movement. It is natural and beneficial for babies to cry vigorously at intervals during the first few days of their birth. This stimulates the perfect expansion of the child's lungs, and is one of the greatest safeguards against so called weak chests in young babies. Besides crying, babies are in the habit of kicking and tossing about; but these natural and healthy movements are greatly impeded by the tight band and the great quantity of clothes which generally surround the child. If the baby from any cause gets a "cold in its chest," these tight bands and excess of clothes are most injurious. Mothers endeavour to keep their babies warm, and yet they generally make all their clothes of cotton materials. After a few months, generally at about three months, the original long clothes are discarded, and baby is put in what are termed "short" clothes. The arms and

legs are laid bare, and the dress is short enough to allow currents of cold air to blow up under the clothes. This change is made just at a time when the greatest possible care is required, and it is generally about the time when children are vaccinated. When the child begins to walk, his dress is again shortened, and he then goes about with bare arms, exposed neck, naked legs, and loose dress suspended from his shoulders, allowing every gust of wind to blow up under the clothes and over the whole surface of his body. Under these circumstances, it is not surprising that one out of every four children who are born die before they reach five years of age. The wonder rather is that so many pass that age. Of the numerous cases of death among young children a very large proportion is due to improper clothing, subjecting the children to all the evils caused by the vicissitudes of the weather. You cannot harden children in this country by exposing their bodies to all the inclemencies of our climate. Many persons will call to mind the thick, rough skin on the bare arms and legs of ill-clothed children. This is an attempt of Nature to make up for the mother's neglect. As children get older, they are able to take exercise to keep themselves warm, but young children are very severely punished by insufficient clothing.

What, then, should a child wear? It should have a loosely-fitting flannel garment to cover the chest and upper part of the abdomen. This "shirt" should reach high up in the neck, and have sleeves to cover its arms as far as the wrist. In infants the linen cloth round the lower part of the body is indispensable, but outside this there should be another loosely-fitting flannel garment to protect its loins and thighs. Beside these, a baby's feet should have woollen shoes, and also woollen socks reaching as high as the knee. Over the body the child requires another loosely-fitting flannel garment, which may be thin in summer and thicker

in winter, and outside this, again, any ornamental garments the mother likes to put on. The outside garments are not of so much importance, the only thing necessary to be observed being that they must be made loose, so as to allow free play of the chest and limbs. The taste may be satisfied or fashion followed in putting on outside garments, but for the safety and health of the child flannel underclothing is indispensable. If the mother cannot afford flannel next to the skin, on account of the extra expense of washing, then the child may have cotton next to the skin with the flannel outside it. A baby's clothes should be particularly light and allow every movement of the body perfectly free. The custom of the present day causes an excessive quantity of clothes to be put on, and makes them tight also. They are excessive, because, being made of cotton, they do not answer the purpose of keeping in warmth without there is a large quantity of them. The two layers of flannel, advised above, should be worn until the child is at least seven years of age, and under no circumstances is it wise to leave the arms and legs bare. When the child runs about, it is particularly necessary that the rules given later on for the choice and character of boots should be rigidly observed. Chilblains, so common on the hands and feet of young children, are due to the arms and legs being so much exposed.

In boys and girls, then, it will be seen that the principles of dress are exactly the same, and in both flannel is the best material for their underclothing. The outside garments must correspond to the sex, but may be of any material and shape that the parents wish or that fashion demands. In fact, the underclothing of every one should be based on the same principles, but should not be subject to the same changeable commotions which we witness on the surface.

Men's dress.—This is not so opposed to all hygienic principles as that of women. There are two points in which the present fashion of men's attire is open to great objection. The waistcoat is left more or less open in front to show the shirt, and thus exposes the chest and throat. The coat is left open behind, and leaves the loins exposed. The first fault in men's attire may have something to do with the frequent occurrence of bronchitis and other chest affections in men, and the second is almost certainly connected with the common complaint of lumbago, which in women is comparatively rare. Another point which is peculiar to men's dress, but hardly connected with fashion, is the use of belts or braces. The use of braces in weakly men makes them stoop. They naturally press upon the chest, and men would find their chests much freer without them. To those who are not accustomed to wear braces they are not only uncomfortable, but cause great physical uneasiness. The objections to belts are of a different character. By being tight round the abdomen they interfere with the natural process of respiration, and if any special exertion has to be gone through they are doubly injurious. By preventing the enlargement of the abdomen, which occurs naturally at every inspiration, and more particularly when straining, they press injuriously the contents of the abdomen against its walls. This increased pressure during active exertion on parts which are not protected by the belt frequently causes rupture. No one would think of putting a tight band round a horse if he wanted it to run a race, and why should it be put round the human body under similar circumstances, or during violent muscular exercise? Working men have got into the habit of wearing these belts, but they little know the dangers and disadvantages which they put themselves under. These remarks apply to the ordinary belts worn above the level of

the hips. The best method of supporting the trousers is to wear a belt round the abdomen below the level of the hip bones and passing between the top of the hip and the prominence of the thigh bone. This is also the most comfortable method of suspending the trousers, and if worn in this position it cannot unduly press upon the abdomen. We shall find that it is the custom of women to wear many of their things a great deal too tight. This is also the case with men. Besides tight belts men are accustomed to wear tight collars. These may frequently be seen cutting into the skin of the neck, and when the head is moved to one side, and the skin momentarily relieved, a white mark can be observed where the pressure of the rim of the collar has forced the blood out of the skin. The injurious effects of tight collars are not, however, upon the skin, but, by pressing on the veins of the neck they hinder the return of blood from the head, and so favour, more or less, congestion of the brain. If any one faints, tumbles down unconscious, or is picked up out of the water half drowned, one of the first things it is found necessary to do is to loosen the collar and other things round the person's neck. It is admitted, under these circumstances, that the clothes round the neck are interfering with some of the processes of animal life. Why should they not always be made to allow perfect breathing and a free circulation?

We shall have something to say about men's hats in a succeeding chapter. The underclothing of men must be based on the same rules as apply to women and children—that is to say, they should wear one or more layers of flannel next to the skin. The remarks to be found in those sections apply equally to men.

If the above faults are corrected, and flannel underclothing is worn, there is not much to complain of in man's dress as far as its hygienic character is concerned.

CHAPTER VI.

WOMEN'S DRESS.

THE prospect of making any impression in approaching this part of the subject is a very doubtful one. Women must be in fashion, and if fashion violates the principles of dress, women will even sacrifice their health to follow it. Women may clothe their children according to the dictates of science, but, until its precepts are followed by the leaders of fashion, women will only clothe themselves as fashion commands them. Fortunately their underclothing is not subject to the same storms of fancy which we witness on the surface. One freak of fashion involving the outer garments deserves a passing notice. Many women have adopted such garments as produce the same outward appearance as that of men. A lady is sometimes so like a gentleman that a sketch in *Punch* once depicted an old lady accosting a would-be young lady dressed according to the fashion, and asking her very indignantly if *he* was aware that *he* was in a ladies' waiting-room. The back view of some ladies is so like that of a gentleman, that if the mistake ever occurred it was quite a pardonable one. The underclothing of women should be made of flannel, for the reasons given when considering the subject of animal heat and the clothing of children. The flannel under-garments should be thick in winter and thin in summer. They should extend as high as the neck, down the arms as far as the elbows, or even to the wrists, and on the lower limbs as far as the knees, or even to the ankles. They must also be loose, or they will neither be so comfortable nor so warm.

The flannel underclothes may be worn in the shape of what is known as a "combination" garment, or divided into two parts representing the shirt and drawers worn by men. This last method is the most convenient. If a long woollen vest is worn next to the skin and the above-mentioned women's shirt and drawers worn outside, there will be no occasion for a woman to burden herself with more underclothes. The stays and large number of petticoats are quite unnecessary, as we shall consider later on. The ordinary underclothes of women are not made of flannel, as they should be, and they do not properly cover the chest and arms. Clothing should be so arranged as to keep all parts of the body at the same equable temperature. In the ordinary dress of women, the arms, shoulders, and upper part of the chest are often covered by the outer dress alone. The waist is sufficiently protected. About the level of the hips the body is surrounded by many layers of clothing. The female body may be thus divided according to the plan of physical geography into a frigid, a temperate, and a torrid zone. The linen chemise is a great delusion, because it is thought to afford sufficient protection, whereas it takes the place of a proper garment. The two chief faults in women's dress are the stays, and the great weight of petticoats bound round the stays and causing pressure where it ought least to be felt. Besides these, there are some minor faults we shall best consider first. Women frequently wear tight garters just below the knee. Garters in any position are bad, but if used they should be worn above the knee, as the two tendons to be felt at the back of the joint receive the pressure and act as a bridge to the veins which pass beneath. The stockings which, from the fashion of wearing short drawers, women are compelled to wear, should be suspended from a skirt-supporter worn on the hips. There is a form of stocking-suspender already

in the market. The garters as usually worn are a frequent cause of enlarged veins in the leg, and by interfering with the blood supply of the foot also favour the development of chilblains.

The tight leather or metal band that is frequently worn round the waist is as injurious as the belt worn round the waist of men, and the remarks made in the section about the belts of men apply equally to these bands worn by women. Women very seriously err in the choice of their boots, and the remarks to be made on that subject will more particularly refer to those worn by women.

Besides wearing tight boots it is a common custom for women to wear not merely accurately-fitting but tight gloves. This not only interferes with the free movement of the hands but keeps them very cold, and predisposes them to chilblains. Tight collars, which are so frequently seen in men, are also sometimes seen in women, but the usual fault here in women is rather that they do not wear their dress sufficiently high in the neck, and thus leave their throat greatly subject to exposure.

There is another article—the veil—which is frequently the cause of serious mischief. A spotted veil has an injurious effect on the eyesight, partly by the eye being constantly adjusted to see the little objects so near to it, and partly by the veil being drawn over the eye and setting up irritation in it. The irritation of some veils causes considerable redness and discomfort in the skin.

Evening Dress.—This costume embodies all the faults to be found in women's dress. It may be beautiful, but it is most unhealthy. In this form of dress the neck, the shoulders, and the upper part of the chest and back, are perfectly naked, while the rest of the body is clothed with "grotesque profusion." An important part, in a dress-maker's point of view, is the train or tail, "containing

enough material to clothe six or a dozen small children." Some parts of the body are thus kept below the proper temperature, others in an unnecessary state of warmth. There is more illness arising from this form of dress than from any other.

Stays.—It is difficult to judge with what object these articles were first worn. The most probable supposition is that they were invented by some stout old lady of fashion who wished to retain the appearance of her youth. There are some women who are said to have "splendid" figures, and the form of these women is the ideal which nearly every other woman tries to follow. Some women would make us believe that a very tapering waist was natural to them. This is not true, although some are able to constrict their bodies with less difficulty than others. These so-called splendid figures are generally those of slightly-built and well-proportioned persons whose movements are graceful and easy, and who do not require to alter the shape of their bodies to command admiration. Other women try to produce this ideal figure by distorting their bodies with stays, forgetting that the original and natural proportions of the body are, in consequence, entirely altered. There is no doubt that the female figure is very different with and without stays, but no woman can produce a good figure, or even improve one, if nature has not given her one originally. As women are as variously sized as men, it is absurd to suppose that by diminishing the size of their waists they thereby improve their figures. Some women look well with small waists, but not all. Some women again have an idea that if they did not wear stays they would have no waist at all. The degree of incurving at the waist certainly differs in women, and depends to a great extent upon development, but no undeformed woman is waistless. The waist is not marked in children, because the body has

not attained the width of full development at the hips and shoulders. Tight-lacing is especially injurious in young girls. In them, unfortunately, the pliant bones so readily enable a small waist to be produced that a so-called elegant waist is obtained without much discomfort. Mothers incite as well as sanction young girls in this practice, in order, as they term it, that the figure should not be spoiled. This is an unfortunate fallacy, for nothing is so likely to spoil the figure of a woman as the custom of having worn stays as a child.

How deformed-looking some women make themselves by drawing in their waists! The width of the shoulders and hips cannot be altered, but by drawing in the waist between them you destroy the natural form and proportions of the body, and produce, what is so ridiculed, a wasp-waist. No sculptor would ever think of carving the female figure distorted by stays, but the ideal he has always before him is the beautiful and natural form of a woman.

Why does fashion, then, try to improve upon nature? And why do the majority of women follow it? If it is done to captivate men, the consequently short-lived happiness must be a very questionable success. "Is it not even worse than senseless that a woman should encircle her body with whale-bones, and then pull the whole arrangement as tight as she can, merely to fulfil what must be honestly regarded as little more than a whim or trick of vanity?"—(Treves.)

We must consider tight-lacing *as a matter of beauty*, as well as *one affecting the health*. Our only method of contemplating female beauty is derived from a study of the nude figure in a fully-developed and normal woman. In that figure the line from the arm to the hip follows a slight curve, which is in admirable contrast with the greater curve of the hip and the outlines of the rest of the body. It is

this figure and this form which has ever been the ideal as well as the pride of the sculptor and the painter, and to picture it has required all the efforts of the greatest artists. Any alteration in the form or figure of any particular woman should be made *towards* this direction, and not from it. The model to which women are taught to aspire is that "of a woman planned upon the outlines of an hour-glass, and the proportions of whose waist are to the rest of the body as the stem of an inverted wine-glass is to its cup."—(Treves.)

Stays are sometimes so small and so tight that they produce very serious consequences. If a woman's waist measures naturally say 26 inches, and she wears stays measuring 22 inches, it is perfectly manifest that there must be considerable pressure on important organs. Besides the pressure on important organs there is the effect of altering the natural shape of the waist, and of putting the internal organs more or less out of place. The natural outline of the waist is represented in Fig. 2. The form of waist produced by wearing stays is represented in Fig. 3.

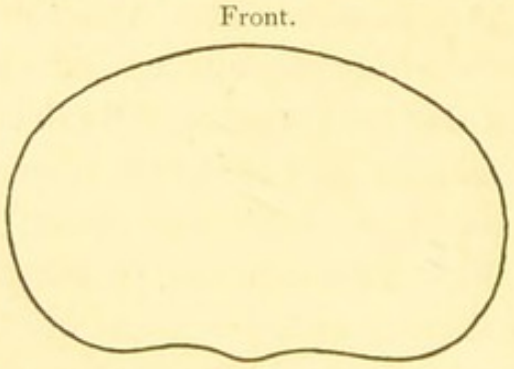

FIG. 2.

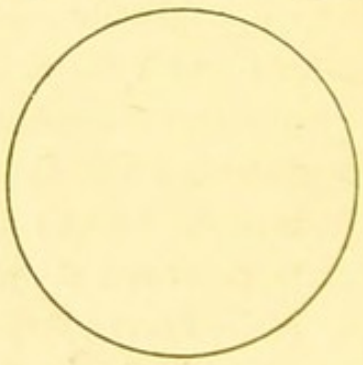
FIG. 3.

The effects of tight stays may be thus enumerated :—

a. Interference with respiration.
b. Displacement of internal organs.
c. Wasting of spinal muscles.
d. Distortions of bony framework.
e. Injurious effects on the general health.

In ordinary respiration the chest moves but very little—the process being effected by the contraction of the muscular *diaphragm* separating the chest from the abdomen. With each inspiration the abdomen becomes more prominent—the vertical measurement of the chest being increased, and the muscular floor of the chest forcing the abdominal organs somewhat downwards. It is especially important in women that the movements of the chest be unimpeded, as they are more dependent upon these movements, compared with men, than upon the action of the muscular diaphragm. If anything is put tightly round the waist this quiet abdominal respiration is interfered with. The muscles of the chest, therefore, have continually to do work which they are only called upon to do under bodily exertions. If any exercise is taken, the stays so fix the lower ribs and interfere with the proper movements of the chest that shortness of breath is complained of. Many women will say they cannot go up stairs, or walk up a hill without having to stop now and then to get breath. This certainly ought not to be. The chest should be perfectly free for any emergencies of respiration that exercise may call for. This difficulty of breathing on the slightest exertion makes exercise unpleasant, and consequently avoided; then follows that impairment of health which always occurs from inability to take exercise. Not only is respiration interfered with, but the heart's action is impeded. The digestion also suffers from the loss of assistance usually given to it by exercise, and from the cramped condition into which the stomach is forced.

The second effect of tight stays is the displacement of internal organs. This is a very serious injury. The following figures contrast the natural outline of the waist and the relative positions of the internal organs with the deformity and displacements caused by tight-lacing.

The lungs are compressed and forced upwards, and have been known to bulge in the hollows above the collar-bones. The heart is also pushed out of its place—somewhat upwards and more towards the middle line of the body. The liver, which does not naturally extend beyond the margins of the ribs, is pushed down even as low as the crest of the hip-bone.

The stomach is pushed down and towards the middle line. Dyspepsia is a very common consequence of this displacement. Many attacks of colic, and especially that

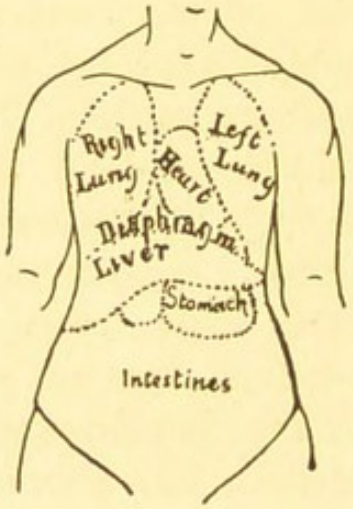

FIG. 4.

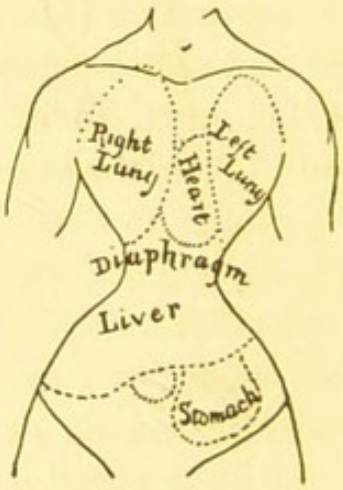

FIG. 5.

ailment popularly known as "spasms," can certainly be assigned to this practice. The lower part of the abdomen is given that unnatural prominence so many young women have, and other organs of the greates timportance are displaced. A woman's life is often made a burden to herself while even she and her anxious friends are totally ignorant of the cause. The smaller the waist you wish to obtain, the more all these organs must be pressed upon. "When stay-laces are being frantically pulled upon, and when a couple of maids are struggling to get their mistress's dress together, it must be remembered that it is no question of

merely squeezing in skin, and muscle, and bone—it is a question of squeezing in lungs, and stomach, and liver" (Treves). Gall-stones are much more common in women than men, and this appears to be entirely due to the peculiarities of their dress. Ulcer of the stomach, again, has been shown to be produced by tight-lacing. The function of all the internal organs is necessarily interfered with, and many persons become diseased without their being aware of it. When known, they are unable to assign any particular cause for it.

Wasting of Spinal Muscles.—During the long time that occurs between the breaking of a bone and its complete reunion, the muscles around the bone are compelled to be at rest. This rest causes wasting of the muscles. When, however, the bone has so far recovered that the muscles are enabled to be used, they soon pick up their lost substance and become as powerful as ever. Exactly the same thing occurs under the influence of tight stays. These stays act as a splint to the spine, and, by keeping it fixed, prevent any action of its muscles; the muscles consequently waste and become weaker. The wearer complains perhaps of weak back or weak spine, and laces tighter. The evil only becomes increased, and she finds the result of it in general and spinal weakness for the rest of her days. The muscles of the back having become wasted from want of use, the support of the back falls upon the corset. The contour of the back becomes altered, and has lost the beautiful outline given it by Nature; the bones appear prominent, and the back looks as if it had been imperfectly developed. The carriage of a woman cannot be graceful and easy while the body is kept stiff and erect by tight stays. The persistent use of tight stays tends to make the shoulders square. This arises from expansion of the upper part of the chest to compensate

for compression of the lower. The graceful slope of the shoulders in the normal woman is thus lost. As years roll on the high shoulders become round, and the altered configuration of chest produces that shapelessness so common amongst middle-aged and elderly women.

Why do girls grow up tall, and thin, and narrow-chested? One reason is that it is thought necessary to brace and strengthen them with stays and other appliances. The child should be allowed to modify her amusements and indulge in some more reasonable forms of muscular exertion than is considered proper for most young girls at the present time. It is a great mistake to suppose that because a girl is growing fast she requires support for the back. What she really wants is appropriate exercise to develope and strengthen the muscles of the back. Women will tell you that they derive great comfort from stays, that they support the body, and that if they go without them they feel "limp and inclined to fall apart." Some will even say they could not do without them. The truth is, that the back has become so weak from the use of stays it has become unable to support the upper part of the body without pain.

Distortion of Bony Framework.—This is in some cases very marked. The deformity is gradual, and the wearer is quite unconscious how she is disfiguring herself. The ribs are pressed into the soft substance of the liver, the marks being plainly seen in some cases after death. The lower part of the chest, instead of being the widest, is pressed in, making the chest barrel-shaped.

Injurious effects on the General Health.—These arise from the impairment of functions of the vital organs. The rest of the body, besides sympathising with these organs, is dependent upon them for its support, and consequently becomes deteriorated from want of a sufficient exercise of

its functions. Want of exercise causes debility and wasting. As the stomach is interfered with, its function will be more or less deranged, and impairment of the general health will consequently follow. We shall consider the effect somewhat more in detail when enumerating the diseases induced by improper clothing. Besides palpitation from pressure on the heart, the disturbances of the circulation induced by tight-lacing affect the colour and complexion of the face. It is a common remark about some women that they cannot sit down without the nose becoming red.

Women by these means cripple their physical and mental constitutions. Owing to a morbid view of what is beautiful, a form of body is cultivated which is injurious to bodily development, diminishes physical power, and impairs mental capacity. Let a tightly-laced woman try to draw in a deep breath, and she will find she is unable to do so. This unfortunate fashion is comparatively modern. When crinolines were in fashion there was no necessity for compressing the chest, because the waist looked slender enough compared with the enormous expansion below. A lady will never own she laces too tightly, and if told of it she will endeavour to refute the assertion by a practical remark, saying she can put her "whole hand inside." This is quite true, for by drawing in a deep breath and inclining the body forwards the size of the waist is still further diminished. To find out whether the stays and other garments around the waist are too tight, have the stays opened and all other garments loosened; then let the patient, after breathing quietly for a minute or two, take in a deep breath and stand perfectly upright. Let her now try and bring her stays and dress together. She cannot do so. In an article upon the effect of tight stays the *Lancet* remarked,* "The notion of improving nature by forcing

* 10th January, 1880.

the feet into tight boots, and the divers other devices with which fashion beguiles the love of personal embellishment, are sufficiently monstrous, but the audacity of attempting to compress the trunk, which contains the central organs of life, for the sake of appearance surpasses belief. . . . . Perhaps the recent death from tight-lacing, in which the heart was found to be so impeded in its action as to render life impracticable, may have some deterrent effect, but we doubt it. Fashion will prevail, and wasp-like waists will be cultivated in defiance of nature and art." Several deaths from apoplexy have occurred in young women who were exceptionally tight-laced. In giving chloroform it is always necessary to loosen the stays and other garments round the waists of women and the collar round the necks of men, because it is found that these articles so interfere with anything beyond ordinary respiration that, if administered without this precaution, the consequences would in many cases be very alarming. In referring to this subject of tight stays Mr. Haweis remarks, "What sensible man or woman can pity the fool who faints, perhaps, in the midst of a dance or conversation from the unbearable pressure on the heart caused by stays and girdle?" Any person who notices a tightly-laced lady after a dance will observe the heaving of the upper part of the chest and the labour for breath. This would not occur if there were no impediment to respiration. So many ladies complain of languor, a total inability for anything like vigorous exertion, and a sense of lassitude—symptoms to a great extent due to the interference with the natural act of breathing. Delicate women with a family history of consumption favour the development of this disease by compressing the chest and wearing low clothes.

Corsets of firm material as steel or whalebone are not necessary for any woman. Some individuals require sup-

port, but it must be only slightly stiffened and quite incapable of exercising constriction. For adult women who are spare no kind of corset is required, but a bodice of some stout material may be worn for the more ready adjustment of dress. For stout persons a corset may be worn composed of stiffened material, but entirely free from whalebones and steel busks. This will have no injurious effect on the health, and yet will fulfil all the purposes of comfort and appearance. For young women, and especially girls, corsets of any kind are not only needless but injurious.

Round the stays are suspended a greater or less number of petticoats. These by their weight cause an additional pressure on the abdomen and intensify the already injurious effects of tight-lacing. This weight draws on the spinal column, and is a serious impediment to the healthy exercise of the frame. Petticoats are intended to preserve the heat of the body, but really take the place of proper flannels. If a proper form of underclothing be worn, there will be no real occasion for any petticoats at all. The introduction of the so-called "combination" garment has provided a sensible means of covering the body as well as the lower extremities, and their proper use should render the wearing of petticoats unnecessary. As far as warmth is concerned petticoats could certainly be dispensed with, but if they must be worn they should be suspended by a band worn round the hips. The weight of petticoats which is frequently suspended from the shoulders is very injurious, and in people who are not strong compresses the chest and is very apt to cause curvature of the spine. The band to be be worn just below the crest of the hip, as described in the section on men's dress, answers every purpose and does not interfere with the functions of the body. Without stays and without petticoats breathing becomes perfectly easy, walking is a pleasure and stooping is not inconvenient.

This cannot be said of the way most women dress. Those who are strong enough to wear their petticoats suspended from the shoulders should wear a skirt-supporter. Under no circumstances should the petticoats be bound tightly round the body. In conclusion, I think it will be admitted by any unprejudiced mind that the corset and waist-belt are opposed to all that is beautiful and healthful.

When we compare the clothing of women with that of men we see that women labour under considerable disadvantage. In men the body is pretty evenly covered with clothing, and all the movements of the body are perfectly free. In women the lower limbs are left without close clothing, the centre of the body is strained with the weight which drags down the lower limbs and back, the chest is more or less exposed to every wind that blows, and the feet are bewildered by heavy garments which women have to kick forward or drag from behind with every movement. The dress of men, on the other hand, is easily put on and off, and leaves the limbs perfectly free. It allows free motion to the breathing, freedom of motion for the circulation, and no undue pressure on the digestive organs. This cannot be said for that of women. The outward appearance of the feminine dress should retain its distinctive character. A woman's dress must retain its gracefulness, but in every point where health is involved, for freedom of movement and for warmth, the dress of women should have all the advantages of that of men. The dress of men in regard to health is vastly superior to that of women. It allows ready change also to suit the vicissitudes of the weather. Few women wear the long cloak like that worn by the peasantry in Belgium, which can be thrown off and put on at each sudden change in the weather. In a variable climate like ours there is wanted an outer garment which should be light and warm, and easily put on and off.

CHAPTER VII.

PARTICULAR FORMS OF CLOTHING.

BOOTS.—There are few persons who are never troubled about their boots, and yet a properly constructed boot is a great comfort compared to those of the ordinary kind. It seems to be a practice in buying boots to pick out the best that can be found to fit the foot, instead of having the boots made for the wearer's feet. Persons who in some places go without boots or shoes do not suffer from the many ills that other people complain of about their feet. If the natural foot be examined, there will be found several points in which the modern boots distort the natural outline of the feet. A well-formed foot gradually increases in width from the heels to the toes, the widest part being across the so-called "tread" of the foot. When the foot is firmly planted on the ground the balls of the toes and the outer border of the foot touch the ground. The arch of the foot is on the inner part of the sole.

In the first place, the heel must be considered as the greatest fault in an ordinary boot, for the natural condition is that the heel should be on the same level as the sole of the foot. Another objection to the modern boot is that its inner side slants outwards from the great toe joint to form a point in the front of the boot with an inward slant on the outer side, whereas the natural shape of the inner side of the foot is perfectly straight. A third objection is that the sole of the boot is made smaller than the sole of the foot, which explains the bulgings beyond the limits of the

boot sole that are so frequently to be seen at the present day. Besides these faults, boots are made in most cases a great deal too tight, although the wearer is painfully cognisant of the consequences of this fashion.

Let us now consider the results of these mistakes, and we shall then be able to see what characters a boot ought to possess in order to preserve a healthy and comfortable foot.

Objections to the High Heel.—It is very liable to catch in any projecting surface. In this way it has caused more than one fatal accident. The most serious result of this fashion is the impaired walking powers and unsteadiness of gait which it induces. The heel is not only high, often exceeding two inches, but it is made so small at the bottom, frequently not larger than a shilling, that every time the heel is brought to the ground the body awkwardly balances on it until the forward movement of the limb transfers the weight to the boot sole. The consequence of this is the ankles become weakened by the unnecessary strain brought to bear on their ligaments, and the balance of the body has to be maintained by irregular muscular action. This interference with the natural movements and exercise of the body makes walking in many instances unpleasant, and consequently avoided. The general health then frequently suffers. The appearance of a person wearing these high-heeled boots is most ungraceful. A woman with high-heeled boots walks as if she were walking on tip-toe. There are few women who walk well or gracefully. This is in great part due to the high heels. The gait is stiff and uncertain. The fault is not in the female figure, but in her dress. Many parts of a woman's dress

FIG. 6.—Modern High-heeled Boot.

tend to make her walk badly. The boots may be too small, the skirts too tight, and the clothes too heavy. The corset keeps the back rigid and prevents the gracefulness of natural progression. Besides these there is the constrained position in which the hands are carried. They must not have the slightest swing when walking, and are often not even allowed to hang at the side. The habit of carrying the hands in front "tends to cause some rolling in the gait, and its unsuitableness for the act of walking is shown by watching the movements of a lady who wants to walk very fast, and yet keeps her hands demurely in her muff. She can effect both objects by rotating the body from side to side, and by developing an amount of movement in the elbows that is angular and inelegant."—(Treves.)

When the heels are worn as long as fashion continues an attraction and afterwards discarded, it becomes almost a new art to learn how to stand and walk with safety. The irregular hobbling tread which characterises many persons who have worn boots of this description can be easily recognised.

Besides being so high and so small, the heel of the modern boot is placed in the wrong position. The bottom of the heel will frequently be found under the middle of the arch of the foot. This form is still more dangerous than the old-fashioned high heel. The front of the foot also suffers from these mechanical errors. The natural foot forms a beautiful arch, having the toes and heel for its pillars, but the high heel spoils the shape of this arch and causes the body to rest on an inclined plane. The foot is thus pushed forward by the weight of the body into the toes of the boot. The elastic spring of the arch being broken by the heel, the vibration produced by its contact with the earth causes a concussion at every step, which travels upwards along the whole spinal column to the head,

and is sometimes very severely felt. From the foot being cramped into the front part of the boot, the natural expansion of the foot on being brought to the ground is prevented, and the foot, therefore, not being properly implanted, the sufferer is hardly able to walk with safety. When the high heels are accompanied by pointed toes the dangers are increased, and the sufferings of the wearer intensified. The effect of the high heel also is to transmit the pressure of the body weight to the middle and weakest part of the arch of the foot. The consequence is that the arch frequently gives way, producing the condition known as the flat or splay foot, and instead of the natural hollow on the inner side of the foot there will be even found a bulging. The unequal strain being thrown upon the ligaments of the ankle-joint some become shortened, others unduly stretched and weakened. This is entirely due to high heels and is frequently complained of as weak ankles. The arch of the foot from before backwards and the second arch extending from side to side, which naturally allow great elasticity, are rendered useless, and these very important arrangements for preventing concussion of the brain and spinal cord are totally subverted. Besides the so-called weak ankles which are developed as the result of the fashionable heel, "sprain at the ankle" is particularly liable to occur. A woman trips and loses her balance, and is unable to recover herself without falling, in consequence of the boot preventing the foot taking a firm hold of the ground. Under these circumstances the ankle gives way, and lacerations of parts around the ankle threaten more or less permanent disability.

Pointed Toes.—Most people wear boots with pointed toes, and a very large number of individuals are in consequence the unnecessary sufferers of corns and bunions. The very existence of a corn shows the sufferer has worn a

badly-fitting or improperly-shaped boot. The pointed boot not corresponding to the natural shape of the foot causes the toes to be pressed together, and in many cases to over-ride one another. When this form of boot is associated with high heels the evils are worse, because the weight of the body jams the foot into the front part of the boot. In a natural or undistorted foot the toes spread out, when the body weight is borne on the foot, but in these kinds of boots the toes are so squeezed as to keep them stiff and immovable. The more the movements of the foot are interfered with, the less graceful is the carriage of the body. This, however, is the least evil consequent on the fashion. The great toe is bent inwards, either above or below the adjoining ones. As a result, the joint of the big toe becomes tender, and perhaps bunions or corns form in the skin over it from the friction constantly taking place at the inner angle of the boot. Nature made the great toe straight, whereas the effect of these boots is to more or less distort the big toe joint, and to crowd the big toe with the others at the point of the boot. From the rubbing together of the closely-compressed toes soft corns and blisters are of common occurrence between the toes, and from the pressure and friction on the outer side of the little toe persons wearing these shaped boots almost invariably have a corn. Another effect of these boots is to cause the sides of the nails to be pressed into the skin, producing what is generally known as "in-growing" toe-nails.

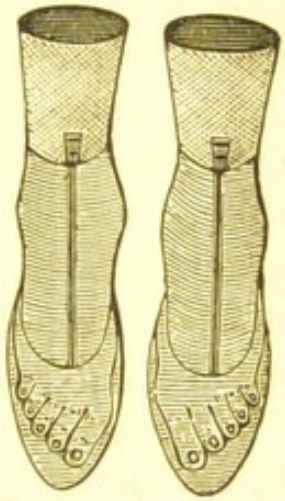

FIG. 7.—Boots with Pointed Toes.

Other Defects in Boots.—One of these is the smallness of the boot-sole compared to that of the foot. The appearance is then very ugly, from the feet overlapping the margins of the

boot-sole; besides which, the deficient size of the tread prevents the foot being firmly implanted on the ground. What with the small soles and the high heels, the steadiness of many persons on their feet is worse than that of those who walk on stilts. Besides this, a foot that has long worn a fashionable shoe becomes hideous. Some one may say, that if boots were made the shape of the foot they would be very ugly. This is not the case. I venture to say the outline of the natural human foot is more beautiful than that of a modern shoe, and a boot properly made to fit a natural foot is by no means ugly.

The soles of most people's boots are either too thick or too thin. Too thick when they are so stiff as to prevent the natural bending of the foot; too thin when they allow every hard object trodden on to cause pain. The waist of the boot is frequently made perfectly stiff, whereas, when made elastic and yielding, the boots are most comfortable. Tight boots are admittedly most uncomfortable, but besides being painful from their tightness they interfere with the circulation of blood, and are a frequent cause of cold feet. They are often the only causes of troublesome chilblains.

The Healthy Boot.—From the above consideration of the usual shape in which boots are made we can find out the proper form a boot ought to present. The heel of the boot should not be any thicker than the sole; it should be as large as the heel of the foot, and it should be placed at the hindermost part of the foot. The waist of the boot should be elastic and yielding, not rigid, as it is frequently made with the idea of supporting the arch of the foot. The boot-sole should be as large as the sole of the wearer, thick enough to prevent any hard object trodden on to cause pain, and somewhat flexible to follow the natural bendings of the foot. It is a good plan to have the bottom of the sole somewhat wider than the upper part. The inner side

of the boot must be perfectly straight to correspond with the inner side of the foot. As the appearance of a boot sloping off from the extremity of the great toe to the outer side of the little toe would be strange, and perhaps objectionable, to the taste of many persons, square toes are the more preferable. Under any circumstances, the inner side of the boot ought to be perfectly straight, or the wearer will be liable to have some complaint in his feet. The ordinary boot with pointed toes is the cause of many troubles.

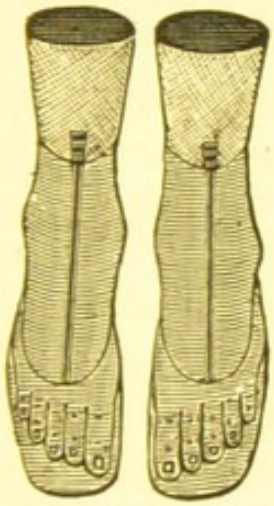

FIG. 8.—Boots with Square Toes.

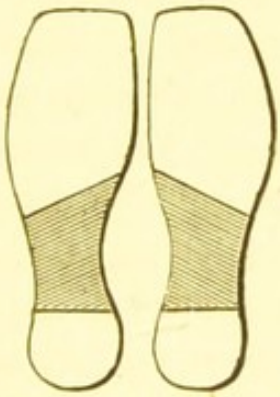

FIG. 9. — Shape of Lower Surface of healthy Boot.

Boots should be sufficiently loose to allow free movement of the foot inside the boot, and certainly not so tight as are usually worn, or as some persons are pleased to term a good fit. It is of the first importance that all boots should be made "rights and lefts," otherwise it is impossible that the boot can properly fit the foot. To ensure that a boot shall correspond to the foot, it is not only necessary that the boot should be specially made for the wearer, but also that something like the following method should be adopted to ascertain the size and shape of the foot. The foot, having the stocking on, should be placed on a piece of paper, and, while the person is standing, an outline of the foot should be traced on the paper. The measurements around the

foot at different parts, such as round the foot at the great toe joint, round the heel and front of the ankle, and round the instep, can afterwards be taken, and the leather cut accordingly. By this plan boots can be made so comfortable that the wearer never has to complain of them, and never suffers from bunions, corns, or blisters.

With regard to the material to be used for the sides of boots there is a great difference of opinion. Many persons think that by having laced-up or buttoned boots the thick leather at the sides gives support and strengthens the ankles. Others, on the contrary, consider that that very support tends to weaken the ankles by taking the place of the natural ankle supports and keeping the joints more or less fixed. The want of muscular action for maintaining the erect position, its place having been partially taken by the artificial support, causes a debility of those muscles which tend to maintain the erect position. The conclusion to be drawn is, that anything like a support for a healthy ankle cannot strengthen, but weakens it. It is certainly best to give children boots with elastic sides which allow free play at the ankle joint; and then their limbs will grow up strong enough without needing artificial support. Winter boots should be large enough to allow the use of woollen socks and those used in summer must be sufficiently large to allow the natural swelling of the feet which takes place in hot weather without rendering the boots uncomfortable.

Mourning.—Although the fashion of "going into mourning" does not violate the main principles which should regulate the character of our dress, there are several objections which may be urged against this custom. It is presumably done to show an outward respect for the dead, and even the poorest people follow this custom and wear some sort of mourning when a relative dies. It is a

custom handed down to us from the time of the Romans, and following the ancient Romans the inhabitants of most civilised countries wear black, whilst in China, which did not have the custom of Rome for an example, the sign of mourning is to wear white. It must be a remnant idea of barbarous times to suppose that a particular attire will show respect for the dead; the custom only affords an opportunity for the hypocrisy of grief. Not the least objection is the heavy and unwholesome folds of inky crape which some people surround themselves with. Besides this, it is a great and unnecessary expense, and in the case of poor people often reduces them to the greatest extremity. Besides, there is no useful purpose served by it. There are many intelligent persons who have broken through the trammels of this custom, and who go abroad in their every-day clothes when other people put on mourning. Besides a large number who do this, the Society of Friends make it a rule not to put on black in memory of the dead. This example is one which might be advantageously followed by people in general.

Mark Hamlet's words on mourning :—

"Tis not my inky cloak, good mother,
Nor customary suits of solemn black,
Nor windy inspiration of forced breath,
No, nor the fruitful river of the eye,
Nor the dejected 'haviour of the visage,
Together with all forms, moods, and shows of grief,
That can denote me truly : these, indeed, seem,
For they are actions that a man might play :
But I have that within, which passeth show;
These but the trappings and the suits of woe."

This custom of wearing black with the idea of showing respect for the dead corresponds to the ceremonies which

accompany some religious rites. It is true these outward shows and performances seem necessary to develope the sentiments in some people, but, as intellectual progress advances, they should be gradually dropped.

Coverings for the Head.—The varieties of articles used as coverings for the head may be most conveniently considered together in one section, although their special features may have called for notice when the separate characters of the dress of men, and women, and children were described. To begin from the beginning. The ordinary baby's bonnet is an absurdity, although it answers its purpose tolerably well. It is a costly article and requires great care to keep it neat and clean. The more or less woollen bonnets used by the poor for their children are much more sensible than, and equally useful articles as, the ordinary stiff coal-scuttle-shaped bonnets worn by the children of those who are well-to-do. The addition of a thick veil to a baby's bonnet is most important, and should always be worn when the temperature is at all low or when the wind is rough.

When the child begins to walk he is provided with one of the numerous varieties of children's hats. These are generally suitable for their purposes, for the reason that children discard any hat which interferes with them in their games. As they get older and approach adolescence, they are topped with coverings more or less like their elder brethren. Here the faults begin to creep in. Who can imagine a more ugly and absurd-looking article than the modern chimney-pot hat. Its only recommendation is, that it holds a large store of air to make up for its want of ventilating-properties. It is generally heavy, too tight, and anything but accurately fitting to the head. Its weight is a great inconvenience, and causes in many people severe headache. Its tightness, to make up for the amount of "sail it carries," causes men to be continually lifting up

their hats to relieve them of the pressure on the skin. This pressure all round the head interferes with the proper blood supply to the scalp, and is probably the cause of the increasing number of bald heads seen at the present day. Premature baldness is more probably due to this than to the use of smoking-caps. The bonnets and hats of women do not interfere with the circulation in this way. A hat of whatever kind in shape should not press tightly round the head, and especially on the temples. It should be permeable to air. It should be as light as possible. The soft felt hats, somewhat resembling the Foresters', answer this description tolerably well, but the common hard felt hats are almost as objectionable as the standard chimney-pot hat. The soft felt hats are most comfortable to wear, and protect the eyes from the direct rays of [the sun. In summer, light straw hats are very suitable. If a hat be air-tight the head will become uncomfortably hot, and will necessitate its being frequently taken off. If it do not fit the head, but presses more on one part than on another, it is hardly necessary to remark it will be uncomfortable. After these few remarks on the hats of men we will pass on to the faults in the hats and bonnets of women. The more or less beautiful appearance of these articles is quite independent of their value as protective coverings to the head. This, however, in many cases they do not do, but leave the front part of the head entirely uncovered. Elderly ladies are in the habit of wearing large and heavy bonnets. These make the head hot and uncomfortable. The faults in women's bonnets are quite different to the faults in the hats of men. They are the deficient size or the absurd position in which they are worn, rendering them useless as a protective covering to the head, or the excess of material, frequently used, rendering them hot and uncomfortable. There is but little objection to many of the light bonnets which

sufficiently cover the head, and many shapes can be picked from the varieties of modern fashion which, as free from the above faults, can be legitimately worn.

The Macintosh.—This article is generally unpleasant, because it prevents the evaporation of sweat, excludes the air from the clothes beneath, and thus makes the wearer uncomfortably hot. Under exercise the body soon becomes warm, and then if a person carelessly exposes himself while wearing a waterproof he is very liable to receive a chill. When driving it cannot be considered an injurious covering, but rather a protection against exposure to cold.

The Scarf.—There are many people who object to be "caudled" about the throat. There is no doubt that by plenty of suitable food and abundant exercise the body may develope so much heat that we shall not feel the cold even with very little covering. By custom under these circumstances the throat will bear exposure as well as the face, but the same exposure in the delicate, ill-fed, or in those following sedentary occupations, will surely bring disease. When driving in cold weather, there are few people who can bare their throats without suffering for it.

The Bed.—Although this would at first sight appear to be outside the limits of our subject, yet on second consideration it will be admitted as forming one of the most important points in connexion with clothing. We pass about a third of our existence in bed, and there are not a few diseases produced by improper clothing of this description. Some people sleep with too many clothes over them, and then get themselves uncomfortably and dangerously hot. Dangerously, because all people are more or less liable to get the clothes off them in their sleep, and therefore, if they expose their over-heated and naked bodies to the cold, they are exceedingly liable to become diseased. Many persons catch cold and get lumbago and other forms of rheumatism

in this way. Besides the risk run by exposure after being heated with excessive clothes, there is the exhaustion which follows prolonged sweating. One very common result of having too many bed-clothes is deep sleep during the night, and drowsiness and disinclination to get up in the morning. Other people will not or cannot have sufficient clothes on at night. It is a common expression to hear, "I was so cold last night, I could not get a wink of sleep." Besides preventing sleep, this want of clothes at night leads to similar results as those of exposure to cold in other ways. It must be remembered that our temperature is lower, that we are making less heat, and that we are less able to bear the cold at night than during the day. Our clothing should, therefore, be comparatively warmer during the night than in the daytime. The clothes should be all made of what is termed non-conducting material—the bed of hair, feathers, or straw, and the coverings of more or less wool. We should sleep in flannel gowns, as we are all more or less apt to get ourselves exposed during sleep, but the flannel garments worn at night must not be the same as those worn during the day. Flannel night gowns, thin in summer and thick in winter, should be worn by every one. One or more woollen blankets should be used, as it is an exceedingly dangerous plan to have nothing but sheets. By this method comfort can be arranged to a nicety. No one need be too hot, and if they can get the materials they certainly will not feel the cold. The advantage of woollen materials is that there is not the same risk on exposure to cold.

CHAPTER VIII.

CLEANLINESS AND CHANGE IN DRESS—DISEASES INDUCED BY IMPROPER CLOTHING.

CLEANLINESS in dress and proper change of dress are as important as the character of the materials which are used to form our dress. The manner in which this is carried out depends chiefly upon habit. The underclothing must be changed, however much a person washes, but a sufficiently frequent change of underclothing is not generally adopted. Under any circumstances it should be changed once a week. The clothes absorb the perspiration, and if the skin is not frequently washed they become full of the refuse matter poured out on the surface. This causes the wearer to become a source of annoyance to every one he meets. Besides this, the clothes lose their power of keeping in the heat. Clothes which have been worn without being changed for some time are also liable to cause checked perspiration, and thus allow a large amount of useless and poisonous matter to accumulate in the system, or cause some of the other organs to be greatly overtaxed to get rid of it. It is also of the greatest necessity to keep the skin clean, so that its secretion may not be retained nor impeded in its flow. After violent exercise, or under the influence of some diseases, the clothes soon become soaked with perspiration. It is then requisite that they should be changed; for the evils resulting are equally as great as if they had got wet through in a shower of rain. I need hardly impress upon my readers the urgent necessity of changing the clothes if they have become soaked by the

rain, nor point out in detail the folly of waiting about in damp clothes. Some people are very careless about getting their feet wet. So long as the person is in active exercise "wet feet" are not injurious, but when at rest they are the means whereby a great deal of heat is rapidly lost from the body, and are under those circumstances very liable to cause "cold."

Diseases induced by Improper Clothing.—Some of the diseases induced by improper clothing were incidentally mentioned as the faults in clothing were pointed out, but there are a large number which may justly be described as dependent upon the unnatural forms of clothing we put on.

These diseases may be divided into—

Those which result from various forms of exposure to cold.

Those which arise from the mechanical defects in our clothing.

Those in which infection is conveyed by means of clothing.

Under the first head we put those diseases which are generally admitted to be caused by exposure to cold, of which the following are the most common:—Sore-throat, tonsillitis or quinsy cold in the head and nose, inflammation of the lining membrane of the windpipe, bronchitis, pneumonia, pleurisy, neuralgia, rheumatic fever, and various forms of rheumatism, inflammation of parts of the spinal cord, and inflammation of the kidney. These diseases are not all equally common, nor are they equally liable to occur in each individual. Of several persons exposed to the same cold, one will develope bronchitis, a second rheumatic fever, a third kidney disease, and so on—the particular disease occurring being dependent upon some peculiarity in the individual. Those who are subject to affections of the throat should be careful to protect it from cold. Many

attacks of neuralgia of the face are caused by exposing the face to a current of cold air, as by looking out of a window or out of the carriage of a train. Those who are subject to take cold in one form or another should be particularly careful to protect themselves by suitable clothing. Why should every sudden change in the weather, especially in spring time, be so productive of disease if it were not that people do not sufficiently protect themselves with clothing?

Under the second division we must place cold feet, corns, bunions, chilblains, and weak ankles, from wearing light or otherwise improper boots; dropsy of the feet and legs, and enlarged veins, from tight garters; rupture, prolapse of rectum and uterus, constipation, indigestion, hysteria, faintness, palpitation of heart and difficulty of breathing, from tight stays and bands round the waist. Headache and mental oppression from wearing ill-fitting or tight hats. Baldness is also produced in this way. Many women injure their breasts with tight stays. The stays are worn so high that the naturally-projecting nipple is pushed into the substance of the breast. This constant pressure on the breasts and nipples causes what are known as "sunken" nipples; it also causes wasting of the nipples. The consequence of this is that when the mother wants to suckle her child she has either great trouble, and experiences great suffering in trying to get the child to take the breast, or otherwise she is not able to suckle at all. A very large number of women suffer from what are termed "cracked" nipples, and this, like the imperfect form of nipples, is almost entirely due to the habit of wearing stays. Another frequent result of tight stays is in favouring the hysterical condition. The pressure of the stays causes congestion of the organs at the lower part of the body, and this, with the impaired health consequent on deficient exercise, has a very powerful influence in developing hysteria. The phenomena of hysteria are so

varied that most people fail to recognise it unless it displays itself in the old-fashioned orthodox fit. Most medical men will acknowledge that it is a very frequent complaint amongst women.

There are a large number of people who suffer from habitual constipation. This is more particularly the case with women. It is due, in a great measure, to the want of active exercise, but in the case of women it is decidedly favoured by the character of their clothes. The whole body should not only be perfectly free to move unimpeded in the slightest degree by any garments, but it should have sufficient active as well as passive exercise to maintain its healthy functions.

The last division includes those diseases of an infectious character which are conveyed by clothes. The habit of hiring clothes for special occasions, and that of buying second-hand clothes, is attended with considerable danger. Who knows but that they may contain the poison of scarlet fever or erysipelas, of small-pox or diphtheria, or that they are perfectly free from parasites, which are allowed by some people to roam undisturbed over their bodies? The infection of some diseases may be carried by a healthy person and communicated to another without the person who conveyed the disease becoming affected by it. People may thus "catch" disease in trains and omnibuses. Clothes sent from one place to another may also convey disease. A dressmaker, if she makes clothes where such a disease as small-pox is raging, may scatter infection over a very wide area. Again, washerwomen may accidentally mix infected clothes with those of healthy persons, and thus convey disease. On the other hand, they are liable to receive disease from some infected article. There are a few diseases which are produced directly by clothes; those we have considered have only been indirectly produced through

clothing. Some garments are coloured with aniline and other dyes, which in some people cause considerable disturbances. I have seen a young lady's hand, that had become hot and swollen, covered all over with pimples and exceedingly painful, through wearing a "poisonous" pair of gloves. Arsenic has also been known to be used in the colouring of clothes producing its local and irritative action in the form of painful red sores. To some people flannel is so irritating that it is unbearable. This can in most cases be overcome by a little perseverance, but in a few instances it cannot be used at all. If cotton material must be worn next to the skin, it should be covered outside with flannel.

The human body can adapt itself to live healthily under any climate, but the effects of climate in the production of disease are less due to simple cold or heat, dryness or moisture, than to the neglect on change of climate to adapt our habits of life to the altered circumstances in which we find ourselves, and to the effects of sudden and unprepared-for variations in temperature. Considering the expense, the suffering, and the waste of time, consequent on ill health, it seems extraordinary that so many persons should be reckless of their health, and should go about insufficiently or improperly clothed. All the diseases which we have enumerated as due to exposure to cold may be avoided. Protection against cold is afforded by plenty of nourishing food, by exercise, and by suitable clothing. If persons take cold, notwithstanding they have plenty of food and get sufficient exercise, the fault must lie with the clothing. With deficient food more clothing is required, and with little exercise more clothing is required also. It is especially necessary to bear in mind that the clothes which are found sufficient while at work or at other forms of exercise are not sufficient when the body is at rest.

CHAPTER IX.

FASHION AND DRESS.

AS FASHION affects not merely the external appearance of our clothes, but, to a certain extent, the character of those worn close to the skin, it is necessary to examine in what points it should be eschewed and in what followed. There is nothing against good fashion in dress, if the fashionable article is not in any way injurious to health. It is quite possible for a lady's dress to be both healthy and pretty. People who dress fashionably have dreaded any reform in dress, in order to avoid appearing in any way like unfashionable people. It is unfortunate also that there are few grades between "fashionable dressing and absolute frumpishness." A certain section of persons, moreover, have adopted a form of dress which, although it has been in strict regard to the laws of health, has unfortunately been a style conspicuous for its ugliness. Fashion rules all classes of society. As a rule, it only deals with the upper garments and their appendages. Everything without a purpose, even in dress, is without beauty, and everything which fulfils its purpose may have some claim to beauty. As Mr. Haweis says, "A hood that is seen to be incapable of going over the head, bows stuck about the dress in an aimless manner, clasps and buckles sewn where they neither unite nor support, lacings that cannot lace, are intolerable to taste." No detail of these kinds ought to be admitted in a dress when it can be possibly avoided. Not only would costumes be more healthy if deprived of all unneces-

sary detail, but they would certainly be more pleasant to those who have "æsthetic" tastes. The æsthetic taste is the faculty which distinguishes the good and bad in dress. It marks what gives agreeable impressions and what disagreeable ones. As this sense is so differently developed in different individuals, we can understand what offence the dress of some people must give to those of refined taste. Clothes have certainly a marked influence, whether pleasurable or the opposite, upon our associates. This taste is to a certain extent a naturally developed one, and therefore readily detects any breach against natural laws. It is admitted by many that nothing which is purposeless can in any high sense be beautiful. It must be remembered, however, that what is useful and beautiful for one is not so for another. It is utterly impossible for all to dress alike. The character of the dress of a nation depends, to a great extent, upon the climate in which that nation lives. It follows, therefore, that the fashion of one nation is generally ill suited for another. Especially is it ill suited if the nation, living in a colder climate, endeavours to copy the dress of that which lives in a warmer one. This is frequently done. Many people, and even nations, blindly copy the fashions of other people and nations, and in the case of conquering nations it will generally be imitated by those it has conquered. The seat of origin of the fashions amongst the civilised world is uncertain, but in modern times fashion has been governed by vain and ignorant *artistes* and fashion-leaders, who have set nature at defiance. It is necessary that women should get rid of the ideal form which they conjure up to themselves as a model for their dress. Neither woman nor man will dress artistically unless he studies his own peculiarities of form and colour, and dresses accordingly. Let everybody, by all means, make themselves look as handsome as they can in a fair way, but to do this

properly it is absolutely necessary they should study taste in dress. If a woman be ugly, it is all the more necessary that she should, if possible, transfer "her ugliness into passable presentation." How many people spoil their appearance by bad taste in dress! Healthy clothing is not incompatible, nor even an impediment to the most artistic and fashionable designs. By a little arrangement, health, comfort, and elegance can all be insured with the most costly as well as with the cheapest garments. The danger in the dress of women is that it should be made so as to transform their own natural figures into the artificial shapes and appearances of their ideal forms. Besides, fashion seems to a large number of women a besetting sin. Many women spend nearly the whole of their existence in following and in thinking about new fashions, because they have no other object in life than to kill time. A large proportion of the women in civilised countries are without employment, and not troubling themselves about the cares and supervision of a home they are absolutely without anything to do. The craving for fashion is the result of this. Not confining itself to the young and old of both sexes amongst the richer circles, it spreads without improvement to the poorest in the land.

To dress fashionably is to adopt the newest style of dress of the period; to dress unfashionably is to adopt that of some other period. Even if a new fashion is ridiculous, or injurious to health, or even uncomfortable, it must still be followed. Many persons are quite contented so long as they consider themselves to be dressed fashionably. Fashionable dresses are put on simply because they are fashionable. The disadvantage of fashion, besides being so despotic, is that it gives no scope for individual opinion and personal judgment. "Fashion has at one time decreed that a woman should bear an excrescence on her head and

a bump upon her back, and the order has been carried out. At one time the waist has been decided to be just beneath the arms, and at another time to be almost below the hips. There has been the time of hoops, when women appear to have endeavoured to clothe themselves with a balloon as with a garment. There has been the time of clinging raiment, when the dress was applied to the body as paper is plastered to a pole. . . . . The cape of the ancient coachman, the coat of the modern dandy, the cap of a sailor, and the jacket of a guardsman, have all been reproduced as appropriate features in female dress. . . . . They regard the works of fashion with a reverent devotion only equalled by the fanaticism of some forms of pagan worship, and they gloat over the latest novelty in dress, and the newest achievement in head-gear, with a rapture akin to that shown by a heathen over some unusually ugly fetish."—(Treves.)

"The fashionable woman," observes Mrs. Howe, "says to the dressmaker, 'Do what you will with me; make me modest or immodest; tie up my feet or straiten my arms till use of them becomes impossible; deprive my figure of all drapery, or upholster me like a window-frame; nay, set me up in the centre of a movable tent; make me a nuisance to myself and everybody else, but array me so that people shall look at me, and so that I shall be in the fashion.' Besides the influence which fashion holds upon ordinary costumes there are the fashionable and distinctive characters of dress as worn by men. One can tell the occupation, religious persuasion, and position in society, of almost every individual you come across. Even the working dress of different trades possesses distinctive characters which are not necessarily connected with the work. The shopman dresses differently from the mechanic, and the agricultural labourer from the navvy. When the holiday or Sunday clothes are put on, the distinctive characters can even then

be recognised. Amongst the more wealthy this peculiarity is equally well marked. Everybody recognises the parson in his wide-awake hat, and the squire, the doctor, and the soldier in plain clothes can be almost as well known. In the ordinary business of every-day life there is no reason why these distinctive characters should be continued. It is quite different when the individual is serving in an official capacity, as it is then sometimes a question of utility, and at other times advisable to impress the sentimental mind. The special working dress of those employed in manual labour is, of course, necessary. If these distinctive forms of dress were carried to a greater extreme, people would perhaps see their absurdity and give them up. The pride shown in particular costumes is like that of a boy with a new suit of clothes, and the sensibility to the opinions of society keeps them up.

The result of our investigations may be summed up as follows :—that the laws of health relating to dress cannot be interfered with without more or less permanent evil resulting; that those who would follow present fashions will do well to estimate the cost; that women are ignorant of their natural beauty and attractiveness when they seek to alter their natural form by superfluous clothing, and pads, and bands, and that they are not dependent upon the milliner's art for the perfection of their form.

As the artistic sense is developed, it will be generally recognised that nothing in the shape of clothing is beautiful which is not possessed of utility and which is opposed to the sound principles of scientific dress.

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