THE SECRET OF SEXUAL BLISS

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BY
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REVISED AND IMPROVED

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BOOKS CONSULTED.

"Knowledge a young wife should have"
by Messrs. A. A. Philip, M. B., C. M., and H. R. Murray.

"Text book of Physiology"
by Mr. M. Foster, M. A., M. D., F. R. S.

"Sexual Physiology"
by Mr. L. T. Trall, M. D.

"Physical Jerks"
by Captain T.A. Lowe, D.S.O., M.C., of the Royal Irish Regiment and Asst. Supdt., Army Physical Training Staff.

"School of Health"
by Mr. Winfred B. Oslen, M. D.

"My System"
by Mr. J. P. Muller, Danish Hygienist..

"Wilson's Anatomist's Vade Mecum"
Edited by Messrs. George Buchanan, M.A., M.D., and Henry Edward Clark.

"Family Medicine"
by Mr. Moore.

"Our Baby"
by Mrs. J. Langton Hewer.

"Physiology of the Senses"

"Ellimon's R. E. P. Book"

"Family Encyclopædia of Medicines"

"Encyclopædia Britanica"

"How to improve the Circulation"

"Havelock Ellis' Works on Sexual Science"

"Sir Morell Mackenzie's Works"

"Alcohol—Its Effects on Body and Mind"

"On Food and Cooking"

"Text Book of Domestic Economy"

and several other works relating to the subject.

Publishers' Note.

It is but a truism when we say that the subject of "Sexual Science" in any of its branches is of profound interest to the public at large. Its presentation in any manner is always found to excite the profound attention of the public mind, the reason for the same being the natural desire in men and women to learn the truth of what lies at the very fount of life. So, innumerable books have been written and published in various parts of the world and one may say that the market is flooded with them everywhere. Having carefully gone through many of the books on the subject, the publishers came to think that they too had a duty to perform towards the welfare of humanity as a whole. Among the three kinds of duties *viz.* personal, social and public what one owes to himself and what arises from his domestic relations may be said to be personal. Under social duties may be mentioned those that arise in the communities to which people belong. But public duties in the widest sense include everything done for the welfare of humanity as a whole. Infancy, youth, manhood, maturity, decline, old age and death are but the successive parts of one's life as it has been graphically put by some one. At each part of the life referred to human beings are in need of help and advice from one another. What one would be in his youth would depend on what he is as an infant, and what he would be in his manhood would perforce depend on what he is in his youth. Similarly, maturity, decline, old age, and death depend each on the one preceding it for its condition. Hence a guide book to keep the several parts of an individual's life in what they ought to be, is highly essential.

Keeping this end in view the publishers took great pains to collect for reference a large number of books on different subjects costing many hundreds of rupees. After many months of hard study and arduous labour, what was gathered from various sources was put in the form of a book named *"The Secret of Sexual Bliss"* containing thirteen chapters, and this is the ***Second, revised and improved edition*** of the same published at the pressing demand from many quarters for copies, since the ***Two Thousand*** copies printed of the first edition have all been sold out in an incredibly short space of about six months.

No opportunity has been left unavailed of to impress on the readers of the book the fact that life, if rightly understood and properly used, would surely be a beneficent gift and that men and women are ushered into this world not to suffer and to mourn but to be happy and gay. If at all he or she suffers, it is due to his or her ignorance, folly or error. Every man and woman is capable of informing himself and herself and the means of doing it have been furnished in this book. If a man or a woman would but be truely informed, then he or she would not have occasion to weep over his or her follies and errors.

By what we have set forth above we do not mean that the achievement would be phenomenal, we only mean that slow progress in the right direction would be possible at least in a few cases. Every one would do well to understand that happiness is not to be had of wealth and wealth. It can be had only from work for the welfare of others, either fellowmen at large or relatives such as wife, children, etc. It is hoped that this book would serve the purpose intended *viz.* that of informing men and women about the secret of being happy and gay by the right living of the various phases of their lives and as husbands, wives, mothers, fathers, fellow-citizens, etc.

PUBLISHERS.

The Secret of Sexual Bliss

PREFACE

THERE ARE TWO SIDES TO A QUESTION IS a saying well known to all. If there are people for a particular thing there are also people against that particular thing. This has been the state of things till now and it would continue to be so for years to come. A thing is considered to be correct and proper to be followed if a majority of the people think so. A thing is considered to be incorrect and improper is a corollary to the above statement goes without saying. What is true regarding one thing may be taken to be true in cases exactly similar. So we may assume that the opinion of a majority of people from different countries regarding the sex question to be the correct and proper thing to follow for the minority also. Some men think that people who marry, bring forth children and lead a steady family life, are fools. They think that matrimony deprives them of the freedom they might otherwise enjoy. The tie of family affection binds people to a

particular country nay to a particular locality even, within the area of locomotion one might stay. They also bring before as arguments, examples pointing out the evils as they think of matrimony. Some men—why some women too as a matter of fact—consider the following facts sufficiently strong arguments against matrimony. It sometimes happens that the income derived in a family is not enough to support the family and consequently untold misery is the fate not only of the husband and the wife but also of the youngsters the fruits of their conjugal bliss! If a woman marries and her husband is not able to support her, then she has to live on her father's charity a very undesirable thing to do for a married woman. A married woman generally brings forth very rapidly after her marriage more children than she could conveniently look after. Therefore she has to lose not only her books, musical instruments and the pleasures derived from them, but also socalled *love*, in her struggle with household cares and broken and failing health. A husband and his wife dread that children may result from their conjugal bliss *par excellence* and consequently evade the result of natural sexual union by unnatural and objectionable methods, resulting in serious illness to one or other or both. In some cases parents may be well off and capable of bringing up

very comfortably many children. But alas! they are under the sterile curse and medical opinion shatters all hopes of parenthood for them. They have to suffer in silence with their desire unsatisfied. Here matrimony actually proves a curse instead of a blessing and the mental pain resulting from the longing for a child is by far the worse of the two evils—unmarried life and the curse of barrenness. Is it not a fact that the most essential thing for domestic happiness is the birth of children and the delight of hearing the music of their prattle? There have been too many instances in which parents have lost their dearly cherished children one after another, and the mental agony gone through by them has been terrible to contemplate. Had they but remained single, this agony of burying their offspring considered by them only a short time ago the pride and joy of their heart, might have been avoided.

The above arguments may appear sound and reasonable from a particular standpoint. They may even go to the extent of setting a premium on leading unwedded lives when viewed from that particular angle of vision. But the other aspect of the thing should not be lost sight of by the people. They should also hear the arguments in favour of matrimony before coming to a decision one

way or the other. Move with the current and everything will be easy and comfortable. Go against the current and you pay the penalty of your rash action. Nature's laws should not be violated and if any one does it, he or she does it at his or her peril. It is intended by nature that men and women should co-operate with her in the propagation of children. See how nature works in plants in this direction. They are provided with flowers with portions corresponding to the generative organs of animals or human beings. As the plants cannot move and consequently impregnate and propagate their species, insects are made use of for the purpose. The bright colours and the delightful fragrance of the flowers attract insects to them. The honey inside the flowers make them go inside the flowers. If the flowers they enter happen to be flowers with parts corresponding to the generative organs of males, then the insects entering them come out covered with a sort of powder or innumerable tiny specks or particles going by the name of pollen. When those insects happen to enter a flower containing the male element in flowering plants—the fine dust or powder which by contact with the stigma the female principle effects the fecundation of the seeds then come out with some of the particles or pollen covered over them. If they come into

contact with or in other words rub against that organ going by the name of pistil or stigma in another flower a seed or seeds is the result of that action. But man happens to be the most advanced work of nature and as such is expected to understand nature and its aims and to co-operate with it freely and willingly. It is laid down in the Bible the sacred book the Christians, that God created women and men to be companions with each other or in other words a man and a woman should mate and propagate their species by bringing forth children. The same sort of injunction is laid down in the Hindu sacred books also, where a woman is a *Sahadharmacharini* or one who takes part in all her husband does. In fact if a man or a woman dies without children, it is laid down in sacred books that he or she cannot attain salvation but will have to suffer in a hell called 'Pooth.' Similarly it may safely be assumed that in all religions, matrimony is strictly enjoined by God through their sacred books. Further let us take our deities one by one. Brahma the Creator has as his consort Saraswathi the Goddess of learning. Vishnu the preserver of the universe has Lakshmi the Goddess of Wealth. Siva has as his wife Parvathi, and Indra and Manmatha, Indrani and Rathi respectively. What do these things show? They surely indicate the

path, human beings should follow. As is the master so are the servants. So it goes without saying that nature or if you prefer it God, requires men and women to marry and bring forth strong and healthy children. There is also another reason, why people should marry. Sexual passion is very strong and at times it may drive men and women mad. Inebriety is nothing when compared with the madness due to sexual passion. Hence in order that unnatural means are not resorted to, to still the excited generative organs by the stirring of the passion sexual matrimony is highly essential. Unnatural means of satisfying sexual passion is not only a wrong thing to do, but it is also highly injurious to health. We shall have occasion to speak about this later on. Apart from all the above arguments *for* matrimony, it is but proper that men and women make provision for their old age—I mean by provision not the things to satisfy physical wants but company and affectionate looking after. Various other arguments also can be adduced in favour of matrimony, but as the above arguments are enough to convince one, we may safely drop the subject and pass on. Barring a few exceptions, let us take it for granted that men and women concede the point that one and all should marry and bring forth children both as a moral as well as a religious

obligation even as they are doing everywhere in the world. Have they then performed their duties thoroughly even as nature had intended them to do? Assuredly not and I may even go to the extent of emphasising the fact and say "Emphatically not." Men and women should, if possible, take very great care in choosing their partners for life. After choosing their partners, they should derive not only the maximum benefit and pleasure possible from each other, but should also prove themselves intelligent co-operators and co-workers with nature. To enable men and women to do this, a guide book is necessary. Though the market is flooded with books on the subject, the publisher sincerely believes that there is room for a treatise like this going by the name "The Secret of Sexual Bliss." This title has been chosen for his book since the pleasure derived from sexual union is considered to be in this physical world, a replica of what is known in the higher world as "Perananda" of the liberated souls. The publisher would feel himself highly rewarded for his labour and expense if the book could be of practical use at least for a few.

CHAPTER I.

LOVE AND LUST

THE two words often trotted out before the people by writers of fiction are "Love" and "Lust." What do these words really signify? Why should there be so much fuss over them? These are questions easy to ask but difficult to answer. They say that the words are intended to convey the idea of the feeling sexual, felt by a man towards a woman and a woman towards a man. But why should there be two words to denote that feeling? Would not one word suffice for the purpose?

Sexual feelings of a man towards a woman and *vice versa* are of two kinds. One is said to be spiritual and the other physical. The spiritual feeling goes by the name 'Love' whereas the feeling excited by carnal passion is named lust. Let us take the case of some birds and animals. The most common bird the sparrow selects a mate. The pair live together and propagate. There lies in this example the germ of love. The birds mate together, not so much for the pleasure of sexual union, but for the pleasure of the company of each other rather largely one should say. There is the bull and the cow or a stallion and a mare. The bull or the stallion does not care a bit what happens to the cow or the mare. What either requires is the satisfaction of the sexual passion roused at the sight of the cow or the mare as the case may be. Here we have a typical example of

lust. Even among men, there are examples corresponding to the sparrow and the bull or stallion. Some marry not so much for sexual enjoyment but largely on account of the pleasure they feel in their wives' company. Love *par excellence* is found in a species of birds going by the name *Crouncha* in Sanskrit and it also goes by the name *Chakravala*. These birds also live in pairs. If one from a pair dies, the other bird does not survive its mate. If in a married pair among human beings, such a feeling is found, then the name love can be applied to it.

Man has ceased to be a brute. He should show in every one of his actions that he is far in advance of the brute he had come from. Where can he show it best but in leading the life of conjugal bliss? Men and women should, as we have already pointed out, marry with the feeling of love as explained before. Only with this aim in view the practice of wooing and winning a wife is in vogue in some of the European countries. Observation goes to prove that this practice of wooing too has arisen from what takes place among some of the lower animals in creation. The he-elephant woos a she-elephant and takes her to a secluded spot to cohabit. A dog follows and follows a bitch for a very long time before it is permitted to cover and impregnate. Certain birds are said to build fine bowers, decorate them nicely and chase one another into and out of them before covering. The Hindu *Nalangu* is perhaps a sort of wooing. The would-be husband and wife remain in each other's company for a sufficiently long period to judge of their feelings towards each other. They try to analyse themselves and

find out whether there is any feeling of repulsion roused in them by the presence of the other. If that feeling is fortunately absent, then they try to find out whether they would feel utterly miserable if the other were to be lost to them. Then and then only they consent to marry each other. This custom is no doubt very good as an ideal. But this is not the time for ideals to be satisfactorily worked out. Ideal customs must be in ideal times with ideal men and women. But in these days of cheating and deceit absolute purity and sincerity of faith in man and women is not to be relied on. So the custom has proved in those countries a curse instead of a blessing. Fortunately for our land, that custom is not in vogue among us. Revolutionary reforms in this direction are not to be thought of. They may land us in difficulty nay may perhaps end in disaster. Therefore the best thing to do is to work with the materials on hand. Generally marriage among us is brought about by the elders to wit by the parents or guardians of boys and girls. So marriage after mutual understanding between a youth and a maiden is not to be thought of. They are married for good and they should make the best of it. They should try to live as happily as they could. Even as an erstwhile fledged young ones of a bird are taught by the parent birds, these also require some sort of advice and guidance from others in leading the conjugal life. Personal talk is not very advantageous since the feeling of shyness stands as a barrier between the adviser and the advised. So the best means of giving and receiving advice is by means of communications on paper or by means of

books. Hence this book may prove a blessing to a large number of young couples just beginning the conjugal life; nay, it may also prove a very valuable aid to all family men and women too, since separate chapters are added on hygiene and other subjects the knowledge of which would go a long way to run a family easily and lead a happy life of conjugal ease, bliss and felicity. The first and foremost thing highly essential in all men and women, young and old, and especially in newly married youth and maiden, is a very healthy body. If either of the married couple is sickly or in ill health, then all conjugal joy would cease to exist for them. So parents should bear this in mind not only in the interest of their sons and daughters but also in the interest of their country. Sickly men and women are burdens sapping the vitality of a country one may say. They lead miserable lives themselves and are objects of veritable eyesore to others. They spread broadcast the germs of their disease. These do incalculable harm in other ways also. The sight of healthy and strong children, men and women, favours the ushering into this world by parents, of healthy and strong children. Every tyro in cattle breeding knows that the sight of a fine strong stallion or a bull in front of a stallion or bull covering a mare or a cow favours the birth of a fine foal or calf subsequently. Kings were not permitted to see sickly people because of the fear that they may bring forth unhealthy or sickly children to rule over the country. Unhealthy and sickly men and women are often irritable and irritability in a sovereign is a very undesirable thing, apart from the fact that he is unfit

to rule over a country. Hindu Dharmasastras say that no man who is sickly should ever be made a king. In Sparta (Europe) in former days weak and sickly children were taken away to a distant place and there left to die. The practice is of course a very cruel one but it rid the country of weak and sickly people and the spartans were considered not only the finest men and women but also the finest soldiers of those days.

As it is the primary and onerous duty of every mother and father to bring forth only strong and healthy children, they should first of all equip themselves with the thorough knowledge not only of sexual science, but also of physiology, hygiene, medicine, cookery and other allied subjects. Even an elementary knowledge of these things would go a great way to serve the purpose and even if people could not acquire a thorough knowledge, they should at least get to know the fundamentals of these sciences. Most of the diseases our men and women suffer from, are easily curable. But the lack of the necessary elementary knowledge, at least of hygiene and medicine makes them lead sickly lives which result in the birth of sickly children who when they grow up are sickly or weak. These when they marry, bring forth in their turn weak and sickly children who curse the hour they were born and the authors of their beings to boot. Indiscriminate sexual intercourse at all times or at any time is a highly undesirable thing. Men and women should manage to have sufficient self-control and cohabit only at nights and that too not when they are ailing slight though it might happen to be. Regulated cohabitation gives

men and women not only greater pleasure, but also health, vigour and long life. No hard and fast restriction is possible in his direction since the regulation should depend on the couples, their physiques and their temperaments. If parents who bring about marriages should but be made to see the necessity for linking in matrimony only youths and maidens of suitable physique and strength, a good deal of misery found in families now-a-days would surely disappear in future days at least. Weak maidens are linked to strong youths and *vise versa* by parents or guardians pecuniary and property considerations playing the chief part in the transaction. A weak or a sickly youth has valuable estates and property and hence is considered by the parents or guardians of a strong and robust girl as a suitable bridegroom for her and the marriage is an accomplished fact ere long. It may also happen that a sickly or weak girl is married to a strong athlete. How do these marriages end? The strong girl with uncontrollable sexual passion casts amorous glances on other young men and often loses her one and only essential virtue chastity. Alas! can wealth and estates compensate this shameful and miserable state of affairs? Assuredly not. Let us take the case of a strong man married to a weak or sickly woman. Since he could not have conjugal pleasure in the company of his weak and sickly wife, he tries to secure the same from other women generally of worst morals, with the result that his health and wealth are both alike impaired and gone and the family is plunged in misery. So the first and foremost duty of parents and guardians of boys and girls is that they should marry

them to suitable wives or husbands as the case may be so that the weak married to the strong may not go to the wall and lead a life of utter misery. Conjugal felicity does not lie only in sexual intercourse. Sexual intercourse gives pleasure to the couple for the time being only. Husband and wife should suit each other in other directions also. A highly educated girl, if she happens to be married to an uneducated or ordinarily educated husband, she could not live in the mental world with him and in his company. Similarly if a husband is highly educated and his wife happens to be illiterate as it is unfortunately most often the case in our country in almost all cases, there is a chasm between his mental world and that of his wife which neither could cross over and live together. The husband considers his wife a child-bearing machine and a sort of domestic servant and not a real wife. A real husband or a real wife should live the life of each other, feel as the other feels and think as the other thinks. Then and then only there can be complete conjugal felicity for both. Now-a-days, girls who are accomplished in music, painting etc. are given in marriage to husbands who could neither understand nor appreciate them. The girl longs for the company of one who could enjoy her aesthetic talents even as she longs for one who could enjoy her physical charm. But alas! in the emotional world she has to live all alone and her husband cannot reach her there and keep her company. Hence it would be highly advantageous if parents or guardians understand these and unite together youths and maidens who could keep each other delightful com-

pany, not only in the physical world but also in the emotional and the mental worlds.

It is an open secret that a wife can keep her husband tied to her apron string even, if she but knows how. A few words regarding this would not be out of place here. A husband goes to a hotel or a restaurant because his wife is not a culinary expert. If the wife desires to attach her husband to her while in the kitchen, she should try to be second to none in the culinary science and art. Bearing this in mind, a chapter on 'cookery' has been added to this work. A husband need not keep himself aloof from the kitchen leaving the cooking to his wife. He may at leisure help his wife. Then he would find a sort of pleasure unthought of in the act, and he would impart the same to his wife too, in addition to winning her gratitude and love. A wife should always look tidy and pleasant and be dressed smartly. An untidy dress takes away her fine look, and perhaps her husband too a short distance away from her. She should comb her hair and wear jewels. Though these are trifles, they go a long way to win the love and esteem of her husband. Even old women and women lacking in beauty, may rouse the admiration and love of their husbands with satisfactory toilette, dresses and jewels. People desirous of cultivating Bakthi or devotion should often be reading the lives of saints and devotions. Similarly, husbands and wives should often try do devise new means of stirring and strengthening each other's love. Occasional presents of flowers, fruits, jewels, etc. and attendance at cinemas and theatres in her company may be mentioned as some of the means

of keeping alive the flame of love for him in his wife on the part of the husband. The wife on her part should endeavour to the utmost of her power to win the love and esteem of her husband and to maintain the same permanently. This she could do by making herself look as attractive as possible by means of toilette, dresses, jewels, etc. as has been pointed out. She by studying the physical needs of her husband and by anticipating his wishes could earn his gratitude and eternal love. She could sing or read to him if he is capable of appreciating the former and listening to the latter. To put the matter in the nut-shell—as a poet has said in the Nitisastra,—she might serve her husband even as a Dasi, advise him even as a wise minister would do, present herself before him even as the goddess Lakshmi and be patient even as the mother earth. Which husband would resist the attraction of such a gem among women and be allowed himself to be weaned away from her? She may be quite sure of the strength of the golden chain of love and domestic felicity with which she firmly binds him to her. The husband on his part should consider his wife not as a domestic drudge, a child bearing machine and a creature created by God for his special benefit, but as a fit companion to be cherished, esteemed and treated with every consideration and comfort. Then and then only there can be what is called domestic happiness and bliss.

The fruits of love and affection of a husband and a wife are children. If they are born of parents whose mutual love has been great, then the love and esteem

they bear to their parents and *vice versa* should and be great and permanent. Animals cover and bring forth the young ones of their species in a fit of passion. We find in them no permanent love on the part of the mother and absolutely no love whatsoever on the part of the father. The mutual affection between the mother and the young one is the outcome of the feeling of divine instinct in the former and the satisfaction of hunger in the case of the latter. But in men the affection referred to should be human and not bestial.

A husband should be a teacher to his wife and children and a wife should if she be capable, make her husband more enlightened by imparting the knowledge she may possess to him if he be lacking in it. The husband and wife should talk freely about social, economical, political and other questions and thus allow their minds to expand and not stagnate as is being done everywhere now, at least in our country.

Another important thing that a married couple should bear in mind is how to keep a house and run a family economically but comfortably and efficiently. A good deal of misery in families is due to bad management and want of economy. Wasteful waste is sure to land people in woeful want and then they should bid goodbye to all domestic happiness. Men and women should learn how to cut the coat according to the cloth. They should regulate their expenditure to the income they derive. They should know at least the fundamentals of domestic economy. The saying "a place for everything and everything in its place" should always be borne in mind both by the husband and the wife, and their

children if any should be made to observe this rule very strictly. Untidy and ugly appearance should not be present anywhere in the house. The saying "a thing of beauty is a joy for ever" should never be lost sight of.

The bed room in a house occupied by a married couple should be a model of beauty and cleanliness, for in it the woman conceives to bring forth a child. Pictures before the couple while cohabiting should be beautiful ones and not those of animals, demons and so on, lest the child born partakes of the characteristics of the creatures represented by those pictures due to the mental power generated in the parents by those pictures while coiting. It is desirable to have in the bed rooms only pictures of strong, healthy and beautiful children, men and women. Then it would be a pleasure to live in such a house. These should of necessity create strong mental pictures of those in the minds of the husband and the wife, and the child impregnated and conceived with those pictures in their minds should also be strong, beautiful and healthy.

If a husband and his wife have their minds blank at the time they cohabit, the child impregnated and conceived then if born subsequently would generally be an idiot. But in rare cases it may happen to be a great sage even. They must be thinking of beautiful objects or delightful episodes. A child partakes of the characteristics of its parents is a belief implanted in men and women from time immemorial. In support of our statement we would narrate the following popular story. Once there was a gentleman very ugly but very wise. In the town in which he was living, there lived a

maiden of supreme beauty but a born idiot. The wise but ugly nobleman married that beautiful but hare-brained maiden thinking that the children born of such a union should be wise like him and beautiful like his wife. But alas for his hopes, the children born were ugly like the father and stupid like their mother!

Thoughts, emotions and actions if strenuous and long continued could completely change the temperament and even the formation of the body also. So married couple living noble lives and feeling high emotions and thinking supreme thoughts, should try to improve or modify their temperaments and through them their own bodies as well as those of their children. It is highly essential that the feeling of love should be in the couple at least while cohabiting though not always, even as it is described in the beginning of this chapter. Then and then only they may enjoy the real bliss of sexual union and impregnate, conceive and become parents of children worthy to be called really human children. Children born of passion roused by lust would surely be bestial in their nature and the sexual pleasure too derived would be bestial and one-sided.

CHAPTER II.
BODY AND HEALTH

Many are the ways in which health is extolled. Some say that health is wealth. Others say that it is happiness and heavenly bliss. All agree that a strong and healthy body is a highly essential thing for a man as well as for a woman. Only healthy men and women can enjoy ideal family lives. To maintain good health, all the organs of the body especially the excretary organs should be performing their functions satisfactorily and well. If the excreta are not easily thrown out of the body, then we may be sure that there is something wrong with it. Generally the excreta when thrown out of the body do not emit bad smell. Only the excreta of sick people emit bad smell. If a man or a woman desire to be healthy, then he or she should take care to clean his or her teeth well daily. Neglect in doing this simple thing often results in ill-health. Human skin is another excretary organ if we may use the term 'organ' for skin. It should also be kept clean, otherwise the process of purification of blood cannot go on. The skin contains innumerable pores and through them the impurities from the body are thrown out. No doctor's advice and assistance are necessary to keep one's teeth and skin clean. If these are kept clean, fifty per cent. of the danger of getting sick may be avoided. In cleaning the teeth, hard substances should not be made use of. The enamel of the teeth should be carefully

Preserved and should not be allowed to be injured. As the use of hard substances like sand in cleaning them is likely to injure them, it is safe to avoid using them. Cleaning the teeth with tooth brushes is a very good thing. As regards the skin, good toilet soap may, with advantage, be made use of. After washing away the soap sud, the body should be well rubbed over with a dry towel. This action helps to keep the surface of the skin smooth and the pores in them open. A man or a woman of strong mental control and moral purity is seldom prone to sickness or ill-health. A thoroughly healthy man or woman delights in fresh air, natural food and physical labour. Further he or she enjoys sweet repose. An unhealthy person on the other hand always feels miserable and spreads this feeling of misery all around. The reason why many people are unhealty and miserable is not far to seek. They do not follow the rules of health. They eat indiscriminately anything at any time. They drink impure water and overwork the kidneys. Human organs like the stamach kidneys, etc. should be given work only at particular fixed times. The food put into the stomach should be such that it might easily digest it. As it takes a fixed time for the stomach to digest the food put into it, and as it needs sufficient rest after that work is over, it is highly essential to regulate the time to eat one's food and not to give work to the stomach by fits and starts. Nature has intended that every man and woman should be healthy and lead healthy and happy life. If he or she but take the trouble to be temperate avoiding unnatural food and injurious alcoholic drinks and subsist

on natural food and pure water, the wealth of health is sure to be his or hers. Daily exercise is highly essential to keep good health. The proverb "Early to bed and early to rise, makes a man healthy, wealthy and wise" should not be lost sight of by men and women, young and old. Every human being should cultivate the habit of going to bed early—without wasting the time in useless occupations like playing at cards—and getting up with the cock's crow to keep good health. Bearing in mind the proverb that "Cleanliness is next to Godliness" men and women should keep themselves and their things scrupulously clean. This would enable them to improve their health. Daily bath in clean and pure water is also desirable to secure good health. Cold water bath is highly invigorating, and consequently people should, if health permits, bathe in cold water only.

People are under the mistaken impression that the more one eats, the stronger he would become. Instances are not wanting in which men and women not only overload their stomachs but also overfeed their children. This, instead of giving strength to the body, only goes to weaken it. The quantity of food which one can *digest* is the thing that counts and not the quantity of food he *eats*. Overeating throws more strain on the digestive organs and puts them out of gear. The quantity over and above that absolutely necessary is to be thrown out of the body and this gives the digestive system unnecessary work. Further, undigested matter in the stomach and elsewhere is the root cause of many

a disease people are suffering from. As mental anxiety of any kind is sure to tell upon the health of an individual, it is highly desirable that he keeps at a distance worry and anxiety of all kinds. As what cannot be avoided must be endured, one should bear patiently and cheerfully all kinds of worry and misery that might come to him to endure and to test his strength. Mental control, moral purity and natural regulated diet are the tripod on which the health of an individual rests.

Blood is life and food is the thing that becomes blood. The main purposes served by food are (1) to supply material for the building of the body, (2) to repair the body, (3) to maintain the heat in the body, (4) to furnish energy to the individual. Nitrogenous foods are known as proteids, albuminoids and flesh formers. So to supply materials for the building and the repairing of the body, nitrogenous foods should be taken. Fatty foods are the greatest heat givers. They are also producers of energy and on account of this only, are largely consumed in very cold places like the countries in the Arctic regions. Starch and sugar too, help to produce and maintain bodily heat. Mineral foods such as common salt, carbonate of lime, oxide of iron and salts of potash are also necessary for the sustenance of the body. A large proportion of the salt and oxide of iron required daily by an adult is obtained from the food he eats. Carbonate of lime is found in the water one drinks. Phosphate of lime is furnished by milk, meat and other similar foods. The salts of potash that go to assist in purifying the blood are obtained from fresh vegetables and fruits.

Flesh of animals and eggs of birds especially of hens contain a large amount of nitrogenous matter. Poultry and game are said to be rich in phosphates. The white of the egg contains phosphate of lime. Milk contains all the four classes of food necessary for health and growth. Among nitrogenous vegetable foods may be mentioned wheat and barley. Butter is a light and easily digestible kind of fat. Among starchy food may be mentioned arrow-root, sago, cornflour, potato and cane-sugar.

From what has been set forth above it is clear that a mixed diet is necessary for the living and the growth of body. The quantity of food required daily by an individual depends upon climate, sex, constitution and habits. Brain work, bodily work, indoor work and out-door work modify the daily requirements of nutritive organs.

All food must be thoroughly masticated. Large quantities of water or any other fluid should not be drunk at meal times since digestive juices are likely to become much diluted and weak and consequently rendered useless to digest food. One should not read or learn anything while eating. A lively talk over a meal is conducive to good digestion.

Mustard promotes appetite and aids digestion. But an excessive use of it may lead on to liver complaint. Mixed with water and taken, it is a good emetic in case of poisoning. Applied as a poultice it is said to relieve the most intense pain.

Food should never be left exposed to air since it may begin to decompose soon and consequently putrefy. There are germs in the air. These when they come into contact with food left exposed to the air, multiply very rapidly, act upon the food and cause it to putrefy. To avoid putrefaction as stated above, vegetables etc. are dried; great cold is applied to fruits, meat, butter etc.; chemical agents are added; heat is applied and air-tight cases and receptacles are made use of. Almost every one might have heard of fruits, flesh etc. preserved in ice.

As regards the utensils made use of in the kitchen, we may say that they are made of metals or glass and at times earthenware pots are also made use of. Metallic utensils are quite unsuited since they produce injurious effects upon the food prepared or kept in them. Food prepared or kept in metallic vessels generally cause injurious influence on the health of the consumer. If at all metallic utensils are made use of, silver vessels may be used with advantage, since they are not acted upon by the food-stuffs. But silver vessels are very costly, and so the use of the vessels made of that metal is not possible in most of the homes.

Water plays a very important part in domestic hygiene since not a day passes but we are forcibly reminded of it. The inestimable value of this gift of nature can be freely realised if one but brings before his mental vision the picture of a home on a day without it when water supply is cut off by the corporation authorities on account of repairs etc. to the main pipes.

Every one knows that it is required for drinking, cooking, washing, cleaning and many other domestic purposes. But a large number of people do not know that there are two kinds of water available and that one kind is called 'hard' water and the other 'soft.' The water using which one finds it difficult to produce lather with soap, is hard. If plenty of lather can be produced using the water, then it is soft. This is the simplest test to find out whether the water available is hard or soft. The hard water contains mineral matters dissolved in it. In soft water, the quantity of these salts is minimised. Of the important mineral constituents in water, carbonate of lime is the chief. Every one knows that rain is the chief or perhaps the only source of water supply on earth. When this rain falls through space or air, it absorbs a quantity of carbonic acid gas and becomes carbonated water as it is called. This water then passes through rocks by the process of percolation. While doing so, it has the power to dissolve and carry with it certain mineral constituents of the rock. The presence of minerals in hard water or in other words how water becomes hard is thus explained. The hardness of water in which carbonate of lime is present may be considered 'temporary' hardness since boiling easily removes it. But water containing sulphate of lime dissolved in it is permanently hard since that salt cannot be got rid of by easy methods. We must make use of objectionable substances to get rid of the same.

There is no harm in drinking moderately hard water. It is not injurious to health. But it is not so

useful for household purposes as the soft water. Green vegetables boiled in hard water lose their colour and even tea, coffee, cocoa, etc., prepared using hard water are not so good as they are when made using soft water.

As we have already pointed out, the rain is an important source of water supply for us. It is in its original purity too soft to be palatable. In rural tracts where there are not many houses, it is generally found very pure. But in or near large villages and towns it is contaminated with impurities and is quite unfit to drink. Water from springs though it may happen to be hard is considered to be excellent for drinking purposes. When rain falls on the ground, all the water does not flow away. A portion of it sinks into the soil. After it sinks to a particular depth it is unable to sink more owing to the obstacle of certain impervious stratum like rock or clay. Then it remains collected in pools and thus we find pools of rain water formed. Frequently these pools of water run along the top of the stratum of clay or rock and sooner or later spring at the surface of the ground and provide men with spring water.

There are wells called surface wells. These extend to the depth of a few feet only. Though the water of such wells may be very clear, it may be contaminated with sewage and hence deserves to be avoided.

The water from rivers and lakes is excellent for drinking purposes provided it is not pollutad or contaminated with the sewage of towns.

Water from springs and deep wells are wholesome and very palatable. Upland surface water is mode-

rately palatable. River water to which there is access for sewage and shallow well water though palatable are dangerous to be made use of. It is desirable to avoid stored rain water and surface water from cultivated lands as the purity of such water cannot be relied on.

People who drink hard water containing sulphate, nitrate and chloride of lime with sulphate and chloride of magnesium are liable to suffer from diarrhœa.

Water containing organic impurities of either vegetable or animal origin is very injurious to health and therefore should be avoided.

As diseases like cholera, typhoid fever, malarious fever etc. are said to be caused by drinking contaminted water, it is highly desirable to drink only pure water. Boiling the water and cooling the same before drinking is good. It is said to be "a ready and effectual method of purifying water." The characteristics of good water are summed up in the saying. "It should be clear, transparent, sparkling and very palatable. It should be free from organic matter, thoroughly aerated and not too hard."

Among domestic pests the house fly is the most dangerous though it is regarded by the ignorant as an insignificant insect. From hygienic standpoint it may be regarded as the medium to spread various diseases by contaminating the food etc. by reason of its flitting habits. It not only deposits on food etc. dangerous death dealing microbes but they also serve as a means of transporting the mites that destroy food.

Damp soil and rotting horse manure etc. contain dangerous microbes and worms causing in human beings diseases like elephantiasis etc. Some of these are parasites or insects clinging to other creatures like the house fly and living on them. So the house fly is dangerous domestic pest and deserves to be exterminated. As that is not possible, every precaution should be taken to guard against the evils arising out of the existence of it in our houses.

CHAPTER III.

THE HUMAN BODY AND ITS ORGANS.

The body of a human being even as the bodies of all animals falls naturally into three divisions, *viz.*, the head, the trunk and the limbs or extremities. The bony structure in the bodies of animals goes by the name of skeleton. The portion of this structure covering and protecting the brain matter is called the skull and it consist of 8 bones. These are wedged together by saw-like edges. The bony case frame work covering the organs in the chest and shielding them consists of a frontal bone going by the name of sternum to which are attached rather loosely twelve pairs of bones called the ribs. These ribs are attached by their other ends to the vertebral column called also the back bone. We may say as it is put in the work going by the name of "Encyclopaedia of medicine" that "The chest is bounded by the brest bone and the ribs in front, the ribs at the sides and the spine and the ribs at the back. The average circumference of the chest ranges from 33 to 40 inches in man. It contains the heart, the lungs, numerous large blood vessels and the thoracic glands of the lymphatic system." Of the twelve pairs of ribs mentioned above the last three pairs below are not directly attached to the sternum or the chest bone. We may say that they are attached to the seventh pair

only. This whole bony chest case or frame-work can move slightly up and down when one breathes.

The limbs can be divided into upper limbs and lower limbs. The arms are the upper limbs and the legs are the lower limbs. These limbs can again be subdivided into fore arms, upper arms and the hands in the case of arms, and the thigh, the calf and the foot in the case of legs. The upper arm has one big stout bone extending from the shoulder bone to the elbow joint. The lower arm has two bones extending from the elbow to the wrist. There are eight bones in the wrist and five bones in the palm and fourteen bones in the fingers, two in the thumb and three in each of the other fingers. There are also two shoulder bones connected with the bone in the upper arm. From what has been set forth above it would be clear that there are 32 bones in each of the arms of a human being. Taking the case of the legs we can say that there is one bone in the thigh, and one in the calf, two in the ankle, seven in the heel, five in the instep and fourteen in the toes similar to the arrangement in the finger. Thus it will be evinced that there are 30 bones in each of the lower limbs the legs.

The backbone or the vertebral column can be divided into four divisions. The topmost division is composed of seven bones and it is supporting the head. The topmost bone is like a ring and the one next to it has a pivot moving round the circular hole in the first immediately above it. The next twelve bones form the next division. The ribs in the bony frame work of the chest are joined to these. The next division the third contains

five bones. The fourth and the last division contains five bones in the upper half and four in the lower.

The pelvic girdle has four bones composing it and the facial bones are fourteen in number.

The bodies of all animals can be roughly divided into hard parts and soft parts, the former the skeleton supporting and protecting the latter. The bony frame work serves the purposes of supporting the soft parts, protecting the important organs and acting as levers facilitating the movements of animals.

Putting the matter in brief we may say that the entire skeleton is useful for support, the skull, the spine, the ribs, the breast bone and the hip bones are useful to protect the internal organs and the others serve in a greater or lesser degree the purposes of three kinds of levers for muscular movements.

As we have already pointed out, the skull protects the soft brain matter, and the bony framework in the thoracic region the internal organs in the thoracic cavity. The vertebral column protects the spinal cord running along the tube inside it.

The bones of skeletons are attached to each other by means of joints and these joints are of three kinds to serve three different purposes. The first kind the immovable joint has for its example in the skull where bones are dovetailed together so as to form a strong box-like shield for the brain matter. The second variety of joint is what is called elastic joint and examples of such joints are found between the different pieces of the backbones

going to join the short bones with one another and thus facilitate the elastic bending of the whole spine in any direction. But the movement of one bone upon the one next to it is but very slight.

The next kind of joint may be called the gliding joint. It unites all the lever-like bones of the limbs of the human body. Almost all of these joints have movements like hinges, and we have examples of such joints in the elbow, the wrist, the knee, the ankle, the fingers and the toes. There are also pivot joints enabling one bone to rotate on another and we have such joints in the spine at its top where the head rotates. There is also what is called the ball and socket joint and we have such joints in the hip and the shoulder. Putting the information regarding the joints of bones in the human framework the skeleton in brief, we may say that joints are of three kinds, namely, immovable as in the skull, elastic as in the back bone or vertebral column, and gliding as in the three kinds of joints, namely, the hinge, the ball and socket, and the pivot, found in the elbow, the wrist, the knee, the ankle, the finger and the toe, as well as in the bone at the top of the spine, the shoulder and the hip. Further all gliding joints have smooth gristles covering the ends of the bones,—a kind of lubricating fluid and ligaments uniting one bone to another. The lubricating fluid is also called most commonly the joint oil, and it resembles the white of the egg in appearance. Just as oiling in machinery makes movements of its parts smooth and easy, this oily fluid also makes the movements of the bones one upon the other smooth and easy. The ligaments called also tendons firmly

bind together the bones outside the smooth gristle-covered parts to prevent the joints: or in other words safeguard them from being dislocated that is displaced from their positions.

Movements of the parts of the body are brought about by muscles and they are of two kinds, namely voluntary and involuntary. The flesh in the major portion of the body is composed of voluntary muscles only. These muscles act under the influence of human will. The involuntary muscles are found in the stomach and the intestines. They cause the food to move along the digestive canal and are not controlled by will. Their movements are gentle and continuous and are going on without our knowledge. The object served by the muscles is mainly to pull on the bones and thus move the part or limb of the body in any direction desired by the will of the individual. There are also small muscles not attached to the bones but attached to soft parts, for example, the muscles of the tongue, the muscles of the eye and the muscles attached to the skin of the face to show the facial expression and changes in it if any, by their contraction, causing the movement of the skin in various ways. To move or lift by pulling upon the bone or the skin to which a muscle may happen to be attached, it contracts and becomes shorter. The power used by the muscles is derived from the combustion of food taken by animals.

It may be asked what arrangements are made by nature to cause the muscular action in animals. To effect the contraction and expansion of the muscles a system going by the name of nervous system is provided

by nature in all animal bodies. This system may be classified under three heads, namely, sense organs, brain and the marrow going by the name of spinal cord found in the tube-like hollow of the spinal column or backbone, and the nerves called communicating nerves. The brain and the spinal cord contain nerve centres to receive external or outside impressions, understand and act upon such impressions. The nerves or fine thread-like fibres connecting the various parts of the body with the above nerve centres carry outside impressions such as light, sound, scent, taste, touch, etc. received through the sensory organs, the eyes, the ears, the nose, the tongue and the skin, even as telegraphic wires do in transmitting messages from one station or office to another. There are two sets of nerves; one set goes by the name of sensory nerves and the other by the name of motor nerves. The sensory organs referred to above convey through the sensory nerves the impressions they have received. Suppose a man puts his finger in the fire accidentally. The finger communicates this fact to the proper nerve centre which immediately sends out motor impulses through motor nerves to the proper muscles. These muscles at once contract to take the finger away from the fire. Similarly, the sight of things is conveyed to the nerve centre and the impression of the things is created in the mind as a picture of that object. Similarly are experienced the sensations of hearing, smelling, tasting and so on through the sensory organs and the sensory nerves connecting their cells with the corresponding nerve centres. In brief, the three parts of the nervous system, namely, the sense organs, the nerve

centres and the nerves are necessary, and if any one of these be lost, the other parts are rendered quite useless. If the eyes are lost the nerves cannot receive outside impressions. If the nerves are absent, the communication between the eye and its nerve centre is cut off. If the nerve centre is injured and thus made unfit for use then no impression could be obtained of external impacts.

A short description of the sense organs would not only be out of place here but would also be interesting. As we have already pointed out, the sense organs are four in number. They are the eye, the ear, the nose and the skin. The construction of the eye is exactly like the construction of a camera used for taking photographs. There is a crystalline lens corresponding to the lens in the camera. There is a portion in the eye called the 'iris' and this corresponds to the diaphragm in the camera. The globe of the eye is the dark chamber of the camera and the retainer the nerve screen on which things are seen even as pictures seen on the screen of the camera.

The sensory organ ear serves the purpose of bringing sound vibrations to the nerve centres through the auditory nerves. It consists of two parts, one part may be called the external ear and the other part the internal ear. The external ear after receiving the sound vibrations from outside, convey them to a stout membrane going by the name of 'drum' of the ear. The internal portion called the internal ear has two chambers, one of which contains air and the other water. The air chamber is immediately behind the

drum of the ear and in it there is a chain of little bones passing from the drum to the water chamber. The sound vibrations brought by the external air striking against the drum, sets the chain of little bones referred to above shaking. This shaking communicates through the medium of the water in the water chamber the external vibrations gathered and passed on by the external ear to the auditory nerves having their hair like fibres ending in it. These auditory nerves then convey those vibrations to the proper nerve centre and thus enables one to understand the particular sound vibrations or in other words to hear the particular sound.

The next important sensory organ is the nose. It serves in carrying smell vibrations to the proper nerve centre. It is divided into two halves by a partition in the middle. The space partitioned off goes by the name of nostril, and thus we see that there are two nostrils. These nostrils are again sub-divided into two portions, the lower a channel for breathing and the upper a chamber for smelling. If a man desires to smell anything or if there be an object sending forth smell, then he snuffs the air into the upper chamber or rather the air charged with the smell is drawn into it. From there it is brought to the nerves of smell found distributed in the membrane, lining the chamber. These nerves carry the smell vibrations to the smell nerve centre and thus a man perceives the scent. The reason why dogs and certain other animals are intensely acute in discerning scent is that their noses are provided with not one layer of membrane as stated above, but different layers

one upon another containing nerves of smell. The feeling of taste when properly analysed and examined would be found to contain the compound feeling of smell, touch and taste. This will be plain when attention is paid to the fact that one loses his taste when he is suffering from a cold in the nose, and the fact that the nose is held when children are made to swallow medicines like castor oil, having disagreeable taste. When a man is suffering from cold and consequently cannot feel smell, he cares less for food because he loses taste. If one bites chalk—a substance having no taste at all—it appears to have a gritty taste and this feeling is due to the sense of touch. There are some little *papillae* at the back of the tongue and true taste is due to the perception brought about by these only. Unless a substance is dissolved or capable of being dissolved, its taste cannot be perceived. The reason for this is, that taste-nerves terminate in little ditches surrounding the *papillae* referred to above.

The feeling of touch is due to the nerves of the skin. The feeling is much more acute in certain portions than in others. The tip of the tongue, lips or tips of the fingers are highly sensitive to the feeling of touch. In these places, the points of a compass when opened about one-eigth of an inch apart and placed, they are felt as two distinct sensations of two distinct points. At other places they do not produce such different feelings. To produce such a feeling on the limbs, back etc. the compass will have to be opened two or three inches. Only on account of the highly sensitive nature of the tip of the tongue, a thermometer is often held there to find out the

temperature of the body of a patient suffering from fever, etc. The portions where the sense of touch is very keen show when observed through the lens of a microscope, the end of the nerves of the skin provided with small bodies. These bodies go by the name of touch corpuscles and they add to the power of touch perception. The feeling of touch may also be viewed as a compound feeling of touch, pain and temperature.

The brain is the central organ governing and overruling not only the entire nervous system but also the entire body one might say. It has connection with every part of the body through nerve fibres. The brain matter inside the skull is divided into two portions and they go by the names of chief brain and the little brain. The continuation of this whole brain matter along the spinal canal or cavity inside the backbone is the third part of the brain and goes by name spinal cord or marrow. This marrow or cord of nervous matter extending down the hollow in the backbone is thick at the base of brain and narrow below in the backbone. The digestive, the circulatory and the respiratory organs are controlled and guided by this third portion of the brain the spinal cord or marrow. The beating of the heart, breathing, the passage of food along the digestive canal due to what is called peristaltic action and the actual digestion of food, are all regulated by this portion of the brain.

Muscular movements are brought about by the little brain. The chief brain does the intellectual work and has connection with the sense organs, the little brain, the spinal cord, the muscles and in fact with every part of the body. Though the spinal cord and the little

brain have their special duties, yet they, like the other parts of the body, are under the control of the chief brain. There is a great difference noticeable in the size of the three divisions of the brain in lower animals, higher animals and men. In very low animals the portion pertaining to the intellect, namely, the chief brain is so small as to be scarcely noticeable. But the little brain and the spinal cord are as large as in human beings. The chief brain grows larger and larger in animals as they ascend higher and higher in the scale of animal life. The weight of the chief brain of a human being is found to be more than the weight of animals [illegible] times the size of human beings. A man leads the animals in the ladder of evolution simply because of the development and growth of the intellectual portion of the brain. Considering what has been stated above we could safely assert that this chief brain controls and guides the sense organs and the muscular movements of the body. It also presides over the vital functions like circulation of blood, respiration, etc. It is in fact the general overruling organ of the human system. It is the organ of intelligence, emotions and will.

Every one knows that there are three kingdoms in nature going by the names of the mineral kingdom, the vegetable kingdom and the animal kingdom. Vegetables live on minerals and animals live on animals or vegetables or both. Mineral or inorganic matter is necessary for animals to live even as it is necessary for the plants to live. Therefore they must get it either directly or indirectly from one or another of the above three kingdoms of nature. Animals must

either be herbivorous or in other words must be feeding on vegetables, or carnivorous that is living on other animals whose bodies have been built up and sustained by vegetable food. Animals like sheep, oxen, deer, hare, etc. live on vegetable, while tiger, lion and other wild beasts require flesh for their food. Thus we see that animals get the inorganic matter they need either from plants living on minerals or from animals indirectly that had built up their flesh feeding on vegetables containing inorganic matter.

Human body may be compared to a living machine, fed on fuel, gas or oil. In place of fuel, gas or oil, the body is supplied with food. Even as the fuel, gas or oil is converted into sources of energy to work the machine, the food which animals take is turned into sources of energy to work the body. An engine has several portions or parts to collect the energy from the burning substances like fuel, gas or oil such as boilers, valves, etc. Similarly a human body has different parts to carry on the work of generating the energy and collecting and utilising the same. How this work is done may be described under four heads, namely:—(1) The digestive system;(2) The circulatory system;(3) The respiratory system; and (4) The excretary system.

The digestive system.—The parts or portions of the human body taking part in this system are (1) The teeth, (2) The tongue and (3) The alimentary system.

Teeth are necessary for biting food and grinding the same. They fall under four classes, namely,—(1)Incisors, (2) Canines, (3) Bicuspids and (4) Molars. Incisors are the front teeth and they are four in number. Two of them

are on the right side and two on the left in the upper row and there are four more similarly placed in the lower. They have edges shaped like those of chisels and are necessary for animals to bite or cut off mouthfuls of food. The canine teeth are strong and pointed and there are two of them in each row, one on each side of the incisors. Next to the canine teeth there are two bicuspids and three molars on each side of each row. Thus we have eight teeth in each of the four halves of the two rows of teeth making up 16 teeth in each row and 32 teeth in all. This arrangement is that found in the adult. But in children with temporary teeth, there are only two incisors, one canine and two pre-molars making up five in all in each half of the two rows making up twenty teeth in all. A child has no teeth when it is born. When it is about seven months old it cuts the first teeth. The other teeth are cut in the course of two or two and a half years. All these teeth are temporary.

The front teeth of children begin to drop out at the age of seven. They are then replaced by permanent incisors. Subsequently all the temporary teeth are replaced by permanent ones. As the jaws increase in size with the growth of the body, the larger molar teeth come up. The last going by the name of wisdom teeth do not come till one is about twenty-one years old. Several diseases can be avoided by keeping one's teeth clean. The tongue is useful not only for feeling and enjoying taste, but it is also useful to move the food about in the mouth for chewing and swallowing and also for forming some of the sounds in speaking.

Digestion of food begins in the mouth and ends in the anus. The digestive system comprises (1) The Gullet, (2) The stomach, (3) The small intestine, (4) The large intestine, (5) The liver and (6) The sweet bread.

The long tube leading from the mouth to the stomach goes by the name of gullet and food is swallowed down it after it leaves the mouth well masticated and mixed with saliva.

The stomach is a baglike enlargement of the digestive tube. Chewed food swallowed down the gullet goes into it. There it remains until it is reduced to a soup-like fluid called *chyme*. How this chyme is formed from the food one eats is as follows. The stomach has three coats or linings. The outside one is slippery and hence the movement is made easy. The middle coat is a layer of muscles and the third is a coat of soft membrane. The latter coat has a number of glands called peptic glands. These secrete and pour into the food reaching the stomach a kind of juice. The muscles by their movements grind and mix this food and this juice together and reduce them into the soup like fluid mentioned above.

There is a valve between the stomach and the intestine. During the process of digestion going on in the stomach this remains closed. After the digestion is over this opens and the soup-like contents of the stomach is then squeezed into it (the small intestine) by the action of the muscular coat. This small intestine is a narrow tube of about twenty feet in length. The food after leaving the stomach passes down it. This tube is gathered up into folds or coils. There are ducts bringing

the juice secreted by the liver and the sweet-bread into this. The food immediately after it has left the stomach is thoroughly mixed with these juices. Even as it is in the stomach, this intestine too has three coats, the outside slippery one, the middle muscular coat and the lining membrane behind. Unlike what is done in the stomach, the lining membrane here does not secrete any digestive fluid. It is covered over with a velvetty fringe of small points and these points are called 'villi'. These villi absorb the digested food into the blood.

The large intestine is only four feet in length. It is the last portion of the digestive tube or canal. The width of this canal is about thrice the width of the canal of the small intestine. The only difference found between the small and the large intestines is, that the former has the velvetty fringe of points while the latter does not possess those points. Further this large intestine begins at the valve at the end of the small intestine allowing the food not digested and absorbed in it, to pass on into the large intestine. It is not coiled up like the small intestines, but is arranged in a single fold around it.

The liver is a large glandular organ. It creates the fluid going by the name bile. This bile is poured into the small intestines and there mixing with the food passed on from the mouth through the gullet and the stomach helps to digest it. The organ sweet-bread too, secretes a digestive fluid and pours it into the intestine at the same place where bile is poured in. This juice also is a very important digestive juice. The only function of the organ sweet-bread is to provide the above-mentioned juice. In brief, food is first of all

chewed and mixed with saliva in the mouth. It is then passed into the stomach down the gullet. In the stomach the portion of the food not digested by the action of saliva and absorbed in the mouth is reduced to the condition of a soup. Here also some part of the food is digested (by the gastric juice poured into it) and absorbed, and the rest is passed on to the small intestines. There it mixes with the two juices bile from the liver and the pancreatic juice from the pancreas or sweetbread and is completely digested and absorbed by the villi. What still remains of the undigested food passes on into the large intestine. There all the water is absorbed and the refuse is thrown out of the digestive system through the anus.

Saliva digests the starch in the food by converting it into easily digestible sugar. The gastric juice is secreted by the lining membrane of the stomach. It digests the flesh-forming substances called proteins but not fat. Food is kept in the stomach from one to four hours according to its digestible nature. The undigested starch and proteins are very much softened in the stomach and consequently the fat released from the meshes passes into the small intestines as globules of oil. We have already stated that bile and pancreatic (sweet bread) juice are poured into the small intestines. These correct the acidity of the gastric juice. Strictly speaking, the bile removes the acidity and the pancreatic juice digests, all food principles, converting starch not digested in the mouth into sugar, proteins into meat juice and fat into cream. Fluids and food completely digested in the stomach are absorbed by the blood vessels inside it.

We have next to consider how blood circulates in the body and the cells or tissues of the body are fed. The blood in the body is in a perpetual state of motion in the tubes called blood vessels. It does not stop moving even for a single moment. What causes this perpetual circulation of blood in the body? The organ heart is the cause and at each of its beats the blood is pumped out and forced along for a certain distance. The heart beats sixty or seventy times a minute and therefore the blood is made to move on in the blood vessels incessantly and rapidly. The blood may be said to flow in a circle since what is forced out of the heart through the blood vessels returns to the heart surcharged with impurities from the tissues of the body.

Why should there be circulation of blood at all in the body? The various parts of the body require food and fresh air since oxidation and consequent wastage of tissues are going on everywhere in the body, due to its activity. As blood passes through the blood vessels into all minute branches of the body, every tissue is supplied with fresh food, oxygen and warmth, in place of what was used up. The used up food is thrown out as carbonic acid gas and other waste matter and is collected by the circulating blood and carried to the lungs and the organs, kidneys, skin, bowels, etc. to be thrown out of the human system. The blood is composed of a fluid portion called serum and a number of blood cells called corpuscles. These corpuscles are of three varieties. The commonest goes by the name of red corpuscles, and it is they that absorb the oxygen from

the air breathed into the lungs and carry it to the tissues. They also abstract from the tissues waste gases such as carbonic acid gas and carry them to the lungs to be expelled in the breath breathed out. The blood also collects waste matter from the tissues and carries it to the kidneys to be thrown out in the urine. How the impure blood is collected and purified is as follows. It is collected from the limbs, head, chest and abdomen by a number of collecting veins and brought into the right upper chamber called the right auricle of the heart. When the heart beats, this chamber and the left upper chamber contract and force the blood out from them. The impure blood forced out of the right upper chamber enters the right lower chamber called the ventricle through a valve. This ventricle then begins to contract with the left ventricle and this forces the blood in the right ventricle into the pulminary artery towards the lungs where it is purified by the oxygen in the air, breathed in passing through a fine network of little blood vessels called capillaries. This purified blood is carried to the left upper chamber and from there is squeezed into the left lower chamber or ventricle and forced into what is called aorta the main distributing artery and carried from there to every part of the body. The pure blood distributing blood vessels are termed arteries and the blood in them arterial blood. The returning blood vessels go by the name veins and the blood in them is called venus blood.

Now, before closing this chapter, we shall notice the human generative organs and their functions in brief.

The pelvic cavity at the lower end of the trunk contains the large intestines, the kidneys, the penis and the testicles. The penis, the male generative organ, is more sinewy than muscular and the sinews themselves may be classed under four heads. It consists of two long narrow bodies, each of which we may say is a net-work of vessels. These bodies are located side by side and below them is the place through which the tube from the bladder passes. During sexual intercourse the net-work of blood vessels in the penis becomes engorged with blood. The penis then increases in length and becomes stiff.

The testicles are the two male glandular organs. They form the male elements (spermatozoa) which fertilise the female element ovum from which the child develops. They are bodies oval in shape 1 1/2 inches in length, 1 inch in width and ¾ inch in thickness. They each consist of nearly from 800 to 1000 minute tubes. Within these tubes the spermatozoa are formed. These are gathered, [illegible] a long convoluted tube which is afterwards continued a more or less straight tube that leads to the urinary passage. The length of these tubes from the testicles to the urethra is about twenty feet.

The generative organs of a female are six in number Excluding the breasts that are not situated in the pelvic cavity there are only five of them. The pelvic cavity is divided into two portions, namely, anterior and posterior by two broad ligaments stretching across it-

These ligaments hold in place the uterus, the fallopian tubes and the ovaries. The other name of the uterus is the womb. In a virgin it is in the shape of a flattened pear. It measures from two and a half to three inches in length, but during pregnancy increases in bulk enormously and rapidly shrinks after child birth. The upper extremity of the womb is broad and is called the fundus. It is about two inches in breadth. It becomes narrow as it reaches the lower rounded portion called the neck of the womb. From this neck of the womb a membranous canal called the vagina extends to the vulva called also *pudendum*. There is a thin fold of mucous membrane called the hymen stretching across the lower part of the orifice of the vagina. Just within the entrance to the vulva referred to above is situated what is called *clitoris* which is plentifully provided with nerves. This is the organ of sexual pleasure in women.

The fallopian tubes proceed from the womb to the ovaries. These are also enclosed within the two broad folds of ligaments supporting the womb.

The ovaries are ovoid in shape. They are each about one inch in length. They are connected with the womb by a ligament and with the extremity of the fallopian tube by a short cord of ligament. The ovaries form ova one or more of which dropping into the fallopian tubes reach the womb to develop into a child later on.

We stated above, that the pelvic cavity is divided into anterior and posterior portions by broad ligaments supporting the uterus or the womb. The former con-

tains the bladder, the urethra and the vagina. The latter the posterior portion contains the rectum. There are two ligaments extending from the neck of the womb and the surface of the bladder. Two more ligaments connect the womb and the rectum.

The vagina attached to the mouth of the womb projects a short distance into the vaginal canal. In normal constricted condition it of course helps to keep the uterus or the womb in its position. But it is extremely flexible and capable of expansion too. So it yields easily to any pressure from within or from above. Stomach, liver, pancreas and the spleen rest upon the small intestines. As the small intestines rest upon the uterus, any compression of the abdomen may force those organs down and upset the proper position of any portion of the generative organ. Thus from the above paragraphs we see that a knowledge of the structure and the situation of the various organs of the body may prove to be of inestimable value to safeguard the health and well-being of an individual. Hence this chapter on human system and its organs must prove very useful portion of sexual science. This is not only the reason but it is also our apology for having included it in this small book of ours named "The Secret of Sexual Bliss."

CHAPTER IV.
DISEASES AND REMEDIES.

The diseases human system is liable to are innumerable. An attempt at giving even very brief descriptions even of a select few of them might swell this volume; yet an attempt has to be made in this direction and hence the diseases and accidents most common are taken up for treatment in this chapter. The most common pain men and women suffer from is due to cold. The pain may be the result of a cold in the nose. Then the best thing to do to relieve the distressing pain would be the application of dry heat using bran bags or small hot-water bottles over the nose and the forehead. This application usually relieves the sufferer from the stuffy feeling he is uncomfortable from, before the discharge comes out from the nose freely. The use of a nasal *douche* at the stage when the discharge from the nose is free and easy is desirable. Soda, Borax and tannic acid are considered good drugs for the purpose. Half a teaspoonful of either Bicarbonate of Soda or Borax dissolved in a pint of tepid water may be used through a syringe. A teaspoonful of Glycerine of Tannic acid added to a pint of tepid water may also be used.

Sore throat and hoarseness are also the troubles brought about when one has caught cold. The sufferer can be benefited if he manages to inhale steam. A jug of boiling water with a few drops of eucalyptus oil may be used with advantage. When there is free running at the

nose and sneezing, mix 2 drachms of Bismuth carbonate, 1 drachm of magnesia carbonate and 10 grains of cocaine together and use as snuff a small pinch at a time.

Some people get tooth-ache also from cold. Then it is desirable to avoid solid food and have recourse to liquid diet. A mixture of equal parts of tincture of iodine and tincture of capsicum may be painted over the gums. Warm fomentation to the cheek and frequent mouth washes with hot water may be tried with advantage. A mild purgative may often relieve the pain. If any of the teeth happen to be decaying two or three drops of oil of cloves in a bit of cloth may be applied to the cavity to find relief. Persons suffering from cough at nights as well as early in the morning after getting up from bed, should do well to swallow a cup of hot milk or hot water immediately before going to bed and immediately after getting up from bed. Persons after subjecting their bodies to exposure are frequently attacked with sudden startings pain in the chest. They have also fever, short dry cough and short painful respiration. Hot flannels sprinkled with a few drops of eucalyptus oil may be applied to the chest before the doctor is sent for.

A kind of disease begins on the tongue as white spots at first. Shortly after these break down, they bleed, increase in size and leave sore places. It may extend to cheeks as well as to gums even. When those spots are touched, the pain caused would be acute. The causes for this disease are improper diet, bad teeth on which a kind of matter grows even as fungus in unclean places,

and mouth made foul by the remnants of food etc. undergoing fermentation in the mouth. As a precautionary measure, the teeth and mouth should be thoroughly cleaned. Soon after the disease is developed, the first thing to do is to rub off gently the white spots with a piece of rag and then to apply to the spots a mixture of either Borax and honey or Borax and glycerine.

Back-ache is a common complaint due to fatigue, constipation or increased strain on the back. Whatever may be the cause of this complaint, it wears out the sufferer's strength slowly but surely. Rest, fomentation and a laxative may be tried, to get relief.

The same muscle when used for a long time causes in men and women what is called 'cramp'. It entirely prevents the use of those muscles for sometime. When it occurs people should take a warning that the nerve centres are exhausted and take rest. People who get this cramp often may be well advised to take good tonics.

People suffering from the stings of gnats, mosquitoes, wasps, bugs etc. may do well to apply to the part stung a lotion containing carbonate of ammonia one teaspoonful in a pint of water, with a piece of rag. Should the swelling and pain persist then antiseptic fomentation may be tried. Get a piece of lint soaked in the saturated solution of boric acid and dried. Put this and a piece of linen together in the centre of a handkerchief or towel. Pour over them some boiling water till they are thoroughly soaked. Then fold the sides of the kerchief or the towel over the lint and the flannel and wring off the excess of water. Take out the

lint and flannel without loss of time and see if the heat can be borne by the patient. Then apply it gently over the part affected.

Burns and scalds are the next accidents, human beings male and female, young and old are liable to. If the burn or scald is not severe but only ordinary and the skin has not been destroyed but is only reddened or slightly blistered, the best plan would be to sprinkle over the affected part or parts some flour and cover the same with some cotton wool to exclude air coming into contact with them. The contact of air with the inflamed part or parts is the cause of the pain, and hence the above arrangement has been suggested. To prevent the cotton wool placed over the burns or scalds from falling off, it may be lightly bandaged over with a piece of lint or clean rag. At times it may so happen that no flour can be had immediately. In such cases butter, if available, spread over a piece of lint or clean rag may be spread over the burn or the scald and bandaged over lightly. Pieces of lint soaked in salad or linseed oil may also be used in place of rag spread over with butter. If the burns or the scalds be severe and the skin has been destroyed, a mixture of ten parts of linseed oil, ten parts of lime water and one part of eucalyptus oil may be freely used to secure the best result possible. The application of the above mixture would not only exclude the air that might otherwise come into contact with the affected parts, but it would also prevent injurious matter from entering into the wound and increasing the trouble by complicating matters. The parts surrounding the severe burns and scalds should be

cleaned daily at least and the piece of lint or rag placed over them should always be oily and never dry.

People often faint from shook or concussion or they may even be stunned.

Then they should at once be put in bed and smelling salts should be applied to the nostrils. Hot water fomentation often proves effective. The patient may be made to drink hot coffee or tea.

People are often bitten by snakes, rabid dogs and so on, and it is highly necessary to know what is to be done in such cases. A string should be tied as tightly as possible immediately above the bitten part. The poison injected from the fangs may then be sucked out. If that be not possible, the bitten part should be burnt out thoroughly with a red hot piece of iron. The wounded portion may also be cut out with a sharp knife. The bitten part should be bathed with hot water. Bleeding should be encouraged as much as possible. If the patient feels faintness, then stimulants should at once be given. A small quantity of brandy would do. Having acted as directed above, the bitten part must be constantly kept immersed in hot bath taking care not to remove the ligature above the wound. Any kind of illness may produce in the patient insomnia or sleeplessness. Anxiety, pain, over-fatigue especially from brain exertion, and error in diet may in their wake bring on sleeplessness. Certain foods taken before retiring to sleep are known to result in sleeplessness. This is due to the distension of the stomach and the consequent pressing upon the heart. Some people do not get sleep if they take coffee or alcohol immediately before retiring to sleep. If one is hungry he may not get sleep.

Deficiency in bed clothes and defective ventilation in the room slept in, are often known to produce sleeplessness. Enough exercise to produce in one what is called 'healthy' fatigue is conducive to good sleep. Further, people should find out the cause for their sleeplessness. If it is due to indigestion they should avoid taking anything indigestible at least before retiring to bed. It is better to avoid taking a meal too late nor it is desirable to go to bed with the feeling of hunger. Bowels should be well regulated and every attention should be paid to avoid constipation. It is undesirable to go to bed immediately after hard study. A brisk walk after mental work and prior to going to bed, is very good to enjoy sound sleep. If over-fatigue is known to induce sleeplessness, then a warm bath followed by a cup of hot milk may give the needed relief. If sleeplesness is due to distension of the stomach some carminitives or a drop of carbolic acid or creosote in a little water may help to relieve the condition.

Hiccough is another most common ailment that attacks people. The most common of the several causes resulting in hiccough is rapid eating or taking of hot or pungent foods. Dyspepsia, diseases of the bowels, etc. may also bring on the trouble. The following remedies may be tried to suit particular cases. Sipping of cold water is the remedy resorted to when hiccough is caused while eating. Holding the breath as long as possible or taking a prolonged inspiration may be tried. Of medicines ordinarily given internally may be mentioned, spirit of camphor, spirit of chloroform and spirit of cajuput. About 20 drops of spirit of camphor in a wine glass of water or about 10 or 15

drops of spirit of chloroform in place of spirit of camphor mixed in water may be given. Spirit of cajuput if given may be administered on sugar, the quantity varying from 5 to 20 drops according to circumstances.

Fever is the next common disease and there are several varieties of it. All of them without exception commence with lassitude, head-ache, weakness of mental and physical power, chilliness and painful sensations in the back and in limbs. There is also the unnatural heat of the skin. The pulse is quickened, the tongue is furred and the stomach is generally disordered. The urine is scanty and high coloured. The patient feels great thirst. Fever also attends contagious diseases like small-pox, measles and chicken-pox. Then it goes by the name eruptive fever. It is often said that fever in many instances must be regarded not as a disease but the sympton of one. The treatment must depend upon the type of fever the patient is attacked from. Generally it may be borne in mind that the first thing to do should be to remove the cause of the disease. Further the regulation of diet and nursing is highly important. All digestive functions would be disordered, and hence solid food could not be disgested by the patient. So only fluid diet should be given. Mild purgatives or an application of enema may be resorted to, to keep the bowels acting after medical advice in critical cases. The drugs most commonly administered are quinine about a grain or antipyrin about 5 grains every 3 or 4 hours according to circumstances and the temperature. It is highly important to note that the waste from the body due to fever is very great, and hence it is highly essential to take

the possible and necessary steps to prevent such waste and replenish as much of it as possible. Most nutritious and easily digested food would go a long way to serve the purpose. An ounce of milk in about a quarter of an ounce of either boiling water, soda water or barley water with a small punch of bicarbonate of soda, given every 3 or 4 hours during the day, and once or not at all during nights may be found very useful according to the severity of the case and the strength, age and digestive capacity of the patient. The quantities of the above diet must be regulated. Double the quantity may be given every four hours in cases not very severe, during the day time, but at nights if the patient wakes, it may be given once. If curds are passed with the stools by the patients, then it shows that the power of digestion is weak. In such cases the milk given may be diluted more freely. In place of a larger quantity at long intervals of time, a smaller quantity at shorter intervals may be tried. When the disease is cured and the patient is on the way to convalescence solid diet is to be resumed slowly and gradually, boginning with slight solids that are easily digested such as crumbs of bread added to the milk and so on. The fact that sleep is as necessary as food, and that the former would do to the patient as much good as the latter should never be lost seght of. A restless patient should he happen to fall asleep, it is better not to waken him to give him food unless he happens to be constantly drowsy and then he may be roused at regulated hours both day and night to give him his food.

The tongue, the lips, the teeth and the mouth may be cleaned with a small piece of clean rag using a mixture of three parts of glycerine, two parts of water and one part of lemon juice.

The most common contagious fevers are chicken pox, influenza, measles, small-pox, typhoid and whooping cough. Each of these diseases has a particular period to run through. When it is developing in the body without any visible sign, the period goes by the name incubation period. Then the disease shows itself by certain symptoms peculiar to it, either suddenly or gradually. Then the progress of the disease is marked by stages, and if it be favourable eventually ends in convalescence.

Head-ache is another ailment most commonly affecting people. It is also in fact a symptom of disease itself rather than a disease. It may be brought on by various causes. Dyspeptic head-ache may be due to stomach, bowel or liver derangement. A draught of soda-water or nitrate of magnesia may give relief if the head-ache is due to the derangement of the stomach. But if the ailment is due to the fault in the liver or the bowels, then laxatives should be administered.

To get rid of nervous head-ache, the best thing to do would be to alter the patient's habit of drinking excess of coffee or tea which probably irritates the nervous system. He may be made to drink milk and water. People should not neglect taking food at the proper fixed hours, being bent on business or pleasure. If the patient happens to be a tobacco-smoker, he must abandon the habit or at least reduce the quantity consumed

to a minimum. Plain wholesome food must be substituted for made dishes, etc. If females happen to suffer from head-ache of the above character about the time of their monthly course period, then bromide of potassium may be tried.

Another common disease is that going by the name of abscess. It is nothing but a collection of matter under the skin caused by the action of certain micro-organisms. A surgeon's help should be had at once to let the matter out after applications of hot linseed poultice to bring the abscess to ahead. If the abscess happens to be chronic, that is, due to the tubercular disease, then the best thing to do would be to build up the patient's health. Plenty of pure fresh air, sunlight and plain but nourishing food should be provided. Iron tonics such as Easton's syrup may be given three times a day after meals about a teasfoonful at a time. Cod liver oil half to one teaspoonful after meals may be given to have very good results in tubercular cases.

A boil is caused by a germ finding its way in hairy parts of the body and there setting up inflammation. People engaged in dirty occupations and occupations leading to much friction in any part are susceptible to boils since the outer protective layers of the skin—cells are being removed. The germ causing the boils is able to gain access to the living tissues beneath. Fat people and those who eat excessively without keeping their bowels regular, do generally get boils. The parts, commonly favourable are the neck, the shoulders, the buttocks and the backs.

Boils are of two kinds. One kind comes to a head while the other may not come to a head. After reaching

a certain stage and size the second kind known as "blind boil," stops growing and then gradually disappears. Ordinarily the boil comes to a head and pus formed inside. After the core is discharged through the opening, healing follows. A boil increases in size and soreness for two or three days. Then it usually breaks and the pus formed inside escapes. In another day or two, the central core too comes away. Then the boil dries up and the dry scab peels away a few days later.

For a few days, the patient should be given only a very light diet with a tonic for three or four weeks. Unless general health is speedily built up, a second boil or even a continuous number of boils may follow. Hence the above suggestion should be attended to. 36 grains of sulphate of iron, half an ounce of sulphate of magnesium, two drachms of dilute sulphuric acid and three drachms of compound tincture of cardamoms mixed in water enough to make 6 ounces is considered an excellent tonic to be given. A tablespoonful may be given in a tumbler of water before breakfast.

The boil itself as well as the surrounding parts must be kept scrupulously clean not only to prevent the spread of the disease to the other parts but also to make it cure soon.

After having disposed of the two diseases namely the abscess and the boil, it is but proper to say a few words about itch and how it is caused since it is a very common sight met with every day. Parasites are organisms both animal and vegetable that live on or within the human body. There are several species of them and some are insects living on the surface of the body and some are worms living within it. Some of

these creatures are harmless, some create much discomfort while many are very injurious. Of the external parasites infesting human beings, the chief parasite is the itch mite. It burrows into the skin, forms a tunnel and lays its eggs in it. In this way is set up the troublesome itching. The places chiefly attacked are the hands, the thighs, the buttocks and the genital parts.

Itching may also be a symptom of some skin disease. It may also develop in the course of certain constitutional diseases such as diabetes. Hence the treatment should depend upon the causative factor to be removed.

The piles complaint a large number of people are suffering from may be traced to one or other of the following causes, namely, liver disease, constipation, sedentary living or abdominal tumours. The piles give rise to moisture about the anus, itching pain when passing stools, bleeding and the coming down of the bowels. Then regular action of the bowels should be maintained. To effect this, laxatives should be made use of and enema utilised. If the bowels comes down, it should be returned at once by applying pressure with the finger if possible. Else getting the assistance of a doctor to do it would be the best thing to do.

Ear-ache is another common disease. Discharge of matter from the ear is due to sore throat from cold, etc. Severe inflammation of the ear or mild attacks of pain affecting the ear and shooting about the head are the signs of the disease. Applications of hot fomentations with hot brain or sand bag over the ear and the giving of a gentle purgative may be tried to give relief to the patient even by the ignorant. Colds should be avoided

with preventive measure. Convulsions usually occur in rickety children between the 8th and the 12th month. They are subsequently brought on even by slight causes. Teething, indigestion and worms in the intestines may also bring on convulsions in infants and young children. In grown up people the fit may be brought on by epilepsy, hysteria, etc. The common symptoms are the rolling of the eyes, sudden movements of the limbs and the head, the twitching of the muscles and the grinding of the teeth. In the case of infants, a hot bath for a minute or two, followed by careful drying should be tried. It should then be put in the cot or bed and a bread and mustard poultice applied over the back of the neck. The poultice referred to may be prepared thus. Broken crumbs of a loaf may be put in a hot basin and boiling water sufficient to cover them may be poured. The basin may be allowed to remain near a fire for a few minutes with the crumbs of bread soaking in the boiling water. The crumbs may be stirred with a spoon now and then. Then as much water as would run off should be drained off and the poultice spread thickly on a piece of clean cloth. The surface should be sprinkled lightly with powdered mustard. Then the poultice may be applied. It is also usual to spread a bit of clean muslin over the poultice so that it may remain between the skin and the poultice. For a child from nine to fifteen months, the soothing mixture prepared with 1½ drachms of ammonium bromide, 2 drachms of tincture of belladona, 1 drachm chloral hydrate and enough chloroform water to make 6 ounces may be administered a teaspoonful every hour for four hours after the last convulsion. If

the convulsion be due to the cutting of the tooth, then the gums should be looked to at once. The irritation caused by the tooth trying to force its way through the gum may be the only cause of the convulsions. Then the best thing to be done would be to run the index finger around the top of the gums and see whether any projecting sharp point of tooth is trying to break through. If the case be such, a little sawing with the finger nail over the prominent edge of the tooth will be enough to cut through the gum and give immediate relief from pain and irritation the causes of the convulsions. Before using the hand for the purpose sketched forth above, it is highly essential that it is thoroughly cleaned with hot water and soap and soaked for a moment in a solution of one part of carbolic acid to twenty parts of water.

At times the sole cause of the trouble may be due to undigested milk in the stomach. It may remain as a curdled mass and it is necessary to make it softer and readily digestible. Then the tendency to further convulsions may perhaps disappear.

If it is suspected that the convulsions are due to round worms as is often the case, then the child should be treated with santonin. Half a grain of it may be given to a child a year old and two grains for a child three to four years old. It may be given mixed with butter or bread and disguised with some sugar. About two hours later a teaspoonful or more of castor oil should be given and this would hurry the worms killed by the drug out of the bowels.

Bleeding is another danger that people should know about to guard themselves and others against. It may be either internal or external. Internal bleeding may occur into any of the organs or cavities of the body. It may be due to injury or disease. Whether internal bleeding has occurred is known by sudden pallor, faintness, cold and clammy sweating, weakness of the pulse and so on. If the bleeding is not severe and has not stopped after a short time but is prolonged, then the patient becomes restless. His sight becomes dim. He hears noises and any exertion makes him faint. Breathing too becomes difficult. It is dangerous to stimulate the heart's action to get rid of the faintness. Nature always tries to do everything to keep the body all right and faintness is brought about by nature as the most proper and desirable thing to do. The force of the heart being diminished, the blood clot formed to serve the purpose of a dam to stop bleeding is not washed away. But if stimulants are given to increase the force of the heart, the blood clot may be washed away. This would facilitate prolonged bleeding ending perhaps in death. It is of course necessary to do everything to save life, and the best thing to do in the present case would be not to do anything at all. It should be borne in mind that bleeding if left alone and not interfered with tends to cease of its own accord and consequently, stimulants, smelling salts, etc. should on no account be recoursed to revive the patient nor should he be made to exert himself by talking.

The commonest varieties of bleeding are bleeding from the lungs and bleeding from the heart. If blood

comes up with coughing, then it is due to bleeding from the lungs. If blood is brought up by vomiting after a sensation of nausea, weight and fullness in the pit of the stomach, then bleeding must have occurred in the stomach.

If bleeding is from the lungs, then the patient should be given cold fluid diet only. He may be allowed to suck small quantities of ice. Careful application of ice bags to either side of the chest with a piece of flannel between the body and the bag may be tried. As for bleeding from the stomach the ice bag may be placed over the pit of the stomach.

Whooping cough is one of the most troublesome contagious diseases that attack generally young children. It has been ascertained that the disease though contagious is not so contagious as measles, etc., that very close association of children is necessary for infection and that girls are more subject to it than boys. At first it begins with a little troublesome cough becoming worse at night. This disease has a period of incubation from four to fourteen days. It has also three stages, namely, catarrhal stage, spasmodic stage and declining stage. In the first or the catarrhal stage, the symptoms that appear are like those of an ordinary cold. The child feels somewhat ill and has a dry cough. Then the nose runs, slight fever and loss of appetite following. Soon the cough becomes louder. The eyes water and become bloodshot. The eyelids (and sometimes the whole face even) are swollen. This stage may be said to last from seven to ten days.

In the second stage called spasmodic or paroxymal stage, the coughing becomes convulsive and is followed

by what is called the "whoop." Any kind of irritation of the throat caused by crying, eating, or drinking, may bring on the violent fit of coughing. The first cough is usually followed by a short whoop. Then a number of coughs follow ending in a second prolonged whoop. At times the coughing continues so long accompanied by a third or even a fourth whoop, that the child is utterly exhausted. It is not able to breathe while the coughing lasts. So the face becomes swollen and dusky and the eyes are bloodshot. The coughing fit often ends in a vomiting of mucus. The bladder too may be emptied and the bowels too may act. In some cases the fits occur very frequently say every half-hour or so. Even in other cases they may occur say five or six times in a day.

The children know when the fit is coming on. They show great fear. They run for support and grasp a chair, etc. After the fit has passed away they remain weak and fatigued for some time.

In the early stages, diet must be carefully regulated since the stomach is liable to get out of order and then excite coughing. Fresh air must be secured and the bowels moved with saline salts, etc. In the second stage bowel action must be ensured throughout and the chief aim should be to reduce the frequency and violence of the coughing fits. For this purpose many sedative and antiseptive drugs are employed.

It was supposed that it was not possible to cure the whooping cough with drugs, etc. and that it should run its course and die out. The flesh of crocodile was considered a good medicine to lessen at least the violence of the fit by some of the Indian physicians. But now

it is said that a Belgian doctor has discovered a serum which when injected under the skin in the abdominal region, not only produces an early cessation of the coughing fit, but it also diminishes the normal period of the illness considerably.

Influenza is another disease one should guard against. It has also a period of incubation lasting from three to four days. It begins with high fever ranging from 103° to 105° F. The patient also feels head-ache and pain in the back and in the limbs. While the disease is on, the patient's strength should be maintained by giving good nourishing food. A mild purgative in the form of two grains or so of calomel may be given. If desirable even stimulants may be resorted to. During the period of convalescence, good fresh air, plenty of good nourishing food and rest, are highly essential. If the patient is worried with cough as is frequently the case after an attack of influenza, a mixture of a teaspoonful of syrup of Tolu with 10 grains of chloride of ammonia and ten drops of ipecacuanha with a tablespoon of pure water may be given every three or four hours.

Cholera is another fell disease taking heavy toll every year from all classes of people. It is believed to be communicated by water used for drinking purposes. Water used for cooking and washing may also convey contagion. Hence care should be taken to see that clothing, milk and food are not contaminated. The best preventive as well as precautionary measure con-

sists in boiling all water used. Fruits and purgatives should be avoided during the period of its prevalence and general health and correct digestion should also be maintained. During the early stages, chlorodyne, camphordyne, spirits camphor, etc. may be administered in appropriate doses. Heat should be applied to the abdomen freely. If the diarrhœa is very severe, plain soda-water, brandy and water and similar fluid drinks may be given, not in great draughts but in small quantities to be sipped.

Heat should be applied to the body and the limbs. The patient should be kept warm in a well ventilated room. The skin may be wiped as often as possible. The pit of the stomach should be fomented. Every effort should be made to supply the fluid lost by diarrhœa and vomiting by copious warm enemas, etc. and the patient's strength also should be kept up. Even during the period of recovery, great care should be taken in feeding. It is highly essential that solid food is given only very slowly, gradually and very carefully.

Another disease that people dread very much is small-pox. This disease is said to have five stages. The incubation period is twelve days. Then appear the warning symptoms such as back-ache, pain in the loins, severe head-ache, vomiting, etc. The bodily temperature also rises up to 104° F or even 105° F. Then the rash appears and develops and with its development the temperature falls. After a few days, the true erruption appears on most parts of the body even in the mouth and the nose. On the third day the eruptions

become blisters and on the fifth day have a red area around. On the eighth or the ninth day matter is formed in the blisters. On the eleventh or the twelfth day scales begin to form and on the twenty-first day they begin to fall off.

As regards precaution and treatment, the patient should be isolated till every trace of peeling has disappeared. All contacts should get themselves vaccinated. A mild purgative in the beginning may prove beneficial. As regards diet, plenty of nutritious fluid diet may be given and to relieve thirst, plenty of drinks may be given. If the patient is sleepless, about 20 grains of bromide of potash may be given.

The disease going by the name of chicken-pox may be prevalent during the epidemic of small-pox. It may also occur when small-pox is not prevalent. The period of incubation for this disease also is from ten to fifteen days. The ordinary symptoms are head-ache and chill with slight fever. In a few hours the rash appears first upon the back and chest or upon the face and the forehead. In twenty-four hours these rashes become blisters. On the second day they are grown to the maximum size, and on the third day matter may be formed in them. Then they burst or dry up and form scabs.

Generally, this disease is mild. Isolation, careful nursing, avoidance of chill, etc. are the advices generally given.

The incubation period for measles is from ten to twelve days. There is generally pain felt in the limbs with slight head-ache and giddiness. Shortly the rash appears. It begins on the face and extends in a day to

the body. After three or four days slight peeling occurs.

The patient should be kept isolated for ten days at least after the disappearance of the rash.

Dengue fever called also dandy fever and break-bone fever is a common disease in the tropics. The fever is accompanied with pains in the joints and the muscles. This disease also is very infectious. If one member of a family gets it, then all the other members also generally get it. At times all the members of a family may also be laid up with this fever at the same time. The disease begins with sudden fever and chills. Severe head-ache and intense pains in the joints are also felt. As the bones ache intensely this disease has won the name "break-bone fever." The disease lasts for three or four days and then subsides. In some cases it may again come on after an interval of a day or two. The disease is generally left to run its course. After the disease subsides, good tonics may be given to the sufferer and the health generally built up.

Typhoid or enteric fever is another very bad disease requiring careful precaution and treatment. The disease is said to attack people between fifteen and twenty-five years of age. It is almost invariably conveyed through contaminated drinking water. The incubation period is from 10 to 14 days and in some cases it may even be longer. It may begin with severe head-ache, diarrhœa or bronchitis. Loss of appetite, pain in the back and alternate chills are the usual symptoms of this disease. The sickness lasts for four

weeks. Improvement generally begins only in the fourth week. The disease has to run its course and the only treatment necessary is careful nursing and dieting. The spread of the disease should be prevented by thorough disinfection. Purgatives should never be given to patients suffering from typhoid fever.

Malaria is a disease brought about by a parasite generally on mosquitoes. The stings of certain mosquitoes introduce the malaria-causing parasite into the btood of human beings. As mosquitoes generally sting people only at nights or rather just after sunset, people living in malarial tracts should try to protect themselves from their attacks by using mosquito nests. Everything possible may be done to escape from the sting of the mosquitoes at nigths living in mosquito proof rooms, etc. having wire gauze mosquito curtains over doors and windows. People living in malarial tracts may do well not to leave the protection of the mosquito curtains covering their beds till sunrise has pretty well advanced. Quinine in doses of two grains may be taken two or three times daily every other week. If 15 grains of the drug is taken once or twice a week it will protect one from this disease to a very great extent. The most common places of breeding and harbouring mosquitoes are swamps, puddles of water and decomposing vegetation. Care should be taken to see that mosquitoes are not given harbours referred to above.

This bad disease has three stages. The first is the shivering stage and it lasts an hour. The teeth may chatter and shivering may be felt all over with the feeling of great coldness. The second is the

hot stage when the patient feels most uncomfortable and desires to throw off his bed clothes. He has fever, the temperature rising up to 104° to 106°F. Intense head-ache is suffered from and vomiting may also be frequent. This stage may last for three or four hours. The third or the sweating stage brings down the temperature. All signs of the disease such as thirst, head-ache, etc. disappear. In about two or three hours the patient is quite well. He only feels little weak and tired.

During the cold stage, the patient may be given hot drinks and kept well wrapped in blankets etc to keep him warm The hot stage may be allowed to pass away. But care should be taken to see that the patient does not expose himself suddenly, since that may result in a bad chill. When the hot stage is over and the sweating stage begins, ten grains of quinine in a tablespoonful of milk should be given. Then five grains of the drug every six hours may be given for three days or so. During the next two weeks, doses of three grains of quinine may be given thrice a day. Good tonics of iron and arsenic continued for some weeks would do the invalid much good. If the disease happen to be in a severe form, then stimulants with quinine may be given even without waiting for the last sweating stage.

The disease which the people of tropical and sub-tropical regions are liable to be attacked by is dysentery. This disease also has been traced to the action of microbes. There are several forms of this disease and they say that there are also several kinds of mi-

crobes responsible for the different forms. The primary cause for the disease is indigestion due to bad diet. People eating food not properly cooked and those eating unripe fruits are said to become its victims. The disease may also be due to other causes favouring the production of micro-organisms. The disease may begin with diarrhoea at first which may afterwards become more copious. Fever and loss of flesh are other symptoms that may be present. A good deal of slime is passed by the patient with blood also. A good deal of straining and griping of the rectum and the anus may also be present. In a chronic form, this disease is most dangerous resulting in indigestion, loss of flesh, weakness and anaemia and terminating perhaps in death. As regards treatment we may say that very great attention and care should be paid to diet. Only easily digestible food such as whey (the fluid constituent of milk remaining behind after the curd has been separated off) should be given. Free purgation using mild purgatives should be aimed at. Starch and opium enema is found to be most satisfactory, since the disease is due to the inflammation of the mucous membrane of the large intestines especially of the colon.

As a very large number of people are subjected to the complaint of constipation, a few words regarding it may not be out of place here. This complaint unlike numerous other complaints, is preventable. The causes leading to the complaint are found to be simply dietic. Highly concentrated food and foods like milk, etc. that are very easily and readily digested, do not leave any residue to excite the bowels to act, since almost the

whole of such food taken is digested and absorbed. Insufficiency of fluids in the bowels makes the residue after the digestion is over very hard to be easily thrown out by the action of the bowels. Lack of sufficient secretion of bile and other digestive juices due to indigestion and torpidity of the liver may also be one of the contributing causes of constipation in men and women. In some cases this complaint has been traced to the use of purgatives too often, without endeavouring to correct the conditions finding out the causes. As the effects of constipation may prove to be too serious to be neglected, it is desirable to recourse to proper timely remedies. The first and foremost thing to do is to correct the diet. Ripe fruits of all kinds taken regularly, often gives beneficial results. Figs, bananas, grapes and apples are considered specially good fruits to be given to people suffering from constipation. Anything found from experience to cause constipation should be avoided Regulated habits of life with moderate exercise and taking walks regularly and systematically, would prove highly beneficial. The massage of the belly daily for about 20 minutes may be tried.

After constipation comes the ailment biliousness, a condition in which the liver is overloaded with bile. Defective eyesight is said to be due to constipation, and biliousness is associated with the latter complaint. So to remove biliousness, eyesight and constipation may be attended to and treated properly.

Another trouble arising to people is from worms The variety found in the human body is what is known

as thread worms. These infest the lower intestines causing much itching and iritation about the anus. There is also another variety generally seated in the small intestines and the stomach. These worms are long and round.

The chief symptoms denoting the existence of worms are, indigestion, foul tongue, offensive breath, hard full and tense body with occasional gripings and pains about the navel, heat and itching sensation in the rectum and about the anus, heavy and dull eyes, itching of the nose, short dry cough, grinding of the teeth, starting during sleep often attended with slow fever, etc.

The first thing to do to effect a cure is to clear the stomach and the intestines of redundant slime. The bowels too should be strengthened so as to destroy the disposition to the generation of the worms. Slime and morbific matter are impurities in the stomach and these are the causes of worms. Bowels are often irregular on account of worms and therefore the state of the bowels should be attended to. Sweets should be avoided. Salt and water taken in the morning will expel worms especially those in the stomach and the small intestines. A tablespoonful of salt may be dissolved in half a pint (quarter of a seer) of water and taken. Camphor dissolved in spirit of wine is another remedy for worms. It may be added now and then to tonic bitters and given. Lime-water is capable of dissolving the mucus in which the worms breed. Therefore it may be taken with tonic, mixtures and bitters. It is very effectual in relieving children from the trouble of worms.

Piles are due to liver disease, constipation, etc. They are the enlargements of the veins at the lower termination of the intestines, frequently causing great pain, bleeding and difficult evacuation. When there is a discharge of blood, then the disease is called *bleeding piles*. When no blood is discharged then they are termed *blind piles*. When the discharge is only serum, then they go by the name *white piles*.

When piles are found to be caused by constipation and debilated state of the bowels, then care should be taken to open them and keep them so by gentle aperients. Juice of nettles lightly boiled with a little sugar is said to cure bleeding piles. To cure dry piles, warm treacle or a tobacco leaf steeped in water for a day or a skinned onion bruised or roasted in ashes may be applied.

Whitlow is an inflammation of the fingers, thumb or hand giving very great pain. A hole may be cut in a lemon and worn on the finger like a thimble to cure this disease.

CHAPTER V.

PHYSICAL DEVELOPMENT.

A word of apology is perhaps necessary for including a chapter on physical development in a treatise on sexual science. But there is no gainsaying the fact that the subject 'sexual science' is an all-embracing one and consequently physical culture may well form a part of it. People at least in India are of opinion that physical culture is necessary for boys and not for girls. This idea is quite erroneous. Only if women are strong and healthy, they can bear and bring forth strong and healthy children. Every one knows that food and air are quite essential for the welfare of the body. But very few recognise the importance of physical exercise which is as necessary as the food we eat and the air we breathe. Further to utilise properly or in other words to get the fullest possible benefit from (1) the food we eat (2) the drinks we drink and (3) the air we breathe, the tissues and muscles of the body should be regularly and systematically exercised both by men and women, young and old. Certain natural actions are imposed on muscles and organs of the human body. These therefore should never be restrained from properly performing those actions. Hence it follows that all the movements of the body such as bending, walking, running, leaping, lying down and so on should be free and natural. The garments worn by men and women should be subser-

vient to the body, and the body should never be made subservient to the garments, as is most commonly the case in countries in Europe where corsets are used by women. The bad habit of mothers preparing their daughter's bodies even before they have reached their teens should be put a stop to and healthy ways of gaining and retaining grace of body and its movements should be resorted to. The poor girls should never be made to submit their bodies to be cramped and pressed to satisfy the dictates of fashion. After all fashion is only man-made while natural formation (barring a few exceptions of the freaks of nature) is according to the laws of God. A slender waist in a woman may perhaps be considered a desirable thing in the fashionable circles and to conform to the dictates of fashion, poor girls and women in Europe subject themselves to the torture of cramping and pressing it. Similarly feet are thrust in slippers too small for them, in order to conform to the dictates of fashion. Fortunately for the Indians, their women are not subjected to such practices though some of them aping the foreign fashion voluntarily submit themselves to the torture. But fortunately for us the number of such people is very small. Further the fact remains that the compression of any part or parts of the body produces deformity in it or in them. The internal organs too may be compressed and thus prevented from performing their functions properly. This perhaps results in the women (already delicate) becoming more delicate than ever sickly and unfitted for motherhood.

From what has been set forth above it should be clear that the organs and the muscles of the human

body should not in any way be restricted from their free action by submitting it to unnatural methods. As this alone would not be sufficient to secure health, every one would do well to exercise his or her body regularly and systematically. One portion of the body should not be allowed to over-develop at the expense of other portion or portions. Certain set of exercises practised regularly and systematically may develop the shoulder or the bicep's muscles and make them strong. Of course these portions are useful in their own ways and therefore they should be strong and vigorous. But vigorous and strong organs and a healthy skin are more important to possess than strong shoulders and biceps. So men and women should understand something at least of the human body and its organs to exercise them uniformly and properly. A rudimentary knowledge of physiology would be enough for the purpose. Specialists in physical culture like the Danish hygienist J. P. Muller have laid down that the exerises of the body should aim at three things, namely, (1) To promote function of the skin enabling it to open its pores freely and throw out through them impurities from the human system, (2) To promote and improve the action of the lungs, and (3) To promote digestion. To the above three may be added one more aim and that is to improve the circulation of blood. J. P. Muller, the Danish hygienist, referred to above, recommends in his book "My system" light muscular exercises to be followed by a hot or a cold bath and the rubbing exercises. It should always be borne in mind that human beings both men and women, young and old have to fight the battle of life. To do this successfully they should possess firm elastic muscles and a state of

general physical fitness. Health and vital efficiency, combined with the symmetrical development of the various parts of the body are also necessary for this battle of life. All these can be had by physical exercise in moderation. It is a known thing to everyone that to keep a thing in good condition sufficient use should be made of it. Similarly the muscles of the body also should be sufficiently made use of to keep them in good condition. Further it has been noted that a certain firmness of muscles and ability to endure severe physical and mental strain, have been the contributary causes for the greatness of a large number of famous people of the world. Men and women with flabby muscles would generally be flabby in their mentality also.

Different people require different kinds of instructions in physical culture suited to their requirements. There are busy men and they do not need exercises to make them giants. They should know to improve their physique and strengthen the organs that may happen to be weak. If they have flabby muscles they should know how to make them firm. They should also learn to increase their chest capacity by regular breathing exercises. They should, in short, learn to make themselves men and women with graceful, strong and symmetrical bodies. Ten or fifteen minutes devoted to the practice of carefully arranged exercises both mornings and evenings would surely result in very satisfactory results. The general principle to be borne in mind power should be fully concentrated on that part or organ which the exercise is intended to improve and strengthen. When exercising the arms the mental power should be

concentrated on the arms fully. When engaged in breathing exercises, the attention of the individual should be fixed on the lungs and the muscles taking part in respiration. No exercise of any kind should be taken when one is weary. All exercises taken should be regular and systematic and never spasmodic *i. e.* taken by fits and starts. Certain hours should be fixed for taking exercise daily and the practice regularly attended to during those hours only Unless one takes a pleasure in the exercise which he practises, he can never hope to derive the maximum benefit from it. The following extracts taken from the chapter on physical development in the beautiful work "The School of Health" by Alfred B. Olsen, M.D., should be of immense practical benefit to the readers of this book.

1. *Standing, Primary Position.*

To take the correct standing position, stand with the back to a door or wall. The heels should touch each other and the feet from a right angle. The heels, hips, back and head should touch the wall and the arms hang loosely. While maintaining the erect position bend the head backwards as far as possible. This pushes the chest forward and upward and separates the back from the wall. While maintaining this position raise the head keeping the chin well in. Only the heels and hips now touch the wall. Test the position by raising the heels. If this can be done without throwing the body forward the position is correct.

Mr. Olsen says that his directions quoted above, if carefully followed, would give one erectness, dignity and

grace pleasing to behold, in addition to spring and elasticity to the step. Further he says that it minimises jarring of the spine, that it is the proper position for people and that it gives freedom of action to the lungs and the other organs of the body. As the position will be tiring for one not accustomed to standing erect, considerable practice may be necessary to make it a natural habit, he adds, to what he has already stated.

The second position described by Mr. Olsen is the "Primary Sitting Position." To quote his own words, "The chair or stool should be of such height as to allow the feet to rest comfortably on the floor. The trunk should be erect, the chest well forward, the head erect, chin in and there should be a strong forward arch of spine. Sitting so that the spine arches backwards is a pernicious habit that interferes with respiration. The proper way to sit down is to bend the knees and hips, keeping the trunk erect."

The next action of human being that requires our attention now is that of walking. Even here we shall do well to quote what Mr. Olsen says about it.

Walking.

"Take the correct standing position and constantly maintain the erect posture of the trunk. Bend the body forward from the hips and step forward lightly letting the weight of the body fall forward on the balls of the feet. The arms may swing at the sides. Walking is sometimes described as an intermittent falling forward with a foot thrust forward just in time to prevent falling."

"There should be very little sideway of the body and the step should be brisk and certain. If the position is correct, there will be a feeling of ease and elasticity that the old stooping gait could never give."

People often have stairs to climb and Mr. Olsen thinks that in this also certain regulated movements of the limbs would be desirable and highly beneficial. He says that "Most people make the mistake of stooping forward when going upstairs. Such an unnatural position makes the climbing difficult and laborious. Walk upstairs as you would on the level, and you will be able to accomplish with comparative ease what is usually considered to be a wearisome task. A very slight forward bend of the trunk at the hip joints is all that is required to maintain the equilibrium."

Running is another action of the human beings which when regulated and performed as a habit would be a highly beneficial thing. To quote Mr. Olsen again, "The initial position is correct standing with the chest well forward. The heels scarcely touch the ground and at each stride, both feet are off the ground for a moment. The elbows are bent and the hands loosely clenched. The movement is really a rapid falling forward, the lower limbs coming forward to support the body and preventing a fall."

The other positions described by Mr. Olsen are (1) Compound Standing Positions (2) Close-standing (3) Toe-standing (4) Knee-bending-standing (5) Wing-standing (6) Bend-standing (7) Heave-standing (8) Rest-standing (9) Stretch-standing and (10) Yard-standing, and they are described as stated below.

(1) Compound-Standing Positions.

"In all cases the correct standing position, (described above) is the basis of the position, the only difference being the position of the limbs."

(2) Close-Standing.

"The feet are close together touching at the balls as well as at the heels."

(3) Toe-Standing.

"Identical with correct standing except that the heels are raised from the ground about two or three inches."

(4) Knee-Bend-Standing.

"The position here is similar to that in standing Primary Position, except that the knees are bent to a right angle."

(5) Wing-Standing.

"Take the standing position and then let the hands rest on the hips with thumbs behind the fingers in front. The elbows form right angles and are in the same plane as the trunk. Avoid bending the wrists. The arm and hand should form a straight line from the elbow to the tip of the index finger."

(6) Bend-Standing.

"This is also the same as Primary-Standing with the exception of the arms which are close to the body, while the fore-arms are bent upward, the fingers resting on the shoulders."

(7) Heave-Standing.

"In this position, the upper arms are extended outwards, forming right angles with the trunk. The fore-

arms are extended upward from the elbows with palms facing and forming right angles with the upper arms. Both arms are in the same plane as the trunk."

(8) Rest-Standing.

"The hands are placed behind the neck with palms forward and fingers touching. The elbows should be well back in the same plane as the trunk. There is always the tendency to bend the head forward which should be guarded against. It is an excellent position for expanding the chest."

(9) Stretch-Standing.

"This is also identical with Primary-standing except that the arms are extended upward with the palms facing."

(10) Yard-Standing.

"Take a correct standing position as described under Primary Standing Position and then raise the arms outward to a level with the shoulders, keeping the fingers closed and the palms turned down."

In addition to the foregoing exercises on the movements and positions of the body and the muscles, there are also other exercises on physical jerks and breathing described by specialists in the science and art of physical culture. Captain T. A. Lowe, D. S. O., M. C., of the Royal Irish Regiment and Assistant Superintendent, Army Physical Training Staff, has in his excellent treatise on "Physical Jerks" described fourteen exercises, namely,—(1) Arms raising sideways and upward to be repeated eight times. (2) Heels raising and knees bending to be repeated four times. (3) Head bending backward and sideways twice to each side. (4) Arms stret-

ching forward, upwards, sideways and downward three times. (5) Trunk rolling four times each direction. (6) Lunging thrice each direction. (7) Balancing thrice each leg. (8) Trunk turning four times each direction. (9) Lying in position and legs raising four times. (10) Trunk bending forward and full downward four times. (11) On the hands arms bending four times. (12) Heels raising and full knee bending thrice. (13) Head turning twice in each direction and (14) Cooling down (arms raising forward and upward, lowering sideways and downwards) until the action of the heart and the lungs is eased.

Mr. Lowe recommending the performing of the above exercises in pyjamas says in his description of the exercise "Arms raising sideways and upward."

"Raise the arms steadily sideways in a line with the shoulders, palms of the hands downward, fingers closed and fully extended. Then by a continuous movement carry the arms above the head, palms turned inward. Lower the arms sideways to the level of the shoulders and then once more to the sides."

"Perform this movement slowly eight times breathing in through the nose at the commencement of the movement and exhaling through the nose when lowering the arms from the upward position. This exercise is of the greatest value when taken in the morning as the first thing to be performed since the ribs are raised upward by the upward movement of the arms enabling their weight to be temporarily removed from the lungs and the heart and thus correcting the cramped effect of contraction during sleep. Further, the exercise warms and exhilarates the whole body."

Now, before giving particulars about the other exercises noted above, Mr. Lowe describes three positions that may often be required to assume before commencing them. The first position, he describes, is the "Hip Hold" or "Hips Firm" position. Here he wants the waist to be grasped firmly just above the hips having the fingers together in front, thumbs behind and palms pressed well down. "This position takes the weight of the arms off the shoulders, fixes the shoulder blades, and keeps the hands clear of the sides when the legs are being moved," he adds.

Before giving instructions regarding the assumption of the second position referred to above he says:—"This position can be an exercise by itself with excellent results since it brings many of the back muscles into play giving a *flat* position to the shoulder blades. It also improves the carriage of the upper part of the body and strengthens the muscles of the arms.

Regarding the instructions on the position to be assumed, he says:—"Bend the arms quickly by carrying the hands close up in front of the body till the forearms are fully bent on the upper arms, the hands remaining clenched and carried will back into line with the shoulders".

The next starting position with the hands as in "Hip Hold" but with feet astride, about twenty-four to thirty inches, gives a broader base for exercises in which the trunk and upper part of the body are employed.

Captain Lowe describes the other exercises as noted below.

(2) Heels raising and knees bending.

"Raise the heels from the ground as high as possible, keeping them together, legs straight, body and head erect. Still keeping the heels together, bend the knees outward. Then straighten the knees evenly keeping the heels raised. After a short pause lower the heels. Perform this movement completely four times breathing deeply and regularly. In this exercise all the muscles of the leg come into play. The carriage of the body will be greatly improved while that tired feeling about the legs usually due to much walking on hard streets will be completely overcome by the practice of this exercise which enables the student to walk upon the ball of his foot. This is also an invaluable corrective exercise for flat feet. It also increases agility and gives the delightful sensation of being on the toes or in other words being ready to move quickly and without effort in any direction".

(3) How to develop a strong neck.

"Bend the head slowly backward keeping the chin from poking forward. Raise it slowly to its normal position. Perform this exercise thrice. Then bend the head slowly to the left, keeping it well back during the movement and the face turned to the front. Raise the head slowly to its normal position and repeat the exercise to the right. This should be performed twice in each direction. These exercises strengthen the muscles of the throat and the sides of the neck and increase the flexibility of the neck portion of the spine. The defect of stiff neck will disappear by the regular practice of this exercise."

(4) Arms stretching.

"Stretch the arms sharply forward in line with the shoulders, palms of the hands turned inwards, fingers closed and fully extended. After a short pause, come back to the starting position. Next stretch the arms sharply upward to the fullest extent, hands remaining the width between the shoulders apart. After a slight pause bring the arms back to the starting position. Then stretch the arms sharply sideways in line with the shoulders, palms of the hands turned downward, fingers closed and fully extended. After a slight pause come back again to the starting position. Perform these movements with the utmost energy thrice in succession. This exercise loosens the shoulder joints and calls for a strong control of the shoulder blade and the muscles of the spine and the stomach."

(5) Trunk Rolling.

"This exercise should be performed in the beginning slowly and gently. Incline the trunk slowly forward from the hips keeping the back straight, the chest advanced and the head in the same relative position as when upwright. Now stretch the whole body by swinging the trunk round in a circle, first round one way and the next round in the opposite direction. Perform this four times to the left and over to the right. Then four times to the right and over to the left. Draw the breath evenly through the nose inhaling as you describe the back half of the circle and exhaling as you swing round to the front. This exercise is very invaluable since the whole of the internal organs are massaged by the action of trunk."

(6) Lunging.

"This is a strong leg exercise bringing a large number of muscles into play not only in the legs but in the sides of the trunk as well. It also develops general body control in a splendid manner and brings in the co-ordination of the brain and the muscles."

"Feet should be kept open to an angle of 90°. Keeping the right foot flat on the ground and the right leg straight, incline the body and lunge out forward with the left leg three feet length in the direction to which the toes are are pointing, left knee bent over the instep and the trunk inclined with the right leg, the body and the head maintaining the same relative position as at the time of starting. After a while or in other words after a slight pause, continuing to keep the right leg straight, press sharply from the ground with the left foot and resume the starting position. Perform this exercise thrice in each direction."

(7) Balance.

This exercise stimulates the nerves. "Keeping the body erect bend the right knee and raise it upwards until the thigh is at right angles to the body and the lower leg hanging straight downward with the toe pointing to the ground. Now straighten the leg and carry it backwards as far as possible. Repeat this exercise with the left knee. Perform this exercise thrice with each leg. This will help one to become well-balanced both mentally and physically."

(8) Trunk Turning.

"This trunk turning exercise will be of great benefit to the internal organs. The body should not be twisted

or jerked too suddenly. Keeping the head in the same relative position to the shoulders, the feet firm on the ground and the legs straight, turn the trunk steadily as far as possible to the left. Then turn the trunk steadily forward to its original position. Repeat the process to the right. Perform this exercise four times in each direction."

(9) *Abdominal Exercise.*

"This is an exercise in which the important muscles covering the stomach come into play. These muscles are seldom used by the sedentary people, and hence this exercise and its importance should be brought to their notice. Lying flat on the back with feet together, toes pointed, hands behind the neck with fingers interlaced. Raise the legs to an angle of 45° keeping the knees straight without raising the seat from the ground. Slowly lower the legs to the ground. After a slight pause repeat the movement. Peform this exercise four times."

(10) *Trunk Bending.*

"This exercise is known as a dorsal exercise because it brings into play the dorsal or the middle part of the spine which supports the ribs. Incline the trunk slowly forward from the hips keeping the back straight, the chest advanced and the head in the same relative position as at the time of starting. Then continue the movement slowly and bend the body downward as far as possible still keeping the back straight. After a slight pause bring the body slowly back to the starting position. Perform this exercise four times."

(11) *On the Hands.*

"This exercise is for the muscles of the stomach and the thigh and should be performed four times. Place the palms of the hands on the ground rather more than the width of the shoulders apart, fingers turned slightly inward, arms straight and nearly vertical. The back should be kept straight and legs fully extended, the weight being supported by the toes and hands. Now bend the arms without altering the position, lowering the body to the ground. After a slight pause resume the position and repeat the performance four times."

(12) *Agility Exercise.*

"This exercise is called agility exercise because it would enable one to move about very quickly and on toes, and the legs will feel like line wires. It brings into play the ankle, the knee and the hip joints and increases their flexibility. Keeping the heels together, legs straight, body and head erect and well stretched raise the heels from the ground as high as possible. Keeping the heels together and the trunk and head erect bend the knees outward till the thigh and lower leg form a right angle. After a slight pause straighten the knees evenly and fully, keeping the heels raised. Then lower the heels evenly to the ground. Repeat this action thrice."

(13) *Head Turning.*

"This exercise is intended to increase the flexibility of the neck and to strengthen the muscles of the throat and also the muscles at the base of the skull. Turn the head slowly but strongly to the left as far as possible.

Then turn the head slowly to its former position. Now, again turn the head as described above but to the right and then slowly turn it back to its former position. Repeat the action twice in each direction."

(14) *Cooling Down.*

"This practice is designed to help the body to return to the normal state at the end of the exercise. Breathing should be slow and deep. Air should be inhaled as the arms are raised and the air should be exhaled as the arms are lowered, the exhalation taking place through the nose. Lower the arms sideways and then downwards touching the body.

"Continue this slowly until the action of the heart and lungs is eased after the exercises. Keeping the arms the width of the shoulders apart, raise them forward until they are vertical to the sides of the head."

We have freely quoted above from the book "Physical Jerks" of Captain Lowe. Now let us return to the advice of Mr. Oslen on the breathing exercises. He says that these exercises may be taken lying, sitting or standing according to the requirements of the individual cases. The only thing essential is plenty of fresh air to breathe. He has described five kinds of breathing exercises, namely,—(1) Deep breathing, (2) Deep breathing holding the breath, (3) Deep breathing with percussion. (4) Deep breathing sounding "Ah!" and (5) Explosive breathing. Regarding deep breathing he says "Take the primary standing position and inhale slowly filling the lungs to their uttermost capacity. Then breathe out slowly. To breathe properly there must be free action of the chest and abdominal muscles.

During inspiration there should be an increase in the there diameters of the chest, antero-posterior, lateral and vertical. In expiration these same diameters are all diminished in size. Constriction of any sort must be avoided. In breathing use both chest and abdominal muscles. This is known as costo-abdominal breathing. Always breathe through the nose. Repeat three to twelve times."

The exercise "Deep breathing holding the breath" is inhaling the air as was done in the last ordinary breathing exercise and when the lungs are full, holding the breath for half a minute or longer and then emptying the lungs. Repeat three to twelve times.

In deep breathing with percussion, while holding the breath after following the instruction given for deep breathing holding the breath, the hands alternately strike the chest gently. The practice should be repeated three to twelve times.

Deep breathing sounding "Ah" is similar to ordinary deep breaihing, but in exhaling, the sound *Ah* is made distinctly and clearly as long as possible. The exercise is to be repeated three to twelve times.

In explosive breathing one has to inhale slowly to his full capacity and then breathe out quickly. This exercise may be reversed inhalation or breathing is made quickly and exhalation or breathing out made slowly. The lungs may also be filled and emptied rapidly. This exercise may be repeated two to six times.

The above-mentioned breathing exercise may be combined with many of the physical jerks and other

movements described before. They may be combined especially with the exercise of raising the arms upward above the head or extending them backward.

The foregoing particulars of exercises have been given in this treatise with a view to help people to safeguard themselves and others from physical deterioration. A large percentage of the population of a country have either unsound organs or poor development of the body. Living as we are in an age when knowledge of all kinds is being widely diffused, it is highly deplorable that such a state of things is allowed to go on. One can understand a few people here and there having unsound organs or poor developments of bodies. But when a large proportion of the population are found to be so, then it needs looking into. It is an acknowledged fact on all hands that (barring a few exceptions) every one can take exercise with benefit. Does every one or at least a large majority of the population take proper exercises? Assuredly not. People engaged in active occupations think that the every-day activities of their lives are sufficient exercise for them. This idea is due to their lack of knowledge in the science and art of physical culture. From what has been set forth it should be intelligible to every one that the several portions of the body and the various organs require separate properly directed activities going by the name exercises for their development and strengthening. The majority nay almost all the women in our country—India—scarcely take any exercise at all. The only exercise they subject their bodies to, is rather indirect and involuntary. It is what is the outcome of their daily routine of household

work and consequently cannot be called exercise at all. An exercise must be the voluntary putting into activities of the muscles and organs of the body with the mind concentrated and fully bent on not only the exercise, but also on the muscles and organs concerned as well. Further the benefit obtained from routine activities for the body, its muscles and its organs is only very partial. The daily activities cannot give exercise to all the parts of the body and all its organs. They can perhaps develop and strengthen certain organs, certain portions of the body and certain muscles. This is not uniform development. Strengthening certain portions of the body, certain organs and certain muscles at the expense of others is contrary to the aim of nature. Further this results in the deplorable physical deterioration not only of those people, but also of their children the future citizens of the land. If parents do not take the trouble of guarding themselves from physical deterioration by submitting themselves to systematic and properly directed physical activities or exercises, how can they beget strong and healthy children free from physical deterioration? Children are said to inherit from their parents certain ailments due to physical deterioration in them. It is said somewhere that a poor father when dying told his sons in despair that he has left them as legacy some of his diseases, consumption to one, hernia to another, piles complaint to the third and so on instead of property and wealth. Needless it goes without saying that parents are responsible for the health and physical well-being of their offspring, for the sufferings they may happen to undergo, owing

to inherited ailments. When this fact is driven home, people would try their utmost to minimise at least the evil of physical deterioration in them and their children.

Complaints have arisen of late that more children die now-a-days than they used to do before. The reason for this has been traced to physical deterioration in the parents. It has been proved that this physical deterioration is mainly due to the non-use of the muscles and organs of the body. If the muscular system is not sufficiently made use of, its healthy tone and vigour may be lost resulting in physical deterioration. If the stomach is strong and healthy and the digestive system is in proper working order then the blood may be charged with the excess of digested food intended for but not used up by the muscles. The circulation of the blood may become sluggish. The aeration of the blood in the lungs may become imperfect. The skin may become inactive. All these may go to make people pale and flabby. If muscles are trained to regular action, the fat and the waste products in the system gradually disappear. The muscles become firm and strong. Then they are capable of sustained action without fatigue. The blood also circulates freely carrying nourishment to all portions of the body. The lungs expand better in breathing and hence blood is better aerated. In brief every part of the body becomes healthier and more efficient if but proper and well regulated exercise is taken.

One of the blessings of nature conferred on man is sleep. Every one knows how sweet and refreshing a sound sleep is to human beings; yet many are deprived of this blessing either partially or fully owing to ill-

health or lack of proper exercise to the muscles of the body. Further sleep is said to be the "physiological rest" of the body after strenuous activities of the muscles. If there be no activities of the muscles, then there would be no need for rest, and consequently there would be no sleep for the man or the woman. A sleepless man or woman may find life irksome, since its loss during a single night proves fatiguing. If it be lost for two or three nights then it is serious. Continuous sleeplessness is sure to end in a man's madness nay even in his death.

A baby is said to need sixteen hours sleep in a day of 24 hours. A child of 2 years requires two hours less. Children of 4 years and 8 years and boys or girls of 12 years and 16 years are said to need 12 hours, 11 hours, 10 hours and 9 hours respectively. Men and women from 21 years and upwards should have 8 hours sleep daily.

To obtain the above-mentioned rest to the whole body through sleep exercise of the muscles is absolutely necessary and this when properly and systematically taken confers on people the benefit of enjoyment of all the important blessing of nature-sleep in addition to giving them physical development, health, strength and vigour.

There is also another benefit that could accrue to one from a systematic practice of systematised series of exercises aiming at the uniform development of the entire body and all its organs, namely, the winning of beauty. Physical culture may appropriately be

called "Beauty Culture" also. But what is beauty? Ordinarily it consists of external art, the wearing of costumes and ornaments and the use of lotions, ointments and powders, etc., for the complexion. It may also include the doing of the hair in a particular fashion. Here we have not *beauty culture*, but *blemishes hiding* since the above-mentioned arts go perhaps to hide blemishes like wrinkles and not to culture beauty. There is no denying the fact that the external art referred to confers on people certain superficial beauty. But can it be called real beauty of people? Certainly not. Real lasting beauty is that of the soul manifested through physical beauty. The soul is described to be an exquisitely beautiful thing encased in what are called bodies. A beautiful object should have a suitable receptacle to be put into. Hence the human body should be made as uniformly developed and beautiful as possible for the soul to live in and manifest its splendour through.

As a chapter on physical and beauty culture would be incomplete without at least a brief description of swimming and bathing, let us endeavour to say something regarding them. As a source of amusment as well as exercise the art of swimming does not deserve to be neglected. In certain countries, swimming is considered to be a useful and desirable art for men and women, boys and girls to learn. Hence there are arrangements made for public baths where people can not only enjoy the luxury of delightful plunge into the cool water, but they can also learn to swim if they are ignorant of the art or enjoy the delight of swimming if they are already clever in it.

It is a common saying that swimming is not at all difficult and it is as easy to float on water as it is to sink in it. What is needed to prevent a man or a woman-a boy or a girl from sinking is a little practical know-ledge in swimming. Bearing in mind the adage "an ounce of practice is preferable to a ton of theory," a person desiring to learn swimming should try to practise the same in water only neck-deep if possible in the begin-ning. Every art has a science behind it and hence it goes without saying that every practice should be pre-faced with certain guiding principles and descriptions. So persons desiring to learn the art of swimming should know beforehand something of the science of swimming. Hence we should proceed to lay down certain hints and suggestions for swimming in addition to brief des-criptions wherever possible.

Almost all animals swim instinctively but man does not. He has to learn it, and he can do it with a little practice and more of confidence, in the water. There are several stages in swimming and the first stage is that of swimming in the stagnant water of the tanks, lakes. etc. The second stage is that of swimming in flowing water of canals, streams, rivers, etc. Beginning his or her practice in the canals, he or she may proceed to swim in small streams and then in big rivers. Swimming in the sea also requires special practice though it may come easy to those who have learnt how to swim in stagnant and running water. As the body is lighter than the water, it cannot sink if left to itself. This fact should be borne in mind by all who learn to swim. When this is understood and confidence maintained, plain

swimming must perforce be a perfectly easy and simple operation. When learning to swim, the hands should be kept open, and that palms should remain concavs with the fingers close together to prevent water from passing through them. The swimmer should lean with his chest on the water and throw his arms forward. This would enable the body to assume a horizontal position beneath the surface of the water. Then with slow and steady action the legs should be made to follow the motion of his arms or in other words the legs must be made to act simultaneously with the arms. He should then spread his hands in such a way as to describe a semi-circle with the elbows coming close to the body and the hands to the chest. This action would take the beginner only a few yards in the beginning. The lips should be kept closed to prevent water from getting into the mouth and giving trouble. If the head is kept up, and the body kept straight with limbs extended, breathing would be quite easy and natural.

When getting ready for each successive stroke as described above, the legs should be drawn back by a simultaneous motion. The feet should be kept wide apart with the toes well turned out. As the arms are sent out, the legs should be kicked backwards and sideways to their fullest extent and they should be kept separate till they have described the widest circle possible. The legs should come together at the end of each stroke. More easy and rapid progress will be possible if the water is pressed against with the sole and not the toes of the feet. To propel the body through water, it is necessary to turn the ankle-joint in such a way that while drawing

the leg up after a kick, the instep or the upper part of the foot does not offer any resistance to the water. This action is considered to be one of the secrets of good swimming.

A beginner in the art of swimming may do well to have a friend to guide him. Corks, ropes and bladders may be dispensed with if a friend is by to help him. A heavy plank to rest the hand occasionally may be had in front by the beginner. He may go on pushing it before him as he proceeds. Great depth of water is not at all necessary for ordinary plain swimming and hence a beginner need not go out of his depth to learn it.

The most common of the several processes of swimming are (1) Floating (2) Swimming on the back (3) Diving (4) The Header (5) Hand over hand swimming (6) Swimming under water and (7) Treading water. These and other varieties of this exercise of swimming can be learnt only gradually after steady practice under proper advice and guidance.

Before closing this chapter, let us say a few words about baths since they are very useful especially after taking exercise. It is a well known fact that when one is hot and tired, a good wash has a refreshing effect on him. This is due to the stimulating effect of water on the nerves and blood vessels of the skin. A complete bath is highly preferable to a partial bath or mere washing of the face, neck, hands and arms. Baths are of various kinds. The most common of them are (1) The warm bath (2) The hot both (3) The cold bath (4) The shower bath and (5) The sea bath. Besides these, there

are also baths going by the names, Turkish, Vapour, and Medicated baths.

The warm bath taken in water heated from 98° to 100°, opens the pores of the skin, encourages free circulation and promotes the healthy action of the sweat glands. Exposure after taking this bath may result in a bad chill. So it is better to take it just before going to bed. One should not use this bath for more than ten or fifteen minutes.

The hot bath using water heated from 104° to 110° raises the temperature of the body and should result in a free perspiration. This cures cold and rheumatic pains and stiffness. The person taking this bath should dry as quickly as he could, cover himself with blankets and remain in them until he perspires copiously. Else harm may result instead of good.

The healthiest of baths is the cold bath. It refreshes the body and keeps the skin in excellent condition. It is often considered a tonic as it gives tone to the whole system. The temperature of this bath should perforce vary according to the season. Only strong and vigorous people should take this bath in water, the temperature of which is below 50°. Ordinarily cold bath means bath in water, the temperature of which is below 70°. In winter cold water may be mixed with a little hot water to take off the chill. A cold bath stimulates the nerves of the skin, but contracts the blood vessels and the muscular tissues. This bath is usually taken as soon as one gets up from his bed. After a few minutes' use of this bath, the body should be rubbed vigorously with a towel to enable the blood to

rush back to the skin. Then a feeling of warmth and freshness would be felt.

The shower bath may be either with hot water or cold water. Ordinarily only cold shower baths are taken. It gives a powerful shock to the nerves. It is desirable that only people in strong health take this bath.

In a sea bath is combined several advantages. The presence of salts in the cold water of the sea has a stronger bracing effect on the body. The sea air has an inspiring effect, and besides one can enjoy swimming if he has learnt it.

The Turkish baths and Vapour baths are hot air bath and steam baths respectively. The first is very cleansing and cures colds, chronic rheumatism and certain other complaints. The Vapour bath induces more copious perspiration than the Turkish bath and is found to be much more opppressive.

Medicated baths are baths taken in water in which some medicinal substances are dissolved. It is akin to creating artificially water resembling natural mineral water or sea water and bathing in it. These baths are found to be good for weak joints.

Descriptions of several exercises, baths, etc. have been furnished to guide people to select from, for their use according to their state of health, temperaments, and needs. Men and women should study their condif tions of health, strength, etc. and after a short trial it need be take to the systematic practice of all or some of the exercises described. Careful noting of the effec- of taking the exercises is very essential. Parents should

study the conditions of health, strength, etc. of their children and subject them to such of the exercises considered suitable. Bearing in mind the fact that only the healthy can be happy every one should aim at securing health not only for him but also for his children, friends and relatives by systematic practice of systematised physical exercises. If but a large majority of people understand the value of physical culture and their responsibilites for the same as a father, mother, husband, wife, friend, teacher and so on and discharge them properly to the best of their ability and conscience, then physical deterioration in the people of the land would surely disappear or at least be reduced to a minimum in a few years.

CHAPTER VI.

GENERATIVE ORGANS AND THEIR FUNCTIONS.

In almost all animals the sexes are distinguished among several other things by the sex organs. The male sex organs are the penis and the testicles with their appendages, while the female sex organ goes by the name genital organ. The penis and the testicles of man and the reproductive organs of the woman namely the vulva, vagina, uterus, fallopian tubes, ovaries and mammae or breasts go by the general name of generative organs. The male generative organs the penis and the testicles with their appendages are located, the first in the pelvic girdle at the bottom of the trunk, and the second a pair below the penis one on each side of it. Of these two, the penis as described in the 'Family Encyclopaedia of Medicine' consists of two long narrow bodies, each of which is a net-work of blood vessels. These are placed side by side and below these is the part called corpus spongiosum through which the urethra or the tube from the bladder passes. During sexual excitement the above-mentioned net-work of blood vessels going by the name corpora cavernosa becomes engorged with blood increasing the whole length of the penis and stiffening the organ. The end of the corpus spongiosum which is covered only by the foreskin is called the glans. The opening in the glans is termed the meatus. The male generative organ penis is des-

cribed in the "Encyclopaedia of Medicine" as stated above. Regarding the testicles, the same treatise says as follows. "Testicles are the two glands in the male which form the spermatozoa, or male elements which fertilise the female element or ovum and from which a child develops. They are oval bodies about 1 1/2 inches long, 1 inch wide and 3/4 inch thick.' Each testicle is covered with a strong fibrous coat. It consists essentially of from 800 to 1000 minute tubes, within which the spermatozoa are formed. These are gathered up by the epididymis, a long convoluted tube which is continued as the more or less straight tube that leads into the urethra or urinary passage. The length of these tubes from the testicles to the urethra is about twenty feet."

Coming to the female organs of generation we may say that they are as stated above six in number and they are all excepting the breasts placed in the pelvic cavity or in other words the lower part of the abdominal cavity formed by the union of 4 bones and placed obliquely with regard to the trunk of the body. The family "Encylopaedia of Medicine" says about these as follows:—

The vulva:—"This is the anatomical name denoting the entrance into the vagina and the surrounding parts which go to make up that opening."

Vagina. "This is the passage which leads outward from the womb. The neck or lower extremity of the womb projects downwards some distance into the upper end of the vagina."

"The orifice of the vagina in the unmarried woman is usually closed by a membrane called the hymen in which a small opening exists for the passage of the menstrual fluid. Sometimes this closing membrane is almost entirely absent. In other cases it completely closes the orifice of the vagina causing retention of the menstrual fluid. The vagina is subject to inflammation and other affections."

Uterus :—"This is the scientific name for the womb. It is shaped somewhat like a flattened pear. In a woman who has not borne children, the womb weighs from 1 1/2 to 2 ounces. During pregnancy it increases enormously in bulk, but after the birth of the child, it rapidly shrinks and at the end of five or six weeks almost reaches its normal size again. This however is about one and a half times its original bulk. The womb is regarded as consisting of a corpus or body and a cervix or neck, the former being the upper portion and the latter the lower extremity which projects into the vagina. The far ends of the body extend into two cornea or horns and into which the fallopian tubes open. These fallopian tubes lead to the ovaries but are not connected with them. At their extremities they open into the peritoneal cavity and result in peritonitis. Into the upper ends of the fallopian tubes the ova which are the female element of the child, drop from the ovaries and pass downwards into the womb."

"The whole inner surface of the uterus is lined with mucous membrane called the endometrium, but the composition of this lining membrane differs in the body and the neck, a factor which has much influence on the

incidence of some diseases such as cancer. This mucous membrane is subject to inflammation like the mucous membrane in the nose, the stomach and elsewhere, the inflammation in the case of the womb being called endometritis."

"The womb lies in an almost horizontal direction when a woman stands upright, crossing from the back to the front of the pelvis. It rests upon the bladder and behind it is the rectum or the lowest part of the bowel. Owing to these relations, if the rectum is overloaded as in constipation the womb is pressed forward or downward, a condition called anteflection; and when the bladder is full, the womb is pressed upward or backward."

"Sometimes but very rarely the womb is entirely absent. Sometimes it fails to develop to its full size (infantile womb) with the consequence usually of sterility. Occasionally there is a double womb in either half of which a child may develop."

"The womb may cause great trouble owing to retroflection (a bending backward) and other displacements. It is particularly liable to cancer and may be affected by other diseases."

The Fallopian Tubes:—These are also called oviducts and with the ovaries they are called the appendages of the uterus or the womb. The French writers call these tubes "the uterine trumpets." These are situated in the upper part of the lateral duplicatures of the peritoneum called the broad ligaments enclosing the appendages of the uterus and are also connected with the superior angles of uterus. Because they are some

what trumpet-shaped being smaller at the uterine than at the free extremity, they are given the name of uterine trumpets by some. The inner extremity is narrow and the outer half wider. The length of each of the two tubes more or less flexuous in their course is about four inches. The canal of the Fallopian tube is exceedingly minute. The derivation of the name is from one Fallopius who first clearly demonstrated them. These tubes proceeding from the superior angles of the uterus run across the pelvis, and become larger and more flexuous or serpentine in their course. They terminate as an expanded opening with fringed edges. These extremities float loosely in the pelvis. The inner covering of these tubes is a continuation of the peritoneum which forms a shut sac except where it is perforated by their open extremities. The lining membrane of the uterus is highly vascular.

Ovaries:—These, in the words of the "Family Encyclopaedia of Medicine," are two small glandular bodies in the female containing the ova or germs which develop into the embryo when conception occurs. They are oval in shape somewhat like large almonds and measure about 1¾ inches in length. The ovaries are situated in the pelvis, one on each side, just below the upper border of the hip joint. They contain an immense number of ova probably from forty to eightly thousand and these are present at birth so that the character and constitution of the child depends largely on those of its maternal grand parents. Just before the menstrual period one or more of the ova is extruded from the ovaries. These drop into the open ends of the Fallopian tubes in

the abdomen and pass through them down to the womb. Sometimes conception takes place during this passage and what is called tubal pregnancy occurs, the child developing in the Fallopian tube. For this condition an abdominal operation is necessary.

The urethra or the tube from the bladder in women does not exceed two inches in length and has a much larger calibre than the same in men. Its inner surface is a continuation of the mucous lining of the bladder. It is liberally supplied with what are called lacunae or follicular glands. These glands secrete mucous to lubricate the parts and shield them from irritation that may be caused by the urine. There are two lacunae found one on each side of the orifice. The urethra or the tube from the bladder takes a straight course along the upper part of the vagina and it is felt there as a cord. But when it reaches the symphysis pubis or the sacro-iliac (illiac-haunch) joint, it becomes curved upwards.

We have already stated above while describing the structure of the penis that the end of the corpus spongiosum is called the glans and the opening in the glans is called the meatus or meatus urinarius. The orifice of the vagina of women is found about the third of an inch below this meatus or meatus urinarius.

From the description of the vagina already given, it should be clear that it is the canal or passage conducting to the uterus or the womb and terminating just above its mouth. The vaginal canal has two extremities. The outer one of these extremities is called the external mouth. The inner one is attached to the neck of the

womb. This vagina is formed of elastic substance and has a constrictor muscle at its entrance. Further it is supplied plentifully with arteries, veins, nerves and absorbents. It has somewhat curved course and is united with the uterus at an obtuse angle. It is commonly about four inches in length and two in diameter during the period of virginity. It is narrower at its commencement and termination than in the middle. In women who have borne children, its capacity becomes much enlarged.

The entrance to the vagina is bounded by a sphincter muscle and by a congeries of blood vessels arranged like a net-work.

Having provided our readers with the particulars for the fundamental knowledge of the sexual or generative organs, let us pass on to a description of their functions after having given a few particulars about the pelvis and the connection between the various generative organs. Our readers are already put in possession of the knowledge that the pelvis is intended to serve the purpose of supporting the vertebral column and the upper parts of the body as well as for giving lodgement to a portion of the small intestines and the urinary bladder rectum and the internal organs of generation.

An adult female pelvis has three parts to be noticed namely (1) The brim or mouth called also the superior aperture (2) The cavity and (3) The outlet or the inferior aperture. Generally speaking, the pelvis, as described in the "Family Encyclopaedia of Medicine," is a bony structure in shape something like a basin which surrounds

the lower part of the abdomen. It reaches from each thigh bone and contains the bladder and rectum in both sexes and in women the uterus. There is a slight difference in the formation of the pelvis in the male and the female. In the case of the latter it is lighter, broader and more expanded in every way so as to be adaptable for child birth. This bony structure is divided into three portions as noted above. The brim in its shortest diameter measures four inches and a half with the soft parts in lateral or middle diameter and it is five inches and a quarter without the soft parts. In the longest diameter with the soft parts, it measures four inches and five-eighths. The cavity is about six inches deep posteriorly, four inches laterally and two inches anteriorly. The anterior and the posterior portions of this pelvic cavity are divided by two broad ligaments which stretch across it. These ligaments hold in place the uterus, the Fallopian tubes and the ovaries. The uterus or the womb of a virgin measures from 2½ to 3 inches in length. The broad upper extremity of the womb is called the fundus and is about two inches in breadth. The membranous canal—vagina—extends from the neck of the womb to the vulva or *pudendum*. The thin fold of the mucous membrane called the hymen stretches across the lower part of the vagina. All these have been touched upon when describing the generative organs. Just within the entrance to the vulva is situated the clitoris the female organ of sexual pleasure supplied plentifully with nerves. This organ is described in Mr. Wilson's Anatomist's Vade Mecum edited by George Buchanan, A. M M. D. and Henry Edward Clark as stated below:—

"The *Clitoris* is a small elongated organ situated in front of the pubes and supported by a suspensory ligament. It is formed by a small body analogous to the corpus cavernosum penis, and like it arises from the ramus of the ospubis and ischium at each side by two *crura*. At the extremity of the clitoris is a small accumulation of erectile tissue which is highly sensitive and is termed the glans. The corpus cavernosum clitoridis like that of the penis is composed of erectile tissue enclosed in a dense layer of fibrous membrane and is susceptible of erection. Like the penis also, it is provided with two small muscles the *erectores clitoridis*."

It should be borne in mind that the entrance of the vagina is about an inch behind the female organ of sexual pleasure the clitoris.

The breast is described in the "Family Encyclopaedia of Medicine" as follows:—

"In the male sex the breasts are rudimentary while in the female they develop for the purpose of secreting milk for suckling. The Central darkish pink part surrounding the nipple is called the areola. This portion takes on a darker colour during pregnancy. The bulk of the breast is made up of a system of tubes, the milk from which during lactation is carried to the common orifice of the nipple. The diseases peculiar to the breast are closely related to the changes which

take place in the organ at puberty, during pregnancy and suckling, and in their return to their original non-functioning state which takes place with the advance of old age."

Now proceeding from the external to the internal we have first the vulva or the entrance into the vagina and the surrounding parts. Between the vagina and vulva the entrance, there is the female organ of sexual pleasure. Then we have the membranous canal vagina itself leading outward from the womb. To put this in other words we may say that the lower extremity of the womb called the neck projects downwards some distance into the upper end of the vagina. The far end of corpus or the upper end of the womb extends into two cornea or horns into which the fallopian tubes open. These fallopian tubes lead to the ovaries but are not connected with them. Into the upper ends of the fallopian tubes, the ova or the female elements of the child drop from the ovaries and pass downwards into the womb.

The process of menstruation is also called ovulation, and the reason for this will be clear by what we are going to say. Menstruation is the discharge of blood and mucus from the womb during ovulation that is the dropping of ova or the female element of the child into the upper ends of the fallopian tubes and passing from there into the uterus or the womb by the action probably of the cilia lining the tube and the peristaltic contraction

of the muscular walls. Originally menstruation and ovulation were considered to be distinct processes though closely related to each other. Now scientists have come to use the two terms synonymously. Immediately after the proper development of the sexual apparatus of the human female, an ovum or egg is evolved from one of the ovaries that are located on each side of the uterus about one inch from it. Further these ovaries are enclosed between the two folds of broad ligaments which support the womb and fallopian tubes. In the book "Knowledge a young wife should have" by Messrs. A. A. Philip, M.B.C.M. and H. R. Murray, the generation and passage of ovum in and from the ovaries have been described as follows:—"Within each ovary are found many small, round, transparent vesicles—membranous cells—in different stages of development and varying in size from that of a pin's head to that of a pea. These small cells are given the various names of ovisacs, follicles or graafian vesicles. The ovisac in its early stages is deeply seated within the substance of the ovary. Upon the side nearest the surface of the organ is a small germinal eminence which contains the future egg called the ovum. As the ovisacs develop, they approach the surface of the ovary forming small projections thereon. The ovum that is the matured egg is very minute being on an averageone two hundredth of an inch in diameter and contains essentially the same parts as the egg of an ordinary fowl. The fallopian tubes serve the purpose of conveying the ripened ova from the surface of the ovary to the uterus or the womb. The canal of each fallopian tube is very small scarcely admitting a fine

horse-hair. The orifice nearest the ovary is surrounded by fringe-like processes, one of which is connected witd the ovary. These processes are called *fimbriae* and the purpose of the fringed extremiiy is to seize the ripened ovum, close round it and guide it to the fallopian tube and thence to the uterus or the womb. During sexual excitement, the fimbriae embrace the ovary, and it was once thought that at such moments the nearest and the ripest ovum was grasped by them and detached from its ovarion bed."

"With the full development of a graafian vesicle or ovisac, it discharges the contained ovum which would drop into the pelvic cavity if the fimbriated extremity of the fallopian tube does not gather it and guide it into the tube along which it travels, to the womb; and unless this ovum is impregnated in its course by meeting and mingling with the fertilising substance of the male-spermatozoa and become attached to the walls of the utero-fallopian canal, it is expelled onwards and outwards through the vaginal passage."

"The process of ovulation in the human female occurs normally once in each lunar month, and is usually attended by a discharge of mucus and blood from the vulva." [The above extracts are from the chapter on Menstruation in the Text Book of Physiology by M. Foster, M. A., M. D., F. R. S.]

"From puberty which occurs at from 13 to 17 years of age to the climacteric which arrives at from 45 to 50

years of age, the human female is subject to a monthly discharge of ova from the ovaries accompanied by special changes not only in those organs but also in the fallopian tubes and uterus. There are also general changes in the whole body. This process goes by the name 'menstruation.' The essential event in menstruation is the escape of an ovum from its graaffian follicle. The whole ovary at this time becomes congested and the ripe follicle bulging from the surface of the ovary is grasped by the trumpet shaped fringed opening of the fallopian tube which is itself turgid and congested. By what mechanism this is effected is not exactly known. The most projecting portion of the wall of the follicle which has previously become excessively thin is now ruptured and the ovum which having left its earlier position, was lying close under the projecting surface of the follicle, escapes together with the cells of the *discus proligerus*, into the fallopian tube. Thence it travels downwards, very slowly by the action probably of the cilia lining the tube, though possibly its progress may occasionally be assisted by the peristaltic contractions of the muscular walls. The stay of the ovum in the fallopian tube may extend to several days. There is an effusion of blood into the ruptured follicle, which is subsequently followed by histological changes in the coats of the follicle resulting in a *corpus luteum*. The discharge of the ovum is accompanied not only by a congestion or erection of the ovary and fallopian tube, but also by marked changes in the uterus especially in the uterine mucous membrane.

While the whole organ becomes congested and enlarged the mucous membrane and especially the uterine glands are distinctly hypertrophied. The swollen internal surface is thrown into folds which almost obliterate the cavity, and a haemorrhagic discharge often considerable in extent constituting the menstrual or catarmenial flow takes place from the greater part of its surface. The blood, as it passes through the vagina becomes somewhat altered by the acid secretions of that passage, and when scanty, coagulates but slightly. When the flow however is considerable, distinct clots may make their appearance. It is not certain that menstruation in the human subject at all events is always accompanied by a discharge of an ovum. It seems probable also that under certain circumstances, ex. gr. coitus discharge of an ovum may take place at other times than at the menstrual period. Since however the time during which both the ovum and the spermatozoon may remain in the female passage alive and functionally capable is considerable, probably extending to some days, coitus effected either some time after or some time before the menstrual escape of an ovum might lead to impregnation and subsequent development of an embryo. Hence the fact that impregnation may follow upon coitus (cohabitation or sexual intercourse) at sometime after or before menstruation is no very cogent argument in favour of the view that such a coitus has caused an independent escape of an ovum. The escape of the ovum is said to precede the catamenial flow. If no spermatozoa come in contact with the ovum, it dies. The uterine membrane returns to its normal condition

and no trace of the discharge of an ovum is left except the corpus luteum in the ovary."

The rationale of the menses or the monthly discharge of blood and mucus from the vulva of a human female as given by R. T. Trall M. D. in his Sexual Physiology is as follows :—

"Why should there be haemorrhage as an accompaniment or incident of menstruation ? A reference to the nature of the process will set this matter in its true light. All organs whose functions are performed periodically—for example, the ovaries during ovulation, the male organ during coition, the breast during lactation and the stomach during digestion—have a special determination of blood and nervous influence to the part when the function is to be exercised. This is clearly for the purpose of supplying the part with the material requisite for the proper performance of its function. In the case of digestion, the increased quantity of blood sent to the stomach is to supply the material more adundantly for the secretion of gastric juice. In sexual congress, the blood is specially determined to the organs concerned in secreting the seminal fluid and conveying it within the sexual organism of the female. In lactation, the determination of blood to the mammary glands is for the purpose of supplying the parts with the material from which the milk is formed. And in menstruation, the special determination of blood and nerve force (which are always coincident) is to furnish the elements for the

evolution of the germ and its nourishment. A certain degree of distension, congestion, plethora or "erethism" is necessary to distend the capillary vessels so that the fimbriated extremity of the fallopian tube may grasp more completely the matured ovum and ensure its passage to the uterus; and if the ovum in its passage becomes impregnated and fixed to the walls of any part of the reproductive channel, the unusual quantity of blood or some portion of it is needed to supply the elements for its nourishment and growth, and for the development of its appendages—the membrane and placenta. In some cases the blood after imparting the nutrient materials required, is wholly returned to the general circulation so that no haemorrhage occurs. But in most cases more or less of it is effused into the uterine cavity and expelled *per vaginam*." This is the view expressed by Mr. R. T. Trall, M. D., whereas Mr. M. Foster, M. A., M. D, F.R.S., has stated in his Text Book of Physiology as follows:—

"According to many authors, the uterine mucous membrane is actually shed during menstruation and subsequently entirely regenerated. According to their view, the haemorrhagic discharge is due to a positive solution of continuity. In animals no discharge of blood or a very scanty one, takes place at heat (menstruation) or 'rut'; hence this point cannot be settled by comparative studies: and in the human subject the interval which must necessarily elapse between death and examination, is sufficiently long to render investigation very difficult. Williams has brought forward

strong evidence in favour of an actual loss of substance taking place. According to him menstruation is accompanied by a rapid growth and subsequent rapid regeneration of the mucus membrane for a depth reaching down to that layer of muscular fibres which passes along the deeper parts of the uterine glands. The growth and degeneration begin at an abrupt line near the cervix and spread towards the fundus. The decay lays bare small blood vessels from which the haemorrhage takes place."

The monthly or rather periodical discharge from the vulva of mucus and blood going by the name menstruation continues in the great majority of cases for a period ranging from three to six days. But the ovum is not expelled from the system till some six to eight days after the menstrual flow has ceased. But in the case of the women with uterine system in a condition of torpor it may happen to be otherwise. We have already stated that the ovum is propelled along by peristaltic action or in other words the regular contractile effort of the muscular tissue of the generative channels. The women in whose system this action takes place are not at all conscious of it. Some women perhaps may at these times have noticed an occasional feeling of stricture, a sense of weight, and this is followed by instant relief. The feeling of sensibility is greater at the mouth of the uterus is a fact that has already been dwelt upon by us. Further there is also more resistance at this point and consequently more effort is required to expel the ovum. Therefore we may conclude that the

feeling of stricture and the sense of weight is due to this. The feeling of relief is due to the throwing out of the ovum. Healthy and strong women may perhaps never notice the slight sensation referred to above unless their attention is directed to it.

It is very common that many women suffer from painful menstruation. Inflammation of the reproductive organs in a greater or less degree has been found to be usual in a larger number of such cases. This results in sexual disorders, debility, haemorrhage in an excessive degree, discharge of whites, ulceration and perhaps even in the displacements of the organs. It has been stated that the processes of menstruation, pregnancy, lactation, etc. are to be regarded as diseases though they may be natural conditions that women are subjected to in the course of their lives. Weak women suffering from torpor of the uterine system take even a whole month to pass the ovum on from the ovary to the vulva. At any rate women in various stages of debility take rather more time to bring the ovum on to the vulva than strong and healthy women. It has been laid down by A. A. Philip, M. B. C. M., and H. R. Murray in the work "knowledge a young wife should have" to which we are indebted for a good deal of information given in this chapter, that increased irritability of the nervous system, excitation of the sexual faculty and mental depression usually accompany the process of menstruation. He also quotes to support his statement the opinion and remark of a physician who says. "It is almost always during

menstruation that the first clouds appear on the matrimonial horizon; the husband who is aware of the importance of these 'critical days' will know how to take the necessary means to prevent their appearance." The physician of course means or rather advises that the husband should make allowances for the shortcomings of his wife during the period and that the wife in her turn should exert herself and subdue her temper if possible.

It is a well known fact that a large number of women patronise the vendors of female pills, etc. A glance at the advertisement sheets of any newspaper would convince one of this. For their benefit we shall quote here Sir Morell Mackenzie's words. "If there were not a drop of medicine in the world, the death rate would be lower." But a woman may be justified in asking, "What am I to do to get rid of the torpid condition of my uterine system and make it strong and healthy?" The answer to the question should be. "Take steps to remedy the evil by restoring the normal activity of the sexual organs by health giving physical exercise, etc."

We have attempted to give in a few of the foregoing pages of this chapter the part played by the generative organs of a woman in the reproduction of human beings by human beings by the process of sexual generation. We also touched upon the fact that the ovum or the female representative element developed in course of time into an adult individual, under the influence of the male representative element the sperma-

tozoon. Let us now pass on to the description of the part played by the male generative organs the penis and the testicles in the process before taking up the process of impregnation to be dealt with.

From the description given of the penis and the testicles (the male organs of generation) in the beginning of this chapter, it would be seen that the spermatozoa (the male elements which fertilise the ovum or the female element) are formed in the minute tubes the testicles are composed of, and are gathered up therefrom by the epididymis the long convoluted tube leading to the urethra or urinary passage. In coitus or sexual intercourse this is discharged into the generative organs of the female along with what is called semen. To perform this process the penis becomes long and erect by the increased vascular supply brought about, and this fact has been set forth when the organ penis was being described. It is stated in the 'Anatomists Vade Mecum' by Mr. Wilson that "Erectile tissue is a peculiar cellulo-vascular structure entering in considerable quantity into the composition of the organs of generation." It is also stated in the same treatise that "the cavernous spaces are at all times filled with blood, but become overcharged and distended during the erection of the organ in consequence of pressure upon its large veins retarding the venous flow, and that the arteries are convoluted in the passive state of the penis but straightened in its distended condition." From the above quotation it should be clear how the penis becomes engorged with blood, increases in its length and stiffens.

Mr. Foster is of opinion that in coitus, the discharge of the semen containing the spermatozoa may also be effected by peristaltic contractions of the seminal vesicles assisted by rhythmical contractions of the bubo-cavernous muscle. Anyhow the emission of the semen is preceded by the erection of the penis and consequently easily discharged into and received by the female organs. These are also in a state of *turgescence* like the erection of the penis at the time, but less marked. The spermatozoa then find their way into the fallopian tube. One of them comes in contact perhaps with an ovum most probably in the upper part of the fallopian tube. How the passage of the spermatozoa is brought about has not been clearly and definitely established. Some say that they pass on by their own vibratile activity. Others say that inasmuch as a retrograde peristaltic action has been observed in some animals from the uterus along the fallopian tubes, the passage of the spermatozoa may have been facilitated by a similar action in human females also, and thus the union of the two fertilising principles may be brought about. But the movements referred to above are regarded as the act of coitus or cohabitation. Impregnation may not take place till sometime after that act. Hence much stress cannot be laid upon the statement regarding retrograde peristaltic action moving the spermatozoa upwards.

The following statement quoted from M. M. Foster's Text Book of Physiology is interesting and worthy of notice. It is stated therein as follows :—

"The ascent of the spermatozoa is certainly puzzling if the cilia of the fallopian tubes which act from above downwards, continue their activity after the escape of the ovum. The spermatozoa directly they come in contact with the ovum become motionless. This suggests that the final cause of their activity is to enable them to reach the ovum."

Whatever may be the process by which the ovum and the spermatozoon are brought together, the fact remains namely that they are brought together resulting in what is called impregnation. The united ovum and the spermatozoon develop into a human being. We stated above that the ovum if it was not impregnated by the spermatozoon died. But when impregnated it is said to awake to great nutritive activity, enlarge and develop into an embryo. Then the necessary changes takes place in the uterus for the growth of this embryo into a child.

Some people think that both the male and the female should experience the contact of sexual organs to result in impregnation. But it has been established that impregnation can be brought about by coitus or cohabitation where he or she was insensible; nay seminal fluid can be passed into the vagina by artificial means to result in impregnation! Though normally the impregnated ovum attaches itself to the walls of the genital channel soon after impregnation, yet it is said that the expulsion of the impregnated ovum from the genital channel is also possible owing to debility or disease of the uterine system.

We have taken so much pains to refer to a large number of treatises on sexual science, anatomy, physiology, etc. to furnish the informations contained in this chapter regarding ordinary descriptions of the several sexual organs of men and women and their functions because this knowledge is highly essential for men and women to lead a happy conjugal life. We have brought the information up to impregnation reserving particulars about pregnancy, labour, child welfare, etc. to subsequent chapters. A large number of people in this world both men and women ruin their health and shatter their constitution simply because of their lack of knowledge in the fundamentals of physiology and hygiene. An elementary knowledge of the general build of the body and the position of the various organs in it with their functions would go a great way to avoid suffering from a large number of ailments and diseases. The sexual passion in men and women especially in their youthhood is a very dangerous thing to cope or rather to content with. It leads them to desperate actions that result in their becoming total physical wrecks. Of this we shall say enough later on in a subsequent chapter. To shield them from the danger referred to above, a knowledge of the sexual organs with their situation, structure and functions is highly essential though it may not be enough for the purpose without a strong will at self-control in them. As many of the actions resulting in evil may be due to want of information regarding these organs, at least some of the young men and women may be benefited by the knowledge contained in this chapter. All persons would

be the better for a knowledge of the organs situated below the waist. Every child should one day or other arrive at the age at which it could understand the use of the sexual organs. If it is only functional, then they may be left to understand it themselves. As it is highly passional in almost all, boys and girls if left to themselves would learn their proper use when too late and at the expense of their health and strength. Elderly members, the parents, teachers and friends should at the proper time put the children in possession of the knowledge and uses of the sexual organs and for this purpose, they should equip themselves first with such knowledge. Unfortunately very few people are capable of imparting real and useful information concerning them and their proper uses and abuses, to guide them aright and to wean them from wrong. Male elderly members should undertake the task of enlightening boys while leaving the work of imparting such knowledge to girls to women especially to the mothers. A good deal of shyness is felt in imparting and receiving this knowledge and this should not be the case. It has been stated that many married women dread the first conjugal approaches or in other words the sexual intercourse or cohabitation for the first time, simply because they are under the false impression that it might give them great pain. A good deal of this mental anxiety and fear may be removed if timely information and advice are only given.

There is also another important point which a husband should note for his information and guidance. Many women do not care to have sexual intercourse and

are apathetic about it, leaving the husband to satisfy his passion. This feeling, they say, is brought about in them by the roughness or want of tact in the husband. No husband has the right to be brutal and selfish to gratify his own passion and indifferent to the pain and distress of his wife.

It has been stated that sexual intercourse may perhaps be beneficial to women, but it is not at all necessary to preserve the health of a man. In some of the Hindu treatises it is stated that the observing of strict continence is highly essential not only for the physical benefit of the individual but also for the spiritual progress. In fact the preservation for the seminal fluid as much as possible is recommended by the great sages of old. The Hindu Dharmasastras say that a man after bringing forth one son should retire to the forest and lead a life of strict celibacy. But as this is not at all possible in this world at this time, let us confine ourselves to things that are strictly practical. There are husbands and wives, and there is this thing cohabitation or sexual intercourse. Among animals as soon as conception has taken place, the 'She' ones are not troubled by the 'He' ones. In fact coitus take place only once for each conception in them. But taking the case of human beings, it is a well known fact that many husbands have sexual intercourse with their wives during the whole period of pergnancy even. Inasmuch as this process has become one of passion in men, we should attempt at reducing the evil to a minimum by offering advice that could be easily followed perhaps with a little self-restraint. Instead of recoursing to either extreme to wit complete absti-

nence or frequent indulgence, let us strike the golden mean and lay down practical suggestions and advice. Man constituted as he is with flesh and blood will have sexual indulgence in spite of anything that might be said against it. But he may be made to be moderate in it and in course of time perhaps be brought to the stage of minimum indulgence. Often advice is sought by people as to the frequency of sexual intercourse that may be indulged in without ill-effects to the body. This is easy to ask but difficult to give. It all depends upon the husband and the wife. Generally speaking, sexual intercourse is desirable to be indulged in only when the wife shows an inclination for it. It is not desirable to have it to satisfy one's lust. Some husbands tell their credulous wives that unless they had frequent sexual intercourse, their health would suffer. Then the poor women submit themselves to the sexual act thinking that by such a sacrifice on their part they are helping their husbands to preserve their health.

Such women should understand that the health of their husbands depends not upon over-indulgence in sexual intercourse but on restricting it as much as possible, and act accordingly. Men are, after all, only higher animals and animals generally do not indulge in frequent coitus. Nature perhaps intended man also to follow the practice of the other animals. But he in this as well as in many other things violates the laws of nature and suffers from his acts. No animal has been known to suffer from over-indulgence in coitus. But take the case of man. Using his reasoning faculty he arrives at wrong

conclusions and blunders. But animals are guided by instincts that are divine in nature and consequently they never blunder. Man may as well take a lesson from these animals that are guided by God in the form of instincts Then he would see clearly how he should act with regard to sexual intercourse and its frequency. No hard and fast rules can be laid for this. Everything should depend upon the temperament of, and the power of self-control in, people. But one advice can be given to minimise the frequency of the sexual act. In Hindu families in bygone days the elderly people regulated the meeting of the husband and the wife and it generally took place twice a week on Tuesdays and Fridays. But now-a-days such a good practice has been lost. If people could follow the above suggestion it would be beneficial for them. If men find themselves unable to do so by their lack of sufficient self-control, they would do well to avoid opportunities to be alone with their wives. They should try to wean their minds away from all thoughts of sexual act by directing their activities in other directions. It may be difficult in the beginning, but a few days' strenuous application should gain for them the needed strength to resist the temptation. After all opportunities tempt men and they can easily avoid opportunities. Some husbands and wives sleep on the same bed. This is not only injurious to the health of both, but it may also tempt them to over-indulge in sexual acts. The best thing for them to do is to separate immediately after a sexual act and sleep apart in separate places.

It has been stated that the pleasure in anything is increased thousandfold if that thing happens to be rare

and little. Applying this to sensual act, we can say that normal and not abnormal gratification of its longing would give increased pleasurable sensations. Further the sexual passion like other appetites grows by what it feeds on. So it should not be allowed to gain strength by over-indulgence to shatter the health and constitution of the individual. After all, people both men and women and husband and wife care more for their mutual welfare than the satisfaction of their sexual passion. Only ignorance of hygienic and sexual laws make them destroy each others' health. To such people this book especially this chapter on 'Generative organs and their functions' should be of immense use and help.

CHAPTER VII.

PREGNANCY AND LABOUR

. In the last chapter we described the process by which impregnation is brought about in a woman by the conjunction of the ovum and the spermatozoon. In this chapter let us describe the gradual growth in the womb of the embryo into a fully developed child and its ushering in into this world. The term pregnancy is given to the condition of a woman from the time of her conception till the child is born. The pregnant condition is said to last for about nine calendar months. More accurately speaking, they say, that it lasts from 273 to 280 days or about 40 weeks. The process of parturition or child-birth is expected generally to take place at about 280 days from the last menstruation. But it is not possible to determine exactly the duration of pregnancy for the reason that we do not know when the ovum which develops into the embryo left the ovary. It might have left it at the ovulation or menstruation that had occurred either before the coitus or cohabitation or after it. As many of the women suffer from bad ailments during the period of gestation or the growth of the child in the womb, pregnancy has come to be regarded as an illness by many. But really speaking it is no illness at all but only a natural state. The foetus developing in the womb is in fact akin to a parasite since it lives at the expense of

its mother. This fact alone is enough to make the pregnant woman undergo a good deal of suffering and discomfort. The digestive system, the circulatory system, the secreting organs, all these have to do more work than when she was in her normal condition to provide the embryo also with nutrition. But "God tempers the wind to the shorn lamb," and so no difficulty will be felt regarding this by a woman with sound and healthy organs. The amount of extra work thrown on them would be performed by them easily and without resulting in any harm whatever. Many women are said to go through the period of gestation with as little discomfort as possible. They are also said to bring forth children rather easily. But such women may be regarded as rare and out of the common by the other pregnant women. But it may be taken for granted that pregnancy being a natural condition would be least attended with danger if a woman but takes care to keep herself in sound bodily health and strength by well regulated dietic habits and exercises. The majority of the women would be what nature intended that they should. But the body of a pregnant woman undergoes changes in many ways and consequently a certain amount of vigilance more than ordinary is essential. The body in fact should be taken special care of.

The first question that may likely to be asked by one trying to understand pregnancy and labour, would be as to how one can know that a woman has conceived or not. The sign by which this is first known is the cessation of menstrual flow. It must be remembered

that the periodical or monthly flow brought about the decay and haemorrhage of the mucous membrane of the reproductive channel and the womb. But after conception this mucous membrane of the womb became congested and grew rapidly. The uterine glands were specially largely developed. The proliferation of the sub-epithelial tissues took place rapidly. *This new growth did not undergo immediate decay and haemorrhage, but remained as a new temporary lining to the uterus, named decidua.* The ovum was received into this decidua and remained imbedded in it with the new growth closing in over it. With the increase in size of the ovum, it carried with it the portion of the decidua that had closed over it. The special flow of blood in menstruation was to bring about a certain degree of congestion in the capillary vessels to enable the fimbriated extremity of Fallopian tubes to grasp the ripe ovum more completely and guide it on to the uterus. Now, after conception, this unusual quantity of blood or at last some portion of it utilised for the growth and development of the appendages forming around the embryo. This is the reason for the stoppage of the haemorrhage or menstrual flow after impregnation. Some portion of the blood not used may be effused into the uterine cavity and expelled through the vaginal passage.

Though the cessation of the menstrual flow is a sign by which a woman can know that she is pregnant, yet it may not happen to be a sure sign. It may not be completely relied on. There have been cases where menstrual flow was taking place for two or even three months after conception. But in such cases it gener-

ally happens in a slighter form than usual and for a shorter time only. The stoppage of menstruation may also be due to certain diseases weakening the system. It is commonly absent when the woman is in milk and in suckling her child. But in the case of ordinary healthy married woman whose monthly or periodical flow has been regular, its stoppage may be taken as a sure sign of conception by her. Regarding the signs of pregnancy it has been stated in the treatise 'Family Medicine by Moore,' as follows :—

"During pregnancy, the condition is one of fulness or plethora and sympathies are excited in various organs serving as the signs and symptoms of pregnancy as below. (1) Morning sickness usually commencing about one month after conception, sometimes earlier. (2) Cessation of the monthly flow at the first month, which however in exceptional cases may not occur. (3) Enlargement of the breast, generally after the first month and occasionally not until the third month and sometime after a few days also. (4) Dark appearance and soreness of the nipples and breast about the third month. Sometimes (usually at a later period) oozing of milky fluid. (5) Enlargement of the abdomen about the third month. (6) Quickening or movements of the child felt about the fifth month and often attended by fainty feelings. (7) Pulsation of the child's heart which resembles the ticking of a watch under a pillow, heard first about the fifth month, most distinctly at the centre of a line drawn from the hip-bone to the navel, sometimes on one

side and sometimes on the other. (8) Movement of the child which may be felt after the sixth month on placing the cold hand over the lower part of the bowels. (9) Variations in temper and disposition, capricious appetite and 'longings,' the woman often showing a desire for special and sometimes improper diet."

The above in brief are the signs of pregnancy, and a few words regarding each may be useful to understand them well. Regarding morning sickness and vomitting that may also take place, we may say that it begins at the time when the natural menstrual flow would take place if conception had not taken place, that is about one month after conception roughly speaking. It may also take place even at the end of a week. This sickness is of no consequence and the pregnant woman would take her breakfast without any feeling whatsoever of uneasiness in the stomach shortly after. This morning sickness may continue from two to four months. There have been cases where it has lasted even throughout the entire period of pregnancy. Regarding changes in the breasts they come fuller at the sixth week of pregnancy with an oft-felt tingling sensation in them. They are slightly hard and knotty to the touch and the veins are shown more plainly than before. The nipples too would have become more prominent. The dark-coloured ring-like skins round the nipples going by the name areola have become darker and larger. Small projections are formed in the skin and they increase as time goes on. Clothing coming into contact with the nipples would be stained

by the small quantity of milk oozing from the breasts due to pressure on them. As regards the altered state of the abdomen, we can say that it begins to enlarge about the tenth week or so The rounded formation of the abdomen begins at first at its lowest part. Then it gradually continues upwards. The naval too is pushed out with the swelling of the abdomen. It is also common that it projects considerably during the last few weeks before delivery. The enlarged womb tightens the skin of the abdomen and this results in the formation of lines on it. These lines become permanent white streaks subsequently. The next sign of pregnancy going by the name of quickening is said to take place generally about the middle of the period of gestation. Hence we may take it for granted that it occurs at the end of about four and a half months since the period of gestation is nine months. There have also been cases where it has occurred sometime before and sometime after four and a half months. This expression 'quickening' describes perhaps the first feeling of the woman that she has a child in her womb. This may at times result in a feeling of faintness, and hence it is desirable that some one is always within available distance during the period. The child is actually moving in the womb and hence the feeling described above.

As regards the special longings or cravings in pregnant women we may but say that it is desirable to gratify them unless they happen to be something likely to prove harmful if satisfied. Then she should be made to put the cravings down by an effort of her will.

Any one of the above signs is not enough to decide the question of pregnancy of a woman. But when several of the signs are present, then it may safely be concluded that the woman is carrying a child. During the last four months of the pregnancy, the beating of the child's heart can be heard distinctly with the aid of a stethoscope. Then it is an unmistakable sign of pregnancy.

As we have already stated, pregnancy is a natural condition and consequently the manner of living need not at all be changed. Careful attention should be paid to the diet of the pregnant woman. It should be ample and simple. The longings may be reasonably gratified. It should be borne in mind that the deterioration in the quality of the mother's blood should perforce affect the child in the womb inasmuch as its nourishment is obtained from it. To safeguard the welfare of the child in the womb, it is desirable to resist capricious appetite. Moderate exercise and exertion without straining the body may prove beneficial.

Any strain on the part of the pregnant woman may excite the womb and bring on premature labour and even miscarriage very dangerous and undesirable things. A well-ventilated apartment should be at the disposal of the pregnant woman to sleep for the reason that with the growth of the unborn baby, there is a greater need for plenty of fresh air. Powerful purgatives should never be given to pregnant woman. Constipation may be relieved by the use of castor oil, and in

fact it is the best possible bowel opening medicine that could safely be given to a pregnant woman at any time during her pregnancy.

Medical men are of opinion that great care should be taken to maintain a quiet and happy mental state in a pregnant woman since they consider that that is responsible to a very large extent for the disposition of the child and the health of the mother. Confinement need cause no fear either for the child or for its mother. The state of pregnancy does of course cause to the woman inconvenience and unpleasantness in several ways, and as these cannot be avoided must of course be borne cheerfully. After all the trouble is only temporary and a passing one and will come to an end as soon as the child is born.

Sleep is a very important thing for a pregnant woman. She needs more of it during the period of gestation than at other times. But too much rest is not good since it might bring on languor and weakness. Ordinarily about eight hours sleep at night and an hour's rest after midday meal would be considered sufficient. As moderate exercise is desirable, a pregnant woman accustomed to ordinary household duties need not give them up. She may continue to do them, but should not exert herself and carry heavy water pots etc. nor should she attempt at stretching to hang up curtains or to spread cloths etc. washed. Such muscular exertions may bring on internal trouble and result in miscarriage.

The dress worn by a pregnant woman should be loose. There should be no pressure put on either abdomen or the breasts by wearing the cloths, bodice, etc. tightly. The breasts must be left free to grow. The delicate nipples should not be allowed to be injured since they may cause difficulty in suckling the child afterwards. Any pressure on the abdomen would press on the growing womb. This is dangerous to the well being and proper development of the growing child in the womb. Pregnant women should not be given strong coffee or tea. All stimulants should be avoided not only for the woman's sake but also for the child growing in the womb.

Larger quantities than at other times of water should be taken by a pregnant woman since it would help the kidneys to perform their functions well and thus she could maintain her health. The greater the quantity of urine passed by a pregnant woman the better it would be for her health. She should pass more than two and a half pints of it in a day. This can be possible only by drinking a large quantity water daily.

As the food taken by a pregnant woman should be light and at the same time nourishing milk may be given to her in plenty. Pregnant women should take vegetables and fruits to get rid of the costiveness they are susceptible to ordinarily.

The stomach of a pregnant woman should never be overloaded. The quantity of food usually taken need not be exceeded and it is quite sufficient. As the system requires more nourishment during the last months of

gestation, it is better to give the pregnant woman food frequently in small quantities rather than a large quantity once or twice.

Care of the nipples is a very important thing that a pregnant woman should pay attention to. They are likely to crack and cause much pain to the mother when she has to suckle her child. They may be washed with spirit or brandy mixed with four times the quantity of water both mornings and evenings to keep them all right.

Young women generally wear tight bodice and this causes the nipples to be embedded in the breast. The child, when it attempts to seize them, is not able to effect it. So it may be necessary to make them prominent during the last months of the period of gestation. There are several ways suggested to bring this about, and one of them is the use of a suitable bottle with a suitable mouth to cover the nipple without causing any discomfort. The bottle should be dipped in very hot water and while it is sufficiently warm should be pressed against the breast in such a way that the nipple fits into the mouth or neck of the empty bottle. This process would, when the bottle cools, enable the nipples to become prominent. Further, the nipples should be sufficiently hard and tough so that, when the child suckles, much pain may not be felt. The painting of glycerine of tannic acid on the nipples daily would make them sufficiently hard and tough.

The most common disorders a woman is susceptible to during the period of pregnancy are (1) Constipation

(2) Piles (3) Discharge of whites (4) Toothache (5) Eczema or skin disease (6) Headache (7) Cramp (8) Heart burn and palpitation of the heart (9) Faintness (10) Irritability of the bladder (11) Swelling of the feet and legs (12) Sleeplessness (13) Diarrhoea (14) Excessive vomiting, etc. Regarding constipation, care should be taken to have the bowels regularly emptied at least once daily. Proper diet and sufficient exercise would surely effect this. If such simple measures are not sufficient then castor oil the best aperient for pregnant women as we have already stated should be resorted to. A dessert-spoonful or a table-spoonful of it may be taken while going to bed. It may, if need be, be taken with warm milk or coffee. Application of enemas may be resorted to if the constipation happens to be obstinate. Soap and water with or without castor oil may be used. In place of castor oil Epsom salt may also be made use of. As neglected costiveness would upset the health and add to the difficulties of labour, great attention and care should be taken to ward off this evil during the period of pregnancy of a woman. Piles are enlarged veins at the lowest part of the bowel *i. e.* the large intestines. As the womb presses on these veins, it is invariably the case that pregnant women suffer from this evil. With the finger covered over with vaseline, this may be gently pushed back into its proper place. The discharge of whites may be due to the pressure of the womb and weak women and women who have borne children at close intervals are often susceptiple to the complaint. This discharge is said to be useful during the last

months of the period of pregnancy. General health, regulated bowels, nourishing food avoiding all sorts of stimulants, good sleep and sufficient rest, are recommended for this complaint.

It is a time-worn belief among people that a woman loses a tooth for every child she bears. This goes to prove the statement that pregnant women are susceptible to toothache. A dentist may be approached to have the pain relieved if need be.

The skin disease may often prove very troublesome during the period of pregnancy of a woman. The watery discharge from the small blisters that are formed on the skin causes when they burst irritability and itching sensation rather unbearable. Crusts too may form. A weak solution of carbolic acid (two teaspoonfuls added to half a pint of water) may be used to dab the parts with a piece of soft cloth. Crusts if formed may be removed by bathing them in the morning after having soaked them with olive oil at nights.

Headache may be caused either by a disordered stomach or by the affection of the nerves. The symptoms to show that the stomach is not in a healthy state are, a coated tongue, foul breath and confined bowels. A mild aperient such as a teaspoonful of caster oil may prove beneficial in such a case. As for headache due to nervous affection any good tonic continued for about three weeks or so might prove effective.

Cramp the common occurrence in pregnancy is due to irregular contraction of the muscles caused by the assimilation of poison by the blood. The pain may be

felt either in the legs only or both in the body and in the legs. Getting up and moving about might relieve the pain. The part affected may be rubbed vigorously for a few minutes and if it happens to be either the stomach or the bowels, hot fomentation would do good.

Heartburn is the result of over-acidity in the stomach and may be removed by regulated diet. The symptoms of heartburn generally are the feeling of the burning sensation at the pit of the stomach or under the breast-bone and the occasional raising into the mouth of a quantity of sour fluid. When these occur, half a tea-spoonful of bicarbonate of soda dissolved in half a tumbler of water may be slowly sipped. In palpitation, the best thing to do will be to make the woman remain quiet and free from excitement in a place where there is plenty of fresh air. A cup of hot coffee or tea may also be given.

Faintness in pregnant women may last about half an hour or so. The best thing to do would be to give them plenty of air, to sprinkle a few drops of cold water in the face and to hold smelling salt to the nostrils. A well wrapped up bottle containing hot water may be applied to the feet if the faintness happens to be a long one. As soon as the woman is able to drink, a small quantity of cold water may be given to her to drink. If the fainting is found to be due to constipation or indigestion, the proper remedies should be resorted to. Castor oil may be given in case it is due to constipation. If it is due to indigestion, simple food should be restored to. A good tonic such as a mixture of citrate or

iron and ammonium two drachms, tincture of nux vomica 1½ drachms, spirit of chloroform 2 drachms, peppermint water enough to make 12 ounces, may be given thrice a day after meals at the rate of two tablespoonfuls or an ounce a dose.

Irritability of the bladder is characterised by the frequent desire on the part of the pregnant woman to pass urine. This is due to the pressure on the bladder exerted by the enlarged womb and it often disturbs the woman's sleep during nights, seriously affecting her general health. Drinking large quantities of barley-water or pure water may often prove beneficial.

Swelling of the feet and legs may be due to constipation which may be removed by giving castor oil.

To cure sleeplessness in pregnant women, every effort should be made to avoid giving drugs. If that be not possible, the doctor may be approached for some drug to overcome the condition.

Diarrhœa in pregnant women is often due to indigestion and may bring on miscarriage if timely attention be not paid to cure it. Light and limited quantity of food only should be given. If the tongue is coated and the breath is foul, then the bowels are not clean. In such a case a dose of castor oil may be given. A mixture of two drachms of Bismuth carbonate, two drachms of sodium bicarbonate and twelve ounces of peppermint water may be got ready and the woman given an ounce of it after each liquid motion.

Vomiting occurring in the mornings is a common sign of pregnancy and a natural condition, as has

already been pointed out. It is often relieved by the taking of some nourishment before rising from bed. But if the vomiting does not stop before the midday meal, then it may be due to constipation and the bad condition of the contents of the bowels. If the tongue is coated and the breath is foul, then a dose of castor oil should be given.

A chapter on pregnancy would be incomplete in the absence of a description of the process of development of the foetus in the womb of its mother. This subject is a vast one and hence needs a good deal of abridgement to be dealt with in a small book like ours.

As this has been done in the best scholarly manner possible by Messrs. A. A. Philip, M B, C M, and H. R. Murray in their book 'Knowledge a young wife should have,' we may as well quote here their own abridged description of this very interesting process of gesture. They have stated under the head, 'The Process of Gestation' as follows:—

"At first the rudimentary human embryo is obtuse-ended, oblong in shape, somewhat swollen in the middle, slightly curved, greyish in colour and weighing about a couple of grains. After five or six weeks the head becomes discernable, considerably larger than the rest of the body in proportion; for it is the head and brain which first develop. By this time the embryo has grown to about two-thirds of an inch in length and weighs about 15 grains. The limbs appear as small knobs or protuberances, and the heart begins to shape itself from a single straight artery. During the fifth and

sixth weeks, the eyes also appear as small specks, and the rest of the features gradually commence to become outlines. The seventh week sees the growth of the genital and some of the abdominal organs, although the sex is not yet determined, nor is this matter fully clear until the twelfth or the thirteenth week. The limbs now begin to form, the hands and forearms before the upper arms and shoulders, while bone deposits are noticeable in the jaw especially as early as the seventh week. By the tenth week when the embryo is about two inches long and weighing from one to one and a half ounces, the skin can be observed. The lips commence to develop, the eyelids to show, the fingers to grow distinct and the chest to form. After four months' growth, the embryonic stage is over and the ovum has evolved into the foetus, six to eight inches long and weighing about 6 1/2 ounces. The tongue now appears for the first time, the sex may be determined by the presence and the absence of the uterus, the face is rounded off and features are visible. Small white hair may even be detected. During the next four weeks, the internal organs become far more clearly developed. At the sixth month, the length is increased to a foot and the weight to about 1 lb. The nails have become solid, and the gall-bladder to display evidence that it is busy secreting bile. In another month, the weight will increase rapidly to about 3 1/2 lbs. while ossification progresses rapidly both in form and substance. At about the same time the eyes begin to open. Development now proceeds apace, the little body thickening up and increasing in weight to four

or five pounds during the eighth month, and the left testicle even appearing in the male scrotum. The last month sees a steady increase in length from about 20 to about 21 inches and in weight from 6 to as much as 13 or 14 lbs., while in some instances, the composition of the brain is clear and the infant is complete".

We have already stated that the time taken by the fructified ovum to develop into the complete infant is 280 days. When this period has passed and the infant has fully grown, the final act of pregnancy takes place and in which the developed embryo or foetus is brought forth into this world. This final act of pregnancy is given the name of labour or parturition. The extrusion of the foetus is said to be brought about what with the rhythmical contractions of the uterus and what with the pressure exerted by the contraction of the abdominal muscles. In the beginning, only the contractions of the uterus take place and these bring about the dilation of the *os uteri*. The action of the abdominal muscles is brought in, only in the later stages of labour while the foetus is passing into the vagina.

In describing the process of labour, the first thing to be noted is the duration of *normal* labour and this is never uniform but varies widely in different women. When a woman delivers her child for the first time, the time she generally takes is from twenty to twenty-four hours. But for a child other than the first she may take about twelve hours. For purposes of description, people generally divide labour into three divisions. The Family Encyclopaedia of Medicine describes these stages as follows:—

"The first stage of labour is when the neck of the womb is being stretched for the passage of the child and the muscular contractions of the walls of the womb are taking place by means of which the body is expelled. The child in the great majority of cases lies head downwards in the womb and is encased in a membraneous bag of fluid known as the bag of waters. This bag is of great use in stretching the passage without so much pain as would be experienced if it had to be done by anything hard and blunt like the head of the infant. At the close of the first stage of labour, this bag bursts and the waters are expelled. A young mother should be warned that this will take place as otherwise the sudden flow of the water may alarm her. The pains during the first part of labour are of a "rending" description. They do not last for long at a time, and between the pains there is an interval varying in duration in different cases from five to twenty minutes. They are felt chiefly low down in the back. As time goes on, these pains occur more frequently and last longer."

"The second stage of labour is when what are known as '*bearing down pains*' begin. During this period, the child is being expelled from the womb. All the muscles of the abdomen take part in these pains and the organs of breathing are affected. When this state is reached, the mother should at once go to bed, placing herself in the position in which she will be confined—that is on her left side, with the knees slightly bent and lying rather low down in the bed with the head raised and only one pillow, and the buttocks close to the right side of

the bed. These "bearing down" pains are felt in the abdomen chiefly. They are far more frequent than those at the beginning of the labour and last longer. Gradually the interval between them shortens and they get more and more severe until the child is born. While they continue, it is often a help to a patient to press her feet against the foot of the bed and pull on to a strong towel which has been fixed to the end of the bed for the purpose. In this way, it is possible to aid nature in expelling the contents of the womb, but all undue straining should be avoided. These pains increase in strength and frequency until the child is born. If it is a natural birth, the head will appear first with the face looking backwards, and a very few minutes after, the rest of the body follows. The child now first breathes and should if all is well with it, cry loudly. The umbilical cord should now be tied after all pulsation in it has ceased, by the doctor or the midwife in attendance and the child taken from its mother. The third stage of labour has still to come. This is when the afterbirth or placenta is expelled and it usually happens within half an hour of the birth of the child. The mother should be left perfectly quiet until the recommencement of the pain gives warning that this may be expected. The after-birth or placenta which is attached to the womb is composed of a spongy mass in the midst of which is the naval string or umbilical cord, through which the child during the period of gestation draws its nourishment from its mother for its development. The placenta with the membranes is expelled after a time, and it seems to be a rounded mass about from eight to

fifteen inches across. Usually it will come away without any assistance or get so near the surface that it can easily be removed. Note however that on no account should the cord be pulled with a view to hastening the expulsion of the placenta. In some cases, however, its coming away may be encouraged by the doctor or nurse gently kneading the womb through the abdominal wall. It is most important that the after-birth be got away entirely as, should any remain, it may decompose, resulting in dangerous fever or severe bleeding. With the expulsion of the placenta or after-birth, a certain amount of bleeding takes place, but the quantity of blood passed should not be more than about a large cupful. With the coming away of the after-birth the labour is over."

There are cases in which twin-children are brought forth. In all such cases the birth of the second child is very quick and easy after the birth of the first. It can be told by persons who know that whether the womb contains another child or not by placing a hand on the woman's abdomen. In case that a second child is to be given birth to, the pain usually begins afresh, well with in half an hour. The second or the twin-child is born in a few minutes. There have also been instances where the interval between the birth of the first child and the second has been half an hour or even more.

Everybody knows that the drug chloroform is administered to people who have to undergo surgical operations. The same drug is also being used now-a-days in certain cases of labour to save the mother a

good deal of exhaustion caused by pain. This has been found to lead the woman to a more speedy return to perfect health and strength. If at all the drug is administered, it is done near the close of the second stage of labour to spare the pain of the expulsion of the child. Specialist in labour cases resort to special injections into the blood to hasten the labour.

In describing the process of labour, it is usual to say something about food to be given to the woman during labour. It should of course be light but sustaining. At the beginning of the labour, the pregnant woman is generally given any ordinary wholesome food she may ask for. But later on all solid food should if possible be avoided. It should be borne in mind that the stomach should never be overloaded during labour. But as it is necessary to maintain strength to cope with the exertion of labour, some sustaining nourishment should be given about every hour if possible.

The mother should not be allowed to exert herself too soon after delivery. She must be made to remain perfectly quiet and still for at least an hour after the labour is over. She should be disturbed as little as possible while removing the soiled cloths or while applying the binder.

What we have described in the previous pages is about labour in the usual and ordinary course after the full natural period. But expulsion of the foetus may also take place either before the period of quickening or afterwards. The birth of a child at any time before the end of the ninth month—*when* only it would be mature and ready to be expelled—goes by the names miscarriage

and abortion. Some people apply the term miscarriage to the expulsion of the foetus between the end of the third and the end of the seventh month. The term abortion is used to denote the birth before the end of the third month, though some use this term to denote the birth at any time before the end of the seventh month. But the birth of the child after the seventh month and before the full period of development of 280 days is termed premature birth. The labour before the full development of the child is called premature labour. If the abortion or the expulsion of the foetus takes place during the first three months of the pregnancy, then it is highly dangerous. It is stated by the proper authorities on the subject that abortion or miscarriage generally happens if at all it does in women, at the time when the menstrual flow is due. Various causes may bring on miscarriage. If the pregnant woman happens to be ill during the period of her pregnancy she is liable to miscarriage. Mental or physical shock, over-exertion, muscular strain and fall are known to be causes likely to bring about miscarriage in pregnant women. If it takes place in the early stage of the pregnancy it may pass for ordinary menstrual discharge. The foetus will appear only as a clot of blood. But if it occurs at a later stage, then the case will be severe and dangerous. The first signs of miscarriage would be similar to those of ordinary labour. There will be a discharge of blood with the pain accompanying it. Then the best thing to be done would be to make the woman go to bed. It has been found that a miscarriage can often be prevented by the timely care and treatment. The most essential

thing to be done is to make the woman lie perfectly quiet. She should be treated after the miscarriage if it happens, even as she would be treated after her confinement. There is no gainsaying the fact that if the woman after the miscarriage be not treated with great care and attention, she would not only run the risk of becoming a chronic patient, but may also be in great danger to her life even.

The expulsion of the foetus during the sixth and seventh months of the pregnancy is called premature labour. Though there have been cases of very rare exceptions, the child born during the sixth month has very little chance of life. It may happen to breathe freely, but generally does not live more than a few hours. But children born after the seventh month though they manage to live and grow are not generally sufficiently strong though there may happen to be exceptions one or two here and there. There is a strong popular belief that the child born during the eighth month has not as good a chance of living as the one born during the seventh month. How this belief originated is not clearly known. It may be due to superstition or it may have been a fact established by the experience of years behind. Medical authorities would surely be of opinion that a child born in the eighth month would have a better chance of living than the one born in the seventh month, on account of its greater development and nearness to the period of child birth in the ordinary course. But it should be remembered that this is not the only instance in which medical opinion and popular belief are at

variance. There is also another popular belief that in all cases of premature labour, the after-birth should all be burnt if the child should at all live and be brought up all right!

A few words regarding the care of the mother after the birth of the child is absolutely necessary before proceeding to the care of the baby ushered into this world. We have already stated about the rest the mother should have after delivery. But it is highly essential to prevent the inflammation or paralysis of the bladder and to see that she passes urine within six hours after child birth. It is recommended to be done in the horizontal position as far as possible. If that be not possible, the woman may turn on her hands and knees. If there be difficulty even then, fomentation should be resorted to. The lower part of the bowels and also the private parts, if need be, may be fomented with hot water. The mother should be made to make an attempt to pass urine; otherwise she may have the tendency to wait longer than proper to do it, owing to the state of her belly.

The state of the bowels of the mother after child birth should be carefully attended to. The bowels must open on the evening of the second day after delivery or on the morning of the third day. If that does not happen, then a tablespoonful of castor oil should be given to bring it about. Most often there happens to be accumulation in the lower bowels during the later days of a woman's pregnancy. This is often known by the woman passing out hard round lumps of matter. In all those cases an enema with warm water should be resorted to clear the accumulated matter.

There is one more matter that has to go in in a chapter on pregnancy and labour and that is about lactation or the act of giving suck to an infant when breast engorgement occurs in women after child-birth. The breast may become swollen and painful due to the blocking of the ducts. It may also become swollen, it is said, to some imperfection or other in the nipples or it may be due to the non-suckling from the child. Then the result is what is called milk fever which may cause a good deal of discomfort to the mother. Generally in ordinary cases the breasts would remain quiescent for a day or so when the confinement has taken place for the first time. Then they would begin to enlarge causing stings of pain to the woman. The substance forming [illegible] becomes heavier and tenser. This is said to be due to the rush of blood to the breasts to be converted into milk. The shivering and feverishness caused by the abovesaid flow of blood to the breast subside usually with the flow of the milk. If the complaint happens to be due to the non-suckling from the child, then the remedy would be to withdraw the milk with a pump that can be brought from any chemist's shop.

It has been the fashion now-a-days that the children are fed using what are called feeding bottles and breast feeding is neglected. This is what it should not be. It is not at all necessary that a mother should be sturdy and strong to feed her child with her milk. Almost all women can nurse their infants in the way in which

nature intended that they should be fed. No mother has the right to shirk the duty of suckling her child and delegate that work to a wet-nurse as is most commonly done by the upper classes of people so that they may enjoy their pleasures unfettered by the act.

The mother's milk is the most perfect of all foods for the infants. A little consideration should convince any one of the fact that nature adjusts the digestive organs of the infants to digest only the mother's milk supplied to them as food. The mother's milk too improves in quality to suit the respective stages of the growth of the infant. Such being the case, artificial feeding of infants with substitutes for mother's milk such as cow's milk, etc. is highly undesirable and it is stated that the child fed on cow's milk, etc. in place of its mother's milk may be found to 'start life' with what may be a serious handicap. There is one more advantage to be derived from feeding a child only with the mother's milk. Cow's milk, etc. are often not free from germs causing disease, and consequently children fed on them may become liable to be afflicted with diverse kinds of diseases. There is no such fear, in case of children fed on their mother's milk only, as it is absolutely free from disease breeding germs.

No actual milk is secreted by the breasts till after two or three days of confinement have passed. A fluid called *colostrum* is secreted by the breasts then. The infant should be put to the breast for a few minutes twice or thrice daily to draw from it this fluid which not only gives the infant what little nourishment it needs

but it also serves the purposes of a laxative to the infant.

The flow of milk in the mother's breast is brought about usually on the third day. The child should thenceforward be put to the breast at intervals of two hours or so, from early morning till late at night. During the first month the child may be fed twice or thrice during the nights also. The duration of feeding may be limited to about ten minutes and strict punctuality observed. After a month and a half, the night feeding may be reduced to two or even one. After three months, the night feeding may be stopped altogether from about eleven o'clock at night till about 6-30 A. M. in the morning. The infant may be made to remain without any feeding at all.

Some mothers not properly advised perhaps may be in the habit of feeding their infants indiscriminately, and this is bad for both the mother and the child. It should be borne in mind that habit is second nature and if the child is made to feed at the breast at fixed feeding times, it would naturally take to the habit and feel hungry at the stated correct hours a habit very valuable indeed. The child may happen to be asleep at the appointed feeding time. Then the mother may be unwilling to distrub it from its sleep and feed it subsequently after it awakens. The procedure should not be followed.

The child should be awakened at the feeding time and fed. Mothers are often in the habit of giving the breast to the child whenever it may happen to cry, in order to pacify it. This is a very bad practice to follow. Breast should never be given at times other than those

fixed, to pacify the infant or to stop its cries. As the food taken by the mother provides the nourishment for the suckling baby, it is desirable to regulate that also to suit the requirements of the baby's food its mother's milk. The following instructions are laid down in one Moore's Family Medicine regarding the care of the nipples and the breasts before and after suckling by an infant. "Each time the child is about to suck, the nipple should be cleaned with soft rag and plain water, and again when the child ceases suckling. This is desirable because even a very little milk drying about the nipple may turn sour and irritate the part; or it may be received into and disorder the infant's stomach. The nipples and breasts should also be washed with warm water and soap morning and evening. By such care, the chance of sore nipples and bad breasts will be avoided. During the first week the mother should give suck while lying down. She can turn on one side and supporting herself on her elbow, let the nipple fall into the mouth of the infant. But afterwards, the semi-erect posture should be taken from which the infant swallows best. Both breasts should be equally used."

Inflammation of the breasts may be brought about by sudden weaning of an infant. It may also be brought about by permitting the breasts to become over-distended with milk during nursing or by the death of the infant. Sore nipples prevent the mother from suckling or drawing the milk off from the breasts and thus render them over-distended. Allowing the child to suck fruitlessly at the breasts while they contain no milk

may also bring about inflammation of the breast. Great care should be taken since inflammation of the breasts often leads to the stoppage of the flow of milk resulting in the formation of an abscess. The treatment suggested is the application of hot fomentation and occasional but not frequent emptying by suckling by the child or by some one else by the mouth or the use of the breast pump.

It is a very common thing that the nipples become sore during the period of suckling owing to the excoriations and cracks about them. This not only causes great pain to the mother, but it may also bring on inflammation resulting in the formation of an abscess. Therefore all nipples should be washed and dried after suckling by the infant and even before they are allowed to be used by the child to draw the milk. It is a common practice with many women to leave the nipple in the child's mouth after it has completed its suckling. The practice should be given up since it softens the part and makes it liable to crack. Further sore-nipple in a mother should be guarded against in the interest and safety of the infant itself. A cracked and sore nipple if allowed to be made use of by the infant, it generally brings about the formation of sores in the infant's mouth also. At times it may so happen that the nipples are not cracked, but they simply become tender. Then glycerine may be applied to them and a rubber nipple used to draw in the milk by the infant's mouth to avoid their coming into contact with each other directly. It is also a common practice

when there are sores in the nipples that the mother uses the old fashioned feeding bottle to draw out the nipple and give the same to the child to feed from. Frequent washing of the nipple with salt water or with a solution of alum, especially during the latter periods of pregnancy would harden the nipples and prevent them from cracking.

After confinement, the womb requires some time to regain its normal size and condition. So the woman after confinement should be made to remain in bed for twelve days. Even after that period she should be made to recline on a couch for some more time and should not be allowed to get up even to have the bed cleaned, and re-arranged. To replace the soiled bed sheets by clean ones, she may be shifted from one side of the bed to the other. Though some women may attend to their avocations even after a few days of confinement, yet women having womb complaints should remain recumbent for a full month. This is the advice given by medical authorities.

CHAPTER VIII.

INFANT AND ITS MANAGEMENT

After the child is born, its care should go on side by side with the care of its mother. Any froth found about its mouth should be wiped away. The navel cord should be tied and cut. There must be two ligatures one at a distance of two and a half inches above the child's navel and the other a little more than three inches from the navel. The cord should then be divided with blunt scissors between the two ligatures. After the child is born this operation of binding and dividing the cord should not be hurried. The child receives more blood while the cord is beating and perhaps feels more vigorously the action. As soon as all the beating in the cord has ceased, the ligatures may be formed as stated above and the cord cut. While the child was inside the mother's body, its temperature was warmer than that of the atmosphere. So as soon as it is born, the warmth is the first thing to be considered. So a warm blanket or a flannel (preferably an old one since a new one is likely to irritate the infant's skin) should be ready to hand, to receive the infant as soon as it is separated from its mother by the cutting of the cord. The child is very slippery as soon as it is born since it would be covered with a white greasy substance. So one should be careful in handling it. To guard against the accident of the infant slipping out of the

hands while handling, it has been suggested that "the neck should be seized in the space between the thumb and the first finger of one hand, while the thighs are grasped with the other."

It is not absolutely necessary to attend to the washing of the infant as soon as it is separated from its mother. It can wait for a while before it is washed, and no harm would ensue if it is made to do so. All that is necessary to do would be to put the infant in a warm safe place. It should be covered in such a manner that it can breathe freely and easily. After attending to the mother, the child may be attended to. The clothing for the infant after it is washed as well as the towel to dry it after washing, should be warmed in a fire and kept near at hand. Then a large basin or wash tub may be filled with comfortably warm water. The washing of the child's face should be the first thing to be attended to. This could be done on the knee. The eyes should be bathed thoroughly and with great care. It is suggested that a solution of boric acid (half a teaspoonful dissolved in half a pint of warm water) should be used for the purpose. A small piece of sponge soaked in this solution may be used to cleanse the eyes. Then a drop or two of silver nitrate solution (2 grains in an ounce of pure water) obtained from a chemist and kept ready may be dropped into each eye by means of an eye dropper. Then a few drops of pure cold water may be dropped to prevent the further action of the silver nitrate solution. It is stated that if the suggestions made above is followed strictly at the birth

of every child, blindness in the country would be reduced to a minimum.

The next thing to do would be to attend to the nostrils of the infant. Care should be taken to see that they are clear. Then the washing of the face may commence. A soft piece of flannel and a little pure soap may be made use of to do it. Great care should be taken to see that no soap enters the infant's eyes. The piece of flannel should be thoroughly rinsed in warm water before use and the face should be dried with a dry towel.

The body covered with the greasy white substance should then be washed. To remove the white greasy matter from the body, it is necessary to rub the infant all over with oil on the knee. It should then be placed in the warm bath and sponged well. Soap of good variety may be made use of. The above-mentioned greasy white matter should be removed very carefully from every part of the infant's body namely the armpits, groins, buttocks and so on. Every attempt should be made to take off the greasy white matter entirely without hurting the tender skin of the infant. But if portions of the substance remain after washing and would not be easily rubbed away, then they may be left to be removed in the future wash. A small pillow covered with one or two towels may be placed on the knees and the child dried on it gently but thoroughly with a soft towel. The infant's body may be dusted over with talcum powder. The washing of the baby should be finished in as short a

time as possible since it should not lose its bodily heat by a long over-exposure.

The navel cord should be dressed properly, and if there be any oozing of matter from it, it should be more securely tied. Equal parts of boric acid and starch may be thoroughly mixed together. This mixture may be thoroughly sprinkled over the stump. Then it may be wrapped in a piece of boric lint in which a hole is cut in the centre and the stump drawn through it. It may then be bent upon the infant's stomach and kept in place using a binder which is made of a strip of flannel about five inches deep and sufficiently long to go round the infant's body twice. This binder should be sufficiently tight to afford support but it must not interfere with breathing. The above binder should be fastened by stitching and not pinning. Then the child may be well wrapped up in its clothes and placed in the cradle between blankets and left to sleep. No feeding is necessary for the first five hours after its birth. It should then be brought to its mother to suckle. The bandage should be used for four months and should even be continued if there be any prominence of the part. Old bandages should be removed and new oiled ones applied daily. The end of the navel string would drop off in five or six days leaving a depressed sore below, which generally heels quickly. If the end of the navel string does not drop off after the above-mentioned five or six days, it should not be pulled out or otherwise

interfered with. It should be allowed to drop out in course of time of itself.

The above in brief is the description of the treatment to be given to an infant immediately after its birth. Let us now pass on to the several phases of its life. At birth a child is on an average rather less than a third of the maximum length to which it would grow in future years. The weight is about one-twentieth of the maximum weight it would attain to in the end.

The weight of a healthy child at birth is usually about 7 lbs. There may also be children with weight 8 or even 9 lbs. It has been observed that a female infant weighs generally less than a male child at its birth. Except at the ages of 13, 14 and 15, boys generally are taller and heavier than the girls of the same age. But at the ages of 13, 14 and 15 girls are usually found to be taller and heavier than the boys of the corresponding ages. The average length of an infant at birth is about 18 inches.

It is generally the practice to ascertain the progress in the development of an infant by weighing it periodically and noticing the increase or decrease in its weight. During the first few days after the birth of a child, it would lose a few ounces from its weight at birth. But a healthy infant generally regains this loss in the course of a week or so. After the first week, the infant should gain in weight perceptibly every day.

It has been ascertained that during the first four months, the daily increase in the weight of an infant

has been from two-thirds of an ounce to one ounce. During the remaining nine months the increase has generally been from one-third to three-quarters of an ounce.

In dealing with the subject of the management, feeding and nursing of infants, new born and grown up, it is highly essential to emphasise the importance of food and the practice of giving it, recommended by those who know from long experience. No infant should be fed immediately after its birth. It has been stated that an infant does not require much nourishment during the first ten or twelve hours after its birth, and what little it needs as nourishment can be had from the secretion from its mother's breasts. In case of mothers who are confined for the second or subsequent times, they would be able to supply the milk to serve the scanty wants of the infant generally within ten or twelve hours. If she does not or if the confinement happens to be the first and consequently the milk is late in coming, then the infant may be fed on milk diluted with water, every three hours. Some milk-giving animal must be selected and it should be kept and fed with scrupulous care and attention for the purpose of getting the needed milk for the child. In some cases an infant is fed on asses' milk from its birth. Then the milk should be diluted with half the quantity of water and given to the child during the first few days. After a few days say four or five, the quantity of water added may be gradually reduced. After a fortnight or so the asses' milk may be given pure without adding any water at all. It has been said

that the best substitute for the mother's milk is that obtained from an ass kept and fed for the purpose. The reason is that it resembles the mother's milk, since it contains a high proportion of sugar and a large amount of water in addition to its being deficient in the quantity of solid matter and consequently well adapted for the delicate stomach of the infant. The wants of a child growing vigorously may be met by having recourse to cow's milk or goat's milk. If there is to be a choice between the cow's milk and the goat's milk, then the latter would be preferable to the former for the reason that it is more like human milk than the other. It is of course the fact that the goat's milk contains more solid constituents and less sugar than human milk. But when compared with the cow's milk, there is no gainsaying the fact that that is preferable. Further in some places it is more easily procurable. Whatever the animal may be that is selected to provide nourishment for the infant, it is highly important that the materials on which it is fed is very carefully chosen. They should not be allowed to feed promiscuously on any dirty fodder ready to hand. It is the nature of these animals to devour greedily any dirty stuff they may happen to come upon, and consequently they should be kept carefully secured and fed only on fodder decided upon beforehand. The milk given to a child should never consist of that obtained from two animals mixed, even though the animals may be of the same class say two cows or two goats. Further the milk from a goat or a cow should be diluted with half the quantity of water for the first ten days. Then the quantity of water added may be

liminished slowly and gradually, and at the end of four months or so the milk if from the goat may be given pure and if from the cow may be given almost pure, i. e. with a very small quantity of water alone added. As human milk is the proper nourishment for the infant provided by nature, the other varieties of milk selected as substitutes cannot be satisfactory. So to avoid the risk of injuring the infant by feeding it on substitutes for its mother's milk, it is better to use any ordinary healthy woman's milk if procurable. Improper feeding is a frightful source of sickness and the cause of many a fatal disease. At the time the child is born, its digestive organs are not at all matured. They develop, grow strong and powerful only gradually. During the first few months, no saliva is secreted and no tears come out, and the stomach and the alimentary canal are rather short. Only after the lapse of several months, that the teeth begin to appear. All these clearly go to prove that the digestive capacity of the infant is very feeble. Therefore the food given to it should be suitable to the digestive power it possesses. The one and only kind of such food is found to be milk.

Nature intends that a healthy mother should suckle her infant. If she does not perform this maternal duty, then she may herself be injuriously affected. A mother who does not perform the duty of nursing her offspring, runs the risk of conception rather too soon after a confinement. It has been ascertained by long experience that a mother who is nursing her infant does not generally conceive up to the tenth month. Further,

it is but proper that the natural functions of the organs—the breasts—should be carried on to prevent the development of maladies like cancer in them. There may be women under peculiar conditions of the system say a tendency to consumption that may forbid their nursing their offsprings. What has been said forth above does not apply to them at all but only to healthy mothers. A nursing mother cannot fulfil her duty without a considerable amount of care. The food she takes must be easy of digestion. Highly seasoned food and alcoholic drinks should be completely avoided. A large quantity of milk food may be taken and she should never overtire herself. She should also avoid excitement and worry of any kind, since it has been ascertained that mental disturbances alter the character of the mother's milk, and there have also been cases where even convulsions have been caused in the infant, fed on such a mother's milk! Further, regularity in feeding is essential for the successful rearing of infants and consequently nothing should be allowed to interfere with it. Mrs. J. Laughton Hewer has laid down in her admirable book 'Our Baby' under the heading 'Nursing Baby' as follows:—

"A mother should nurse her child every eight hours for the first twenty-four hours, then every four hours until her supply of milk comes, and afterwards every two hours *by the clock*, from 6 A. M. to 1 P. M. After 10 P. M. it is well from the very beginning to accustom a child,—unless exceptionally delicate—to go as long as possible without food; four hours is the usual time; thus it will come to its mother at 2 A. M. and again at 6 A. M.

Some children are more easily taught this rule than others, but perseverance will always win the day. Infant's stomach needs rest and night is the time for it.

When a mother is capable of resuming her ordinary duties after her confinement, it may happen in some cases that her supply of milk is not sufficient in quantity to satisfy the requirements of the growing baby, though it may be excellent in quality. The hungry child may suck and suck until it is tired and then leave off the action in a fit of rage due to hunger. Experience has shown, that if the mother has some nourishing food such as a glass of milk about half an hour before the baby's nursing hour and lies down to rest, it does some good in increasing the quantity of her milk. Even this may not be enough to satisfy the hunger of the baby. Then diluted cow's or goat's milk should be resorted to following the directions laid down above regarding the use of substitutes for the mother's milk.

According to nature a mother should be able to supply her infant with the required quantity of milk. If she is not able to do it, it shows that her constitution is not what it should be, and that she is unequal to the task of secreting enough milk to satisfy the wants of her child. In such a case we may conclude, that her milk is more or less deficient in quality, and that it does not contain materials sufficient to serve the nutritive purpose. It goes without saying that milk of the best quality cannot be secreted by a woman whose constitution is not powerful enough to carry on its functions

and consequently what she secretes cannot then serve the purpose satisfactorily. The best thing for the mother to do would be to leave off suckling the child herself immediately, and entrust the task to a wet-nurse. If the services of a wet-nurse is not possible to be secured, then hand-feeding should be resorted to. In the event of securing the services of a wet-nurse to nurse the infant, it is desirable to see that her milk has commenced about the same time as the mother whose child is to be entrusted to her. Further her general health should be satisfactory.

If wet-nursing is to be resorted to from the birth of the infant, then the following points should be taken into consideration and acted upon. The wet-nurse chosen may be strong and healthy. Then her milk would be too rich for the delicate stomach of the infant during the first two or three days after its birth. The best thing to do then would be to feed it artificially for three days or so as has been suggested before on asses', cow's or goat's milk properly diluted with water. As goat's and cow's milk are comparatively deficient in sugar, a little of the same has to be added to the diluted milk. Sugar of milk may be used if available since it does not ferment like other sugars and hence is not so liable to turn acid in the stomach of the infant as the use of the other kinds of sugar may result in. The milk should not be rendered too sweet. It should be borne in mind that its addition is intended to form a compound resembling human milk and as such should be only such a quantity as to give a moderate *mawkish*

sweetness as it has been termed. A mother should know exactly how the human milk tastes. Guided by that, she should prepare the milk for feeding her infant. The temperature of the milk used should also be that of human milk sucked by the infant. A mother's milk is said to be slightly alkaline whereas a stall-fed cow's milk is often found to be slightly acid. As it is essential to remove the acidity from the milk before it is used to feed the infant, a few teaspoonfuls of lime water may be added to the milk. To prepare the lime water the following recipe is quoted. Place two quarters of pure cold water in a glazed earthen vessel and one ounce of quick lime. Cover and let it stand for three hours. Then pour off the clear liquid for use. The bottle in which it is kept should be provided with a stopper or be very well corked as access of air spoils lime water. For the same reason it should be made fresh every second or third day. Dose from one to three ounces several times daily with a child's food. This is useful in teething, diarrhoea, indigestion cholera and dysentery.

To find out whether the cow's milk is acid or not a litmus paper should be made use of. If the milk contains acid, then the blue litmus paper would turn red if put in it. If it does so, then the lime water obtained following the directions of the recipe quoted above should be added to the milk to get rid of the acidity. It may sometimes happen that the child vomits clotted matter. It may be due to the fact that the cow's milk on which it was fed was rich in a substance called caseine. To reduce it in the milk or in other words to make it less

rich in caseine, the milk should be exposed in a wide open vessel to a gentle heat. Then a film of caseine would form on the surface which may be removed with a spoon. It is also usual to let the cow's milk stand in a tall glass jar for two or three hours, and then dropping out the upper third to use the lower two thirds of the milk.

The motions of a child fed on cow's milk may happen to contain specks of white or undigested caseine. The addition of a little barley water to the milk would remedy this evil.

Milk of any animal if it is not quite fresh would be more or less sour due to the weather or to the vessel that may happen to be dirty. As it goes without saying that the milk on which an infant is fed should be quite fresh and pure, the vessels etc. made use of should be kept scrupulously clean. Every precaution should be taken to get pure water to dilute the milk with. It is always safe to filter the water and afterwards boil it. Water so treated and allowed to cool may be used with perfect safety when required.

If need be, the cool water may be heated to the proper degree before adding it to the milk to be used to feed the infant.

It is the practice in many families in India to feed the infant with a beaker like cup. Such a procedure may if possible be given up, since feeding from a bottle is an improvement upon the practice referred to, and it is also very convenient and advantageous from more

standpoints than one. The first and foremost advantage is that the risk of overfeeding the infant is avoided. Further, when the child is fed from a bottle, it has to suck even as it does when nursed at its mother's breasts. This act is natural and further it promotes the flow of saliva which when mixed with the food assists digestion. When choosing the feeding bottles, it is desirable to select the kind using which the child may not suck in air.

The next important point to be considered is the cry of the baby. Whenever a baby cries, the mother naturally concludes that it is hungry and proceeds to nurse it or feed it from a bottle. In point of fact, a baby may not at all be hungry when it cries and consequently feeding it then may prove injurious to its health. Various reasons may contribute to the cause of a baby's cry. It may cry because it has been in a particular position for a long time and consequently feels cramped. It may cry because of the uncomfortable pressure of the napkin, navel bandage or the unprotected point of a safety pin used. Too hot or too cold feeling may also make it cry. There are also other reasons for a baby crying, and consequently it is highly necessary to know for certain why it cries before attempting to pacify it. As a child may cry because of its hunger, it may be fed if it is the time when its nourishment is really due. There is an old saying in Tamil which when rendered into English becomes the saying, "The hunger of a baby is akin to the sharp sting of a scorpion." So a hungry child's wants should of

course be forthwith attended to. But if it cries because it wants its position changed, then it should be turned over on its other side. If it cries because the napkin or the cloth it lies upon is wet and dirty, then the same should be removed or replaced by a fresh one. Similarly the binder, the pins etc. may be examined to see that they do not make the infant cry. If the child is perspiring then the blanket it is covered with, should be removed. If the baby cries because it feels chilly, then it should be made warm and comfortable. At times a child may cry because the wind in the stomach does not come out freely. If such be the case, the child should be placed over the shoulder and its back should be gently rubbed. It may also be put upon its belly on the knee. The wind then may be brought out freely and the child may cease crying.

At times babies are liable to bring up sour-smelling milk or curd, due to want of digestion in the stomach. Then the digestive system should be given sufficient attention, and the best plan to do it would be not to give the baby any food at all for about half an hour or so, even though the feeding time may come. Nursing the baby a little may perhaps stop its crying, since the warm milk from the breast is soothing to the baby indeed. But as the digestion is at fault, no greater harm can be done to the baby than nursing it and thus giving more work to the stomach to do, instead of the rest it needs.

At times it may chance that a baby with no signs of wind, sickness, etc., cries frequently and takes to the

breast very eagerly, even though it may happen to be sufficiently nursed by the mother. The reason perhaps is not far to seek. The mother is able to provide the child with sufficient quantity of milk but the quality secreted is perhaps not satisfactory. The best thing for her to do then would be, to try to improve the quality of her milk by paying attention to the food she takes. A properly nourished baby should increase in weight day after day. If it does not do so, then there must be something wrong with the milk it is fed upon and consequently it needs looking into. The child may seem to be contented with the nursing it has and yet may not be growing in weight. The best criterion for judging whether a food is nourishing the infant satisfactorily or not is, the gain in its weight. If a child seem to be contented after sucking but with no increase in its subsequent weight, it may be desirable to give up nursing it at its mother's breast. A nursing mother should never take indigestible food. If she does so, her infant, as soon as it is is nursed, is likely to suffer from indigestion necessitating the use of medicine.

We have now to deal with the question of weaning; that is giving up the practice of nursing the infant at its mother's breasts. It has been pointed out, that the proper time to begin weaning in right earnest would be at the infant's ninth month. To go on nursing the baby at the breasts till it is a year or a year and a half old is bad both for the mother as well as for the child, and consequently the practice should be given up. As the replacing of the mother's milk by substitutes should proceed

gradually, the following procedure has been suggested. Eight or nine ounces of cow's milk may be diluted with about an ounce of boiled water. To this may be added about two teaspoonfuls of sugar of milk and the whole put in a feeding bottle and given to the baby to feed from. The number of times fed in this manner should be gradually increased giving up nursing at the breasts slowly. If a baby nine months old is to be weaned, it should be given two bottles, one in the morning, and one at midday in the beginning. A few days later it may be given a bottle in the evening too. By increasing the number of bottles, nursing at the breasts may be given up completely at the tenth month or so of the infant. Weaning would prove a troublesome task if the baby be not accustomed to feeding from the bottle. There have been instances in which a baby has also been weaned in a few days. It was handed over to some one else to be fed from bottles. Hunger made the infant take to the bottle of course after a good deal of resistance on its part.

Teething in children is the next thing to be dilated upon in this chapter. The date at which the first tooth is cut by infants varies in different cases. There have also been instances where children have been born with teeth, but such instances are rare and also exceptions. Some children do not cut their teeth until they are one year old. Illness in children may cause delay in the teething of the children. The chief cause for late dentition has been traced to rickets a very common disease in infants generally between the sixth and the

eighteenth month in which the nutrition of the whole body is impaired, bones soften and frequently become deformed permanently.

Generally children cut their teeth in the following order as detailed in the book, "Our Baby," by Mrs. J. Langton Hewer. "About the seventh, the two middle teeth in the lower jaw. A few weeks later, the two middle teeth in the upper jaw, these four being the central incisors. At eight months the lateral incisors top and bottom. At twelve months the four back teeth or molars. At sixteen months the four eye teeth. At twenty-four months, the other four molars. The above constitute the temporary or milk teeth. If not cut in the right order, a baby is said to cut its teeth 'cross'. Most healthy children cut their teeth with very little trouble, indeed the teeth are often through, before the mother is aware that anything is going on."

"When teething, the gum generally becomes swollen and hot and the child dribbles a great deal and puts its fingers in its mouth. Here it might be mentioned that without care, this constant dribbling may be a source of danger through the child's clothes becoming saturated and the consequent chilliness producing bronchitis. A jaconet bib should be worn beneath the ordinary one—jaconet being a thin cloth faced on one side with mackintosh. The child's hands should be frequently washed and if an ivory ring is given to bite, it must be cleansed with boiling water every day."

"Some children are said to cut their teeth with difficulty, getting an attack of eczema, bronchitis or diarrhoea with each tooth. It is however found that many of these troubles occur independently and are due to general reasons, the age being one of rapid growth and instability of the whole system."

"Sometimes, when cutting a tooth, the child will get very fractuous and restless, waking up many times during the night starting and screaming. A little bromide is often very useful in these cases. A warm bath also given as follows if often most soothing."

"Put water of temperature 105° into a bath of sufficient depth to reach to the child's waist when sitting down. Place a board or sheet over the bath for the child's toys and keep it in five minutes not allowing the hands or any part above the waist to be wetted. A little shawl should be fastened round the upper part to prevent chill. When taken out, the lower part of the child will be of a scarlet colour and it should be well rubbed and put to bed."

"Convulsions during teething are not very common and if they occur, it will generally be found they are really due to rickets. A hot bath and a dose of castor oil is the best treatment. * * * * * A slight diarrhoea may act as a safety valve during teething, but it should never be allowed to become at all severe or it will quickly weaken the child."

"How soon should a child's teeth be cleaned? As soon as it has any. The mouth washing with the

finger wrapped in linen dipped in boric lotion having been regularly carried out twice a day from birth, a soft tooth brush can be substituted as soon as the eight incisors are cut. A little good soap may be used occasionally."

"It is a great mistake not to carefully look after the milk teeth, as upon their welfare depends at any rate to some degree the welfare of the permanent set."

The next important point to be considered is the baby's sleep. It is absolutely impossible to determine the amount of sleep a baby should have. In general it may be said that a baby enjoying sound sleep is healthy and has been brought up in a satisfactory manner, whereas one that may happen to be sleepless is perhaps delicate and has been brought up rather badly. Just as in many other things, proper training is essential for a baby even with regard to sleep. Experience has shown, that a well brought up baby sleeps during the whole time unoccupied, at least for the first fourteen days or so after it is ushered into this world. Roughly speaking we may say that an infant sleeps about eighteen or nineteen hours a day during the fortnight or so after its birth. After about a month or so, it must be trained to be awake an hour or so previous to the time it generally goes to sleep. This would enable it to sleep more soundly during the night. The practice of rocking and pushing the baby to put it to sleep should be avoided. A baby two months after its birth would remain awake lying quietly in the cradle during the day many hours at intervals between sleep. It may

remain awake about an hour or so. This period of keeping awake would be going on increasing with the growth of the child. At the expiry of about six months or so, the baby should be made or rather trained to go to sleep at about 6 or 7 P. M. It may have to be disturbed from its sleep at about 10 o'clock at night for the purpose of feeding. Then it may be left to sleep till 6 A. M. in the morning. During the day time also, the child may be made to sleep both in the morning and in the afternoon for an hour or so on each occasion. It is however highly desirable that the child is not permitted to sleep after 4 P. M. or so in the evening so that it may enjoy undisturbed sleep during the night hours, after going to sleep by bed time. A year old baby may be trained to have sleep from about 7 o'clock in the evening till about the same hour in the morning. It may also have about two hours sleep at midday after eleven or twelve o'clock. After the age of two, till the age of five, a child should be encouraged to have an hour's sleep or so at midday. In general every little child should have sleep from evening till morning that is about twelve hours sleep. The fact that energy is recuperated by sleep should never be lost sight of. If the required amount of sleep is not given, then it is sure to weaken the child, instead of making it vigorous, strong and healthy.

The next important thing for a baby after the question of sleep is exercise. People may be under the impression that a baby having lessons in exercise is a novelty introduced in the subject of infant training. It is of course true that a baby's exercise is not what

school boys take under the guidance and supervision of the instructor. But it is having exercise all the same just as school boys and others. Every one has seen babies kicking out their legs and arms. Nothing delights them more than lying on their backs and kicking their limbs and stretching them. As these are exercises intended by nature for them to have to be healthy and strong, they should be allowed to have them freely without being interfered with or hindered.

A word or two about how to carry a baby will not be out of place here. In fact it would prove an invaluable advice for those who have not had any experience in handling young babies. Even experienced people may with advantage pay heed to what we are going to say. Mistakes generally—very bad mistakes too—are sometimes made in things quite ordinary and common. Though lifting and carrying a baby is a very common thing, yet many people do not consider the fact that great care and gentle handling are essential for its well being. An infant's spine is very soft and delicate. Though it may be straight at first, it can bend in any direction on account of pressure applied. So one should be very careful when handling a child. When carrying it, its back should always be well supported. Even grown up babies should not be made to be sitting for any length of time. As its backbone or the spinal column would not have become sufficiently strong to support the weight of its head and arms, and as the same would be tender, there is always the danger of its bending in the wrong direction and

thus making the child deformed perhaps even permanently. It is always safe to make an infant remain in its cradle kicking and stretching its limbs even when it is awake, as much time as possible, till it has grown sufficiently old.

Another point to be noticed is the baby's cry. A healthy growing child cannot remain quiet. It should be noisy to give sufficient exercise to its lungs. If a child happens to be always quiet, then we may conclude that it is not all right.

Toys give children great delight and contentment, and consequently children as soon as they are in a position to appreciate them may be given some select ones. At ten or eleven months old, a few toys left with a child will make it remain perfectly quiet and contented. When the child begins to crawl, very great care should be taken to see that the places it may crawl over are very clean. It is the habit of children to put the fingers into their mouths, and consequently a crawling child is likely to run the risk of getting disease due to microbes that may happen to breed in dirty rooms. To the above may be added the importance of pure air and ventilation for a growing baby to be strong and healthy.

The tendency of children to imitate their elders may be taken advantage of, to teach them cleanliness, tidiness and method, in addition to many other virtues. There is a Tamil proverb that what is learned in the cradle is not easy to be got rid of and it follows one to the grave. So parents and others responsible for the

training of children may either make or mar their good nature and good qualities. Habits good or bad once formed in children are not easily broken. So every attempt should be made to cultivate in them good habits and to nip in the bud any bad habit the baby may be getting into. This is best done by setting examples to them by elders by their own acts and habits.

As regards the normal progress of an ordinary child we may not be able to do better than quoting what is stated in the book 'Our Baby' by Mrs. J. Langton Hewer freely consulted in writing out this chapter on infant management. It is stated therein under the heading "Normal Progress" as noted hereunder.

"Roughly speaking, a normal child at 2 months, should take some notice of coloured balls and follow them with its eyes. Smile when pleased and coo to itself. At 4 months, it should be able to hold the head erect, know its mother—especially by her voice; show active signs of pleasure at toys or outdoor clothing; use the hands with more precision to grasp things within reach. At 6 months, it should begin independent investigations by sight, touch and taste; sit up; like to be sung to, and often begins to be shy of strangers. At 8 or 9 months, it should begin to imitate, use syllables such as mu, pa, ba, ta without any distinct meaning, but begin to associate words with things so that by twelve months it should indicate by signs many objects correctly, say a few words and understand many more. At 18 months, it should enjoy coloured pictures and use more

coupling several together. Should walk a little. At two years it should have a vocabulary of several hundred words and use simple phrases correctly."

Many of the illnesses a baby may be liable to have been touched upon in Chapter IV of this book. But a few of the most common drugs and their uses in cases of emergency may with advantage be described before closing this chapter.

Bicarbonate of soda :—This is a common substance available in almost every grocer's shop and drug vendors. But is it desirable to get it from a chemist to be sure of its purity. This drug is chiefly made use of as a stomachic powder for children. Two grains of sodium bicarbonate mixed with one grain of powdered rhubarb and a little sugar is often prescribed to relieve acidity in stomach and flatulence. If a child six months or so old suffers from an attack of wind in the stomach, about five grains of this drug dissolved in a teaspoonful of dill water mixed with two teaspoonfuls of warm water and administered, would often give relief. Pain resulting from scald or burn may be allayed by the immediate painting over with a strong solution of bicarbonate of soda. Children often pass scalding urine and feel very uncomfortable. Giving of this drug thrice a day as suggested above would prove beneficial.

Bromide of Potassium :—This drug may be given to children occasionally as a nerve sedative. Children that may happen to be nervous and excitable and who often cry out and talk in sleep may be given this drug with advantage. The dose recommended is

one grain for a baby one year old and two grains if it happens to be four years old or so. It is usual to give this drug mixed with salt, so that a child may not know that it is being given medicine. For constipation in children, the drug cascara is often prescribed in the form of syrup and administered regularly for a time it is said to act as a tonic for the intestines. It removes constipation accompanied by flatulence or wind. The dose for children is from 1 to 2 grains of dried extract, and half to one teaspoonful as a liquid extract. Calomel is a preparation of mercury and is generally given to children at bed time.

Castor oil :—This is considered to be an ideal purgative for infants and children. In the southern parts of India the very name given to this oil in Tamil, shows that it is regarded as the infant's friend. The dose for an infant about three months old is about fifteen drops. For a child two or three years old, a teaspoonful or more may be given. It has been said that castor oil can be prescribed as a remedy at the beginning of all sorts of disorders infants may be susceptible to. The laxative effect of castor oil is not produced in the stomach. Its effect begins only after it has passed into the intestines. This is the reason why bowels do not move until four or five hours even have passed, after the oil is taken.

Olive oil:—This too may be given to children in doses of a teaspoonful or so in place of castor oil.

Aromatic chalk :—This powder is given to children suffering from diarrhoea with acidity.

Glycerine :—A teaspoonful of this substance may be given mixed with some water to serve the purpose of a good aperient for children.

Thin children with poor appetites and delicate digestion can be given malt with or without codliver oil. They may be allowed to suck from the finger half a teaspoonful or so. The malt may be rubbed up with a little milk if need be. A year old child may be given a teaspoonful twice a day after food. Children are found to relish malt very much.

Anise is another drug having a carminative and pectoral property. It may be used in indigestion and flatulency. It forms an ingredient in the cough drops prepared and sold. The seeds are used for flatulence and bowel complaints in children and adults. The oil of this seed dropped on sugar ranging up to four or five drops is the best mode of administering this drug, which is also considered to be a good remedy for coughs. The infusion of the seeds may also be used.

Aperients are mild purgatives and a knowledge of the most common aperients for infants and children may be useful to those having infants and children under their care. The best aperient for an infant is found to be the following mixture. Rhubarb 5 grains; magnesia 3 grains; white sugar one scruple that is 20 grains. Manna (a concrete saccharine exudation sold in bazaars) 5 grains. These ingredients may be well mixed together and given to infants in doses varying from the size of a sweet pea to a piece of the size of an ordinary pea.

For an aperient for children the following preparation has been recommended. Infusion of senna (obtained by putting 2 drachms of the leaf in a quarter of a pint of boiling water and allowing it to remain for half an hour) one ounce. Mint water half an ounce; Calcined magnesia one scruple or 20 grains; manna three drachms, (even a solution of sugar will do) syrup of roses 2 drachms. These must be mixed and given in doses of one to two teaspoonfuls at a time. Castor oil which is also a very valuable and safe aperient for children is said to act speedily and clean the bowels effectually. The only disadvantage in its administering is that it has a disagreeable odour and often has to be disguised. There is a way described as the French way of giving castor oil to children and it is as noted below. "Pour the oil into a pan one or two table-spoonfuls and put the pan over a moderate fire. Break an egg into it and stir it up. When it is done add a little salt or sugar or some currant jelly prepared as follows (strip red or black currant fruit and stew them in a sauce pan of water placed over the fire. Strain off the liquid and to every pint of it add one pound of loaf sugar. This is then to be allowed to simmer and jelly on a plate. Then it may be removed to a small jar). Children generally eat it as an agreeable thing and do not discover the disguise."

The terrible disease whooping cough often attacks children, and hence some hints regarding treatment of this fell disease may be very useful to those looking after

children. When putting a child suffering from whooping-cough to bed, its feet should be thoroughly rubbed with hog's lard before the fire, and the child kept warm. If old rum can be had, the child's back may be rubbed with it. A spoonful of the juice of the herb penny-royal mixed with brown sugar-candy may be given twice daily.

Thrush is an affection very common and peculiar to young children during the period of teething and hence a few lines regarding the treatment of children suffering from it may not be out of place here. The disease is an affection of the mucous membrane of the mouth. Small white ulcers appear on the tongue, gums and around the mouth. In severe cases the ulcers may extend to the whole of the alimentary system from the mouth to the anus attended with flatulency, purging, etc. and may end fatally too. Sometimes the inside of the mouth becomes so raw and sore as to make it painful to take nourishment. Elderly people and persons with debilated constitutions are said to be liable to this disease. Stomach and bowels should be attended to. Emetics and gentle aperients are often found to be beneficial. Lime-water also is recommended to remove acidity from the stomach and bowels. A solution of burnt alum is useful to wash the affected parts. Even pulverised burnt alum may be applied.

Children and others are troubled by worms in the alimentary system. There are two kinds of worms, the

thread worm infesting the lower large intestines causing much itching and irritation about the anus. The long round worm is generally seated in the small intestines and the stomach. The symptoms denoting the existence of worms of any kind are indigestion, foul tongue, offensive breath, hard, full and tense belly with occasional griping, and pain about the navel, heat and itching sensation in the rectum and about the anus. Heavy dull eyes, itching of the nose, short dry cough, grinding of the teeth and starting during sleep. There may also be slow fever.

The first and foremost thing to do to get rid of the worms is to clear the stomach and the intestines of the redundant slime to destroy the disposition to their breeding. Emetics once or twice a week may get rid of the impurities like slime and morbific matter the cause of worms. The state of bowels should be attended to since they may not be satisfactory but be irregular on account of the worms. Bitter tonics are found to be of great service and may be continued for a week or two. Lime water dissolves mucus in which the worms breed. So it may be given to grown up people, a tea-cupful twice or thrice a day but to children, only properly regulated. Sweets should be avoided, since they are supposed to be the cause of worms. Salt and water taken in the morning will expel worms. Spirits camphor may be added to the tonic given.

Powdered rust of iron expels worms and strengthens the constitution. To a child six years old tenty to for

grains may be given in treacle to be followed by an aperient. A handful of rue and wormwood boiled in water and applied as a poultice to the belly often brings away worms from children who will take no internal medicine. The belly may also be fomented with the decoction of wormwood and rue.

These are some of the most useful hints for persons entrusted with the care of children.

CHAPTER IX.

REPRODUCTION AND SEXUAL PASSION.

It has been an established fact that an individual living body after constantly changing its substance and undergoing continual modifications ends in death. But the continuation of the kind is secured by the detachment of portions which run through the cycle of forms as the parent. The primary and fundamental form of life is said to be a unit called a protoplasmic cell. All higher forms of life are only aggregates of such cells variously modified. No cell can arise otherwise than by becoming separated from the protoplasm of a pre-existing cell. After it has arisen, every cell proceeds in the course of its development from a condition in which it closely resembles every other cell through a series of changes until it differentiates and becomes a special tissue. This fact applies to the development of the body as a whole also. However complicated the body of an animal may be now, it originally ought to have been a nucleated cell, that had begun its separate existence. That cell, following nature's law of fission became two, four, eight and so on and eventually developed into many by an aggregate of nucleated cells. Parts of this aggregate, obeying the different laws of growth and multiplication, gave rise to the rudiments of organs, which after development resulted in the formation of a perfect structure to wit the body of an animal.

Hence we may say that the complex organisms of animals are nothing but the development of cell aggregates repeating the principle of cell development. In this connection it may be mentioned that the activities of living matter depend upon moisture and a limited amount of heat. Every kind of living matter must have in its component constituents water in a more or less amount. It has been ascertained by experiments that drying living matter to a certain degree arrests all vitality in it and complete drying up of all moisture results in its death. But among many of the simpler forms of life, this drying up of moisture, though it may make them appear to be dead, does not annihilate life but only keeps it arrested till circumstances duly moisten them when they return to life again.

Turning our attention and confining it to living beings, we may say that they have of course a definite form and mode of structure, growth and development. They are in fact 'machines in action', and the actions themselves are called functions. These functions may be classed under three kinds, namely, (1) Generative (2) Sustenative and (3) Correlative. Of these three, only the first two are to be found in living beings. Even of these two, we are concerned now, only with the first namely the generative function of human beings.

We have already pointed out in Chapter III that organs are parts of the body of an animal that perform particular functions. In the progress from the lower to the higher organism, there is noticeable, a gradual

differentiation of organs and of their functions. In the lowest form of life, the mode of generation was by fission. A body divided itself into two or more parts and each part grew and assumed the size and form of the parent body. In some organisms, only a small portion of the substance is detached, and that developed into the likeness of the parent. Here we see that the development of the new being is without the influence of other living matter. This process is common in plants and certain lower animals but becomes rare among higher animals. Cells at the end of an amputated portion that were capable of reproducing the lost part disappear in higher animals. In them as in almost the whole series of living beings, the mode of generation in which the germ develops into an organism resembling the parent, depends on an influence exerted by living matter different from the germ. This mode is given the name of sexual reproduction, and the two germs referred to above may be called the male and female elements. How these elements influence each other for the reproduction of sexes is wholly unknown.

Leaving the question of reproduction in the vegetable kingdom alone, as foreign to the subject on hand, let us proceed to animal sexual reproduction. In the lowest forms of animal life, the reproductive organs grow and their product matures. The fecundation of the ovum takes place after their passive liberation. The fate of the embryo is left entirely to the circumstances of the environment. But in higher animals and even plants the process of maturation of reproductive organs be-

comes more complex. We can even say that this maturation has a more marked influence over the other function of the organism. The attraction of the sexes becomes distinct and an increasing definiteness is acquired. The reproductive maturity has a profound reaction upon the whole system and this is very marked in birds, animals and man.

The circulation in testes is greatly increased and they increase greatly in size and weight and begin to develop spermatozoa. What are called "secondary sexual characters" show in animals in the form of gay plumage for attracting the female, weapons for contesty with other males, and marked increase in strength and courage. The voice too may alter. In man the changes at puberty are the erection of the penis due to the distension of the seminal vesicles. Periodical expulsion of the seminal fluid during sleep may also take place. There will be growth of hair on the pubic region and later on on the lower part of the face. In the females, similar activity to what takes place in the testes may be said to take place within the ovary, the fundamental part of maturation in them. We have already spoken about the enlargement and escape of the ripe ova from graffian follicle known as ovulation. Further, the act of copulation and the union of the spermatozoa and the ova have also been dilated upon and the process of conception and the development of the infant in the womb have been fully explained in a previous chapter of this book. The spermatozoon and the ovum by their union result in the formation of an aggregate, out of which many aggregates of nucleated

cells develop and they eventually develop and grow into an infant. All these processes are devices of nature to preserve and propagate the species. But these do not give sexual pleasure to men and women and they are merely certain functions discharged as intended by nature. To make the males and females copulate, a sort of inducement is necessary, and this is had by the sexual pleasure of copulation. Let us take for example a sweet fruit like the mango fruit. The sweet pulp is intended by nature among other aims, to serve the purpose of bringing the fruit to a suitable place where the stone can germinate and grow into a plant. Men, monkeys and other creatures that feed on fruits, carry them away and drop the stones in different places where the environments may happen to be favourable for their growth after eating away the fleshy pulp. The pollen from flowers has to be brought into contact with the pistil of the female flowers to become a seed, and to serve this purpose flowers are given colours in addition to honey inside to attract and make use of insects for the purpose, and this has already been dilated upon. Similarly to make men and women copulate nature has arranged for the enjoyment of sexual pleasure by them using the special organs of sexual enjoyment. These organs are the *penis* in man and the *clitoris* in woman. The penis is formed largely of erectile tissue, and consequently it becomes erect and stiff when excited by sexual passion or tickling to enter into the vagina and discharge the semen there. The clitoris is to women what the penis is to men. It is often called the female organ of pleasure. It is described in Wilson's Anatomists Vade

Mecum as given below. ["Clitoris is a small elongated organ situated in front of the pubes and supported by a suspensory ligament. It is formed by a small body analogous to the corpus cavernosum penis and like it, is provided with two small muscles the *erectores clitoridis*. At the extremity of the clitoris is a small accumulation of erectile tissue which is highly sensitive and is termed the glans. The corpus cavernosum clitordis like that of the penis is composed of erectile tissue enclosed in a dense layer of fibrous membrane and is susceptible of erection."]

From the above quotation it would be seen that the male penis and the female clitoris are the organs of sexual pleasure. The tickling of the glans of these organs that are highly sensitive really causes the intense pleasure to males and females, and the natural mode of causing the tickling is by copulation when the ends or the glans coming into contact excite each other. But people both men and women have recourse to unnatural modes of tickling the glans and exciting the organs and suffer serious injury thereform. The glans of the two organs are so formed by nature that *they* only should tickle each other to cause the sexual pleasure in the highest possible form. Any other modes of tickling them cannot be compared to it, and further they are against nature and highly injurious to the persons resorting to them. We shall deal with this at length in the ensuing chapter on 'self-pollution and solitary vice'. The highly sensitive organs the clitoris and the penis, are often tickled by the highly sensitive portions of the

human body such as the tongue, the finger and so on. These are nasty habits and revolting to the highest degree and consequently should never be resorted to. If persisted in, they are sure to result in dangerous disease of the mouth. As nature has intended, only copulation and the tickling of the organs of pleasure clitoris and the penis by each other, should be indulged in moderately, by men and women, to be healthy and strong. Sexual passion is the strongest passion animals have to contend with. In animals other than men, the act approaches more or less the functional act. They cover and as soon as conception has taken place, the she animal is let alone. But men continue to cohabit with women even during many months of pregnancy. This clearly shows that the act of copulation is passional in men. It has been said that the instincts of lower animals are divine in origin, and as such may be taken as guides for human beings and their actions. It is almost clear, that all organs are intended by nature to be functional and therefore the generative organs too should be regarded as such. Here by generative organs it is intended to mean the organs of pleasure the clitoris and the penis. As soon as conception has taken place the generative function has been performed and so no sexual enjoyment should be indulged in if possible. We know that this principle is impossible to be followed by a very large number of people. Yet a fact is a fact and as such it deserves to be pressed on the notice of the people. Human beings should try as far as possible to indulge in sexual intercourse not for sexual pleasure but for

reproduction of species. When this fact has been grasped, then we may proceed to dilate upon what is best to do in connection with the same. After all men and women marry and lead a family life of ease and comfort and this may be said to be the *summum bonum* of conjugal happiness. The father delights to earn of the comforts of his children and the mother works hard for the same purpose. Herein lies conjugal happiness and not in exciting the organs of pleasure and enjoying the pleasant feeling of the tickling of their glans. But a family life cannot be one of happiness unless there is mental ease and physical health and comfort to one and all of its members. Therefore every attempt should be made to secure these by attending to hygienic and other laws of nature. Mind can make a heaven of hell and a hell of heaven, and so by its proper training and domestic economy, even the poorest family can secure and enjoy to its full, the conjugal happiness referred to above. If one member of a family is ill, it is bound to react upon every other member also, even as a limb affected, affect the whole body. If one member of a family is ill at ease, then there can be no mental ease for the others. This will be evinced from observing the faces of the members in a family where a dearly loved child may happen to be bedridden. As carelessness of one member may result in the discomfort of all the other members, every one should be careful to be healthy, strong and cheerful and try to influence others also in those directions.

A period of 100 years is said to be the maximum age of human beings. This is possible only for persons who follow very strictly the laws of nature hygienic, moral and so on. But violation of such laws is inevitable in a more or less degree, and consequently the ages of men and women too go on diminishing. Now-a-days, the average age of men and women may be taken roughly to be say 50 years. The sages of old had divided the period of human existence into four stages *viz.* Balyam (Infancy), Kaumaram (Youthhood), Yauvanam (adult age), and Jara (old age). Every tyro in the subject of the development of infants and children knows that the various organs evolved from the aggregate as rudiments as pointed out in the beginning of this chapter. Obeying the laws of growth, they grow and develop very rapidly. Parents and those responsible for the care of children should therefore pay great care and scrupulous attention to bring them up into strong and healthy children. If this be properly done, then children may be said to be launched into the second stage of their existence—the youthhood. This period is regarded as that of Bramhacharyam—a period or the period in which the youth learns and equips himself with knowledge to be useful to him in after-life. It has been laid down in the Hindu Dharma Shastras that the parents are responsible for the proper Upadesa or instruction of their children. If they are not in a position to do so, they might entrust them to a suitable teacher in whose house they may be allowed to remain and gain knowledge. As this practice is not in vogue in India now, the parents should see that

their boys and girls are given general, moral and physical instructions suitable for them to fight the battle of life. Then comes the period of adult age—Yauvanam—the most difficult and dangerous period to pass over. In this age, the youths are said to 'sigh like a furnace' since he attains sexual maturity. The potency of the sex is said to commence at the age of sixteen or seventeen and go on developing till the age of thirty or thirty-five. Then it begins to decline. In cold countries like England, the marriage of adults may be postponed to their twentieth or twenty-first year. It may also be consummated even later. But in our country, it is safest to get our boys and girls married a few years after the age of their maturity *viz.* at the age of eighteen or so in the case of boys and at the age of fifteen or sixteen or so in the case of girls, to minimise the danger of self-pollution. But there is no gainsaying the fact that the consummation of marriage a few years after the attainment of maturity would be for the benefit of the boys and girls if they would not fall into evil ways, since the proper development of the body and the sexual organs would surely result not only in their preserving the sexual potency and bodily strength for a longer time, but also in bringing forth strong and healthy children. At any rate young girls should not be made to bring forth children, in other words to become mothers prematurely as it is unfortunately the case in our land. Not only parents but also the husbands should bear this fact in mind. The former should try to postpone the consummation of the marriage of their daughters to the

age of sixteen or so and the husbands should keep their sexual passion under control for a few years more so that they may not by their premature copulation injure the bodily health of their wives. It has been the experience of many, that the sex passion may be kept down or rather ignored by keeping the body and the mind engaged in one or other of some useful and interesting work. If one finds that he is likely to be overpowered by the sex passion, he must try to avoid remaining alone and to avoid the danger of falling into evil ways. The same advice may be followed with advantage by the other sex also.

The attainment of maturity is characterised by certain definite symptoms both in boys and girls. We have already stated with reference to maturity in boys that not only circulation is greatly increased in the testes, but they also increase in size and weight to develop the male sperm. The growth of hair on the pubic region and on the lower part of the face has also been pointed out. In the case of females the development of the ovary has also been detailed upon. In addition to these it may be stated that boys after attaining maturity feel a sort of ardent attraction, kindness and sympathy for girls and women generally and towards girls who have attained maturity like themselves in particular. Their boyish tendencies and playfulness may be said to be replaced by a certain amount of the thoughtfulness. The very voice of boys is changed after they attain maturity and itis often said that it loses its original gentleness and becomes somewhat rough. Unless the girls who

have attained maturity happen to be their near relatives, they feel a sort of shyness and lack of freedom of speech with them. These are perhaps the characteristic changes in the behaviour of boys towards girls and girls also may be characterised by similar changes in their behaviour towards the boys.

The time at which greatest care should be taken of boys and girls is this period of their attaining maturity. Even great sages are said to have succumbed to this passion of sex and consequently rigid supervision on the part of guardians of boys and girls is highly necessary. Every attempt should be made by them, not to leave them alone lest they fall into evil ways. They should tactfully keep them from bad company and may do well to point out to them the evils of self-abuse if they are sure that they know about it and are likely to fall into it. Else talking about it may perhaps prove to be a source of information leading on to the abuse. It is the nature of human beings to be curious and try to experiment on prohibited things. They may at first try the experiment with the honest intention of making it the first and the last. But alas! it is most often the case that one experiment leads on to another and so on till at length the boys and girls addicted to this evil of self-abuse become not only moral wrecks, but also life-wearied and shortlived. Life appears to be not at all worth living for them. We shall have occasion to deal with this at length in the ensuing chapter, and so we now simply pass on with the advice, that boys and girls if they are ignorant of the vices of self abuse should never have their know-

ledge allowed to be expanded in this direction by tactless talk on the subject.

Passing out to the subject of matrimony, the author of this treatise knows of many persons who have actually studied several books written by several persons on the subject before seriously taking steps to be tied in wedlock to a woman. Marriage is not a trifling matter, and consequently needs mature consideration before one contracts it. But unfortunately in our land marriages are contracted before any thought at all is bestowed on the subject by the parties concerned in it namely the husband and the wife. Marriages are arranged for them by the elders. But this is not at all a desirable thing. In European countries, men and women do not marry unless until they have laid by, sufficient money to lead the family life or they have sufficient resources to do the same. But here in India it is not at all the case, and consequently there is a good deal of misery and pecuniary difficulties in many of the families. Among the lower classes, as both the husband and the wife earn and their children too most often when they are sufficiently old to do their might, there is not much difficulty felt by them. But among the middle classes, the women generally do not earn anything, and the responsibility of running the family falls on the shoulders of the husbands only. So, when a number of children are born to them, they curse the day when children were born to them, since they find it impossible to make both ends meet. As this book is not intended so much for the lower classes as for the educated middle and higher grades of society, the following points are

mainly intended for the guidance of the latter classes only. The middle class people may do well to marry only after looking to the means of running the family, and people responsible for their marriage must see that they have enough to meet the expenses at least moderately before bringing about their marriage. There is also another evil in our country and that is, marriage between boys and girls in different grades of society. At times a girl born and brought up in a rich family happens to be given in marriage to a boy belonging to a poor family. This results in the girl's missing the several comforts she was accustomed to in her parent's house, when she enters her husband's house. Further it is but natural that rich people would look down upon poorer people, and consequently proper respect is scarcely paid to poorer relatives by the richer and thus marriage between families of different grades in society often results in unhappiness to the newly wedded couple. So it is always desirable to secure matrimonial alliance in families of one's own grace in society.

The next point for consideration before contracting marriage is, health and freedom from sickness. In several families, wives are burdens to their husbands since they are always suffering from some chronic incurable diseases like consumption. At times, the husbands are veritable eyesores to their strong, beautiful and healthy wives if they happen to be suffering from chronic cancer, consumption or any other similar diseases. It happens most often, that certain men and women suffering from bad diseases happen to be rich.

As money can make many things, such sickly people secure as partners in life healthy and strong husbands or wives as the case may be. They discover when too late the folly of their act since they cannot have even an iota of conjugal happiness. Perhaps they may be said to have bargained for conjugal misery!

We have already pointed out on more occasions than one that the sex passion is a dangerous thing and often leads people into serious difficulties and troubles. Sickly people are not immune from such dangers and consequently bring forth children who curse the hour they were born when they grow up into lepers and consumptives of the worst type even, having inherited the disease from their parents. Madness in families is another serious thing to be taken into consideration when a man or a woman is about to contract a marriage. The fact that marriage and sexual intercourse are means to certain ends and one of which may be said to be the reproduction of strong and healthy children to adorn and to prove veritable blessings to society and the world at large, should never for a moment be lost sight of. Sickly men or sickly women have no right to marry and mar the happiness of their partners. The guardians of boys and girls if they fail to pay heed to this, and knowingly bring about the marriage of sickly boys or girls with healthy they [illegible] would become veritable sinners and be held responsible to God for their actions. As we have already pointed out, marriage should never be regarded as a pretext for the satisfaction of the animal sex passion. It should be regarded as a means of deriving mutual benefits and pleasures of different kinds between husbands

and wives and among them may be included the pleasure of sexual intercourse also if need be. But it should never be made to subserve the sole purpose of satisfying the animal passion, for it would then mean that the finer emotions and instincts are killed in such people. Even among the people belonging to the working classes, this tie of marriage serves not only the purpose of reproduction of the species, but also that of co-operation and mutual help in running the family. The husband works and the wife works, and the income derived from the work done by both serves the purpose of running the family. So when men and women of the working classes of society if they marry should see that their partners are suitable to serve the above purpose before they marry. Else their marriage may prove a failure. There are also families in our country where the husband earns to run the family while the wife looks after the household duties only and does not do any work to supplement the income of her husband. Here what is required is, a wife capable of running a family smoothly with the moderate income of her husband and looking after him and his comforts, when he returns home after his day's labour. If families happen to be tolerably well off and neither the husband nor the wife has to do any work, then the husbands and wives should have common inclinations and tastes between them; else they would find conjugal life boring them instead of proving a blessing. So men and women above need, should consider well before marrying, their tastes and inclinations, and select as partner in life only such men or women as have inclinations and tastes in common with them.

It is the custom to deal in books on sexual science about the ages of men and women desirous of linking themselves in matrimony. In European countries there is no restriction placed on marriages of men and women with regards to age. A woman of any age may marry a man even many years younger than herself. But in our land it is generally the custom for a man not to marry a woman older than himself. Broadly speaking, it is desirable that the ages of men and women who marry do not show very great difference. In India a man does not marry a woman older than himself as has been pointed out. So it may safely be stated that the marriage of a man may begin at the age of twenty, twenty-one and so on according to circumstances, with girls whose ages may range from sixteen or so onwards. But a man of forty years or so, marrying a girl about sixteen years in age, is not desirable. There should not be many years of difference between the ages of boys and girls united in marriage. An aged man say forty or forty-five years old in India, marrying a girl fourteen or fifteen years old is as a bad as a woman of forty or forty-five in European countries marrying a man about half her age. It has been stated that a man's as well as a woman's sexual virility reaches its highest point about their thirtieth year or so and begins to decline gradually. This fact may be taken as a guiding factor in linking men and women in matrimony. Then it will be seen how pernicious is the custom of marrying young girls to old men. When the woman's sexual virility was at its height, the husband was perhaps impotent or in his

grave. The same may be said to be the case when aged women marry young men as is being done in European countries. When the man's virility is at its height, the woman's might have diminished or entirely gone. The above statements apply only to men and women sexually inclined and not to those intellectually or otherwise inclined and of the same inclinations and temperaments. What we have set forth above is general and not particular. Conjugal happiness is quite possible between husbands and wifes of any age if they love each other and are contented and happy. So why should not old men and young wives and young men and old wives linked to one another by matrimony be happy and contented? It may be possible, but we can say that such cases are rather very rare.

Men writing on the evolution of human forms have said, that nature grafts or in other words bring into sexual union men and women of varying physical characteristics and temperaments, to people the world with new types of humanity. Our Hindu Sexual Science treatises also refer to types of men and women. A detailed description of them may not be of any practical use and consequently it is omitted. But the fact remains that there are different types of men and women in this world and that sexual union between selected males and females results not only in conjugal happiness, but also in the satisfactory reproduction of the human species. The union of certain types of men and women results in the reproduction of beautifully formed men and women. The fruits of union of certain men snd women are strong even as elephants and so on.

Great sexual scientists who have made the study of human beings and their characteristics, their life work, have laid down that man's love for his wife runs the risk of losing its stability whereas a woman's is stable always. So a man may do well to try to be more stable in his love to his wedded wife instead of being attracted by every passing woman. Men should try to kill in them the polygamous tendency or the desire to marry or copulate with many wives or women.

In the Hindu sexual treatises Brahmacharyam or celibacy is highly praised. But people go to the extent of saying that moderation in sexual intercourse is almost qual to Brahmacharyam. Nature has of course intended the various organs of men and women to perform their functions. But she intends the performance of the functions without exceeding certain bounds. Overloading the stomach often upsets digestion. Similarly over-exerting the sexual organs may result in injury to men and women indulging in it. Men and women newly beginning to taste the pleasures of sexual enjoyment may overdo the thing and shatter their health. To those people, this advice to be moderate would prove very beneficial. After all men and women are masters and their organs are their servants. So they should not allow the servants to overmaster them. If they but train the body to have sexual enjoyment only once or twice a week, there will be no difficulty at all felt. The wise have laid down the rule that men and women should have sexual intercourse only on Tuesdays and Fridays. On these days women are advised to have an oil bath in the

morning, so that the bodily heat may be moderated Men are advised to have oil bath on Saturdays and Wednesdays. Perhaps experience has shown them that these actions are conducive to the welfare of the couple. If people both husband and wife happen to be very strong and robust, they may be tempted to have sexual intercourse daily and at times even more than once in a single day. This is not good and therefore they too must try to be moderate and never exceed more than three intercourses in a week even if they cannot be satisfied with two on fixed days like Tuesdays and Fridays. Experience has taught men and women that excessive indulgence in sexual enjoyment leads people to premature old age and even premature death. It is also believed by some that the male sperm if it is not allowed to be wasted is absorbed by the system and then it proves highly valuable for leading a healthy, strong and long life. How far the statement is acceptable is left for science to decide. But there is no gainsaying the fact that a large quantity of blood is formed into a small quantity of sperm and consequently waste of sperm means waste of blood. As blood is life waste of blood means shortage of life period,

It is generally usual to give in treatises on sexual science some particulars regarding sterility in women and the birth of male or female child according to the nature of the semen secreted. To put the matter in brief, sterility may be due to the defect in the womb or the generative organs of females. Then proper treatment by a doctor who is a specialist may set the matter right. If sterility be not due to any defect in the womb

then it may be due to past karma and in such a case, certain religious observances are prescribed. People who have belief in them may take advantage of it and try. Circumambulating the aswatha tree (Ficus Religiosa) for a few days in the mornings for about an hour or so daily is said to cure sterility in women. The magnetism radiating from the tree may have special virtues, and consequently the experiment may be worth trying by sterile women. As regards the birth of either male child or the female child, it has been stated after making experiments on animals, that the sperm generated from the left testicles or the right testicles, the ovum from the right ovary or the left ovary from the right ovary or the left ovary, has much to do in determining the sex of the children to be born. It has been said that if the sperm secreted by the right testicle goes to fructify the ovum from the right ovary then the resultant infant would be a male one and that if the sperm secreted by the left testicle goes to fructify the germ secreted by left ovary, then the child developed will be a female one. In coition, at the time when the semen is discharged, the testicle from which the sperm is to be introduced into the woman's reproductive organ rises, and consequently people noting this may know (if conception has taken place by that union) whether the child developing in the woman's reproductive organ rises, and consequently people noting this may know (if conception has taken place by that union) whether the child developing in the womb is male or female. It is also suggested that a man by lifting this or that testicle at the time of coition can discharge into the woman's reproductive system either male-infant-developing sperm or female-infant-

developing sperm, and thereby beget either male or female child for him. It has been ascertained by experiments that conception is not possible by the union of the sperm from the right or the left testicle with the germ form the left or the right ovary respectively. Only the sperm from the right testicle can fructify the germ form the right ovary, and only the sperm from the left testicle can fructify the germ from the left ovary. Therefore as the sperm introduced may be controlled by man by lifting this or that testicle, he can persist in doing it either from his right testicle or from the left, till conception takes place and thus beget either a male infant or a female infant as he pleases.

In our country nay in many of the other countries too many people both male and female desire to have coition, but they do not want conception to take place for various reasons, the most important and common of which is inability to support a big family. Various means are resorted to for the purpose. Some take medicines that are veritable poisons and injure themselves. Some have recourse to Malthusian appliances, particulars of which will appear in the ensuing chapter on 'Self-Pollution and Solitary Vice.' Many do not allow the sperm to be discharged into the woman's generative organs by the timely withdrawal of the penis and the discharge of the seminal fluid outside. But the practice considered to be the safest and the best though bad in principle is not to have coition about a week, before or after the period of menstruation of the woman.

CHAPTER X.

SELF-POLLUTION AND SOLITARY VICE

It has been stated that nature when creating men and women and male animals and female animals, created the sex passion as the strongest of animal passions almost absolutely impossible to control. Even sages of marvellous will power and self-control have fallen victims to this passion, will be seen from the episode of the sage Viswamitra whose penance was put a stop to by the passion roused in him by the celestial damsel Menaka. Therefore it is no wonder that our boys and girls are greatly influenced by it as soon as the sex instinct commences in them. Grown up men and women who passed this critical stage of growth of human beings should have their attention drawn to the fact that youngsters should be warned by them by all possible ways and means, of the dangers that are sure to arise, when they reach this particular stage. For their guidance as well as for the guidance of young boys and girls this chapter is particularly intended, recording the sufferings of many youths and maidens, resulting from their having allowed themselves to be carried away by the sex passion into evil ways. As the sex instinct commences at a more early agein girls than in boys,

attention should be paid to the former sooner than to the latter. Prevention is better than cure, and consequently it is highly essential to prevent youngsters from falling into evil ways rather than paying heavy doctor's bills subsequently. So parents and guardians should by tactfully taking the opportunity by the top, grapple with this danger of their wards coming to grief by being allowed to be overpowered and dragged into the habit of self-abuse and solitary vice. It has been ascertained and recorded that the victims to this awful habit have been many. Thousands are laid in early graves every year because of self-abuse and solitary vice they are led into, by want of timely warning and shielding by those responsible for their welfare. Boys and girls form bad habits by associating with bad companions, and therefore at this stage especially, they should be allowed to keep only good company and avoid the bad ones. Of the commonest evil our boys are liable to is that arising from the practice of masturbation—an act in which the male organ of the penis is excited by unnatural method and the seminal fluid is, thereby brought out. From our description of generative organs elsewhere in this book it will be seen that the penis consists not of flesh but of elastic seminal vesicles and glans. These are injured if roughly handled. But boys addicted to the habit of masturbation, are carried away for the nonce by the fierce sex passion. For the time being they cease to be masters of themselves. Bent upon bringing the seminal fluid out forcibly and by unnatural means, they injure their generative organs most seriously. But the evil does not stop with this. Exces-

sive use or rather abuse of the organ renders the erectile tissue powerless and weak and the man becomes impotent in a short time and may even lose all vitality, memory, eyesight and what not, and thereby feels life one of intense misery and not of joy, as nature has intended it to be. The excessive practice of masturbation results in the semen coming out very easily. Every drop of it is said to be obtained from about eighty drops or so of pure blood and consequently, with the loss of one drop of it, he loses from his life blood about eighty times of that quantity. It is therefore no wonder that he grows weaker and weaker and eventually sinks into premature grave. The first and foremost thing to be done with regard to a youth addicted to this evil practice is, not to allow him to remain alone. Every attempt should be made to make it impossible for him to repeat the practice.

Spermatorrhoea is said to be a common ailment that results from long continued masturbation. The term spermatorrhoea literally means a running away of the spermatic fluid and the disease is said to cause acute mental distress in the patient. What is said in the Family Encyclopaedia of Medicine about this ailment may with advantage be quoted here. There it is laid down as follows:—"The patient is always greatly worried by his symptoms and usually looks forward with certainty to early approaching impotence. He greatly increases the physical depression and general debility resultant on the undue drain on his system by constantly dwelling on his symptoms. Too often, he foolishly

delays consulting his own doctor on account of a feeling of false modesty and allows himself to get into the hands of unscrupulous quacks. These, in order to make certain of their victim once they get him in their toils, exaggerate the importance of the condition, threatening that unless he carries out their treatment (which of course is an expensive one) all sorts of dire results including complete impotence, will surely follow."

"When the patient, now a complete nervous wreck, has spent all his money on expensive appliances guaranteed on account of the "radium" or "electricity" they contain, to give him back his lost youth and manhood," he finally finds his way to a reputable physician, only to learn that in the great majority of cases, spermatorrhoea unless too far advanced, is readily cured at home."

Under the heading 'treatment,' the same book says: "The first step in treatment is to determine the cause of the condition and to remove it if possible. Any habits of artificially inducing sexual excitement must be vigorously avoided. Any local condition such as inflammation of the inner surface of the foreskin and the underlying parts and the extension of the foreskin beyond the end of the penis, etc. should be seen to, by the surgeon. If the patient is of constipated habit, he should overcome this by following out treatment along the lines laid down for constipation or costiveness under (1) Preventive treatment and (2) Active treatment. The preventive treatment is as follows:—'The habit of

going to the closet and making a serious attempt, at least, to have the bowels moved directly after breakfast regularly every morning is the best preventive of and against constipation. Nothing should be important enough to cause the postponement of this essential duty. If in addition to this unalterable habit, one eats a moderate amount of an ordinary mixed dietary with some fruit at breakfast, takes a moderate amount of outdoor exercise, and drinks at least two pints of water between meals, there is little danger of developing a constipated habit.'"

Under active treatment, it is laid down as follows:—

"If constipation is already a habit, the first step in treatment is to look for the presence of one or more of the general causes such as—(1) Hereditary disposition to constipation, (2) Sedantary habits particularly in people who "do themselves well" and eat largely of rich meaty foods, (3) Chronic diseases such as anaemia, diabetes, chronic liver affections and (4) Improper dieting, and remove it. Try taking more outdoor exercise, cutting down any excess of food if a heavy eater or eating more if a very light eater. If any disease such as anaemia or diabetes is present, treatment for the same should be sought at once."

"The diet should include plenty of green vegetables. Sodium sulphate, phosphate of soda, sulphate of magnesia, and castor oil may be used in chronic or habitual constipation, and these are the least harmful of the common aperients."

The patient should thoroughly overhaul his habits of life and map out a new way of living which will throw the least possible strain on his already overwrought system. If his daily pursuits are of a nerve-racking variety necessitating constant tense brain work and a sedentary life, he would do well to exchange all this for a more leisurely and placid outdoor existence. Above all things, he should make a point of keeping his mind pleasantly occupied, and refrain from introspection and unnecessary dwelling on his symptoms."

"He should keep to an abundant nourishing and readily digestible diet avoiding all highly spiced foods, mustard, red pepper, etc. and alcoholic beverages of all kinds. His last meal at night should be a very light one, so that he avoids going to bed with undigested food in the stomach. His bed-room should be large and particularly well ventilated. He should sleep on a rather hard flat mattress and train himself to sleep on his side. He should use just sufficient bed-clothes to keep him from being cold."

"If his circulation is sufficiently robust to permit it—that is if he 'reacts' sufficiently after it—a cold bath each morning often has a bracing invigorating effect. Medicines as a rule are unnecessary, though in some cases the physician may see fit to prescribe some sedative such as fifteen grains of a mixture of equal parts of the bromide of potassium and the bromide of sodium in a little milk at bed time."

"If a speedy cure is to be effected, the patient should constantly bear in mind two points:—(1) That his condition is a not uncommon one and is usually readily curable. (2) That it is largely the result or excessive use or abuse of a function which nature meant to be used *only in moderation*. Recuperative rest, obtained during several months, complete avoidance of all forms of sexual excitement natural or otherwise, is therefore an essential of any treatment if it is to be successful."

A perusal of the above quotation would clearly show, that a lad addicted to the evil habit of masturbation has his nervous system shattered and wrecked, and it would take a pretty long time if not already too late to recuperate his lost vitality. The semen is considered by many to be more valuable for human vitality than muscles, sinews, etc. that go to build the body. Every tyro in the science of physiology knows that the food a man takes is converted into blood. This blood furnishes an essence of one drop out of every eighty drops or so and this essence is the semen. It is said that the principle composing the semen is separated in the cerebellum of the brain and passes from there through two pinial vessels behind the ear and passes into the minute tubes of the testicles. There it undergoes modifications even as the blood does in the woman's breast to form milk and becomes the semen, increased loss of which is akin to increased loss of vitality. Several causes may contribute to the wastage of the seminal fluid in addition to masturbation. Those causes are said to be (1) Celibacy (2) Excessive sexual intercourse (3) Excessive brain wok

and so on. These are points outside the subject we are dealing with and therefore we have simply pointed out the fact so that the evil may be remedied if need be. What has been said by a lady in the United States of America deserves to be pondered over. She has stated that her husband was addicted to the vice of self-pollution, the long continued practice of which deprived him of his manly powers. Deprived of the possibility of getting children of her own she had to adopt children. The first son adopted was also addicted to the vice and so were the two others adopted by her subsequently. She learnt that her first adopted son when approached with a view to get him married at the age of about twenty-two, was addicted to this vice of self-abuse. She also learnt thet her other adopted sons at the ages of eighteen and sixteen were already overmastered by the evil practice. The lady concludes her statement by adding that there are perhaps innumerable cases like the one given out by her, with a view to be utilised as a warning to unwary youths. From this as well as from many other instances of boys and girls whose valuable lives have said to be rendered miserable nay completely wrecked, it will be clear that timely warning and proper control and guidance are absolutely necessary to save the youths and maidens of every country from the danger of this monster vice 'self-pollution.' There is also another danger that may threaten the youngsters of our land. They may perhaps save themselves from the vice of masturbation, but if unmarried may be dragged into the snares of loose women most of whom are surely

unhealthy nay are perhaps suffering from dangerous venereal diseases that are highly contagious. Carried away by the sex passion, the youths go to the dens of these harlots and return home after having contracted one or other of the venereal diseases. As gonorrhoea is the most common of these loathsome diseases contracted by men and women, a brief description of the same as well as those of the others akin to it with suggestions for timely treatment may not be out of place in this chapter on self-pollution. As these diseases are most beautifully dealt with in the treatises, Indian Domestic Medicine by Mr Moore and the Family Encyclopaedia of Medicine, we may as well quote or furnish extracts from them for the benefit of the readers of this volume. In the family Encyclopaedia of Medicine it is stated as follows :—

"Under the heading, 'venereal diseases' are usually grouped the two great constitutional diseases, syphilis and gonorrhoea and the much less important chancroid or soft chancre as well as venereal warts. The most common seat of the disease gonorrhoea in women as in men is the urinary passage or urethra. From this region it may extend up to the neck of the womb, thence into the body of the womb, and from there it may pass outwards along the fallopian tubes. These tubes are connected to the womb at their lower ends, but the upper ends are free and open into the peritoneal cavity. The germ may therefore occasionally pass into this cavity, producing localised peritonitis or the inflammation of the peritoneum or the serous membrane lining it. Sometimes it affects the ovaries which are separated

from but closer the fallopian tubes. The consequence of gonorrhoea in a woman may be very serious. As a matter of fact a large percentage of the cases of inflammation of the fallopian tubes are due to gonorrhoea. The tubes may become closed by the inflammatory processes preventing the ova from travelling down to the womb, thus resulting in sterility. It is computed that about one-third of the cases of sterility in women is the consequence of gonorrhoea. The vulva or the parts around the external opening of the vagina frequently become involved in the gonorrhoeal inflammation. The vagina may also become affected. The causes for the chronic gonorrhoea in the male evidenced by a very light discharge from the urethra may set up an acute attack in a woman. Sometimes but very rarely gonorrhoea may be contracted from the use of infected sponges, towels or clothing. Babies may become infected from the mother during birth. When an infant born of an infected mother suffers from gonorrhoeal conjunctivitis or inflammation of the transparent membrane which covers the white of the eye and lines the eyelids, the infection may be carried on the fingers from the eyes to the genitals of the child."

"The symptoms of gonorrhoea in women depend on part or parts affected. As a rule the disease begins in the urinary passage. Then it is called *urethritis*. The symptoms of urethritis resemble those present in the male sex, but they usually are not so severe and do not last so long. Some three or four days (in some cases only a few hours, in others eight or ten days) after infection, tingling smarting sensations are felt when

passing urine. The opening of the urinary passage is swollen and a purulent discharge comes from it. The discharge may not at first be noticed unless it is pressed out. In the very slight attacks, these symptoms may disappear in a few days. Otherwise the discharge increases, the urine is passed frequently and with considerable pain and the external parts become swollen and inflamed. This latter condition is called *vulvitis*. The discharge is now profuse and foul. As it trickles down, it irritates the skin and may cause painful inflammation on the inner sides of the thighs. Walking or any movement of the legs causes much pain. The glands in the groin may swell."

"With proper treatment a cure may usually be effected without further extension of the disease, but in neglected cases, the disease extends inwards."

If the inflammation of the womb is brought about, then the symptom goes by the name *Metritis*. The disease may be confined to the neck of the womb or may involve the whole of the membrane lining of the uterus. Then the development is very serious. Once the disease is allowed to reach the neck of the womb, it is difficult to cure. It may remain in a chronic form for years and the victim as a rule is *sterile*.

Experience has shown that the above-described gonorrhoea or the inflammation of the lining membrane of the urinary passage arising from contagion either in the male or in the female, commences usually on the third day after exposure to contagion. Itching and redness of the urinary passage accompanied by a thin

which discharge are the first symptoms. In two or three days there is swelling of the private parts. There is also felt a severe scalding pain in making water and a copious discharge of thick yellowish-coloured matter. The groins, thighs and testicles ache and feel tender, and there is often particularly during the night partial hardness of the penis known as *chordee*. The duration of simple gonorrhoea is from ten to twenty days.

"Gonorrhoea frequently causes one or other of the following affections. First, the inflammation may extend to the testicle which swells and becomes painful, the discharges from the penis generally stop and there is a dragging sensation in the groin. Secondly, the bladder may become inflamed. Thirdly, bubo may form. Fourthly, the foreskin may be drawn from the end of the penis where it remains and cannot be returned. Fifthly inflammation of the end of the penis called balanites may occur. Sixthly gonorrhoeal warts may grow. Gleet may remain and ultimately cause *stricture*."

"If gonorrhoea in the male be detected at the first, when only a little itching or watery discharge is present it may be often cut short by injecting once every four hours a solution of nitrate of silver of the strength of 2 grains to 8 ounces of water. This should be repeated six or eight times, desisting however sooner if the discharge is in the least bloody, or if pain is excited. The patient should take a gentle aperient and avoid fermented liquors, spiced dishes and coffee. After the aperient he should also take one drop of tincture of nux vomica

every hour in a teaspoonful of water. He should also lie down as much as possible and the private part should be enveloped in a rag kept wet in a solution formed of one drachm of acetate of lead, one ounce of rectified spirits of wine and twelve ounces of distilled water. As soon as the patient is free from febrile or feverish symptoms in four or five days, he should take copaiba. Some may find the taste of copaiba too objectionable. Then they may take instead the following mixture. Infusion of cubebs (made by infusing 1½ ounce of bruised cubebs in 12 ounces of water) 12 ounces. Iodide of potassium 1¼ drachms. The dose is 2 table-spoonfuls thrice a day. The bowels should be kept freely open and if *chordee* occurs, the part should be immersed in cold water and thirty drops of spirits of camphor may be taken in water. The part should be well supported and not allowed to hang down."

The following information under the heading Syphilis may be found useful. "This disease is the consequence of contagion, and may appear at any time up to a month after exposure. It first shows on some part of the genitals in the shape of a small red pimple or crack, which about the fourth day becomes a watery vesicle with an inflamed base. Then a little matter forms, and discharging leaves an open sore or ulcer with a hard margin, elevated edges and depressed centre. In other cases, the parts are less hard and elevated and the sore more resembles an ordinary ulcer from other causes. This softer kind of sore comes on sooner after infection than the hard one, usually appearing within fifty hours after exposure. About fifteen to thirty days after the

commencement of the sore or after the sore has healed there may be swelling or tenderness of the glands in the groin, eventually forming a tumour about the size of an egg or in some cases as large as an orange called *bubo*. This is extremely painful and tender. If this swelling occurs, it may either subside or proceed to the formation of matter which then points like an ordinary abscess. The bubo is most likely to subside if it follows the harder description of sore, and most likely to form into an abscess if it occurs after the softer description. The sore on the privates and the swelling in the groins complete the symptoms of primary syphilis. Secondary symptoms of syphilis may, having remained dormant, occur in a person tainted with it after excellent health for a series of years even. Women may also miscarry as a result of syphilic poison in the system. If a sore occurs, the parts should be kept perfectly clean, alum solution or carbolic solution should be applied. Alum solution is obtained by dissolving twenty grains of powdered alum in eight ounces of distilled water. Similarly carbolic lotion is obtained by mixing ten grains of acid and one ounce of water. The patient should be kept as quiet as possible and given aperient medicines. If the sore is not true syphilic chancre, it will get well and if it is, the best method under the circumstances will have been pursued. If the pimple on the genitals is observed before it becomes a sore or chancre, it will be advisable to destroy it by the careful but thorough application of nitrate of silver. The best remedy for secondary symptoms is iodide of potassium in five or eight grain doses."

The Family Encyclopædia of Medicine states under Venereal Warts as noted hereunder. "Venereal Warts are reddish or pink small pointed growths, found most frequently in regions where the skin gives way to a mucous surface as for example on the labia, penis, arms, mouth, etc. Venereal Warts which are very contagious grow rapidly, sometimes attaining a large size. When occurring on private parts, there is usually a certain amount of offensive smelling secretion given off. The presence of one wart is very likely to lead to the development of others. The cause is always a germ which has been brought into contact with the part in a discharge from an infected person. Venereal Warts are the common accompaniment of gonorrhœa and chancre. The treatment for this disease consists in keeping the region on which they appear carefully cleansed with soap and water, after which the warts should be thoroughly dried by sprinkling on a dusting powder made up of equal parts of zinc oxide and starch."

The above particulars regarding the common venereal diseases have been furnished since persons desisting from solitary vice may be dragged into the evil of having sexual intercourse with others suffering from those diseases and thus ruin themselves.

In this connection we may mention the fact that men of the medical profession like Colonel W. G. Pridmore, C.M.G., I.M.S., Mr. Le Gros Clark, late President of the Royal College of Surgeons, Sir James Paget, Sir Andrew Clarke and several others of great experience have deplored the physical consequences of the 'sweet-

ness of stolen waters'—a term applied to unlawful intercourse with women perhaps at the risk of infection of one or other of the virulent venereal diseases. Colonel W. G. Pridmore referred to above says that he deals with this subject of 'Physical consequences' though he knew that there were people who cried down any dealings with the subject at meetings or on paper and called it indecent and so on. He is also of opinion that the private lives of those objectors may not bear looking into. The reason given by him for publishing a booklet on the subject is that he has the welfare of men in all parts of India and Burma at heart and consequently hopes to help them through it in spite of the fact that silence on the subject would be the easier course and that men generally recoil when an address on the subject is suggested to them. Having made up his mind to deal with the subject he says that unlawful intercourse carries with it the risk of excess besides the risk of infection, since human tendency is to be attracted by that which is forbidden, and to esteem lightly that which is lawful. The physical consequences of such excesses, he adds, are weakness and premature decay both bodily and mental. Before continuing the subject further we shall give a few extracts and advices from the booklet on physical consequences by the Colonel W. G. Pridmore embodying cases that had come under his direct notice. He says "the subject of specific infection in its various phases is so revolting that I shrink from referring to it. Most diseases limit themselves to special organs of the body, but this invades them all. The bones, skin, senses and brain itself are included in its deadly grasp.

Often as loathsome as the lepers we pass by, their self-inflicted suffering makes life a burden to the tainted, and like the leprosy of old, renders them objects of pity and disgust to those around them.

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"A Sergeant I was acquainted with was about 40 years of age, a married man with one child. In early manhood, he had contracted this disease in England and thinking himself cured had married. For a time all went well, but after a while the disease broke out again in a more aggravated form. His nose and throat were attacked and so loathsome was his appearance and so foul the smell that it was necessary to put him apart. Men told off to look after him ran away leaving him to his fate. With great difficulty the man's food was arranged to be carried to him."

* * * * *

"To gratify carnal impulses men do violence to their moral instincts and run personal risks of perhaps lifelong duration. But this is nothing when compared with the domestic misery which is hidden from the world but unfolded to the medical men. They know why children are born but to die or still worse to survive with shattered constitution, to be a lasting reproach to their fathers and to become themselves parents of a degenerate race."

* * * * *

"An eminent physician with whom I am acquainted was called one day to see the baby of a gentleman. The child was suffering from an affection of the brain. The

ctor tried many remedies without benefit. This and e nature of the symptoms made him suspect that the disease was inherited from one of the parents.....At the interview with the father, the doctor from certain signs with which this disease had branded the father, recognised that his suspicions were correct.....When the father heard that his child bore the same trait as himself, he said with tears in his eyes, that his worst fears had been realised."

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"To incur the risk of physical contamination is not only a personal sin, it is a social nay a national sin, in view of its possible consequences."

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"There are two important hindrances to chastity frequently suggested as apologies. The first is the supposition that the sexual passion must be indulged in, because it has been given to man, and sexual abstinence is an impossibility. As regards this we may say, that sexual passion which is a natural endowment must not be confused with unlawful encouragement or gratification which alone is sinful. Complete abstinence from sexual indulgence is not only possible and advisable for an unmarried man but it is also the only safe course. The first thing a man has to do is to admit that indulgence of the vice is wrong. Having done this, he will find if he take the proper steps that to abstain from it is not impossible. To the man who thinks lewd thoughts until his mind is full of them, who reads lewd stories, who gloats over lewd pictures it *is* impossible. But he who

desires to be saved from his sin and the suffering following it and is prepared to "play the man" and be master of his thoughts and himself, cannot complain that it is a hopeless task."

"The second hindrance to chastity has been suggested by some who allege that sexual intercourse for man is essential for the preservation of health. This assertion is absolutely false. It is absurd to think that what is morally wrong can be physically right."

* * * * *

"The passion may be strong and the craving imperious, but this proves rather the slavery of the individual than the necessity of a body which is kept in subjection."

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"Entire sexual abstinence is a condition of a race horse enjoying all his powers and therefore its health in perfection. * * * * Greek athletes of old abstained from all sexual indulgence on principle, when training for a race or feat requiring strength and endurance. Therefore it is clear that sexual indulgence is not essential to bodily health."

* * * * *

"If from any cause the work of certain organs like the salivary glands, liver, etc., is stopped for any length of time, the result is derangement of health. But organs like the reproductive organs may have only occasional activity, even as the female breast which yields milk only when needed and when the requirement ceases, its function is suspended."

"This subject or sin has also a social bearing. When you are tempted to this sin think of the other one concerned in it. If she be already fallen, do not be the one to further soil her soul, and place one more barrier in the way of her return to virtue and happiness. Think of her mother whose heart in some distant home is perhaps breaking because of her child's fall! Think of the agony which would fill your own mother's heart if one of her daughters were similarly placed."

* * * * *

A woman's nature is finer, more acute, more susceptible than a man's. The loss of her virtue works more havoc with her mentally and socially than it does with man, and it is often the first sad fall which produces that despair and recklessness which is so piteous. So do not become the one instrumental for the evil."

* * * * *

"Constant occupation is sure to help one to lead a steady life. Satan finds some mischief still for idle hands to do. Work and exercise keep the body healthy. Wholesome reading, recreation and amusement should leave the mind no idle time or inclination for brooding over impure thoughts."

* * * * *

"Unhealthy excitement, such as coarse talk, indecent pictures and books, and above all doubtful companions should be avoided. If you do find yourself face to face with temptation, get away from it as quickly as possible. Instant flight is your best chance. If obliged to stay where you must hear or see foul things, set a strict

guard over your senses till you can get away. Don't look, don't listen, keep silence and don't laugh."

* * * * *

"Don't consult quacks and doctors who advertise. They are generally impostors and may grossly mislead any one who consults them. If you are anxious about your health and want treatment, go to a well known doctor who does not advertise. He will always give you good and kind advice if you treat him with confidence and tell the truth about your case."

* * * * * *

"Never do or say anything which you would be ashamed to do or say before your mother or your sister."

They may, both boys and girls, men and women, take timely warning from what has been detailed above. The parents and guardians of boys and girls may also read this chapter with advantage. Even a cursory reading would surely be an eye-opener to those. Most of them are unaware of the fact that the critical stage in the growth and development of boys and girls is most difficult and dangerous to pass over, and hence it needs all their care and attention to save their wards from ruin. There are two evils the boys and girls are liable to and they are onanism or masturbation in boys and self-abuse or the tickling of the clitoris by unnatural ways in the case of girls and indiscriminate sexual intercourse perhaps in excess of both. Therefore the best thing to do is to keep a careful watch over boys and girls when they

approach their period of maturity and thus not allow them opportunity to fall into the evil ways. The boys and girls themselves may be advised not to remain single but always to remain in company. Further the mind constantly engaged in some useful work or other, the sex passion will be deprived of the opportunity of influencing the boys and girls. Unfortunately there are books everywhere reading which boys and girls get their minds filled with bad thoughts. These thoughts are surely very bad and dangerous companions and consequently every attempt should be made to prevent boys and girls from getting at bad books and going through them. Boys and girls may freely ask their parents and guardians to get them married at the earliest suitable opportunity if they find that they are unable to resist the sex passion stirred in them. Parents and guardians too should take note of the fact that suitable marriage arrangements at the proper time for the boys and girls under their charge are of absolute necessity for their well being. They should therefore not delay the performance of this most important duty to their sons or daughters or wards as the case may be.

CHAPTER XI.

ALCOHOL AND ITS EVILS

A Chapter on Alcohol and its Evils would surely be a most appropriate and useful one after the chapter on self-pollution and wreckless satisfaction of sex-passion by men and women. It has often been said that men are ruined by coming under the influence of either loose women or strong alcoholic drinks. Some people even go to the extent of placing these two together and say 'women and wine.' It is a common belief that one addicted to drink would generally resort to the company of women who sell themselves and their virtue for money. So without any further preamble we shall proceed to the subject on hand. Many people do not know what alcohol is and therefore they should be told about it. It is that ingredient in all strong drinks as the different kinds of malt liquors like beer, ale, stout porter etc., wines and spirits *that is hurtful.* The malt liquors are obtained from malt which is chiefly prepared from barley grains. These grains are left steeped in water for about two days. Then they are placed in heaps on the floor for a day, so that they may begin to grow. Then they are spread out and turned over two or three times a day to prevent their sprouting. Then they are dried in kilns and turned about to break the sprouts to be separated later on from the real malt with the aid of a sieve. The malt is then easily crushed and placed in a wooden vessel with holes like those seen in a coffee strainer. When boiling water is passed through this,

certain ingredients from the malt are dissolved and carried to the tub below. This liquid is boiled for an hour or so with dry ripe flowers of a plant called hop to give it a bitter taste as well as to prevent it from turning sour. Then it is drawn off into large shallow vessels or vats and allowed to cool. Then some yeast a kind of brown frothy liquid is added to make it ferment. After some time a large quantity of frothy substance rises to the surface. This is removed and the liquid is stored in casks. The other kinds of malt liquors too are prepared in a similar manner and they differ from one another in colour, taste and strength.

Wine is prepared from the juice of grapes. Ripe grapes are gathered and the juice is pressed out of them and collected in large tubs called vats. When preparing malt liquors, they have to add yeast to make the liquid ferment. But in grape juice this yeast is provided by nature in the shape of fine particles on the outer skins of the fruits and twigs of the plant that get into the juice. The fermented juice is drawn off into the barrels and stored. Wines are of three kinds namely (1) sweet wine (2) dry wine and (3) effervescing wine. The first is sweet because all the sugar in the grape juice is not allowed to be changed into alcohol and carbonic gas. In the second all sugar is changed into alcohol. In the third a large quantity of carbonic acid gas is allowed to remain while being bottled. Some of the well-known wines are port, sherry, claret and so on. Wines are also made from other ripe fruits like apple, gooseberry, raspberry, mulberry etc. and all of them contain alcohol and are therefore hurtful.

Spirits are called "the strongest of strong drinks" and they are prepared from malt liquors and wines by the process of distillation. Brandy, rum, gin and whiskey are all spirits distilled from fermented liquors. Brandy is pure wine distilled. Rum is distilled from fermented molasses left after the crystals sugar are formed in sugarcane juice. Gin and whiskey are obtained from malt liquors of grains like wheat, barley, rye, maize, oats, potatoes etc. Whiskey distilled gives the alcohol of commerce.

Let us now pass on to the evils of drinking strong liquors described above. Every one will admit that food, drink, fresh air, cloths etc. are of absolute necessity for one and all, and consequently nature has provided them in plenty. Taking the question of drink, water is the natural healthful drink of all animals. Coffee, tea and cocoa are harmless drinks that men can make and take. But drinks like malt liquors, wines and spirits are unnatural and harmful drinks and are therefore to be abstained from by one and all Unless people are pointed out the dangers of strong drinks, they, if they are addicted to them, would treat our advice with scorn. To them as well as to those likely to take to drinking this chapter may prove to be of immense benefit. It may also serve the purpose of a useful text book and a guide book for men and women engaged in anti-drink campaign. What a man swallows or puts into his stomach should be useful to him. We have pointed out in a previous chapter that the food taken by one should go to build up the body or keep its warmth or supply the vital force. As strong drinks do not serve any of these purposes, they are of ab-

solutely no use as food. People think that they help digestion and give an appetite for food. What they think is perhaps true. The bitter ingredient in some of the strong drinks and the acids in all of them do perhaps quicken the appetite. Alcohol is a stimulant and consequently arouses in people taking it, a temporary feeling of strength and liveliness. *But these seemingly good effects are not benefits at all.* Natural appetite and feeling of strength are to be secured and not stimulated ones. Further, experiments have proved that alcohol hinders digestion. Alcohol has a great attraction for water and as such makes the mouth of the men drinking it dry. In a previous chapter we have shown that the saliva in the mouth digests the starch in the food. So alcohol puts a stop to or at least hinders digestion in the mouth. As alcohol is said to inflame the coats of the stomach and to put them in a very unhealthy condition impairing digestion, the use of it deserves to be avoided. Meat put into water for a time becomes soft. The same when put into alcohol becomes hard. This experiment shows that foods that go to form flesh may be hardened by alcohol and thus rendered unsuitable for absorption and assimilation in the stomach. In addition to the above evil effects of alcohol, we may mention that it deadens the nerves of the stomach and also affects the liver causing much harm to digestion from want of proper bile secreted and brought to the food to be digested. It is also found that alcohol entering the blood system makes blood thin and the corpuscles weak.

Even a tyro in the science of physiology knows about the work of the heart. By its rhythmic beats it forces blood along the blood vessels and thus makes circulation and physical activities of the various parts of the body possible. The use of alcohol is found to make the heart beat faster by partly paralysing the nerves of the arteries. This means it increases the work of that organ. Further it is also said to weaken its power to do proper work.

The next important function of the human system affected by the use of alcohol is the respiration of the respiratory system. Every one knows how the lungs work and in what way respiration is useful. The inspiration furnishes the requisite oxygen to be absorbed by the red corpuscles of the blood to be utilised in the oxidation of the waste tissues of the body. The expiration throws out the oxidised waste matter brought to the lungs by the blood. Now alcohol by partly paralysing the nervous activities of the arteries, minimises their power of resistance to the rush of blood. Hence the blood circulates more freely and the heart beats faster. This increases the flow of blood in the lungs and thus makes them congested and inflamed. Thus we see that alcohol injures the lungs and prevents them from discharging their work properly. Similarly the work of the other organs also is hindered by the use of alcohol or any strong drink containing it.

There are of course people who say that alcohol like many other substances has its good qualities as well as bad. They assert that its use gives the people bodily

strength and power of endurance. But experiments go to prove that it does neither. The following experiment made by Dr. Richardson proves this clearly. The hind leg of a frog was carefully weighed by him. Then he by using electricity stimulated its muscles to its utmost power of contraction to find out how much weight the creature could lift. After noting this, he administered alcohol to the frog and submitted it again to the above test. He found that the response of the muscle to the electric current became feebler and feebler with the narcotic effect of alcohol. At last it was found that the creature was not able to lift even half the weight it was able to lift at first.

It is sometimes claimed that alcohol imparts heat to the system. But extensive series of experiments have conclusively negatived this statement. It has been found that the usual increase in the temperature of the body during digestion of all kinds of food is diminished within half an hour after alcohol is taken either in its fermented form or in the form of distilled drink. The fall in temperature continues for two or three hours. The reduction of the temperature as well as the duration is also found to be in exact proportion to the quantity of the stuff taken. Even in the cold arctic countries, the experience of travellers is said to have been what is contrary to the advantage claimed for alcohol in this respect. Fat was found to be absolutely essential for the purpose, while alcohol was found to be not only thoroughly useless but also injurious.

The destructive relation of alcohol to plant and animal life may be evinced from the fact that a small

quantity of strong spirits when poured upon a growing plant, it is known to shrivel and die.

In addition to the evil effects of alcohol as detailed above, it has highly injurious effects on the nervous system and according to the researches of Dr. Richardson, four distinct stages have been noticed. The first is said to be 'the stage of excitement' when the nerves are paralysed and the heart's action is increased. The second is the stage of 'muscular weakness' and the third and fourth 'The stage of mental weakness' and the stage of unconsciousness' respectively. Further the influence of alcohol upon the mental and moral powers of an individual is highly ruinous. Alcohol is a potent agent in establishing a heredity is beautifully explained by Dr. Norman Kerr in the following words:—"There is a marked tendency in nature to transmit all diseased conditions. Thus the children of consumptive parents are apt to be consumptives. But of all agents alcohol is the most potent in establishing a heredity that exhibits itself in the destruction of mind and body."

As Dr. Lee has put the whole evil effects of alcohol as a summary in a single short paragraph as if he had put the matter in a nut-shell, we may as well quote it and conclude this chapter on 'Alcohol and its Evils.' He says "Food is digested, alcohol is not. Food warms the blood directly or indirectly and alcohol lowers the temperature. Food nourishes the body in the sense of assimilating itself to the tissues and alcohol does not. Food makes blood and alcohol never does anything more innocent than mixing with it. Food feeds the blood-cells while alcohol destroys them. Food excites in health

to normal action only, but alcohol tends to inflammation and disease. Food gives force to the body and alcohol excites reaction and wastes force in the first place and in the second as a true narcotic represses vital action and corresponding nutrition. If alcohol does not act like food, neither does it behave like water. Water is the subtle but innocent vehicle of circulation, which dissolves the solid food, holds in play the chemical and vital reactions of the tissues, conveys the nutritive solutions from cell to cell, from tube to tube, and carries off and expels the effete matter. Water neither irritates tissue, wastes force, nor suppresses vital action, while alcohol does all the three. Alcohol hardens solid tissue, thickens the blood, narcotizes the nerves and in every conceivable direction antagonises the operation and function of water."

CHAPTER XII.
DOMESTIC ECONOMY AND THRIFT

Income and expenditure are the two things that play everywhere in everyday economic life, is perhaps known to one and all. People may work or make different articles not to satisfy their own wants but to satisfy the wants of others. While doing so they actually bring about the satisfaction of their own wants. A carpenter makes a table, not for his own use but for the use of some one else. But the money he gets for the article procures him food or other necessaries of life. Hence we may say that he by satisfying the needs of others satisfies his own needs. Similarly one man renders service to another for which he gets up. With the money received he buys articles of daily need for him. Hence we see receipt and payment playing a great part in everyday life of people. But this receipt and payment differs in different people. One man gets either money or the necessaries of life more than he needs while another is unable to make both ends meet with what he is able to get by his service or mutual labour. The man who has more money than he needs or more of the necessaries of life is said to be rich, while the one who is unable to meet his expenses with what he earns is said to be poor. But richness and poverty depend upon the modes of living of individuals. What appears trifle to a rich man may be wealth untold to a poor man whose wants are few. One rich man can afford to have a bungalow worth say ten thousand rupees and a motor car costing about three thousand rupees

but another rich man will never be satisfied with what this man can afford to have. He may require a bungalow in the midst of a spacious compound and a motor car costing not less than ten thousand rupees or so. So we may say that there are several grades both among the rich and poorer classes. So the application of the principles of domestic economy and thrift may be different with different classes of people, though the principle underlying may be the same. Broadly speaking, the proverb 'cut the coat according to the cloth' should never be lost sight of. There is also a Tamil saying that there will be no harm in having the source of income small provided the expenses are not on the increase. A man be he rich or poor should regulate his expenses to the income. Else he is sure to come to grief sooner or later. Riches take to themselves wings and fly away is a proverb that should ever be in the mind of a man who would retain his wealth. Further a man would do wisely if he puts by something occasionally against a day of want. We may be asked as to how this can be done. Our answer would then be 'practice economy and thrift.' Do not buy a thing because it is cheap. See if it is of absolute necessity to you. Remember the saying 'Take care of pence and pounds will take care of themselves.' Avoid wastage of any kind, however small it may appear to you. 'Wilful waste makes woeful want' is a proverb fit to be borne in mind and acted upon. Every one may know the moral story of the man who married the servant maid in preference to her rich mistress simply because he found that she had made a dress

for herself out of the handful of linen thrown away by her mistress to save the trouble of untying the knots. It is a true but sad fact that the poorest people are those that pay more for an article than the rich. The rich people buy things wholesale and so get them cheap. But poor people buy in small instalments from very poor dealers paying very much more for the articles than what a rich man buying wholesale has paid for the same quantity. So every thrift individual should avoid buying in small instalments as much as possible. Nowadays, people go in for things because they are in fashion though their limited means may not permit their having them. How many people there are who say that the drink coffee swallows a good portion of their income! yet they have not enough grit in them to give it up and take to the cooling and curd of bygone days! 'Mr. A. drinks coffee in the morning and so should I,' says the husband and the wife acquiesces! A large number of people go in for this but costly stuff for wearing because of the question of sentiment. But this sentimental feeling launches them into difficulties subsequently when a son or daughter is to be married and they find themselves helpless.

Every one is familiar with the saying that the habit cultivated in the cradle lasts till grave. So parents and guardians of boys and girls should cultivate in them the habit of economy and thrift. They may make their sons, daughters or wards occasional presents of money and encourage them to save the whole or a fraction of its to be utilised later on usefully if need be. The

would create in them the healthy habit of economy and thrift.

It is human nature to be free with money and articles ready at hand. So men and women would do well to put their money in the savings bank and their surplus articles in the store-room, so that they may not be readily available. Only a very small amount should be had on hand and a small quantity of the articles near at hand to be made use of daily. These may be replenished now and then. Then there will be no temptation—at least much of it—either to spend more money or to make use of or even waste more of the articles in daily use.

There are people with the tendency "Take care of to-day and to-morrow will take care of itself." This is a very dangerous tendency and should therefore be nipped in the bud. Suppose for example a young couple have coffee powder in a limited quantity. It may be used up in a fortnight if a particular measurement of it be used every day. The same quantity may be made to last the whole of the month by reducing the quantity used daily without altering very much the quality of the drink prepared. Then they would do well to make it last as long as possible without recklessly exhausting the whole lot in a short time and then going a borrowing.

A man of thrifty and economic habit should never go a borrowing. He would stick to the saying 'Neither a borrower nor a lender be.' If he begins to borrow

then the practice of borrowing would become one of second nature to him and thus foil his attempts at economy and thrift. If he lends, then he creates or encourages in the borrower the pernicious habit of always borrowing and thus prevents him from becoming economical and thrifty. The following conversation between a thrifty man and a spendthrift will be found interesting and instructive.

Spendthrift to the thrifty individual :—Sir ! would you lend me five rupees from what you have saved ?

Thrifty individual :—Why do you come and trouble me? Why had you not saved money yourself ?

Spendthrift :—I have not learnt the art of economy and thrift.

Thrifty individual :—Then I will teach the art to you now. I won't give you a pie, you may go away from here now.

Cares and anxieties disappear from a family of economical and thrifty habits. Lakshmi the Goddess of Wealth would ever be in their midst. Above all the feeling of freedom from want is soothing to the mind and no greater bliss than mental tranquility can be found in this world. A man or a woman with mental worry and a feeling of eternal want will be at constant war with himself and the whole world, whereas a man with a tranquil mind and freedom from want would be friends with the whole world. So the choice between thrift resulting in the mental tranquility coming in its wake, and the lack of the same with the resultant evil

mental worry of all kinds is left to each individual. We have drawn the attention of men and women to this fact by means of this chapter, so that they may choose the right one and reject the wrong. May all who go through this chapter cultivate the habit of economy and thrift, and thus lay the foundation for a happy home of men and women and children of mental ease, comfort and freedom from want for ever.

CHAPTER XIII.

INDIAN DIETARY.

It is laid down in one of the sacred books of the Hindus that a disciple had once said that bliss *par excellence* lay in food, since everything depended on it. So we may take for granted that every animal has a right to eat and live. But man has grown up to the state of the most superior of all animals and as such has his taste immensely cultivated and refined. Refined and cultivated taste requires refined and cultivated preparations of food. Experience of centuries has brought the Hindu system of dietary to a state of perfection and no country can boast of such a system of variegated preparations of food, sweets, soups, cakes and so on. Even as there are people who, even while pure and fresh air is available near would not enjoy it but remain confined within the four walls of a room, there are men and women in abundance who deny themselves palatable preparations of food that can easily be had. The proof of the pudding is in the eating of it and similarly the proof of good food is in its preparation and cooking. In order to have this proof one should know how to prepare at least a few of the ordinary dishes of Hindu diet. This knowledge is highly essential to newly married wives and women generally since on it depends the quality of the food consumed in a family. Even for cooking the rice, some experience is necessary, else the same pot is likely to have three layers, carbon at the bottom, paste in the middle and raw rice at the top. So to enjoy domestic felicity the female members should be culinary experts, at least a few of them in a family if it be big.

To a novice in the art of cooking the following extract from a treatise on "food and cooking" by T. M. Mallick, B. L., M. A., M. D., may be of great use:—

"The primary object of cooking was to make hard food soft and more digestible. But along with this some flavour also develops which is a secondary object of cooking. Man became a cooking animal long after his evolution into manhood. During the hunting period there was need of cooking, as animal food was quite soft and digestible without cooking. It was when vegetable diet largely came in more especially during the agricultural age, that cooking was necessary and of course it was only after man came to learn the use of fire."

"Cooking at first consisted only in throwing the thing into the fire. This is roasting. Boiling came on much later as the knowledge of a vessel in which water can be put over fire for boiling purposes came to be known long after. The other methods of cooking as frying is essentially boiling in oil instead of in water. Baking, grilling, etc. evolved much later. All these are methods of cooking in dry heat. Steaming is perhaps the most modern method as it is the most economic and the best for digestion. Nothing is wasted in this method."

"According to the modern method of cooking, it is primarily meant to make food soft and digestible. Flavour is to be added to food after it is cooked soft. For flavour is a volatile oil and if put long before, it disappears after some time. So flavouring should always be done immediately before eating."

"Taste and flavour are very important for the digestion of food and should always be secured. The process

are the agents which artificially give flavour to food. Salt, sugar and bitters lend flavour. Pungent things like mustard, chilli, pepper, etc. stimulate taste, relish and flow of saliva. This helps the enjoyment of food and brings about its easier digestion."

"Animal food should be cooked at low temperature as they are already soft and eatable. Vegetables should be cooked at higher temperature as this would break their hard cellulose coating. Steaming is the best method of cooking vegetables as boiling removes all the salts and a large portion of the nutrition and makes the stuff less palatable and poorer in nourishment."

"Stewing of meat and slow heat of simmering water is the best for invalid cooking."

"Grilling over a slow fire for 2 or 3 minutes is the quickest and best and the most digestible and palatable of all meat preparations. Excellent flavour develops by its subjection to heat for a short time and nothing is wasted."

"Soups and meat extracts are not so much nourishing, but supply a lot of valuable salts and extractives which stimulate digestion. Gelatine contained in it, is not so much nourishing in the sense of tissue building; but it saves tissue waste and is thus so useful as a convalescent drink."

In Hindu treatises on the art of cookery special preparations of food are recommended for the several seasons of the year based on climatic conditions and the properties of food materials. Want of space necessitates the omission of detailed particulars.

We shall now conclude this chapter as well as this treatise on Sexual Bliss with our earnest wish that our poor attempt may not prove fruitless.

THE END.

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