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HEALTH, DISEASE,

AND

LONGEVITY,

CONSIDERED IN RELATION TO ~~DIET~~, REGIMEN,

AND THE

GENERAL PRINCIPLES OF HYGIENE.

BY

LIONEL JOHN BEALE, M.R.C.S.,

AUTHOR OF THE "LAWS OF HEALTH," ETC.



LONDON:

SAMUEL HIGHLEY, 32, FLEET STREET.

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1854.

151. c. 18



LONDON :
T. E. METCALF, PRINTER, 63, SNOW HILL.

P R E F A C E.

HYGIENE, or the Art of Preventing Disease, has of late years attracted attention, as of equal, if not of more importance than the art of curing disease. Both branches of the science of medicine require the attention of the medical practitioner, but the former is that which most deserves the attention of the public, because the means of preventing disease are more intelligible, of more practical application, and not liable to do the mischief which too often results from the treatment of disease, unless based on an intimate knowledge of the subject. The laws of health in relation to the prevention of disease, may be learned and applied by all: perhaps, when the subject is more appreciated, it may become, as it ought to be, a branch of public

education; in some degree, however, public attention has been drawn to the subject, and very great good has resulted.

My work on the "Laws of Health" has, I am told, been of some service in helping to diffuse a knowledge of Hygiene; and I trust the present, being calculated for wider circulation, may still further extend information on this subject, one of the most important to which civilized man can direct his attention; for health of mind is so connected with health of body, that in a definition of the word "health," we must include both. An opinion is too generally held and acted upon, that disease is so certainly the lot of man, that to be free from it is the exception, and not the rule. This is a mischievous opinion, for it induces that negligence of the means of preventing disease which are within the reach of all. That health depends on the will of the individual, is much more nearly the rule; and its possession is more within our own management than we are always willing to admit. That a highly civilized and refined condition of society throws impediments in

the way of preserving health is unquestionable; and an unreasonable indulgence in the pleasures of social life is assuredly incompatible with sound health.

That a large enjoyment of the more rational of these pleasures may be indulged, and the health still preserved by those who will take the trouble of learning how to do so, is equally clear. An acquaintance with that, which truly constitutes health of mind and body, and the real art of enjoying existence, is known to very few, and most men struggle through life without ever learning how to preserve it. The pleasures of human life are exclusively neither corporeal nor mental, but a due combination of both, and the wise exercise of all the faculties constitutes health and happiness: to pursue one class alone must be at the expense of the other. By over-application to mental pursuits, we prevent the proper development and health of the body; and by over-employment of the bodily powers, we destroy all desire for those of the mind: true wisdom consists in the employment and exercise of both, and there is no surer way of preserving health than by an

alternation of the labours, or rather what ought to be the pleasures, of mind and body.

The first thing to be done in our search after health, both of mind and body, is to learn in what it really consists, and the powers we possess of so managing and regulating ourselves in relation to the circumstances in which we are placed as to realize as large a portion of happiness as possible ; for the search after health is the search after happiness ; and a perfect knowledge of the whole subject may almost be said to constitute philosophy or the search after wisdom.

12, WILTON PLACE,
July 17th, 1854.

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influence on health, and are under our individual control. The arrangements, ventilation, and warming of our residences; the prevention of exhalations from drains, &c., of all moisture or damp at the basement of our houses, of all accumulations of dirt or rubbish. Cases of fever, and other illness, have been frequently caused by vegetable and animal remains allowed to putrefy in cellars. Domestic Hygiene applies to all the laws of health, as regards personal cleanliness, washing, bathing, clothing, air, exercise, and diet. In a well-regulated State, all circumstances applying to Public Hygiene, should be duly guarded, and every district should have its officer of health. In a well-regulated family, Domestic Hygiene should be equally attended to; every head of a family should be sufficiently acquainted with the subject as to perceive at once when the laws of health were infringed. At present the public mind is not fully awake to the importance of this subject, but the periodical visitation of cholera has directed attention to the means of its prevention, because this is avowedly a disease but little amenable to medical treatment

If Public Hygiene in all its parts was looked after by the Board of Health and local officers of health in every district of the kingdom, and if Domestic Hygiene was applied in every family, the benefits to the community would be incalculable: in another generation the whole race would be improved. Who can doubt but that the superior forms, figures, and faces of the higher classes of society result from a certain attention to Hygiene, in the superior construction of their habitations, in the advantages of air, exercise, and clothing, with that refinement and cultivation of the mental and moral powers so necessary to a sound condition of the human constitution as a whole. That in all the classes of society much improvement in the general health has resulted from the attention directed to the subject during the last twenty or thirty years is unquestionable—the physical powers and condition of our people has been greatly improved; but much yet remains to be done before the human race shall exhibit those advantages from a due attention to the subject, as is shewn in the improvements of the races of our horses and cattle. We have for



years applied the laws of Hygiene for the benefit of our animals, and it only remains to apply them to our whole human population, to derive equal advantages in the health and vigour of the physical powers of man, as the diffusion of a small amount of general education has a little improved the mental powers. With the evidence of the good results of a diffusion of some knowledge, both of physical and moral education, we have only to stimulate a still further extension of both, as a certain means of increasing individual happiness and national greatness.

PART I.

ON THE ORGANS AND FUNCTIONS OF DIGESTION, NUTRITION,
SECRETION, AND EXCRETION.

WHEN we are about to perform a journey into an unknown country, we study a map; so, in considering the human constitution in health and disease, it is necessary to know something of the bearings of its various functions, and in particular those which are principally concerned in the preservation of health, and the prevention of disease. We shall trace our food through the organs of digestion, noting the various changes it undergoes to make it fit for nutrition; when, after having fulfilled its purposes in the support of the organism, its relics become the objects of various secretions, to be cast out of the body.

In thus attempting to shew how food is converted into blood, we must necessarily touch upon all the important organs and functions of

animal life; and in so doing, we shall be led to make some observations on those organs and functions which are principally concerned in the preservation of health.

The first process towards converting food into blood is mastication:—we thus not only divide our food into very minute particles by the grinding action of the teeth, but we gradually mix it with that secretion of the glands around the mouth,—viz., the saliva, which renders it more adapted for the action of the juices of the stomach. In the stomach the food is mixed with the gastric juice, the action of which renders it more soluble and in a state fit for absorption by the vessels which carry it into the blood. The roots of plants absorb and imbibe from the soil the necessary nourishment for their growth and maintenance; in like manner the absorbing vessels of the stomach and intestines may be compared with those of the roots of plants, and the food to the soil from which the nutriment is extracted.

The stomach is internally coated with a very delicate membrane, somewhat similar, but of a nature much more complicated than that which

lines the mouth and throat. In its healthy condition the stomach transmits no sensation : we ought not by any feeling to be aware of its existence ; but any disturbance in its natural condition, from improper quality or quantity of food, is immediately perceived : to feel that we have a stomach is certain evidence of its derangement. As by its healthy action the stomach provides the elements of blood, and generates nourishment, health, and vigour, both to mind and body, so, in its deranged condition, it is the primary source—the mother of most diseases. When our stomach is in good order and our digestion sound, we are in the best condition to resist all external causes of disease. Infectious poisons act most readily on those whose digestive powers are weak or depraved ; we can best resist the causes of ordinary colds, and, perhaps, we never even catch cold, when the stomach is quite in good order. Besides the great variety of dyspeptic, bilious, nervous, and other complaints, which may be directly traced to their source in disturbance of the stomach ; indirectly it may lay the foundation of disease by not supplying the blood with

those plastic elements best calculated for the nutrition of our various organs, and the system generally is more open to attacks of disease. It is easy to understand that as health must depend on a sound condition of the blood, and as the stomach is the prime elaborator of that fluid which is to become blood, if this primary action is deranged and an unsound chyle generated, this, in its confluence with the blood, must carry into the circulation the germs of disease. I believe that more frequent disorders of stomach arise from quantity rather than quality of food; various kinds of indigestion are produced by the unnecessary quantity which most people take; for there are very few who limit themselves to the amount of food which nature really requires. Bad quality of food produces diseases of the blood, as well as disorders of the digestive organs, by the depraved juices supplied to the organs of nutrition. If we would prevent disease we should take care of our stomach. Supply it only with what is really necessary, and we shall suffer very little from disorder of any kind. The health of that fluid destined to nourish every part of the body, the various

organs, the muscles, the nerves, and brain, is mainly dependant on the healthy action of the stomach, in separating from our food only those parts which are essential to the well-nourishment of the whole system. The entire constitution—the skin, the brain and nerves, the lungs and heart, the blood-vessels, the absorbents, the digestive organs themselves, and every atom of our organism, are dependant on the soundness of the primary process of assimilation, or that conversion of dead matter into vital tissue, which begins in the stomach.

When we reflect on the wonderful change that must take place in the conversion of a mutton chop and a slice of bread into blood, nerve, muscle and bone, we are lost in admiration at the facility with which such processes go on in a state of health for seventy or eighty years. The stomach may be considered the caldron in which are brewed the various fluids which nourish the body, and repair the wear and tear of the solid parts of our frame; for every muscular action, and probably every mental exertion, wear away some particles of muscle and brain, so that a constant rebuilding

is always going on in every part. In order that healthy matter should be concocted, we should supply the caldron only with such solids and liquids as are by their nature fit for the production of sound and healthy materials for the repair of our constantly-wasting structures. The agents of these repairs are the blood vessels; the material by which they are effected is the blood. The blood cannot be in good condition if the stomach is not so; hence the necessity of great care in the management of this organ by all who would enjoy health. There are many other conditions necessary for sound health, which we shall touch upon in their turn; but the stomach is the primary source of most of the evils which tend first to disordered action, and then to disease.

In that condition of society when men are the whole day in the open air, where their wants are few, and where the climate is such that they require but little protection either from houses or from clothes, and where the soil produces the necessaries of life with the expenditure of very little labour of mind or body; in such a happy or unhappy state, it

matters little what is received into the stomach—it digests almost anything. So, in a higher degree of civilisation, those who are employed in agriculture, and almost constantly breathing a wholesome atmosphere, who exert but moderate bodily labour, and little or none of mental, it matters not what such people take as food, they can, as they say, away with anything. But the inhabitants of towns, struggling through life with every possible impediment; worn out in body and wasted in mind by unceasing exertions—to this class it is vitally important how they treat their stomachs. Subject as they must necessarily be to hot rooms, offices, factories, and many other deteriorating influences on the health, both of mind and body, if they would only take in moderation what they know to agree with them, they might avert many of the evils to which their health is subjected. By great care in diet, and by being very much in the open air, the inhabitants of towns may preserve their health even to a greater degree than some habitants of a healthy country, who altogether despise and neglect the rules of diet. People who will

shut themselves in a house from Sunday to Sunday, and who will eat and drink twice as much as is required, will have bad health whether they live in town or country.

According to our present knowledge there are in nature fifty-five elements, from various combinations of which, all substances, whether belonging to the mineral, the vegetable, or the animal kingdoms, are formed. No element has yet been found in any living body which does not exist in inorganic matter. The elementary substances found in the human body are oxygen, hydrogen, carbon, nitrogen, sulphur, phosphorus, silicon, fluorine, potassium, sodium, calcium, magnesium, iron, manganese, aluminium, copper, and a few others in various animals. The first four may be considered essential elements; of the others, some are constantly found, others only incidentally. Sulphur, phosphorus, iron, and the salts of potassium and sodium, are always found. Every known organic substance is composed of at least three of the elements. This is essential to the very existence of organic matter, and, by the addition of one or more of the

other elements, the peculiarities of the various organic substances are induced. In the inorganic world most substances are formed of only two elements—as the atmospheric air, of oxygen and nitrogen—water, of oxygen and hydrogen—lime, of oxygen and calcium—soda, of oxygen and sodium. In the vegetable world we find most frequently three of the elements. Starch, gum, sugar, are composed of varying proportions of oxygen, hydrogen, and carbon. In the animal substances there are generally four or five elements; albumen, fibrine, gelatine, being compounds of oxygen, hydrogen, carbon, and nitrogen, with a small quantity of sulphur.

These four elements (oxygen, hydrogen, carbon, and nitrogen) preponderate in the composition of all vegetable and animal matter. They differ from all the rest, not only by their quantity but by their peculiarities. If vegetable or animal substances are exposed to a high temperature, the largest part is dissipated into the atmosphere, while the rest cannot be volatilised, and is no longer affected by heat, all these elements, with the exception of some

oxygen, are carried off. For example, bone contains carbon, hydrogen, nitrogen, oxygen, phosphorus, and calcium. The three former and some oxygen are present in bone in the form of gelatine; the rest of the oxygen, with the phosphorus and calcium, in the form of phosphate of lime. When the bone is burnt the whole of the gelatine disappears, leaving only phosphate of lime. The burnt bone may still retain its shape, but its weight has been diminished by the combustion of its gelatine.

All vegetable and animal matter submitted to combustion have their elements changed; their carbon is converted into carbonic acid by its union with oxygen, their hydrogen into water; their nitrogen escapes as such, and the ash contains the rest of the elements. Decay and putrefaction are processes similar to burning, and the ultimate changes are the same in their results. The elements entering into the composition of vegetables and animals have been divided into those which are destroyed by a red heat, and those which remain unchanged at a very high temperature; or, organic and inorganic constituents. By burning,

the former are resolved into gases, which afford nourishment to living plants and animals: while the latter return again to the soil, and in their turn are again appropriated by the roots of vegetables. It is shewn by agricultural chemistry that the growing plant derives its fixed elements from the saline constituents of the soil, its carbon, hydrogen, nitrogen, and oxygen, from the atmosphere, and, in its decomposition, returns the same elements to their respective originals. A similar process takes place in animals. Both the atmospheric and saline elements combine with each other to form a great variety of compounds, which are known as "the proximate constituents of plants and animals"—albumen, fibrine, gelatine, starch, sugar, vegetable and animal fats; the great number of acids occurring in animals and vegetables, coloring matters, essential oil, and resins, are among the endless variety of proximate constituents that are formed by the atmospheric elements. The inorganic or earthy elements are associated in other compounds, as sulphates, chlorides, and phosphates of potass, soda, and lime, &c., which are left

in the ashes of animal and vegetable substances after burning.

The natural organic compounds are also arranged in two classes—the nitrogenous and the non-nitrogenous principles. The non-nitrogenous, including starch, gum, oils, fat, &c., which are compounds of oxygen, hydrogen, and carbon; the nitrogenous include albumen, fibrine, caseine of milk, and gluten of corn, and are composed of oxygen, hydrogen, carbon, and nitrogen.

Albumen and its allied substances, gelatine and fibrine, are among the most important constituents of the animal body, being in the greatest quantity in the blood, and in all the fluids which contribute to nutrition. A substance very nearly allied to fibrine is the essential constituent of flesh or muscular fibre; albumen again enters largely into the composition of nervous matter. The ova of all animals are in great part composed of albumen, of which the white of egg is the type. Milk, besides the caseine or cheesy substance, contains a large quantity of albumen, so that Nature has thus provided albumen for the support of

the young, both before and after their birth. The fats are important principles in the animal economy; and the vegetable products, starch and sugar, are closely allied to them. Recent investigations have detected sugar in almost all the fluids subservient to nutrition. Sugar and fat also enter into the composition of milk; and, in all cases, starch is converted into sugar in the digestive process.

All substances necessary for the food of man may be divided into four classes:—

1. The aqueous—water, composed of oxygen and hydrogen.

2. The oleaginous and saccharine, composed of oxygen, hydrogen, and carbon.

3. The albuminous, composed of oxygen, hydrogen, carbon, and nitrogen, with sulphur, and in some cases with phosphorus.

4. The saline.

The second class is also called the respiratory and non-nitrogenous; the third class is also called the plastic and nitrogenous; and a fifth class might be added, the gaseous—since atmospheric air and the gases it contains, play most important parts in the nutrition, as well as the

degeneration and decomposition of the animal body.

Water is absolutely necessary to all animated structures. Four-fifths of the blood consists of water; and so much of this fluid enters into the structure of all parts of the body, that the dried mummies of Teneriffe, the Guanches, weigh only 7lbs. Water is the medium by which all plastic changes are carried on, by holding in solution the nutritive parts of our food; and it has been proved that persons deprived of food do not starve so soon if they have a supply of water. Water is also essential for the removal of our worn-out tissues, the particles of which must be held in solution before they can be ejected from the system. Fatty and saccharine food is consumed in the production of animal heat; what is superfluous for present use being stored up in fat cells. The albuminous substances go to the support of the muscular and nervous systems, and the tissues composing the various organs of the animal body. The saline and earthy elements of our food are required for the more solid parts of our frame, the bones.

The proper object of taking food is to supply materials for the repair of the waste which results from the active exercise of the organs, especially of the nervous and muscular systems; to replace the continual decay which is always going on in all parts, and to introduce substances necessary for the production of animal heat. When animals are deprived of a sufficient quantity of wholesome food, degeneration takes place, and a long continuance of such privations, from generation to generation, will deteriorate a whole province, or even a nation. This is exemplified in some of the natives of the western parts of Ireland, in the miserable Bosjesmans of the Cape, the Australians, &c. In a less degree, insufficient or improper food, lays the foundation of various diseases in the organs of nutrition: in the glandular system, producing various forms of scrofula: in the bones, producing rickets and deformities, &c. But, on the other hand, equally unhealthy conditions of a different kind are produced by an over supply of food. In healthy animals a superabundance of food engenders fat, which is stored up for future use. Animals likely to

suffer from deficiency of food in winter become fat, very remarkable in those which hibernate; they require little or no materials for the repair of the nervous and muscular tissues, the functions of which are totally suspended; but their respiration and animal heat must be kept up, and for this purpose the fat is gradually absorbed, so that before the end of winter such animals become lean.

The quantity of food required by the same person will differ under the different circumstances of sex, age, season of the year, amount of mental, nervous, and muscular exertions, &c. The average quantity for an adult is from 30oz. to 36oz. of dry aliment; but half this quantity of good food will maintain a person in good health, unless his work is very great. The relative value of different alimentary substances depend on their respective amounts of solid materials. All vegetables contain much water, and must be eaten in large quantities to supply the requisite nutriment. The process of nutrition may be said to begin in plants, by the absorption of elements from inorganic matter, and thus food is prepared for animals.

Vegetables produce two kinds of nutritive aliment—one consisting of oxygen, hydrogen, and carbon ; and the other of these elements, with the addition of nitrogen. Of the first kind, we may here mention starch, sugar, and oil, which supply materials for animal heat ; and of the last, corn and leguminous seeds, peas, beans, &c., which, containing nitrogen, are essential to replace the waste of the animal tissues ; because, of vegetable substances, these alone contain the principles, in any quantity, from which the albuminous solids and fluids of animals can be furnished. Potatoes, rice, &c., must be eaten in very large quantities to supply the requisite nutriment, and people so fed must be inferior to those races which provide themselves with the proper food of man—corn and animal flesh. Nothing can be more beautiful than the relations which the physiological systems of vegetables and animals exhibit in their mutual dependencies, and their mutual subservience each to the welfare of the other. Carbon is most important to vegetables, oxygen most important to animals ; the first is excreted by animals, the last by vegetables.

The higher classes of vegetables which minister to the wants of man, can only be produced in sufficient quantity by resupplying the earth with those principles which, having renovated the wastes of the animal economy, are again committed to the earth, taken up by the roots of wheat, &c., and again elaborated into food proper for the highest classes of animals. How beautiful is this circulation of materials, required for successive generations both of vegetables and of animals; how clear is the design, and how admirable the adaptation.

The four classes of materials subservient to the food of man, in due combination, constitute the blood. Proper food must contain a due proportion of these matters, and that diet is the most suitable in which they are all combined; deficiency or excess in the various principles of our aliment is attended with corresponding evils to the healthy action of our organs. If nitrogenous aliments are not in sufficient quantity to repair the waste of the muscular and nervous tissues, they will decrease in vital power; and if the non-nitrogenous principles be insufficient, we shall not

retain a due amount of animal heat ; the substances which furnish the former being albumen and gluten, the largest quantity of these being in the lean of meat and in corn ; those which furnish the greatest amount of the latter are oil, fat, starch, and sugar.

Nature has pointed out the proportions of the various principles of our food, in the composition of milk, in which are combined the various elements necessary for the nutrition of animal tissues, the production of animal heat, a due supply of watery fluid, and the requisite quantities of saline and earthy matters. In this especial food for the young, Nature has combined albuminous, oily, and saccharine matter ; the caseine is albuminous, the butter a modification of oily fat, and the sugar of milk does not materially differ from ordinary sugar, while we also find in milk a due amount of earthy principles to furnish the solids of animals. It is remarkable how exactly habit accords with the chemical and physiological facts in relation to the wants of the system, and the means of supplying them. Good wheaten bread contains more nearly than any substance

in common use the proportions of plastic and of heat giving materials to repair the waste of animal tissues, and to support combustion, which are required under the conditions of life in the temperate climates of the earth. In cold weather we require and have a desire for more fatty matter; and the more we employ our muscular system the greater is the demand and the necessity for such food as will supply the waste. In rice and potatoes the farinaceous and saccharine components exist in such large proportions, that we require a considerable quantity of such kind of aliment to extract a sufficiency of nutritive particles; but if we mix with such a diet a small quantity of animal food, the same combination takes place as exists in bread. The colder the climate the greater is the desire for fat, to maintain the heat of the body by its combustion with oxygen. The Esquimaux are said to devour several pounds of blubber at a meal; while, in hot climates, there is but little inclination for oily matter.

Health cannot be long sustained on any one alimentary principle: neither pure albumen or fibrine, gelatine or gum, sugar or starch, oil or

fat, alone, can give nourishment for any length of time. Numerous experiments on this subject have been made ; and it has been found that animals, after a time, become so disgusted with being limited to any one article, that they prefer starvation to such food. Added to organic compounds, there must be certain inorganic substances taken with our food in order to preserve health. Common salt is necessary to digestion, giving its acid to assist the operations of the stomach, and its soda to form an important constituent of bile. Salt is found in the blood, and may aid in preventing decomposition in the organic compounds. Phosphorus is found in some quantity in nervous matter, and also in the bones, and sulphur in several of the tissues of animals. Lime exists in the bones and teeth, and iron is required for the red corpuscles of the blood. All these inorganic materials should be taken into the body combined with various articles of food ; and, if in deficient quantity, the animal suffers if they are not otherwise supplied. Salt exists in the flesh and fluids of animals, in milk and in eggs, but not much in vegetable matter ; and this is the

reason why cattle thrive so much better when it is artificially supplied. Most animal substances contain phosphorus, and it is found in many vegetables as a phosphate of lime, magnesia, or soda. Phosphate of lime occurs in the seeds of all the grasses, and largely in combination with caseine in milk. Sulphur is obtained both from animal and vegetable food in flesh, eggs, milk, and many vegetables, as well as in the water we drink, which generally contains sulphate of lime. Phosphate and carbonate of lime are both found in the ashes of grapes, and phosphate of lime is very abundant in corn; hence the value of this salt as a manure. The same law applies to the soil of the earth as to the economy of the animal; whatever is taken away, used, or consumed, must be again restored, if we would maintain health and strength. This law is exemplified in the eggs of the common fowl. Deprive a hen of the means of obtaining chalk or lime, and her eggs will be soft, their inverting membrane not having its interstices filled, as they should be, with a layer of carbonate of lime.

To form blood and to supply materials for

animal heat, are the principle objects of the process of digestion ; to effect the first we require aliments which contain nitrogen ; to effect the latter they must contain hydrogen and carbon. The digestion of these two classes of food is different ; they maintain a separate condition throughout the animal system, and when used up, their relics or debris are separated from the blood, and ejected from the system by different organs. Those articles of food which admit of conversion into the albumen or fibrine of the blood, and of being subsequently assimilated through the medium of the blood by the tissues of our organs, have been called plastic or nitrogenous ; and those which constitute materials for animal heat are consumed in the body, and effect the changes which take place in the respiratory organs, have been called calorifacient, respiratory, or non-nitrogenous. In the first class are flesh, corn, the seeds of leguminous plants ; in the second are fat, oil, starch, sugar. Albuminous matters are digested and rendered soluble in the stomach by the gastric juice ; fat is not digested or absorbed until the food has passed out of the stomach, and has been

converted into a kind of emulsion by other fluids than those supplied by the stomach. The first commencement of digestion begins in the mouth, by the minute division of our food and its admixture with saliva, which fluid assists in the transformation of starch, from its naturally insoluble state to a condition more fit for absorption as sugar. Starch is entirely a product of the vegetable kingdom, and exists in large quantity in wheat, rice, potatoes, &c. Starch is by many processes, both in and out of the body, converted into sugar; one thousand parts of barley contain forty-six parts of sugar, while one thousand of malt contain one hundred and fifty-four of sugar; shewing, that in the process of malting starch is converted into sugar. If we add yeast to a solution of sugar, the latter will be separated into carbonic acid gas and alcohol. Sugar in the animal system is converted into fat. Bees eat sugar and form wax; and negroes are observed always to get fat in the sugar-making season. All starchy, saccharine, and fatty food, by admixture with oxygen, after a species of combustion and the generation of heat, is converted into carbonic

acid gas. The same amount of heat must be produced as if they were burnt out of the body. In twenty-four hours we excrete from seven to fourteen ounces of carbon, formed from starch and fat ; and if a sufficient amount of these ingredients is not taken in the food the accumulated fat of the body is first consumed, and afterwards the muscles and other tissues are disintegrated, and carried to the lungs to support respiration.

All animals require a receptacle for their food, which in the lowest creatures is of a very simple nature, the digestive sac being in some equally capable of absorbing food on its inner or its outer coat, as in the Hydra or fresh-water Polype. The gastric juice for the solution of food is secreted from the walls of the stomach ; and these creatures being transparent, the process may be watched. The arms seize the prey, and convey it to the mouth ; after being a short time in the stomach a film collects on it, and it is gradually reduced to a fluid state, while any indigestible portions are rejected by the same aperture by which they entered. As the digestive appa-

ratus increases in complexity, an organ like the gizzard of birds is added for the trituration of the food, which is then subjected to the action of bile, in addition to the gastric fluid. As we ascend the animal scale we find an increase in the digestive apparatus, but essentially it is the same in all. There is near the entrance of the stomach a grinding apparatus for the mechanical reduction of the food, either in form of a gizzard or of teeth, except in such animals as receive their food in a liquid or soft state, so as to be readily acted on by the digestive fluids. In some animals the food is first received into a mere bag or preliminary stomach, from which it is again returned to the grinding apparatus, as in Ruminants chewing the cud.

When the food is very soluble by the gastric juice, a simple bag constitutes the stomach; but when from its nature, long maceration is necessary, we find a more complicated apparatus; this is illustrated by the stomachs of herbivorous, granivorous, and carnivorous animals; grass-eaters having a more complicated stomach than corn-eaters, and these than flesh-

eaters, while the stomach of man is intermediate, shewing his nature to be omnivorous. The length of the intestines also bears reference to the kind of food. In the lion it is three times the length of the body; in the sheep twenty-eight times, and in man, six. In the carnivora the teeth are mere dividing instruments like scissors, the action of their jaws only permitting this movement; in herbivora the teeth are rough, and of large surface, while the jaws are so connected as to admit of much lateral movement for the purpose of grinding tough vegetable substances. In man we find intermediate conditions, both as regards the teeth and the articulation of the jaws. From his whole apparatus of digestion we should infer that man was intended to live on a mixed diet of flesh, and of such vegetable substances as require moderate crushing or grinding; this primary process is, however, of great importance; and unless we triturate our food sufficiently, and thus mix it with a sufficient quantity of saliva, we impose more work on our stomach, and may thus engender some amount of indigestion. •

Gastric fluid is not secreted when the stomach is empty, but on the introduction of food, or other foreign substances, the mucus membrane, previously quite pale, becomes turgid and reddened by the influx of a large quantity of blood, the glands begin to secrete, and an acid fluid is poured out. Much valuable information relative to the action of the stomach was obtained by Dr. Beaumont, who had a patient, Alexis St. Martin, with a permanent external opening into his stomach, the result of a gunshot wound. Through this opening substances could be passed into the stomach, and again taken out, and the gastric fluid could be removed. The introduction of a thermometer, which always stood at 100° , stimulated the inner coat of the stomach to secrete gastric fluid. The gastric juice is a clear, inodorous liquid, rather salt, and very perceptibly acid; it coagulates albumen, is powerfully antiseptic, and is an efficient solvent of the most important alimentary substances. The gastric juice softens and reduces into a pulp various articles of food; but in order to do so the operation must take place in a temperature

of 90° to 100° of Fahrenheit ; and it is also necessary that the food be subjected to the muscular movements of the stomach, by which every part is brought successively into contact with the mucus surface, from which the digestive fluid is poured out in great quantity. After seventeen hours fasting, Dr. Beaumont took out of the stomach one ounce of gastric juice, put into it three drachms of recently-salted boiled beef, and placed the containing vessel in a water-bath at 100°. In forty minutes digestion had commenced on the surface ; in fifty the fluid became opaque and cloudy ; in two hours the texture of the meat was entirely broken up, leaving the fibres loose and floating in fine shreds ; in six hours it was nearly all digested. A similar piece of beef was suspended in the stomach by a piece of thread ; in one hour it was changed, as in the artificial digestion ; but in two hours it was completely digested and gone. Dr. Beaumont performed many other experiments. He macerated a piece of meat in water for several days, until it acquired a strong putrid odour ; on the addition of fresh gastric juice it lost its

smell and all signs of putrefaction, and soon began to digest.

The action of the gastric juice is supposed to depend on a principle which has been called pepsine, and may be compared with that of a ferment inducing certain changes in organic matters with which it comes into contact, and itself participating in these changes, or it may excite by its mere presence some chemical action; and that pepsine does act thus, appears probable, from the very small quantity necessary to excite the digestive action in a large amount of food. The process differs from ordinary fermentation, in being unattended with the formation of carbonic acid, in not requiring the presence of oxygen, and in the non-production of new quantities of the active principle or ferment; but, like fermentation, whatever alters the composition of pepsine destroys the digestive power of the fluid, as heat above 110° , alcohol, or strong acids. The real action of the gastric juice is the solution of the albuminous parts of our food. A high temperature, and the motion of the stomach, have been mentioned as neces-

sary for digestion. Salts are also required. Common salt is required to act on the mucus membrane of the stomach, or to supply by its decomposition the muriatic acid found in the gastric fluid. Many aromatics and gentle stimulants, like spices and mustard, also promote digestion, by their action on the mucus membrane. As soon as the substances taken into the stomach are rendered soluble, they are either absorbed by vessels on the walls of the stomach, or they pass into the intestine, and permit a new surface of food to be exposed to the action of the gastric juice. If milk be taken as food, it is at once coagulated, the watery part directly taken away by the veins, and the caseine or curd gradually dissolved by the digestive process. The ferment of the saliva, with the bile and the fluids of some other glands, act chiefly on the most important non-nitrogenous or heat-producing element of our food, starch; while the ferment of the gastric juice acts chiefly on the nitrogenous or plastic element, albumen.

The various substances taken in food, according to our present knowledge, are thus

disposed of:—Water is taken up by itself, as well as mineral matters soluble in water or in acids; non-nitrogenous organic compounds (some are soluble, as sugar; others insoluble, as starch) are acted upon by the saliva and other fluids, and rendered soluble by being converted into sugar; for nitrogenous substances the proper agent is the gastric juice—it converts albumen, fibrin, and caseine, into matters soluble in water, and fits them for absorption into the system for the purposes of life. There are many insoluble parts of our food which pass the stomach unchanged, and are ejected from the system.

The experiments of Dr. Beaumont and others shew the rapid absorption of fluids, which are taken up as soon as they enter the stomach. Water, wine, weak saline solutions, are at once absorbed, as is the fluid part of soup, leaving the rest in a concentrated state. The stomach of St. Martin, Dr. Beaumont's patient, was stronger than the average,—his powers of digestion were great,—and some allowance must therefore be made in his case, but the following was the order in which various substances were acted upon. Rice and tripe were digested in

an hour; eggs, salmon, trout, apples, and venison, in one hour and a half; milk, liver, and fish in two hours; turkey, lamb, and roast pig in two and a half hours; beef and mutton in three and a half hours. Fatty matters pass through the stomach unchanged. Three to four hours may be considered the average period for the digestion of a meal. As digestion proceeds, and the dissolved portions of our food are gradually taken up by the vessels, the insoluble parts become of a firmer consistence, and, proceeding onwards, assume the character in which they are excreted from the body. Some parts, both of animal and vegetable substances, undergo no change in the intestinal canal, as horny matter, skin, hair, woody fibre, skin of fruit, husks of seeds, &c. A free acid, usually the hydrochloric, is found in the stomach, in combination with the organic digestive principle, pepsine; but other acids are also found in the stomach, combined with pepsine, as the phosphoric, the acetic, the lactic, the butyric. These acids may all be required in some of the digestive processes, but they often give rise to many morbid dyspeptic conditions when

they are secreted in excess, or that the food we take does not neutralize the whole quantity. A liquor containing hydrochloric acid and one quarter of a grain of acetate of pepsine, is capable of dissolving 210 grains of coagulated white of egg, at a temperature of 95° to 104°. The same fluid will dissolve blood, fibrine, meat, and cheese. The acid without the pepsine requires a much longer time to act on these substances ; the acid is considered by some as the true solvent, and the pepsine is supposed to act as a kind of ferment. When the gastric juice is withdrawn from the stomach it retains its solvent powers, but more time is required, and frequent agitation, in a temperature of 100°. At a low temperature no solution takes place, hence we may infer the impropriety of drinking a large quantity of any cold liquid with our meals, and those who are subject to dyspepsia, should take a hint from Nature, and let their drink be about the temperature of 100°.

If we take a superfluity of food beyond the wants of the system, or in excess of the solvent powers of the gastric juice, it remains undissolved in the stomach, or passes into the

intestinal tube in a state to cause irritation and disorder. Stimulants, as pepper, mustard, currie, mixed with our food, no doubt, cause a larger secretion of gastric fluid, and so promote digestion for a time; but taken in excess they do mischief, by bringing too much blood to the mucous surface, acting in a similar way to excess of food, by depraving the qualities of the secretions; the appetite becomes impaired, the mouth dry, the tongue foul, and other dyspeptic symptoms follow, until the stimulus of food itself will excite no gastric secretion. Probably there are few persons in health who do not take more food than is absolutely requisite, and this is done for a long time without apparent mischief, but sooner or later, serious consequences follow. Eating too rapidly is one cause of taking more food than is necessary, as we do not observe when the stomach is satisfied. Any one who will try the experiment, will find that his appetite ceases with a much smaller quantity of food when eaten deliberately than when bolted rapidly.

We may form a pretty correct judgment of

the best way of treating the stomach, by the effect experienced of the food or drink we have swallowed. After a meal of plain food, in moderate quantity, we feel a pleasing refreshment, but beyond this, no consciousness that we have a stomach, and such is the natural condition; but, if we take a very large quantity of food or drink of a stimulating kind, we feel a glow, a warmth, and an excitement in the region of the stomach, which tells us of the existence of the organ, and that we have over-filled or over-excited it. After a plain meal we produce no conscious sensation in the stomach; but if we take a glass of brandy, we excite a conscious sensibility in the stomach, telling us that we have exceeded the wants of Nature, which she intimates to our feelings by the production of unnatural sensations.

Some kind of respiration is necessary to all animals, to complete the process of blood-making, which is commenced in the stomach; the circulating fluids, both of vegetables and animals, require the chemical action and influence of atmospheric air, before they become efficient agents of organic life.

Atmospheric air contains twenty-three parts of oxygen, and seventy-seven of nitrogen.

Water contains eight parts oxygen, and one of hydrogen.

Carbonic acid gas contains sixteen parts oxygen, and six of carbon.

In atmospheric air there is some aqueous vapour, a small amount of carbonic acid gas, and a very little ammonia. Air is rendered impure by the breathing of animals, and by the combustion of wood, coal, or other fuel, both processes taking from the air oxygen, and returning carbonic acid gas to it. The law by which gases are diffused prevents the accumulation of deleterious particles, which would be incompatible with animal life: for although carbonic acid gas is much heavier than atmospheric air, it is gradually diffused through the atmosphere, and does not accumulate on the surface, except in confined places,—as the Grotto del Cani, near Naples, where the lower stratum of air, about two feet from the ground, consists entirely of carbonic acid gas, and is fatal to dogs but harmless to men.

Whenever carbon or hydrogen unites with

oxygen, a development of heat occurs, and the amount of heat is always in proportion to the quantity of the gases consumed. The air we breathe gives out its oxygen in the lungs to the blood-vessels, the oxygen combining with the blood, and circulating with it to all parts of the body; in this course it meets with carbon, the two gases combine, heat is evolved, carbonic acid gas is produced, and carried onwards by the veins to the lungs, where it is exhaled. The consumption of oxygen, and the rapidity of the respiratory changes—consequently, the temperature of the body—vary according to the nature of our food, the amount of exercise we take, the temperature of the air, the powers of our digestion, the conditions of our mind, sleep, age, sex, &c.

All the oxygen received by the blood in the lungs is not employed in the formation of carbonic acid gas. If the total quantity taken in is represented by 100, the quantity found in the carbonic acid gas exhaled will be only seventy-four. The other twenty-six parts go to oxidise other substances—hydrogen, sulphur, phosphorus.

The temperature of man and the higher animals is entirely sustained by the combustion of certain organic materials within the body. Warm-blooded animals in our climate are generally 30° or 40° above the temperature of the air; the heat of their bodies varying from 97° to 111° . The production of heat arises from the action of oxygen on certain elements of food, especially fat, and hydrates of carbon, starch, sugar, &c., and on the elements of the tissues wasted by use, the store of fat, &c. About $13\frac{1}{2}$ ozs. of carbon pass through the lungs daily in combination with 37 ozs. of oxygen. A large quantity of watery vapour is also exhaled, from the union of oxygen with hydrogen. These products must, of course, vary with circumstances—chiefly, the season of the year, the supply of food, the activity of respiration, the metamorphosis of tissue, &c. The carbon and hydrogen consumed must be resupplied by food, which will be required in proportion to the oxygen absorbed. When we maintain a high temperature of the body by exercise in the pure and open air, we require, and may take with

advantage, a larger quantity of food. The higher the animal heat, the more is food required. The temperature of a child is 102° ; an adult, 99° ; a bird, 105° . Children require more food, in proportion to their size, than adults, and they bear hunger less readily. A bird, deprived of food, dies in three days, while a cold-blooded serpent will live for months without. It is easier to bear hunger in hot than in cold climates. In tropical climates the number of respirations are fewer than in cold countries, the amount of food required is less, and less exertion can be made. Moreover, the air contains less oxygen, on account of its greater rarity. A much less internal development of heat becomes necessary, so little being lost in the surrounding medium. If, under these external conditions, a great amount of highly-nutritious food be taken, the stomach will have difficulty in digesting it. The respiratory functions not being sufficiently active to furnish oxygen enough to decompose the excess of food, the fatty elements accumulate in the system, the liver is over-worked,

and becomes gorged with fat, as in the Strasbourg geese. There is much relation between the functions of the lungs and the liver; in the lower animals, in the foetus, the liver is very large, and when the actions of the lungs are imperfect in disease—as in phthisis—the liver enlarges. Most of the cases of liver disease, from residence in tropical climates, are produced by Europeans carrying out the habits acquired in colder climates, and indulging in as much animal food and beer, or perhaps more, than they had been previously accustomed to, while they ought to diminish the quantity of both, if they would preserve their health.

In the lungs, gases are on one side of membranes, liquids on the other; the blood in the vessels, according to the law that denser fluids attract rarer, imbibe the oxygen through their delicate coats. It was formerly supposed that the interchange of gases and the development of heat, only took place in the lungs; but there is reason to believe that these processes take place in every part of the body. Carbonic acid gas is formed in the ultimate

parts of the tissues, and it is a component part of all animal juices. The interchanges of the gases are between those of the blood and of the intercellular fluids all over the body, and between those of the blood and the air in the lungs. The principal interchanges are the carbon and hydrogen of our food mixing with oxygen, forming, in the first case, carbonic acid gas, and in the second, water; and whenever these interchanges take place, a species of combustion occurs, and heat is produced.

Experiments have shewn, that of eighty parts of carbon in food, seventy-four combined with oxygen to form carbonic acid gas; and of fifty-eight parts of hydrogen, fifty-four combined with oxygen to form water.

Two marmots slept for eight days in a closed apparatus; on the evening of the eighth day there was oxygen enough left for two days' consumption, but one of the animals awoke, took all the oxygen, and died suffocated; the other remained asleep, and lived on in the same atmosphere for several hours. Other experiments on animals have

shewn the difference of the heat of the body, according to the quantity of oxygen consumed; the temperature being when asleep, 52°; directly after awaking, 78°; and five hours after, 90°.

From the preceding account of the progress and changes in the elementary principles of our food through the processes of digestion, nutrition, respiration, and oxygenation, it will be obvious how close is the relationship of the functions of the stomach and liver with those of the lungs. All the materials of nutriment which we take into the stomach, require not only to be digested, but to be vitally as well as chemically changed by the action which takes place in the lungs. Hence the importance of obeying all the laws relating to healthy respiration and the impossibility of enjoying good health unless we breathe good air; nothing contributes more to bad health than living in hot and ill-ventilated rooms, for all air that has been once respired becomes unfit to be again used. The laws which regulate the diffusion of gases, cause the removal of all particles deleterious to animal life and the constant reno-

vation of pure air, but this can only take place where the currents of air are free. The more hours we spend without the house in the course of the day the better for our health, and this is self-evident by comparing the persons whose occupations oblige them to live almost all day in the air, with those who spend most of their time in chambers, offices or factories. In duly observing the laws of health, we have many things to observe—the quantity and quality of our food, solid and liquid, the necessity of breathing pure and fresh air, a sufficient amount of exercise to quicken the circulation and to aid in the removal of effete and worn-out particles in our muscles, bones, &c. The circulation of sound and healthy blood is necessary for the due action of the brain and nervous system, while the nervous energy supplied by these organs is essential to the well-being and due action of all other parts of our constitution. Hence the influence of the nervous system in the production of sound and vigorous health; and for this purpose we require that our sensa-tional, our intellectual, and our moral departments should harmonise with those of our more

material functions. It will thus be apparent that the reciprocal action of the stomach, the liver, the lungs, and the nervous system, are the most essential principles of Hygiene or the art of preserving health; to these must be added the skin which performs some very important functions, and which is a great aid to, and element of good health; for perhaps no one means contributes more than that sound condition of the skin which is produced by a daily bath and friction.

The purification and vitality of the blood depends on the air we breathe; the changes effected in the lungs between the blood and the gases we inspire and expire, are the primary and most important processes in the animal economy. Animal life is supported by absorbing into the blood after every respiration some of the atmospheric air which surrounds the earth; every act of inspiration brings renewed power to animal life, and every expiration sends out of the body particles that would be prejudicial to animal life. However careful we may be of our health in regard to eating, drinking, and purity of the skin, we cannot enjoy good

health, unless the air we breathe is frequently renovated from the atmosphere; and as there are many agents operating within a house to the deterioration of the air; unless we breathe daily and for some hours in the open air, and inspire something better than a house affords, we must not expect to enjoy good health. A fire cannot burn, a lamp give light, nor an animal breathe, without destroying a portion of that part of the air upon which vitality depends, viz., oxygen; and all these agents add a gas to the atmosphere, viz., carbonic acid gas, which is especially dangerous to animal life. The feeling of languor which occurs after being for some time in a crowded assembly, is thus to be accounted for, and hence the great importance of ventilation in our houses, our churches, our offices and factories.

The flesh and the blood contain the same four classes of substances which we take into the stomach as food:—Water, salts, non-nitrogenous substances for respiratory or heat-making purposes, and nitrogenous or plastic materials for building up and keeping in repair the organs and tissues. The aliments we

take in differ in their relations to oxygen with the excretions passing out ; but the same substances pass out of the system, although in a different form, as those which have entered. The animal organism may be compared with the soil, to which we must re-supply the materials, or the principles which we have removed, in the shape of wheat, &c. In both cases, whether we waste the soil or the animal economy, without a due restoration of their respective aliments or fertilising principles, we cannot expect that either will be in good condition. The weight of the body remaining the same, whatever we take into the stomach is used in the daily actions of muscle, nerve, brain, &c. Bread and flesh taken in at the mouth, pass into the blood, supply new particles to the muscular and nervous tissues ; the organs wear them away by their respective exertions, and the used-up materials, entering into new combinations with oxygen, pass out of the system by the lungs as watery vapour and carbonic acid gas ; by the skin, as aqueous fluid combined with saline matter ; by the kidneys, as water holding urea, lithic

acid, &c., in solution. Every organic action results in the decomposition of a certain number of organic particles, which ought to be renovated as they are expended by the deposition of new particles from the blood.

The due relations of waste and demand, of expenditure and income, may go on in exact proportion for years, if no more food is taken than is required, and no more waste allowed than can be re-supplied. This is perfect health, when our outgoings and our incomings are justly balanced ; but some eat and drink too much, and many work too hard, both mind and body: corpulence, indigestion, hemorrhages, nervous diseases, and premature degeneration, are the consequences. The salts of the urine are always increased after a meal, and if more food is taken than the system requires, the kidneys are overworked : hence the frequency of diseases of the urinary organs, and the absolute necessity of large feeders to take purgatives to remove the surplus, and to sweep out the chimney of the factory, to which Liebig compares the large bowels. It is much better that our excesses should be at once cleared

away through the bowels, than that the surplus should first be made into blood and require an over-action of our internal organs to convert the superfluity into urea, carbonic acid, &c.

There are certain relations between the inspired oxygen and the quantity and quality of our food; and probably the discovery of the complete action of oxygen on organic life, when made, will rank higher even than that of the circulation of the blood. The entire effects of oxygen are obscure and difficult to trace through all the various organs; for no doubt can exist that, from its entrance into the blood to its exit in various secretions, it pervades every part of our system, carrying its influence to the most minute structure, and effecting changes of the most microscopic kind. Every muscular effort, every mental action, in all probability, calls for some expenditure of oxygen; in the innermost parts of us it enters into combination with carbon, hydrogen, &c. As the varying tints of autumnal vegetation owe their brilliancy of colour to the action of oxygen, so all the colouring matter of animal

excretions are dependant on the same all-pervading influence (*Liebig*).

By the process of absorption fresh materials are introduced into the blood from the air and from food, and by absorption parts of the body itself are removed, when they have fulfilled their office, or for any other reason require removal. Two sets of vessels are concerned in this process—the blood-vessels, or the lymphatics and lacteals. The lymphatics exist in all parts of the body, the lacteals on the inner surface of the intestines, and absorb such part of our food as is fit for nutrition; both sets of vessels carry their contents into the blood near the heart. As soon as anything is swallowed, the fluid and soluble part is absorbed and carried into the blood by the veins; the lacteals absorb certain constituents of the food, especially fat, and derive their name from the white appearance of their contents, caused by the minute division of the fat in a state of emulsion. Chyle is always whitest and most turbid in carnivorous animals, it is less so in the herbivorous, while in birds it is quite transparent. Lymph is clear and colourless, contains

more water than chyle, this having nearly 10 per cent. of albumen, fat, &c., while lymph has only $3\frac{1}{2}$ per cent. Both lymph and chyle contain some of the same constituents as blood, viz., albumen, fibrine, fat, salts, iron, water; they may be considered as rudimental blood, and approximate the more to this fluid the nearer they approach to their confluence with the blood.

There are two modes by which the contents of the digestive organs are received into the blood; all very soluble matters pass at once into the blood-vessels on the coats of the stomach, by the process called endosmose, by which liquids of a less density will at once pass through a membrane which separates them from a fluid of greater density, and the blood being of a greater density than the very soluble substances, as sugar, gelatine, &c., taken into the stomach, these permeate the very delicate coats of the minute vessels directly into the blood. The other less soluble matters pass into the intestines, and are there absorbed by the lacteals and introduced into the circulation without passing through the

liver, which the other matters entering the blood-vessels must do. Thus, one portion of our food is subjected to the elaboration of the liver before it becomes blood, and the other portion is not. Before passing into the liver, the blood contains much albumen and little fibrine, but the latter is much increased after having done so. It also appears that sugar may be changed into fat by the action of the liver. Sugar injected into the general circulation is soon found in the urine as sugar, while, if thrown into the veins which take the blood to the liver, it cannot be so detected; hence we may infer that one very important function of the liver is to act specially on all matter of a saccharine or starchy nature, and all products of saccharine fermentation, as wine, beer, spirits, &c.

Inferences of great importance in medicine may be drawn from the two modes in which nutritive matter is taken into the blood. When the stomach is unable to digest food, the absorbent power of the lacteals may be altogether suspended, and the body may be starved as completely as if no food whatever was taken.

Under these circumstances, it is advisable to introduce such perfect solutions of food, that they may be taken up at once by the blood-vessels; this we effect by broths, wine, brandy, &c., which in the utter inability of the digestive process to supply the respiratory organs with materials for combustion, keep up the spark of life while Nature has time to eliminate from the system the poison of fever or other disease. The modern treatment of typhus, the merit of which belongs to Dr. Todd, is a remarkable exemplification of these facts—the heat-producing powers being maintained by frequently-repeated doses of alcohol, in cases of great exhaustion. When brandy is administered in this manner, $\frac{1}{2}$ oz. or 1 oz. every hour, it is so immediately elaborated by the liver and burnt away by the lungs, that it cannot be accumulated in sufficient quantity to produce over-stimulating effects on the system.

Nutrition is the process by which tissues and organs already formed are maintained in their integrity. By the incorporation of new materials into their substance, the loss consequent on the waste and natural decay of the

various organs, &c., is repaired, each part selecting its appropriate particles—nerves taking nervous matter, muscles muscular substance, &c. By this process an adult in health is maintained through a series of years with the same general outline of features, of nearly the same size, form, and weight; although during all this time the various portions of his body are continually changing, parts decaying and removed being replaced by new ones, which also in their turn die and pass away. In the muscles every act of contraction is accompanied with changes in the composition of the contracting fibres, a development of heat, and a decomposition of the fleshy tissue into urea, carbonic acid, and water. Yet the muscles retain their structure and form by the renewal of a composition of fresh particles exactly similar to those which have been removed. Thus nutrition consists in this constant change, the vessels ever and anon taking away worn-out or disused matter, and replacing the latter with new substance, which has first been elaborated by digestion, and then taken into the blood for the support of the animal economy.

As every tissue differs in chemical composition and functions, each will require different nutritive elements, and will have the power of selecting from the blood those materials best suited for its nutrition. Bone will require gelatine and phosphate of lime, while muscles and nerves will select their own peculiar constituents. As the amount of repair differs in relation to the activity of the different tissues, so the quantity of different nutritive elements will vary. In teeth and bone the interstitial changes take place very slowly, while in the muscles and nerves they are of a more rapid nature. By nutrition, every part of the body is enabled to retain its original form, size, weight, and general character, notwithstanding the constant change of substance by the disintegration and destruction of its component particles. The manner in which the old tissue is replaced by the new differs. In some structures the old particles are removed from the surface and the new grow from below; the skin, hair, horn, and nails, grow in this way. In bone and muscle the growth must be within the interstices. Slow as must be the nutrition

of bone, we know that such process is constantly going on; because if madder be taken with the food, the bones become tinged with it. The new tissues always take the exact likeness of the old ones, and although after some time not a single particle of a former structure remains, the physiognomy and personal identity continue through life unchanged.

It would appear that in the decomposition as well as in the nutrition of each distinct organ and tissue there were peculiar substances eliminated; after long-continued mental exertion, there is an increase of the phosphatic salts in the urine, leading to the inference that the various acts of the nervous system are attended with some change in the nervous tissue, involving the decomposition of phosphorus, and an increased quantity of phosphoric acid in the blood. In every organ the discharge of function impairs and wears away the tissues, and the nutritive power appears in their repair and restoration. One of the most essential conditions for the due nutrition of a part, is a regular adequate supply of appropriate blood, for unless this condition be ful-

filled, if the circulation of the blood in the part is partially or entirely cut off, we may have deficient nutrition or mortification.

All the products of the destruction of tissues which are not converted into carbonic acid gas, must be sent out of the system; and it is the special purpose of certain glands to remove them, viz., the kidneys, the liver, the intestinal glands, and those of the skin, from all which are excreted substances which, if retained in the blood, act as poisons and destroy life.

Thus terminates the system of nutrition, and the course the food may be supposed to take, from its absorption to its ultimate removal from the system. If the supply of nutriment and the waste of the tissues are duly balanced, these changes continue in the same order, until they are affected by that law of every organic atom by which its existence is terminated by death. Its power of resisting the action of the forces which destroy animal structures, viz., the action of oxygen, &c., gradually diminish in old age, and finally cease when the individual dies from the completion of a fixed and definite series of changes. This

is on the supposition that nothing has interrupted the vital processes; and that nutrition, respiration, secretion, and excretion, have continued their progress uninterrupted by disease (*Carpenter*).

Secretion is the process by which materials are separated from the blood, with the object of serving some ulterior purpose in the animal economy, or of being discharged from the body. Most of the secretions do not pre-exist as such in the blood, but require special apparatus for their elaboration, as the liver for the bile, the mammæ for the milk, &c. On the other hand, some of the excretions are in all probability merely separated from the circulating fluid, to be discharged from the body as carbonic acid, urea, &c. Some of the secretions are formed from mucus and serous membranes, some from the skin, and some from glands. The serous membranes line the internal cavities of the chest, the abdomen, the joints, &c., and, in health, the secretions from their surfaces are just sufficient to lubricate the parts; while in disease the secretion may be so increased as to constitute a form of

dropsy. The mucus membranes line the cavities which have outlets from the body, as the nose, mouth, throat, intestines, &c. The mucus surfaces are covered by a thin membrane, called epithelium, which renders smooth and protects the surfaces on which it is placed. The various kinds of mucus, when in a state of health, consist of this epithelium floating in a peculiar clear and viscid fluid, which is altered by cold and other causes of derangement, and in a morbid condition becomes mixed with purulent matter, as we all know by the effects produced on the mucus membranes of our nose, throat, and when under the influence of catarrh, influenza, &c.

The secreting glands are very various—as the lacrymal, which secrete the tears; the salivary; the mammary; the liver; the kidneys, &c. Some secretions are little more than exudations from the blood-vessels, and differ but little from the serum or watery part of the blood; but for others much more than mechanical forces appear to operate. The liver, for example, may be in a manner compared to a chemical laboratory, where the changes in

fluids coming in are of the most complex and important kind, among which has been mentioned the preparation of sugar, fat, and other compounds of carbon and hydrogen, to fit them as proper fuel for that peculiar kind of combustion which takes place in the animal body, enabling it to maintain, in some instances, a degree of heat exceeding that of the surrounding medium by 100°. The discharge of glandular secretions may take place as soon as formed, or they may be stored up for ulterior purposes, or until the retaining vessels are filled. Those which are in active operation in separating noxious matter from the blood are soon discharged; but when the office they fulfil is only occasional, they are retained for a considerable time. The nervous system has great influence on our secretions—a familiar instance of which is the rapid formation of saliva when the body is somewhat exhausted by fasting, and favorite articles of food are seen or even thought of. Another remarkable instance is the changes produced in the milk by grief, anxiety, and other emotions; serious danger, and even death, having accrued to

children from the effects produced on the milk of the mother.

The secretion of urine is very much affected by the kind of food; in herbivorous animals it is alkaline, in carnivorous it is acid; a dog fed on vegetable substance will pass alkaline urine. The specific gravity of urine differs much in twenty-four hours; the relative quantities of water and solid constituents are affected by the condition and occupation of the body during the time that has passed since the last meal: in hot weather we lose much watery fluid by the skin, and the saline part of urine of course forms a stronger solution; in summer, we pass about 30 oz. and in winter about 40. The ordinary constituents of urine are certain animal and saline matters, and occasionally are added various substances taken with the food, as colouring matter, &c.; 1,000 parts contain the following:—

Water	983.00
Urea	30.10
Uric acid	1.00
Lactic acid, Lactates, and Animal matter	17.14
Mucus of the bladder	0.32
Sulphate of potash	3.71

Sulphate of soda	3·16
Phosphate of soda	2·94
Phosphate of ammonia	1·65
Chloride of sodium	4·45
Chloride of ammonium	1·50
Earthy matters with a trace of } fluoride of calcium }	1·00
Silicious earth	0·03
	<hr/>
	1000·00

These constituents vary much even in health, according to season of the year, variations in food, mental influences, &c.: as an instance of the latter may be mentioned the increase of the mere watery part by hysterical affections, under the influence of which it is very pale. The colour varies, however, without any disorder; it is in its most natural condition of a straw colour, but is sometimes of a deep orange, and at others quite pale. It will be often rendered turbid by an article of diet, and the accession of cold or fever will at once change its appearance and character. In some diseases the solid parts are much increased. In diabetes it will contain large quantities of sugar, and in other diseases, the albumen, instead of going to

nourish the tissues, is separated from the blood in the kidneys, and passes away with, the urine.

The principal solid constituent of urine is urea, it is also the most important, as it is the chief substance by which the nitrogen of decomposed tissues and superfluous food is excreted from the body. The secretion of urine appears to be specially provided for the removal of urea from the body, and when it is retained its effects are most pernicious, in extreme cases acting as a poison. Urea, when decomposed, evolves ammonia—hence the smell of stables, &c. The animal matters in urine becoming putrid, act as a ferment, and ammonia is the result of the change, being returned to the earth in an inorganic form, after having acted its part in supporting the vital principle, both in plants and animals, destined again to go through the same changes, by being absorbed by the roots of plants to nourish a new generation of animals. Urea abounds most in urine when the diet is exclusively animal, least when vegetable; it is derived from two sources—in part from the unassimilated elements of nitro-

genous food—this is shewn by the increase of urea on substituting an animal for a vegetable diet; but the larger part is derived from used-up or disintegrated animal tissues, which is proved by the fact that urea continues to be excreted, though in smaller quantity, when all nitrogenous substances are strictly excluded from the food, and the diet made to consist of starch, sugar, and similar vegetable matter. It is even excreted when no food at all has been taken for a considerable time. The uric or lithic acid is another nitrogenous animal substance, rarely absent from the urine of man or animals. In birds and serpents it exists in much larger quantity than in other animals, and may be said almost to replace the urine of higher animals. In most febrile diseases lithic acid is formed in unnaturally large quantities. In gouty subjects it is deposited around joints, as urate of soda, forming what are called chalk stones. The saline substances in the urine are the same as exist in other fluids and tissues of the body, with some peculiar to the urine itself; the sulphates of soda and potash—phosphates of soda, ammonia, lime and magnesia. The

wearing out and decomposition of nerve substance and of brain supplies phosphorus; a person in health parts with 5.70 grs. in twenty-four hours, which is increased by undue exertion of the mental faculties.

PART II.

ON THE FOUNDATION OF A SOUND CONSTITUTION, AND THE
REPARATION OF A BROKEN ONE.

THERE are few truths more universally assented to than that health is the most important object of our life, and the most valuable possession we can attain; and yet practically there are few things about which people are so ill-informed, or so indifferent, or so negligent. Bitter experience of its loss appears necessary to all before an appropriate value can be set on its possession; we only find out its importance when we suffer from its derangement; nor does a moderate amount of experience suffice to make us study its laws, that we may preserve what remains of it; and the only persons who can sufficiently appreciate its value are those who have irrecoverably lost it. When people become valetudinarians, they begin to attend to the laws of health; such

persons form so large a class of the community; so much of the happiness of others, as well as themselves, depends on a proper knowledge of the subject, that it is impossible to overrate its importance. Probably, in a perfect scheme of education, the philosophy of health should find a place in it; for how many discover, when they have possessed themselves of wealth, honour and worldly welfare, that the want of health saps their enjoyment? A sound mind in a sound body is a very rare possession; the combination of an unsophisticated, unprejudiced mind, with a body unimpaired in physical power, ought to be more common if our education was good; for the want of both may be attributed to the neglect of true knowledge.

It would be easy to trace unsound health, both of mind and body, to imperfect education; for the body is too often disordered by absurd indulgences from our very infancy, while our minds are immersed in prejudices which the experience of a long life too often fails to remove. Probably if true knowledge was imparted to us in our school-days, the subject of health, both in mind and body, would neces-

sarily result from the very system of tuition ; for if we were led forward from a knowledge of natural objects to their relations and uses in the arts and sciences, some knowledge of chemistry and physiology must be acquired, and with it some acquaintance with the laws of health. Perhaps our school education is too much engrossed with the works of man, while the works of God are comparatively neglected. The teaching in some infant schools is in the right direction, and it is to be lamented that such a mode of imparting the elements of knowledge is not employed for all classes. Children readily fix their attention on objects, and where the real things cannot be shewn, pictures and models are the proper substitutes. The very constitution of the human mind confirms the wisdom of the arrangements of infant schools. Nouns are the only words used by children when first acquiring the elements of language, and when they have acquired a number of names of things, they begin to appreciate their relations—connect and compare them by means of verbs. If, in our earliest years, we were taught the names and uses of

every natural object that can present itself, the curiosity thus engendered would, in the majority of cases, lead children to acquire more of this kind of information for its own sake. Perhaps if the laws of language and of metaphysical divinity were not forced upon the mind at so early a period as is usual, it would be more conducive to the right development of the intellectual and moral powers. It might seem that in advocating an attention to the laws of health, I was going out of my way to say anything about the laws of education; but the two subjects are most intimately connected: probably a high degree of health, both of mind and body, can only be possessed by those whose minds have been properly developed: hence, a true education will be the surest road to sound health.

As a general rule, we may say that every human being is born with the latent powers of intellect and morals, of reason and virtue. In some the innate powers are individually or generally greater than in others; but all have them in some degree, except idiots, and even these unfortunates have been found, by the per-

severing efforts of modern benevolence, capable of some teaching; these form an exception—but the general rule is, that all children have inherent faculties, which it is the business of education to develop. The law appears to be that the mind remains a *carte blanche*, unless its powers are elicited, first by an extensive knowledge of things, and then by knowledge of their actions, and relations one on the other. If we watch the progress of a very young child, we shall see that the senses are first employed: he feels and examines a toy with his fingers, and afterwards with his other senses: thus are the perceptive powers of the mind exercised and developed, and probably we should do well to limit the teaching of many years of childhood to the exercise of the faculties of perception, attention, and memory for things.

The laws of grammar are very proper to be taught; but perhaps they would be better known if deferred to a period when the corresponding mental powers had been brought forth by a more complete knowledge of things; if we first taught our children more from the book of Nature;—if, in other words, we first taught

them the things and the laws of God, before we went into the rules by which men have arranged and classified the mere symbols of things, viz., words. We try to teach children the logic of language, of religion and morality, before their intellect can appreciate such things; while we neglect to give them that knowledge of things which, when acquired, must lead to the grammar. Go into many schools; examine a child on some absolutely metaphysical point, and he answers your question; shew him half-a-dozen of the commonest plants or trees, and you will find he does not know an elm from an oak. It would be very conducive to the well-being of children, both as regards mind and body, if they could be schooled in the open air, and taught the names of every plant in every lane, field, and hedge-row; in the same way knowledge might be acquired of the ground we tread upon, the stones we kick, the sand, gravel, &c., we see dug up, and the earth in which the plants grow. Every locality offers illustrations for this kind of knowledge, and it is the kind truly adapted to the minds of children. Ani-

mals are so peculiarly interesting to all children, that their attention to them does not even require to be directed. Acquaintance with a vast number of objects necessarily leads the mind to class them in some order, and a knowledge of how they are employed in the arts and sciences naturally follows. What a vast amount of knowledge could thus be imparted without much effort, and certainly without any danger of overtaxing the developing mind of childhood. Having learnt something of the nature of the things by which we are surrounded, and which we daily use, the mind is naturally led to take an interest in their structure and composition; the uses of the atmosphere he breathes, the water he swims in, the fire which warms him, become obvious, and he will like to know something of their composition. If the mind has been awakened to an interest in natural objects, it will be led on to a knowledge of some of the laws which govern vegetable and animal life; the laws which regulate the actions of living beings, by which the integrity of the animal frame is maintained. Lastly, the structure of the mind

itself will excite attention; the classification of its various impulses, feelings, instincts, perceptions, their relation to each other, and the adaptation of the mental faculties to the required knowledge of man. Without some acquaintance with his own mind, how can a man be said to be educated? Nor is such knowledge at all incompatible with classics, literature, and grammar, more especially the latter; for, is it not the outward expression of those laws of mind, which regulate the speech and language of all races of men—those wonderful laws which, amidst the diversities of the words and component parts of language, nevertheless require that the construction and grammar should be the same, because this is founded on those mental requirements which are fundamentally the same in all the races of man.

But what has this to do with the laws of health? If we acquire some knowledge of the nature of life and mind, and the true employment of these valuable gifts, we should take more care of them, and study the laws by which we can retain them the longest in a

condition to be serviceable. If we knew that mind is developed in proportion as the laws of its progress are attended to—if we knew that the life of grown men and women resulted from the manner in which they were treated from infancy upwards; that the physical health and the moral power might be made what we please by proper direction, we should not so basely neglect them as we do. If half the exertions made to improve the breed of horses, cattle, and sheep, were employed in similar endeavours to improve the physical and mental powers of the human race, what a different world we should live in. It is the real duty of parents to give their children all the life and all the mind which is possible; and the extent to which these blessings may be diffused by right training, we have no present conception, because we neglect the laws on which they both depend. Without some knowledge of the general principles of physiology, and without some knowledge of the laws of health, parents will be incapable of giving to their children that amount of health of mind and body, without which life ceases to be a blessing.

Rules of life may be laid down by religion and by moral philosophy. Rules of health may be laid down by physicians; but unless some real knowledge on these subjects—unless the mind is capable of appreciating the value of such rules, by knowing their power to increase human happiness—unless the mind of the taught can go with the mind of the teacher, the mere enunciation of rules and laws will make no lasting impression.

The whole subject may be resolved into two questions :—

1. How to found a good constitution in mind and body, by training and education.

2. How to re-establish a good constitution when impaired by bad health, whether induced by inheritance, or by a mistaken system of nursery training, prejudice, and ignorance.

The proper answer to the first question is to point out to parents, and all who have the management of children, the necessity of learning the business they have undertaken—for such knowledge cometh not by intuition. Instinct leads an infant to suck, and there are few mothers so ignorant as not to know what

to give their baby for that purpose; but beyond this point ignorance begins, and the number of infant lives annually sacrificed to such ignorance is an awful reflection. If we could depict the progress of infancy and childhood graphically, we should be able in the process to shew many of the omissions and commissions by which, at this early period of our lives, our afflictions begin.

The principal inlets, founts, or origin of disease, are the digestive and nervous systems. An infant with quick and healthy digestion, and with a nervous system not easily disturbed, will pass through its infantile period without disorder; but, on the contrary, one that has inherited weak organs of digestion or sensitive nerves, will not pass many days of its early life without betraying its predisposition. In childhood, vicious management may soon derange both these systems, and when we reflect on the utter ignorance of the subject, of the entire neglect of any means to acquire the knowledge necessary for the management of infants and children, we need not wonder at the early development of disorders, both of the

digestive and nervous systems. The majority of persons about to become parents appear to expect that the knowledge of how children should be treated is intuitive; while, in truth, it is a study which it is the duty of all in such circumstances most seriously to contemplate. How much of our happiness depends on the management of our earliest years—health of body and of mind. How much may be done, and how much may be omitted to be done, by those who undertake to conduct us through the early years of life. Many of the disorders which return upon us at intervals all through life, have their foundation in mismanagement of childhood, in the profound ignorance of parents and nurses on all subjects connected with the important duties they find themselves called upon to perform. The majority of people give themselves no thought about the matter; it has never crossed their minds that they have anything to learn on the subject: most children may really be said to take their chance, and an unhappy chance it is too often. I believe more real good would be done, if parents could be made to learn their duty

in the practical business of assisting the proper development of mind and body in the foundation of good health in early life, than by all the sanitary measures that may be enforced by legislators, important as they are. The wisest, the best, the happiest, and the healthiest of the human race, owe all distinctions in their future career to the early directions of a sensible mother.

How should a good constitution be established? That healthy offspring result from healthy parents; that much may be done towards the future health of offspring, even before birth, is unquestionable; but, as unsound and weakly people cannot be prevented from intermarrying, nor could it ever be just to attempt to prevent such marriages, for who could draw the line of demarcation between sufficient and insufficient degrees of health; and as the offspring of delicate parents, by judicious management after birth, may be made sound and healthy children, we shall commence our observations from the period of birth. We will suppose a child is born, as the great majority are, of fair average develop-

ment; it is washed, dressed, and fed, and much of its future health depends on a judicious system in these early arrangements. A good nurse will wash an infant with great patience and great care, and it requires much of both to do the office well, especially to an irritable and crying child; and this may be one reason why quiet children generally do so much better than irritable ones; they have more time bestowed on them. The general health so much depends on health of the skin, that too much time cannot well be expended in washing, cleansing, and rubbing the skin of children; and for the latter purpose there is nothing so suitable as the human hand. You will see a good nurse, after a thorough washing and drying, spend some time in rubbing every part of the body and limbs with her hand. With regard to the dress of infants, much depends on the judgment of the mother, for the nurse must use for this purpose what has been provided. If everything is very loose, the form or materials signify little; the simpler and the easier in its adjustment the better is the dress. Some nurses still continue to bind babies too

tightly; the rapid development of an infant requires that there should be no undue pressure on any part of its body. I have seen many well-formed children at birth, who, in a few months, become narrow and pigeon-breasted, which I cannot help imputing partly to bandaging, although bad feeding and general bad management have much to do with this, as I shall hereafter point out. In regard to the feeding of infants there is not much to be said; it should, during the first three or four months, be confined to the breast, and the necessary exceptions to this rule may be looked upon as a great misfortune, both to mother and child. How should a mother live to be a good nurse? is a question often asked; and the proper reply is, to do exactly as she has been accustomed, to continue the same habits of feeding, &c., which have best agreed with her health under ordinary circumstances. Many women double their allowance of beer, &c., sometimes on the plea that their appetite for food is bad; but nothing can be more injudicious, for the increase of the stimulant still farther depresses the appetite for wholesome food. Every

woman about to become a mother should pay great attention to her own health; by so doing she will promote the health of her offspring, and fit herself for the better performance of her future duties. A sensible woman will at once see the wisdom of this, and will do everything to promote the welfare of her child; and how much she can do, both before and after its birth, is so obvious, that it would appear superfluous to say anything on the subject. To those mothers who enjoy fair average health, the general rules of food, air, and exercise apply as under ordinary circumstances—the habits which best agree in regard to diet, as much fresh air as possible, and regular exercise short of fatigue; to those who do not enjoy good health, particular rules will be requisite in each particular case, and in all cases much may be done in this respect, for Nature herself has been so considerate, that most women, under these circumstances, find their health improved.

When a child is three or four months old, it is wise to begin to feed it once or twice in the day; this relieves the nurse, habituates the

child to a change of food, and facilitates much the future operation of weaning. The simplest preparations of good bread or other farinaceous matter with milk, will, in most cases, be sufficient; in very delicate children, beef-tea may be necessary; but all taste for cakes, sweets, fruit, beer, &c., should never be encouraged. Among the varieties of opinion one meets with, we occasionally come across people who think that children of a few months should live much as they do themselves, with no exception but in quantity. It is no uncommon thing to see a poor, ill-nourished, ricketty child, the picture of all that is wretched—who, as the mother informs us, “lives as we do,”—partake of a little of every thing—beer, unripe fruit, unwholesome cakes, bread reeking from the oven; all and everything, the dear little creature is permitted to indulge in. It may be very amusing to see a child enjoying itself over such things; but it is an amusement for which the child will have to pay in weakness and disease, and the parents in anxiety and distress. The food of young children cannot be too simple; and to found a good constitution

in their children, parents should watch with earnest care all the proceedings of the nursery.

The proper age for weaning is from ten to twelve months, by which time several teeth ought to have made their appearance, and the child thus enabled to eat some solid food. At this period habits of regularity should be induced, even if they have been neglected in earlier infancy. Three meals in the day are now sufficient; they should be at the same hours every day, and may consist pretty much of the same food, for children do not require that variety which adults indulge in. It is often injurious to change the food of infants. There are many different farinaceous compounds recommended to every anxious mother, who with the expectation of advantage to her child, will try three or four kinds of food, and so cause diarrhoea, or other morbid conditions of the digestive organs. Having adopted a food of proper quality, it is wise to adhere to it, although possibly some temporary inconvenience may arise. Care should be taken—indeed, it is impossible to be too cautious on this head—to procure good food. The flour, or bread,

should be the best of its kind. The ordinary London bread is ill-adapted for the stomach of a tender infant.

It is impossible to impress too strongly the necessity of inducing habits of regularity and method in the feeding of children; of confining the food to those articles alone which are necessary for nutrition; of avoiding all things that are useless but to pamper appetite, and teach children to eat for the sake of eating.

The principal rules to be observed in the management of the health of infants, are regularity in feeding, careful washing night and morning, the most rigid attention to cleanliness, regular hours for sleep, and that in an airy apartment. As far as possible, order should be observed in the earliest management of infants; but as soon as the child is weaned the most strict attention to regularity in feeding should be punctiliously observed. With very good management, and rigid observance of the rules for feeding, clothing, air, and exercise, the evils which surround children in large cities may be alleviated. The kind of food must be regulated by circumstances, some chil-

dren requiring more animal food, &c., than others; therefore, what is said on this subject must be considered as general rules, liable to individual modification.

When a child is first weaned, it is advisable to give a small quantity of animal food twice or thrice a week; and I believe the majority up to the age of six or seven years, would be well nourished if only allowed meat on alternate days. When they have meat for dinner, they should have no pudding. It is a very bad custom to have puddings or pies always after meat, and it is worse to give pudding invariably first, as is too much the case at schools. A child generally prefers pudding, and, having filled its stomach with that which it likes best, will have little inclination left for meat, which is doubtless the object of the system. Most parents are delighted when their children come home at the holidays, to see their round, chubby faces bronzed by the open air into the appearance of health, but which is dissipated in a week or two. The colour goes first and the plumpness next, being only the effect of a too farinaceous diet.

It is not solid muscle nor even good fat, that is produced by this kind of diet, but a loose lymphatic fullness, which, carried to excess, and further encouraged by long residence in a damp and unwholesome locality, or too much confinement from air and exercise, may produce a condition favourable to the development of tubercle or scrofula.

That animal food is essential to the strength and full development of the physical and mental powers of man, is a proposition hardly requiring an argument. We deduce the necessity from the superior physical power of those who use animal food, and from laws of our constitution, which prove that we were intended to use it. The love of hunting, fishing, &c., are remnants of the instinct possessed by man to destroy or capture animals for the sake of food; and the possession of some teeth much resembling those of carnivorous animals, constitutes a pretty conclusive argument that man was intended to use flesh as food. Much more might be said in favour of the argument, but the general conclusions of mankind in this part of the world are only

called in question by an occasional dissident in favour of an exclusive vegetable diet.

As a child advances in age, the quantity of animal food should be increased. After the age of seven, he should have one meal of animal food daily, and this constitutes the general rule for all ages ; but I fear it is only a small minority of mankind who can put it in practice. That it is possible to enjoy a considerable share of health on a strictly vegetable diet, has been proved over and over again ; but in all the cases coming under my own knowledge, the parties have not been capable of great endurance of fatigue, nor have they been long-lived. In many cases of disease, we see very beneficial effects from a purely vegetable diet ; and life has, by this means, been preserved for many years after the occurrence of one fit of apoplexy, and in other diseases resulting from a plethoric habit. There are some persons whose aptitude to make blood is so great that, with only a small allowance of animal food, they become so overcharged with rich blood as to require an occasional bleeding

or cupping, or they are liable to fall into some inflammatory or congestive disease. No doubt such persons may be kept in health by a well-regulated vegetable diet. On the other hand, there are persons whose blood is so thin that they require animal food more than once a day. These are extreme cases—but the general rule is, meat once a day, and then in quantity regulated by individual experience. There is an old maxim, that every one at forty is either a fool or a physician; and this is quite true as applied to individual experience. Before the age of forty, all should have discovered what agrees and what disagrees with them; they should have found out by this time the peculiarities of their own digestive organs, and the effect of all articles of food on their stomach and general health. All the particular laws of health, as applying to their peculiarities, such as the effects of particular articles of food, bathing, &c., should have been long known, and always guarded against, so that everything injurious to health may be avoided. This, with great sobriety at all times, and occasional abstinence, are the principal means

to establish a sound constitution and long life.

A medical man can only deal in general rules, which each must apply to his own case. No rules of diet are universally applicable. The powers of the stomach vary in different persons, as all other parts of the body vary. In a large family of children there will be the greatest differences in the powers of digestion, and it is folly to insist on applying the same rules to all. If a child is disgusted with fat, it is often injurious to his powers of digestion if he eats it, although it is quite right to persuade him to try a small quantity; just as in those children who would always prefer to dine on pudding, it is advisable to teach them to eat a little meat. There is so much in custom, that we should endeavour to induce good habits of feeding, as well as good habits of order, &c. By management, a child may be induced to take some, at least, of the kind of food that is best for him; and it is precisely this direction of the early habits of children by which a foundation is laid for future health and happiness. A watchful parent will be

alive to every peculiarity in a child, and correct that which has any tendency to be mischievous in its earliest bud. This can only be accomplished in the nursery, under the eye of a parent, or a first-rate nurse ; and if left to ordinary servants, is never properly done. How much of the misery of life would be prevented, if parents were more attentive to the nursery ! The subject is almost a science, but which is supposed to come by instinct, anybody being thought capable of taking charge of children ; and we all find, as life advances, and knowledge of the subject increases by experience, how much our early management of children might have been improved.

This is a subject of vast importance to the community, as well as the heads of families ; for how important it is to a state that its members should be capable of rendering it physical assistance in time of need. So much of happiness and well-being through life depends on the direction of the first few years of our existence, that it is a question whether, in a well-regulated state, public means should not be adopted to give this sort of knowledge

to all classes of the community. At all events it is the positive duty of all who are likely to have the superintendence of children, to acquire some knowledge of the proper means of early training. The acquisition of this knowledge would save parents from many an anxious hour, and it would enable them often to prevent, and in all cases to alleviate, and perhaps cut short the disorders of their children.

I cannot too strongly urge upon every one likely to become a parent, the wisdom of learning all that can be learned of the practical application of the best rules for the development of the mind and body in health and strength. For this purpose, it is not necessary to have sufficient medical knowledge to treat diseases; on the contrary, what is recommended will lead to a discernment of the wisdom of applying to a confidential medical practitioner in the earliest stages of real disease, as the prudent and proper course. The information which all parents should possess is that which will tend to the prevention of disorder, or to induce that vigorous state of constitution which enables a

child to shake off the diseases to which all are liable, without laying the foundation of lasting bad health.

In a country where good medical advice is always at hand, it is most unwise to treat any real illness without assistance. Every one should be very particular in the choice of a medical adviser: it is impossible to be too much so. Evidence should be obtained, not only of his competent knowledge of medical practice, but of his strict integrity and conscientious principles. Having reposed their confidence, after due inquiry, that confidence should be unlimited; and it is the wisest and most economical plan to consult him at the earliest period, whenever any symptom has occurred that may be connected with internal disease. Most important maladies may be cut short by proper treatment in the earliest stage; whereas, too often, the delay of a few days allows time for the establishment of serious organic mischief, and may confirm a disease which, if not fatal, may be of three four weeks' duration, instead of as many days. My purpose, therefore, is not to advise much know-

ledge of medical treatment, but of that acquaintance with the laws of health which will enable parents to manage children in a rational manner, so as to secure that strength of constitution which will prevent the establishment of disease.

Every child has some peculiarities of constitution which require to be studied. Observation should be busy in watching these peculiarities, because general rules can only be applied with those necessary modifications requisite in every particular case. The most obvious peculiarities observed in infants will be in the stomach and bowels, the skin, or the nervous system. Some infants will invariably reject a portion of their food; others, having a less irritable stomach, will retain it, and throw off the superabundance by the bowels; while those who possess powerful digestive organs will convert all into nutriment, and become too fat. Great diversity will be observed in the action of the bowels—some will be too lax, while others will almost constantly require management to keep them sufficiently so. Here let me advise mechanical means, in

preference to physic, in the cases of all infants whose bowels are costive. A little warm water, thrown up by an India-rubber bottle, will generally be sufficient, and not at all injurious; whereas giving medicine by the mouth may derange the stomach and the whole digestive apparatus, when the object is only to promote the action of the lower part of the intestinal canal. This advice is equally applicable to adults suffering from costiveness: the difficulty is in the large bowels, which are torpid—the stimulus of the warm water induces them to act. By a lavement, you apply your remedy to the seat of disorder, while an aperient dose irritates a very extensive line of intestine, before your remedy reaches the spot you wish to act upon.

There is also danger in the constant daily use of aperients, such as an aloetic pill. Cases of obstruction in the bowels occur where no passage can be obtained, and in which, on examination after death, no mechanical strangulation is discovered. There is a general distended condition of the whole of the intestines, which has been considered to be caused by a

kind of paralysis, destroying the contractile power of the muscular coat, and is thought by some practitioners to be brought on by the constant use of purgative medicines.

Some people seem to think that any broken food, or hotch-potch, or heavy pudding, will do for children ; but of all species of economy this is one of the most pernicious. There may be in the kitchen some cold meat which is to be disposed of :—“ Oh ! it will do for the nursery,” says the cook, and forthwith cuts it up, re-cooks it into a hash, an Irish stew, a pudding, or some such abomination ; the children are, perhaps, delighted with the savoury mess, and their taste perverted for more simple things. It should be a rule in all nurseries that fresh meat, in its simplest forms only, should be given to children ; that cold meat is wholesome, while re-cooked meat is indigestible and bad ; that all sauces, pickles, &c., which make people eat more than they want, should be utterly forbidden in the nursery. Puddings, and those light and good, should not be every day a regular part of the dinner, the effect of which is to prevent some children

from eating as much meat as does them good, and induces other children to put enough for a second meal on the top of one amply sufficient, of meat, vegetables, &c. Let every mother, if she cannot always see her children at their meals, at least as often as possible go into her nursery at these times. Good digestion is the primary foundation for a good constitution, and the stomach is the inlet of many diseases. So long as the stomach does its duty well, and is only permitted to act on proper materials, we need fear no disease that may occur. A child with a sound stomach and healthy digestion will soon shake off disordered health. In the intervals of meals children should be prevented from taking sweets and other trash, which kind friends and kind servants are too ready to furnish. The rewards for good behaviour should never be stomach-pleasures; and the pocket-money should be directed to any other channel rather than the pastrycooks or the confectioners. We may even assist the development of mind while taking care of the stomach; for if we direct the taste for pictures, books, or ingeni-

ous toys, in preference to sweets, &c., we lay a foundation for the preponderance of intellectual pleasures over sensual ones ; and we can hardly begin too soon to form such a taste.

To found a good constitution, air and exercise are essential. One daily walk of an hour or two in fine weather is altogether insufficient. A young child should almost spend his whole day in the open air. Even a London garden, with all its dirt, is better than a close room. There is much advantage to children in having a few simple gymnastic contrivances in a well-ventilated room ; they form a great resource to children doomed to a city life, or in bad weather, as well as being very conducive to health. Weather, unless very bad indeed, should be no excuse for confining children to the house : the streets and squares of London afford very good air, if they cannot reach the Parks. I have known several very healthy families brought up in London, by taking every advantage of opportunities for air and exercise, and very special attention to the stomach and its provender. Of course children subjected to the disadvan-

tages of a city life, should be doubly guarded in respect to good and wholesome food, for we may all take greater liberties with our stomachs while enjoying the fresh and open air in a healthy part of the country, than when living in a large town.

Bathing, and every means that will keep the skin in good condition, is an essential item in the process of founding a good constitution. All children should be well washed at night, and immersed into cold water as soon as they are out of their beds in the morning. There are few children who will not be benefited by a cold bath ; but it should be a rule to do it as soon as they leave their bed, while the body is very warm. If allowed to run about the room in their night-dress first, they do not get half as much good, because the rapidity and power of reaction is not so great ; the glow, as commonly understood, is more certain and more decisive when the body still retains the heat of the bed. Mere sponging with cold water is not so beneficial as actual immersion, head foremost, but it is a good substitute where a real bath is impracticable ; two, three,

or four, immersions should be given in quick succession, and the skin then well dried and rubbed for ten minutes with a rough towel, flesh-gloves, and the hands. Perseverance in this process for a few weeks will sensibly improve the health ; and a few months will often convert a delicate child into a strong one. An occasional visit to the coast, and daily immersion in the sea, will always be advantageous, but by no means sufficient to supersede the continuous daily domestic bath.

The great anxiety, as well as necessity in these days for education, induces many parents to begin the process with too little regard to the physical development of the body. A child cannot begin to learn too soon, but the learning need not be by tasks ; a sensible mother is always teaching her child, and at a very early age may begin to excite attention to a knowledge of objects. The inquiring nature of the human mind does not require much leading for this purpose, most children intuitively directing their attention to every new thing presented to them. Something may be done even in infancy towards the de-

velopment of a good memory, by keeping the attention on the same thing long enough to acquire a complete knowledge of it. Nothing is so important as a good memory ; and this appears to be the result of complete knowledge of a subject acquired by continuous attention to one thing at a time. What the French call "*attention suivie*," is the grand foundation for retentive memory.

To give a young child a task to learn out of a book is little less than barbarous, and defeats its own end, for the child soon thinks learning a bore, and for ever after associates school and its objects with pain and disgust. To found a good constitution, the first six years of life should be devoted to physical education ; three-fourths of the waking hours of a child's life should be spent in the open air, in all but the very worst weather, and the rest of its time in well-ventilated apartments, rather erring on the side of too much cold than too much heat. This is not inconsistent with sufficient attention to mental development, by storing the memory with a knowledge of things, pithy sentences, and


scraps of poetry ; but a sedentary and studious child should rather be discouraged, and amused into more activity. A precocious development of any of the intellectual faculties is not to be desired, for it is too often accompanied with life-long disorder. We need not fear the destruction of Genius ; where that exists it will be developed in due time, and better by the natural efforts than by any artificial aids.

If we can succeed in establishing sound bodily health in our children up to the age of seven, we need be under little apprehension for subsequent years ; such children readily shake off the usual disorders of childhood, and are in a condition to withstand some considerable rough treatment during their school-life. The important question now arises of the respective advantages of school or home education ; I believe the advantages lie on the side of schools, both to girls as well as boys ; but also that the most desirable system of education is daily attendance at a very good school, with residence at home, thus combining the good of both, and moreover insuring a certain amount

of exercise daily, in going to and returning from school in all weather. However, this question must be answered according to circumstances; for, unfortunately, in some homes, children learn as much harm as good, and there are many cases in which school is absolutely best. The choice of a school is most important; and it is next to impossible to meet with one combining the advantages of the most healthy locality with the most rational method of instruction. But we should never lose sight of health, and send our children to a low, damp situation, or any place where malaria is likely to exist. We should also be clear that the mode of feeding is judicious; for the combination of bad air and bad food will engender scrofula and other diseases, in almost any constitution. If we are fortunate in the school-life of our children, and give them all the advantages in our power for health and for elementary knowledge—if the strength both of mind and body advances with their years, we may enjoy the gratification of having done all in our power towards the establishment of a sound constitution in both.

It is wonderful how much may be effected by long perseverance in a judicious method, towards establishing sound health even in children who were weakly at birth, and during their early years; and it is equally certain that similar perseverance in a right method will develop intellectual faculties in children of the dullest original capacities. *Nil desperandum* should indeed be our motto in all such cases, when we know the wonders that are now effected by the education even of idiots, as a visit to the Asylum at Highgate will prove in several remarkable instances. Nothing can be more glorious than the power of aiding the development of mind, and ought to be the grand pleasure and object of all parents; and whatever time and attention may be given to a study of this subject, will amply repay them in future years. Experience and philosophy corroborate the unexceptional truth, that if you "train up a child in the way he should go, when he is old he will never depart from it." Mere teaching without example will be too often unavailing to develop in children the moral faculties, and

although the germs of them have been implanted deep in our nature, they will not grow unless they are watered from the springs of parental feeling; if the parental garden of the soul has not been cultivated to the production of the fruit of moral principle and power, the consequent want of due example will neutralize all mere wordy enforcement of the rules of virtue. The same principle applies to heads of schools, and, indeed, all who undertake the teaching of youth or of mankind, if they do not verify their precepts with that test of sincerity, their own example, their tuition will be unproductive of that genuine love of the good and search after wisdom, which follows the instructions of those who practically apply the truths of religion and philosophy. Let the brilliant examples of Dugald Stewart and of Dr. Arnold of Rugby, be selected to prove this principle. I should think no two men in the history of mankind had ever by their own individual teaching, propagated sound intellectual and moral views to so large a number of pupils, many of whom have been the best men of



the age in every sense. A sound mind is intimately connected with a sound body ; perhaps the one cannot exist in full integrity without the other, the laws of mind bearing a close relation and adaptation to the laws of health. If the intellectual faculties and moral principles have been duly developed, the body, the mind, and the feelings will always be under the due regulation of sound knowledge, judgment, reason—and their harmony of action constitutes what we are in search of—*“mens sana in corpore sano.”*

The importance of selection in the teachers of our children must be clear to all, and yet upon what poor reasons are children sent to particular schools ; the truth is, that this importance is not sufficiently appreciated, and the majority of people do not think at all about it, but are led to choose a particular school for mere convenience, or other motive, without considering they are doing one of the most important duties of life. Too much time, and reflection cannot be given to the subject ; and having, after proper examination, placed our children at a good school or college, no

light matter should induce us to remove them, for nothing is so detrimental to sound education and the establishment of fixed principles of action, as alterations in the system of mental training. The change of schools is a very frequent cause of vacillation of character, unsettled opinions, doubt upon all subjects, and scepticism on the most important guiding principles of life. Having so far laid the foundation for a sound constitution in mind and body, the few years that elapse from our school-days until our establishment in life require consideration, for however sound we may be in mind and body up to this age, every benefit of teaching and example may now be annihilated by idleness, indulgence, and a vicious employment of our time. Much of the happiness of life in both sexes, as well as their future health, results from the way in which the period from school-life to the age of twenty-two or twenty-three is spent.

There is no greater mistake made by a very large number of parents, than to suppose that all necessary education is obtained at school before the age of sixteen, and that all subse-

quent teaching spoils a lad for business. To establish a sound constitution, both of mind and body, some further teaching is essential to form those habits of thinking and acting which constitute the basis for that continuous self-education without which no man ever became well informed; and unless a man is well informed, he neither knows how to take care of his mind nor his body. The Natural Sciences are among the most worthy, if not the best, objects of attention, after the rudimentary knowledge of school has ceased. There are very few minds that could not be directed to take an interest in the pleasing information afforded by Chemistry, Botany, Vegetable and Animal Physiology, and other branches of Natural History; nor are there any inquiries which so much tend to fill the mind with that objective knowledge which develops the understanding, the reflecting and moral powers of the human mind. If a man is acquainted with Natural Science, he possesses within himself available resources for improvement of mind and recreation of body, which lead to habits of life most conducive to sound health.

Science can be prosecuted in gardens, in fields, on the sea, and on mountains ; everywhere is the Book of Nature open to our inspection, and everywhere can we learn those truths which lead us to contemplate the wisdom and intelligence everywhere surrounding us, and the wonderful adaptation of our own mental faculties for the acquisition and enjoyment of such knowledge. In this respect the prosecution of Science has a great advantage over the pursuits of Literature : health of body as well as of mind will be strengthened by the one, while the sedentary pursuits of the other have the reverse tendency, to say nothing of the mischief often endangered by the class of literature too generally indulged in—works of fiction and imagination. Many nervous disorders may be traced to over-indulgence in the absorbing interest of romances and other imaginary descriptions of life, which render those who thus season their mind impracticable and unfit for ordinary duties, by having their imaginations of society so exalted, that disappointment, and too often disgust, is the result.

I might adduce, as an additional and very

important reason for an early training of the mind with a view to its proper development, the melancholy evidence of the unhealthy state of the understanding in a large proportion of so-called educated people, exhibited by the delusions of mesmerism, table-turning, spirit-rapping, *et id genus omne*. Whether we attempt to account for the progress of these absurdities by referring them to long-known principles of the human mind, to the absence of self-will and self-possession, to the force of imagination, or the prevalence in the mind of one predominant idea, it is a melancholy fact that there should be a large number of persons so destitute of force of mind as to be deluded into the belief that the effects witnessed arise from supernatural interposition. There is an able article in a late "Quarterly Review," which places in a clear light the supposed wonders of electro-biology, table-turning, &c., shewing that all these singular delusions of the mind may be traced to well-known mental operations, which have been observed and recorded from time immemorial. A butcher, in taking down a joint from one of

his hooks was caught by it, held suspended in dreadful torture, and when released from his position his sufferings were excruciating from the supposed wound of the hook, until the examination of a surgeon proved that the skin had not been touched, but only his coat, &c. Here was exhibited the power of imagination and the force of a dominant idea, just as the victims of electro-biology, being destitute of any will of their own, have suggested and enforced by the authoritative command of the operator that they cannot rise from a chair, and have even forgot their own name. That so many can continue to be deluded with the idea that tables turn by some unknown mysterious power, when the effect can be proved to be the consequence of their own muscular force, is remarkable ; but this is in part to be explained from that spirit of party by which some minds will adhere to opinions when once adopted, in spite of all logic and the experience of the whole world.

Does not all this shew some great deficiency in education. The human mind requires to be developed by tuition, observation, and expe-

rience; and, until it is developed, is liable to delusions of all kinds. In a very early and ignorant state of society, every inexplicable circumstance is referred to supernatural agency. Many things which are now known to observe regular laws, and are looked upon by the most ignorant as ordinary operations of Nature, were formerly considered by all classes as dependent on direct supernatural agency. The winds, the weather, various diseases, and even the common every-day affairs of human life, were referred to the interposition sometimes of a spirit of good, sometimes of a spirit of evil. That the negroes of Africa, and the aborigines of Australia, should be under the influence of such opinions, excites no surprise; but it is lamentable to see amongst ourselves, and the enlightened inhabitants of North America and Germany, that numbers are still led away by such notions, and it affords evidence of the existence of a weak and undeveloped state of the understanding and the intellect.

That state of mind which lays it open to delusions of various kinds is an incipient condition of insanity; and I believe it is a fact

that many who have commenced by being influenced by mesmerism and its sequences—table-rapping and spirit-moving—in whom one dominant idea has been generated, and whose minds are thus abstracted from common sense principles of action, become, in time, monomaniacs. No one with any experience of life doubts but that frequent cases of insanity may be traced to the absence of some definite purpose in the mind, the result of early indulgence, vicious education, and total neglect of the means to elicit and give strength to the powers of self-knowledge and self-possession. The understanding has been neglected, and the intellectual and moral powers are almost as dormant as they were in infancy, while the sensual organs, the love for the marvellous, and morbidity of feeling have been exercised, encouraged and developed in undue proportions. All the supposed marvels of mesmerism, electro-biology, &c., are referrible to laws of the mind, either in a healthy or a diseased state; and it is the general neglect of the study of the laws of mind which renders so large a portion of the community open to delusions of

various kinds. If the laws of mind formed part of our education ; if we were taught not only how to use our minds but how to direct and develop them, we might all have logic enough in us at once to detect fallacies, and no system of education will be really worthy of the name, unless it embraces this important element.

The misapprehensions in regard to table-turning, &c., arise from the false inferences and conclusions which most people draw from the observed facts ; instead of looking for an explanation of them from known laws, they either proceed to impute them to supernatural influence, or they allow them to float in their minds as inexplicable and mysterious. Both these conditions of mind are disgraceful to the age in which we live, for they both testify to the fact that we so neglect the mind in our plans of education, that it must be either prejudiced and morbid in its opinions, or it must sleep in the torpor of indifference or the uncertainty of scepticism. Let us endeavour to elicit the dormant powers of the human mind by introducing into the education of all our people as much information as we possess of

the nature, the mode of action, and the relations of the intellectual and moral powers ; let the elements of the science of mental development and evolution form part of an universal system of education, and then there may be some hope of seeing the public mind less open to the impostures of quackery, the delusions of enthusiasm and prejudice, and the sophistry of falsehood, however plausible may be the language in which it is clothed.

We now proceed to consider our second proposition—how to repair and re-establish an unsound constitution. We will suppose that by birth, parentage, or education, a very unsound state of health has been engendered—that from childhood upwards a feeble condition has existed ; that, in youth, the usual games and exercises were not to be indulged in from this cause—that sedentary pleasures became the habit—that the bodily organs were in consequence badly developed ; and that all the functions of digestion, respiration, and nutrition were imperfectly carried on. Under such circumstances, on reaching the age of maturity, a person would be always, more or less,

an invalid, suffering from indigestion, debility, nervousness, &c. In such cases, can the constitution be improved, and a fair amount of health established? In the large majority I have no hesitation in answering in the affirmative, if a steady and very persevering attention is paid to all the laws of health. But in weak constitutions, and in chronic disorders, no permanent good can be effected by carrying out a few rules for a few weeks; in all diseases of slow growth the means of cure must also be slow, and a constant undeviating attention to every known condition of sound health is absolutely imperative to such invalids.

In attempting to repair a weak constitution, there are three organs over which we have great control, and which, if we can place in a good condition, must establish a fair amount of health—the stomach, the skin, and the nervous system; these are the great inlets of disease, and by placing them in the most favorable circumstances for the proper performance of their functions, we may in time re-establish a high degree of health in almost any constitution.

Many of the worst cases of stomach and nervous disorders owe their origin to the barbarous practises of nurseries and schools; the system of governing by fear is the prolific source of nervousness, from the morbid sensibility of slight cases to the incipient insanity of others. How much of moral restraint and intellectual arrangement, which all find so essential to health and comfort in after-life, and which to attain costs us so much bitter experience, might be given to us in early life, by wise and well arranged tuition. How many weak stomachs might have been made strong ones, if all parents would be at the pains of acquiring some knowledge on this subject, before they are called upon to attend to so important a thing as the health and happiness of their offspring. Disorders of childhood, as well as disorders of mature life, are often induced, and always aggravated, by weak and depraved conditions of the digestive organs, engendered by inattention to quantity and quality of food. The grossest ignorance is too often witnessed in the extraordinary things a delicate child is allowed to

partake off ; indeed, is often prompted to take, by misapplied kindness, or the unthinking system of rewarding merit by stomach indulgences.

Disease not only originates in the stomach, but is aggravated by its cravings, and the injudicious supplies granted to its supposed wants ; and as this organ is the vehicle through which we must direct most of our curative agents, it deserves to be attentively studied under all circumstances, both of health and of disease. There are many articles of food and of medicine, which act differently on different persons—things which may be in general use, disagree with some persons in any quantity ; it is therefore the duty of every one to study the peculiarities of his own stomach, and thus to discover what agrees and what disagrees. If Cornaro's rule was then acted on—"to take in moderation what best agrees with us"—there would be little occasion for such inquiries as those we are now concerned in. If, by the study of our own constitution, we knew what to take and what to avoid, we might most of us, like Cornaro, live to enjoy a healthy, cheer-

ful and happy old age. By keeping the stomach in health, we may put ourselves in a condition to resist the deranging influences of the most untoward state of the elements, for few catch an ordinary cold when their digestive organs are in the best condition; the most essential elements of health depending mainly on a sound stomach and a healthy skin, and the latter will generally exist as a consequence of the former.

We might almost say that every disease depends on the state of the stomach and digestive organs, but there are some especially that most obviously do so; among them may be enumerated gout and rheumatism, which in many instances may be altogether prevented by acquiring an acquaintance with the principles of digestion and nutrition, and strictly acting on such knowledge. Most persons subject to these diseases are great generators of acid; their stomach may be considered a vinegar-cruet that is self-supplied; many never wake in the morning without that sure test of an over-acid stomach, roughness on grinding the teeth together. Those

who are in this way inconvenienced, might, by a round of experiments on themselves, determine what to take and what to avoid ; and all invalids would be able by such knowledge to defend themselves from many incursions of their enemy. To be acquainted with individual peculiarities, is of great value in adopting the remedies for the cure of any disease, and a medical man may be much assisted by the communication of such knowledge. Even an incurable disease may for years be kept at bay, if the stomach and digestive organs can be maintained in good condition by the strict observance of such rules as have been found by experience to be best adapted for that purpose. Confirmed organic diseases are best treated by both patient and physician directing their chief attention to the organs of digestion.

Whatever may be the future development of disease, the stomach is generally the first organ to be deranged, and obviously the one through which our remedies, both of diet and medicine, must be directed ; and to acquire a full knowledge of its individual peculiari-

ties, should be the first step towards adopting a course of remedial means. It is easy to perceive that our remedies, if not appropriate, may do as much, or more harm, than good. Consider the delicate structure of the internal coats of the stomach, and the work it has to perform in the conversion of food into blood; its whole surface consists of a congeries of most minute and almost imperceptible nerves, arteries, veins, and various tissues, adapted for secretion, digestion, and absorption. When we reflect on all this, so far from complaining of its frequent disorders, it is most marvellous that it should so long resist our indiscretions. Let us only remember how we treat it; the variety of pernicious things the best of us ask it to digest; what a medley of heterogeneous matter we place in it during a single meal; what ingenuity in cookery to torture into every form, to combine in every possible variety, articles, which by themselves alone, we should never dream of oppressing our stomachs. This organ, from our earliest infancy, and in all classes of society, is at all times pampered with such an

extraordinary variety of materials, that its taste is almost always depraved; things which at first disgust it, we induce it by habit to enjoy; until, instead of being our servant, and employed solely for the welfare of the rest of our body, it becomes our master, and urgently demands supplies which may be very deleterious to the well-working of the rest of the animal economy. How soon are the simple tastes of childhood perverted: the stomach, instead of being the receptacle of wholesome food for the formation of healthy blood, becomes the deposit of all sorts of trash that can excite any pleasurable feeling in itself or its caterer, the organ of taste. The pleasure of enjoying the expression of a young infant induces us to create in it a taste for various things, which would be better delayed as long as possible. We make the reward of what we call a good child to consist of sweets, or things which please its sensuality. Not content with this, many parents take infinite pains to teach, at as early a period as possible, a love for wine, beer, &c.; and however disgusting they may be at first, the extraordinary

imitative powers of children very soon imparts to them a fondness for the same things which they observe their seniors to take and to enjoy. Hence many of the disorders of childhood. A stomach overburdened with too much food, or perverted by improper food, either has its powers impaired, or it converts all it receives into the element of blood, and sends into the current of the circulation depraved fluid, the germ of many of the diseases of which an infant, however healthy at birth, may soon become the victim.

An invalid ought to be scrupulously attentive to the kind of food introduced into the stomach—the simpler the better; and in the case of young children, nothing but the very simplest articles should ever pass the portals of the mouth. When we reflect that the stomach is the receptacle for matter destined to be converted into blood—that the real object of its existence is to subject such things as are fit for the nourishment of the body to certain processes which altogether change their conditions; when we reflect on what the blood is, and that the object of eating and

drinking is to make blood, we must feel the great importance of studying how to supply the stomach with food that is best adapted for this purpose.

Upon the health of the blood must depend the well-being of every part of us; every organ and every square inch in our body is interested in the condition of the blood; it requires, therefore, very little physiological knowledge to comprehend how a disease of the skin may result from bad food. Our mind itself, being in our present state of existence manifested through the organic matter of the brain, which is dependant on the state of the blood, may be sound or unsound, in such degrees as are related to the sound or unsound results of the action of digestion; our very intellectual and moral powers therefore are advanced or retarded in their development by the way we treat our stomachs. As we manage the primary source of all nutrition, so we prepare for all the organs and parts of our body the elements of health, comfort, and happiness; or the reverse. If we supply only a proper amount of wholesome food, the general result

will be a wholesome state of the blood, and vigour and health to the constitution. The food of children cannot be too simple; and when they are sound at birth, not inheriting ancestral sins of the third or fourth generation, they will resist the influence of much incorrect diet; but if by birth and parentage they do inherit disease in some shape, then it becomes imperative that we should be doubly vigilant, that the stomach is supplied with those things only which are essential to good nourishment. Here is the really important point in relation to health of mind and body: if we inherited from our parents a constitution sound in all its parts, what we ate and what we drank would be of little importance; but as there are few who do not inherit the germ of some disease, care in most cases is necessary, and when the inheritance is clear and distinct, then it is that the most rigid laws of health should be enforced from earliest infancy: for, by so doing, we may often rear a healthy tree from the branch of a diseased stock. Place an unhealthy child under the most favorable circumstances—attend carefully

to every element of good health—let no ignorant servant pamper him with trash—let him have nothing but food from which his stomach may alone extract the elements of healthy blood; continue such a system for a sufficient time, and you will convert a sickly infant into a sound and vigorous child. The same remarks apply to all ages; if the constitution be good and the stomach powerful, it matters little what is administered to it—you may much exceed the bounds of reason—very considerable liberties may be taken without any permanent mischief; but in a feeble constitution, and a depraved condition of the digestive organs, if we would avert evils that oppress the body, and render the mind incapable of any true enjoyment of life, we must attentively study the power of our stomach, and only partake moderately of such things as are known to agree with it. Every stage and condition of dyspepsia may be counteracted, by learning the laws of health, so far as our individual self may be concerned, and then by resolutely adhering to them, always bearing in mind that there can be no general rules for

diet; every stomach having its peculiarities, it must be individually studied.

In attempting to answer the question, how to re-establish a unsound constitution? we should consider the stomach in all its relations, in health and in disease, because it is necessarily the agent through which we must carry on our operations. All our means of curing disease can only operate on the system through the stomach or the skin, when it becomes necessary to introduce medicaments into the blood; if we can do so through the skin, it will generally be better than through the stomach, but our power of doing so is more limited, although it may be doubted whether this means of treating disease has been sufficiently attended to. In the administration of medicine, our object is to act locally and directly on the stomach and bowels, or to introduce substances into the blood, some of which act on the constitution generally, and others specially on a particular organ. Now the last object can be fulfilled as well through the skin as through the stomach, with some medicinal substances, as mercury,

sulphur, turpentine, &c. Baths, of course, act through the skin, and this may be illustrated to non-physiological minds, by the fact that thirst may be allayed by the fluid absorbed into the system from an ordinary bath. The vessels of the skin absorb, as well as the vessels on the mucus surfaces of the intestines—in fact, the mucus surfaces are continuations, if not modifications, of the skin—the lips forming the intermediate junction of the two surfaces. When a new lip has been formed by the operation of separating skin from the under part of the chin, to supply what is deficient at the mouth, as the wound heals, the new parts which are in and round the mouth gradually assume the character of mucus membrane and lip. We have therefore access to the blood through the skin, and when it is objectionable to introduce medicine by the mouth, we may succeed in so doing by absorption from the surface. It is worse than folly to continue to put medicine into the stomach when it is in a state of irritability, or disturbed by the introduction of almost any article of food; under such circumstances, we

should allow it total rest until its powers are restored. The skin then becomes a very useful auxiliary in the treatment of disease, as well as important in its direct influence on the health of other organs; for if the skin is in good condition, the constitution at large will generally be so: hence the importance of baths, friction, and exercise.

But the stomach is the organ through which our principal means for bettering the condition of the general system must be administered, either in the way of food, drink, or medicine. Could we succeed in making the stomach do its duty properly, we should have little difficulty in curing disease; therefore it is that a rigid system of diet and regimen may, by long perseverance, effect the cure of a disease without one grain of medicine being administered; and it is thus that a case of cure under the *Medicine Expectante* or *Homœopathy* now and then occurs. But the cure of disease by diet alone is rare, for several reasons;—it is rare to have a patient with sufficient faith in it to persevere long enough; and in truth disease may be cured much quicker by the joint adminis-

tration of diet, regimen, bathing, &c., combined with a judicious employment of proper medicine. That medicine is to be banished altogether from the treatment of disease is an idle dream which does not deserve a moment's attention, the beneficial influence of numerous drugs is established on too firm a basis; the reform wanted is only to employ them when really required; and the safeguard the public have in this respect, is always to give their confidence to a man of judgment and integrity. I am quite sure we are running fast into the opposite danger of neglecting drugs too much; and all men who profess to cure disease without medicine, or with a *Materia Medica* which they can carry in their waistcoat pocket, are equally dangerous practitioners, pandering rather to a mistaken view on the part of patients, or trying to curry favour by advocating something new and original "to take the ears of the groundlings," by appealing to that excessive love for the marvellous which leads mankind into all sorts of absurdities.

Whatever may be the diseased part we have to treat, whether the disease be acute or chro-

nic, the stomach either sympathises with the general derangement, or is itself disordered, and will require special attention. It not unfrequently happens, that in trying to relieve some other disease, the very treatment adopted deranges the functions of the stomach, as in the cure of nervous disorders by stimulants. Here we have a fruitful source of mischief: delicate, weak, or nervous people think they require a great deal of keeping up, and by constantly plying the stomach with food or stimulants, they induce some form of dyspepsia, and thus aggravate the original disease. The practice of always taking something into the stomach for every morbid feeling of languor or faintness is quite wrong, for sooner or later disease of the coats of the stomach will be added to the original malady. Let any one consider what must be the immediate effect on an already irritated organ, of alcohol in its various forms of brandy, whiskey, eau-de-Cologne, essence of ginger, &c., &c. Let any one examine the change effected by the preservation in spirit of any dead animal structure, and he will perceive that it is the life of the part that alone preserves

it, and then only for a time, from these powerful agents. The living principle in some degree protects the coats of the stomach from various unwise doings, but not altogether; for, by the undue employment of stimulants, many nervous and other invalids seriously complicate their maladies with some form of indigestion, by an indiscriminate use of what are basely termed the good things of life, under the impression that by so doing they are keeping themselves up. Possibly they may require to be kept up, but this is not the way to do it; on the contrary, it is often the very reverse of the right way, for by treating the stomach with more simple means, it might extract some good nutriment, while under the other system it extracts nothing but what is very bad. Nervous people of all others should endeavour to maintain the health of the stomach by great simplicity of diet, and by attending to the golden rule of taking in moderation such things only as they know will agree with them.

Among the complications of disease most commonly met with, are what are called ner-

vous complaints, combined with deranged or diseased states of some or all of the digestive organs, and the two disorders act and react on each other to produce a multiplicity of maladies, so various, so numerous, so changeable, and so obstinate, as by their extreme mutability to justify the epithet Protean, which has been applied to them.

Nervous disorders are the complaints, par excellence, of the largest number of valetudinarians. It is very difficult to classify them, varying as they do with every individual and every shade of feeling or opinion—depending as they often do on the characteristic mind of each individual sufferer, they are as Protean in shape as is the human mind itself. Every nervous affection is so modified by the bent and tendency of the mental and moral powers of the subject of it, that to understand it properly, we ought to be well acquainted with the individual mind of our patient, as well as the general laws of mind, which exert their influence on every form of disease. The influence of the mind in all disease, and more especially in nervous diseases, always should be closely in-

spected. We cannot understand the true character of the various phases of nervous complaints, without having some knowledge of the principles of mental and moral science, and are able to take into account the combined effect of the manifold constituents of human character. Nervous people have always some morbid peculiarity of mental operation: they are sensitive to impressions which pass unheeded by the more obtuse; they exaggerate their feelings by their strong imaginative power; they magnify the importance of their symptoms by endeavours to trace them to some vital organ; they bring the powers and peculiarities of their mind into operation by thinking too much of themselves, and the symptoms and causes of their complaints. The modes of thought, the direction and habitual tendencies of the mind, modify the symptoms of nervous persons; and as the mind may be frivolous, imbecile, superstitious, active or passive, sensitive or torpid, so are nervous disorders modified; for it is a great mistake to suppose these diseases to be always imaginary, or under the influence of the will. All ner-

vous people are not *malades imaginaires*; whether we designate these diseases as hysterical, hypochondriacal, neuralgic, or by any other vague term, they depend on some really morbid condition of the nervous system or brain, and are not the result of mere idleness, caprice, or weakness of mind. Unquestionably they occur most frequently among the idle classes, among those whose circumstances and condition render work either of mind or body unnecessary; but still they result from a morbid condition, and are not at the command of caprice, or low spirits, or ill temper, to be assumed whenever the patient wishes, as many people seem to think. Among the sufferers from this class of diseases there are people of every shade of mental power, and many have what are called strong minds. That there is in most cases no organic disease, no established mischief in the structure of any organ that endangers life, is generally true; but still the sufferings are real while they last, and disturb the functions of the individual part attacked, and, as a consequence, the whole constitution. But although no organic change has yet oc-

curred, and although years may elapse before a purely nervous complaint shall establish a condition bad enough to endanger life, yet the sufferings are so great, and the number of persons who are more or less affected by nervous disorders constitute so large a class, that their causes and effects well deserve our studious attention. We know too little of the real nature of the matter constituting the nerves and brain, to be able to account for the various distressing complaints consequent on their deranged condition ; but we have only to reflect on the wonderful powers and delicacy of structure of those organs, and we shall cease to be surprised at their frequent derangements. Examine the structure of the brain or nerves, and bear in mind what they have to do in the animal economy, what their office in every mental manifestation and every corporeal change, however trifling, and their frequency of derangement may be in some measure comprehended.

The functions of the nerves and brain are those especially connected with animal life, with sensibility, irritability, and muscular contractions, with instinct, sensation, and per-

ception, with knowledge, reason, and moral power. The vegetable world is endowed with powers analagous to the digestion, respiration, and circulation of the animal kingdom, but the addition of nervous matter is the essential characteristic of animal life ; and among those doubtful beings which connect vegetables and animals, and which even the powers of the microscope have failed in some instances to elucidate, if we can detect any nervous matter, it is at once evidence that we are dealing with an animal. In ascending the scale of animal life, the nervous matter becomes more and more distinct ; in the lowest creatures in which nerves are detected, they are unconnected with any masses of nervous matter ; we have only nerves, but as the animal functions increase in number and in power, we find, in addition to the nerves, small masses of a similar substance to that which constitutes the nervous filaments, into which the nerves pass, and we may consider that the greater the amount of these ganglia the greater is the complicity of animal life. The more regular the nervous distribution, the more the nerves

themselves are assisted with the concentrated matter of ganglia, the more advanced are the instincts and the functions peculiar to animal life. The ganglia are masses of nervous substance into which the nerves lose themselves, and from which other branches of nerves pass out; they are found in all parts of the body, are of the same nature as brain, but are not entitled to this appellation until they are concentrated into one mass in the head of the animal. The possession of a head does not prove the possession of a brain, for there is no true brain in insects or any animal below the rank of a fish. The brain is not a mere congregation, concentration, or development of the ganglia; it is a distinct addition of nervous substance added to the ganglia, and increasing in size as the functions of animal life increase in number and power. In the lowest of the fishes it is very small, gradually increasing in this class, being larger in reptiles, larger still in birds, increasing in the different classes of mammalia as they increase in intelligence, until it reaches its climax in man. Instincts, propensities, sensations, affections, are all con-

nected with nervous substance and dependant on nerves, ganglia, and brain, and *ceteris paribus*, the larger the brain the larger and more advanced are these functions and powers. No one can doubt the possession of intelligence and affection in the dog, and the more distinguished a dog will be for these powers, the larger will be his head, the best bred and most instructible of the class being easily distinguished by the roundness and compactness of its brain-case in comparison with the length and size of its snout and face. We find nothing like affection and attachment in any creatures without a brain; and we find the greatest amount of these powers in those animals which have most brain; the parrot among birds, the seal, and the dog, among quadrupeds. Love, fear, joy, grief, anger, and other affections and passions are manifested by dogs, and a certain amount of intellectual power must also be conceded to them, all bearing an evident relation to the amount of brain; and some dogs are distinguished by another similarity to the mental and moral powers of man, in being subject to various nervous disorders,

very similar to the same train of symptoms in their masters or mistresses. We may also conclude that the greater the development of the nerves and brain, the greater is the tendency to that large class of complaints commonly called nervous.

The larger the brain, the more is the amount of nervous substance to be disturbed; and as the brain partakes of the law applicable to all other animal structures of increasing in size by employment and exercise, the more it becomes developed by education and refinement, the greater is its liability to disease. Hence the greater increase of disorders of the brain and nerves as society advances in refinement, education, and purely intellectual occupations and pleasures. The affections and moral sentiments are, in civilized life, of a higher order, and become more and more complicated with the general avocations of mankind in the progress of the social state. The increase of competition in all pursuits, the necessity of considerable mental development and acquirement in all classes, the collision of mind against mind in political and religious disputes, the

intense action of hope and fear, the vicissitudes of life, the precarious tenure of many occupations, one year giving a large and another a poor income, the difficulty of maintaining a family and retaining a certain position, these and many other circumstances connected with modern life, demanding larger exertion of the intellectual powers, necessarily entail more frequent derangement of the brain and nervous system. All nervous disorders are connected with some deranged or morbid condition of the mind or the feelings, over-excitement or depression, or both; a debilitated condition of the mental powers resulting from corporeal disease, diseases in the organs themselves, something implicating the brain and nervous system as the organs and agents by which the manifestations of intellect or feeling are in this state of our existence most closely and intimately connected, are the seats of that large class of diseases commonly called nervous. As we look to the organs of digestion for the seat of the various degrees and kinds of indigestion, so we must look to the organs of intellect, feeling, and moral power.

as the seats of the various degrees and kinds of nervous derangements. The brain and nervous system, are the organs from which emanate in this world, all intelligence, feeling, will, propensity, instinct, or other manifestation of the mental or moral powers and all sensibility ; a long-continued excited, or depressed, state, or other morbid condition of these powers or feelings engender actual organic disease of the brain and nervous system. But in their earliest stages, nervous complaints may be only functional derangements of their organs, and in this condition are much under our control.

In attempting to answer the question—“How should nervous diseases be cured?” we ought to be able to look at them in their moral aspect ; for, in their origin, they will generally be found to have a cause in some morbid condition of mind ; but to go into this subject would require a volume, and not a pamphlet, and therefore our observations must be very general. Nervous complaints often begin after some distressing event has absorbed the mind of the patient, and diverted

it from all ordinary occupations. A severe illness, or death of an object of affection—reverse of fortune—inordinate indulgence in scenes of great pleasure and excitement—the depressing effect of being withdrawn from pleasing society to comparative solitude—the dissevering of ties of affection—the misconduct of a beloved relative; to these, and many other circumstances operating on the mind or feelings, may be traced the origin of many nervous affections. They are usually accompanied with indigestion, so that it is often difficult to say whether the primary mischief was in the nervous or the digestive system, because all excited states of feeling at once put an end to appetite, render the taking of food irregular, if they do not prevent it altogether, and thus lay the foundation of that complication of nervous and stomach disorders, which constitute half the diseases of the civilized world, and are the opprobrium of medical science. Why they are so, Shakspeare told mankind long ago :—

“ Can’st thou not minister to a mind diseased,
Pluck from the soul a rooted sorrow,

Raze out the written troubles of the brain,
And, with some sweet oblivious antidote,
Cleanse the foul bosom of that perilous stuff
Which weighs upon the heart!"

There lies the secret of cure in all nervous diseases; if the patient cannot or will not minister unto himself, and aid the counsels of his physician by the power of his will, and the moral influence which God has implanted in every human mind for this very purpose, then can the physician alone do little. That our great business in this life is to instruct the mind and to temper the moral powers, has been taught by religion and philosophy in all ages; that the wisest and best of the Greek and Roman philosophers saw this, through the obscure lights of their own days, is as certain as that such is the fundamental principle of the Christian religion. Both religion and philosophy teach us that the more we instruct the mind and temper the moral powers, the more clearly do we see, and the more convincingly do we feel, that our real destination is not the mere enjoyment of the pleasures, or even of the learning, or the affections of this

world, great as are such blessings, but that all true acquirement—all true development of our mental and moral powers can have no other object than to fit us for another and a more perfect condition. The anomalies that surround us can have no other rational explanation; calamities, disease, and death are the tutors of the mind of man, which lead him to reflect on his true condition, past, present, and future. God has given us mental and moral powers all-sufficient to rescue us from any degree of anxiety and distress, provided we have developed them, and know how to use them. Their development results from their education, their experience, their active employment. When by such means they have been matured, they help us to reflections which are capable of counteracting the greatest evils this world can inflict on us:—

“Can’st thou not minister to a mind diseased?”

“No,” says the physician, “therein the mind must minister unto itself.” And here is the answer to our question—“How should nervous diseases be cured?” By ministering unto ourselves

those consolations, under distress of mind, that religion and philosophy alone can help us to. Some may object to my employment of the term philosophy at all, and, in truth, I believe it is superfluous, for the philosophy of Socrates was as truly religion, as the religion of our highest minded Christians has been true philosophy. The terms are, in point of fact, synonymous, although, perhaps many classes, both of religionists and of so-called philosophers, would not admit the principle. However, such remarks do not apply to mere partizans or sectarians, either of religion or philosophy, but to those highest examples of both classes who have worshipped the same God, because they have both acquired the same knowledge of his attributes through the exercise and teaching of the same faculties which he has implanted in all human minds for the same purposes.

All nervous diseases, from the primary influence of excessive fear and disturbance at trifling or imaginary dangers, to the overwhelming influence of complete insanity, are disturbed or diseased states of the brain or nervous system. Probably a person having

a well-regulated mind is not susceptible of nervous disorders; but this is a question I shall not enter on here; neither shall I touch on those extreme cases of nervous disease where unmistakable insanity exists. The nervous disorders we speak of, are those disturbances of mind and body, which, resulting from over-indulgence in melancholy feelings, or the anxiety of real distress, are still within the domain of a curative treatment, and which treatment must be applied to the moral causes and effects of the malady, as well as to the physical ones. It will be vain to apply physical remedies alone while moral causes are still operating to keep up the disease. If the mind is incapable of ministering to itself, we must endeavour to minister to it, at the same time that we are combating the physical mischief by our curative material agents. Had we always in such cases well-informed, well-developed, and well-regulated minds to deal with, our task would be comparatively easy—but, alas! such minds are, indeed, few and far between; and, as I have before hinted, probably such minds are never troubled with

such diseases, and at all events can minister unto themselves. The classes of minds we have to deal with in nervous disorders are too often of the very weakest kind, and the difficulty of ministering to them is proportionately great ; but there is a way of getting at the internal spirit and feelings of the most obtuse and most obdurate of human beings as well as the most sensitive. So beautifully has our Creator adapted the mental faculties to the comprehension of his works and wishes, that a mind properly tutored can always influence the most ignorant, by wisely adapting the subject and manner of its teachings to the capabilities which the intellect and moral powers of his patient afford. Nothing can be more beautiful than the influence of a well-regulated mind when combined with charitable feeling and a just view of human nature, over the ignorant, and even over the most vicious of our fellow sufferers. There are redeeming points in all characters, and none can say what are the unseen, unexpressed, inward feelings and workings of any human soul ; the most untoward, and even the most brutal, have in

all probability moments, when the inward spirit contemplates in secret long-neglected aspirations of something better than its practical doings would appear possible to a confined or prejudiced mind. It is at such moments that the wonderful influence of sympathy, from one mind to another, would always have powerful influence if actuated by pure motives; it can just touch the dormant feeling in the right way, and arouse contemplations of something better than has been the ordinary occupation of long-perverted feeling and misdirected intellect.

A judicious combination of moral and physical remedies is the proper answer to the question—"How should nervous diseases be cured?" In these cases there is always more or less of disorder in the organs of digestion, and the reaction of the one class of diseases on the other often increases the evils of both. Some absorbing interest of mind or feeling prevents persons taking their usual meals, or they take them at snatches, irregularly; and from the consequent languor, refresh themselves with more wine or other stimulants than they

have been accustomed to. The continuance of this state of things for some days is certain to engender derangement of the digestive system; there will be loss of appetite, discomfort from food when taken, sluggishness of the bowels—such symptoms accompanying depression from overwork of mind or body, or from over-exertion, or over-excitement of the feelings, constitute the ordinary commencement of nervous complaints. These disorders take their subsequent character from individual peculiarities, and are very different as minds and tempers differ. Persons in robust health, and of well-attuned minds, minister unto themselves—battle against the storm; and when its violence has subsided, repair their damaged sails and rigging, and refit their vessel for the prosecution of its voyage, perhaps with weakened powers, but still sound enough to escape from ordinary dangers. A mental or moral shock, occurring to persons of indifferent health, or of weak reparative powers of mind or body, will leave traces more or less permanent, both of bodily and mental disorder for the rest of life; and such

are the persons who constitute that large class of invalids called "nervous." Among them we find an immeasurable variety in the feelings, the symptoms, the bearings of their disorders on different organs or parts of the body—they will have pains here, there, and everywhere ; sometimes a pain in one side, sometimes in the other ; now the lungs will be the apparent seat of the disease, then the spine or the liver, or the heart. Perhaps the head is the part most frequently referred to, and is, in real fact, the general seat of the disturbance, as is proved by the frequent termination of nervous disorders in epilepsy, or other diseased condition of the nervous centres ; but the termination of nervous complaints in fatal diseases is rare in their early stages ; they generally last for many years, and give more employment to regular and irregular medical practice than all other diseases put together.

Distress of mind is far from being the principal source of nervousness : there are other conditions, both of mind and feeling, which engender this constitutional derangement : the morbid feeling of having exhausted all sources

of pleasure and enjoyment, of being used up, of ceasing to take an interest in passing events, or social meetings: viewing the world with too much distrust or suspicion: thinking that the finger of scorn, or the hand of malice, is always ready to seize its victims. Some nervous people cease to mingle with the world, because they think that the entire system of social life is under the guidance of the Spirit of Evil; that all human knowledge, all the most glorious inventions of the human mind are the mere temptations of the Evil One; that science, in all its agency, and especially such wonderful applications of it as railroads and steam ships, are but the evidence of the coming on of the Infidel Power predicted, as I was once told by a nervous invalid, "that ye shall be as Gods is the plea of Satan to the world now, as it was to our first mother. I am alarmed rather than interested in the wonderful development of man's intellect and power in the present day; and I shrink from association with my species, thankful that my disordered nerves oblige me to relinquish what is termed society." In fact, irregular and morbid condi-

tions of mind are the food of many religious sects, and those who indulge in them rarely escape one or other form of nervous disorder. Perhaps it would be wise in all communities to have religious establishments, to which such persons could always retire : they are not bad enough for lunatic asylums, and they are too morbid to mix with the world without discomfort to themselves and all who come in contact with them. What a relief it would be to many families, if those who love to indulge in morbid humours, who in their own esteem are too good to mingle in the affairs of this sinful world, could retire to a well-regulated establishment, the entire business of which was contemplation of the future ; all such incarcerations being purely voluntary, for no lengthened or fixed term, but with the perfect understanding that the inmates could again join the world if they so desired. If every distinct religious sect had a place of this sort for the reception of its hypochondriacs, its incurably nervous members, its zealots, and other morbidly-minded persons, society would be relieved of many unfortunate individuals, who are the

great support of medical quackery. This further good might result from such establishments, that we might judge of the comparative value of the different sects and their different modes of directly influencing and reforming the mental operations, by the per centage they respectively sent back cured into society. We have instances of persons who have been inmates of a lunatic asylum, voluntarily returning on the accession of fits of insanity. I have no doubt such would be the case in the establishments recommended, which might deserve the name of "Havens for the Wretched." Monasteries and nunneries, under well-regulated laws, and as much supervision as lunatic asylums, limited to the reception of morbid minds at present disgusted with themselves and the world, subjecting such morbid minds to instruction and discipline, and permitting their inmates to rejoin society if they chose. Such institutions might be great blessings, and a great relief to our over-crowded lunatic asylums, by providing a home for many who are not really insane.

The number of nervous valetudinarians is

increased by the disappointed—whether it be disappointment in pleasures, sensual or of the imagination, or in the rewards of literature, professions, or business. Excessive expectations from any condition of life, must be disappointed, whether we place the *summum bonum* in a round of absorbing pleasure, in obtaining a high position either in rank or in wealth, if our anticipations are excessive and unreasonable, disappointment and consequent vexation is the result, and this state of mind always engenders nervousness and dyspepsia. We might arrange nervous invalids into several classes—there would be the great idle class, that army of people which have no real occupation, who, by their own good fortune or the exertions of their progenitors, are placed in a position to be free from the ordinary cares of life. Not having any strife with the world, not having to fight their way through rivals and competitors to competence, wealth, or distinction, their minds are free from those anxieties which bear upon the mass in struggling to provide for themselves and families. Being released from the necessity of work, either of

mind or body, if they do not adopt some voluntary and absorbing occupation, they have too much time to think about themselves. The human mind must be employed; if it has no regular work it preys upon itself, dwells too much on its own feelings, devotes too much attention to itself and its present tenement the body, until every trifling disturbance of health is magnified into one of vital importance. Want of occupation for mind or body is the principal cause of nervous disorders, whether idleness results from competence, from indolence, or from vice; whether a man is idle because he has no necessity, or because he does not choose to work, similar consequences follow. Work is the natural condition of man, and without it he must fall into a morbid state of mind or body, or both. It is a great mistake to pity the working classes because they are obliged to labour; on the contrary, if all classes could compare and analyse their pursuits and the results of them, it would be found that the working-classes have the fewest hours of unhappiness. I do not mean to assert that there are no nervous disorders

among the working-classes, but when they do occur, their ravages are not so devastating, as the mind must necessarily be occupied in some routine and daily pursuit.

The great speculative class feeds the ranks of the nervous; the ups and downs, the contingencies, the fluctuations in value of all human commodities; that lottery of life, the gaining of money by large dealings in articles which are always changing their money value, engenders a love of gambling which, in itself operates injuriously on the nervous system, but in some of its effects is destruction both to the mind and body. No man should enter the lists of the speculative class unless he has a mind that can look on calmly while a large fortune may be in jeopardy—when any turn of the scale may make a difference of hundreds or thousands; this is an occupation only for the hard-headed and strong-willed, who can bear a severe blow without flinching. Unfortunately, men assume occupations not because they are suitable to them, but because circumstances place them in their way, and therefore many very unsuitable persons join the ranks of the

speculative to the destruction of their nerves, their happiness, and too often of their mind. A man finds that a stock, a railway, or a commodity which he holds largely, is falling in value. Shall he sell or not? He cannot make up his mind, but watches the markets with absorbing anxiety, neglects his regular meals, and substitutes stimulants, until he loses his appetite; passes sleepless nights, and disarranges both his digestive and nervous systems. This may go on for weeks or months, giving rise to various symptoms of derangement, sometimes in the head, sometimes in the stomach; but the end often is that he becomes a valetudinarian for life, ever obliged to be doctoring his nerves or his stomach. In some such cases in advanced life, or in persons disposed to brain diseases, the end is apoplexy, epilepsy, or other disease of the brain; which, if it does not destroy life, leaves its victim a hopeless cripple or an imbecile.

The literary class affords many examples of nervous diseases. All men know that the brain will only bear a certain amount of work consistent with health; but absorbed in a sub-

ject that makes captive the imagination, the flight of time is unperceived, meals are neglected or taken hurriedly and without discrimination. Such interruptions as eating or taking exercise, are not allowed to waste the precious moments of inspiration; sleep itself is countermanded and delayed so long, that weary as the mind may be, it cannot be refreshed by "Nature's best restorer, balmy sleep." Some of the noblest minds have been destroyed by over-work, and the annals of our universities and schools supply many victims to nervous disorders among their competitors for honours.

PART III.

ON LONGEVITY.

No determinate limit can be assigned as the absolute duration of human life; the great majority die before the age of 70—one-half of the population of England die before the age of 20—yet we have so many instances of hale and hearty people of 80 years and upwards, that there is much reason to believe in the possibility of a considerable extension of the duration of life by a careful study of all the sources of health and of disease. The records of our Life Insurance offices corroborate the fact of the increased value of human life within the last century. The better educated part of our population are more attentive to the laws of health; their habitations are more wholesome, their clothing more suitable to the season, and just ideas of the means of preserving health

are more generally diffused. Medical treatment is more simple, more efficacious, and more within the reach of all classes of the community. From these and other causes, there is no doubt that the average duration of human life has increased, and there is much reason to think that it may be still farther extended as a knowledge of the means of preserving health and preventing disease is more practically applied.

In attempting to sum up the qualities of mind and body which have proved favourable to good health and long life, we find it very difficult to establish general conclusions—the examples which are recorded of longevity occur among persons of such varied habits, that many at once conclude that it depends on original strength of constitution, and that a person so blessed may live as he pleases without disturbing his chances of longevity. The most practical mode of looking into this question would be, to collect numerous instances of long life, and see whether some general principles might not be found characteristic of all who have lived to a great age, and from which useful conclusions might be drawn. In all the

individual cases of great age within my own personal experience, I have observed a large possession of what is called common sense—a coolness of temperament which rarely allowed feeling or passion to govern—sometimes a positive absence of feeling or of affection, or at least of so utilitarian a kind that it could easily be shook off if necessary. They have been, generally, persons free from anxiety, either living in circumstances that exempted them from all possibility of worldly difficulties, or of a temperament so cool and collected, that happen what would, they might be disappointed, but never anxious—they look upon sickness and death as the common lot of men, and whether in their own persons or their dearest connections, they were rarely so completely absorbed in anxiety as to be prevented from taking and digesting a sufficiency of food. With bodily constitutions that soon shook off disease, they were possessed of minds equally capable of shaking off anxiety.

Equanimity of mind is an important element towards longevity ; if it results from reflection and contemplation, from great know-

ledge and sound views of the past, the present, and the future, it is one of the most desirable of possessions, and would enable us to meet the storms of life with calm resignation, certain that all present apparent evils will be rectified in some happy future. Such a condition of mind, if joined with sound bodily health, will make longevity desirable, but in the majority of its examples, we see little to encourage the wish for great length of years; beyond the period when health of mind and body ceases, and decrepitude becomes our lot, old age cannot be considered a blessing. Second childishness is, of all other conditions, the most lamentable; the childishness of youth has all sorts of redeeming qualities, but the childishness of age not one; to live to be a helpless creature, dependant on others for every movement of our body, is a state of existence the very reverse of desirable. But as longevity may be our lot, the possibility should act as an additional reason for taking care of our health. Seeing, as every one must, so many examples of long life which are by no means envious, we should do all that is in our power,

if we do reach an advanced age, that it may not be accompanied with hopeless decrepitude. That we can all guard against every accident, and altogether prevent ourselves from being a burthen on our friends in infirmity and age, would be to assert what is daily contradicted by fact; but that very much of the incapacibilities of age may be prevented by regulating our minds and bodies by the laws of health is an equally unquestionable fact. I believe that wisdom and prudence will cut very short indeed the period of decrepitude, and that the last stage of all

“Sans teeth, sans eyes, sans taste, sans everything.”

is a condition that will rarely occur, if we have guarded our health both of mind and body with proper care. We do occasionally see an example of green old age, where soundness of bodily constitution is accompanied with a mind stored with knowledge of men and things, and with all the advantages which long experience can confer on an observant, a reflective, and contemplative mind. Such a mind has long been satisfied that in this state of existence men must agree to differ; that the various

faculties and feelings which in the aggregate constitute the soul, exist in such different proportions, that it is next to impossible that any two should be able to agree on all things ; and there is no one result of long life and experience more to be desired than the knowledge that there are vast numbers who, though disagreeing in present opinion, are all equally in search of Truth. In such inquiries and contemplations as must occupy all searchers after Truth, in the boundless inquiry with our limited human powers, there must be various stages where the mind will be as it were in a state of transition from one set of opinions to another ; for to assert that a wise man forms his opinions in early life, and never changes them, is to assert that the human mind is not progressive in the acquisition of knowledge and reflective power. The longest life is insufficient to learn all that is known on any of the advanced sciences ; and as most men have occupations which necessarily employ much of their time, there can be but few thoroughly and completely informed even on one extensive science. All who have devoted their mind

to inquiry, and have become authorities in any literary or scientific department, will admit the progressive nature of their knowledge, and that their opinions at various stages of life have been much modified, if not entirely changed. In all minds there must have been transitional states resulting from different degrees of knowledge, and therefore what may have been our opinions in former days, will differ materially from those which, in a more advanced state of our judgment, we have adopted.

Surely this should teach us that, however opposite may be the opinions of men, that they should live in harmony, seeing that no two minds can be of the same shape, or exactly in the same condition ; therefore as it is impossible they can think exactly alike, they should agree to differ, and to be charitable one to another, as being all on their travel to the land of Truth ; but having different instruments and different powers, they must all be at different stages of the same journey.

It would appear that at all times within the range of authentic history, the duration of life has not materially differed from what it is at

present. In all times, and in most countries, at least in Europe, an individual has occasionally outlived a century. Great Britain, Sweden, and Denmark, can boast of the largest ratio of centenarians ; and a moderately cold, together with a moist climate, seems to be favorable to longevity. There exists a record of the ages of old people, which, if authentic, would shew that the numbers of those who exceeded 100 years, was in somewhat larger proportion than at present. In the reign of Vespasian, the 77th year of our era, a census was taken of the inhabitants of Italy. In that part of the country which lies between the Apennines and the River Po, the record gives the number of 124 who had attained the age of 100 years and upwards : there were 54 of 100, 57 of 110, 2 of 125, 4 of 130, and 7 from 135 to 140. In all probability the whole of Italy would not now produce so many old people. There is no doubt that the climate was much colder in the time of the old Romans, and this may have been the principal cause of their greater longevity.

Exclusive residence in large cities is opposed

to longevity, more especially when they are closely built, badly ventilated and drained, and lying in low alluvial soil, hardly raised above the bed of a neighbouring river. But in those parts of a great city which are well drained, and where many open spaces exist for free ventilation, people live to as great age as in the country, if they attend to dietetics and are moderate in all things. The great mortality of cities more especially applies to children, who labour under great disadvantages, requiring as they do better provision for air and exercise than adults; it is almost impossible they can have in large towns as much as is desirable; but adults of sound constitution, where sanitary laws are publicly and privately carried out, may live as long in a great city as in a country district. In the London workhouses there have been some very old people. I remember a woman upwards of 106 in St. Margaret's workhouse, and among the catalogue of centenarians given in the subsequent pages, will be found many inhabitants of towns.

The Bills of Mortality are fallacious in regard to the number of deaths in large towns, and

especially capital cities, to which invalids from all parts resort, for the sake of medical advice: this and other circumstances, will increase the number of deaths in the city, and to the same extent diminish those of the country. To these may be added the large number of immigrants of large cities, who kill themselves by intemperance and the seductive pleasures of such places; as well as those who destroy themselves by hard work, and the anxieties of the adventurous life they have selected. If the number of the deaths in cities be analysed, we shall find there is an undue proportion of children under five years, who are cut off prematurely by neglect, ignorance, mismanagement, want of good air, and other disadvantages which are so destructive to young children in close and confined places. To arrive at just conclusions, we must not calculate the difference in the total number of deaths: for example, the present average is, in London, 1 in 40; in all England, 1 in 45; in Northumberland, 1 in 72. We should first compare the numbers who die before the age of five and after that age.

In Liverpool one-half of those born die before they reach the age of five; in Manchester and in Birmingham, nearly as many; in London, one-half live to the age of 20. We must also remember that, in all such places as Northumberland, the most adventurous, and therefore those most likely to die early, emigrate and swell the deaths of large towns; while the passive, easy, and contented souls continue to vegetate in their country districts, and thus diminish the statistical numbers of local deaths, without proving a greater degree of longevity.

In the Metropolis 893 out of 1,000 die before the age of 70; in the year 1839 the number of deaths above 70 was 107. In Liverpool the proportion was 947 to 1,000, and the number of deaths above 70 was only 53; while in Cumberland and Westmoreland, only 797 died before 70, and 203 after that age. In Liverpool, 53; in Westmoreland, 203, lived beyond 70; these are the extremes of health and disease, according to the Registrar-General's report for 1840. In London, during the same year, 107 lived beyond 70. These facts illus-

trate the power we possess on health and on disease, and the extension of sanatory measures to our towns has already much increased the value of human life.

It is very questionable whether a purely natural life, as that of a shepherd, is the most conducive to longevity, and whether some admixture of art does not promote long life. In all civilised countries the life of man must be artificial, and if art be properly applied to the promotion of health, we may gain more by the wise application of experience to the welfare both of mind and body in a large city, than is afforded by the chances of longevity in a country district, unless it be among the most favoured. The real truth is that long life, under all circumstances, depends on the moderation with which we indulge our appetites and passions; and whether we live in town or country, we cannot enjoy health unless we live in a simple and rational manner with regard to diet and regimen.

Long life appears to depend as much on the mind as on the body. In most instances of longevity, we find well-balanced minds and

moderate passions added to sound bodily constitutions, and many of the wisest of men have been the longest livers. Wisdom must, as a general rule, be productive of length of days, because it will lead us to live the kind of life most congenial with health of body, and a truly healthy mind can hardly be concomitant with a valetudinarian existence. Common sense is often an inheritance, and but another name for wisdom; and among the healthiest of uneducated people, the majority will be found to be so gifted. Among the circumstances favourable to longevity, we may enumerate—equanimity of mind, moderate passions, simplicity of taste for the pleasures, both of body and of mind, leading to the enjoyment of the gifts of Nature, rather than the excitements of art. Regularity and order in all our proceedings, mental and bodily, is very necessary to health and longevity. A due amount of sleep, a due amount of food taken at regular times, a due amount of exercise to regulate our secretions and excretions, without which neither our lungs nor our skin can be subservient to sound health, nor can the absorption

of worn-out materials, their combination with oxygen, and expulsion from the system go on with due effect without a certain amount of muscular contractions. Regular mental operations are equally necessary; every mind should have some special pursuit, some resource as an object of inquiry and of reflection. Nature has endowed us with a special faculty for looking into the future, which is all-sufficient for this purpose, because, if exercised, it must lead to inquiry sufficient to occupy all our vacant hours. What is the nature of our being and our spirit? What is our mind; whence its origin; whither its destination, its powers, its desires, its hopes, its apprehensions? What the purpose of our existence, and the true way of employing it? If we occupy our mind in such investigations, restrain our appetites and passions, look upon the events of life with equanimity, and take ordinary care with regard to dietetics, we may almost ensure health and longevity.

All extremes are unfavourable to longevity; great powers of mind or body, great positions in rank, wealth, or science, do not supply a

greater average of length of years than their opposites of mental weakness and great poverty. Mediocrity appears more favourable, whether of condition, climate, temperament, or general constitution. Great natural gifts, either of mind or of person, even great strength of constitution and vigorous bodily powers may be impediments to the prolongation of life, by leading their possessors to employ their faculties with such intensity as to wear them out rapidly. May not this be the cause of the comparatively early death of poets, and especially those in whom imagination has been the most ardent.

Climate, air, and exercise, are most important elements towards longevity. In the first half of life we can hardly take too much exercise; while, in the latter half, it is much less necessary to our well-being. Idleness is unfavourable to longevity; a regular and not disagreeable occupation, which obliges us to spend some hours daily in business of some kind, on the other hand, is favourable. Peace of mind, cheerfulness, and consistency in our views of life are very desirable, and these will

materially depend on the opinions we hold on the objects and duties of life. Is life a perpetual struggle, a vale of woe, a place of disappointment and trial? Should it not be looked upon as a condition for continued hope and continual mental development, by reflection on our own thoughts and those of others. Surely the gift of life should of itself be regarded as the greatest of blessings, that the gift is coupled with the means of great enjoyment—that, in fact, enjoyment is the rule, disappointment and vexation the exceptions, and most frequently the result of our own want of judgment. Evil appears necessary to induce us to reflect on our present condition as one, not of unmixed happiness, but rather a transitional state—an educational preparatory stage to some more advanced condition of existence. Our present life must have constant reference to a future. To attain longevity, and to enjoy it, we must not be afraid of calamity; we must habituate ourselves to contemplate death itself as an event which must occur in the ordinary course of things. The love of life is not inconsistent with a con-

stant view of the possibility of death. Fear is said to be a base passion, beneath the dignity of man. There is nothing of which a wise and consistent man need be afraid, death itself being looked upon as a mere change—a necessary passage from one condition to another, under the laws of a Being of perfect goodness and justice. Were we consistent in our belief of the Supreme—had we such perfect reliance on the absolute wisdom and benevolence of His government, as a proper and attainable knowledge would give us, we should hardly know what fear was; for, however apparently malevolent was our fortune in this world, however untoward our circumstances, however lamentable the separation of our dearest attachments, however lonely and desolate we may be left by the death of those who, for a series of years, may have made existence one continuous enjoyment; be our calamities what they may, if our faith be steadfast, we must conclude that our suffering can be only temporary, and in comparison with the future, a mere point in time unworthy of the sacrifice of our equanimity.

Mental anxiety, inordinate ambition, disappointments, are all causes of early death; but all are dependent on ill-developed and ill-directed mental powers—the want of spiritual discipline, placing too high a value on temporal things; the non-tutoring of the mind, to meet the evils inseparable from the very purposes of our temporary existence on the earth. The whole of life may be considered as a series of experiences for the tuition of our intellectual and moral powers, more or less progressive, as we employ our existence, more or less, in a right direction, for the health and welfare of our souls as well as our bodies.

Although experience shews that persons of all conditions of life, and of great variety of habit, attain old age, yet there are circumstances which promote longevity, and some general conclusions may be arrived at. Climate is a very important element. Although many instances may be adduced in hot latitudes, they are few compared with the numbers of long livers in colder climates; and, in most instances, although the situation may be tropical, the land is high and mountainous, as

in Jamaica and Peru, where the inhabitants live to very great age. There are more very old people in Scotland than in England. Norway and Sweden afford numerous examples; but Russia in the present day exhibits a longer list of centenarians than any other country. May not the spare diet of these northern and poor countries have something to do with longevity? It is also a question, whether the records of the great age of many in our own country during former years, and those in the Russian empire at the present, may not be fabulous. Since the establishment of the Registrar-General's Office, during six years, 1839 to 1844, I find 689 deaths above the age of 100, of which only one exceeded 110.

Among the circumstances favourable to longevity, we may consider the establishment of a strong constitution first and foremost; and unless this is accomplished in youth and early life, it is difficult afterwards, but nevertheless it is not impossible; and Cornaro is a remarkable instance of success in re-establishing vigorous health and long life, after seriously injuring his constitution by irregularities and excesses,

carried beyond youth into middle life. Those who desire the enjoyment of a vigorous old age, should neglect none of the appliances of health; and it is a great mistake to suppose that attention to such rules deprives one of the pleasures of society; rational indulgence of the good things of life being perfectly consistent with health and longevity. To eat and drink to repletion daily; a continuous uninterrupted indulgence of a large dinner every day of the week, is incompatible either with health or long life; those who cannot be every day moderate, should adopt the rule of an occasional abstinence, one or two spare days every week, for moderation in eating and drinking is the most essential element of health.

The most healthy old people have been early risers. It is a good rule to get up as soon as we are fairly awake, at a reasonable hour, say six or seven o'clock, and habit soon enables us to sleep pretty regularly up to the right time. As soon as we are out of bed, some modification of cold bathing should be adopted—a wet towel or sponge rubbed all over the skin; or a large sponge of water squeezed over every part,

or a shower-bath, or complete immersion in cold water, as may be most convenient, most agreeable, or most useful according to experience, and most fitting according to the season of the year. Some persons cannot use the cold-bath in its more intense forms, when the milder modification of a wet towel will be more proper, or the water may be made tepid. After ablution, a quarter of an hour should be spent in friction to every part of the body, with horse-hair band and gloves. This answers two good purposes: it rubs away the worn out superficies of the skin, and excites action and warmth by the exercise. There is no one circumstance which tends more to establish soundness of the constitution than most minute attention to the cleanliness of the general surface of the whole body; every part of the skin should be washed and rubbed daily, winter and summer.

Every body ought to know that the secretions of the skin, and the glands of the folds of the skin, as the arm-pits, &c., excrete matters which if not removed, become offensive and injurious to health. There is every reason to

believe that the skin by these secretions is a most important organ in depurating the blood of worn-out matter, which, if it remained in the circulating fluid, would be destructive to life itself; but by being allowed to remain on the skin, or in its folds, is injurious not only to the skin but to the general health. A man may be guilty of many things inimical to perfect health if he will take great care of his skin by frequent changes of linen, ablution, and friction; much irregularity, overfeeding, and the ill effects of too much wine, are in a great degree counteracted by cold bathing. Persons who are really too delicate for a cold bath, or cold water in any form, must use warm baths or tepid water; and many very delicate people will find their health vastly improved by daily ablution with tepid water, succeeded by friction with coarse flannel or linen gloves, if the horse-hair are too rough. Persons who do not use daily ablutions should at least take a warm bath once or twice a week; to maintain the purity of the whole of the skin, covered or uncovered, ought to be as positive a duty as to wear clean linen; we

owe the one, as well as the other, as a claim of society, and a maintenance of the decencies of life. Now that warm baths can be had for a few pence, there can be no excuse for any person whatever going about the world with an unpurified skin.

Among the more important circumstances conducive to longevity may be reckoned regularity in the intestinal function; the healthy action of the bowels should be natural, habitual, and not dependent on medicine. The frequent repetition of purgative medicine is a very pernicious custom, and engenders disease in those organs, which is very frequently the indirect cause of frequent illness and early death. It is no uncommon thing to meet with cases of obstruction in the bowels attended with great local pain, which is sometimes referred to inflammation, of which no trace is found after death. In some of these cases the only appearance of disease that can be discovered, is a distended state of the bowel, which has been imputed to paralysis of the muscular coat, induced by the practice of taking frequent purgatives; for it

is usually found in such cases that the patient had been in the habit of taking antibilious or other aperients, two, three, and four times every week. Some persons think that if they clear away superfluities of food by frequent purging, they may continue to indulge in the habit of feeding largely; this is a very pernicious doctrine, and an additional reason for moderate eating should be, to avoid the necessity of taking aperient medicine, the constant repetition of which induces torpor and inactivity of the bowels, and ultimately in many cases total paralysis of the muscular coat.

Of 145 persons recorded to have died at the age of 120 years and upwards, more than half were inhabitants of Great Britain; 63 in England and Wales, 23 in Scotland, and 29 in Ireland. The majority of centenarians are of middle stature, or rather below; but we have a record of James McDonald, of Cork, who was 117, and measured 7ft. 6in. Mary Jones, of Wem, Shropshire, died at 100; was only 2ft. 8in., very deformed and lame.

The Chinese erect triumphal or honorary arches to those who exceed 100 years, con-

sidering it a proof of a sober, temperate, and virtuous life. Temperance is the best security for health; the few instances of persons of licentious habits who attain a great age are mere exceptions in comparison with the multitudes who are destroyed by them. Dr. Fothergill says, "The due regulation of the passions contribute more to health and longevity, than any of the other points of regimen." More persons of cheerful and contented dispositions enjoy health and longevity than those of irritable or fretful tempers. Whatever promotes good humour and hilarity must have a beneficial effect on health; and it has been observed that many eminent musicians have attained to great age. Handel was 80.

The medical art among the Greeks was somewhat different to our modern systems; the prevention of disease being as much or more the object of its professors. Hippocrates taught that the art of prolonging life was to breathe pure and free air, frequent bathing, and friction of the skin, and moderation in all things. Plutarch says, "keep your head cool and your feet warm; instead of taking medi-

cine for every ailment, fast a day, and while attending to the body neglect not the mind." Health, among the Greeks, appears to have been studied, while among modern physicians diseases and their remedies have been more especially attended to. The art of medicine among the Greeks, consisting of the appliances of diet, bathing, and regimen rather than of drugs: they studied and taught in the open air, we shut ourselves up in closets until the feeling of any air, but of the mildest character, becomes unpleasant to us, and then complain of the just consequences of our unnatural habits. Those who stir out only in fine weather, must be more or less invalids: frequent changes from art to nature are necessary to maintain the true harmony of our powers both of mind and body. Just and true thinking, as well as bodily health, will be promoted by country excursions; frequent views of Nature will modify those theories and visions which mystify the minds of eternal dwellers in towns. The Greek philosophers probably owed much of the clearness of thought, appositeness in their logic, and force in their reasonings, to

their more open air life, their attention to the vigour, both of mind and body, by regimen and exercise, and possibly in some degree to the contemplative habits induced by their intimacy with the scenes of wild Nature which their magnificent country afforded.

A philosophical mind, interested in the study of Nature and the search after truth, besides affording the purest of human enjoyments, appears to have a tendency to promote longevity; Plato was 81, Newton 85, Kant 80, Halley 86, Galileo 78, Buffon 81, Herschell 84, Franklin 84, Morgagni 89, Hans Sloane 93. The majority of great poets have died at a comparatively early age, Tasso was 51, Virgil 52, Shakspeare 52, Dante 56, Ovid and Horace 57. Milton lived to be 66, and Dryden 70. Of great modern poets the most imaginative have died young—Keats, Burns, Chatterton, Byron, &c., while some who have combined philosophy with literature, have reached longevity:—Goethe was 82, Voltaire 85, Corneille 78, Young 80, Wordsworth 80, Fontenelle 100. Some celebrated painters have reached a great age—Claude 82, West 82, M. Angelo 96, Titian

96. Kings and emperors have not furnished many instances of very great age—Augustus lived to 76 ; he was moderate in sensual enjoyments, simple and abstemious in his habits, taking little wine, although fond of society. He is said to have thus expressed himself shortly before his death:—"Applaud, my friends, the farce is ended." During a severe illness, cold bathing was employed as a remedy, and this practice being continued with a beneficial change in his mode of living contributed to his advanced age.

Tiberius died at 78 ; although of a brutal temper, and a voluptuary, he was not inattentive to health. Augustus called him, "*Vir lentis Maxillis*," because he was slow in eating, and probably also, alluding to his indifference as regards the mere pleasure of eating. Tiberius used to say, that a man was a fool who, after the age of 30, consulted physicians on dietetics, because all who were not fools would before that time have discovered what agreed and what disagreed with them.

Frederick the Great lived to the age of 76, although much exposed to danger, fatigue, and

anxiety ; but he was moderate in the enjoyments of the table, possessed of great equanimity, and of a philosophic mind, undisturbed by reverses, destitute of all fear, and very liberal in his opinions. He paid some attention to the laws of health, and is reported to have said, "When I consider the physical structure of man, it would appear that nature had formed us rather to be postillions than sedentary men of letters." His magnanimity was greater than has been often evinced by monarchs. On one occasion, riding through Berlin, he saw a crowd reading something against a wall. "What is it?" said the king. One of his attendants replied, "It is a libel on your majesty." "Have it placed lower," said the king, "that the people may read it more easily." George III., of England, was one of the greatest examples of longevity among monarchs ; and all the world knows the simplicity of his habits of living and his practice of taking much exercise in the open air. Of the Roman and German emperors, in number above 200, only four reached the age of 80.

In the Library of the College of Surgeons,

London, there is a very curious record of cases of longevity, in a volume compiled by Mr. Easton, of Salisbury. It consists of a catalogue of 1712 persons who attained a century and upwards: for some of the cases he gives his authority, and we may admit a large number as authentic. Old Parr and H. Jenkins are well-known cases of long-life; but Mr. Easton gives many others of 130 to 150 and upwards. We have also records up to the present time in the Russian empire, of several deaths annually from 130 to 160 years. Probably in all these instances we must allow something for exaggeration and the love of the marvellous. In the authentic records of our Registrar-General, I find but one instance of death exceeding 110, and those from 100 to 110 vary from about 120 to 140 annually. However, I must admit that there is authority for more cases of very old age than I had believed before I looked into the subject; and I think we are warranted in upholding the opinion of Hufeland, in the last century, that human life is capable of extension beyond its supposed and ordinary duration by attention

to the laws of health. Hufeland places the period of our possible existence at 200 years.

This volume on longevity by Mr. Easton is continued in manuscript by Dr. A. P. Buchan, physician to the Westminster Hospital, a man whose memory will be respected by all who knew him. Long before clinical lectures formed a part of medical education, I have heard from him observations on the diagnosis and treatment of disease, that would have done him credit even at the present time. He was the son of the author of Buchan's "Domestic Medicine." For the following selection of cases of longevity up to the year 1799, my authority is Mr. Easton; after that date it is that of Dr. Buchan, who generally gives the name of the journal or person from whom he obtained his information. After 1838 we have the authentic documents of the Registrar-General for our authority.

Up to the year 1760, Mr. Easton records 380 persons who lived from 100 to 110 years; 48 from 110 to 120; 43 from 120 to 130; 13 from 130 to 140; 9 upwards of 140. The following are some of the more remarkable:—

A.D. 95.—Appolonius, of Tyana, died at the age of 130. He was a Pythagorean philosopher. At 16 he adopted very strict rules, renouncing wine, and all sorts of flesh. He lived in the temple of Escalapius, and is said to have performed many miraculous cures, which were instanced by the Pagans as equal to those of our Saviour.

A.D. 491.—St. Patrick, the first Irish bishop, died at the age of 122.

A.D. 500.—Attila, King of the Huns, is said at the age of 124 to have married for his second wife one of the most beautiful princesses of Europe. About the same time died at the age of 150, Lywarch Hen, a Welsh bard, a contemporary of King Arthur. He had 24 sons killed in resisting the Saxons. An Elegy on Old Age, and his sons' deaths, is said to be still remaining.

In 1612 died the Countess of Desmond, aged 145. On the ruin of the house of Desmond, she was obliged, at the great age of 140, to travel from Bristol to London to solicit aid from the Court, being reduced to poverty. Lord Bacon says, she renewed her teeth two

or three times, and retained her vigour to the last. There is a portrait of her in Windsor Castle.

Cornaro is a remarkable instance of what can be effected by a persevering regimen. He lived to the age of 98, after having, by a dissipated youth, brought himself at the age of 40 to such a state of health that his life was despaired of. He had long been under medical treatment, when he resolved to relinquish the use of medicine altogether, and put himself under a rigid system of spare diet. He limited himself to 12ozs. solid food, and 14ozs. of fluid daily; his health began to improve, and under this regimen, in a few years, his vigour was entirely restored. He avoided all extremes of heat and cold; entirely repudiated all passion and excitement; preserved his equanimity of mind under all circumstances; even a tedious law-suit, which killed two of his brothers by anxiety and vexation. At an advanced age he was thrown out of a carriage, dislocated his arm and one of his ancles, and imputes his recovery to the pure condition of his blood from the simplicity of

his diet. At the age of 80 he was persuaded to increase his food to 14ozs., and his drink to 16ozs., but it did not agree with him, and he returned to his old habits. At 83, he boasts that he can mount his horse without assistance. He had eleven grand-children, in whose amusement he took great delight.

1635.—The most celebrated case of English longevity was Thomas Parr, who lived to the age of 152 years and 9 months. He was a farmer's labourer; at the age of 120 married a widow, and performed all his usual work till he was 130. In 1635, he was brought to London at the desire of Charles I., but the great indulgencies he received at Court probably shortened his life. He died in London. His body was examined by the celebrated Dr. Harvey, who found no organic disease. Parr had a grandson who lived to 120.

1648.—Thomas Damme, 154. His age is recorded on a gravestone in Chester church-yard and in the registry.

1650.—Mr. Hastings, 100; a great sportsman, and rode to the death of a stag when 90. In Ware church-yard is a tombstone to the

memory of Dr. William Mead, aged 148 years and 9 months.

1670.—Henry Jenkins; remembered the battle of Flodden Field in 1513, and is said to have appeared as a witness in the Court of Chancery 140 years before his death, which occurred in his 169th year.

1691.—Mrs. Eccleston, 143. Philipstown, King's County, Ireland.

1706.—John Bayles, 126, of Northampton.

1711.—Jane Scrimshaw, 127. Born at Bow. Died in Rosemary Lane workhouse.

1711.—William Edic, 120, bellman, Canon-gate, Edinburgh: married his second wife after 100.

1732.—William Leland, 140, of Lisneshea, Ireland; was never sick, or lost the use of any of his faculties till the hour of his death.

1733.—William Harding, 112; fought at the battle of Edgehill. Married twice after he was 100. Served under King William and Marlborough, and died in Chelsea Hospital. The Duke of Richmond and Sir Robert Walpole allowed him a crown a-week besides his pension.

1734.—John Rousey, Esq., 138, Distrey, in Scotland. He was 100 years old when his son was born, who inherited the estate.

1734.—John Burnett, 109. Married six times; thrice after 100, and died in the same house in which he was born.

1738.—Margaret Patten, 137, St. Margaret's Workhouse. Always enjoyed good health till a few days before death. For many years she chiefly subsisted on milk.

1741.—John Rovin, 172; his wife, 164: Temeswar, in Hungary. Both died in the same year, the 148th of their marriage. Their youngest son was 116.

1743.—William Kellock, 111, Sangwhar, N.B., one of the town officers for 95 years; enjoyed all his senses, and never wore spectacles.

1744.—Adam Turnbull, Newcastle, 112; able to walk twelve miles a-day until three years before his death.

1752.—D. M'Carthy, 111, Kerry. At 84 married his fifth wife, who had twenty children; he was very healthy, never observed to spit; no degree of cold affected him. When

in company drank plenty of rum and brandy, and claret and punch when required.

1753.—Mary Jenkins, 110, Cloth-workers' Alms-houses, London ; never had any illness, and died suddenly.

1754.—Judith Banister, 108, Isle of Wight ; lived for last sixty years on biscuit, apples, milk and water.

1757.—Fontenelle lived to the age of 100, although he was so weak at birth that his life was despaired of. He had no violent disorder, or any of the maladies of age, till past 90, after which he was rather deaf and his sight somewhat impaired. The tranquil ease of his temper is thought to have extended his life.

1761.—Charles Cotterel, 120 ; his wife 115. They were married 98 years, in great union and harmony, and died within four days of each other.

1761.—F. Atkinson, 104, porter at Palace-gate, Salisbury, in the time of Bishop Burnet. He wound up the clock at the top of the Palace every night till within a year of his death. In ascending the stairs he usually halted half-way to say his prayers. He maintained his

good health by regular living and exercise ; walked well and uprightly to the last.

1762.—Eady Haddam, 114, an inhabitant of St. Christopher's Workhouse, London, for 50 years.

1762.—Rob. Oglebie, 115, a travelling tinker. Could see to work a short time before death ; his wife was 103 ; they had been married 73 years, and had twelve sons and thirteen daughters.

1762.—Mrs. Esh, 100, Eynes, Burton, York ; a few days before her death had prepared everything for her own funeral.

1762.—Rev. Peter Alley, 111, Dunamoni, Ireland, of which he was Vicar 73 years. He performed the duty until a few days before his death ; he was twice married, and had thirty-three children.

1762.—This year there were in the diocese of Aggerhaus, in Norway, 150 married couples who had lived together 80 years ; 70 married couples who had lived together 90 years ; 12 from 100 to 105 years ; and 1 of 110.

1763.—Elizabeth Taylor, Piccadilly, 131.

1763.—George Kirton, Esq., 125, Oxnop-

Hall, York; was a great fox-hunter till he was 80; from that age to 100 was always taken to the unkennelling of the fox in a wheel-chair, and drank wine freely until ten years before his death.

1763.—Robert Maber, 100, Frampton, Dorset. An estate had been held on his life from 1663.

1765.—Janet Anderson, 102. Her life was regular and moderate; she was remarkably active, and continued to work at spinning to a short time before her death. Her faculties were strong to the last.

1765.—Elizabeth Macpherson, 117, Caithness. Her diet was chiefly buttermilk and greens. She retained her senses until three months before death.

1765.—Mr. Dobson, 139, farmer. By much exercise and temperate living, he preserved the inestimable blessing of health: ninety-one children and grand-children attended his funeral.

1767.—There died this year, in Great Britain and Ireland, 59 persons from 100 to 110; 10 from 110 to 120; 3 of 130 to 134.

1768.—The numbers this year were,—46

from 100 to 110; 8 from 110 to 120; 2 of 120; 1 of 130; 1 of 150.

1768.—Francis Confit, Burythorpe, near Malton, 150; took much exercise and was very temperate; very fond of a raw new-laid egg; for the last 60 years of his life he received parish support.

1769.—25 from 100 to 110; 2 from 110 to 120; 8 from 120 to 130; 2 above 130.

1769.—Mr. Butler, 133, Golden Vale, Kilkenny. He was related to the Duke of Ormond; could walk well and mount his horse until near death.

1770.—32 from 100 to 110; 3 from 110 to 120; 2 from 120 to 130.

1771.—38 from 100 to 110; 3 from 110 to 120; 8 from 120 to 130.

1772.—38 from 100 to 110; 15 from 110 to 120; 4 from 120 to 130; 2 above.

1772.—Christian VI., King of Denmark, with his Queen, this year visited Norway, and resided with Colonel Colbiornson, at Friddershall. They were amused by a jubilee-wedding of four married couples of 100 years each. The women danced with green wreaths

on their heads, the custom of brides in Norway.

1774 to 1777.—In these four years there died in the United Kingdom 78 persons from 100 to 110; 12 from 110 to 120; 9 from 120 to 130; 7 from 130 to 140.

1777.—Mrs. Jones, Cambridge Workhouse, 125. She enjoyed her health and senses to the last.

1777.—Mr. Moral, 136, was a surgeon. at Dumfries.

In the next ten years, from 1778 to 1788, died 296 from the age of 100 to 110; 72 from 110 to 120; 12 from 120 to 130; 7 above 130.

Jane Davis, 113, a maiden lady of Hackney, who had enjoyed some post under Queen Anne.

Mary Rogers, 118, Penzance; lived the last 60 years on vegetables.

Margaret Scott, 125, a maiden 25 years, a wife 50, and a widow 50.

Fluellen Pryce, 101; was director of the village choir until three years of his death; had a great flow of spirits, sound health, and great activity; his living abstemious, herb tea

for breakfast, meat plainly drest for dinner, and, instead of supper, a pipe of tobacco.

William Ellis, 131, Liverpool, shoemaker ; was a seaman in the reign of Queen Anne, and a soldier in that of George I.

Henry Grosvenor, Wexford, surveyor, 115. By a very sparing diet and much exercise, preserved what the French call the youth of old age, being an agreeable and cheerful companion at 100, when he married his last wife.

Susan Edmonds, 104, Hants. Five years before death she had new hair of a fine brown colour, which began to turn grey four months before her decease.

Mr. Evans, 139, Spitalfields, retained his senses to the last; was seven years old when King Charles was beheaded.

Janet Taylor, Finlay, N.B., 116; was baptized in the fields during the troubles in the reign of Charles II.

1786.—Magnus Reid, 114, Dunbar. When 80 years old, commenced the business of a travelling chapman, which he continued till eight weeks before his death.

London, to see Mrs. Siddons, and attended her performances nine times. This old lady was equally active in mind and body. One morning, during her last visit to London, after sitting for her portrait, she mounted to the whispering-gallery at St. Paul's. She was remarkable for regularity and moderation, and lived for the last 30 years chiefly on potatoes.

1790.—Samuel Fidler, 105, Buxton; walked daily five miles, till within three days of his death. He was attendant on St. Anne's Well, Buxton, and was supported by the company who resorted there to drink the waters.

1790.—Mary Foley Rothreigh, Ireland, 117. Her descendants at her death were, 6 children, 94 grand-children, 258 great-grand-children, and 27 great-great-grand-children.

1790.—Valentine Cateby, 116; went to sea at 18, was a sailor 36 years, then a farmer. His diet the last 20 years was milk and biscuit. His intellect was perfect until two days before his death.

1790.—John Wilson, 116. His supper, for 40 years, was roasted turnips.

1790.—James Pearce, 105, was servant to

farmer Pope, of Beaminster, Dorset. He walked to market three or four times a week shortly before his death. On the farm was a goose 86 years old, having outlived four successive tenants.

Mary Melvil, 117, Fife, renewed her teeth at 100, never had an hour's illness, and could see and hear well to the hour of her death.

Alexander Macintosh, 112, Dunkeld; lived the last ten years on vegetables, and enjoyed good health till two days before his death.

Thomas Edgar, 108; read many years with spectacles; twenty years before death he so far recovered his sight as to read small print without them.

Mr. Froom, 125, gardener to the Hon. J. S. Bury Holmes Chapel, Chester, who, in consideration of his great age, left him £50 a year. He enjoyed great health until two years before his death. Left a son 90.

Mary Cameron, 128, Inverness. Retained her senses to the last. Remembered the rejoicings for the restoration of Charles II. Her house was an asylum for the exiled Epis-

copalians of the revolution, and for the proscribed gentlemen of 1715 and 1745. On hearing that the forfeited estates were to be restored, she said, "Let me now die in peace; I want to see no more in this world."

Mary McDonnell, 118, Down; was born in Skye, which she left in 1688. The day before her death she walked to Moira, 14 miles. In 1783, reaped a ridge of corn, and was strong, healthy, and active.

John Maxwell, 132, Kiswick; walked ten miles a few days before his death, and enjoyed through life exceeding good health and spirits. He left nine children, the youngest 60.

In 1785, died Cardinal de Salis, Archbishop of Seville, aged 110. He used to say, "By being old when young, I find myself young now, when old." He led a sober, studious, but not a lazy or sedentary life. His diet was sparing though delicate, his drink the best of Xeres and La Mancha wines, of which he never exceeded a pint, except in very cold weather. He rode or walked daily for two hours. He endeavoured to keep his mind in due temper by obedience to the divine commands, and

consequently was void of offence to God or man. "Glorious old age," said the king, "would to heaven he had appointed a successor, for the people of Seville have been so long used to excellence, they will not be satisfied with the best prelate I can send them."

Jean Jacob, 128, a celebrated patriarch of Mount Jura. In 1789 he was a deputy to the National Assembly of France, at the age of 127; he was led into the hall by his daughter, and seated opposite to the President. On entering, all the members stood up, and he was desired to sit covered, which he did, having the national cockade in his hat. The king granted him a pension. Thus he was a spectator of a part of the reign of Louis XIV., of the whole of that of Louis XV., and the greater part of that of Louis XVI.

Mary Lacy, 102, Horsferry-road, Westminster. She died in the same house in which she was born, and in the full possession of her faculties.

Archibald Cameron, 122, Keith; died without a pain, a groan, or any previous sickness. He was domestic piper to seven lairds

in ninety-four years, but his fingers failing, he was allowed a small pension.

Jonathan Hartop, 138, Aldbrough, York ; was very short in stature, as most centenarians are. He was married five times, and left behind 7 children, 26 grand-children, 74 great grand-children, 140 great-great-grand-children. He could read to the last without spectacles, and played at cribbage with perfect recollection. At Christmas, 1789, he walked nine miles to dine with one of his grandchildren. He remembered Charles II. He ate but little, and only drank milk. He enjoyed an uninterrupted flow of spirits. His third wife was said to be an illegitimate daughter of Oliver Cromwell. He possessed a portrait of Oliver, for which he refused £300. Mr. H. lent Milton £50 ; an angry letter of the poet was found among the possessions of the old man.

Hugh Llewellyn, 115, celebrated for his performances on the Welsh harp, which he was enabled to continue till a fortnight of his death.

Rachel Huddy, 100, Somerset. She was

blind for the last eleven years, but continued to pursue her calling as a midwife notwithstanding, and assisted at the birth of a child seven weeks before her death.

Thomas Seville, 103 ; retained all his faculties in a very remarkable degree ; had a full set of teeth, not one unsound. Was a very hearty and cheerful man.

Rebecca Povey, 106 ; was born Nov. 5, 1688, the day King William landed. Her mother was frightened at the noise of the guns, and was put into a coach, where Rebecca was born. She enjoyed uninterrupted health : cut two teeth at 102, and kept her bed but three days before her death.

Susan Mills, 102 ; lived in a lock-house on the Bungay navigation, a most unwholesome marshy situation, surrounded by floods all the winter. Her husband was the manager of locks to Sir J. Dalling's grandfather in 1715.

Charles Macklin, the actor, 100 or 107 ; was very intemperate until the age of 40, keeping late hours and drinking hard. He afterwards lived by rules, which he scrupulously observed. It was his custom to promote great perspira-

tion by violent exercise, and then to change his linen. He became moderate, but not abstemious, and ate and drank as other people till he was 70, when finding tea disagree with him he substituted milk with bread boiled in it, with a little sugar. In 1764 he lost all his teeth, and lived on a spoon diet for the rest of his life. His principal beverage was white wine and water. In his very latter years he never took off his clothes unless to change them. He ate when hungry, drank when thirsty, and slept when sleepy.

John Weeks, 114. Married his tenth wife at 106. His grey hair had fallen off, and was renewed by a dark head of hair, and several new teeth had made their appearance.

The Rev. Bellingham, who had been curate to Dean Swift, died in 1798, aged 102.

J. Wilson, 100, Blackheath; after 60 his beverage was milk and water, with the exception of two glasses of ale and one of spirit.

In the "Philosophical Magazine," of Nov. 1803, is an account of a man then living at Polack, in Livonia, who served under Gustavus Adolphus, and was present at the battle of

Pultowa, when he was 86. Among the deaths recorded in 1803, we find Mr. Dennis Cranabee, Ireland, 117; he retained all his faculties, and until two days before his death, never suffered pain or sickness except toothache. Three weeks before his death he walked to Galway and back, twenty-six miles. He was married seven times; the last at 93. He left 48 children, 236 grand-children, 944 great-grand-children, and 25 great-great-grand-children. His youngest son was 18.

1804.—John Boys, 101; never had any illness; rose at six summer and winter; nearly abstained from fermented liquor of any kind. All his teeth were perfect, and he could see to read without spectacles.

1805.—Ffestiniog, North Wales. "With the woman one loves, with the friend of one's heart, and a good library of books, one might pass an age in this vale and think it a day. If you would enjoy health, come and take up your abode here. We have just witnessed the death of a farmer aged 105, who has left thirty children by his first wife, ten by his second, and four by his third. His youngest son was

81 years younger than his eldest, and 800 persons descended from him attended his funeral."

—*Letter of Lord Lyttleton.*

From the *Morning Post*, Nov. 2nd, 1805 :—
"Mr. John Mirehouse, Loweswater, Cumberland, invited between thirty and forty friends to an entertainment on account of having on that day completed the 100th year of his age. The veteran, who enjoys all his faculties, sight excepted, and who is an intelligent man, has possessed a strong and robust constitution with a cheerful disposition. He received his company seated in a new oak chair and a new coat, that it might hereafter be said it was first used when J. Mirehouse was 100."

"The Hebrides boast of many instances of longevity. The inhabitants of Southuish are very healthy. A man lately died there aged 130, having retained all his faculties. The island of Jura is esteemed the most wholesome spot of ground belonging to Great Britain: no epidemic was ever known there. Gout, rheumatism, consumption, &c., are rarely heard of, and madness never. When Mr. Martin was there, no woman had died in childbirth for 35

years. Gillow Maccraw, who died about fifty years ago, kept about 180 Christmas days in his own house. A woman in Scort, just by, lived 140 years, and to live 90 and 100 is not rare."—*Chamberlain's State of Great Britain.*

1805.—At Laymore, near Balyman, Mr. Wm. Simpson, 119; four days before his death he was walking about the farm in his usual health; he was never sick an hour, and never intoxicated but twice in his life.

Mr. Crick, Thurlow, Suffolk, 125; had been 85 years a schoolmaster. "This may, perhaps, be considered an additional instance of a habitual association with young people tending to prolong life."—*Dr. Buchan.*

Mrs. Miles, Jamaica, 118; followed to the grave by 265 descendants; practised as a midwife for 95 years, and followed her business until two days of her death.

1806.—John Tucker, fisherman, Itching, 131. Followed his occupation until a few weeks of his death.

Mrs. Twist, Birmingham, 104. Began to use spectacles at the age of 50; after using them 30 years she discontinued their use, find-

ing that she could read very small print without them. She retained every faculty.

There is now living at Wakefield, York, Samuel Sperr, in the 109th year of his age; he lives entirely by himself; cultivates his own garden, milks his cow, and makes his butter, which he takes to Wakefield market every week. He is in perfect health, and his cottage is admired by the surrounding neighbourhood for its neatness and cleanliness.

In the registry of deaths in the Russian empire for 1806, there is one from 145 to 150; one from 130 to 135; four from 130 to 135; six from 120 to 125; thirty-two from 115 to 120; 102 from 105 to 115; 137 from 100 to 105, and 1134 from 95 to 100.

Jamaica has produced many centenarians. In 1807, died Joseph Rann, a negro, on Morrice Hall estate, aged 140. He remembered the Duke of Albemarle, governor, in 1687. He enjoyed great health; his appetite was always good, and he walked four miles a few days before his death. On the 5th Feb., 1809, Mrs. Elizabeth Fletcher, aged 120, relict of the late J. Fletcher, Esq. She retained all her

faculties ; a good appetite, perfect health, and great flow of spirits to the period of her death. She did all the duties of her domestic establishment until the last three years of her life.

1809.—Nov. 24. Now living in her 108th year, Sarah Williams, in a neat cottage between Tavistock and Ledford. Within the last few years she has cut five teeth, three of which still remain with ten old ones. Her diet consists principally of broths. Her eldest son is 82, a strong, hale-looking old man.

Mary Robertson, Aberfieldie ; became blind at 63 by a gradual decay of sight, in her 78th year she recovered sight enough to read with glasses, and the following year it became so strong that she threw her glasses aside till she was 87, when it again failed. She retained all her other faculties in undiminished vigour.

There were living at Stockholm, in 1809, 243 men and 364 women, from 100 to 110, and 22 men and 19 women from 110 to 120. One man at 122 and one woman at 127 years of age. The deaths in Russia, 1809, were 294 from 100 to 110, 59 from 110 to 120, 13 from 120 to 130, 1 of 135, 1 of 145, 1 of 155 to 160. Part of Peru is remarkable for longevity.

Caxamorea contains 70,000 inhabitants, and among them were living eight persons of the respective ages of 114, 117, 121, 131, 132, 135, 141, 147.

October, 1814.—The oldest Jesuit in the world is Father Albert de Montaine, in Perugia; he took his vows in 1724, and is now 126 years of age.

December 15, 1817, a Catholic priest in the Cathedral of Adria, returned thanks for the completion of his 110th year. He is without infirmity, and chaunted the cathedral service in a firm, manly, and dignified tone of voice.

In 1837, among the deaths in England and Wales, there were 2,579 between the ages of 90 and 100; 105 between 100 and 110; of those who reached 110, one was in Cornwall and one in Kent.

In 1838, the total deaths were 331,007. There were 2,498 between 90 and 100, 102 between 100 and 110, 1 of 115. There were 5 deaths of 100 years in the metropolitan districts.

In 1839, the total deaths were 359,604; from 90 to 100, 2786; from 100 to 110, 121.

In 1840, the total deaths 358,624; from 90 to 100, 2876; from 100 to 110, 114.

In 1841-2, the total deaths were 343,847; from 90 to 100, 2857; above 100, 110.

In 1843, total deaths, 349,157; from 90 to 100, 2965; above 100, 109.

In 1844, total deaths 356,950; from 90 to 100, 2,903; above 100, 137.

Among the deaths on record are two of 200 years, one of which is said to have occurred in the parish of Shoreditch.

In some of the London workhouses there is a fair average of very old people. In the West London Union House, of 754 inmates there are 58 between 80 and 90, and 3 between 90 and 100. In 1851, among the deaths, there were 17 between 80 and 90, 3 between 90 and 100, and 1 above 100. In Marylebone Workhouse there are 9 men and 43 women between 80 and 90, 2 men and 3 women between 90 and 100, and one woman of 104. In the out-door poor there are 128 between 80 and 90.

There were registered in 1832, in the Russian Empire, 4,440 deaths from 90 to 100; 722 from 100 to 110; 123 from 110 to 120; 41 from 120 to 130; 5 from 130 to 140; and 3 of 135, 140, 145.

In the United States of America, in 1840,

there were 5,738 deaths from 90 to 100, 2,507 males, 3,231 females; above 100, 791; 476 males, 315 females.

In the metropolitan districts, in 1841, there died between the ages of 90 and 100, 203 males, 418 females; and above the age of 100, 7 males and 16 females.

Among the eminent persons who have died during the last three years at an advanced period of life, we find the following:—The Rev. W. L. Bowles, 89; Wordsworth, 80; Rev. W. Kirby, 91; Sir M. A. Shee, 80; Joanna Baillie, 89; Dr. Lingard, 82; Basil Montague, 82; H. Luttrell, 86; Miss Agnes Berry, 88; J. Landseer, 90; W. Scrope 81; Miss M. Berry, 90; Dr. Lepsius, 84; J. Cottle, 84; Duke of Wellington, 81.

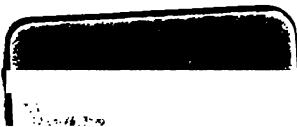
I think I have given examples enough, *pour encourager les autres*, to shew to all who may desire to attain long life, that it is to be done. Attention to the laws of health, regularity, moderation in all things, cheerfulness, due exertions, both of mind and body, that acquiescence with the position of life in which circumstances have placed us, and making the best of every event that may occur to us,

appear to be among the more important elements of longevity. There is no universal rule by which long life is to be attained; we find among the examples of it persons of very different habits and constitutions, who have lived in various ways, some on vegetable food, others on animal; some have been water drinkers, others have indulged in wine and beer during their whole lives, and occasionally we find an instance of a great spirit drinker attaining longevity. We have many examples of great age in towns, and even in very unhealthy districts; and I think there is one conclusion that may be distinctly drawn from our examples, that the constitution must have been originally very sound, or has been rendered so at some period of life by long continuance of circumstances tending to the establishment of almost perfect health. Among our centenarians we find some who have lived a very boisterous life in youth, and up to middle life; some who have from their irregularities brought on a very depraved condition of health; but in all these instances there has been induced in the constitution a great change, by the voluntary or necessary adop

tion of a strict system of regimen for the restoration of health; and the experience of the comfort and happiness so induced has established a regularity in living, the continuance of which has been conducive to long life. Wherever there is no established organic disease up to the age of 50 or 60; wherever there is sufficient stamina left to be benefited by regularity and system, it is not too late to place the constitution in a condition for attaining a long and vigorous age; the point being to lengthen out the period of middle life, to continue into extreme old age that equable condition of health of mind and body, which, in some happy instances, we see continued to 80 and even 90 years without decrepitude. The art of longevity should be to make that condition of green old age, continuous to the last, so that decrepitude and death may be almost simultaneous.

THE END.





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10-14-70

