

THE PRESERVATION OF HEALTH

WITH REMARKS ON CONSTIPATION, OLD AGE, USE OF
ALCOHOL IN THE PREPARATION OF MEDICINES
JOHN COLLINS WARREN



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PRESERVATION *Of* HEALTH.

I. —PHYSICAL EDUCATION.

1. *Introductory Remarks.*

The preservation of health depends principally on a perfect original organization; this maybe materially modified by education. The physical and intellectual education of man demand the application of very different systems. The culture of the mind requires the early, constant, and well-directed efforts of an artificial system. That of the physical faculties is fully effected by the powers of Nature. All that she asks is, that we would leave her free and unconstrained. Unhappily, our state of civilization, while it has copiously supplied the means of intellectual improvement, has, nearly in the same ratio, raised obstacles to the development of the physical (9) powers; and if we wish to restore to these their original spring, we should either revert to our primitive condition, or find substitutes in art for the modes employed by nature.

Considerations of this description have presented themselves occasionally to every one who has observed the evils arising from the prevalent systems of education, and who has noticed the effects of too steady an application to literary pursuits in educated men. The unfavorable influence of studious and sedentary habits on health was exhibited at one time among the members of the sacred profession, a number of whom became its premature and much-lamented victims. At another were displayed the effects of a mistaken system on the constitution of multitudes of the fairest work of creative power. Many a medical man has had the misfortune to behold, when it was too late to apply a remedy, numerous instances of decay in the most vigorous constitutions, and of distortion in the best proportioned forms.

The importance of health to the regular exercise of the faculties of mind, as well as those of body, is very well understood in theory, and very generally

neglected in practice. We are daily seen to accumulate the treasures of science on intellects where the physical machinery is disordered and made useless by the burden. What is the value of a brilliant genius, or a highly-cultivated mind, in a weak and laboring frame? Let us suppose the existence of such a case in either of the learned professions. If it occur in the minister of religion, the organs of utterance are enfeebled, and the power of instructing his hearers is diminished or destroyed. The thoughts that should speak remain unembodied in language, and the words that should burn are extinguished on his lips. His usefulness is impaired in the midst of its full career; and even if his days are not cut off at an early period, he finds his mental abilities prematurely chained down by bodily weakness.

If it happen in the interpreter of the law, the powerful workings of the mind, in the investigation of obscure points and the elaboration of profound arguments, break down a sickly and yielding organization, and bring on a train of nervous affections and perverted imaginations, as permanent perhaps as life, and less supportable than death.

Again: a bad constitution in a professor of the healing art keeps him at variance with all his duties. How can he heal others in whom the springs of health act feebly and imperfectly? A laborious and active course of duty demands a bodily vigor that can endure all unseasonable labor; a steadiness of fibre that can bear to witness without agitation the sufferings of others while attempting to relieve them; and a firmness of health able to resist the attacks of those malignant epidemics that prostrate a whole community.

When we regard the influence of a debilitated body on the more delicate sex, we find it not less distressing. A young female, at the age of twelve or fourteen, presents a beautiful figure, rosy cheeks, an airy step, and the fullness of life and happiness in every

movement. As she advances, her vivacity naturally lessens; but, as if it would not be soon enough extinguished, it must be repressed by art. The lively motions of the body and limbs must be checked, the spirits must be restrained, and a sort of unnatural hypocrisy made to conceal every ingenuous movement. The activity of disposition is destroyed; by confinement she loses the inclination for exercise, and passes from her school to a state of listlessness at home, or to frivolous and useless amusements, or perhaps to fresh tasks. By this regular repression of the physical powers, their energy is at last broken. Various organs lose their tone and their healthy action. Even the most solid parts are gradually impaired, and, being unable to support their ordinary burden, they sink under its weight, and bring on unchangeable deformity. Perhaps the exterior of health may remain a little longer, although the destroying principle is working in the heart. v Should she be called on to be a mother, then comes the most important trial of her strength. The fruit, so fair without, is found decayed within when scarcely matured. Next the roses of the countenance wither; the limbs are feeble and tottering; the vivacity is extinguished; the whole system undermined, and ready to fall on the first shock. Of what use now are all the finery of accomplishment, and the rich stores of literature and of science, the fruits of so many years' labor? They are all wasted, and perish unemployed.

What has now been stated as the result of the mode of female education in use at present is not a picture of the imagination; it is a fair representation of what we are but too frequently compelled to encounter.

2. *Effects of Literary Pursuits on Health.*

My wish now is, to point out some of the principal ways in which literary pursuits may be destructive to health; and also to show what measures might be adopted to prevent these pernicious consequences.

Action is the object for which organization was created. If the organs are allowed to remain inactive, the channels

of life-become clogged; and the functions, and even the structure, become impaired. Young animals are filled with the desire of motion, in order that the fluids of the body may be forced rapidly through their tubes, the solids thus elongated and enlarged, and every part fully developed.

The immediate consequences of action on the bodily frame are familiar and visible to daily experience. Observe the sinewy arm of the mechanic. The muscles are large and distinct; and when put in motion, they become as hard as wood, and as strong as iron. Notice those who are accustomed to carry considerable weights on the head. The joints of the lower limbs are close set and unyielding, the frame perfectly erect, and the attitude commanding. In the cultivator of the soil, though the form may be vitiated by neglect, you will observe that the appearance of every part is healthful, vigorous, and well fitted for labor.

While all of us are desirous of possessing the excellent qualities of strength, hardiness, and beauty, how defective are our systems of education in the means of acquiring them! In the present state of civilization, a child, soon after it can walk, is sent to school, not so much for the purpose of learning as to relieve its parents of the trouble of superintending its early movements. As he grows older, the same plan is incessantly pursued and improved on, till a large part of his time is passed in sedentary pursuits and in crowded rooms. In the short intervals of confinement at school, the boy is allowed to follow the bent of his inclinations, and seek in play that exercise which nature imperiously demands. The development of his system, though not what it was destined to be, is attained in a degree, and he is exempted from some of the evils which fall heavily on the other sex.

The female, at an early age, is, in many families, discouraged from activity, as unbecoming her sex, and is taught to pass her leisure hours in a state of quietude at home. The effects of this habit have been already spoken of in general terms; it now remains to point

out some of its results in a specific manner.

In the course of my observations, I have been able to satisfy myself that at least half the young females, brought up as they are at present, undergo some visible and obvious change of structure; and of the remainder, a large number are the subjects of great and permanent deviations, while not a few entirely lose their health from the manner in which they are reared. The proportion of those who fall under the first description has already been stated. The amount of the two last it is impossible to ascertain with precision; but it is sufficient to form the basis of a powerful claim on the attention of those engaged in the management of young persons.

The nature of all the particular affections and diseases thus induced it would be impossible to describe in this place. We shall venture to direct our views to the details of only one of them.

8. *Curvature of the Spine.*

The freight of the principal part of the body, or trunk, of the neck, the head, and the two upper extremities, is supported by a single bony column, called the spine. This column is about three inches in diameter. It consists of twentyfour pieces of bone, placed one on the other; and between each two is interposed a substance, somewhat resembling caoutchouc, or India rubber, for the purpose of giving it elasticity. This column, is hollow, and contains the spinal marrow. The spinal marrow is the origin and source of the nerves, that convey the influence necessary to voluntary motion; and they are sent off in pairs to the muscles on each side of the body. The bony pieces of the spine are confined together by many small ligaments, by the elastic substance' just spoken of, and by numerous muscles, affixed, not only to connect and support, but also to move them.

The bones of the spine, at an early period of life, are themselves, in part, composed of an elastic, cartilaginous, or gristly substance, and are always of a porous and sponge-like texture. In consequence of this kind of organization, the spinal column possesses much elas-

ticity and flexibility, which enable it to yield and to move in different directions, and expose it to receive permanent flexures, when there is a deficiency of natural strength in its composing parts.

Causes which affect the health and produce general weakness operate powerfully on this part, in consequence of the complexity of its structure and the great burden it supports. When weakened, it gradually yields under its weight, becomes bent and distorted, losing its natural curves, and acquiring others, in such directions as the operation of external causes tend to give it; and these curves will be proportioned in their degree and in their permanence to the producing causes. If the supporting part is removed from its true position, the parts supported necessarily follow, and thus a distortion of the spine effects a distortion of the trunk of the body.

The change commonly begins at the part which supports the right arm. The column bends towards the right shoulder, forms a convexity on the side where the shoulder rests, and thus elevates the right higher than the other. This elevation, or, as it is commonly called, growing out of the shoulder, is the first phenomenon that strikes the friends of the patient. Often, when observed, the shoulder has already undergone a considerable change of position; and the change is not confined to the shoulder, nor to the portion of spine immediately connected with it. On examination, it will be discovered that the curvature to the right, in the upper part of the column, is accompanied, as a natural consequence, by a bend of the lower part to the left, and a correspondent projection of the left hip. It is perfectly obvious that the inclination of the upper part of a flexible stick to one side will leave the lower part on the other; and when, by this inclination, the vertical support is lost, a disposition to yield at the curving points will continually increase, until it be counteracted by some other power. Thus it happens, that any considerable projection of the right shoulder will be attended by a correspondent projection of the left hip.

The rising of the shoulder involves other changes in the osseous fabric; for, as the spinal bones support the ribs, when these bones project they necessarily push forwards the ribs dependent on them. These ribs form the frame of the chest, and of course the right side of the chest is projected forwards, and causes a deformity in the fore part of the body. The changes do not stop here. The posterior ends of the ribs being pushed forwards, and the anterior ends being confined to the sternum, or breast bone, the right edge of the sternum will be drawn forwards, and the left edge consequently turned backwards. The fore parts of the left ribs will be gradually forced inwards or backwards, and thus the left side of the chest distorted and contracted.

It is difficult to have a distinct notion of these intricate changes in the human machinery without an exhibition of the parts concerned in them; but we shall endeavor to represent the train of phenomena as they exist in nature, and to render them sufficiently intelligible to excite consideration and inquiry.

Perhaps it may be imagined that these cases are of rare occurrence, and that we have no occasion to alarm ourselves about a few strange distortions, the consequence of peculiar and accidental causes. Unhappily they are very common. It has been already stated, that, of the well-educated females within my sphere of experience, at least one half are affected with some degree of distortion of the spine. This statement cannot be accused of exaggeration, when compared with that of one of the latest and most judicious foreign writers. Speaking of the right lateral curvature of the spine, just described, he tells us, "It is so common, that, out of twenty young girls who have attained the age of fifteen years, there are not two who do not present very manifest traces of it."

As the bones serve to contain most of the great organs, any change in their forms will be likely to produce changes in the condition and healthy action of these organs. The spine gives lodgment, as has been said, to the spinal marrow; and this sends out nearly all the nerves

that carry the influence of voluntary motion, and many of those that convey energy to the great organs of respiration, circulation, and digestion. When the containing part is distorted, the part contained is likely to be disturbed; and this disturbance must produce important effects on the nerves issuing from it, and of course on the organs to which these nerves are distributed. If the compression be slight, the operations of the organs will be partially disturbed. Hence proceed shortness of breath, palpitation of the heart, the phenomena of indigestion, flatulence, acidity, &c. These again give rise to the uncomfortable feelings called nervous, though they may be the direct consequence of partial compression of the spinal marrow. When this pressure is considerable, the bad consequences are more obvious and formidable. In such instances, the muscles supplied with nerves from the part below that compressed lose their activity. The circulation in the lower limbs is retarded; they grow cold, and livid, and swell. Sometimes even a complete paralysis, or loss of the power of motion, occurs in one or in both of these extremities.

Laehaiee, Sur les Courbures de la Colonne Vertebrale. — P. 23.

The ribs and the breast bone enclose and guard, as we have said, the organs of the chest. Their position being altered by the deviation of the spine, the cavity they form becomes deranged. Its left part, where the heart is placed, being diminished in extent, this organ is embarrassed in its movements, and, striving to relieve itself, produces painful and dangerous palpitations, and a general disturbance in the circulatory system. The lungs, for the same reasons, cannot fully expand in the effort of inspiration. This function is but partially performed, and the blood imperfectly oxygenated — an irregularity of itself sufficient to bring on a low state of health and a disposition to disease.

The want of conformity between these organs and the bones they are in contact with, causing interference between the parts, an irritable condition of the lungs may be engendered, disposing

to acute inflammation, or to the slow development of chronic disease.

4. *Causes of the Affections arising from Mistakes during Education.*

Having given some notion of the nature of the affections brought on by mistakes during the time of education, let us advert now to their causes.

The general causes of these derangements are those things that weaken the constitution. They may be physical or mental. Among the most important physical causes are want of the exercise proper to develop the powers of the body, the taking of food, improper in quantity or quality, and many other causes of inferior importance. The mental causes may be a too constant occupation of the mind in study, the influence of feelings or passions of a depressing nature, &c.

The facts that show the want of exercise to be one of the greatest causes of these affections and of the weakness that induces them are very numerous. Among these, we observe that young people brought up to hardy and laborious occupations, whether they are males or females, do not suffer in this way. The sons and daughters of farmers and laborers, for example, never exhibit the deformities spoken of, except in cases where there is a great scrofulous defect by inheritance.

A still more remarkable fact of a general nature may be seen on a comparison in this respect between the two sexes. The lateral distortion of the spine is almost wholly confined to females, and is scarcely ever found existing in the other sex. The proportion of the former to the latter is at least nine to one. What is the cause of the disparity? The two sexes are equally well formed by nature. The difference in physical organization results from a difference of habits depending upon education. It is not seen till after this process is advanced. The girl, when she goes from school, is, as we have before said, expected to go home and remain, at least a large part of the time, confined to the house. As soon as the boy is released, he begins to run, jump, and frolic in the open air, and continues his sports till hunger draws

him to his food. The result is, that in him all the organs get invigorated, and the bones, of course, become solid; while a defect exists in the other sex proportionate to the want of physical motion.

A question may fairly be asked, whether these evils are supposed to be greater now than formerly, when females were equally confined. The answer, in reference to the young females of our country, is, that they then took a considerable share in the laborious part of the domestic duties; now, they are devoted to literary occupations, of a nature to confine the body and require, considerable efforts of the mind.

It is not necessary, in this place, to say any thing of the second of the physical causes of weakness spoken of, as it will be adverted to hereafter. The next of these causes which presents itself to our view is of a moral nature — the influence of too great occupation of the mind in study, and that of feelings and passions of a depressing nature.

The operation of mental causes on the bodily frame is not unknown to any of us; though it may not perhaps have been thought, in regard to education, to be of very great importance. The effect of anxiety, grief, and other feelings, in diminishing strength and wearing away health, are quite familiar. The loss of property and of friends has been known to bring on diseases; and it has sometimes happened, that an agreeable reverse or a favorable incident has speedily removed them. Confidence in a physician is a great help towards receiving benefit from his prescriptions; and many of the cures wrought by empirical or quack medicines are to be attributed rather to the operation of the mind than to the action of the medicines.

5. *Effect of Moral Causes in producing Physical Changes.*

The production of physical changes in a sudden and sensible way, by the action of moral causes, is difficult to comprehend. Yet medical men do sometimes have an opportunity of observing changes effected by this power, which might appear incredible, and almost miraculous, to those not aware of the

force of mental operations on the human organs. Many such cases could be adduced. Perhaps it will be proper to state one or two in detail.

When, some years ago, the metallic tractors were in the height of their reputation for the cure of diseases by external application to the part affected, the following experiment was performed by Dr. Haygarth, of Bath. Two tractors were prepared, of a non-metallic substance different from the genuine tractors, but made to resemble them. These were applied, in a number of instances, with all the good effects of the real tractors. Among other remarkable cures was that of a person with a contraction of the knee joint, of six months' duration. After a few minutes' application, this man was directed to use his limb, and, to the surprise of all present, he was able to walk about the room. Such instances are not very unusual. Many empirics succeed in calling into action the same principle. The patient, after a number of manipulations of the part affected, is directed to make use of his limb; and though this call on his imagination does not infallibly succeed, it is not wonderful that, by exciting the nervous energy of the part affected, it should occasionally do so.

I will relate another case of this kind. Some time since a female presented herself to me with a tumor, or swelling of the sub-maxillary gland of the neck. It was about the size of an egg, had lasted two years, and was so very hard that I considered any effort to dissipate it by medicine to be vain, and advised its removal by an operation. To this the patient could not bring her mind; therefore, to satisfy her wish, some applications of considerable activity were directed to be made to the part; and these she pursued a number of weeks, without any change. After this she called on me, and, with some hesitation, begged to know whether an application recommended to her would, in my opinion, be safe. This consisted in applying the hand of a dead man three times to the diseased part. One of her neighbors now lay dead, and she had an opportunity of trying the experiment, if not thought

dangerous. At first I was disposed to divert her from it; but, recollecting the power of the imagination, gravely assured her she might make the trial without apprehension of serious consequences. A while after she presented herself once more, and, with a smiling countenance, informed me she had used this remedy and no other; and, on examining for the tumor, it had disappeared.

The possibility of operating powerfully on the corporeal organization by moral causes being established, it is clear that the long exertion of intellectual efforts, and, still more, the frequent action of depressing passions, may have an influence on the condition of the body, at the flexible period when education and growth are going on together. A close and constant occupation of mind, too long continued, lessens the action of the heart; and a languid circulation thus being induced, prevents the full growth of the body. Depressing passions do not act less conspicuously. We sometimes have occasion to notice, though the case is rare in this country, the condition of children subjected to a persevering system of harshness at home. They are pale and shrivelled, and their growth is checked.

6. *Injurious Effects of Competition at School.*

In the present modes of education, great pains are taken to excite the imagination by competition. These efforts are attended with but too much success in susceptible minds. An anxiety to excel becomes the predominant passion. The health, the sports, and too often the friendships of youth are sacrificed to the desire of surpassing those around. When this becomes an all-absorbing passion, the result is most unfriendly to physical organization; and a multitude of fine constitutions are ruined by it, in both sexes.

Whether any proper substitute can be found, in the male sex, for competition and rivalry, must be left to others to decide. So far as my experience extends, the answer would be in the affirmative; and without pretending to be a competent judge in the case, it is fair to say, that the habit of giving public instruc-

tions for forty years has afforded me some conclusions of a satisfactory nature. In the attendance of lectures on anatomy and surgery, no competition was employed; yet a large part of the students acquired during their three years' curriculum a fair knowledge of these two sciences, and every year presented a number of them who might be said to be distinguished. This subject might be expanded with advantage; but this is not the place.

The application of the system of rivalry to the softer sex, with submission, appears to me fraught with mischief. It inflames the imagination, festers the passions, and poisons the happiness of the brightest days of life; and since the very highest grade of literary acquirement is not essential to the duties of the sex, it seems as unnecessary as it is pernicious.

The question is, whether there is a substitute which is sufficiently practical to be of general use. ' If none exist, the ingenuity of instructors could not be employed on a more important subject than in devising such substitute. The spirit of improvement has already discovered that the reasoning process may be generally employed with great success in the instruction of young persons. There are individuals who use it to a considerable extent, and with the most happy results. They endeavor to enforce on their pupils the doctrine, that the path of duty is the most easy, and most-for i the interest of the individual to pursue. They do this by argumentative conversation, and the process succeeds with those who are capable of being influenced in any way: and why should it not? Children of a very early age are capable of feeling the force of reason; and it will generally be found that they are under the power of their parents rather in proportion to the employment of this agent than to that of the rod or any other compulsory means. If they understand reason at so early a period, surely they cannot lose their susceptibility to it at one more advanced. There are minds on which the powers of language make no impression, and all the weapons of argument fall as if pointless. But these

are to be considered as exceptions to general laws — cases in which all the means of severity and kindness equally fail. They should not cause discouragement. Patience should be the everlasting motto of the instructor. With it he performs wonders — without it he can do little.

1. *Local Causes of Spinal Distortion.*

The remarks made above will give some notion of the most important general causes of ill health and imperfect growth during the educating process. It is desirable to say a few words on some of the immediate causes of spinal distortion, which may be called local.

The most obvious of the local causes are bad postures of the body and limbs. The habit of bending the neck forwards, while writing or drawing, gradually compresses the vertebrae, and the intervertebral substance on their anterior part, and causes a permanent change in the form of this part of the spinal column. This distortion is so very common among us that we are apt to consider it a necessary evil. In fact, however, it is the effect of habit in a great number of instances. Sometimes it is the consequence of negligence, and not unfrequently of timidity. "Whether it tends to impair the health always, is a question; that it sometimes does so, is certain; and its effect in deforming the shape is even greater than a moderate degree of lateral curvature.

The immediate cause of the lateral curve of the spine to the right, opposite to the right shoulder, is the elevation and action of the right arm in drawing, writing, and other acts. This posture pulls the part of the spinal column to which the muscles of the right arm are fixed to the right side. The convexity of the spine thus produced keeps the right shoulder elevated, and the left consequently depressed. The lower part of the column is thrown to the left side; and this displacement being favored by the disposition to rest on the left foot, while standing to speak or read, causes a permanent projection of the left hip. The postures employed in practising on some musical instruments sometimes bring on these distortions; as, for exam-

ple, a great use of the harp favors the disposition to lateral curvature, from the constant extension of the right arm.

8. *Means of Avoiding some of the Defects.*

Having adverted to the nature and the causes of some of the defects that arise from want of attention to physical education, some hints will be thrown out as to the modes in which they may be avoided.

Nature, as has been before said, if left to herself, is all-sufficient to the development of physical organization. But we live in an artificial state — a state that continually thwarts the course of the native dispositions of the animal economy; and as we must abandon the advantages of these, we must seek for substitutes in an artificial process.

The principles which should form the basis of such a process will readily be seen on attending to the nature and the causes of these defects. We shall then see that the remedy, or rather the preventive means, lies in a certain regulation of the sentiments, and passions, and intellectual operations; in promoting bodily activity; in a salutary regimen, and in some other inferior considerations. In regard to the first of these, that is, to what relates to the mind, having already said all that is intended at this time, the others will be now adverted to.

Towards a perfect system of education, it is necessary there should be a balance preserved between physical and intellectual cultivation. When the mind is closely occupied, the body should be carefully guarded. If the pursuits of the former are severe and absorbing, those of the latter should be cheerful and relaxing. Instead, then, of abandoning the physical to the intellectual culture, it should be increased in the same ratio, and followed with the same earnestness,

Exercise is so material to physical education that it has sometimes been used synonymously, though it really constitutes only a part of it. In order that exercise may have its due operation, it must begin at the earliest period of life; and, of course, the parent must in this act the part of instructor. He must take pains to

have the infant carried into the air every day, and in every season; for, whatever may be the dangers of such a course, they are in the end less than those incident to the accidental exposures of a delicate constitution. In the earlier years, the dress should be arranged so as to allow that use of the body and limbs to which nature prompts, in a perfectly free manner, yet without impropriety. When children are sent to school, care should be taken that they are not confined too long. Children under fourteen should not be kept in school more than six or seven hours a day; and this period should be shortened for females. It is expedient that it should be broken into many parts, so as to avoid a long confinement at one time. Young persons, however well disposed, cannot support a restriction to one place and one posture. Nature resists such restrictions; and if enforced, they are apt to create disgust with the means and the object. Thus children learn to hate studies that might be rendered agreeable, and they take an aversion to instructors who would otherwise be interesting to them.

The postures they assume while seated at their studies are not indifferent. They should be frequently warned against the practice of maintaining the head and neck long in a stooping position; and the disposition to it should be lessened by giving a proper elevation and slope to the desk; the seat should have a support, or back, of a few inches, at its edge. The arms must be kept on the same level; and there should be room to support them equally, or the right will be apt to rise above the left, from its constant use and elevation. A standing posture in writing and studying is not commendable for young persons. The secret of posture consists in avoiding all bad positions, and avoiding all positions long continued.

For many years, in my anatomical lectures, it was recommended that children should be taught by their parents to use the left hand equally with the right. This habit will in a great number of instances prevent the occurrence of the distortion mentioned, and preserve the lateral symmetry of the body. It will al-

so give a valuable resource in case of those injuries, which in every one temporarily, and in some permanently, impair the use of the right arm.

The ordinary carriage of the body, in walking, should be an object of attention to every instructor. How different are the impressions made on us by a man whose attitude is erect and commanding, and by one who walks with his face directed to the earth, as if fearful of encountering the glances of those he meets! Such attentions are not less important to the fairer sex, where we naturally look for attraction in some form or shape. If nature has not given beauty of face to all, she has given the power of acquiring a graceful movement and upright form — qualities more valuable and more durable than the other. These qualities are lost or gained during the period of education; and of course they lie, to some extent, within the control of the instructor. It should seem that it would afford great satisfaction to the superintendent and guardian of the rising population to be able to send out to the world his annual recruits, not only well imbued with knowledge and virtue, but also endowed with a handsome form and graceful manners.

A personal fact in support of this opinion may be added. In the earlier part of my anatomical practice I experienced an affection of the right thumb, which compelled me to rely on the left hand for nearly a year, and, in consequence, produced a facility in doing many surgical operations, and in shaving with the left hand, which otherwise would not have been attained.

The influence of an upright form and expanded chest on the health has been sufficiently explained; and what may be done to acquire these qualities, is shown by many remarkable facts, one of which may be mentioned. For a great number of years it has been the custom in France to give to young females of the earliest age, the habit of holding back the shoulders, and thus expanding the chest. From the observations of anatomists lately made, it appears that the clavicle, or collar bone, is actually

longer in females of the French nation than in those of the English. As the two nations are of the Caucasian race, as there is no other remarkable difference in their bones, and this is peculiar to the sex, it may be attributed to the habit above mentioned, which, by the extension of the arms, has gradually produced a national elongation of this bone. Thus we see that habit may be employed to alter and improve the solid bones. The French have succeeded in the development of a part that adds to health and beauty.

As young persons advance in age, and as the disposition to motion naturally diminishes, it becomes important to encourage and provide for it, especially in females and in young men of studious character. Instead of restraining their movements, and blaming the disposition to frolic, they should be allowed and advised to it, at proper times, and in becoming modes.

Next to walking in the open air, the best exercise for a young female is dancing. This brings into action a large part of the muscles of the body and lower limbs, and gives them grace and power. The best mode in which it can be employed is not in balls and crowded assemblies, but at home, alone, or with two or three friends, or in the domestic circle. As this practice does not give motion to the upper limbs, and as the exercising of them is too apt to be neglected, it is important to provide the means of bringing them into action, as well to develop their own powers as to enlarge and invigorate the chest, with which they are connected, and which they powerfully influence. The best method of accomplishing these objects is the use of the triangle. This exercises the upper limbs and the muscles of the chest, and, indeed, when adroitly employed, those of the whole body. The plays at ball with both hands, and that of dumb bells, are useful. The parallel bars afford a very fine exercise for the muscles of the body and upper limbs. Battledoor should be played with the left hand as well as the right — a habit, like all others, which may readily be acquired by practice. While these are par-

ticularly mentioned, as great a diversity as possible in exercise and amusement should be adopted, so that, when the mind or the muscles get fatigued with one, they may take up another with fresh ardor. Every seminary of young persons should be provided with the instruments for these exercises. They are not expensive, occupy but little room, and are of unspeakable importance.

The triangle is made of a stick of walnut wood, four feet long, an inch and a half in diameter. To each end is connected a rope, the opposite extremities of which, being confined together, are secured to the ceiling of a room, at such height as to allow the motion of swinging by the hands.

In the various modes of physical development accidents are occasionally produced, and hence prejudices have been naturally excited against this very important part of education. It must be recollected, however, that such accidents are exceptions to the general rule, and should have no other influence than to increase the care which should form a part of every system of education.

While active exercises should occupy time sufficient to excite the circulation and gently to agitate the organs, there must also be an occasional relaxation. At proper intervals, the whole muscular apparatus should be allowed to repose; not that the young lady should sleep during the day, but should assume a graceful attitude on a couch, or sofa, as a necessary alternation to muscular effort.

The remarks last made have reference principally to the exercises of young ladies, who are more likely to suffer in this respect, in our plans of education, than the other "sex, 9; *Cultivation of the Physical Powers in Young Men.*

The necessity of cultivating the physical powers in young men is sufficiently understood.

In the year 1825, a great effort was made in Boston to form a gymnasium on a large scale, in the hope that its principles and practice might be disseminated through the country. The writer of these pages took an active part

in the execution of this plan, and addressed to the celebrated Professor Jahn an invitation to come to this country. The Professor did not accept the invitation; but in his place came Dr. Lieber, now Professor in Columbia, S. C., and an ornament to the science of this country. Soon after his arrival, Dr. Lieber opened a very successful gymnasium. At the same time letters were addressed to some of the most distinguished persons in this country, to invite their attention to the subject of gymnastics, and their influence in diffusing a knowledge of their importance. Among these, a letter was addressed to a gentleman now no more, whose name and opinion must have great weight;—his reply to this letter is, inserted below.

The establishment of gymnasia through the country promised the opening of a new era in physical education. The benefits which resulted from these institutions far transcended the most sanguine expectations. Many instances occurred of protracted and distressing affections wholly removed, of weakly organized forms unfolded and invigorated, and of the attainment of extraordinary degrees of muscular energy and elasticity in persons in health.

November 17, 1825. My Dear Sir: I am highly pleased with the idea of a gymnasium. It is a subject which has often occupied my thoughts, and in relation to which it has appeared to me that the fashion of the times needs to be changed. Those who have the charge of education seem sometimes to forget that the body is a part of the man. The number of young men who leave our colleges, emulous indeed, and learned, but with pale faoes and narrow chests, is truly alarming. The common rustic amusements hung about our literary institutions for a long time; but they at length seem to have been entirely abandoned, and nothing, at least nothing useful, has succeeded them. If it be desirable that there should be cultivated intellect, it is equally so, as far as this world is concerned, that there should be also a sound body to hold it in.

I shall most gladly assist in your endeavors; thinking that I do some service

when I aid any measure calculated to enforce on the rising generation a sense of the invaluable advantages of temperance and exercise.

I am, dear sir, most truly yours,
Daniel Webster.

For Dr. Warren.

The diversions of the gymnasium should constitute a regular part of the duties of all our colleges and seminaries of learning; and, to give them the requisite power of excitement, the system of rewards, so dangerous when mismanaged in literary education, might be introduced with beneficial effect. Our young men may surely find time to cultivate those exercises which Cicero, and Caesar, and some of the most studious among the ancient and modern philosophers, considered necessary, and contrived to prosecute in the midst of their studies and affairs.^f Some cases of great increase of muscular vigor and of general health have presented themselves from the regular use of gymnastic exercises, even at an advanced period of life. Among these I might refer to a distinguished member of the legal profession, who first began the practice of gymnastics when nearly seventy years old. He acquired great additional vigor, lived to the age of eighty-four in habits of constant activity, and died at this period in the most easy and tranquil manner. He was one of three generations bearing the name of William Prescott, all of whom have done honor to their country.

^t Cicero is described by Plutarch as being, at one period of his

If the gymnasium is deserted because it calls for too much effort, let me entreat them, at least, to adopt a regular plan of walking. If they are desirous of avoiding the marks of disorder in the face while young, and a dyspeptic, nervous, disabled frame through that part of life, which especially requires health and activity, two hours a day must be devoted to this business.

10. *Exercise among Factory Operatives.*

The foregoing remarks on exercise are, perhaps, sufficiently extended for the general objects of society; but there is a class, which has risen into existence

"within a few years, to whose condition I feel myself called on to advert. A large number of persons in this country have lately engaged in the labor of manufactories. The establishments in which these labors are carried on are, it is well known, better regulated than those in the old world, and the amount of health of the individuals employed in them is undoubtedly greater.

life, extremely lean and slender, and having such a weakness in his stomach that he could eat but little, and that not till late in the evening. He travelled to Athens, however, for the recovery of his health, where his body was so strengthened by gymnastic exercises as to become firm and robust; and his voice, which had been harsh, was thoroughly formed, and rendered sweet, full, and sonorous.

In regard to Julius Caesar, the same author informs us that he was originally of a slender habit of body, had a soft and white skin, was troubled with pains in his head, and subject to epilepsy; but, by continual marches, coarse diet, and frequent lodging in the fields, he struggled against these diseases, and used war, and the exercises and hardships therewith connected, as the best medicine against these indispositions. — *Sir John Sinclair.*

Notwithstanding these favorable circumstances, no one, I think, will maintain that they possess so robust an appearance, and enjoy so high a degree of health, as do the members of families, both male and female, who are occupied in the pursuits of agriculture. The difference in the influence of these occupations is attributable to the difference in the variety of labor, and to that in the atmosphere which is respired by these classes. As to the former of these circumstances, no important changes can be expected, but in the latter much improvement may be made.

The operatives in our manufactories, especially females, ought to form and pursue a regular plan of exercise in the open air during the intervals of labor. This plan, I am aware, will seem to impose on them an additional burden; but the practical effect would, I am confi-

dent, be beneficial. A walk abroad two or three times in the day, at all seasons, would bring into action muscles which are not sufficiently exerted in their daily toil, would give fresh vigor to the circulation of the blood, and inspire them with new cheerfulness in their monotonous routine. In this way it may be hoped that an impending physical degeneration may be avoided in a large and interesting portion of our society.

11. *Compression of the Chest, and its Consequences.*

Females are unfortunately compelled by fashion to adopt partial and unequal coverings of the body. A part of the chest is very much covered, while another part is occasionally exposed. The dangers which spring from fashion are more easily pointed out than avoided. They serve, at least, to place in a clearer light the necessity of inuring young females to exposure, and invigorating them by exercise.

There is one part of female dress, the dangers of which have been made known, but which still continues to be practised; I mean the close girding of the chest.

In what notions of beauty this practice took its origin it is not easy to discover. The angular projections formed by a tightly-drawn cord and certain pieces of whalebone, or steel, are in direct opposition to the models of Grecian or Roman beauty. In the flowing robes of the Juno, the Vesta, and Diana, every part is light and graceful. Nor can we discover, in the representations of the Muses or the Graces, any habiliment which would lead us to believe they wore stays or corsets. The taste of the other sex is uniformly opposed to the wasp-like waist and the boarded chest. Yet, strange as it seems, there is scarcely a young lady of fifteen who has not imbibed a disposition for this species of application, and scarcely a well-dressed lady of any age whose chest is not confined in such a manner as to impede the motions of respiration and the free use of the muscles of the upper extremities. It is true, we are constantly told that they are uncomfortable without these appendages; but this only shows what

great inconveniences we can, by habit, become accustomed to. The Indian nations, who consider the flattened forehead to be a beauty, confine the heads of their infants between two pieces of board corded together; and the child exists under this pressure, and may grow up. Yet there can be no doubt that diseases are generated by it; that some lose their lives, and others their intellects. Still the fashion continues from age to age. I have now in my possession flattened heads which must have lived some hundreds of years since, and others which have belonged to individuals of the existing generation.

Nature has so contrived the human chest that, there is no superfluous play of the parts composing it. Its movements are just sufficient to give such an expansion to the lungs, and such an extent of oxygenation of the blood, as are adequate to the wants of the individual under different occurrences. In females, the chest is shorter than in males; and to compensate for this, the motion of the ribs is naturally more extensive and more frequent. Whatever limits this motion is, therefore, peculiarly injurious, especially as they are more disposed to consumption and other chronic affections of the lungs than the other sex. The ligatures in the fashionable dress are placed precisely on that part where the motion should be greatest; that is, below the middle of the chest. It is precisely here, that, in case of fracture of the ribs, when we desire to stop the movements of the chest, we apply a tight bandage; though rarely do we venture to make it so tight as the ordinary corsets. The effect of such pressure, begun at an early period of life, will be understood from what has been stated in regard to the spine. The bones must yield to it; their shape become permanently altered; the lower part of the breast contracted; the space destined by nature for the heart and lungs diminished; and what the fatal results of all this on these tender and vital organs are, every day's experience shows us. The influence on the health, though slow, is certain. It may not at once produce consumption, but it lays the foundation

for ills painful to describe. By way of specification, among other diseases of which this is the fruitful germ, I might adduce a number of instances of perpetual headache, at last bringing on insanity, and terminating in death.

The immediate cause of the disease was the compression of the heart and great blood vessels, and the consequent accumulation of blood in the head.

As young ladies are disposed to this practice, probably by fancies communicated by their companions, those who have charge of them should not only inculcate the prohibition of these applications; they should, for themselves, observe whether any thing is wrong; and after the young ladies have reached the age when dress is considered a primary object, they should resolutely oppose every encroachment on the rights of the vital organs beyond what is required by a decent attention to the prejudices of the day.

12. *Reflections.*

Too much of the time of the better educated part of young persons is, in my humble opinion,

» Within a few years, the practice of tight lacing has so far diminished, that we now and then have an opportunity of seeing the female form in a dress which does not wholly conceal its natural symmetry and grace. It would be thought singular if this pernicious practice, thus becoming unfashionable in the one sex, should have been adopted by the other, as is believed to be the fact.

devoted to literary pursuits and sedentary occupations, and too little to the acquisition of the corporeal powers indispensable to make the former practically useful. If the present system does not undergo a greater change than has taken place within the past few years, it is much to be apprehended we shall see a degenerate and sinking race, such as existed among the higher classes in France before the revolution, and such as now deforms a large part of the noblest families in Spain. I am informed, by a lady who passed a long time at the Spanish court in a distinguished situation, that the grandees have deteriorated by their habits of living and the restric-

tion of intermarriages to their own rank; and, though fine persons are sometimes seen among them, they, when assembled at court, appear to be a group of manikins. But if the spirit of improvement, so happily awakened, continue to animate those concerned in the formation of the young members of society, we may be able to exhibit an active, beautiful, and wise generation, of which the age may be proud. II. — THE FUNCTION OF DIGESTION. 1. *General Observations.*

The renovation of organized structures is accomplished by the process of digestion. This, whether it take place in vegetables or animals, is effected by the assimilation of external substances constituting the food which is to be appropriated to the structure to be repaired.

The digestive organs are very simple in vegetables. Food is taken from the earth by the radicles of plants, circulated in the vessels, elaborated or digested in the leaves, and sent to the different parts of the plant for their support and development. In most animals, the apparatus of digestion is much more complicated. In the lower classes, it is, in truth, but little more complex than in vegetables; but in the higher animals, and in man, it forms one of the most extensive parts of the animal economy.

The primary and most essential portion of the digestive apparatus in man is the stomach. Into this cavity articles of food are introduced in great variety, and these, in the course of a few hours, are gradually dissolved. The power by which this solution is accomplished has been ascertained to be a liquid exuded from the coats of the stomach, similar in its aspect to liquid saliva, and which has been denominated the gastric fluid, or juice. The experiments of Spalanzani, Stevens, and others, and finally those of Dr. Beaumont on Alexis St. Martin, an individual who had an aperture in his stomach from an accidental wound, have proved, that, when food was introduced into an empty stomach, this exudation was seen to take place in proportion to the quantity of food received into the organ within certain limits. The food, brought into contact with the dif-

ferent parts of the stomach by the action of its muscular coat and by the movements of respiration, is attacked by this Hquid in successive portions, and gradually melted into a homogeneous mass. An opportunity was presented to me of examining and verifying this remarkable phenomenon. I saw the interior of the stomach of St. Martin, and saw him discharge a quantity of water he had recently drunk through an aperture in the side of his body. He lived many years in this condition, enjoyed a good appetite and good health, except when he drank brandy and water, which he was much inclined to. St. Martin is now dead, and Dr. Beaumont has followed him, after possessing for a long period the best opportunity of investigating the physiology of the stomach which is recorded in the annals of medical art.

In a healthy stomach, a moderate meal is digested in four hours, and then the food is pushed by the stomach into the duodenum, a sort of second stomach, in which, and in the tube below, "the nutritious liquid is separated from the solid part of the food, then absorbed, and carried into the blood vessels, and circulated through every part of the animal body. It may, therefore, be said that the whole of the drink taken into the stomach, and a considerable part of the solid food, ultimately make their way into the blood vessels, and are circulated throughout the animal system.

2. *Effect of Liquids on Digestion.*

It has been also observed, that, when liquids were taken into the stomach at the same time with solids, the liquids were separated from the solids, and disappeared. Both reasoning and observation have plainly shown, that, while any considerable quantity of liquid remains in the stomach, the gastric fluid is too much diluted to accomplish the solution of the food.

From the facts above mentioned we consider it to be established, that the taking of quantities of liquid at the same time with solid food does not promote the digestive process, but interferes with and suspends it. Hence the swallowing of large quantities of fluid of any description, such as wine, tea, coffee, or

even water, is not consistent with a healthy and speedy digestion. The practice of drinking at our meals is so universal as to make it appear like a second nature; but it is, in fact, contrary to nature. Animals do not drink at the time they eat, but some hours after; and they generally take very small quantities of liquid compared with that which is used by man. The savage, in his native wilds, takes his solid food, when he can obtain it, to satiety, reposes afterwards, and then, resuming his chase through the forest, stops at the rivulet to allay his thirst. The disadvantage of taking a large quantity of The distinguished Professor SULIMAN, among other valuable suggestions in a letter addressed to me on this subject, has made the inquiry, whether water may not be converted into nutriment, and whether this fluid is not necessary to preserve the pliability of the body. To this it may be answered, that water may no doubt be converted into nutriment, as it has been established by many facts, that, in persons deprived of food, life can be maintained longer by the use of water than without it. Water has another use under these circumstances — that of filling the blood vessels, and thus keeping up the action of the heart. Moreover, it has been stated that the moderate and seasonable use of fluids is not intended to be proscribed, and that a large proportion of fluid is contained in all the solid we employ for food.

liquid must be obvious when it is considered that the digesting liquid is diluted and weakened in proportion to the quantity of drink. Children, especially, are much mismanaged in this particular. We begin at an early period of life to drench the stomach of a child with large quantities of milk and water, of simple water, or of some other liquid. The poor child suffers from distention of the stomach, and, complaining frequently, the mother supposes it to be hungry, and drenches it with additional drink till it can take no more. If the child still continues to suffer, she presumes it may be affected with worms, and many violent purges are given to destroy these supposed invaders. The digestive apparatus

is thus weakened still more; chyle is imperfectly formed, the blood itself hence becomes weak and impure, and in this way the seeds of scrofula may be developed. 3. *Temperature of Drinks.*

The temperature of our drinks is another point worthy of attention. Very hot and very cold drinks are unfavorable to a healthy action of the stomach; the former by diminishing the tone of this organ, and the latter by suppressing its secretions. Cold liquids are, in our present habits, more copiously used than hot; and it is, therefore, more necessary to guard ourselves against them. Ice, iced water, and iced cream are valuable remedies in the hands of the physician, but objectionable as luxuries or articles of daily food.

There is a practice very extensively adopted in this part of the country, especially among ladies, of using iced water, and cooling the stomach below its natural temperature. Dr. Beaumont found in the stomach of St. Martin that a glass of very cold water lowered the animal heat of the gastric organ for a period of half an hour. The process of digestion would, of course, be retarded during this time. Ices taken freely and hastily into the stomach must produce the same effect. The employment of this luxury, therefore, during or after a full and luxurious meal, is an attack on the digestive function, which must disturb its natural and healthy progress.

4. *The Effect of Stimulating Drinks; Medical Abuse; Sudden Disuse; Ethereal Intoxication.*

Animal food should be sparingly taken by young persons who use little exercise; and children, generally, do not need it. Bread and milk, and fruit, are the best articles for children. Wine is highly pernicious to young persons. It is a slow but certain poison. Before the body has attained its full growth, there is an overplus of excitability; and if to this is added the powerful agency of wine, or any other stimulating drink, the constitution cannot fail to be hurt. Females are more injured by stimulating drinks than males, because their system is more susceptible of physical excitement. The nervous power is more en-

ergetic; the pulse and respiration are quicker; and the development of animal heat greater. Hence it is, that they require less covering in cold weather, and suffer more inconvenience from heat, than the other sex.

Stimulating drinks are of pernicious effect in two ways: 1st, by diluting the gastric fluid, as above stated; 2d, by over-stimulating the stomach. When food is taken into the stomach, the inner coat of the organ is excited, and thereon becomes reddened from an increased flow of blood; this is a natural excitement of the organ. If stimulants of any kind are thrown into the stomach, it becomes over-excited, and, like all other over-excited parts, suffers a proportionate debility afterwards. If then a quantity of alcohol and water, or wine, which is a mixture of alcohol, water, and some vegetable substance, are taken into the stomach at the same time with the food, the over-excitement must be injurious. It may not, indeed, produce immediate disease or death; but it lays the foundation for the former, and shortens the road to the latter. A single excess or debauch takes off something from life; and when this excess is frequently repeated, even if not carried to habitual intoxication, the effect must be materially to diminish the term of existence. One of the effects of the over-excitement produced by stimulant liquid on the stomach is, a separation of the cuticle, or epithelium, which guards its inner coat, and the formation of little canker spots in the interior of this organ. This was often observed by Dr. Beaumont in the stomach of St. Martin when he had taken much alcohol.

All alcoholic drinks have the property of preventing the decomposition, and of course the digestion, of food. This property it is that enables us to preserve portions of the flesh of animals for a great number of years, when steeped in alcohol.

The employment of the tinctures or alcoholic preparations of medicine has been a frequent cause of the habitual use of ardent spirits, and the consequent production of ill health and even of positive disease. The sensation of warmth

communicated to the stomach, and the temporary exhilaration, would naturally lead to a repetition of the cordial. In this way the use of such articles became so common in these parts, that, in the year 1827, the State Medical Society passed a resolution containing a warning against the frequent and protracted use of stimulant drinks in the convalescent stage of fevers and other diseases. This expression of opinion had the effect of greatly reducing the use of medicines in this form during a year succeeding its passage; but whether the diminution has continued, I am not able to say. The reasons in its favor are so closely connected with the health of individuals, that it has been thought expedient to introduce at the conclusion of these remarks some considerations on the possibility of substituting other preparations for the tinctures.

Many persons, and even many medical men, believe that there is danger in suddenly abandoning the use of stimulant drinks. Most of the great English physicians appear to be of this opinion; and they seem to be particularly clear in regard to the ill consequences of the abandonment of ardent spirits in those who have become diseased by the habitual use of these articles. In this country, where more has been said and done on this subject than in any other, a very great mass of experience has been accumulated. The results of this experience are, that persons in health and in disease, with certain exceptions, may safely break up the habit. We know of hundreds of instances, and there is reason to believe that thousands exist, of a sudden and total abandonment of the use of ardent spirits, and of all the fermented liquors, without bad consequences. This mode has, therefore, been adopted generally, wherever the temperance reform has extended itself, in preference to the difficulties of a gradual abandonment. Vide "Use of Alcohol in the Preparation of Medicines."

This method has been based on a multitude of observations, tending to show that the gradual disuse of habitual stimulants can rarely be effected. We therefore always recommend to those in

health to break off the practice suddenly, and we do it generally in cases of disease brought on by the use of these articles. By supporting the patient with small quantities of good, nutritious food, we succeed in bringing him right without resorting to the deleterious fluid. The worst cases of this description are those of delirium tremens occurring in drunkards from violent injuries, such as fractures and extensive wounds. In such instances, the patient may, perhaps, be saved, if it is possible to save him, by the use of opium.

Without going into further detail, we feel quite authorized to state, as a general rule, that the use of wine and other stimulating liquids may be suddenly relinquished by persons in health without bringing on disease, and that, in the greater number of instances of those disordered by them, there is, on the whole, more safety in abandoning than in continuing the practice.

Since the diminution in the use of stimulant drinks in this country, other modes have been resorted to for a pleasurable excitement — opium and tobacco among males, and ether among the more delicate and sensitive sex. These practices have not an equal immoral tendency with that of stimulant drinks; but they all tend to debase the intellectual, corrupt the physical faculties, bring on ill health, and produce incurable nervous affections. Opium and tobacco eaters there are and always will be, notwithstanding the pernicious effects of these narcotics; but that the more moral of the sexes could plunge into the brutality of ethereal intoxication, at the risk of all that is pure and holy, would not be credible, if there were not abundance of evidence to support the fact.

The introduction of ether as an anæsthetic in surgical operations, and the use of chloroform to allay the pangs of parturition, have, we are well informed, induced a growing habit in the sex to employ these articles for the relief of trifling ailments, and even for the purpose of procuring a brief intoxication. Susceptible nervous females are most likely to fall into this practice, and most liable

to be dangerously affected by it. Without detailing the particular evils this habit will inevitably induce, we think it sufficient to warn the sex that such evil practices do exist, and that it is their duty to avoid the first steps which may lead to them.

5. *The Quantity of Liquid required.*

The quantity of drink required for health and comfort is very small. In cold weather, a pint of liquid in twenty-four hours is sufficient: in the hot seasons, this quantity may be increased; but this increase is rarely necessary, except in the laborious classes, if a reasonable amount of fruit can be obtained.

6. *The Quantity of Food required.*

The agent in the digestive process being a fluid, formed in limited quantity, it is obvious, that, when the amount of solid food taken into the stomach is too great in proportion to the quantity of this gastric liquid, the whole of the solid cannot be digested in time to prevent it from undergoing the acid or putrefactive fermentation. The fermentation thus generated is productive of every degree of suffering, especially from the following symptoms, viz., a burning sensation in the stomach, foul breath, and frequent eructations of offensive gases. Further, the existence of a putrefied mass in the centre of the human body must, if it occur frequently, lay the foundation of disorder.

The Author of Nature did not destine his offspring to be the victims of complicated and protracted diseases. In a state of nature, disease is comparatively rare; and the conveniences of social life, if rightly employed, would aid us in the prevention of those affections to which the savage state is obnoxious. So that, instead of being less healthy than in a state of nature, we might be more so. To attain such a state, however, we should be compelled to alter our habits to a greater extent than our social organization would admit. This change being impracticable, the best thing to be done is to realize, that all that part of society who are not called to daily and constant labor constitute cases exceptional to those laws which the Author of Nature has been pleased to establish for the

whole race. By a due consideration of this exceptional state, as applied to ourselves, and a right accommodation of our habits to this state, we may prolong life, and avoid much suffering.

The inhabitants of the Philadelphia Penitentiary, confined to a uniform regimen, which almost necessarily limits itself, enjoy uninterrupted health. Those who were diseased from bad habits before they became its tenants are effectually cured after a short residence there. I say this from personal knowledge derived from an examination of the prisoners.

Regulation of the food is of primary consequence towards the formation of a good constitution. The most common error in relation to it consists in the use of too much food. Nature has given us organs of a certain capacity, on the presumption that, being called on to manual labor, we should then require a large quantity of food. Muscular effort exhausts the strength, and requires renovation by nutritious substances; but when the muscular efforts are small, the quantity of nourishment required is comparatively less; and if, in consequence of the appetite, a large quantity is taken, the result will be pernicious, directly or indirectly. Parents are uneasy when their children eat but little, and would encourage them to eat against their inclination. No mistake can be more pernicious to health; and if persevered in, disease will infallibly result from it. When the child wants appetite, instead of being compelled to take food, it must be compelled to take exercise, unless positively ill, and then it must be compelled to take medicine.

The quantity of food, then, is not to be regulated by our appetites, but by our occupations. A great deal of exercise requires a great deal of food; little exercise will tolerate only a moderate portion of food; and if we offend against this rule, we must expect to suffer some form of disease sooner or later. Liebig has clearly elucidated, what was settled before, that food and clothing should be in an inverse ratio. An individual exposed to cold requires a greater amount of food than one in whom the animal

heat is retained by warm clothes and a warm atmosphere. On the other hand, those who live in an elevated temperature, whether natural or artificial, must take less nourishment, or expect to have the organs clogged by unassimilated food.

Inhabitants of warm climates require less food than those of cold. The Italians, Spaniards, and other southern people eat less than the English, Swedes, and Danes. Chevalier di Renzi, an eminent physician of Naples, in good health, and well constituted, told me that his habit was to rise early, go out on business, and return to breakfast at two o'clock; after which he took a very moderate meal in the evening; and he added, that this course was pursued by his contemporaries. In a great number of instances we are able to trace the origin of diseases, at first view not connected with digestion, to derangements of this function. In the course of my professional experience, I have had occasion to witness many instances of acute disease originating from a single excess. A person much exposed to cold, and wet is more liable to be dangerously affected after taking an inordinate meal. Some species of typhus undoubtedly begin in disorders of the digestive apparatus; for it has been established by Louis and others, that derangement of the bowels occasionally precedes an attack of fever, even at some distance of time. Gout, though generally produced by combined excess in eating and drinking, is, I have had occasion to notice, often the consequence of excessive eating alone. Scrofula likewise, though the disposition to it is generally hereditary, may be developed by an improper use of food. We could go on and Sir James Clark, one of the most able physicians of our times, in his *Treatise on Pulmonary Consumption and Scrofulous Diseases*, says, "An imperfect supply of food, or food of an innutritious quality, forms a very efficient cause of scrofula, although we have rarely an opportunity of observing the effects of this alone; because, when the means of procuring proper nourishment are wanting, other causes are generally in action at the

same time, such as residence in ill-ventilated and dark apartments, exposure to cold from imperfect clothing, &c.; all of which are often combined, and hence more speedily effect the deterioration of the health. But proper food, when taken in excess, or when of too exciting a quality, may also induce tuberculous cachexia in youth — a circumstance which is not sufficiently attended to, I may say not generally understood, even by medical men; nevertheless, I hold it to be a frequent cause of scrofula. The adaptation of the food, in quality and quantity, to the age of the individual, as well as to the powers of the digestive organs, is too little considered, and the evil consequences of this neglect are often evinced in the children of the wealthy classes, who are frequently allowed an unrestricted use of the most exciting kinds of animal food, than which there cannot be a greater error. By a too stimulating diet at this early age, the digestive organs become over-excited; the biliary and other secretions connected with digestion are diminished; congestion of the abdominal circulation ensues; and the skin, sympathizing with the irritation of the internal surfaces, becomes dry and harsh, and cutaneous eruptions, or copious perspiration, are common consequences. The ultimate effect is often tuberculous disease, which is generally attributed to imperfect nourishment; and, on this erroneous view, steel and other tonics and stimulants are often prescribed, by which the evil is increased." specify a great number of diseases which undoubtedly take their origin from disorders of the stomach, liver, and intestines, and which are brought on by the abuse of food; i. e., by a disproportion between the quantity of food and the quantity of exercise. Habitual temperance in the use of food is, therefore, indispensable to the healthy action of the physical powers.

From the preceding remarks, it appears that persons of different occupations require different quantities of food. The point we wish to ascertain is, what amount of food is necessary for those who do not live by manual labor.

Such persons generally consume three or four pounds in a day. That this quantity is too great there can be no doubt, and of this a distinct proof is found in the following fact. The seamen in the British navy were formerly allowed to eat as much as they desired;—of late years, however, the quantity of food has been fixed at about 32 oz., or $\frac{1}{2}$ lb. avoirdupois; and the result has been, that a smaller number have been found upon the sick list since the introduction of this regulation. If, then, the laborious British seamen can be kept in the best possible condition by two pounds, or two pounds and a quarter, of solid food, certainly a much less quantity would be proper for a gentleman in England or in this country. This quantity we might fix, perhaps, at from one pound to one and a half. It is said, and I apprehend on very good authority, that the soldiers of the American army are allowed not less than four pounds of solid and four pounds of liquid a day. What a multitude of diseases in our army might be traced to this bountiful supply of food! What a preparation it must make for typhus fever, yellow fever, cholera, &c.! The loss in our army by disease in the Mexican war is said to have been much greater than that from the hostile army! and it is known that a great portion of it arose from errors in regimen.

Vide Carpenter's Human Physiology, p. 382. HI. — CONSTIPATION.

The retention of any of the habitual excretions produces derangement of the animal economy. The suppression of the cutaneous exhalations is followed by local inflammation. The suppression and retention of urine bring on a sudden paralysis of the nervous system; and the suppression and retention of the contents of the alimentary canal produce indigestion, foul breath, hemorrhoids, chronic headache, cutaneous affections, and, in fact, a vast number of diseases, which, though not all arising directly from this source, may be traced to its remote and gradual influence.

1. *Causes of Constipation.*

Constipation of the bowels is frequent in persons of sedentary habits, especially those called by profession to constant

mental occupation; while bodily activity and a correspondent inception of food protect the cultivator of the soil. The most common cause of this evil would, therefore, seem to be an inert state of the bowels from want of exercise and of sufficient stimulus from food. Weakness of the bowels, a deficiency of mucous secretion, and, above all, an absence of healthy bile, are also common causes. The bile being the natural purgative, its deficiency will, of course, leave the intestines in a torpid condition; and thence it happens that, in persons constitutionally costive, the liver is found to be in many cases unnaturally small. Dry atmosphere predisposes to this affection; and we find, therefore, that the inhabitants of the eastern parts of the United States are more disposed to it than those of the damper climates of England and Holland. For this reason it is, no doubt, that the latter are able to make great use of astringent wines with less consequent inconvenience than the former.

The use of improper articles of food is a frequent cause of constipation. Food is composed of two kinds of substance, possessing different properties; one soluble and nutritious, the other insoluble and non-nutritious. The former is taken up, in a great measure, by the absorbent vessels, and conveyed into the blood. The latter, the non-nutritious, remains in the intestines, stimulates their action, and is subsequently expelled. One of the most remarkable of the nutritious substances is fine wheat flour, a very common article of food. This, in its varied preparations, unless counteracted by some other article, is an indirect cause of costiveness; and the reason is, that its particles are in a great measure absorbed. The same is true of other substances containing a considerable proportion of nutritious matter. Such are jelly, arrowroot, starch, milk, and its preparations. I knew a learned gentleman troubled with dyspepsia, who had come to a conclusion to live wholly on nutritious substances, which, being easily absorbed, he thought might be taken without indigestion. After he had employed this kind of food for some

weeks, the intestines ceased to act with sufficient energy. It was even difficult to excite them by medicinal substances, and he came near losing his life.

The insoluble part of the food is of no use for the purposes of nutrition, since every substance to be taken up by the absorbent vessels must be in a state of solution. Such are frequently the coverings of seeds and fruits, woody fibre, etc. Skins of fruits, especially dried fruits, which have been eaten, are constantly seen in the evacuations. Seeds, as those of mustard, etc., are well known to pass through the whole intestinal tract in an unchanged state, in consequence of the insolubility of their outer coats. Hence it happened, when these articles were medicinally employed, some thirty years ago, that in some cases the intestines became ultimately filled with insoluble matter, actually plugged by them, in such a way that nothing but mechanical means were sufficient to remove the obstacle and save the patients' lives. In these instances they were relieved, not without much suffering, by breaking down the concreted substances and extracting them with scoops and forceps. The same kind of obstruction is said to have been produced by accumulation in the intestines of the remains of undigested nuts and raisins.

A great alarm has been excited in regard to magnesia, because some persons have died from its excessive use, and the intestines, it is stated, have been found paved with it. This is possible. Magnesia is an earth, insoluble in the human stomach to any considerable extent. When it is taken in small quantities and of the best quality, it unites with, and is neutralized by, the acids it meets with in the digestive tube, — hydrochloric, carbonic, lactic, etc., — and salts more or less soluble are produced. But when the quality of the magnesia is bad, and the quantity great, the acids of the digestive canal are inadequate to its conversion into a salt; and, mass being thrown in upon mass, the intestines will ultimately be clogged, and sometimes wholly blocked up.

The immediate consequence of the

retention of excrementitious matters is the absorption and passage of part of them into the blood. For, although there seems to be a natural repugnance in the intestinal lacteals to the absorption of excrementitious matter, this repugnance may ultimately be overcome, and absorption of the fecal contents of the intestines take place. The consequences will be offensive breath, dyspepsia, cutaneous eruptions, etc., as already mentioned, and an impure state of the whole mass of blood.

2. Remedies for Chronic Costiveness.

The principal of these are either medicinal or alimentary. Of the former, I shall mention only four — aloes, magnesia, the extract of dandelion, and the wine of senna produced by fermentation. The bitter quality of aloes seems to render it a proper substitute for the natural purgative, bile. A few grains of the substance of this gum in the state of powder are a mild and effectual purgative. The watery extract, or inspissated solution, in the dose of from five to ten grains, combined with an aromatic, such as a drop of oil of anise or oil of nutmeg, taken fasting, is one of the mildest laxatives.

It is a common practice to take a laxative medicine at night. There are objections to this. One is, that the stomach usually contains a quantity of food, and the medicine, being intermixed with this, is sometimes too much diluted, sometimes altogether buried in the alimentary mass, and thus becomes ineffectual. Another objection to taking medicine at night is its having the effect of disturbing repose, especially if the patient be of a nervous temperament. The proper time, therefore, is when the stomach is empty, as before dinner or before breakfast.

The mildest, though not the most certain, of all laxatives is pure magnesia. This useful preparation, as made by English chemists, may be taken in the dose of a teaspoonful in two thirds of a wine glass of water, with the addition of four or five drops of tincture of peppermint, at night — being therefore an exception, in this respect, to other laxatives. It is so mild that it does not disturb the night's sleep, and combining,

as it does, with the acids which have been generated in the stomach during the day, it is likely to be more completely neutralized under this circumstance, and to have a more certain effect. When the stomach is not acid, the juice of half an orange will aid its operation.

The extract of dandelion combines a tonic with a laxative virtue. Many think it is to be preferred to other laxatives, because its action causes less sinking of the bowels than other medicine. A moderate dose is a teaspoonful, or about one drachm; but many persons require double or triple this dose. The way in which I have recommended it to be taken is to dip a teaspoon into ginger syrup, then to spoon up the dandelion and dip again into the syrup, when it may be swallowed very conveniently. Another mode of taking this article is by dissolving a teaspoonful in a wine glass, or about two ounces of hot water, and adding a drachm or a teaspoonful of ginger syrup.

The fourth substance — one which I have employed lately with much satisfaction — is the wine of senna, produced by the fermentation of infusion of senna with sugar, according to the process of Dr. Butler Lane. The dose of this for an adult is from half an ounce to two ounces; being slightly stimulating, it may be taken for an oppressed stomach at night. If used in the morning on an empty stomach, it should be diluted with an equal quantity of water.

A curious fact connected with the operation of purgative medicines was brought to my knowledge in the early part of my practice, perhaps thirty or forty years ago. On visiting a patient the day after a purgative medicine had been advised, and inquiring if it had operated, I was occasionally told that it had eight or ten hours after it was administered, but that dejections had occurred before the operation of the medicine, within an hour from its administration. This at first appeared to be accidental, but ultimately it was ascertained that the first operation was no less the effect of medicine than the others, but that, in the first case, the purgative had not passed through the bowels, and that

there was an interval of many hours between the first dejection and the actual passage of the medicine. The conclusion, therefore, was, that the first dejection was the effect of sympathy or reflex action between the stomach above and the intestines below. This observation, which is of some practical importance, I have been able to confirm by the experience of some of my most distinguished colleagues. 3. *Injections.*

It would not be proper to pass over injections, so generally employed abroad and so little in this country. Their application is to be preferred, when it answers, to that of any cathartic. A valuable use of this remedy has been introduced by the followers of the much-exalted and muchdenounced Broussais, on the supposition that it would extinguish inflammation of the intestinal mucous membrane. Cold injections into the rectum were proposed by them, and it was shown that cold water might be thus employed without alarming consequences. For the relief of the bowels, the prevention and cure of hemorrhoids, the mitigation of urinary and uterine derangements, cold water, in quantity from a gill to a quart, is most valuable.

Fifty years ago, I first heard of a distinguished Italian lady who was in the habit of dashing the abdomen with cold water, for the relief of the bowels. This fact, considered so wonderful at the time, made a deep impression on my mind, and led me to recommend for this purpose, with excellent effect, a sponge with cold water, or the hip bath, and finally general shower baths.

4. *Preventives of Constipation; the Use of Cracked Wheat, and its Effects.*

The most important of the remedies applicable to constipation are to be found in articles of food. Some individuals have discovered substances of this kind which suit the exigencies of their constitutions, and carry them comfortably through life. The greater part of those subject to this derangement are obliged to temporize with their trouble, and employ different substances under different conditions.

Fruits are among the most useful and agreeable of these. Fresh fruits are

preferable to dried, because a large portion of the latter consists of a skin which is with difficulty attacked by the gastric fluid. Whether fresh or dried, fruits, if used to aid the bowels, should be taken when the stomach is free from other food, especially before breakfast and before dinner. The use of fruit after a regular satisfactory meal of meat and vegetables is a common cause of cholera, and other disorders of the bowels, by bringing on the acetous fermentation. Fruits and vegetables produce their laxative effect by their acid and saccharine qualities, and also by the bulk of their effete or insoluble portions. The laxative vegetables are not very easily digested by patients who have weak stomachs, and they are often obliged to abandon them on account of the distressing flatulence which follows their use. On the other hand, a beneficial effect results from acids in some peculiar cases. Some children, after weaning, become excessively costive; this state may be altered by an infusion of cranberries, slightly sweetened. It is likely that any other smart vegetable acid would have the same effect. Some individuals find great advantage in drinking a glass of cold water before breakfast; and it is a practice of others to drink a cup of strong coffee before rising in the morning. The rise of these drinks must be accommodated to different constitutions.

Animal food has rather a laxative effect than the reverse, perhaps by the animal oil intermixed with its fibres. Fatty substances are, in fact, generally laxative, but they are also-uniformly unmanageable by weak stomachs. The Laplanders, and other inhabitants of very cold regions, as well as a certain number of individuals elsewhere, are able to take, in large quantities, the fat of various animals, without exciting a revolt in the stomach.

Some individuals use great quantities of wine, under the belief that the bowels would not move without. The laxative effect in such a case would arise from the pressure made on the intestines by the bulk of the liquid. Perhaps, again, the wine taken in this way exerts a toxic

or poisonous influence, which causes the bowels to throw it off; and the notion is confirmed by the fact that this practice, so far as I have seen, has uniformly terminated in dropsy, or some other chronic affection. Most of the wines we are acquainted with, when taken in moderate quantities, constrict the fibres of the intestines, and produce costiveness. This is certainly the effect of sherry, madeira, and other strong white wines; and still more so of brandy and every form of alcohol. The use of articles having a stimulating effect is followed by indirect debility and constipation.

Many persons are unfavorably affected by the use of coffee. The toxic principle causes headache, giddiness even to falling, etc. Some years ago, my attention was called to a preparation of coffee by Dr. J. M. Langdon, of Kennebunkport, Maine, which he considered to be divested of the toxic principle in a degree sufficient to obviate the evils mentioned above, without impairing its agreeable flavor. This preparation I have employed almost without interruption for the last fifteen years, and have recommended its use to many friends and patients. The mode of preparation I am not acquainted with, but know that there is no foreign admixture — the bean being presented to me in its entire state, and never burned nor ground, as is the practice in many foreign countries.

The cerealia were perhaps the earliest, the most general, and the most valuable articles of human food. Wheat, rye, barley, oats, and maize are employed in different countries, according to the properties of the soil and the taste of the inhabitants. Wheat seems to be more extensively used than either of the others, and is, perhaps, the most palatable and the most digestible. This grain is not used entire. It consists of, principally, two substances; the coverings, or part containing, and the flour, or part contained. In the early ages of the world, these were probably employed together; but art has been directed to their separation, and has reduced the flour, as nearly as possible, to the state of an impalpable powder.

Flour, taken apart from its coverings, has a most constipating property. Its great use by the inhabitants of towns and cities will, therefore, go far to explain why constipation is so general. The separation of the coverings from the flour, as usually practised, seems to counteract the intentions of nature, which undoubtedly destined them to be employed together. The external skin of the grain, thus thrown away, contains important properties; and instead of being in a great measure rejected, it should be altogether preserved and ground up with the flour. This substance, which is known by the name of bran, is the part which prevents the flour from producing costiveness.

About the year 1825, I began to use bread in which the bran was retained; and after having employed it a considerable time in my own family, I ventured to recommend it to others. For some time it was ridiculed under the name of sawdust bread; but finally, in a very slow way, it came to be employed by a large number of persons, its valuable properties were ascertained and admitted, and it has now come into general use. In a tour through Europe, about fifteen years since, I found that this same bread was becoming an article of food for the upper classes in London, Paris, and Rome. Among poor people, a brown bread is employed in most countries of Europe, and probably has been from time immemorial. In Germany, coarse meal is made into cake, with oil, and forms a convenient food for horses on a journey.

Some years ago, it occurred to me, that, as the brown wheat bread was beneficial on account of its coarseness, but was not sufficiently active in all cases, it might be well to use the wheat in a coarser state, and without making it into bread. I therefore directed some wheat to be ground in a coffee mill, and after boiling three or four hours, a little salt having been added, it was found very palatable. This substance has a better effect in preventing constipation of the bowels than any article of food I have ever met with, after many years of observation and inquiry. When the stom-

ach is very weak, it will not bear it in sufficient quantity to answer the purpose. But for costive people in general, it will produce quite a remarkable revolution, and a consequent favorable change, in the appetite and general health, when taken in the right quantity; and this I consider to be about twelve ounces for an adult. It may be used at breakfast as a part, or, when the case requires a large quantity, as the whole of a meal, and at dinner as a substitute for puddings and vegetables. For the evening meal, I have rarely recommended it. By those who require some addition to render it savory, the substances which are employed with hominy for the same purpose may be used, such as milk, butter, cream, or molasses. The sweet articles are not well borne by a weak stomach, especially molasses; but when they can be used without inconvenience, they add to the laxative efficacy of the wheat.

The preparation of it consists in washing clean in cold water, then in boiling from three to four hours, adding water, from time to time, sufficient to bring it out with about the consistence of hominy or boiled rice. The longer it is boiled, the more agreeable it is, but less effectual. A moderate degree of fluidity — for instance, that of boiled rice or hominy — renders it more laxative.

The principles on which the coarse wheat operates as a laxative are not very obvious. M. Millon has reported to the Academy of Sciences that the bran of wheat possesses various valuable properties not before known. Whether any of these are calculated to have a purgative effect, we know not; but such may possibly be the fact. The wheaten bran operates in two ways: first, by the stimulus of the edges of its branny particles; second, by mere bulk. It may be supposed to operate in the first mode by the undissolved portions of bran acting on the mucous coat of the intestines, exciting thereby the nervous energies of the parts, and producing contractions of the muscular fibres. Secondly, bulk is necessary to keep up the action of the bowels, as has been already shown in the allusion to the effect of highly nutri-

tious substances, which, being in a great measure taken up by the lacteals, leave no mass of insoluble matter to fill the calibre and excite the action of the intestines. People who eat much food are more regular in the bowels than those who eat little; though they may be obliged to pay for this advantage by the injury done to the overburdened stomach.

Superfine flour bread, as has been stated above, is not a healthy article of food for man or animals. Dr. Truman, in his *Rules for Diet*, says, "The French plan of eating enormous quantities of bread at dinner is unwholesome for most people, unless they take very violent exercise: a very liberal allowance of bread is always apt to induce headache and a confined state of the bowels." Animals, so far as I have observed, do not like, and for the most part cannot live upon, fine bread; whereas many animals, even carnivorous, can subsist on coarse wheat bread. Dogs, according to the French physiologists, die after feeding about three weeks on fine bread, but will live on coarse bread an indefinite time. Birds are very fond of coarse bread and of cracked wheat hominy, which they eat with avidity; and it agrees with them. There is reason to believe that the vertebrated animals generally can be subsisted on coarse bread, but not on fine. Many persons object to coarse bread, that it is not so agreeable as fine. This sentiment is the result of habit; for those who have been accustomed to use the coarse bread, for a reasonable time, find it sweeter to the taste, and more satisfying to the stomach, than the other. It seems, then, unfortunate that fine flour, an article of food which is deficient in some principle necessary to its healthy action on the animal economy, should have been so long employed, and so widely spread, among the population of cities, and, in truth, among a great mass of people elsewhere.

Truman on Food, p. 161. London, 1842. My authorities for these experiments I am unable, at this time, to quote, many years having elapsed since I read them; but, as they were published in the pop-