

Biology. An inquiry into the cause of natural death : showing it not to arise from old age, but from a gradual process of consolidation, arising from substances which may be so far controlled as to preserve health and active life for an indefinable period / By Tryon [pseud].

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BIOLOGY
OR
NATURAL DEATH

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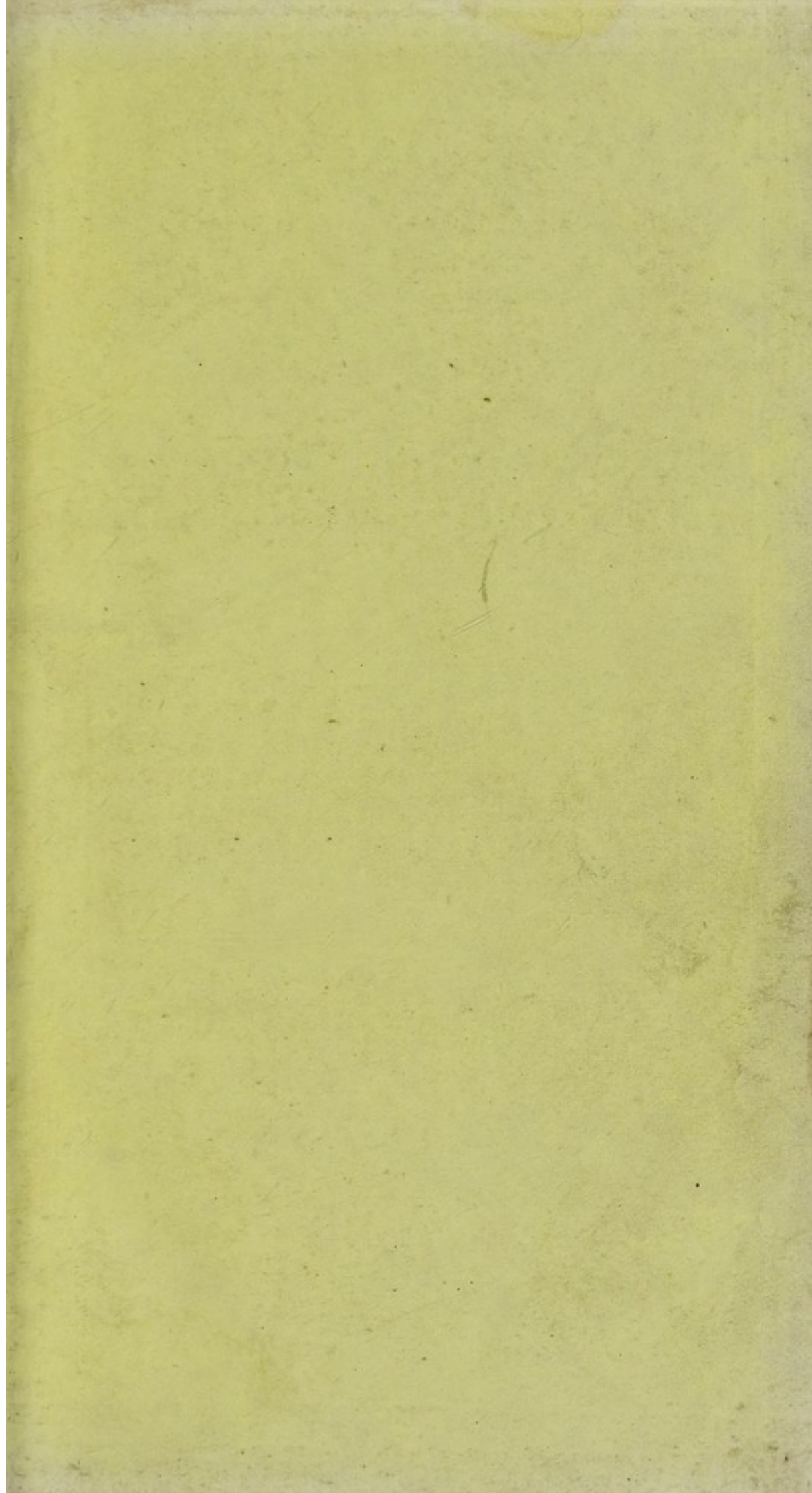
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TRYON, pseud
c

= Samuel Birley Rowbotham

[1816-84]

See Boase



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BIOLOGY.

AN
INQUIRY INTO THE CAUSE
OF
NATURAL DEATH,
SHOWING IT
NOT TO ARISE FROM OLD AGE,
BUT
FROM A GRADUAL PROCESS OF CONSOLIDATION,
ARISING FROM SUBSTANCES WHICH MAY BE SO FAR CONTROLLED
AS
TO PRESERVE HEALTH AND ACTIVE LIFE
FOR AN INDEFINABLE PERIOD.

BY TRYON.

The human frame, as a machine, is perfect: it contains within itself no marks by which we can possibly predict its decay: it is apparently intended to go on for ever.—*Dr. Munro's Anatomical Lectures.*

Manchester:
ABEL HEYWOOD, 58, OLDHAM STREET.
1845.

BIOLOGY

INQUIRY INTO THE CAUSE

NATURAL DEATH

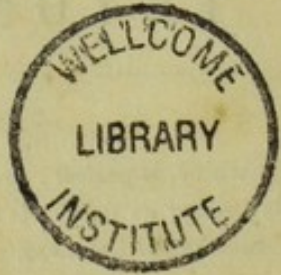
AND TO ASSESS THE VALUE

OF A GENERAL THEORY OF CONSERVATION

AND THE POSSIBILITY OF A GENERAL THEORY

OF CONSERVATION AND THE VALUE

OF AN INDEFINITE PERIOD



P R E F A C E .

THE author is fully aware, that in the following pages, conclusions have been arrived at, and practices proposed, which may startle and greatly oppose the preconceived opinions of his readers. This consideration, however, has had no influence in preventing the statement of these conclusions, nor the recommendation of those practices, without either fear or reserve. He felt convinced that this course alone would do justice to the subject, satisfy himself, and best serve the public. Every thing of a metaphysical, or speculative character has been carefully avoided: so that whosoever may feel disposed to raise objections, will be obliged to do so, not in accordance with any whim, prejudice, or superstition, with which he may be afflicted, but by denying either the truth of the premises, or the legitimacy of the deductions; or, in other words, by combating with *truth* and *reason*. Let it not be said that the life of man cannot be prolonged to many times the present period of his existence, because it *is not so*; as it was said that travelling by steam could never be accomplished, because passengers and luggage had been carried so long only by coaches and pack-horses! It does not follow, that because a thing is not, or has not been, that it therefore cannot be. Yet this is the common mode of reasoning adopted by the world; this alone has been sufficient to bring down ridicule, and even punishment and death, upon those who have ventured to propose any thing out of the common path; even

though it has ultimately been the source of great comfort and delight to the persecutors themselves. Human improvement, and progression towards a better state of existence, will ever be retarded, if discoveries and inventions are to be judged in such a foolish, unbecoming manner. Let the groundwork of every new subject be examined, and if found to be correct in principle—if truth be at the foundation, what has the world to fear from consequences? Are we so far wedded to old notions and practices, even though they constitute a very personification of falsehood and misery, that we are afraid of truth, and tremble lest it make us happier? To judge the world by its own standard, this would certainly be the conclusion.

In the last edition, a number of cases were given of persons being restored to health upon the principle evolved in this work: since that time, however, the author has treated so many cases as to render their enumeration impossible—they would fill a volume of considerable magnitude. If the present medical practice succeeds in restoring an average of one-fourth of its patients, it is considered excellent. By treating cases upon strictly chemical and dietetical principles the author has succeeded in restoring *three-fifths*! and he can say, without fear of contradiction, that he has not failed in a single case, however desperate, especially in asthma, palpitation of the heart, rheumatism, scrofula, and dropsy, where his directions in regard to food have been fully executed.

AN INQUIRY
INTO THE
CAUSE OF "NATURAL" DEATH.

CHAPTER I.

ON THE CHANGES WHICH OCCUR IN THE BODY IN ITS
PROGRESS TO OLD AGE AND DEATH.

THE first visible state of a human being, (in embryo,) is a small, globulous, pulpy, or jelly-like substance, approaching the nature of albumen or the matter which constitutes the white of an egg. In this pulpy substance, or globule, various particles of more solid matter begin to appear. These particles of matter gradually increase in bulk and density until they come in contact with each other. These different points of contact are slowly modified into so many joints or hinges; and thus, by degrees, a distinct framework of bone, or skeleton is formed. During the formation of this bony fabric, the surrounding pulpy matter gradually accumulates, and changes in form, until, at length, that degree of organization is produced which constitutes a fœtus, or child in the womb. This fœtus becomes larger and firmer up to the time of birth, when the state called infancy begins. The same process of consolidation which commences with the first visible state of existence still continuing, the being passes successively through the different stages of life, called infancy, childhood, youth, manhood, old age, and decrepitude, to that condition which is termed "Natural Death." Each of these stages is characterised by an increased degree of hardness and solidity. The bones, tendons, cartilages, ligaments, tissues, membranes, both of

a cellular and fibrous nature—the coverings, and the very substance of the stomach, liver, lungs, and other organs, gradually increase in density and firmness. The joints become rigid and dry, and begin to grate and crack when they are moved—the synovial fluid, which oils and softens them being diminished in quantity, and rendered too thick and glutinous to be of much service. The heart also, and the whole muscular system, as well as the brain, spinal marrow, nerves, eyes, &c. partake of the same consolidating process, and, ultimately, present a firmer, harder, and more rigid texture; millions of the minute or capillary vessels, which ramify, or spread like the branches of a tree, throughout the whole body, gradually choke up and change into solid fibres, no longer pervious to the blood. The larger vessels also become indurated, contracted in diameter, and diminished in flexibility. The fluids of the body become thick and putrid, and loaded with earthy particles. The skin becomes husky and wrinkled, the hair falls off, the teeth drop out, the movements of the body become awkward, slow, and uncertain, the memory fails, the eyes grow dim, deafness comes on, the nerves of taste, smell, and general feeling, or sensation, lose their wonted susceptibility, and thus, the whole system gradually choking up, the circulation slows, and ultimately ceases altogether; the blood then becomes stationary, thickens or congeals, stagnates in the vessels, and what is called “Natural Death,” or “Death from old age,” is the consequence. The body thus dies by little and little; once elastic, healthy, active, and lively, keenly sensible of passing events—of the pains and pleasures of the world, it becomes rigid, diseased, feeble, and unconscious—lost to the cares and enjoyments of life, it sinks down, trembles, and totters in its efforts; power and motion gradually diminish; life is extinguished by successive gradations, and death is the last term in the succession. Truly, “In the midst of life we are in death!” we are dying even during the most active periods of our existence!

CHAPTER II.

ON THE CAUSE OF THE CHANGES WHICH OCCUR IN THE BODY IN ITS PROGRESS TO OLD AGE AND DEATH.

FIRST.—If we analyze the blood of a young animal, it will be found to contain, among other substances, a certain amount of solid matter.

SECOND.—If the blood of an aged animal, of the same species, be analyzed, it will be found to contain a *much greater* amount of solid matter.

THIRD.—There is a *much greater* amount of solid matter in the secretions, as milk, urine, fæces, &c. of old than of young animals.

FOURTH.—The flesh, liver, cartilage, and other eatable parts of old animals are drier and tougher than corresponding parts of young ones.

FIFTH.—The chemical difference in these parts of old and young animals consists only in the greater and less proportions of solid matter.

SIXTH.—The bones of a child, or other young animal, are light, spongy, and elastic, while those of an aged animal are heavy, dense, and rigid,—any one can distinguish the bones of a lamb or a calf, for instance, from those of a sheep or an ox, not only by the size, but by the difference in weight, texture, and form.

SEVENTH.—When analyzed, the bones of young and aged animals are found to differ greatly in their amount of solid earthy matter. The difference may be represented by the following assumed proportions:—

	Gelatine.	Earthy Solids.	Total.
Bones of a child, lamb, &c.....	3	..... 1	..... 4
“ Middle-aged person .	2	..... 2	..... 4
“ Aged person, sheep, or ox.....	1	..... 3	..... 4

Here we observe that the proportions of gelatine and earthy solids are entirely reversed in the progress of the animal to maturity and old age. The difference in the nature of the bones of young and old animals may be illustrated by the following experiments:—Dissolve three ounces of common glue, and mix it with one ounce of chalk in fine powder; the compound will be comparatively elastic and yielding, and may represent the bones of a child. Now, reverse the proportions, viz. one ounce glue, and three ounces chalk, and the mixture will represent the bones of an aged animal, which, being very short and brittle, in consequence of containing so large a quantity of earth, and so little gelatine or glue, to hold it together, the individual is at all times liable to the most serious injuries from fractures and bruises, the least accident, even an ordinary fall, being sometimes sufficient to shake or break him to pieces, like a plaster image. The child, or other young animal, whose bones are little more than masses of cartilage, is on the contrary, so highly flexible, India-rubber-like, that its limbs, yielding in every direction, a thousand falls and knocks have scarcely more than a momentary effect. The middle-aged person is more solid and brittle than the child, but less so than the aged individual, and we perceive a corresponding difference in character.

EIGHTH.—The substance of the brain, spinal marrow, and nerves, is much more solid and resisting in old than in young animals.

NINTH.—When analyzed, the substance of the brain, &c. in old animals, is found to contain a greater amount of solid earthy matter than in young ones.

TENTH.—The substance of the eye partakes of the same consolidating process. In infancy and childhood, the eyes are bright, sparkling, and crystalline, and the sight is quick and powerful. In old age they become dull, lifeless, and glassy, and the power of vision faint and indistinct.

ELEVENTH.—When the eyes of old and young animals are analyzed, no difference is found but in the proportion of solid matter entering into their composition.

The same may be said of the body at large. The only chemical difference to be found in the body, as a whole, of an aged, enfeebled, decrepit being, and an active, energetic youth, is the amount of solid matter which enters into their composition.

TWELFTH.—The specific gravity of the *whole body* of an aged animal, is much greater than the specific gravity of the *whole body* of a young animal.

THIRTEENTH.—The specific gravity of the various *parts* of the body is much greater in old than in young animals.

These differences in the solidity, weight, texture, flexibility, &c. of the body, at different stages of its existence, evidently arise from the *gradual accumulation of solid, earthy elements, and from no other cause.*

CHAPTER III.

ON THE NATURE OF THE SOLID EARTHY MATTER,
WHICH, BY GRADUALLY ACCUMULATING IN THE
BODY, BRINGS ON THOSE CHANGES WHICH TERMINATE
IN OLD AGE AND NATURAL DEATH.

IF we take the bones of an animal, and place them in a crucible, in an open fire, and keep them at a red heat until all the carbonaceous and other matter disappears, or until nothing is left but solid grey or white ashes; and, if these ashes are then boiled for a short time in distilled water, all the alkaline, or other soluble matter will be dissolved by the water, and nothing left but solid earthy matter. Other processes, (but which are too complex for the general reader, and could only be repeated by the

adept in chemistry,) will then determine these earthy ashes to consist of:—

	<i>Parts.</i>
Phosphate of Lime, about	50
Carbonate of Lime	10
Sulphate of Lime, with sometimes traces of other earths, as Magnesia, &c.....	10
The Gelatine which has been burned away in the crucible, and the saline substances dissolved by the distilled water, will make up the loss, viz.....	30
Total.....	100

If portions of the flesh or tendon, cartilage, liver, lungs, kidney, or any other part of the body, even the brain and spinal marrow, be subjected to the same process, the same substances will be found, but, of course, in less and variable proportions, according to the state and habits of the animal.

The blood also, by the same process, will be found to contain the same earthy elements, in proportions varying from 5 to 12 or 14 per cent. Brande, Thompson, and other chemists, give the following composition of blood:—

Water	78.0
Albumen, fibrin, muco-extractive matter, ozmazome, an oil, sulphates of potass and soda, phosphates and muriates of soda, and ammonia.....	12.0
<i>Phosphate of lime, magnesia, and other earthy salts</i>	10.0
Total.....	100.0

The colouring matter of blood, when incinerated, according to Brande, affords a residue consisting of:—

Oxide of iron.....	50.0
Subphosphate of iron	7.5
Carbonic acid and loss.....	16.5
<i>Phosphate of lime with magnesia and lime</i>	26.0
Total.....	100.0

The urine, (which often deposits an earthy sediment in cooling,) faeces, milk, bile, gastric juice, saliva, synovia,

mucous from the nostrils, tears from the eyes, liquid perspirable matter, or sweat from the body, the matter which discharges in fluor albus, gonorrhœa, ulcers, abscesses, menstruation, and in procreation, (the *fluid seminales*;) have all been subjected to analysis,* and found to contain more or less of the phosphate of lime, and other earthy compounds.

We have now found that the solid earthy matter which by gradual accumulation in the body, brings on ossification, rigidity, decrepitude, and death, is principally *phosphate of lime*, or bone matter; *carbonate of lime*, or common chalk, and *sulphate of lime*, or plaster of Paris, with, occasionally, magnesia, and other earthy substances.

CHAPTER IV.

ON THE SOURCE OF THE PHOSPHATE OF LIME, ETC.
WHICH, BY CHOKING UP AND CONSOLIDATING THE
BODY, PRODUCES OLD AGE AND DEATH.

WE have seen that a process of consolidation begins at the earliest period of existence, and continues without interruption until the body is changed from a comparatively fluid, elastic, and energetic state, to a solid, earthy, rigid, inactive condition, which terminates in death,—that infancy, childhood, youth, manhood, old age, and decrepitude, are but so many different conditions of the body or stages of the process of consolidation or ossification—that the only difference in the body between old age and youth, is the greater density, toughness, and rigidity, and the greater proportion of calcareous earthy matter which enters into its composition. The question now arises, what is the *source* of the calcareous earthy matter which thus accumulates in the system? It seems to be regarded as an axiom, that all the solids of the body are continually built up and renewed from the blood. If so,

* Repeatedly by the author himself; and the results are borne out by the experiments of Brande, Hatchett, Dr. Bostock, and other British as well as Continental chemists.

every thing which these solids contain is derived from the blood: the solids contain phosphate and carbonate of lime which are therefore derived from the blood, in which, as already shown, these earthy substances are invariably found to a greater or less extent. The blood is renewed from the chyle; which is always found, upon analysis, to contain the same earthy substances as the blood and the solids. The chyle is renewed from the chyme; and, ultimately, from the food and drink. The food and drink then, which nourish the system, must, at the same time, be the *primary source* of the calcareous earthy matter which enters into the composition of the chyme, the chyle, and the blood; and which is ultimately deposited in all the tissues, membranes, vessels, and solids of the body—producing old age, decrepitude, and “Natural Death.” The food and drink, with the earthy choking-up matter they contain, are first *outside*, or *external* to the body; the *cause of obstruction and ossification*, and, therefore, of disease, old age, and “Natural Death” is first *external* to—outside the body, and is therefore *entirely within our own power and control!*

Having traced the earthy matter which ossifies and chokes up the system to the food and drink; it becomes of the greatest importance to know what amount of this matter each article of diet contains; the following table will exhibit the amount in each of the articles named:—

25,000lbs. of	lbs.
Common table Salt, (Muriate of Soda, Chloride of Sodium,) contain	500
Maize, or Indian corn	360
Peppers, Cinnamon, Nutmeg, Cloves, Ginger, Coffee, Cocoa Liquorice, Turkey Rhubarb, Lentiles, Cinchona or Peruvian bark, Cascarilla, Sarsaparilla, Gentian, and the seeds of the Lupin, average	300
Wheaten Flour *	220
Beans, (field or horse beans dried)	206
Beans, (fresh from the garden)	183
Kidney Beans	150

* In Parke's Chemical Catechism, page 191, the following passage occurs:—
“Phosphate of Lime exists in the farina of wheat. La Grange remarks, that a person who eats a pound of farina a day, will swallow 2lbs 6oz. 4 drachms 44 grains in the year.” According to this statement, 25,000lbs of flour will contain above 300lbs of earthy matter.

	lbs.
25,000 lbs. of	
Rye, contain.....	140
Oats	118
Rice (according to M. Braconnot).....	109
Potatoes	90
Peas	85
Barley	65
Beef, Mutton, Pork, and the flesh of animals and fowls in the adult state generally average	26
Lamb, Veal, and <i>young</i> animals generally average	15
Rice, Arrow-root, Tapioca, and Sago	20
Fish of all kinds, including Shell-fish and Turtle	18
Linseed	17
Beet-root, Parsnips, and Mangle Wurzel	14
Cheese	10
Cabbage, Savoy, Brocoli, artichokes, Coleworts, Endive, Asparagus, Cauliflowers, and greens in general, average	6
Turnips, Carrots, Onions, Radishes, Cress, Celery, Leeks, Spinage, Small Salading, Lettuces. Parsley, Cucumbers, Rhubarb, Mushrooms, Vegetable Marrows, and herbs and flowers generally, average	2
Eggs of all kinds, average	2
Apples, Pears, Plums, Cherries, Strawberries, Gooseberries, Raspberries, Cranberries, Blackberries, Mulberries, Bilberries, Elderberries, Sloes, or wild plums, Currants of all kinds, Melons, Olives, Peaches, Apricots, Pine Apples, Nectarines, Tamarinds, <i>Dates</i> , (4) Pomegranates, Prunes, Raisins, Figs, Lemons, Limes, Oranges, Shaddocks, Grapes, &c.	1
Honey, Treacle, Sugar, Butter, Oil, Vinegar, Wines, Cyder, Perry, and Alcohol, i. e. Brandy, Rum, Gin, Whiskey, Arrack, &c-	0
Milk, (according to the age and state of the animal from which it is taken,) from	10 to 20
Spring water, (differs according to the depth and the nature of the district from which it is obtained,) averages perhaps .	10
Rain water, if caught as it falls from the clouds, say in large sheets in the open country	0
Snow and Hail obtained in the same manner	0
River and Pit water, (contain as much as spring water, besides putrid animal and vegetable matter and other floating or mechanically mixed substances	10
Distilled Water	0
Infusion of Malt and Hops, (ale and porter,) as well as the decoctions of Tea, Coffee, Cocoa, Chocolate, and also Ginger Beer Pop, Lemonade, Soda water, &c, if well cleared, contain as much only as the water with which they are made—the earthy particles remaining in the grounds or sediment.	

The above table must be understood to give the general or average proportions only, as it is found by analysis,

that no two articles, (even of the same species,) contain exactly the same amount of solid matter; but they differ both in animals and vegetables according to the kind and quantity of aliment, and the nature of the soil and manure they may have lived upon.

It also appears from this table, that articles of diet differ materially in their constituent proportions of calcareous earthy matter. Common table salt, which is used in the preparation of almost every kind of food, and along with many of our meals, contains a fearfully large amount; and is productive of much greater mischief to the animal economy than is generally believed. A very careful examination of the various kinds of salt has been made by Dr. Henry. The general results of his experiments will be found in the following table, copied from *Ure's Chemical Dictionary*, art. Salt.

Kind of Salt.	Insoluble matter.	Muriate of Lime.	Muriate of Magnesia.	Total earthy Muriates.	Sulphate of Lime.	Sulphate of Magnesia.	Total Sulphates.	Total Muriates.	Pure Muriate of Soda or Pure Salt.	
For Bay Salt.	St. Ube's.....	9	Trace.	3	23½	4½	28	40	960	
	St. Martin's.....	12	do.	3½	3½	19	6	40½	959½	
	Oleron.....	10	do.	2	2	19½	4½	23¾	964¼	
Brit. Salt from sea water.	Scotch (common)....	4	—	28	28	15	17½	32½	64½	935½
	Scotch (Sunday)....	1	—	11½	11½	12	4½	16½	29	971
	Lymington (common)	2	—	11	11	15	35	50	63	937
	Lymington (cat)....	1	—	5	5	1	5	6	12	988
Cheshire Salt.	Crusted Rock.....	10	0.1-16	0.3-16	0.¼	6½	—	6½	16½	983¼
	Fishery.....	1	0.¼	0.¾	1	11½	—	11½	13½	986¾
	Common.....	1	0.¼	0.¾	1	14½	—	14½	16½	983½
	Stoved.....	1	0.¼	0.¾	1	15½	—	15½	17½	982¼

Many elaborate articles have been written, and some by very "learned philosophers," to account for the declared absolute necessity for the use of salt in carrying on the general functions of the body. But this supposed necessity for the use of salt is merely an opinion derived from some of the many *theories* held in the present day to account for the different phenomena connected with organization and life. There is no foundation in fact for

such an opinion. Whole tribes and nations of powerful active persons are known to have subsisted without even the knowledge of salt. The Author of these remarks, and several of his friends, have lived without salt for more than two years without any injurious consequences, but, on the contrary, with considerable advantage. There cannot be a doubt that if persons who have been in the habit of consuming salt freely, should suddenly abandon its use, much evil might arise, just as it might by any other sudden change of habits: but if the change is made *by degrees*, and the old articles of diet *gradually* removed by the substitution of new ones, such changes may be wrought in the body *without injury*, as would appear at first sight incredible.

Bread, (from wheaten flour,) when considered in reference to the amount of *nutritious matter* it contains, may with justice be called the "Staff of Life;" but in regard to the amount of *earthy matter*, we may with equal justice pronounce it the "Staff of Death." Wheat differs considerably in the amount of earthy ingredients it contains, according to the nature of the soil and manure it is grown from. That grown upon chalk soils contains much more than such as is produced upon soils of a different nature. When the farmer puts lime and bone dust upon his fields, he is unconsciously supplying us, through the medium of his crops, with an increased amount of obstructing, choking-up, and therefore disease and death-producing matter. For as the rains descend, the lime is gradually dissolved, the roots absorb the fluid holding the earthy matter in solution, which matter is then carried and deposited into the substance of the plant, or vegetable. Not only is wheaten flour highly charged with calcareous earth in its *natural* state, but it is often most shamefully adulterated by the *artificial* introduction of earthy substances—such as ground chalk, whiting, gypsum, or plaster of Paris, finely powdered granite, slacked lime, bone ashes, magnesia, pipeclay, and even the refuse of potteries. Large quantities of cracked and crooked pots are regularly purchased by the millers for the *pretended* purpose of grinding between the millstones to clear the flutes or ridges from the flour which occasionally clogs

them up. These pots, when thus reduced to powder, are found to be as cheap and as useful for the purposes of adulteration as any other article, and in this way many tons are used annually. In using flour, therefore, in any form—bread or pastry of any kind, we consume not only pipeclay, gypsum, whiting, and other injurious articles, but old broken jugs and platters, the bones of dogs and horses, and very possibly the bones of our departed friends and relatives! Ay! start not, reader; perhaps the last morsel of bread which found its way to thy stomach was contaminated with the bony remains of thine own grandmother! For what care unprincipled millers, whether the articles of trade are obtained from the butcher's store or the charnel-house! Within the last few years accounts have appeared in the newspapers, of several parties being brought to justice for adulterating flour with these earthy ingredients. It was proved that large quantities (ten thousand pound's worth in one instance) of flour had been mixed at the fearful rate of fifteen per cent with plaster of Paris (gypsum). Besides the earthy substances already mentioned, there is a large amount of fine sand unavoidably mixed with flour, arising from the friction or rubbing together of the mill-stones. The author of the "History of Inventions," calculates that in the quantity of flour and bread which a person consumes, he swallows six pounds of sand every year! Flour and bread are also farther adulterated with ground peas and horse beans, potatoés, alum, ammonia, and subcarbonate of potash; but these are harmless when compared to the dreadful qualities of the foregoing earthy substances. The use of these various pernicious substitutes for flour being found to have an astringent or constipating effect on the bowels, it soon became necessary to counteract this, and thus to prevent suspicion, for which purpose the use of jalap and other cathartic ingredients was introduced, in order to produce a laxative or purgative effect upon the unfortunate consumers.

In addition to the mischievous ingredients which are *purposely* mixed up with flour and bread, there is a great deal of filthy, pernicious matter *accidentally* or *carelessly* introduced. In the store and warehouses, for instance,

where the corn is hoarded up, it becomes contaminated with the urine and fæces of rats and mice, which, when the corn is removed for consumption, is all ground up together. In the bakehouse too, it is not a very uncommon thing to see a man with scabbed and ulcerated arms and hands mixing up the bread; others again, taking snuff and chewing tobacco, and, as they lean over the troughs and benches, the snuffy mucus from the nose, and filthy secretion from the mouth occasionally dropping into the paste. In some of the large establishments for making bread the bakers knead the paste with their feet—several men together in a large trough, working and treading it together like mortar. In these places it is not unusual for men who have been walking about in shoes and stockings, and whose feet, pent up for several hours perhaps, have acquired an intolerable stench, to jump at once into the paste without, in many cases, even washing or drying themselves. Now and then we find in the bread purchased from the baker's shop, a well-cooked cricket, or what is generally called a witchclock or black beetle, which insects abound in bakehouses and other warm places. To enumerate all the filth and deleterious articles combined in artificially prepared food and drink, would not only be tiresome but extremely disgusting. In the language of an influential Journal*, we may justly declare, "There is no wisdom in the well; if we fly to wine, there is no truth in that liquid; bread turns out to be a crutch to help us onward to the grave, instead of being the staff of life; in porter there is no support, in cordials no consolation; in almost every thing poison, and in scarcely any medicine, cure!" "Devoted to disease by baker, brewer, grocer, wine-merchant, spirit-dealer, cheesemonger, pastry-cook, confectioner, &c., the physician is called to our assistance; but here again the pernicious system of fraud, as it has given the blow, steps in to defeat the remedy; even the physician's prescription is adulterated!" "No skill can prevent the effects of daily poisoning; and no man can prolong his life beyond a short standard, where every meat ought to have its counteracting medicine."

* Literary Gazette, No. 156.

With regard to the other grains, we find them all, except maize, or Indian corn, containing less earth than wheat. Barley, for instance, only contains one-third the amount of wheat; and the use of barley bread and barley flour generally would certainly conduce to health, and add many years to the usual term of life. Rice and Sago Arrow-root and Tapioca, contain still less than barley, and ought to enter freely into the list of our articles of diet.

The constituents of wheat and other grains may be gathered from the following tables, from *Ure's Chemical Dictionary*.

According to Dr, Proust one hundred parts of wheat flour contain:—

Yellow Resin	1.0
Gummy and Saccharine extract	12.0
Gluten	12.5
Starch	74.5
Total.....	100.0

Vogel found in two different specimens of wheat the following ingredients and proportions:—

	1st. specimen.	2nd. specimen.
Fecula (starch)	68.0	72.0
Undried Gluten	24.0	22.0
Gummy Sugar	5.0	5.5
Vegetable Albumen	1.5	0.5

Some Earthy Phosphates and other Salts

The following are Vauquelin's results on the analysis of different kinds of wheat:—

	Moisture	Gluten.	Starch,	Sugar.	Gum- Gluten.
Gross Flour of Wheat.....	10.0	10.96	71.49	4.72	3.32
Flour of Maslin (Wheat and Rye.)	6.0	9.80	75.50	4.22	3.28
Gross Flour of Odessa hard Wheat	12.0	14.55	56.50	8.48	4.90
Do. do. soft Wheat	10.0	12.0	62.0	7.36	5.80
Do. Second quality	8.0	12.10	70.84	4.20	4.60
Do. of the service called second	12.0	7.30	72.0	5.42	3.30
Flour of Parisian Bakers ..	10.0	10.20	72.80	4.30	2.80
Do. of Hospitals, second quality	8.0	10.30	71.20	4.90	3.60
Do. do. third do	12.0	9.02	67.78	4.80	4.60

Sir Humphrey Davy drew as the general results of his experiments, that the wheat grown in the southern provinces of Europe and America contains more gluten than that of the northern.

Beans, the seeds of the *vicia faba*, a small esculent bean, which becomes black as it ripens, such as our horse bean, has been analyzed by Einhoff. He found 3840 parts to consist of:—

Volatile matter	600
Skins	386
Fibrous starchy matter	610
Starch	1312
Vegeto-animal matter	417
Albumen	31
Extractive, soluble in Alcohol.....	136
Gummy matter	177
<i>Earthy phosphate</i>	37½
Loss	133½
Total	3840

Fourcroy and Vauquelin found its incinerated ashes to contain the *phosphates of lime*, magnesia, potash, and iron, with uncombined potash. They found no sugar in this bean.

Kidney beans, the seeds of the *phaseolus vulgaris*, yielded to Einhoff:—

Skins	288
Fibrous starchy matter	425
Starch	1380
Vegeto-animal matter, not quite free from starch...	799
Extractive	131
Albumen, with some vegeto-animal matter	52
Mucilage	744
Loss	21
Total	3840

According to the above analysis of beans by Einhoff, 3840 parts contain 37½ of earthy matter. This amount would be equal to 241lbs in 25,000lbs, instead of 206 as given in the table at page 12-13.

Rye consists according to Einhoff, in 3840 parts of:—

Envelope (husk)	930
Moisture	390
Flour (farina)	2520
Total	<u>3840</u>

The flour (or farina) consists of:—

Albumen	126
Undried Gluten	364
Mucilage	426
Starch	2345
Sugar	126
Envelope (husk or bran)	245
Loss	208
Total	<u>3840</u>

Oats, the *avena sativa*, analyzed by Vogel, gave:—

Fecula	59.00
Albumen	4.30
Gum	2.50
Sugar, and bitter principle	8.25
Fat oil	2.00
Some salts.	
Total	<u>78.06</u>

These results differ much from those obtained by Sir. H. Davy, who found oats to contain six per cent of gluten.

Potatoes contain in every 100 parts according to Einhoff—

Starchy matter	22.0
Albumen and Mucilage	5.4
Total	<u>27.4</u>

Its nutriment equals one fourth its weight.

Peas, the *pisum sativum*, contain according to Einhoff:—

Volatile matter	540
Starch	1265
Vegeto-animal matter	559
Albumen	66
Sugar	81
Mucilage	249
Fibrous starchy matter	840
Salts, (earthy and alkaline)	11
Loss	229
Total	3840

Barley. M. Proust has given the following as the constituents of this grain:—

Yellow Resin, soluble in Alcohol	1
Gummy and Saccharine extract.....	9
Gluten	3
Starch	32
Hordeine	55
Total	100

The analysis of barley by Dr. Thompson gave:

Gum	5
Sugar	4
Gluten	3
Starch	88
Total	100

And of Malt gave:—

Gum	14
Sugar	16
Gluten	1
Starch	69
Total	100

It seems that what Dr. Thompson regarded as starch was found by M. Proust to be a compound of starch and what he called hordeine. The hordeine and starch of

Proust amount to 87 per cent. and the starch of Thompson to 88 per cent.

“Flesh, the muscles of animals, consists chiefly of fibrin, with albumen, gelatine, extractive, phosphate of soda, phosphate of ammonia, *phosphate and carbonate of lime*, and sulphate of potash.” *Ure's Dictionary*.

It may be useful to know that the principal part of earthy matter in flesh exists in the muscle or lean, the fat containing a very small amount. The following table is from *Brandé's Chemistry*.

100 parts of muscle or lean of—

	Water.	Albumen or Fibrin.	Gelatine.	Total nutritious matter.
Beef contains	74	20	6	26
Veal	75	19	6	25
Mutton	71	22	7	29
Pork	76	19	5	24
Chicken	73	20	7	27
Cod-fish	79	14	7	21
Haddock	81	13	5	18
Sole	79	15	6	21

Rice. The following are the results of M. Braconnot's analysis of the rice of Carolina and Piedmont.

	Carolina.	Piedmont.
Water	5.00	7.00
Starch	85.07	83.80
Parenchyma	4.80	4.80
Vegeto-animal matter	3.60	3.60
Uncrystallizable sugar	0.29	0.05
Gummy matter	0.71	0.10
Oil	0.13	0.25
<i>Phosphate of lime</i>	0.40	0.40
Total	100.00	100.00

With traces, in the Carolina rice, of muriate and phosphate of potash, acetic and vegetable calcareous salt, vegetable potash salt, and sulphur.

According to Vogel, rice is composed of:—

Starch	96
Sugar	1
Fat oil	1.5
Albumen	0.2
With some salts.	

Fish contains rather less albumen and gelatine than flesh. Fish of various kinds have been found to contain free phosphorus; hence in a putrid or decomposing state they are often found to shine in the dark with a blue phosphorescent light; which is doubtless owing to the slow combustion of the phosphorus, which in combining with the oxygen of the air forms phosphorus acid. Oysters and other shell fish, have been found to contain besides phosphorus, according to M. Bolard, a small amount of Iodine.

Linseed contains a considerable amount of oily and mucilagenous matter. Beet-root, parsnips, and mangel-wurzel, contain a large proportion of saccharine matter. Brande states, "that 100 pounds of beet-root furnish between 4 and 5 pounds of purified white sugar, besides a quantity of syrup, at the average expense of between threepence and fourpence a pound." These roots might be used as articles of diet to great advantage. They are far more suitable to the proper nourishment of the body than potatoes, and much cheaper.

Cheese contains a small proportion of earthy matter, and is very nutritious. It bears a strong resemblance to the gluten of wheat, and may be eaten to great advantage with fruits and fresh garden vegetables, but should not be taken with bread. The latter combination is very dry and indigestible.

Cabbage and greens in general abound in albumen, or white of egg matter, and contain a small proportion of earths.

Turnips, carrots, &c, contain a small amount of earth, with starch, and saccharine matter.

Mushrooms consist of several species; but they generally contain:—

Water, fungi, animal matter, vegetable albumen, sugar, adipocere, oily matter, *phosphates of lime and magnesia*, and potash, with sometimes iron and benzoic acid.

Onions have been examined by M. M. Vauquelin and Fourcroy, who found them to be composed of:—

1. A white, acrid, volatile and odorous oil.
2. Sulphur combined with oil, which makes it foetid.

3. A large quantity of uncrystallizable sugar.
4. A large quantity of mucilage, like gum-arabic.
5. A vegeto-animal matter, coagulable by heat, and analogous to gluten.
6. *Phosphoric acid*—in part free, in part *combined with lime*—and of acetic acid.
7. A portion of *citrate of lime*.
8. A very tender fibrous matter, retaining some vegeto-animal matter.

Eggs consist of the shell, a lining membrane, the white and the yolk. The white consists of albumen, combined with traces of sulphur and soda. The yolk also contains albumen, with an oily matter, some colouring substance, and phosphorus, with a *trace of phosphate of lime*.

The white and yolk are very nutritious; but the yolks of eggs alone beat up with sugar and warm water are exceedingly strengthening; and on account of the phosphorus may be used in all cases of debility, where there are no inflammatory symptoms, with great advantage.

Ripe fruits in general as given in the previous table, consist of the following elements and average proportions, according to M. Berard in the *Ann. de Chem. et Phys.* p.16.

Vegetable albumen	0.44
Colouring matter	0.10
Lignin	1.40
Gum	3.45
Sugar	16.50
Malic, citric, tartaric, and oxalic acids	1.10
<i>Lime</i>	0.01
Water	77.00
	<hr/>
Total	100.00
	<hr/>

The Date contains a larger amount of earth than any other fruit, and the Grape the least; the latter is generally free from earth, sometimes only a mere trace is found.

Honey is composed of sugar, mannila, mucilage, an acid, and sometimes the essential oil of the plants from which it is gathered by the bees. In some parts of Asia and America, the honey is sometimes of a poisonous nature, in consequence of the bees feeding upon poisonous flowers.

Sugar is one of the constituents of a number of vegetables, and is sometimes produced by animals, as in the disease called diabetes, and may be obtained from animal glue by the action of sulphuric acid and water.*

It is obtained from the ordinary sugar cane, maple, birch, wheat, parsnips, mangle-wurzel, beet, carrot, figs, grapes, mushrooms, gelatine, starch, sawdust, and hemp flax, or linen rags. Persons unacquainted with chemistry may feel much surprise to be told that 100 parts of starch will produce 110 parts of sugar merely by being boiled in oil of vitriol and water; or that a pound of sawdust or linen shreds will produce more than a pound of saccharine matter. It is nevertheless known to be true by the practical chemist.

Molasses, or treacle, is that portion of the juice of the cane, which during the manufacture of sugar, does not crystallize. It differs somewhat from sugar in its composition, but is equally as good for domestic purposes, where taste and habit form no consideration.

It is a very prevalent opinion that sugar, or any sweet or saccharine substance, is injurious to the health generally and particularly to the teeth, causing their decay, and producing tooth ache. Such an opinion is only true under certain circumstances; when a person has not been accustomed to its use, and when it is held long in the mouth as in the form of candy or boiled sugar, and when the body is already labouring under some kinds of disease. It is hurtful for instance, to bilious and hypochondriacal as well as to dyspeptic habits. But persons in health, whether children or adults, beginning to use it sparingly, and gradually increasing it as the stomach becomes modified to its use, will find it a most powerful article of nourishment. "It is a curious fact, that in countries where sugar is much used, scurvy, and other cutaneous diseases are almost unknown. On board the American vessels, where the seamen are allowed the use of sugar at pleasure, such a disease as the scurvy is scarcely ever heard of; and would the cheapness of sugar permit the British shipowners to be as liberal to their men as the

* See *Annales de Chimie*, xii.

Americans are, the health of that class of men would be materially improved."*

It is a well-known fact, that the negroes of the West Indies, notwithstanding their increased labours, become greatly improved in health and bodily condition during the sugar-cane harvest, or crop time; and this is only attributable to their fondness for the saccharine juice of the cane. The same may be said of horses, cows, pigs, and even fowls; they are all fond of the refuse syrup about the sugar works, and all become fat at this season, and much improved in the appearance of their skins and feathers. Horses fed principally upon boiled carrots, in a few weeks become remarkably sleek, their coats shine like silk, and their general activity is much augmented; which is owing to the saccharine matter the carrot contains. A favourite dog was greatly afflicted with what is commonly called the "mange." After all other means had failed, it was sent to some sugar works, and having very little food, it took to licking the refuse syrup, and in a few weeks was perfectly cured. A sheep which had got some foul disorder, was also placed upon the premises and in a very short time manifested signs of improvement.

As an antiseptic, or preservative, saccharine matter is an invaluable article. Meat well rubbed with sugar instead of salt, has been known to keep for a long period. Beef has been kept perfectly sweet and sound for above two years, by being simply covered to a few inches in depth with treacle. In this way fruits have been preserved in their natural state without the ordinary and troublesome method of boiling and potting them. All that is requisite for this purpose, is to gather such fruits as are ripe and dry and the skins unbroken, to place them carefully in a deep mug or jar, and pour some treacle over them to the depth of several inches. In this way the treacle prevents the action of the air, gathers round each fruit, suspends it, and keeps them from crushing and spoiling each other. When required for use, all that is necessary is to take them out of the treacle, carefully rinse them in luke-warm water, and

* *Essex and Suffolk Times*, for August 1st. 1840.

fresh ripe fruits of any kind may thus be had at any season of the year.

Sugar and Molasses have been said to equal any other article as a general manure, but for some purposes superior to anything else.

With regard to sugar being injurious to the teeth; as already stated, this can only be considered true under certain circumstances. Sugar has the remarkable quality of rendering lime more soluble in water, and if kept for some time in the mouth, in contact with the teeth, may tend to decompose them, and produce pain; so that taking sugar in the shape of candy or sweetmeats of any kind, and sucking them until dissolved may be injurious; but taken at once as an article of diet, either solid or in the fluid form, as entering into the composition of drinks, it is highly nutritious and beneficial.

Butter is the oily part of milk, and is much used as an article of diet. Although it is considered an animal product, consisting of *butyrine*, *oleine*, *stearine*, and butyric acid, some vegetables yield a substance very analogous to it. "In the interior of Africa," Mr Park informs us, "there is a tree much resembling the American oak, producing a nut in appearance very like an olive. The kernel of this nut, by boiling in water, affords a kind of butter, which is whiter, firmer, and of a richer flavour than any he ever tasted made from cow's milk, and will keep without salt the whole year. The natives call it *shea toulon*, or tree butter. Large quantities of it are made every season."—URE. Butter of cocoa and palm oil are other vegetable specimens. The milk of sheep produces the greatest proportion of butter; after the sheep, the goat and the cow give the largest amount.

"Parmentier could not make any butter from woman's ass's, or mare's milk; and that from sheep he found always remained soft. From their general properties he divided them into two classes, one abounding in serous and saline parts, which includes ass's, mare's and woman's; the other rich in caseous and butyraceous parts, which are cow's, goat's, and sheep's."—URE.

Oil, for eating, is generally the olive oil, and consists of Carbon 77.21, Hydrogen 13.36, and Oxygen 9.43,

in every 100 parts; or, according to Craconnot, of a greenish yellow oil 12, and a very white suet 28 parts in the 100.

Common Wine Vinegar consists of acetic acid, water, alcohol, mucilage, tartaric acid, tartrate of potassa, sugar, extractive, citric, malic, and phosphoric acids.

Distilled Vinegar, consists only of acetic acid and water; all the other ingredients being separated by the process of distillation.

The moderate use of vinegar as a condiment promotes digestion, urges the flow of urine, and increases the insensible perspiration.

Wine of the grape, consists of water, alcohol, bitartrate of potassa or tartar, extractive matter, a volatile oil, malic and tartaric acids, and, in that species called Champagne, a large quantity of almost free carbonic acid gas.

Taken moderately, (that is to such a degree as will not produce inebriety) wine promotes digestion, gently stimulates the whole system, and improves the circulation of the blood in the arteries. Taken to excess, (that is until symptoms of intoxication arise,) it produces debility, stupor nausea, and diarrhoea. When new it is flatulent, purgative, debilitating, and sooner intoxicates; but when good and of a proper age, it is nutritive and strengthening.

Cider and Perry may be called the wines of apples and pears; being the expressed juice of those fruits slightly altered by fermentation, and may be classed amongst the most wholesome of drinks.

Rum is the spirit obtained from the juice of the sugarcane, and is highly impregnated with the essential oil of that plant.

Brandy is the spirit obtained by distillation from wine, or the fermented juice of the grape.

Gin is, or ought to be, common malt spirit, rectified or re-distilled from juniper berries.

Whiskey is distilled from wheat, barley, oats, rye, potatoes, or any other vegetable substance, and often from the washings of ale and porter barrels.

Arrack is a spirituous liquor brought from the East Indies, and is manufactured (chiefly at Batavia, and at Goa, upon the Malabar coast,) from rice.

All these different spirituous drinks are but so many varieties of alcohol, which is a powerful and diffusible stimulant. It is highly useful when greatly diluted, as an excitant application in cases of extreme debility; but when undiluted is capable of producing the most fearful effects upon the human constitution. Dr. Thomson, in his *Materia Medica*, speaking of alcohol, says, "In examining the effects which follow the introduction of a large quantity of moderately diluted alcohol into the stomach, we find that the first is the local excitement of the viscus, indicated by a sensation of heat in it, an effect, the result chiefly of the impression of the alcohol on the gastric nerves, increasing the sensibility of the organ; this impression is next conveyed to the brain, spinal marrow, and entire nervous system; ideas of unusual brilliancy pass through the mind; there is, as it has been beautifully expressed, a soft tumult of the soul; fancy is awakened, and creates, from uninterrupted associations, new combinations and a world of its own; and it is at this moment, between sobriety and intoxication, that the poet sometimes pours fourth his sublimest conceptions and most harmonious strains. As the power of the stimulus however increases, all control of the will is suspended; the ideas are then irregular; and, instead of being combined in such a manner as to produce even agreeable conceptions, they arise in the most incongruous order; the extent of the excitement of the cerebro-spinal centres becomes apparent in the unusual vivacity of the eye, the swelling of the veins of the neck, and the beating of the carotids; but new symptoms indicating cephalic congestion quickly follow; namely, pain in the frontal region; the head drops upon the chest; the eyes lose their expression and are half closed; the physiognomy is altered and vacant; the voluntary muscles cease to act; the arms are pendent, or their movements are irregular; the legs cross one another in the effort to walk; vertigo supervenes, and delirium follows. The exhausting influence of such a state is too great to continue; in a short time collapse, and sleep resembling that of apoplexy, follow. Under certain states of the habit, this sleep may prove the prelude to death; but, in the majority of instances, nature adopts

this method of restoring the exhausted excitability ; yet he does not awake in his usual state ; his hand is tremulous ; his limbs are weak and unsteady ; his surface is susceptible of the slightest impressions ; his stomach nauseates all kinds of food ; his thoughts are gloomy : his temper irascible ; and, if the moral principle be not blunted by the frequent repetition of this vice, his mind is overpowered with the most distressing sense of degradation."

Although alcoholic beverages when moderately used, may be of service to the body, especially in cases of habitual debility, still, when we consider the vast amount of wretchedness and degradation which follow in the wake of their constant use, we may justly decide, that society on the whole would be greatly improved and benefited by their total abandonment.

Milk, according to Berzelius, consists of:—

Water	928.75
Curd, with a little cream	28. 0
Sugar of Milk	35. 0
Muriate of potash	1.70
Phosphate of potash	0.25
Lactic acid, acetate of potash, with a trace of lactate of iron	6. 0
<i>Earthy phosphates</i>	0.30
	<hr/>
Total	1000
	<hr/>

Cream consists of:—

Whey	92.0
Butter	4.5
Cheese	3.5
	<hr/>
Total	100
	<hr/>

A very simple method, has lately been discovered, of preserving milk for any length of time. It consists in gently simmering the milk in shallow vessels until the whole of its water is evaporated and the solid elements of the milk left in a dry powder. This powder may then be packed in canisters or bottles, and kept perfectly dry. When it is required for use, all that is necessary is, to take a spoonful of the powder and mix it well in a mortar with a small quantity of lukewarm water ; gradually

adding as much more water as will give it the consistency and colour, as it will be found to have the taste and flavour of good new milk. This plan might be taken advantage of by sailors and others taking long voyages, whether by sea or land; and would certainly be found of great service when fresh milk could not be obtained.

In large towns milk is often found adulterated to an almost incredible extent. The most common adulteration is that of simply thinning it with water; but the most expert in this "liberal art" use a composition of yolk of eggs and flour, with warm water. A mixture of treacle and salt has also been used. The scientific "milk artists" can give the colour, taste, and consistency of good new milk to a mixture of milk-and-water, by a solution of annatto with sub-carbonate of potash, and a little sugar. Cream is often "increased" in quantity by skimmed-milk and starch, or flour, or what is better, rice powder and arrow-root boiled together. Milk is sometimes put into leaden vessels to make it throw up a larger quantity of cream. This practice is very pernicious and ought to be severely punished. The particles of lead which may impregnate the milk may produce the most fearful disorders.

Little fault can be found with the other ingredients of adulteration, as they are, on the whole, somewhat analogous to the elements of real milk itself. The very common opinion that milk is adulterated with chalk and whiting is certainly erroneous; for, being insoluble in water, they would sink to the bottom of the vessel immediately, and thus be of no service to the milk-dealer.

During some of my chemical experiments I have several times produced an excellent imitation of milk, without a single drop of real milk being used, and at less than one half the present cost of that article. From the ingredients used, I should recommend it as being equal in every respect; and might be so made as to be even superior in its power of nourishing the body to the natural milk of the cow.

Spring water contains an amount of earthy ingredients which it is fearful to contemplate. It certainly differs very much in different districts and at various depths; but it has been calculated that water of an average quality

contains so much carbonate and other compounds of lime, that a person drinking an average quantity each day, will, in forty years, have taken as much into the body as would form a pillar of solid chalk or marble as large as a good sized man. So great is the amount of lime in spring water, that the quantity taken daily, would alone be sufficient to choke up the system, so as to bring on decrepitude and death long before we arrived at twenty years of age, were it not for the kidneys and other secreting organs throwing it off in considerable quantities. These organs, however, only discharge a *portion* of this matter: for instance—supposing ten parts to be taken during a day; eight or nine may be thrown out, and one or two left somewhere in the body. This process continuing day after day and year after year, the solid matter at length accumulates, until the activity and flexibility of childhood become lost in the enfeebled rigidity of what is then called, though very erroneously, “old age.” A familiar instance of earthy deposition and incrustation from water, is observed in a common tea kettle, or steam boiler. Every housewife knows that a vessel which is in constant use will soon become “furred up;” or plastered on the bottom and sides with a hard stony substance. Four and five pounds weight of this matter have been known to collect in twelve months. The reader must not mislead himself by thinking that because so much lime is found in a tea kettle, the water after boiling is therefore free from lime. It is true boiling water does cause a little carbonate of lime to precipitate, but the bulk of the sediment is left from that portion of the water only which is driven off as steam or “boiled away.” This can easily be ascertained by testing the water both before and after boiling. It will be found to contain earthy particles however long the boiling may continue. Filtering it is also of no use; for this only removes what may be floating or mechanically mixed in the water; whereas the earthy matter here spoken of is held in solution. So that spring water, clear and transparent as it may appear, is nevertheless, charged with a considerable amount of solid choking up matter, and is therefore, in any form unfit, or at least is not the best suited for internal use. The only

means whereby it can be rendered perfectly pure and fit for unlimited consumption is distillation. A very simple apparatus might be attached to a kitchen fire so as to be of very little trouble, and yet to gradually distil as much water as would be required for a family. There cannot be a doubt that distilling the water intended for tea, coffee, soup, and other internal purposes, even without any other change in diet, would diminish disease and add many years to our existence.

A good substitute for distilled water may be had in rain and snow or hail. If a large sheet was suspended by the four corners in an open yard or field, and a stone or other weight placed in the centre so as to give it somewhat the form of a funnel; the rain or melting snow would run to the centre and might be caught in any vessel for the purpose. This would be almost equal in purity to distilled water. If this cannot be done, clear rain water filtered might be used, although it is liable to become charged with earthy and other substances in passing over the house tops.

River and pit water, besides containing as much lime as that from springs is contaminated with putrid animal and vegetable matter. Professor Clarke says, that the inhabitants of London use thirty-seven millions and a half imperial gallons of the water of the river Thames every day; and that this quantity of water contains about twenty-four tons of chalk!

Dr. Thomson, in his *Materia Medica*, has the following remarks upon distilled water:—"Water which contains no volatile matter, when passed through the still is the purest state of this important fluid. It is beautifully transparent, colourless, perfectly void of taste and smell, and lighter than any other water. * * * * It feels softer to the touch and the fingers are instantly wetted with it. Another singular property it possesses is, that it produces a greater sound when poured from one vessel to another. * * * * If kept free from the access of matters floating in the air, time produces no change on it. * * * * It is the best solvent of all soluble animal and vegetable matter, without decomposing them; on which account, could it be more easily procured, it would be the best and

most wholesome beverage for common use that can be employed, and might be rendered sufficiently palatable by agitating it mechanically with the air, which it rapidly imbibes. * * * * As a diluent it is more likely to pervade the minutest vessels than water containing foreign ingredients, either gaseous or solid; and therefore, could it be easily and cheaply procured, it ought always to be preferred when simple dilution is required in the treatment of diseases."

CHAPTER V.

PROOFS THAT THE CALCAREOUS EARTHY MATTER OF THE BODY IS DERIVED SOLELY FROM THE FOOD AND DRINK.

THE following is a simple yet forcible illustration of the influence of food in producing or preventing osseous formations. "One thousand parts of egg shells are composed of—

Carbonate of Lime	896
Phosphate of Lime	57
Gluten and Moisture	47
	1000
Total.....	1000

If fowls are kept in a state of confinement where they cannot get at any calcareous earth, they lay their eggs without shells." *Parke's Chemical Catechism.*

In this case it is evident that if no lime is put into the body, through the medium of food, *no lime will generate* by any peculiar action of that body. Again, if the leg of a common fowl be broken, its eggs will be laid *without shells* until the fracture is repaired. It would seem that the earthy matter and gelatine which would have formed the egg shell are required to unite the broken limb; and the body *has no power to generate an extra quantity.* The same has been observed of females, both of the human race and of the lower animals. When limbs have been broken during pregnancy the young have been born with a marked *deficiency in the structure of the bones.* The earthy elements required to re-unite the broken limbs have

been taken from the amount already existing in the system of the mother; and that system has had *no power* to form a *fresh supply* for the bones of the young.

Dr. Playfair, in a lecture delivered in 1843, in the Royal Institution, Manchester, after describing a series of experiments, undertaken by himself, with a view to ascertain the quantities of butter and cheese produced in the milk of cows by different kinds of food, makes the following remarks, as reported in the *Manchester Guardian*:—
“It (the cow used in the experiments) was now treated to various kinds of food, such as hay, boiled potatoes, oatmeal, beans, peas, &c.; and the changes which these articles of food occasioned were carefully determined by analyzing the milk morning and evening. Beans were found to increase very materially the quantity of cheese in the milk, and it is very singular that beans actually contain cheese exactly identical with that which is procured from milk. Potatoes were found to increase the butter of the milk, and diminish the cheese; and the butter was still more increased when the cow was made to drink beer instead of water. Thus the food and the exercise of the animal was shown to exert very material influence on the composition of the milk. *The quantity of the earth of bones* and other salts *also varied according to the amount of these ingredients presented in the food.*” This last statement fully corroborates the conclusion insisted upon; namely, that according to the greater or less amount of earthy matter taken in the food and drink, will the body consolidate more or less rapidly in a given time.

It has been stated, by several continental chemists and physiologists, that arterial blood contains a greater amount of crassamentum, and is heavier than venous blood. The crassamentum is the solid part of blood, and consists of colouring matter, fibrin, *phosphate of lime*, &c. If, then, the blood which flows from the heart, through the arterial vessels, contains an amount of solid matter which does not exist in it when returning to the heart through the veins, it is certain that some portion of this matter must be left in the minute terminations of the arterial vessels. The arterial blood is renewed and receives a fresh supply of elements, including the earthy matter, from the food.

There are many places where the spring-water is so very hard, (which quality of hardness is owing to the amount of sulphate of lime and other earthy substances,) that many strangers are unable to live for more than a few days, without suffering greatly from gravel and other calculous disorders. Dr. Thomson, in his *Materia Medica*, p. 1047, says, "The abundance of this earthy salt (sulphate of lime) in the water of Paris, and in the waters of many parts of Switzerland, produces uncomfortable feelings to strangers who first visit these places. It is also said to produce calculous complaints in the inhabitants. In weak and irritable stomachs hard spring-water causes an uneasy sensation of weight at the stomach, and, when long used as daily beverage, produces a degree of dyspepsia, to which we must attribute the calculous deposits which Dr. Percival and others have observed to be common in places where hard water is drunk." Again, at p. 1051, continuing his remarks on water as an aliment, he observes, "No water which contains so much foreign matter as to place it within the class of mineral waters can be employed as an ordinary diluent; and even hard or well-water, when daily used, proves injurious. This fact is well known to horse jockeys, who, when they are desirous to sell a horse to advantage, give him either spring-water, or water which has been boiled, for drink; well knowing *that the use of hard-water makes his coat rough.*" In these cases we have at least instances of the influence of drink containing earthy matter, increasing the formation of calculi, and even affecting the skin. *These effects do not arise unless the earthy substances are taken into the body with the drink.*

Three common fowls were fed fourteen days upon a mixture of equal parts of wheat, oats, and barley, with hard spring-water to drink; the amount of earthy matter in these four articles is represented in the table of diet, by the numbers respectively, 220, 118, 65, and 10; the average of which is 91. In the fourteen days the number of eggs from the whole was 28. The shells from which weighed one ounce, two drachms, one scruple, and fifteen grains, or 635 grains. The shells were then analyzed and found to contain 93 per cent. of earthy matter; and

gelatine and water, 7 per cent. The same fowls were then fed fourteen days upon cooked potatoes, greens, fish, and flesh, about equal parts, with filtered rain-water to drink. The numbers representing these articles are, potatoes 90, greens 6, fish 18, flesh 26, and rain-water 0; the average of which is 28. In the fourteen days the number of eggs was 27. The shells from which weighed seven drachms and a half, or 460 grains; which for 28 would be 477 grains; being a difference of 158 grains, or one-fourth less. The shells were analyzed and found to contain 82 per cent. earthy salts, and 18 per cent. gelatine and water, being a difference of 11 per cent. in the amount of earth, and 11 per cent. in the amount of gelatine, &c. These results will be more clearly perceived by giving them in a tabular form.

Kind of Food.	A- mount of earth in each.	Aver- age amount	Period of Feeding.	No. of Eggs.	Weight of Shells.	Composition.		Differ- ence.
						Earthy Matter.	Gelatin & Watr.	
Wheat	220	91	14 days	28	635 grs.	93	7	11
Oats	118							
Barley.....	65							
Hard or Spring- water	10							
Potatoes.....	90	28	14 days	27	460 grs. or for 28 eggs 477 grs.	82	18	
Greens	6							
Fish.....	18							
Flesh	26							
Rain-water....	0							

The fowls were then fed as at first, and a corresponding difference was again found in the character of the shells.

A dog, that had always lived in the ordinary way, on bread, bones, meat, &c., was bled, and the blood analyzed. It was found to contain 14 per cent. of phosphate and carbonate of lime; the urine 1.5 per cent.; and the excrements 2.75 per cent. The dog was then fed fourteen days on flesh, potatoes, fruits, (of which it was very fond,) and distilled water. The blood was then found to contain 9 per cent. of phosphate and carbonate of lime; the urine .75 per cent.; and the excrements 1.5 per cent.; being a diminution of 5 per cent. in the blood, .75 in the urine, and 1.25 in the excrements. At the end of this period the dog was fed in the ordinary way for a month, the blood

TABLE III.

Food consumed by a cow in 24 hours.

Articles in Food.	Weight in the Fresh State.	Weight in the Dry State.	Carbon.	Hydrogen	Oxygen.	Nitrogen.	Salts and Earthy Matters.
Potatoes ..	15000	4170	1839.0	241.9	1830.6	50.0	208.5
After-grass	7500	6315	2974.4	353.6	2204.0	151.5	631.5
Water.....	60000	.....	.....	.....	.....	.....	50.0
Total	82500	10485	4813.4	595.5	4034.6	201.5	898.0

TABLE IV.

Excretions of a cow in 24 hours.

Excretions.	Weight in the Fresh State.	Weight in the Dry State.	Carbon.	Hydrogen	Oxygen.	Nitrogen.	Salts & Earthy Matters
Excrements .	28413	4000.0	1712.0	208.0	1508.0	92.0	480.0
Urine	8200	960.8	261.4	25.0	253.7	36.5	384.2
Milk	8539	1150.6	628.2	99.0	321.0	46.0	56.4
Total	45152	6111.4	2601.6	332.0	2082.7	174.5	920.6
Total from the last Table	82500	10485.0	4813.4	595.5	4034.6	201.5	889.0
Difference ..	37348	4374.6	2211.8	263.5	1951.9	27.0	31.6
More or less .	less	less	less	less	less	less	more

By the above tables it appears that the salts and earthy matters, in the urine of the horse, amounted to 109.9 parts out of 1,330, or above 8 per cent. The excrements 574.6 parts out of 14,250, or about 4 per cent. The salts and earthy matters, in the urine of the cow, amounted to 384.2 parts out of 8,200, or above 4.5 per cent. Those of the excrements amounted to 480 parts out of 28,413, or above 1.5 per cent. The milk contained 56.4 parts out of 8,539, or about 0.65 per cent. The total weight of food consumed by the horse was 25,770 grammes. The total amount of salts and earthy matters in that food was 672.2 grammes, or 2.6 per cent. The total amount of urine and excrements was 15,580; the total weight of earthy salts, &c., 684.5, or 4 per cent. The earthy salts, &c., in the food of the cow amounted to about 1 per cent. The total in the whole of the excrements, urine, and milk,

was 2 per cent; so that the secretions of the horse, living on hay, oats, and water, contained double the amount of earthy matters, &c., to those of the cow, living on potatoes, after-grass, and water.

A man who had always lived as the working-classes generally live, upon bread, puddings, potatoes, flesh, cheese, milk, tea, coffee, ale, &c., was induced to submit himself to various experiments for several weeks:—first the urine voided every morning for a week was preserved, and a portion carefully analyzed; the amount of earthy matter was found to be 3.5 per cent; the excrements 6 per cent.; the saliva 1.5 per cent.; and the blood 8 per cent. He then lived upon flesh, fish, greens, and a large quantity of ripe fruits, for a fortnight. The urine, for several mornings, was collected and found to contain only 2 per cent. of earthy matter; the excrements 4 per cent.; the saliva 0.75 per cent.; and the blood only 5 per cent. He was also induced to run until he perspired freely, when as much of the sweat was scraped from his body as was capable of being analyzed, though not in quantity sufficient to be weighed. This was done both before and after the change of diet, and a very sensible difference was found in the amount of earthy salts. The sweat obtained before the change of diet contained considerably more than that obtained at the end of the experiment; though it was altogether so small that the exact amount could not be accurately ascertained. The man was then allowed to return to his old habits and food; and at the end of a month the secretions and blood were again analyzed, and found to contain a much greater proportion of calcareous earthy matter than when last examined; but not quite so much as they contained previous to the experimental change of diet being undertaken. The following very striking experiment was tried upon a female and her child, only three months old:—a portion of the milk of the mother was obtained sufficient for analysis, and found to contain about 1.75 per cent. of phosphate and carbonate of lime. She then had lived upon bread, tea, coffee, flesh, potatoes, and pastry of various kinds. A portion of the urine and stools of the child were obtained every day for six days; when, on being analyzed, the urine was found to contain 0.5 per

cent. of earthy matter, and the stools 2 per cent. The mother was then induced to live, for a week or seven days, upon sago, puddings, roasted apples well sweetened, grapes, figs, and port and sherry wine. At the end of the fifth day a portion of the milk was examined, and found to contain 0.5 per cent.; the urine and stools of the child were then collected, and repeated on the sixth and seventh days. On being analyzed the urine was found to contain only a trace of earthy matter, and the excrements only 0.25 per cent. The mother then quickly returned to her usual food, having found the change for a week rather a severe task. In about a fortnight the excretions of the child and the mother's milk, were again examined, and the proportions of earthy elements had greatly increased, approaching the amount found on the first analysis.

At an early period of the present inquiry it occurred to me that the degree of solidity and bulk of the bones of a child, previous to birth, must depend upon the amount of calcareous or osseous matter in the food of the mother, taken during gestation; and that the process of fetal ossification might be so far retarded, that a more elastic, yielding, or india-rubber-like condition of the child might be secured; and the mother thus relieved of much of the sufferings and danger usually attending the periods of delivery. I was more particularly impressed with the importance of such a view, by the fact that, in various parts of the world, the females are comparatively free from the evils generally attending the females of European society. "Among the Arancanian Indians of South America, a mother, immediately on her delivery, takes her child, and, going down to the nearest stream of water, washes herself and it, and returns to the usual labours of her station." *Stevenson's Twenty Year's Residence in South America*, vol. 1, p. 9. Many accounts have been given of these and the females of other tribes requiring no more than ten or fifteen minutes for all purposes connected with their delivery. These easy births have generally been accounted for on the supposition of their being favoured in physical structure and climate; but that they are not more favoured in the first respect than our own females is expressly denied by Professor Lawrence, in his *Lec-*

tures on Physiology, who states, "The very easy labours of Negresses, native American, and other women in the savage state, have been often noticed by travellers. This point is not explicable by any prerogative of physical formation, for the pelvis is rather SMALLER in these dark-coloured races than in the European and other white people." That they are not favoured by climate is evident from the fact that the females of the North American tribes have as easy labours as those of the Central and South Americans. In our own country also, cases have occurred where females who have generally suffered severely, have occasionally given birth with such ease as to surprise both themselves and their friends. I remember speaking some time ago to a few friends on this subject, when one of them related the case of a lady of his acquaintance who had given birth to four children. The first two were born with all the danger and difficulties usually attending parturition, the third was born with the greatest ease, while the fourth delivery was equally difficult with the two former. It was quite fresh in the memories of her friends, that from an early period, and during the whole time of gestation of the third child, she was excessively fond of oranges, limes, and even lemons, which she took in such abundance that she required very little of any other kind of food. Her desire for these fruits was so very great that, although her husband, and those around her, continually remonstrated, and enticed her to leave them off for fear of injuring herself, she continued to live almost entirely upon them. To her surprise and that of her friends, however, she gave birth with so much more ease and safety, that notwithstanding the supposed impropriety of so doing, she was able and did resume her ordinary duties in a few days afterwards. During her pregnancy of the first, second, and fourth children, she lived in the ordinary way.

END OF PART I.

CHAPTER V.—CONTINUED.

THESE considerations led me to the conclusion, that our own civilized females might so adapt their food during gestation, that they might escape the sufferings which endanger their lives, as well as the females of savage tribes. In the month of January, 1841, I induced a female who had suffered severely on two former occasions, and who was now a third time full seven months advanced in gestation, to try an experiment under my directions. She commenced by eating an apple or an orange, or both, the first thing in a morning and again at night. This was continued a few days, until she found she could take more without inconvenience. At breakfast, she took several roasted apples with a very small quantity of wheaten bread and butter, and one small cup of coffee. During the forenoon she took several oranges or apples. To dinner she had a little fresh animal food, with roasted apples or apple sauce, and a potato or green vegetables, (no bread or pastry of any kind,) sometimes a few boiled or roasted onions, and always took plenty of pickles and vinegar. In the afternoon she again took freely of oranges, apples, grapes, or such other fruits as could be obtained. At tea she proceeded as at breakfast—a little bread, tea, and a number of roasted apples. Supper, sago boiled in milk, mixed sometimes with currants, raisins, or cut apples. She continued this course for about six weeks; when, to her surprise and satisfaction, her legs and feet, which, when she began, were considerably swelled and painful, and the veins, which were very large and full, almost ready to burst, had returned to their former state; and she became altogether as light and active—or more so, than she was previous to her pregnancy. She was often seen to run up and down a flight of more than twenty stairs, with apparently as much ease as any other person, and certainly with less fatigue than she could have done at any former period within her recollection; such an influence had the fruit diet in rendering the body light and buoyant, and the spirits active and cheerful. Her

health altogether became excellent—in fact, she many times declared that she never felt so light and healthy before; not an ache, or a pain of any kind, was she troubled with, up to the night of her delivery. Even her breasts, which at the time she commenced the experiment, were exceedingly tender and painful, became, and continued, entirely free from pain. Between ten and eleven o'clock on the evening of the third of March, she, for the first time, expressed her belief that her “time was come”; about twelve the surgeon was sent for, he came about half-past, at a quarter to one the delivery was safely effected, and at one o'clock he had left the room! Had she not been influenced by custom, she might have resumed her usual duties immediately after the delivery; or, at all events, next day. Indeed, the prejudices which exist upon this subject, and the fear of violating the “notions of propriety” of her friends and neighbours, alone restrained her.* However, on the fourth morning, such was her condition, that she left her bed, *washed and dressed herself and the child*, and commenced her ordinary family pursuits. She had no assistance from medicine. It may be stated as a further proof of the influence of diet upon the foetus, and in diminishing the difficulties of parturition, that the same female, during two former periods of pregnancy, subsisted very much on bread, puddings, pies, and all kinds of pastry; having an idea, like many others, that solid food of this kind was necessary to support and nourish the foetus †, and she

* If there is one thing more than another, which betrays a mind totally ignorant of the laws and purposes of nature, it is the abuse which is heaped upon females, in proportion as they escape the dangers and sufferings of childbirth. Many, otherwise intelligent persons, do not blush to avow their belief, that these miseries are really essential to the love of offspring—that females would have little or no regard for their young, did they not suffer in giving them birth. That a woman should suffer severely at such a time, is spoken of as a wise and inevitable law of nature; and those who escape with the least amount of danger, are taunted as being most analogous to the “beasts that perish”. It is to be hoped, however, that ere the close of the nineteenth century, such mischievous and foolish prepossessions will have ceased to disgrace mankind. For, surely, science and careful observation of causes and effects, will enable us, sometime or other, to discover the sources of physical evil, and avoid not only one, but all the “ills which flesh is heir to”. Else all our labours in seeking truth and happiness are in vain; these being the grand object of our exertions and existence.

† It is quite right to suppose that nutritious food is necessary to support and strengthen the fetus; but the nutritious, and the solid earthy matter, in food, are very different substances. Wheaten flour, on account of its containing so much of this earthy matter, is the most dangerous article a female can live upon when pregnant. The other grains are bad enough, but better than wheat.

suffered very greatly in delivery. On this occasion, with only six weeks' adoption of a contrary course, she secured for herself a more easy labour than is ever perhaps experienced by females in this or other civilized countries.

This experiment has proved the truth of the conclusion, that in proportion as a female subsists during gestation upon aliment free from calcareous earthy matter, will she retard the consolidation of the child, and thus prevent pain and danger in delivery. Hence the following may be given as an axiom for the guidance of females at these particular times. *The more ripe fruits, and the less of other kinds of food, but particularly of bread or pastry of any kind, they consume during pregnancy, the less difficulty will they have in labour.*

“It is remarkable that, though phosphate of lime is always found in the urine of adults, this salt is not evacuated by infants. The rapid formation of the bones, in the first periods of life, requires that there should be no waste of any of the phosphoric salts.”—*Parke's Chemical Catechism.*

In my own experiments, I have discovered a small portion of phosphate of lime, but only a trace, in the urine of infants. The infant not having lived long, has not consumed much food; and, therefore, not taken into the system much calcareous matter; and, in fact, what little it has taken in being required to complete the formation of the bones, cannot appear in the secretions. But, in the urine and excrements of the adult, who has, by living longer and taking more food, deposited more earthy matter in the body, and the bony fabric being completed, it is found in considerable quantities; and in still greater proportion in the secretions of aged persons.

The flesh of animals, in proportion to the age, and therefore, to the amount of food and earthy matter which has been taken in, becomes dry and solid,—approaches more to the nature of cartilage and bone. In very old animals, a great portion of the tendon is converted into cartilage, the cartilage into bone; and the bones, now become solid and brittle, constitute by far the greatest part of the body. Hence the emaciated, fleshless, death-like condition, presented by extreme old age.

The urine of a female when pregnant, contains *less earthy matter* than when she is not so. It is no doubt taken up in the formation of the bones of the fœtus.

As age advances, or rather, as the consolidation of the body increases, the composition of the teeth gradually changes;—the amount of earthy matter increasing, and the gelatine, or animal glue, diminishing. The following table is from *Brand's Chemistry*.

Roots of the teeth:—

Phosphate of Lime	58
Carbonate of Lime	4
Cartilage	28
Water and loss	10
	<hr/>
Total	100
	<hr/>

First teeth of children:—

Phosphate of Lime	62
Carbonate of Lime	6
Cartilage	20
Water and loss	12
	<hr/>
Total ..	100
	<hr/>

Teeth of adults:

Phosphate of Lime	64
Carbonate of Lime	6
Cartilage	20
Water and loss	10
	<hr/>
Total	100
	<hr/>

Enamel of the teeth:—

Phosphate of Lime	78
Carbonate of Lime	6
Gelatine (or Cartilage)	16
	<hr/>
Total	100
	<hr/>

Sometimes the amount of earthy matter becomes so great, and the cartilage or gelatine which holds it together so little, that the teeth, even in young persons, will begin to crumble and wear away like a piece of chalk; and this, very often, without the individual feeling much pain. Persons thus affected I have always found to be great

consumers of bread, puddings, pies, and other flour preparations, all which contain a large amount of phosphate of lime. By a course of diet of a different nature, I have caused several persons to succeed in arresting the progress of decay, and fixing the remaining teeth firmly and usefully in the gums.

The broken limbs of old people do not unite so readily as those of children, and persons in the prime of life; because in advanced age, although there is more bony matter in the system, the vessels which should convey it to the injured part being obstructed, the union cannot take place.

The periods called puberty and maturity, are simply conditions or states of the body, depending on certain degrees of arterial ossification. Both which may be brought on sooner or later, according to the intensity of the consolidating, or choking-up, process. It is possible to force a child through the various stages of life, much earlier than is usual; or to delay them for an extraordinary period, by simply regulating the amount of solid matter in its food. Children, when overworked, as in some manufacturing districts, necessarily devour a greater amount of solid food than would otherwise be sufficient; they consequently deposit the greater amount of earthy matter which that food contains, into the system; the capillary vessels are sooner obstructed to those degrees which constitute puberty and manhood, and thus they cease to grow, and become men and women (such as they are) at an earlier age than those around them who have been placed under different circumstances. Children who are not overworked, but who are great eaters of solid grain food, arrive at these states much sooner than others of different habits. The sooner an individual comes to maturity, the sooner, if the same habits are continued, will he come to the periods of old age, decrepitude, and death. There seems to be no exception to this principle, either in the animal or vegetable world. So true is it, that the average age to which any species of organized beings exist, may be almost determined, by knowing the time at which they arrive at maturity, or begin to propagate.

As manhood is attained, the skin begins to be incrustated

with a plaster-like substance, which accumulates as age advances. If the linen of some persons, after being worn a few days, be well shaken, a quantity of dust, like flour, will come from it. If the body be rubbed well with a dry hard brush or cloth, the same flour-like substance will be obtained. This dust, when analyzed, is found to consist of gelatine, combined with earthy or bony matter. That it is originally derived from the food and drink, is evident from the fact that its presence on the skin is in proportion to the amount and quality of the food consumed. Aged people for instance, having consumed through a period of sixty or eighty years an immense quantity of aliment, and therefore deposited a large amount of earthy matter into the system, are incrustated to a much greater extent than young persons. Old people of the same age, also differ much in this respect; those who have taken freely of solid grain food, always being much worse than such as have been more sparing in their habits, and have consumed less flour preparations, and more fresh vegetables, fruits, fish, flesh, &c.

Women generally eat less food, and labour and perspire less, than men; and are therefore less incrustated with calcareous matter. Their skins are much smoother, and more pliant, and on this, as well as on other accounts, they may be justly styled the "softer sex". In advanced age, however, even they are more or less affected with this external impurity. For the same reasons, we observe that the skin of a child is much softer and cleaner than that of an adult. This collection of gelatinous and calcareous matter upon the surface of the body, is highly injurious to health; inasmuch as it prevents the elimination of the superfluous vapours and gases which the skin is alone calculated to discharge. It is, in fact, a part of that general ossification of the system, which is the source of disease, and ultimately of death itself. It ought very forcibly to remind us of the absolute necessity of keeping the surface of the body clean, not only by frequent washing, but by actual grooming, or scrubbing with a rough cloth or a close, strong brush; or, what is, perhaps, the best of all, the "horse hair gloves" and belts which are sold for this purpose, by almost every respectable druggist in

the kingdom. As the earthy matter which often incrusts a common tea kettle, is deposited in consequence of the water which held it in solution being converted into steam and driven off; and as, therefore, the more the water contains, the more will be the quantity deposited in the vessel, and the sooner will it become incrustated or "furred up"; so, in the same manner, the fluids of the body constantly passing off in the shape of sensible and insensible perspiration, or, in other words, changing into vapour and gas—boiling away, as it were, the more we eat and drink of substances containing calcareous earth, the more will enter into the composition of the blood, the more will be deposited internally, as well as on the skin; and, therefore, the sooner will the whole system become ossified, or filled or choked up, and the sooner will rigidity, decrepitude, and death, take place.

Persons of a dull, cadaverous appearance, with harsh, rough skins, who are thin and bony, and continually troubled with some complaint or other, I have always found to be greatly attached to food of a solid, earthy nature, such as bread, puddings, pies, tarts, cakes, and flour preparations in general. I do not mean to assert that such persons never partake of much of other substances, for they are generally fond of rich, strong food, as well; but that bread and pastry composed of wheat, oats, or other grain, constitute the basis of their diet. The same may be said of such as are troubled with bad teeth, ulcers, pimples, and blotches of every kind, and who are very susceptible of colds, head-aches, &c.; and more particularly is this the case when the individuals are of a costive habit of body, because then much injurious matter is retained, that would otherwise have been discharged. On the contrary, those who are bright and lively in appearance, who have clear and shining skins, full in flesh, bones small and flexible, seldom troubled with disease of any kind, and who are generally stirring and animated, I have always found to partake more of fresh vegetables, greens, fruits, and animal food, fish, fowl, eggs, and all kinds of albuminous and saccharine substances, and often, though not always, fond of a glass of good brandy and water, wine, ale, or other kinds of

alcoholic and fermented beverages, and who cared but little for gross, solid grain food, such as flour in its various forms.

Heavy, clumsy persons, whose movements—when they do move—are stiff and awkward, are always great consumers of solid food, especially of bread, and pastry of all kinds; some of such persons I have known, who could, and did devour half a quartern loaf at a meal, and who always preferred a pie with a crust approaching the thickness of the rim of a coach wheel, to one of a more delicate and decent construction.

Among children and young persons too, it may be seen that the dull, heavy, ill-tempered ones, are mostly great eaters of solid, grain foods; while the more active and lively, are less anxious for food of a solid character, but mostly fond of light, fluid, and saccharine substances. If the reader will look around him, and inquire into these matters for himself, he will soon be convinced of the truth of these remarks. If, for instance, he should at any time observe a big, clumsy, stupid lad, whose greatest pleasure consists in doing all kinds of mischief, and in teasing and tormenting every one about him, upon inquiry, it will certainly be found that he is fonder of eating and destroying, than producing any thing in return. If he could be seen at his meals, he would appear more like a hungry wolf than a human being, devouring all that comes in his way, yet never being satisfied.

It may here be remarked, that the stomach is an elastic bag or sack, and the more food is put into it, the more it is distended, and the larger it becomes. Hence, the more a person eats, the more he requires to eat, in order to satisfy himself; and, very often, such a diseased state of the stomach and bowels is produced by this habit, that the greatest eaters are nevertheless the most bony and ill-looking. Many persons who are full in flesh and healthy in appearance, are less eaters than such as are thin and meagre.

These facts, and many others which could be advanced, all tend to support and prove the position, that the food and drink alone are the source of the calcareous earthy matter which is gradually deposited in the body, and

which, by degrees, brings on a state of induration, rigidity, and consequent decrepitude, which ends in a total cessation of consciousness, or death. We have seen that different kinds of food and drink contain these earthy elements in different proportions; and we cannot avoid the conclusion, that the more we subsist upon such articles as contain the largest amount, the sooner shall we choke up and die; and the more we live upon such substances as are comparatively free, the longer will health, activity, and life, continue. That such are the effects that must arise from a practical application of this principle, will be seen from the facts in the following chapter.

CHAPTER VI.

PROOFS THAT THE DURATION OF LIFE IS PROPORTIONATE TO THE AMOUNT OF EARTHY SUBSTANCES PRESENTED IN THE FOOD AND DRINK.

IN Pinnock's Edition of *Goldsmith's History of England*, the following note appears:—

“It is stated by Plutarch that the Ancient Britons (were so temperate) that they *only began* to grow old when a Hundred and Twenty years of age! Their arms, legs, and thighs, were always left naked, and for the most part, were painted blue. Their food consisted almost exclusively of acorns, berries, and water.”

Other historians mention fish, fowls, and the flesh of wild animals, as well as eggs, milk, and the fruits, leaves, and roots of the forest, as occasionally forming portions of their diet. These articles contain a much smaller amount of earthy matter than the farinaceous, or grain food, used in the present day, and hence their extraordinary longevity. Such food must also produce a wonderful degree of activity and strength. Dr. Henry, in his *History of England*, states, that they were remarkable for their

“Fine athletic form, for the great strength of their body, and for being swift of foot. They excelled in running, swimming, wrestling, climbing, and all kinds of bodily exercise; they were patient

of pain, toil, and sufferings of various kinds; were accustomed to fatigues, to bear hunger, cold, and all manner of hardships. They could run into morasses, up to their necks, and live there for days without eating."

The food of the inhabitants of New Zealand, and many of the South Sea Islands, consists of flesh, fish, fowls, eggs, fruits, roots, berries, leaves, and sometimes seaweeds, all which contain on the average, a comparatively small amount of earthy substances; and we learn from the accounts of those who have visited and lived amongst these people, that they are healthy and energetic to beyond the age of a hundred years! They are said to be able to go to war, to follow the chase, to obtain a full supply of their wants by hunting, fishing, and roaming the forests; and, in short, to be equal to the finest young men of Europe, long after they have reached a hundred years of age! A gentleman who has spent seven years among them, declares that he has known many who could not remember their ages to within ten or twenty years.

Herodotus gives us an account of a people of Ethiopia, who, because of their longevity, were called "Macrobians". Their diet consisted entirely of roasted flesh and milk; both which contain a small amount of earthy matter; and they were remarkable for their "beauty, and the large proportion of their body, in each of which they surpassed other men". "They lived to a hundred and twenty years old, and some to a much longer period!"

The ancient Gymnosophists of India subsisted entirely upon fruits and fresh vegetables. It was a part of their religious ordinances to eat nothing but what the sun had ripened and made fit for food, without any further preparation. This diet contained a very small proportion of earthy elements; and, it is said that these people were perfectly healthy, and scarcely ever died a natural death. They lived to a hundred and fifty, and two hundred years; and some lived so long, that, disgusted with the sins and follies of the world, they became weary of their lives, and actually committed themselves to the flames. These suicidal proceedings were no doubt encouraged by the hope of realising another and more perfect state of existence in some other region of the universe.

It was a doctrine commonly taught by the Pagans of various parts of the world, that the goddess of Justice, usually named Astræa, a daughter of Jupiter, and represented with her eyes bound, a sword in one hand, and a pair of scales in the other, came down from heaven, to live with mankind, during the golden age; but at length, the world became so corrupted, that she left the earth, and returned to heaven, where she formed the constellation *Virgo*. She still looks down with regret upon the iniquities and consequent sufferings of men; and whenever the world becomes virtuous, she will return and live among us.

Many persons, even in our own day, have been so grieved at the wickedness and miseries of the world, that no other way of finding relief has been perceived, than to commit suicide. But surely no truly enlightened person, one capable of understanding the origin and purpose of evil, and the probable future condition of humanity, can for a moment, think of self-destruction.

The peasantry of those parts of Ireland where wheaten bread, or any kind of grain food is scarcely ever tasted; but where potatoes, fish, turnips, greens, and fresh vegetables, generally form their principle diet, all which things contain a moderate amount of earthy matter, are proverbial for health, activity, and general longevity.*

The English peasantry consume a much larger quantity of solid grain food, as bread and pastry of all kinds, than the Irish, and are greatly inferior both in health, activity, duration of life, and in temper and disposition. Although the same external conditions, fresh air and exercise, and much better clothing and lodging, are enjoyed by the English, they are more bony, rigid, clumsy, and stupid than the Irish. Neither have they as much generosity, attachment, or affection; for it can be demonstrated, that the moral qualities of the people depend greatly upon their habits of living—upon the nature of their diet.

Fishermen, and others near the sea, who live principally upon fish, with a large proportion of potatoes and green vegetables, enjoy good health, and live to considerable ages.

* "Ireland does not consume at the rate of half the quantity of wheat used in England."—*British and Foreign Review*.

Writers on Natural History inform us, that the wild hog lives free from disease to the age of three hundred years. Its food consists of fruits, chesnuts, acorns, roots, and grass, with grains occasionally. This food contains little earthy matter.

The swan is said to attain the age of three hundred years. Its food consists of fish, worms, grass, weeds, and fresh-water muscles, or swan-muscles, as they are called. This food contains a small proportion of earthy elements.

“Some time ago, a male swan which had seen many generations come and go, and witnessed the other mutations incidental to the lapse of two hundred years, died at Rosemount. He was brought to Dunn when the late John Erskine, Esq., was in infancy; and was then said to be one hundred years old. About two years ago, he was purchased by the late David Duncan, Esq., of Rosemount; and within that period his mate brought him forth four young ones, which he destroyed as soon as they took the water. Mr. Mallison Bridget, (in whose museum the bird is now to be seen,) thinks it might have lived much longer, but for a lump or excrescence at the top of the windpipe, which, on dissecting him, he found to be composed of grass and tow. This is the same bird that was known and recognised in the early years of octogenarians, in this and the neighbouring parishes, by the name of ‘the old swan of Dunn.’”—*Medical Gazette.*

Rooks and crows live to a great age, more than a hundred years; and they feed, the latter upon flesh, carrion, and putrid offal, the former on worms, fresh-water muscles, and other shell-fish, grubs, snails, caterpillars, and sometimes grains and seeds. This food is not very earthy.

When crows find the shells too hard for their bills, they carry them up to a considerable height in the air, when, by dropping them down upon a rock or stone, the shells are fractured, and they can then easily pick out the fish.

The raven, hawk, goose, and other birds of similar habits, are known to live for a long period. Their food consists of flesh, fish, worms, and all kinds of garbage; which contains but little earthy matter.

The pelican lives to more than a hundred years of age. Its food is principally fish.

The heron, crane, sea-gull, and others of a like nature, live to great ages. Their food is chiefly fish.

The eagle is supposed to attain a great age; Tacitus says to five hundred years.

“Thy youth is renewed like the eagle’s.”

Psalm ciii. v. 5.

Its food consists of flesh and fish, which contain a much less amount of earthy ingredients than the flour food of the human species.

Some of the parrot species are believed to live in their native state for five and six hundred, and even seven hundred years; and their food to consist principally of the pulp of fruits, which is almost free from earthy matter.

Common fowls, the sparrow, tame pigeons, singing and other domesticated birds, that feed upon bread, seeds, and grain of different kinds, which food is highly charged with earthy substances, live only from ten to twenty years.

The elephant subsists upon fruits, flowers, meadow-plants, and the leaves and tender shoots of trees,—particularly the banana, cocoa, palm and sago tree; all which contain a small proportion of calcareous earth, and it lives to a great age. That poet of nature, Thomson, thus sets forth the longevity of the elephant:—

“With gentle might endued,
Though powerful, yet not destructive; here he sees
Revolving ages sweep the changeful earth,
And empires rise and fall;—regardless he
Of what the never-resting race of man
Project.”

The horse, cow, pig, dog, and other domesticated animals, subsist upon food which contains a larger amount of earth than their natural food, or that which they choose in a wild state, and we perceive a corresponding difference in the periods of their existence. It is well known to carters and others who feed and drive horses, that corn food, although it makes them plump and fleshy, soon renders them rigid, and materially shortens their existence. It is a common remark, when a horse is stiff and lifeless, “that it is no wonder when we consider what a quantity of corn he has had.”

It is customary for sportsmen, when they require greyhounds for unusual activity and swiftness in coursing, to

give them as little solid food as possible ; and to feed them upon rice or sago pudding, mixed with a large quantity of grocers' currants.

The monkey tribes are supposed to live, in their wild state, to a considerable age. They consume a great deal of fruits and herbs ; and they are known to eat eggs, small birds, and cocoa and other nuts. When brought to this country, however, their food is changed, and they are fed chiefly upon bread and potatoes, which food is very solid and earthy when compared with their natural aliment ; and, however young they may be when brought to this country, they seldom live for more than five or six years. Symptoms of decrepitude rapidly come on, and they die of apparent old age. If the proprietors of these animals would allow them plenty of fruits—their natural food, they would live in this country much longer than they do at present, notwithstanding the difference of climate, which is urged as the cause of their premature death.

The pike or jack, as well as most other fish, is known to attain a great age.

“ Gesner says, that the longevity of the pike is almost incredible ; he mentions as an instance, one that was taken in Hailborn, in Swabia, in the year 1497, with these words engraven on a ring,— ‘ I am the fish that was first of all put into this lake, by Frederick II., Oct. 5th, 1230.’ This gave it the age of two hundred and sixty-seven years.”—*Rhind's Six Days of Creation.*

The whale, shark, and some others, are supposed to live very long ; some naturalists think for upwards of a thousand years.

Serpents are supposed by many to be almost immortal. Several writers have declared their belief that the serpent never dies, but continually renews itself.

“ The wisdom and subtilty of the serpent are frequently mentioned in scripture, as qualities which distinguish it from other animals ; and several are the instances wherein it is said to discover its cunning. 1. When it is old, by squeezing itself between two rocks, it can strip off its old skin, and so grows young again. 2. As it grows blind, it has a secret to recover its sight by the juice of fennel. 3. When it is assaulted, its chief care is to secure its head, because its heart lies under its throat, and very near its head. And 4. When it goes to drink at a fountain, it first vomits up all its poison, for fear of poisoning itself as it is drinking.” *Calmet's Dictionary.*

The present population of London may be fairly calculated to amount, in round numbers, to two millions; and the annual consumption of food and drink to be somewhat as follows:—

Bullocks	140,000
Calves	320,000
Sheep	980,000
Lambs	320,000
Pigs	340,000
Fish	120,000 tons.

Immense quantities of hares, rabbits, venison, turtle, and fowls, of every description.

Wheat	1,360,000 quarters
Butter.....	14,000 tons
Cheese	17,000 tons
Potatoes.....	700,000 tons
Milk	13,000,000 gallons
Wine	10,050,000 gallons
Ale, Porter, Cider, Perry, Home-made wines, and other artificial drinks	100,000,000 gallons

Besides innumerable tons of fresh vegetables, and garden produce of every kind; vast quantities of native and foreign fruits,—fresh, dried, and preserved; sugar, treacle, honey, oils, sauces, pickles, and every possible variety of natural and artificial aliment, from every corner of the earth. “There are not less than seven hundred persons, men, women, and children, obtain a living in London by the vending of water-cresses alone. The total sum received daily for this article is about 1,400 shillings, or £25,560 sterling, in the year.”—*Morning Advertiser*, Oct. 24, 1840.

It is remarkable that the consumption of flour in London, is less than half-a-pound a day for each inhabitant, to make both bread and every kind of pastry. The articles which constitute the average diet of the inhabitants of London contain much less earthy elements than those of most other cities and towns of Europe or America. And, notwithstanding the frequency of destructive fires, fogs, and accidents of various kinds, both on land and on the river, the constant influx of strangers from every clime, and of every constitution; the prevalence, in some parts, of so much vice, filth, disease and misery; the many deaths from murder, suicide, legal execution, and other violent means; as well as the existence of many other drawbacks to their general health, which are almost inevitable in such places, they enjoy life for a much longer

period, as will be seen by the following tables of annual mortality:—

London	1	dies out of every	46
Geneva	1	“	43
Petersburgh	1	“	37
Baltimore	1	“	36
Leghorn	1	“	35
New York.....	1	“	35
Berlin	1	“	34
Paris	1	“	32.3
Philadelphia	1	“	31
Naples	1	“	28.2
Brussels.....	1	“	25
Rome	1	“	24
Amsterdam	1	“	24
Vienna	1	“	22.5

If we could take the average mortality of the regular, well-conducted, and well-conditioned native inhabitants of London, apart from strangers and occasional residents, from the mass of wretchedness and vice, and from the numerous adventitious causes of disease and death which exist around them, there can scarcely be a doubt that they would exhibit a much higher standard of health and longevity than the same number of persons congregated under similar external circumstances, in any part of the globe.

The inhabitants of England, on the average, consume more animal food, fish, fowl, fresh vegetables, fruits, spirits, wine, ale, and other fermented drinks, and (except in Ireland,) less bread, or flour in any form, than the people of most other nations; the necessary consequence of which is, that a less amount of earthy matter is consumed, the process of ossification is less rapid, and natural death less premature, than in places where more grain or flour food is consumed. This will be seen to be the case by the following table of mortality, averaged for the last twenty years:

In England, every year,	1	dies out of every	52	
Netherlands	“	1	“	48
Russia	“	1	“	41
France	“	1	“	39
Austria	“	1	“	38
Prussia	“	1	“	35
America, U. S.	“	1	“	30
Bavaria	“	1	“	29
Sicily	“	1	“	27

The poorer classes of society consume a much larger quantity of bread, or flour, and potatoes, than the middle and higher classes, chiefly because their scanty means will not enable them to purchase more costly food. The wealthier classes use more animal food, fowls, fish, fresh vegetables, fruits, wines, and other luxuries. Mr. Cobden, M. P. for Stockport, in a speech before a conference of preachers, at Manchester, on the 17th of August, 1841, says, "I think it might be said that the poorer the family, the greater amount of bread will that family consume. It has been further estimated by a very important body, the hand-loom commission inquirers, that the average of the working-class families in the kingdom earn ten shillings a-week, and of that ten shillings every working-man's family spends five shillings upon bread."

The Rev. T. East, of Birmingham, in a speech on the same occasion stated, "In proportion to the paucity of the man's income, is the proportion of bread he consumes. For, as his wages rise, he purchases a little meat, and other gratifications, and the use of these diminish his consumption of bread." Bread and potatoes constituting so large a proportion of the diet of the working-classes, and containing so large a quantity of earthy matter, must inevitably render them more liable to disease and premature old age and death. And so it is found, that the rate of mortality among the poor, is much greater than among the rich, as the following table will show:—

From the age of 25 to 40.....	205	Rich, and	550	poor die.
“ 40 “ 50.....	244	“	426	“
“ 50 “ 60.....	349	“	718	“
“ 60 “ 70.....	737	“	1501	“
“ 70 “ 80	1489	“	2873	“
“ 80 “ 90	2787	“	000	“

From this table, it appears that at every stage of life, up to the age of eighty, the number of poor who die is double that of the rich.

“The Egyptians arrive at a great age. Dr. Clott speaks of a man whom he had seen, one hundred and thirty years old, without any other infirmity than cataract in one eye; and he knows another now living, at one hundred and twenty-three years of age, who enjoys a perfectly sound state of health, and has several

children, the eldest of whom is eighty, the second seventy-four, the third three years old, and the youngest only a few months. This man, at the age of eighty-two, cut six new teeth, which he was obliged to have immediately extracted, on account of the pain and inconvenience they occasioned him."—*Foreign Quarterly*.

Fruits and fresh vegetables enter largely into the ordinary food of the Egyptians. These contain a small proportion of earthy substances, and must tend, by preventing the consolidation of the system, to preserve their health, and lengthen out their existence.

Women are generally more analogous to children in the choice of their food than men; they also consume a smaller quantity, but are mostly fond of the best description. Instead of a large amount of rough, solid food, they prefer a smaller proportion of aliment, and that of a more fluid, pulpy, and nutritious nature. It is not so much the quantity they care for, as the quality. The consequence of this course is the avoidance of a large amount of earthy matter, and they are therefore softer and more flexible—less ossified than men, and require more time to harden and "fur up" to that degree which produces death; hence women are found to live longer on the average than men. Dr. Thompson, in a lecture recently published, says—

"It cannot fail to be remarked as a striking fact connected with human mortality, that, notwithstanding the peculiar and more severe diseases to which females are necessarily exposed, and their more delicate constitution, they are longer lived than males. The average age of males in England and Wales, in 1838, was forty-four, while that of females was forty-seven; giving an average of seven per cent. of excess of mortality of males over females. This fact is the more remarkable, when we consider that upwards of one hundredth of all the deaths in the metropolis arise from diseases peculiar to females, while they are equally exposed to all other diseases of a mortal nature."

"In Sweden, the whole number of females in 1763, was to that of males, in the proportion of ten to nine. The number of old women who exceeded eighty years of age, was to that of old men of the same age, in the proportion of thirty-three to nineteen; and there were more women than men who had attained the age of eighty-six, in the proportion of almost two to one."—*Sibly*.

In Great Britain, the deaths among the women are in proportion to the men as fifty to fifty-four. The number of widows is to the number of widowers, as three to one.

“For every three widows, or women without husbands, there is only one widower, or husband without a wife.”—*Edinburgh Philosophical Journal*.

On this principle we may at once account for the fact, that, notwithstanding the causes of disease and dangers peculiarly incidental to females, by the census just taken, (1841,) it appears, that the number of females in this country is above half-a-million greater than the number of males, and this too, after more than twenty years of comparative peace! So that this difference cannot be attributed to the sacrifice of male lives in war; but solely, or chiefly at least, to the greater longevity of females; which extra longevity is the consequence of their being less attached to solid, earthy food. It is true that many women are as stout and bony, and as rough as men, and are as liable to premature decrepitude and death; but these will always be found to eat and drink like men.

The *primitive Christians* of the east, when driven to the desert by persecution, lived upon a *daily* allowance of *twelve ounces* of coarse bread, with water for their drink, and they attained to very advanced periods of life,—ranging from one hundred to one hundred and twenty years. It is clear that if a person lives upon a *small* amount of food, containing a *large* proportion of earthy matter, he may live as long as one who consumes a *large* amount of food, containing a *small* proportion of earthy matter, and *vice versa*. The effects, so far as the amount of earthy substances deposited, and the consequent ossification of the body is concerned, being, in both cases, the same. Here we discover the cause of some persons having lived to great ages, who have been remarkable for their abstemious habits, and of others having attained to equal ages, who have been noted for their indulgence both in eating and drinking. The primitive Christians, just named, are instances of the former, and the latter may be instanced by the following cases.

“In the one hundred and fifth year of his age, Mr. Thomas Whittington died at Hillingden, Middlesex, in December, 1804. This gentleman retained his faculties as well to the very last hour, as ever he had enjoyed them at any period of his protracted life, and could walk a distance of three miles with perfect ease. His long

life was rendered remarkable, not by abstemiousness, nor by temperance, as the innumerable instances which we have recorded of longevity, undoubtedly were, and which the gentlemen of the faculty and ourselves so strongly recommend, but the contrary line of conduct; by his constant attachment to making hearty meals, and his propensity to drinking. Mr. Whittington's favourite liquor was gin, of which he seldom failed to take a tolerable portion, till within a fortnight of his dissolution."

"Mr. Henry Hastings, a very celebrated sportsman, lived in the time of James I. and his son Charles I. He was second son to the Earl of Huntingdon, and inherited a good estate in Dorsetshire from his mother. His oyster-table stood at the lower end of his room, which was in constant use twice a-day, all the year round, for he never failed to eat oysters, both at dinner and supper. At one end of his room was a door, which opened into a closet, where stood bottles of strong beer and wine; answering to this closet, was a door into an old chapel, which had long been disused for devotion; but in the pulpit, as the safest place, was always to be found a cold chine of beef, a venison pasty, a gammon of bacon, or a great apple pie, with thick crust, well baked. His sports supplied all but beef and mutton, except on Fridays, when he had the best of fish. He never wanted a London pudding. He drank a glass or two of wine at meals; put syrup of gillyflowers into his sack; and had always a tun-glass of small-beer standing by him, which he often stirred with rosemary. He lived to the age of one hundred and ten years, and never lost his sight, nor used spectacles. He rode to the death of the stag till he was upwards of four score. He died in 1639."

"Maffeus, a Portuguese author, who wrote *The History of the Indies*, who has always been a model of veracity, as well as elegant composition, mentions a man of the name of *Numas de Cugna*, a native of Bengal, who died in the year 1566, at the incredible age of *three hundred and seventy years!*

"He was a person of great simplicity, and quite illiterate; but of so extensive a memory, that he was a kind of living chronicle, relating, distinctly and exactly, what had happened within his knowledge, in the compass of his very long life, together with all the circumstances attending it. He had four new sets of teeth, and the colour of his hair and beard had been very frequently changed from black to grey, and from grey to black. He asserted, that in the course of his life, he had had seven hundred wives, some of whom died, and the others he had put away. The first century of his life passed in idolatry, from which he was converted to Mahometanism, which he continued to profess to his death."

"This account is also confirmed by another Portuguese author, Ferdinand Lopez Costequeda, who was Historiographer Royal."

"Margaret Patten, aged one hundred and thirty-seven, of St. Margaret's Workhouse, London; a Scotch woman. She always enjoyed good health, till within a few days of her dissolution; and for many years subsisted mostly on milk."

“Charles Macklin, Esq., aged one hundred and seven, of James'-street, Covent Garden, London, an eminent dramatic writer, and celebrated comedian, of Covent Garden Theatre; the veteran father of the stage. He had long been in a state of natural decay; but, although incapable of quitting his bed, for several weeks previous to his dissolution, his spirits did not forsake him, till within a few minutes of his final exit from the stage of life. After a severe struggle against the invincible force of death, he passed quietly into eternity, without a groan.

“In the former part of his life, till about the age of forty, he lived very intemperately and irregularly, by sitting up late, hard drinking, and violent exercise. Subsequent thereto, he determined to proceed by rule, which he scrupulously observed. It was his frequent custom to promote perspiration, and then change his linen, particularly as he advanced in life; and if, on occasion, he drank a glass or two of wine too much, he always took a Scotch-pill at night, going to bed, which prevented the head-ache next morning. He was moderate at his meals, but no ways abstemious, and eat fish, flesh, &c., till the age of seventy; when, finding that tea did not agree with him, he used as a substitute, milk, with a little bread boiled in it, sweetened with brown sugar. About the year 1764, he lost all his teeth, and was thereby obliged to subsist principally on fish, eggs, puddings, and spoon-food, which, however, he was very fond of; as also custards, jellies, &c. For the last forty years, his principal beverage was white wine and water, pretty sweet. In the year 1770, he was attacked with a severe fit of the rheumatism, and, in consequence, to avoid it, discontinued the use of sheets, and slept in blankets. It was his custom not to sleep on a feather bed, but on a mattress, which was on a couch, without curtains, placed in the centre of the room, and on which he reposed whenever he found himself sleepy. He usually lay with his head high, but, for the last twenty years, never took off his clothes, unless to change them, or his linen, or to be rubbed all over with warm brandy or gin, a custom he often repeated; and occasionally steeped his feet in warm water. He strictly observed the dictates of nature,—ate when hungry, drank when thirsty, and slept when sleepy.”

“Ann Day, aged one hundred and eight, a well-known Gipsy. She had not slept in a bed for seventy years; and, for the last forty years, she had not a tooth in her head, nor sight, but by one eye. She lost three of her toes, by the frost, about twelve years before, and at the same time, lost the use of one of her arms. She died under a hedge, near Henlow, Bedfordshire, and was buried at Arlsey, near that town.”

“John Wilson, aged one hundred, of Sosgill, Cumberland. He was formerly a blacksmith, which profession he followed for near sixty years; in all which time his beverage was milk or water, with the exception of two glasses of ale, and one glass of spirituous liquor.”

“Ann Bannerman, aged one hundred and five, of Aberdeen. She lately subsisted on vegetables and small beverage.”

“Honourable Mrs. Watkins, aged one hundred and ten, of Glamorganshire. She was remarkable for regularity and moderation. For the last thirty years she subsisted entirely on potatoes.”

“Rev. Mr. Davies, aged one hundred and five, of Hereford, Rector of Staunton-upon-Wye, and Vicar of All Saints’, Hereford. The last thirty-five years, he never used any other exercise than that of slipping his feet, one before the other, from room to room; and they never were, after that time, raised up, but to go down or up stairs. His breakfast was hearty, of hot rolls and butter. His dinner was substantial, and consisted of a variety of dishes, at least during the Carnival, every summer, at Lord Bateman’s seat, at Shobden Court. At his supper, he generally eat roast meat, and always drank moderately of wine. He had neither gout, stone, or cholic; lived beloved by all who knew him, and died without possessing those disagreeable infirmities which generally attend old age. He was, as most long livers are, very short.—What will the advocates for temperance and exercise say to this?”

“Jonathan Hartop, aged one hundred and thirty-eight, of the village of Aldborough, near Borough-bridge, Yorkshire. He eat but little, and his only beverage was milk. He enjoyed an uninterrupted flow of spirits.”

“Rebecca Joseph, aged one hundred, of Malpas, Monmouth. She retained all her faculties till the hour of her decease; and till within about three years previous thereto, could walk without the help of a stick. She was not known to have a fit of illness from her infancy, sufficient to confine her to her bed, till within a month of her death. She lived a very temperate life, though she had kept a little public-house for seventy years. Her chief sustenance for the last two years, was brown sugar and cold water.”

“Paschal Seria, aged one hundred and eleven, of Valentia. He subsisted, towards the latter part of his life, principally on vegetables, and frequently smoked tobacco.”

“Ann Frost, aged one hundred and eleven, of West-Raisin, Lincolnshire. For many years past she had lived on milk and tea diet.”

“Richard Brown, aged one hundred and eight, of Peter-church, Hereford. In the instance of this old man, the assertion that smoking tobacco is prejudicial to health, is completely refuted, as he was seldom seen without the pipe in his mouth, and took his last whiff a short time before his death.”

“Susan Mills, aged one hundred and two; she resided in a house called the Ship-Meadow Lock-house, on the Bungay navigation. This instance of longevity, seems to contradict the generally received opinion of the unwholesomeness of low, marshy situations, her residence being mostly surrounded by floods throughout the winter.”

“ William Sharply, aged one hundred and thirty-eight, of Knochall, county of Roscommon. He lived well and regular, but in no wise abstemiously.”

“ John Riva, aged one hundred and sixteen, of Venice, Exchange broker. He always chewed citron-bark, and had a child after he was one hundred years old.”

“ John Michaelstone, aged one hundred and twenty-seven, grandson of Thomas Parr. He lived to the above great age, by *EXTREME temperance*, and much exercise.”

“ Owen Carollan, aged one hundred and twenty-seven, of Dulech, county of Meath, Ireland, labourer. He had six fingers on each hand, and six toes on each foot. By temperance and hard labour, he attained so great an age.”

“ Elizabeth Macpherson, aged one hundred and seventeen, of the county of Caithness, in Scotland. Her diet was buttermilk and greens. She retained all her senses till within three months of her death.”

“ Mr. Dobson, aged one hundred and thirty-nine, of Hatfield, farmer. By much exercise and temperate living, he preserved the inestimable blessing of health. Ninety-one children and grandchildren attended his funeral.”

“ John de la Somet, aged one hundred and thirty, of Virginia, He was a great smoker of tobacco, which, agreeing with his constitution, may not improbably be reckoned the cause of his uninterrupted health and longevity.”

“ ‘ Poor Joe, all-alone,’ aged one hundred and five; a poor man of Ware, Hertfordshire, well known by the above nick-name, and said not to have been in bed for fifty years.”

“ Philip Laroque, aged one hundred and two, of Frié, in Gascony, butcher. At the age of ninety-two, he cut four new teeth, was drunk regularly twice a-week, till he was one hundred years old, and worked hard to the time of his death.”

“ Francis Confit, aged one hundred and fifty, of Burythorpe, near Malton, Yorkshire. He was very temperate in his living, and used great exercise, which, together by occasionally eating a raw new-laid egg, enabled him to attain such an extraordinary age. He retained his senses to the last.”

“ Catherine Moon, otherwise Mooney, aged one hundred and thirty-six, near the city of Tuam, in Ireland; was very temperate at her meals. Her husband died aged one hundred and twenty-eight years.”

“ Donald Mc. Gregor, aged one hundred and seventeen, of the Isle of Sky, in Scotland, farmer. He was temperate at meals, and took much exercise.”

“Philip Loutier, aged one hundred and five, of Shoreditch, London, a French barber. He drank nothing but water, and eat only once a-day.”

“Mrs. Boyce, of Guildford, Surrey, aged one hundred and seven. By temperance she acquired constant health, and retained her senses to the last.”

“Paul Barrot, aged one hundred and six, of Nice, a priest. He continued in good health by living on vegetables.”

“Mary Rogers, aged one hundred and eighteen, of Penzance, Cornwall; lived the last sixty years on vegetables.”

“Fluellyn Pryce, aged one hundred and one, of Glamorgan. His organs had been so little injured by the weight of years, that within three years of his death, he directed a village choir in some variations for the Sunday. He never used spectacles till within fifteen months of his dissolution; and possessed a great flow of spirits, attended with sound health and activity, which blessings were the result of his abstemious manner of living. Herb teas were his breakfast; meat, plainly dressed, his dinner; and, instead of a supper, he refreshed himself with smoking a pipe of tobacco.”

“Joseph Ekins, aged one hundred and three, of Combe, Berks, labourer. He never suffered a week's illness; and, for the last forty years, subsisted entirely on bread, milk, and vegetables.”

“Henry Grosvenor, aged one hundred and fifteen, a gentleman of French extraction, of Inch, county of Wexford, Ireland, surveyor of the coast, at Blackwater. He was very sparing in his diet, and used much exercise.”

“Spottiswood mentions one *Kentigen*, (afterwards called *St. Mongah*, or *Mungo*,) who never tasted wine or strong drink after he came to the years of understanding, and slept on the ground, notwithstanding which he lived to the very extraordinary age of one hundred and eighty-five years.”

“Valentine Cateby, aged one hundred and sixteen, of Preston, near Hull. His diet for the last twenty years was milk and biscuit. His intellects were perfect till within two days of his death.”

“John Wilson, aged one hundred and sixteen, of Warlingworth, Suffolk. His suppers, for forty years, were roasted turnips.”

“Edward Drinker, aged one hundred and three, of Philadelphia. He lived on very solid food, drank tea in the afternoon, but eat no supper.”

“Anthony Loydi, aged one hundred and fourteen, of Amezquet, in the province of Guipuscoa, husbandman. Never had any sickness, but the oppression of his lungs, with which he was seized a few days before his death. He always had an aversion to physic, and refused to

take what was ordered him during his illness ; he retained his senses and had all his teeth and hair, to the day of his death. He ate nothing but bread made of Turkey wheat, and constantly abstained from wine and tobacco."

" Alexander Macintosh, aged one hundred and twelve, of Marseilles. For the last ten years he lived entirely on vegetables, and enjoyed a good state of health till within two days of his death."

" James le Mesurer, aged one hundred and eighteen, of St. Jean Pied de Port, in Navarre. His common food for some years was vegetables."

" Lewis Morgan, aged one hundred and one, of Llwringtdod, Radnorshire. His death was occasioned by a fall ; he was in perfect possession of his faculties, lived chiefly on vegetable diet, and drank frequently of the famous rock water of Llandridod."

" Mr. Smith, aged one hundred and three, of Dolver, Montgomeryshire, farmer, was never known to drink any thing but buttermilk."

" Cardinal de Salis, aged one hundred and ten, Archbp. of Seville, died in 1785. He enjoyed to the last every faculty, except strength and hearing. He used to tell his friends, when asked what regimen he observed, ' By being old when I was young, I find myself young now I am old. My diet was sparing, though delicate ; my liquors, the best wines of Xerez and La Mancha, of which I never exceeded a pint at any meal, except in cold weather, when I allowed myself a third more. I rode or walked every day, except in rainy weather, when I exercised for a couple of hours. So far I took care for the body ; and, as to the mind, I endeavoured to preserve it in due temper, by a scrupulous obedience to the divine commands, and keeping (as the Apostle directs) a conscience void of offence towards God and man. By these innocent means, I have arrived at the age of a patriarch, with less injury to my health and constitution, than many experience at forty. I am now like the ripe corn, ready for the sickle of death ; and, by the mercy of my Redeemer, have strong hopes of being translated into his garner.' "

" Ann Davies, aged one hundred and two, of Tetbury, Gloucestershire. She had the perfect use of her faculties till the last minute of her life. She had not been out of her room for upwards of thirty years, nor ever, during that period, even in the most extreme cold weather, would suffer any fire in her chamber."

" Jonas Warren, aged one hundred and seven, near Baldoyle, in Ireland, fisherman. His appetite was so keen, that within a few weeks of his death, he ate near three pounds of solids, and drank three pints of ale, at a meal."

" William Riddell, aged one hundred and sixteen, of Selkirk, in Scotland. This man, who, in the early part of his life, was a considerable smuggler, and remarkable for his love of brandy, which he

drank in very large quantities, was always so fond of good ale, that he never drank a draught of pure water. He was not a drunkard, but had frequent paroxysms of drinking, which continued several successive days. After his ninetieth year, he at one time drank for a fortnight together, with only a few intervals of sleep in his chair. He was three times married; when he married his third wife, he was ninety-five years of age. He retained his memory and other faculties, to his death. For the last two years of his life, his chief subsistence was a little bread infused in ale."

"James Peters, aged one hundred and seven, of Dundee, a travelling packman. Although he often slept in the fields and shades, he enjoyed an uninterrupted state of good health; and, until the last year of his life, retained his memory. His strongest beverage was small beer."

"Daniel Bull M'Carthy, aged one hundred and eleven, of the county of Kerry, Ireland. At the age of eighty-four he married a fifth wife, aged fourteen, and had by her twenty children, one every year; he was always very healthy, and never observed to spit; no cold affected him; he could not bear the warmth of a shirt at night, but put it under his pillow; for the last seventy years, when in company, he drank plentifully of rum and brandy, which he called *naked truth*; and if, in compliance with solicitations, he drank claret or punch, he always drank an equal glass of rum and brandy, which he called a *wedge*."

"Margaret Hunter, aged one hundred and four, of Newcastle. Her beverage was mostly water or milk, having never drank more than two gills of malt liquor."

"Judith Bannister, aged one hundred and eight, of Cowes, in the Isle of Wight. She was attended to her grave by eighty of her descendants. She lived upon biscuit and apples, with milk and water, the last sixty years of her life."

"On Sunday, the fifteenth of July, 1764, died in the one hundred and twenty-fifth year of his age, George Kirton, esq., of Oxnop Hall, near Reeth, in the county of York. He was a remarkable instance that length of days are not always entailed upon a life of temperance and sobriety; for no man, even till within ten years of his death, made more free with the bottle."

"Died lately, (1840,) at Kingston-upon-Thames, Surrey, Mr. Worrall, aged one hundred and twenty years. For the sixty years previous to his death, he is said to have almost lived entirely upon fermented and spirituous liquors."

"An old man, (name unknown,) died several years ago, at Richmond, Surrey, at the age of one hundred and ten years. He was seldom sober for the thirty years before his death."

"John Baylis, of Northampton, was reported to have been one hundred and thirty years of age when he died. Dr. Kiel says, 'his

diet was any thing he could get ; I never heard he was more fond of one sort of food than another."

"Old Thomas Parr, who was born at Winnington, in Shropshire, in the year 1483, and although in his youth he was greatly afflicted with the king's evil and bloody flux, lived to the age of one hundred and fifty-two years. He was first married at the age of eighty-eight, and seemed no older than many do at forty-five ; he married a second time at the age of one hundred and twenty ; at the advanced age of one hundred and forty-five he was able to run races, thrash corn, and accomplish any laborious work. He frequently ate by night, as well as by day, and always preferred the plainest food. He might be seen early in the morning,

"Lusty as health, come ruddy to the field,
And there pursue the sport, as if he meant to overtake time,
And bring back youth again."

His body was found to be in the most perfect condition when opened after death, as it was by the celebrated Harvey.

Taylor, the water poet, thus describes his habits :—

"Good wholesome labour was his exercise,
Down with the lamb, and with the lark would rise ;
In mire and toiling sweat he spent the day,
And to his team he whistled time away ;
He was of old Pythagoras' opinion,
That green cheese was most wholesome with an onion.
Coarse meslin bread, and for his daily swig,
Milk, buttermilk, and water, whey and whig ;
Sometimes metheglin, and by fortune happy,
He sometimes sipped a cup of ale most nappy.
Cyder or perry, when he did repair,
T' a whitsun ale, wake, wedding, or a fair ;
His physic was good butter, which the soil
Of Salop yields, more sweet than candy oil ;
And garlic he esteemed above the rate,
Of Venice treacle, or best mithridate."

"The body of old Parr is said to have been covered with hair.
From head to heel, his body had all over.
A quick set, thick set, nat'ral hairy cover."

"At Valentia, Ireland, in his one hundred and sixth year, died, Mr. John Murphy, commonly called 'Paul Jones'. He had been taken prisoner by that remarkable man, when commanding a French squadron off the coast of Kerry. When he sent a boat on shore at Valentia, for a supply of water, the people siezed the boat and crew, and young Murphy being on board his vessel at the time, as pilot, Paul Jones carried him off, and he was compelled to serve for two years in the French frigate ; during which time he accumulated a good sum of prize money. *He lived on potatoes and milk* ; and, notwithstanding his wealth, never increased his comforts. He was a remarkably strong man ; and, till within the last few years, hale and robust, and walked and rode."

“It has been said that the Irish labouring classes are a remarkably robust race; although their food consists almost exclusively of potatoes. The fact is overlooked, that the Irish eat a quantity of potatoes so enormous, as could not fail to make up, in some measure, for the want of animal diet. It was found by the Poor-Law Commissioners, that the greater number of the peasantry of Ireland, women as well as men, take at their two daily meals, in general, about nine pounds weight of this food.”—*Chambers' Journal*, No. 42.

“Francis Wilks, of Stourbridge, Worcestershire, labourer. Died at one hundred and nine years of age, was very abstemious in his habits of eating, and seldom drank any thing stronger than small beer. His poor neighbours believed that he had purchased immortality from a witch.”

“Henry Jenkins lived to the extraordinary age of one hundred and sixty-nine years.. He was born on the 17th of May 1500, at Ellerton, in Yorkshire, and died in 1670. He assisted his father in his early years as a fruit grower, and market gardener. All his family were remarkable for longevity. An only sister of his died at the age of one hundred and twenty-five, and his grandmother lived to the age of one hundred and thirty-eight years. Old Jenkins was always a great admirer of nature, and extremely fond of fruits, flowers, and herbs. It was his daily custom to rise very early, with the ‘song of earliest birds’, and wander through the woods, or over hill and meadow, at peep of day, in quest of divers medicinal herbs, the study of which he was so fond of.

“With regard to the diet of this wonderful old man, it was always simple; consisting mostly of cold meat and salads, of which he partook, with water for his drink, in moderate supplies. It was in the year 1524, during the reign of Henry VIII. that the hop plant was introduced into England from Flanders, and cultivated for the preservation of beer; which Jenkins, being a great advocate for bitters, used for that purpose; and he never found a moderate portion of that beverage taken once a day, at all disagree with him, or hurt him. He partook of light suppers, frequently walking out in his garden afterwards, for a short time, to promote digestion. Water was, however, his favourite beverage, and he usually drank nearly half a pint of it every morning when he first arose. Besides abstemiousness in the article of food, his general habits were regular and sober. Following the directions of his mother, he always continued the use of flannel and warm clothing, which had been commenced in infancy. He was robust and healthy to old age—a hearty, respectable, good-looking old man, who never knew what real illness was, until a year or two before his death. He warded off the first attacks of disease by resorting, at the first appearance of the enemy, to defensive or preventive measures, never waiting to parley with the insidious foe; and he always found his plan successful.

“It is said that Jenkins was crossed in love during his younger days; and that, taking the conduct of the fickle fair one to heart, he ever afterwards vowed enmity to a wedded life. Whether this

report was authentic or not, it is true he always had an aversion to marriage. It is, however, stated, that when he was ninety years old, a young woman was pregnant by him, for which he was severely lectured by the minister of the parish, and nothing but his age excused him from doing penance.

“When Jenkins was near his 160th year, king Charles II., being informed of his astonishing longevity, expressed a desire to see him in London, and sent a carriage purposely to convey him thither. He preferred, however, to go on foot, and actually walked to the Metropolis, in easy stages—a distance of two hundred miles. On his arrival in London, the hoary patriarch was introduced to his majesty. The king held a long conversation with him, and made many inquiries as to his mode of living; but nothing particular being observable in that, inquired by what means he contrived to live so much longer than other people. To this he replied, that temperance and sobriety of living, had been the means, by the blessing of God, of lengthening his days beyond the usual limit. The king, who was fond of dissipation and luxury, seemed not much pleased with some of Jenkins’ homely maxims, and dismissed him; but allowed him a comfortable pension, which he enjoyed the remainder of his life.”

In the Scriptures we are told that, for several centuries after the deluge, one hundred and twenty was about the average period of human life. Abraham lived to one hundred and seventy-five years of age; his sons, Isaac and Ishmael, the former died at one hundred and eighty, and the latter at the age of one hundred and thirty-seven. Jacob lived to be one hundred and forty-seven years old, and his son Joseph reached one hundred and ten years of age. Long after this, Moses lived to be one hundred and twenty years old, and “his eye was not dim, nor his natural force abated”. Joshua died at the age of one hundred and nineteen years.

As before remarked, it is not, strictly speaking, the diet itself which influences the process of ossification, but the earthy substances which the diet contains. And, as the proportion of earth differs in different articles, it will be obvious that persons who indulge freely in eating and drinking, but who happen to select such kinds of food and drink as contain a *small* proportion of this matter, will be quite as healthy, as full in flesh, as good-looking in every respect, and as likely to live to as great an age, as those who are abstemious, and consume a *less* amount of food containing a *large* proportion of earthy matter. This is

proved by the fact that statesmen, clergymen, merchants, physicians, and the middle classes generally, who are mostly fond of what is called "good living" are as healthy, and attain to as great ages, as any other class in society;—as will be seen by the following table, condensed from *Chambers' Journal*.

	Average duration of life.
Statesmen and Lawyers.....	69.5
Physicians	68.0
Divines and Theologians	67.4
Musical Composers	65.7
Philosophers and Mathematicians	65.5
Artists.....	64.5
Miscellaneous Literary Men.....	62.6
Poets	59.8

It may be remarked, in reference to this table, that artists, literary men, and poets,—the last in particular, are in general exposed to more privation than the other classes named in the list; their difficulties and sufferings arising from poverty, and, in some cases, utter destitution, are proverbial. Being poor, they cannot, of course, enjoy many luxuries or choice articles of food; but subsist, for the most part, in the same manner as the poorest of the people—bread and potatoes constituting the *basis* of their diet. This food, being of the most earthy and gross kind, necessarily induces decrepitude and death at an early period. Even their *average* life, which, of course, includes those who are in good circumstances, is eight or ten per cent. less than some of the classes who are more fortunate in condition; and who, consequently, are enabled to enjoy more nutritious and less earthy aliment; but if we take individual cases, we shall find a still greater contrast. There is, however, another consideration on this point. Literary men and poets are generally less thoughtful, as to what they should eat, than, perhaps, most other persons. They seldom make their stomachs their study, but are often content with that kind of meat which is soonest prepared; and this will commonly be something made with flour as the basis.

It is also clear from what has already been advanced, that even if two persons, or classes of persons, subsist upon the *same kind* of food and drink, if one consumes less than

the other, a less amount of earthy matter will be taken into the system, the process of ossification will necessarily proceed less rapidly, and therefore, life will be enjoyed for a longer period. A direct practical proof of this is found in the statistics of prisons and workhouses. A writer in *Chambers' Edinburgh Journal*, No. 366, after describing the different articles of diet consumed in several English and Scotch workhouses, proceeds in the following language.

“ It thus appears, that paupers in England are fed in a much more liberal style than those of Scotland: the former getting about thirty ounces of solids per day, including three ounces of the best animal food; while the latter have only nineteen ounces, whereof less than two are of meat, and that of the least nutritious kind. It now becomes of importance to learn how the paupers in the two countries thrive on their respective allowances, *and here a very surprising result meets our eye.* The deaths in the Manchester workhouse, from September 1st, 1837, to August 31st, 1838, were 295; the average number of inmates being 708. In the Edinburgh charity workhouse, during the five years preceding 1831, the average annual mortality amongst an average of 400 inmates, was 61 and 3-5ths, say, for the sake of round numbers, 62. Thus, in the Manchester workhouse, 1 dies for every 2 and 8-20ths,—or about 2½; while, in the Edinburgh workhouse, 1 dies for every 6 and 9-20ths, or about 6½; the mortality in Manchester, (where the greatest amount of food is given,) is nearly three times greater than in Edinburgh.”

The same principle is confirmed by the returns of the Prison Discipline Society, as shown by the following statements.

	s. D.		Per cent.
Weekly cost of food per head, in the Wakefield House of Correction, in Yorkshire is	1 8½	Amount of sickness in the same place per annum is	6
Ditto in the County Jail of Suffolk.....	1 9	ditto ditto	10
Ditto in Woodbridge Jail...	3 6	ditto ditto	18
Ditto at North Allerton	5 0½	ditto ditto	37

By this we clearly observe that *sickness and disease increase just in proportion as the consumption of food increases!* This, which may appear incredible to many, is nevertheless verified by other observations.

	Ounces.		Per cent.
In the House of Correction Cold-bath fields, London, the weekly amount of solid food per head, is.....	174	The proportion of sick in the same place per annum is	4½
Guilford House of Correction	230	ditto ditto	9

From returns of the Poor Law Commissioners respecting the diet and mortality in sixty different prisons, sickness and mortality appear to increase in proportion as the consumption of food increases.

	Ounces.	Sickness per cent.	Deaths.
In 20 prisons the average weekly consumption of solid food was	188	3	1 in 622
In 20 others the amount was	213	18	1 in 320
In 20 others the amount was	218	23	1 in 266

Although we have seen by the foregoing tables, and other evidence, that sickness and death advance with an increase of solid food ; it by no means follows, that this is applicable in the contrary direction, beyond a certain point. It certainly would appear, at first sight, that the less food we take, the better will be our health, and the longer shall we live ; but when we know that the human body is continually wasting—that its elements are constantly being thrown off, we shall see the necessity for supplying, at least, as much nourishment as will equal the amount wasted. This is the *minimum* point. Below this we cannot go without producing injury to the system. If we fail to take in as much nutriment as the body throws off, sickness and death will speedily and inevitably follow. But through all degrees above this *minimum* point, we may consider it as an axiom, *that the less we eat and drink, the more shall we retard the process of ossification ; the longer will it take to choke up or consolidate the body to that degree which constitutes old age or decrepitude ; and the longer shall we enjoy existence.* Abstemiousness, so far, at least, as it regards the food in ordinary use, as bread, potatoes, and other gross solid articles, will certainly conduce to health and long life. But still, if we take care to avoid those things which contain a large proportion of earthy matter, we may enjoy the same amount of health and length of days, even though we are not so sparing in our diet. It may be repeated, that, if this one principle be attended to, there will not be so much occasion for nicety in other respects. Let no one, however, misunderstand me, and think from this that I would encourage intemperance, and gluttony, or extravagance, for nothing can be farther from the object of the present remarks.

The facts which have now been brought forward, and which are but a tithe of what might be advanced, tend to prove, in the most unequivocal manner, that in proportion as individuals, classes, or even nations, subsist upon aliment containing the smallest proportion of earthy elements, do they prevent or retard the process of ossification, maintain a state of health and activity, and prolong their existence.

As long as we can supply fuel to a fire, and keep it free from the ashes, it will continue to burn. If this can be done even for a hundred or a thousand ages, the fire will continue to warm and enliven, to burn for a thousand ages; so, in the same manner, if we can supply the body with proper food, and keep it free from the earthy matter,—the ashes which choke it up, will it continue to live. Time, or the number of years, has nothing whatever to do with old age and death. A man is old, or decrepit, when he is choked up, or consolidated, to a certain extent; whether he be ten, fifty, or a hundred years old. It is the chemical changes that occur in the body, that produce disease, decrepitude, and death; and these we must carefully consider. The wild hog, the swan, parrot, eagle, and other creatures, are known to live to periods of several hundred years; the whale, and others, for a thousand years; while serpents are believed by many naturalists to avoid death altogether! The ancient Britons, and other people, only *began* to be *old*, only *began* “to go down the hill” at a hundred and twenty, and a hundred and thirty years of age! Reader! what art thou less than a pig—a swan, an eagle, a parrot, or a serpent; or than thy ancestors? Is it not thy ignorance of God and nature’s laws alone which kills thee?

END OF PART FIRST.

...the cause which have now been brought forward, and which are far a step of what might be advanced, tend to show in the most important respects, that in proportion as individuals, classes, or even nations, exhaust upon themselves, the smallest proportion of early ailments, do they prevent or retard the progress of debility; and that a state of health and activity, and perhaps that of a long life, is the result of a long life.

As long as we can supply food to a fire, and keep it free from the action of wind, it will continue to burn. If the fuel can be supplied, and the wind excluded, the fire will continue to burn, and the heat will be maintained. In the same manner, if we can supply the body with water, food, and keep it free from the various matters which are introduced into it, it will continue to live. The number of years, has nothing whatever to do with the natural death. A man is old, or decrepit, when he is tired up, or exhausted, to a certain extent; whether he be ten, fifty, or a hundred years old. It is the chemical changes that occur in the body, that produce the symptoms of old age, and these we must examine. The will, the soul, the brain, the nerves, and the organs, are all subject to the same changes, and in a hundred years, while we are in the world, many of these changes are performed. The ancient Egyptians, and other people, only lived to be old, only lived to be old, at a hundred and twenty, and a hundred and thirty years of age. Herodotus, what are the causes of old age, he says, he explains a part of a subject, or part of a subject. It is not the ignorance of God, and man's part, which will kill him.

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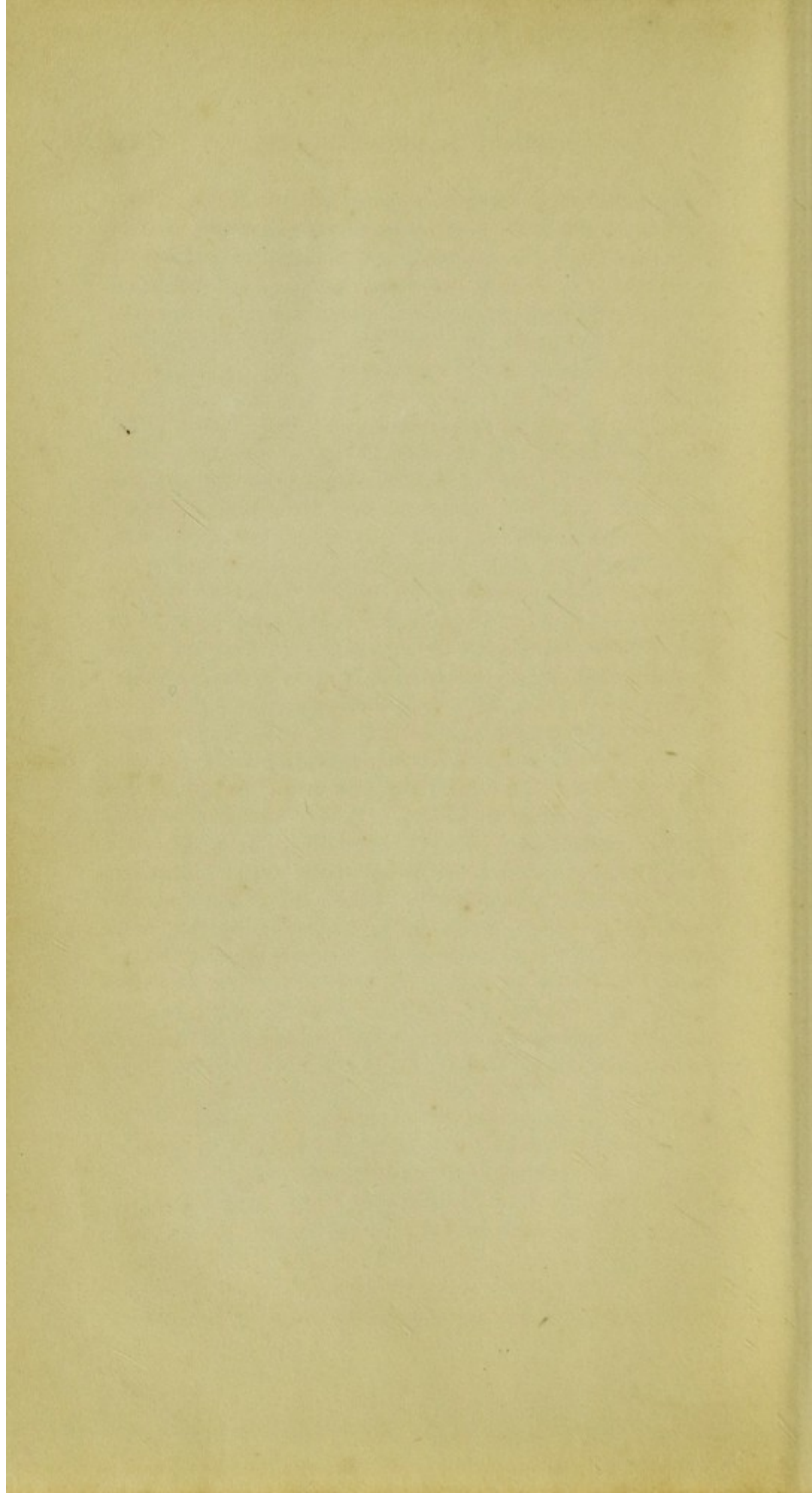
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BIOLOGY

LECTURE NOTES

NATURAL HISTORY

PART I



BIOLOGY.

AN

INQUIRY INTO THE CAUSE

OF

NATURAL DEATH;

ETC.

PART SECOND.

BIOLOGY

AN ENQUIRY INTO THE CAUSE

NATURAL DEATH

PART SECOND

AN INQUIRY
INTO THE
CAUSE OF "NATURAL" DEATH.

PART II.

CHAPTER I.

ON THE VARIOUS PLANS AND OPINIONS RESPECTING THE PRESERVATION OF HEALTH AND PROLONGATION OF LIFE, SUGGESTED BY ANCIENT AND MODERN PHILOSOPHERS.

FROM the remotest antiquity, the human mind seems to have been occupied in endeavours to preserve health and life to a much greater period than is usually enjoyed. Whatever danger or difficulty may beset us, our whole strength and energy are called into action to defend ourselves, and preserve our existence. Destitute of ordinary comforts; deprived of those joys which render existence desirable; struggling with poverty and want; or even shackled within the gloomy walls of a dungeon; life still has charms, still we cling to it; and it seems to require a total subversion of every prospect of happiness, to render existence odious, and to lead us to self-destruction. A "longing after immortality" has characterised the human race in every age; and that too, not only in reference to a future spiritual state, but in regard even to a conscious condition of the body.

The idea that life might be greatly prolonged, existed in the earliest ages of which we have any record. It may be traced in the annals of every civilized nation down to the present day. The dread of pain, the fear of death,

and the desire to avoid both, are feelings inseparable from man in every condition; visible alike in childhood, manhood, and in old age; in the christian and the infidel; the black slave as well as the white civilian; in the wild untutored savage, and the highly-finished scholar and philosopher.

In Egypt, at one period, it was thought that the best means of preserving health and life were to frequently take emetics, and keep the body in almost a constant state of perspiration. So general was this idea, that it became a custom among the people to address each other with "How do you sweat?" instead of "How do you do?" as in this country. The degree of perspiration was supposed to indicate the degree or state of health.

The philosophers of Greece and Rome, in general, endeavoured to convince the people that the best and only means of strengthening the body, and prolonging life, consisted in the judicious use of the various articles necessary for the system; and in the constant exercise of the mental and bodily faculties. Temperance, free and pure air, bathing, and particularly the daily friction, or rubbing of the skin. In bodily exercise they placed the greatest confidence. A system of varied (stronger or weaker) motions of the body was established. This soon became a science, (gymnastics,) and has been preserved in our schools and pleasure grounds up to the present day. Their views of the use and necessity of exercise were, however, often carried too far. One Herodicus recommended his patients to walk freely every day, and the more the disorders increased, the greater was the exertion to be—the weaker they got, the more were they to fatigue themselves.

A work written in verse about the year 1099 for the use of William the Conqueror, or his son Robert, Duke of Normandy, is so replete with information regarding the opinions of the philosophers of the time, that a place may be given it here to the advantage of the reader. It is supposed to have been drawn up by Johannes de Mediolanus, or John of Milan, with the concurrence of the other physicians of Salerne; at that time reckoned the most celebrated school of medicine in Europe. The

work is entitled, "*Regimen Sanitatis Salerni*:" or "*The Regimen of Health, containing Directions for the Life of Man.*" The following translation is by Dr. P. Holland.

" All Salerne school thus write to England's king,
And for man's health these fit advises bring.
Shun busie cares, rash angers, which displeas ;
Light supping, little drink, do cause great ease.
Rise after meat, sleep not at afternoon,
Water, and nature's need, expell them soon ;
Long shalt thou live, if all these well be done.

When physic needs, let these thy doctors be,—
Spare dyet, quiet thoughts, heart mirthfull, free.

Sleep not too long in mornings, early rise,
And with coole water wash both hands and eyes ;
Walk gently forth, and stretch out every limb,
Combe head, rub teeth, to make them clean and trim.
The braine and every member else these do relieve,
And to all parts continuall comfort give.
Bathing, keep warm, walk after food, or stand,
Complexions cold, do gentle warmth command.
Let little sleep, or none at all suffice,
At afternoon ; but waking keep thine eyes.
Such sleep engenders feavers, head-aches, rheumes,
Dulnesse of soul, and belcheth up ill fumes,
From forth the stomach. All these harms ensue,
By sleep at afternoons ; beleeve it true.

Rheumes from the breast, ascending through the nose,
Some call catarrhs, some tysick, some the pose.

When wind within the belly you restrain,
The body gets, by four diseases, pain,
Cramps, dropsie, collick, giddiness of brain.

Great suppers put the stomach to great pain,
Sup lightly, if good rest you mean to gain.

Thou shouldst not eat untill thy stomach say,
The meat's digested which did pass that way,
For the true use of appetite to feed,
Is nature's dyet, no more than she'll need.
Peares, apples, peaches, cheese, and powdered meat,
Venison, hare, goat's-flesh, and beef to eat.
All these breed melancholly, corrupt the blood,
Therefore not feeding on them, I hold good.

Your new-layd eggs, brisk, cheerfully-coloured wine
And good fat broth, in phisick we define,

To be so wholesome, that their purity,
Doth nourish nature very sovereignly.

The priest's fair daughter held it a law most true,
That eggs be best when they are long, white, new.

Bread of red wheat, milk, and new made cheese,
Beast's testicles, pork marrow, brain of these.
Sweet wines, delicious meats, eggs that are rear,
Over-ripe figs and raisins, these appear,
To make the body fat, and nourish nature,
Procuring corpulence, and growth of stature.

Smell, savour, colour, cheerful, fine,
These are the best proofs of a cup of wine ;
In choice of good wine, these are ever speaking,
Strength, beauty, fragrance, coolnesse, sprightly, leaping.
The sweetest wines do most of all revive,
And cheer the spirits, being nutritive.
When too much red wine carelessly we drink,
It binds the belly, makes the voice to shrink.

I reade; from garlick, nuts, hearb-grace, or rew,
Pears, radish-roots, and treacle do ensue,
Such vertuous qualities, that they all serve
As antidotes against poison to preserve.

He that takes garlic early in the morn,
Needs let no drink, by him to be forborne :
Diversity of countries he may see,
And well enabled if his mind so bee.

Dwell where the ayr is clear, sweet, wholesome, bright,
Infected with no fumes that hurt the sight ;
For sweetest ayrs do nature most delight.

If overmuch wine hath thy brain offended,
Drink early next morning and its mended.

The better that the wines in goodnesse be,
The better humours they beget in thee.
If wine look black, it makes thy body dull.
If it be clear, old, subtile, ripe and full,
Well qualified, leaping, drunk discreetly,
Then with thy body it agrees most sweetly.

For drinking beer or ale thus we advise,
Not to be sharp or sower in any wise ;
Let them be cleer, well boyl'd, corn sound and good,
Stale, and not new : all these cause healthfull bloud.
Of whatsoere you drink, see no offence,
Unto the stomach be procured thence.

The spring-time doth command our dinners be,
 But light and little, sparing in degree.
 The summer season being soultry hot,
 Immoderate feeding should be then forgot.
 The fall of leaf, or autumn, doth deny,
 Eating much fruit, great harm ensues thereby ;
 But in the winter, cold doth then require,
 Such a full meal, as nature can desire.

If in your drink, washt sage is mixt with rew,
 It is most wholesome poyson to subdue :
 Adde thereto rose flowers if you feele the heat,
 Of Venus to wax wanton, or grow great.

Sea water drunk with wine doth well defend thee,
 If on the sea, casting chance to offend thee.

Sage, salt, and wine, pepper therewith applyed,
 Garlic and parsley, these have well bin tryed :
 To make good sauce for any kind of meat,
 Procuring appetite when men would eat.

If thou wilt walk in health, let me advise,
 Oft wash thy hands, chiefly when thou doest rise,
 From feeding at the table ; for thereby,
 Thou gain'st two benefits, it clears the eye,
 Gives comfort to the palmes, both which well tended,
 Our health (thereby) the better is befriended.

Not over cold nor hot let be thy bread,
 Hollow and light, but easily leavened,
 Sparingly salted, and of the purest wheat,
 And see that crusts thou do forbear to eat ;
 Because that angry choller they beget.
 Thy bread well bak'd, light salted, sound of grain :
 All these observed, thou dost not eat in vain.

To feed on pork, whether we sup or dine,
 Is worse than mutton, if we have no wine :
 But drinking wine therewith, it is sound food,
 And physick for the body very good.

The tripes or inwards of the hog is best,
 And better than of any other beast.

Sweet wine to urine is a stop or stay,
 To loosenesse in the belly it makes way.
 It harmeth both the liver and the spleen,
 Causing the stone, as hath by proof bin seen.

He that drinks water when he feeds on meat,
 Doth divers harms unto himself beget :

It cools the stomach, with a crude infesting,
And voids the meat again without digesting.

Flesh of young calves, or veal, is very good,
Quick in digestion, nourishing the blood.
The hen, the capon, turtle, and the stare,
The ring-dove, quail, lark, owsell fat and fair,
The partridge, robin-red-breast, cock of the wood,
The pheasant, heath-cock, moor-hen, all are good :
So the wild mallard, and green plover too,
Eaten with wisdom, as we ought to do.

The fish of soft and biggest body take,
If hard and little, do not them forsake.
Pike, perch, and sole, are known for dainty fish ;
The whiting also is a courtly dish :
Tench, gurnard, and a well-grown plaice in May,
Carp, rochet, trout, these are good meat I say.
Among our fish, the pike is king of all,
In water none is more tyrannicall.

Who knows not physick, should be nice and choice,
In eating eeles, because they hurt the voice ;
Both eeles and cheese, without good store of wine,
Well drunk with them, offends at any time.

In feeding at our meals some doctors think,
Oft-times, and yet but little, we should drink.
In eating eggs, choose them are soft and new,
For otherwise, great perils may ensue.

Pease may be praised, and discommended too,
According as their nature is to do.
The husks avoyded, then the pulse is good,
Well nourishing, not hurtfull to the blood.
But in the husks they are gnawing meat,
And in the stomach cause inflations great.

Goats' milk, nor camels' milk, to drink is good,
When agues or consumptions touch the blood,
They nourish well. But (beyond all) some say,
Milk of an asse doth nourish more than they.
Yet when as head-ache, or hot fevers fall,
The milk of kine and sheep are best of all.

Butter doth soften, moisten, and make loose beside,
Those bodies where no fever doth abide.

Whey is incisive, washing, piercing, too,
Cleansing, and purging where it is fit to do.

Cheese is by nature cold, stuffing, grosse and hard ;
 Yet good with bread, where sicknesse is debar'd,
 When being sound in health, for then it's good,
 But if not joynd with bread, unwholesome food.
 Cheese doth apology his own defence,
 When they (unskilled in physick) urge pretence
 That it is hurtfull ; yet through ignorance,
 Know not whereby his hurtfulnesse doth chance.
 The stomach languishing, cheese doth releeve,
 And (after stuffing cakes) great ease doth give ;
 A modicum thereof, after all other food,
 By best phisitians, is allowed for good.

Often, yet little, drink in dinner time,
 But between meals, you must from drink decline ;
 That sicknesse may in power less prevail,
 Which else (through drinking) sharply doth assayl.

Physicians much contend about this text,
 If that with sicknesse thou wouldst not be vext :
 With drink begin thy supper. Others say,
 Till thou have eaten first, keep drink away.
 The comment therefore yeelds the best direction
 Of drinking when we go to our refection.

A new-laid egge craves a good cup of wine,
 Drunk after it, it will the blood refine.
 Nuts after fish, cheese after flesh is best,
 In both these, they are helpfull to digest.
 One nut doth well, the second doth offend,
 Beware the third, it brings a deadly end.

When we eat pears, boldly we may drink wine,
 Nuts against poyson are a medicine.
 Pears eaten (without wine) are perilous,
 Because raw pears are counted venomous.
 Being boyl'd or bak'd, weak stomachs they do chear,
 Because restoratives they then appeare,
 By being raw, the stomach they offend ;
 But comfort (otherwise) doth them attend.
 Drink after pears, and after apples, use
 The course that nature no way can refuse.

By eating cherries, great good doth arise,
 To such as use them ; for the learned wise
 Say, that they purge the stomach, and beside
 The broken stones and kernals have been tried,
 To break the bladder stone, breed wholesome blood,
 To fat and feed the body they be good.

Prunes cool and loose the body very kindly,
 No way offensive, but to health are friendly.

Must or sweet wine with peaches we should drink,
 Else harm will happen by them, as most think,
 And show good reasons why it should be so.
 With dry old nuts a raisin still must go ;
 Because in cooling, they are dull and slow.
 Yet raisins hurt the spleen by opilation ;
 As nuts are divers, and cause inflammation.

The evil that is termed by the swine,
 Under the chin doth to the throat incline,
 Swellings, boyls, kernels, all these holpen are,
 If you a plaister made of figs prepare.
 But if the same with poppy mingled be,
 Broke bones it knits, and strengthens perfectly.

Both lice and lust by figs engendered are,
 Of those corrupting humors they prepare.
 Medlars do bring very much increase,
 And loosenesse in the belly makes to cease.
 The hardest medlars therein you may use,
 But yet to nourish, then the softest choose.

Must doth provoke much urine, and some say,
 It doth inflate, and quickly scours away.
 By drinking ale or beer, grosse humours grow,
 Strength is augmented, blood and flesh also
 Encreaseth daily, urine they do procure,
 Inflate the belly, as the learned assure.
 And furthermore, of vinegar, they say,
 Although it drieth, yet it cools his way,
 In passage, and it makes one lean,
 Being received fasting, so I mean,
 It causeth melancholy, harms the seed
 Of generation, and doth shaking breed.
 Lean folk it hurteth, drying up their blood.
 And unto fat folks greatly doth no good.

Turneps do hurt the stomach, breedeth wind,
 Provoketh urine, as by proof we find :
 They comfort sight, but yet the teeth offend,
 And gripes into the belly they do send,

Rapes are the best to nourish, so some say,
 And for our urine they do cleanse the way.

Prescriptions for the inwards of a beast ;
 The heart is held but hardly to digest.
 The maw is of like nature, slow in descent,
 And therefore is no wholesome nutriment.
 The tongue is said to be of good digestion,
 And therefore is allowed in our refection.

The like opinion of the lights we hold,
 Though nature is sometime by them control'd.
 Of brains, a hen's is best of all to eat,
 And those of chickens are most wholesome meat.

Of fennell-seed, our learned physitians say,
 For breaking wind, it makes a ready way.
 Four virtues in the fennell are allowed,
 It quails the ague when it growes too proud ;
 Poyson it soon expels, the stomach cleareth,
 Sharpens the sight, and comfortably cheareth.

Anni-seeds for the stomach wholesome are,
 And quickness of the eye-sight they prepare.
 For sweetnesse, goodnesse, look how they exceed,
 The better blood, and humours still they breed.

If flux of blood at any time abound,
 Spodium doth instantly that flux confound.
 Spodium the liver worthily doth please,
 And mace the heart, if ought do it disease.
 Musk is a wondrous comfort to the brain,
 And lychoris keeps the lights from any pain.
 Gallingle helps the stomach ; capers the spleen,
 All these are wholesome physick, as I ween.
 Concerning sauce that doth our table fit,
 Salt is commended best by men of wit.
 Poyson it doth resist, makes savoury meat,
 Whets on the stomach with desire to eat ;
 For without salt, our food can yeeld no taste,
 Yet over-salted meats are bad repast.
 They inflate the face, diminish nature's seed,
 Itch, scabs, and pushes, they do daily breed.
 Salt should be first upon the table set,
 And last tan'e off, when we have done with meat,

Three kinds of tastes do soon the body heat,
 Salt, bitter, sharp, and divers harms beget.
 Three other savours cool in moderate kind,
 Tart, stipticall, and pontick, as I find.
 Three more, unsavory, unctuous, and sweet,
 Nor heat, nor cool, and therefore held most meet.

Four benefits come by our sops in wine,
 They purge the teeth, they make them clean and fine,
 They sharp the sight, cause good digestion,
 Remove superfluous things, that breed infection.

To keep a customary diet is the best,
 Both for our health, and for mild nature's rest.
 Custome observed, we may not lightly leave :
 A dietarie custom will receive

No giddy imperfection. Grave Hypocrates
 Gives good advice, for health and nature's ease.
 It is a better way to cure by dyet
 Than lavishnesse, which brings all out of quiet.
 He that is careless for his proper good,
 By such a one, no danger is withstood.

Six things in dyet should observed be,
 First, to respect the food in quality.
 Next, what it is in substance ; and withal,
 What time for ministration best doth fall.
 Fourthly, the quantity requires a care ;
 Fifthly, how oft we should the same prepare.
 Lastly, the place is not amisse to know,
 And where such dyet best we may bestow.

Broth made of cole-worts doth both loose and bind,
 According as their nature is inclined :
 Yet if the broth and substance both you take,
 Digestion the more solid they will make.

Malowes the belly much do mollifie,
 And their roots shaven, physick doth apply,
 For sound purgation ; hereof I am sure,
 The menstruous flux in women they procure.

Mint were bely'd if it should want the might,
 The stomach worms, and belly to kill quite.
 As wormwood juice, it works in operation,
 And is to health a sovereign preservation.

Why should man dye (so doth the sentence say,
 When sage grows in his garden day by day ?
 And yet all garden-physick not prevailes,
 When death's stern power our chiefest health assails.
 Sage comforteth the nerves both sweet and kindly,
 The palsie-shaking hands it helpeth friendly.
 His power is sovereign gainst an ague fit,
 Sage and the beaver stone, by learned writ.
 Lavender and the primrose of the spring,
 Tansey and water-cresses comfort bring,
 To all such members as the palsie shake,
 When in the very greatest kind they quake.
 Sage doth both councill and keep nature sound,
 Where sage then groweth, happy is the ground.

Needs must we call rew noble, by due right,
 Because it clears and perfecteth the sight.
 Carnal desires (in men) it doth appease,
 But yet to woman giveth no such ease.
 Rew-water sprinkled in the house, kills all the fleas.

Rew, as it causeth chastity, it whets the wit,
And for the eye-sight always counted fit.

Onyons (in physick) winneth no consent
To choleric folke, they are no nutriment
By Galen's rule. Such as flegmatic are,
A stomach good in them they do prepare.
Weak appetites they comfort; and the face
With cheerfull colour evermore they grace.
And when the head is naked left of hair
Onyons (being sod or stamp'd) again repair.
A mad dog's byting may recured be,
With onyons, honey, vinegar, these three.

Though mustard-seed is held the smallest grain,
His powerfull heat and strength is not in vain.
By causing tears, it purges well the braine,
And takes away infecting poysonous pain.

The heavy head-ache, and that irksome pain,
Which drunken surfeiting doth much constrain,
The smell of violets doth soon allay;
And cures the falling sicknesse, as some say.

The nettle soveraign is, in his degree;
It causeth sleep in bodies sick that be.
Casting or vomiting it clears away,
And flegme that hurteth nature day by day.
An ancient cough it quickly doth prevent,
For flegme thereby is soon dispatcht and spent.
It cures the chollick, a most cruel pain,
Diseases in the joynts it doth restrain.
Cold in the lights, the bellie's tumours too,
And other harms the nettle doth undo.
Some say beside, that it doth cure the gout,
Though divers doctors thereof make some doubt.

Hysop a purging herb is held to be,
And flegme from forth the breast it sendeth free.
Being sod with honey, then it comfort sends
The stomach, and the lungs it much befriends.
Purgeth the lights from flegme, and adds a grace,
By a most clear complexion to the face.

Chervill or cinquefoyl, call it what you will,
Being steeped with honey doth a canker kill;
Drink it with wine, the belly-ache it healeth,
And doth asswage inflation where it swelleth.
Lastly, when lask or vomit shall oppresse,
The power thereof doth heat, and makes to cease.

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Young swallows that are blind, and lack their sight,
 The damme (by celendine) doth give them light.
 Therefore (with Plinie) we may boldly say,
 Celendine for the sight is good alway.

The juyce of willow put into the ear,
 Doth kill the worms which are engendered there.
 The rind of willow sod in vinegar,
 For taking warts away, they most prefer.
 Let teeming women cast willow flowers away,
 Because they hinder child-birth with delay.

Saffron doth glad the heart being sick and ill,
 But yet too much endangereth to kill.
 Defective members it doth comfort kindly,
 And next, restores the liver very friendly.

Leeks, if their property is not belyde ;
 To make young women fruitfull, hath been tryde.
 Beside, they stint the bleeding at the nose,
 In greatest violence, as some suppose.

Black pepper in dissolving is not slow,
 But quickly purgeth flegme, as many know ;
 Beside 'tis very good to help digestion,
 When other things may fail that are in question.
 White pepper, to the stomach comfort sends,
 And many ways it from the cough defends.
 For divers griefs it yeeldeth good prevention,
 And with a feaver stands in stout contention.

If after meat we fall to sudden sleep,
 Our food from all digestion it doth keep.
 Over-much moving is hurtfull too,
 And drunkennesse doth most of all undo.
 In all these, let us use discreet forbearing,
 Being enemies that do offend our hearing.

Long fasting, vomiting, and sudden fear,
 Are hurtfull to the organ of the ear.
 Blowes, falles, and drunkennesse, are even as ill,
 And so is cold ; beleeve me if you will.
 Such as would noises in the ear prevent,
 To shun all these, think it good document.

Bathing, wine, women, boysterous wind,
 To harm the eye-sight always are enclin'd.
 The like doth pepper, garlick, dusting, smoke,
 Leeks, onyons, lentils, draw the sight aslope,
 And dims it as beans do. Such as use weeping,
 I would not have mine eyes in their moist keeping.

Mustard, and gazing much against the sun,
 The sight thereby is utterly undone.
 The violence of lust, in hot desire,
 Spoyles them outright; and looking on the fire.
 Extremity of labour hurts the eye,
 And the least blows, bloodshot it instantly.
 Tart and sharp sauces needs offend them must,
 As also walking in a windie dust.
 The last is too much watching; these, beleeve me,
 Avoyd, and then thine eye-sight will not grieve thee.
 Of fennell, vervein, roses, celandine,
 With rew among them, water stilled fine,
 They are most wholesome for to clear the eyen.

To cure the tooth-ache, take the seed of leeks,
 When that fell pain annoyes and swels the cheeks;
 But seed of henbane must be mixt among;
 And burn them both to make the smoke more strong.
 Hold thy mouth o'er, and so receive the fume,
 The pain it slakes, and worms in teeth consume,
 If through a funnel you the smoke assume.

Nuts, oyl, and cold, which strikes into the head,
 Eeles, and raw apples, drinking, late towards bed,
 By all these hoarsenesse in the voyce is bred.

Use fastings, watchings, if the rheum possesse thee,
 Hot meats and drinks avoyd, they not redresse thee,
 Labour thy body, and thy breath restrain,
 Inspire warm air, if the catharre do pain.
 Beware of drinking much, it doth offend,
 These (gainst all rheumes) to thee I do commend.
 To know these rheumes, this is an observation,
 If to the breast they flow in exaltation,
 They are called catharrs. But running through the nose,
 Its called corisa; others say, the pose.
 When by the neck it doth itself convey,
 They term it branchus, as physitians say.

Auripigmentum, which some arsenick call,
 Remember to mixe brimstone therewithall,
 White lime and sope; these four by way of plaister,
 Are able any fistula to maister.
 Observe these four then, if thou wouldst be cured;
 Many (thereby) of help have been assured.

The bones, the teeth, and veyns that are in man,
 The author here doth number, as he can.
 Two hundred nineteen bones agree some men,
 Two hundred forty-eight, saith Avicen.
 Numbring the teeth, some two and thirty hold,
 Yet four of them by others are control'd.

Because some lack those teeth stand last behind,
 In childhood. Others till their greatest age they find.
 The grinders, and duales, quadrupli,
 And them above, beneath called canini,
 That grind, that cut, and hardest things do break.
 And those called sensus, nature these bespeak,
 To grind man's food. The veyns in man we count,
 Three hundred sixty-five, which few surmount.

Four humours in man's body always are,
 Blood, choler, flegme, melancholy. And compare
 These, unto those four severall elements,
 Whereof they are continuall presidents.
 To earth melancholy, to water flegme,
 The ayr to blood, choler to fire extream.
 The blood is hot and moyst, like to the ayr,
 And therefore therewith carryeth best compare.
 Flegme cold and moist, even in his chiefest matter,
 Bearing his best resemblance with the water.
 Sullen is melancholy, cold and dry,
 And to the earth itself doth best apply.
 But choler being hot and dry, desires
 To meet (he cares not) with how many fires.

To sanguine men, nature hath much commended,
 First, with a jocund spirit they are attended:
 Desirous to hear tales and novelties,
 Women, nor wine, they gladly not despise.
 Their looks are cheerfull, and their language sweet,
 For any study they are prone and meet.
 No common matter kindle's anger's fire,
 Contentious company they not desire.
 They are liberall, loving, mirthfull, and benigne,
 Fleshy and fat, capring and apt to sing.
 No muddy countenance, but smiling chear,
 And bold enough, as causes may appear.

Men that be flegmatick, are weak of nature,
 Most commonly of thick and stubbed stature.
 And fulnesse overtaketh them amain,
 For they are slothfull, and can take no pain.
 Their senses are but dull, shallow, and slow,
 Much given to sleep, whence can no goodness grow.
 They often spit; yet nature's kind direction,
 Hath blest them with a competent complexion.

Choler, is such an humour as aspires,
 With most impetuous, insolent desires.
 He covets to excell all other men;
 His mind outsteps beyond a kingdom's ken.
 Lightly he learns, eats much, and soon grows tall,
 Magnanimous, and somewhat prodigall.

Soon moved to anger, though upon no cause,
 His own will is his reason's largest laws.
 Subtile and crafty, seldom speaking fair,
 A wasting unthrift, overgrown with hair.
 Bold-spirited, and yet but lean and dry,
 His skin most usual of a saffron dye.

Where melancholy bears the powerfull sway,
 To desperation it inclines alway.
 The melancholy spirit is dark and sad,
 Sullen, talks little, and his sleeps are bad.
 For dreadful dreams do very much affright them.
 Start out of sleep, and nothing can delight them.
 Their memory is good, and purpose sure,
 All solitary walks they best endure.
 Because to study they are still inclined,
 And being alone, it fitteth best their mind.
 Simple, and yet deceitfull, not bounteous ;
 But very sparing, doubtfull, suspicious.
 Earthly and heavy looks. By all opinion,
 Here melancholy holds his sole dominion.

The humors that complexion do extend,
 And color in our bodies, thus they lend.
 To him, flegmatick, is a color white.
 Brownish and tawny, under choler's might.
 The melancholy man is pale as earth,
 The sanguine ruddy, ever full of mirth.
 Yet, where the sanguine doth too much exceed,
 These inconveniences thereby doth breed ;
 The blood ascends too proudly to the face,
 Shoots forth the eyes beyond their wonted place,
 And makes them swell. The body lumpish growes,
 The pulse beats thick, by vapors them inclose,
 The head will ache, and costiveness ensues ;
 The tongue is dry and rough, can tell no news.
 Extremity of thirst, caus'd through great heat,
 And bloody-coloured dreams, which make men sweat.

Where choler rules too much, these signs will shew,
 The tongue grows sharp and rough, in speaking slow.
 More wakefullnesse than needs, tinglings in the ear,
 Uwonted vomits, hatefull they appeare.
 Great thirst, the excrements do quickly void,
 The stomach is too nice, as over cloid.
 The heart is full of gripes, and extreme heat
 Compels the pulse impatiently to beat.
 Bitter and sour our spittle then will be,
 And in our dreams, strange fires we seem to see.

Where flegme superabounds, these signs will tell ;
 The mouth distastefull, nothing can relish well ;

And yet with moysture overfloweth still,
 Which makes the stomach very sick and ill.
 The sides will ake, as if they beaten were ;
 Loathsome will all our meat to us appear.
 The pulse beats seldom. The stomach and the head
 With gripes and pangues do seem as they were dead.
 Our sleeps are troublesome, and when we dream,
 Of brooks and waters, then we see the stream.

When melancholly in the body reigns
 It doth endanger many dreadful pains.
 It fills it with corrupting filthiness,
 Makes the skin look of blackish fulsomeness.
 The pulse beats hard, the urine weak and thin,
 Solicitude, fear, sadness, sleep it drowneth in.
 It raises bitter belches, breeds much rheum,
 And in the ear oft breeds a tingling tune.

At seventeen years of age, we safely may
 Let youthful bodies blood, the learned say.
 The spirits are restored by letting blood,
 And to encrease them drinking wine is good.
 After bloodletting little good they gain
 By present eating meat, that is but vain.
 Plebothomy doth purge and clear the sight,
 Cleanseth the braine, and makes the marrow right.
 The stomach and the belly it doth clear,
 And purge the entrails throughly every year.
 It sharpens wit and doth induce to sleep,
 And from the heart all painfull grief doth keep.
 It comforts hearing, and relieves the voice,
 Augmenting strength, wherein the most rejoice.

Three special months, our text doth here remember,
 For letting blood, April, May, and September.
 The moon rules most these months, yet certain dayes,
 Some do deny, and other some dispraise
 The first of May, and the last of April ;
 As also of September they hold ill.
 Days of these months they do forbid to bleed,
 And think it dangerous on a goose to feed ;
 But this is idle ; for these months are good,
 And for our health in these to let our blood.
 For old or young if blood abounding be
 All months it may be done advisedly.
 If length of days and health you do desire,
 These are the months that bleeding best require.

A cold complexion, and a chilly ayr,
 Aches, or ingreams, that to inflame prepare,
 Bathing, and wanting dallying in that sport,
 Where Venus most delighteth to resort ;

Too young or else too old, a long disease,
Eating or drinking, nature to displease.
Sea-sick feeling, when the stomach's weak
And empty veyns, that loathingly do speak.
All these forbid blood-letting, and advise
Not then to deal therewith in any wise.
What should we do when we to bleeding go?
These few instructions following will show.
Before and after, unction will do well,
Lest the incision, or the veyn should swell.
Yet unction, (without wine,) is not so good,
It prevents sowning and begets new blood.
Bathing is wholesome, in divers times observed.
And linen clothes ought well to be reserved.
After blood-letting, be discreet in walking,
And trouble not the braine with too much talking.
Bleeding removes sad motions from the heart,
Asswageth anger, being too mallepart.
And those distempered fits procured by love
Blood-letting gently doth them all remove.
The orifice, (or as some say,) incision,
When as for bleeding you do make provision,
Ought to be large, the better to convey
Grosse blood and fumes which issue forth that way.
Grosse humours and grosse blood must needs have vent,
In cold or hottest times by good consent.
When blood is come away, ye must be sure
Six hours after watchfull to endure ;
Lest sleep raise fumes, or turning on that arm,
Imposthumes breed, by doing it least harm.
The nerves, and sinews, arteries also,
Offend not, if in health you mean to go.
The blood thus purged, you instantly may eat :
So that the humours be in quiet set
Shun milk and white meats, when we are let blood,
Because (at such times) they are never good.
And drinking then perforce we should refrain,
With undigested drink ne'er fill a veyn.
Cold, and cold ayr, with all cold things beside,
Are then our enemies, by proof well tryed.
Cloudy or troubled ayrs are likewise ill,
With melancholy blood the veyns they fill.
Too stirring motion, or excessive labour,
Avoyd, and with soft ease the body favour.
In the beginning of a sharp disease,
Then letting blood is good, if so you please.
The middle age doth favour bleeding best,
Children and aged folks may let it rest,
Or take but little from them. In the spring,
A double loss of blood no hurtfull thing.
At other times to take but indifferently,
And still let good advice keep company.

Spring-time and summer, if we intend to bleed,
 Veins on the right side do require as need.
 Autumn and winter, they the left side crave,
 In arm, or foot, as they best like to have.
 The head, heart, foot, and liver, all these four,
 Emptying require themselves best to restore.
 The heart calls for the spring, summer the liver,
 Order unto the rest is a due giver.
 Salvatella, the opening of that veyn,
 In any man five benefits doth gain.
 The liver it doth purge from all offence,
 And from the spleen commands annoyance thence.
 Preserves the stomach's mouth, and clears the breast,
 And keeps the voyce from being by harms opprest.

If head-ache come by drinking too much wine,
 Or any other drink that may resign
 The body's danger to an ague fit,
 Engrossing fumes that much perplex the wit,
 To drink cold water let him not refrain,
 Because it hinders all that hurts the braine.
 Crown of the head, or fore-head being vext,
 And with extremity of heat perplexed,
 Chafe then the temples with mild moderation,
 And wash them with warm water in good fashion.
 But seething motherwort therein is best,
 Because it gently cools, and causes rest.

In summer season fasting is not good,
 Because it dries the body and the blood.
 To vomit once a month wholesome some hold,
 For hurtfull humours thereby are control'd
 And voided quite away. The stomach clear
 Beware what next annoyance cometh there.
 Spring, autumn, winter, summer, rule the year,
 And all their several hours in them appear.
 The vernal season is both moyst and hot,
 And for blood-letting no time better got.
 Let men with Venus meddle moderately,
 For then they best may spare such company.
 Then temperate motion, lask, nor sweat offends,
 To purge by bathing, physick then commends.
 Summer is hot and dry, red choler then
 Increaseth, and dries all that's moyst in men.
 Meats moyst and cool, do best become that season,
 And wantoning with women shews small reason.
 Bathe not at all, and seldom open a veyn.
 Use little motion, labouring much refrain,
 And drink but little, least it prove to pain."

There is fully as much truth and useful information concerning health and life in this poetical regimen, although written above seven hundred years ago, as there is to be found in any of the numerous works of modern times.

Marcilius Ficinus, at one time the first physician in Western Europe, among a great deal of useless matter, advises people to consult a good astrologer every seven years of their lives; and, after ascertaining from him what hangs over their heads, to then go to their physicians for advice to ward off the pending dangers. He also recommends the use of gold, frankincense, and myrrh, internally to old people, after the manner of the wise men, who, to obtain the benign influence of Sol, Jupiter, and Saturn, the three Lords of the planets, offered these to the Creator of the stars.

Platina Cremonensis, who wrote in 1529, advises delicate persons to be careful in chewing their food well; asking,

“How is it possible that those who swallow their meat whole, should escape crudities and eructations?”

Sir John Sinclair, in his *Code of Health and Longevity*, makes the following remarks upon the plan adopted by the celebrated Cornaro, respecting whom so much has been said and written.

“Though sobriety and temperance are certainly to be recommended, yet to carry it to such an extreme as to weigh one’s food, or to measure one’s drink, may be practised by a few individuals for the sake of experiment, but would never do for mankind at large. Twelve ounces of solid food, and fourteen ounces of liquids, may serve to carry on a vegetative kind of life for many years; but few would wish to continue so lifeless and uncomfortable a state of existence. Cornaro tells us that in order to preserve his health, he not only resolved to restrict himself to the quantities above mentioned, but was also obliged to be careful to avoid heat, cold, fatigue, grief, watchings, and every other excess that could hurt his health. How could the business of the world be carried on, if every man, like Cornaro, was to begin to follow such a system at the fortieth year of his age?”

Cornaro says his chief rules were—

“To choose such wine as suits the stomach, drinking of it but the quantity that could be digested. Do the same by meat, as well in regard to quantity as to quality. Accustom yourself never to cloy the stomach with eating or drinking; but constantly rise from table with a disposition to eat and drink still more. Thus fulfil the pro-

verb which says that, 'a man to consult his health must check his appetite.

"The things I eat are as follow:—bread, panado, some broth with an egg in it, or such other good kinds of soup or spoonmeat. Of flesh meat I eat veal, kid, and mutton. I eat poultry of every kind. I eat partridges and other birds, such as thrushes. I likewise eat fish; for instance, the goldney and the like amongst sea fish; and the pike and such like amongst fresh water fish."

He consumed twelve ounces of solid food, and fourteen ounces of wine and liquids, per day.

Leonardus Lessius, a learned jesuit who lived about the end of the 16th century, says—

"He who eats or drinks such a quantity as renders him unfit for any exertion of the mind to which his profession calls him, has certainly exceeded, and ought to retrench. And he, who in bodily labour or exercise was active and nimble before meals, if he becomes heavy and dull after meals, has certainly transgressed; for the true end of eating and drinking is to refresh, and not to oppress, the body.

"Though there cannot be a certain and invariable measure prescribed to all persons, because of the difference of ages, constitutions, and occupations; yet, generally speaking, to those who are old, or of a tender constitution, and live a sedentary life, twelve, thirteen, or fourteen ounces of solid food, including bread, flesh, fish, and eggs, together with an equal quantity of drink, will be sufficient.

"And this rule has been verified by the experience chiefly of those whose proper employment has been study and meditation. The quality of people's food and drink is little to be regarded, if it is but plain, and such as common use has recommended, and does not particularly disagree with him who uses it, provided the quantity be properly adjusted. To cure you of your fondness for high living, consider these delicacies you sit down to, not as they appear on the table, but as they will be quickly altered after you have eaten them; for the richer their flavour and taste is now, the more corrupted and acrimonious they will become in your body, and the more hurtful will be their consequences."

The same author says that—

"Many lived in the deserts, on bread, dates, salad, and water, to a hundred years and upwards. Paul the hermit died at the age of 115 years; of which he spent near a hundred in the desert, living for the first forty on dates and water only; and for the remaining time on bread and water, as Jerome testifies. St. Anthony lived to 105, of which he passed more than eighty in the wilderness, on bread and water, with the addition at last of a little salad, according to St. Athanasius. Arsenius, the preceptor of the emperor Arcadius, lived to 120, of which he spent the first sixty-five in the social world, and the other fifty-five in the desert with great abstemiousness. And Epiphanius lived with equal austerity to almost 115."

Robin Hood, whose bold exploits are familiar to every school-boy, lived principally upon venison, fish, eggs, and the fruits and berries of the forest; and was a fine, active man, at the time of his decease, when he was bled to death. It is probable that had he escaped the treachery of pretended friends, he would have lived to a very extraordinary age; as it was, he was more than eighty years old at the time of his murder. Tradition says that he often advocated to his merry followers the necessity of temperance, and even abstemiousness, with frequent fasting, as not only constituting an essential part of true religion, (he being a Roman Catholic,) but as tending to preserve health and length of days.

Thomas Philologus of Ravenna, in a treatise, *de Vita ultra Annos 120 protrahenda*; addressed to Pope Julius III, recommends purity of manners, temperance, and pure air, as the principal means of long life. He complains also of the custom of burying the dead in populous places, by which the atmosphere is tainted with pernicious steams and distempers. He expresses his astonishment—

“That the moderns should approve of a practice, which the wisest nations of antiquity prohibited by the most solemn laws.”

Speaking of the Venetian nobility, he contends that their voluptuousness and excesses only had so shortened their days, that few of them reached their ninetieth year; whereas formerly it was a common thing to see at once several senators, each a hundred years of age, walking together in the public streets.

Hieronimus Cardanus, a famous philosopher of Pavia, born 1500, in a voluminous work upon the subject of health, denounces the common ideas of the time in regard to exercise. He declares that whatever exercise in the least fatigues the body, or produces the most gentle sweat, or in the slightest degree increases the rapidity of respiration, is positively injurious: and instances trees as living longer than animals, because they never move from their places, and use no exercise. He strictly enjoins abstemiousness, and gives the following rule:—

“The true measure of eating and drinking is, that a man shall feel no fulness or weight in his stomach, but shall be able to walk or write immediately after meals, in case either should be necessary:

that his sleep shall not be disturbed or shortened by his supper : that he shall have neither head-ache, nor bad taste in his mouth next morning : and that he shall awake refreshed and cheerful after his night's rest."

He also gives the following indications and conditions of longevity ; First, to be descended from a long-lived family, at least by one of the parents ; Second, to be of a cheerful, easy disposition, undisturbed by any irksome care, or inquietude of mind ; and Third, to be naturally a long and sound sleeper.

Levinus Lemnius, born in Zealand, anno 1505, after desiring his readers to lead a virtuous life, as necessary to health, says —

"Health is preserved by temperance in eating and drinking, wherein excess is indecent as well as pernicious ; and by a moderation in all the other articles which Galen calls the preservatives of health, but moderns call the six non-naturals, not that they are by any means unnatural, but because they are not within the body, like our blood and humours ; though they have influence enough to hurt or destroy it, when a bad use is made of them."

Joannes Valverdu de Hamusco, a Spaniard, after travelling in many distant countries, wrote a treatise in 1552, in which he gives as a rule, in addition to what was known at the time, that it is necessary to diversify our food as much as possible ; and especially so according to the change of climate. He states that when he was in Scotland, he could not forbear eating more frequently than he used to do in his own country.

Guilielmus Gratarolus, a Piedmontese, published his book in 1555, in which he advocates moderation in all things ; eating, drinking, labour, sleep, and women, as the principal means of preserving health.

Henricus Ranzovius, a Danish nobleman, wrote his work in 1573, in which he insists upon the necessity of constant prayer to God for health ; and the only way to secure life was to worship and serve the Almighty in everything. "For though the stars have their influence it will always be true" that

"Astra valent aliquid, plus pia vota valent."

Ferdinandus Eustatius, son of the famous anatomist Bartholomæus Eustachius, in a work dedicated to Pope

Sixtus V., anno 1589 : although he points out no means himself of prolonging life, refutes many of the arguments of others, and declares that the medical art is of no use whatever in preserving health or prolonging life.

Many other works were published in the Fifteenth and Sixteenth centuries, abounding in all kinds of fanciful notions on these subjects ; and particularly so in regard to the different kinds and proportions of food at different meals. One Oddi de Oddis, who published his treatise, *De Cænæ et Providii Portione*, in 1570, asserts, that people should make dinner the lightest, and supper the heaviest and fullest meal ; the very reverse of what modern writers recommend.

About this period the famous Sanctorious Sanctorious, chief professor of physic at Padua, published his aphorisms, *Medicina Statica*, or rules of health. He opened up a new path in physic and philosophy, by his experiments, which were the result of thirty years' diligent investigation. His plan was to weigh himself repeatedly, in order to ascertain the amount of waste in the system in a given time ; and thence to deduce rules for the preservation of health and life. By the process of weighing, he affirms that two advantages are gained. First:—

“By finding out the daily insensible perspiration of our bodies ; which perspiration, not well considered, medicine proves for the most part vain and ineffectual ; for all indispositions, almost, are the productions of a lesser or larger perspiration than is requisite.”

Second:—

“By weighing during our refection, we perceive when we are come to that just proportion of meat and drink, beyond which, or short of which, we are prejudiced.”

The following selections from his aphorisms, will be found to be serviceable:—

“If the addition of those things that are deficient, and the subtraction of those that are exuberant, be daily made, as to quantity and quality, such as it ought to be, lost health would be recovered, and the present always preserved.

“He only who knows to what quantity, and when, the secret perspiration [transpiration] of a man's body amounts to, more or less, shall find out how much, and when, any thing ought to be added or subtracted, in order to the preservation or recovery of his health.

“Insensible perspiration is made either by the pores of the body, which is transpirable in all its parts, and is inclosed in the skin, as it were in a net; or, by respiration, performed by the mouth, which, in one day, commonly amounts to about half-a-pound: for that may be discovered by the dewy drops upon a looking-glass, if it be set close to the mouth.

“If the meat and drink taken in one day amount to the weight of eight pounds, the insensible perspiration ordinarily amounts to five pounds, or thereabouts.

“That weight, which to any one is such as that, when he goes up some steepy place, he feels himself lighter than he is wont, is the exact standard of good health.

“If the weight of the body begin to be augmented more than it is wont, without any greater addition of meat and drink, or a retention of the sensible excrements, there ensues a difficulty of breathing.

“Insensible perspiration, attended by sweating, is not good; because, sweating abates the strength of the fibres. Yet sometimes it is accounted good, because it occasions a diversion from a greater evil.

“The more subtle and free from moisture the invisible perspiration is, the more healthy it is.

“If a man feel himself lighter than he is, and yet is not really so, it is an argument of a most healthful constitution.

“If nature be obstructed while she is employed in the office of perspiration, she becomes presently defective in divers others.

“When the head aches, the body receives a sudden check in perspiration, and becomes more ponderous.

“If that which is perspirable should not be dissipated, either by nature, or some feverish heat, the body would immediately be prepared for a malignant fever.

“A small quantity of *Cassia* does not divert perspiration, does not impair the strength, but only eases the body of a superfluous weight.

“Any pain or grief of the body obstructs the passage of that perspirable matter which is concocted.

“Any cold, even the least that we feel in the night while we are asleep, obstructs perspiration.

“One of the most frequent causes that hinder perspiration in the summer time, is the often turning of our bodies in bed.

“In fluxes and vomiting, perspiration is obstructed because it is diverted.

“A burthensome weight of garments is a hindrance to perspiration, because they abate a man’s strength.

“The secret and insensible perspiration eases us more than all the sensible ones put together; for, after sleep, before there be any evacuation of the sensible excrements, every one feels himself lighter, because he is really become lighter, by three pounds, or thereabouts.

“In the space of one night, there are commonly evacuated, urine sixteen ounces, more or less; of concocted excrements, by stool, four ounces; and by occult perspiration, forty ounces and above. There are many, who, in the space of twenty-four hours evacuate as

much, by insensible perspiration, as they do by stool in fifteen days. How comes it then, that most of our countrymen, in all diseases, mind only the evacuation by stool or urine, and hardly ever think of insensible perspiration ?

“ If in the night, thou hast perspired more than usually, but without sweating or any disturbance, be assured of thy being in perfect health.

“ What quantity of perspiration is convenient for every one, in order to his continuance in a most healthful constitution of body, you will find out thus ;—observe in the morning, after a somewhat plentiful supper over night, that sort of greater perspiration which may be completed in thyself in the space of twelve hours ; grant it to have amounted to fifty ounces ; some other morning, after fasting over night, yet with this proviso, that thou didst not exceed at thy dinner the day before, make the same observation ; let us admit the perspiration to have amounted to twenty ounces ; this foreknown, pitch upon that moderate proportion of meat, and other non-natural causes, which will be likely to reduce thee daily to the mean between fifty and twenty ounces ; and that mean will be thirty-five ounces. *Thus mayest thou live a long and healthful life, nay haply arrive to that of a hundred years.*

“ The external causes which ordinarily obstruct perspiration, are a cold, troubled and moist air ; swimming in cold water ; gross and viscous meats ; the intermission of corporeal exercise ; or that of the mind ; and, in robust persons, over much abstinence from venery.

“ External cold obstructs perspiration in a weak body, because its heat is dissipated ; but, in a robust person it augments it.

“ They who in the scorching heats of summer, are obstructed in the exhalation of the perspirable matter, are incommoded by heat ; but to those who have an absolute freedom of perspiration, the heat is not troublesome.

“ Warm air and baths, if crudities do not obstruct, promote perspiration, refresh the inward parts, and render men’s bodies lighter.

“ That water which is more heavy, and the air which is more muddy, and more ponderous, convert the invisible perspiration into an ichor (or thin matter), which being pent in, and afterwards not dissolved, does for the most part cause a cachexy, or evil disposition of the body.

“ The hinderance of perspiration, occasioned by unexpected cold, is much more hurtful to weak bodies than that which is hindered by degrees.

“ To swim in cold water after violent exercise is extremely pleasant, but mortal ; for there is nothing more pernicious than opposite motions.

“ A pleasant gale of wind from the south surprising a man at a violent exercise, is many times mortal ; for the gale occasions a difficulty of breathing, and from the exercise proceeds acrimony.

“ Fauning obstructs perspiration, and makes the head more hot and more ponderous.

“ The wind, as it is colder than the skin, so is it ever obstructive and hurtful to it ; but more than any part to the head, because it is more exposed.

“In all seasons of the year, generally dry weather is more healthy than continual rains, for it renders men’s bodies lighter.

“In a warm air the body is of less strength as well by reason that with the perspiration there is somewhat of the better spirits exhaled, as because the warmth is not concentrated.

“Perspiration, procured by the force of warm air or water, is hurtful, unless the malignancy of it be not balanced by some greater benefit.

“To sleep in the summer time with the body uncovered, or abroad in the open air, does for the most part dispose it to putrefaction, by hindering the perspiration.

“Thou wilt not be troubled with any disease in autumn, if the cold weather then coming in find thee well furnished with clothes; if thou use diuretics; and wilt be kept in the same weight as before.

“He who is well clothed, perspires the better for it, and is rendered of less weight.

“They who in the winter time are commonly troubled with diseases proceeding from the abundance of humours, are to be purged in autumn, and not in the spring; and ought to be reduced to the weight they were of at the beginning of summer. But if the diseases proceed from some malignant quality, the bodies are to be purged in the spring, and not in the autumn; for the malignancy of the quality is more augmented in the summer than in winter.

“They who at the beginning of spring, divest themselves too soon, and in autumn are backward in putting on their winter garments, are, in summer, apt to fall into fevers, and in winter, to be troubled with distillations.

“The retention of the perspirable matter, as it has a sharp quality, causes fevers and erysipelas; as to its redundancy, it causes apostems, distillations, or an evil habit of the body.

“There would be an uninterrupted healthfulness, even to the extremity of old age, if men’s bodies were kept in an equal weight during the four seasons of the year.

“If the stomach be quite empty and fasting, though the party sleep, he does not perspire above eighteen ounces. On the contrary, the stomach full, while the body sleeps, does in the same time amount to forty ounces.

“Meats that are very nourishing, mutton only excepted, from supper over night to dinner next day, do not usually perspire above eighteen ounces.

“Many who feed plentifully on meats of little nourishment, may, in the space of one night, perspire above forty ounces.

“Mutton is easily concocted, and vaporous; for, in a night’s space, it perspires one-third part of a pound more than other meats, and such as a man is accustomed to.

“The meats which are made of leavened paste, do not make bodies more ponderous, for they perspire more easily than turnips.

“The full stomach and the empty, both diminish the perspiration; the full stomach diverts it, by the corruption of meats; the empty attracts it, that it may be filled.

“Windiness is nothing else but an imperfect kind of perspirable matter. Undigested meat hinders perspiration.

“ When there is a lightness and agility of the body, felt for a whole day together, it argues that there preceded a concoction of the chyle and blood, and that the dregs, as it were, of the third concoction, are almost evacuated.

“ The use of swine’s flesh and mushrooms is hurtful, as well because these do not perspire, as because they suffer not other meats eaten with them to perspire.

“ Upon the eating of swine’s flesh and mushrooms the body commonly perspires less than it is wont, by a third part of a pound.

“ Melons perspire so little, that they abate about a fourth part of the usual perspiration.

“ The retention of the perspiration caused by melons, is evacuated by urine or sweating.

“ Grapes and green figs perspire but little, and somewhat hinder the perspiration of other meats, haply because they are sensibly evacuated,

“ That kind of food does perspire best of all, and conveniently nourishes, whose weight is not felt in the belly.

“ If thou canst but find out every day what quantity of meat is convenient for thee, thou wilt know how to preserve thy vigour and life a long time.

“ The body is made more ponderous by four ounces of meat that is of much nutriment, such as pork, eels, and all fat things, than by six ounces of meat that is of little nourishment, such as are small fishes, chickens, small birds, and the like.

“ That person who eats more than is requisite, is nourished less than is requisite.

“ They who in their youth are immoderate in their diet, make the stomach larger than it should be, whence it comes to pass, that it proves a hard matter to reduce them afterwards to a moderate diet.

“ If any one be desirous to be reduced to a moderate diet, let him use food of little nutriment, and so the stomach soon disburthening itself of it, will be contracted, and reduced to a less capacity.

“ Those meats that most conduce to perspiration are not corrupted; nay, after watching whole nights, they keep a man from weariness and heaviness.

“ Meats not apt to perspire, are wont to cause obstructions, corruptions, lassitude, pensiveness, and ponderosity.

“ If excess in drinking make the eyes, as it were, full of tears, it is a sign the body has not perspired as much as it should have done.

“ If after much drinking, you sweat or urine much, it is an argument of either great strength, or great weakness.

“ The drinking of cold water obstructs insensible perspiration, but augments the sensible.

“ To eat immoderately after immoderate exercise of body or mind, is hurtful; for the wearied body perspires with some difficulty.

“ New wine, though somewhat muddy, if it be concocted in the stomach, does not only perspire itself, but very much promotes the perspiration of other meats. This quality also have those hot things that are flatulent.

“ Onions, garlic, mutton, pheasants, but above all, the cyrenaic juice, promote the perspiration of meats not easily perspirable.

“ Undisturbed sleep is so great a promoter of perspiration, that, in the space of seven hours, fifty ounces of the concocted perspirable matter do commonly exhale out of strong bodies.

“ They who sleep with their feet and legs uncovered, are deprived of as much perspiration as may amount to a pound, in the space of one night.

“ Perspiration is more obstructed in persons sleeping, by a cool, southerly gale of wind, than it is in persons awake, by a great cold.

“ They who sleep and do not dream, perspire well; and so of the contrary.

“ Oscitation, and the stretching of the joints after sleep, denote that the body has perspired very well; as it is related of cocks smiting themselves with their wings before they crow.

“ Men's bodies perspire more in half-an-hour's space, by yawning, gaping, and stretching out of the body, than in three hours of any other time.

“ There is so plentiful an exhalation of the body in persons sleeping, that not only the sick lying with the sound, but also the sound among themselves, do mutually communicate their good or evil dispositions.

“ An excessive rest of the mind, does more obstruct perspiration, than that of the body,

“ The exercises of the mind which most conduce to the cheering up of the spirits are anger, sudden joy, fear and sorrow.

“ Frictions and cupping-glasses, in bodies full of crudities, obstruct perspiration.

“ Swimming immediately after violent exercise, very much obstructs perspiration.

“ Violent exercise in the wind obstructs perspiration.

“ Moderate dancing, without any capering or jumping, comes near the commendation of moderate walking; for it moderately expels the concocted perspirable matter.

“ By immoderate exercise the fibres are hardened, whence follows old age, which is an universal hardness of the fibres; this hardness, by condensing the passages, obstructs the heat; softness, by keeping them open, causes length of life.

“ He who would have a youthful face long, let him avoid sweating, or perspiring too much through heat.

“ Nothing contributes more to freedom of respiration, than satisfaction and consolation of mind.

“ Grief and fear obstruct the perspiration of the gross perspirable excrements; and the obstruction of perspiration, from what cause soever it proceeds, causes grief and fear.

“ Anger and hope take away fear, and joy taketh away sadness; for a passion of the mind is overcome not by medicines, but by some contrary passion.

“ In venerous meditations, the gross part of the perspirable excrements, is with grief retained.

“ Melancholy is two ways overcome; either by a free perspiration, or some continual satisfaction of the mind.

“ Consolation of the mind, from whatsoever cause it proceeds, opens the passages, and very much promotes perspiration.

“ Those aliments which open and facilitate perspiration produce joy ; those that obstruct it, grief.

“ Parsley, and other aliments that are opening, induce joy ; pulse, fat meat, and other things which incrassate and presently fill the cavities of the passages, cause grief.

“ The body would pine away, and be destroyed through idleness, were it not for the motion of the mind ; but the contrary cannot be affirmed.

“ They who are sometimes merry, sometimes sad, sometimes angry, sometimes timorous, have a more healthful perspiration than they who continue in one and the same, though that a constantly good, affection.

“ Gladness makes the diastole and the systole more easy ; grief and sadness render them more difficult.”

In the year 1710, a book was published for the use of Raynald, Duke of Modena, by Bernardin Ramazzina, principal professor of physic in the University of Padua. He states, that a prince who regards his health, should permit his physician to remind him of the following particulars ;—

“ 1st. He should be put in mind of the annual changes of the seasons, that his clothes, palace, furniture, and method of living may be adapted to them.

“ 2nd. He should be advertised when any epidemical distemper begins to spread, that he may remove into a more healthy air.

“ 3rd. As the variety of delicacies, which cover the tables of princes, is a great temptation to excess, they should be exhorted to partake of a moderate quantity, of such things only as they know by experience to agree with their constitutions.

“ 4th. Princes should not be fatigued with business soon after dinner, nor with any business at all after supper ; but should follow the example of Augustus Cæsar, who would neither read nor write letters after supper, lest they should disturb his sleep.

“ 5th. It is shameful in a prince to be a drunkard, and thereby become the jest of the mob : as Claudius Tiberius Nero was, in derision, called Caldius Biberius Mero. Let princes imitate Julius Cæsar, who, as Suetonius informs us, *vini parcissimus fuit* ; and Augustus, who rarely drank above three glasses after supper.

“ 6th. Manly exercises, suitable to their high rank, according to the custom of the country, and especially riding on horseback, should be recommended to princes. They should also indulge themselves in other innocent and genteel recreations, and never fail to admit young people to partake of their diversions.

“ 7th. The constitution of the prince should be carefully studied, and well understood by his physician ; and his diet, exercise, and evacuations, ought to be regulated accordingly.

“ 8th. No man is ignorant of the bad effects which violent passions produce in the human body. Anger, fear, grief, and even

excessive joy, have been the causes of death to many. And princes are so far from having any right of exemption from these passions, that they are generally more exposed to them than any of their subjects. Let a man read the forty-fifth chapter of the seventh book of Pliny's Natural History, and when he has considered the many misfortunes, dangers, terrors, and real calamities which Augustus encountered, let him honestly declare whether or not he envies that exalted ruler of the world. It should, therefore, be the physician's study to know what passions his prince is prone to, that, in the favourable moments of good humour, he may respectfully recommend a diet and regimen proper to subdue those enormities."

The famous Plutarch concludes his instructions upon this subject with the following well-known rules:—*Keep the head cold, and the feet warm. Never lose sight of the body for the sake of the soul. And, when you feel indisposed, instead of immediately taking medicine, first abstain from food for a whole day.*

It was, at one period, a very common practice among the aged Greeks and Romans, to inhale the breath of healthy children. An old and emaciated person was often placed day and night in an apartment filled with young and blooming boys and girls; the heat and breath from whose persons were supposed to create an atmosphere favourable to health and longevity. The prevalence of the opinion that this practice had a very benign influence is evinced by the fact, that about a hundred and fifty years ago, an old monument was discovered in Rome, with an inscription, in which it was stated, that one Lucius Clodius Hermippus lived to the age of one hundred and fifteen years and five days, by this practice alone. It was also stated, that this man was the keeper or proprietor of a kind of orphan school; and had thus an excellent opportunity of accomplishing his object

The great Dutch physician Bœrhaave, advised an old burgomaster of Amsterdam, to sleep regularly between two warm and healthy boys; and assures us that by these means alone, he recovered greatly his strength, vigour, and cheerfulness.

The period, however, most fruitful in fanciful notions on this subject, was that generally called the "middle," or "dark ages." The sun and moon were admitted as

exercising a most important influence on the vegetable world ; and, as it was thought the stars could not have been created for the mere purpose of shining in the firmament during the night, they were supposed to have considerable power over the body. According to their various positions and relations to the earth and each other, did they influence the health and strength of the system, and prolong or diminish the term of existence.

It was during this period also, that the opinion arose that the preservation of life depended upon certain chemical transformations ; that the discovery was expected of the "primeval matter," of which it was thought all things were first composed ; and which, it was hoped, could be separated in its pure, original state, and kept in bottles, ready to be used for the restoration of health, and the prolongation of life.

At this time also flourished the numerous modifications of witchcraft and legerdemain, with their various pretensions to power over health and life ; as also the "Philosopher's stone" (*lapis philosophorum*), usually described as a red powder, having the power to convert the baser metals into gold. At this period too, great exertions were made to discover what was called *Elixir vitæ*, or a panacea for the removal of every disorder that could possibly afflict mankind. Great search was made also for a supposed *Universal solvent*, by which all bodies could be reduced to one homogeneous condition. Ideas too, prevailed respecting "sympathetic analogy of bodies," "hidden powers," "cabala," "chiromancy," "communion of spiritual beings," and many other strange and fanciful notions, bearing upon the subject of longevity, and which are even now very far from being entirely eradicated from the public mind.

The celebrated Paracelsus, or, to give his whole charlatanical name, "Philippus Aureolus Theophrastus Paracelsus Bombastus ab Hohenheim," declared that he possessed the power to make a man live to four hundred years of age, or even to any greater extent ; and boasted that he had discovered an elixir or panacea for the cure of every disorder. This medicine was a kind of strongly exciting liquor, very similar to the sulphuric ether, of

modern apothecaries, and was sold to the public for its weight in gold. A princely fortune would very soon have been realised by its sale, had not the boasting inventor himself died a natural or ordinary death at the early age of forty-eight years! Thus refuting his own pretensions, and displaying either his great hypocrisy, or gross ignorance of the conditions and requirements of the body for preserving health.

At another period it was taught, that to restore health and prolong existence, nothing more was necessary than, by any means, to diminish the quantity of blood in the body. King Louis XIII. (treated on this plan) received within the last ten months of his life, *two hundred and fifteen* purges by medicine alone, and *two hundred and ten* by other means; making, *four hundred and twenty-five purges in forty weeks!* And, in addition to these very extraordinary evacuations, he was bled *one hundred and forty seven* times during the same period!

It was supposed by others again, that, by forcing a quantity of fresh blood, drawn from a young and healthy person, into the veins of an invalid, the spirits would be revived, and the decay of old age prevented. No sooner was the circulation of the blood, as taught by the celebrated Harvey, acknowledged, than people's minds were seized by a kind of delirium. It was thought that the means were found of curing all diseases, and of even rendering man immortal. The cause of all our evils was attributed to the blood; and, in order to cure them, nothing more was necessary, than to remove the bad and replace it with the pure blood, drawn from a sound and healthy animal. The first attempts were made upon animals, and with complete success. A dog having lost a great part of its blood, received by transfusion, that of a sheep, and became well. Another dog, old and deaf, regained by these means the use of hearing, and seemed to recover its youth. A horse, twenty-six years old, having received into its veins the blood of four lambs, recovered his strength and vigour. Transfusion was soon tried upon man. Denys and Emerez were the first who ventured the experiment. They introduced into the veins of a young man, an idiot, the blood of a calf, in greater

quantity than that which had been drawn from them, and he appeared to recover his reason. A leprous person, and a quartan ague, were also cured by these means; and several other transfusions were made upon healthy persons, without any disagreeable result. However, some sad events happened to calm the general enthusiasm caused by these repeated successes. The young idiot fell into a state of madness, a short time after the experiment. He was submitted a second time to the transfusion, and was immediately seized with *Hæmaturia* (discharge of blood with the urine), and died in a state of sleepiness and torpor. A young prince of the blood royal was also a victim of it; and in Italy two persons died after the operation. Such were the zeal and expectations of the votaries of this operation that the efforts of the satirist and caricaturist were enlisted against them and brought to bear in such a manner, that it was scarcely possible at times to distinguish truth from falsehood—to judge between the real and the fictitious reports which from time to time appeared before the public. Among other things it was seriously given out, that several individuals who had been submitted to the operation of transfusion, had begun to change their natures, and actually appeared to partake of the character of the animal whose blood had been used in the process. One, whose veins had been plentifully filled with the blood of a sheep, was represented as having a new covering of wool growing upon the skin, which would be lasting as that upon the sheep itself. Thus a new mode of supplying mankind with natural clothing, was suggested, and of putting an end to all those manufactures and trades connected with artificial coverings for the body. Pictures and engravings were assiduously circulated, representing the wonderful changes said to be produced by transfusion; some, with new coverings of wool, hair, and feathers, and others with horns, hoofs, tails, and claws, analogous to the various animals whose blood had been employed in the operations. So piercing and effectual were these satirical weapons, coupled with the several failures that had occurred, that transfusion was at length prohibited at Rome, and throughout the papal states, by the Pope, and in France, by the govern-

ment; since which time, it has generally been regarded as useless, and even dangerous.

The great Lord Bacon, whose genius embraced almost every branch of human learning, honoured this subject with attention and enquiry. His views were bold and new to the age in which he lived. He considered life as a flame, constantly acted upon and carried off by the atmosphere; and, as all known substances, even the hardest, were at last consumed by the air, he thought that by preventing this consumption, and renewing from time to time, the juices of the body, life might be greatly prolonged. For this purpose, he recommended *cold bathing*, and afterwards *anointing the body with oils*, after the manner of the ancients; also, tranquillity of mind, a cooling diet, the use of opium, and a kind of renovating process, to be performed every three or four years. This process consisted in first clearing the body of all its old and corrupt humours, by means of a very spare diet, and copious frequent evacuations, and afterwards, filling up the emptied and thirsty vessels with rich new blood. This blood to be created by means of a cooling, yet highly nourishing diet, and the repeated use of certain aromatic and strengthening baths. This he called *Renewing from to time to time, the constitution; and rendering it, as it were, young again.*

Sir Edward Barry, after investigating this subject, suggested that pulsation, or the circulation of the blood, was the cause of general decay, and death, by *attrition* or *friction*; by which the substance of the body was gradually broken down, and carried off in the various excretions; and therefore, *the only means of prolonging life, would be such as prevented pulsation, or diminished the circulation of the blood.*

One of the alchemists of the middle ages declared that it was possible to preserve life for hundreds of years, by *rubbing the body daily with oil of cinnamon, and wearing a plaster composed of certain gums and essential oils, over the region of the heart*; during which, from ten to twenty chickens (according to the appetite of the individual), were to be consumed every day. These chickens again, were to be previously fed upon food made of the

flesh of serpents, reduced to a pulp, and mixed with vinegar; a particular mode of cooking to be adopted, and the whole washed down with a pint of the best white wine. This process, continued for seven years, would enable a person to live to the age of Methusaleh!

At one time there appeared a Dr. Graham, who, in accordance with some notions he entertained of life and its requirements, constructed a curious apparatus, which he called the "Celestial bed;" this bed it was stated, possessed the power of giving to those who slept in it, a new and highly invigorated state of existence, and especially so in regard to the power of procreation, which would be raised to the highest possible degree. After a time, however, this wonderful bed ceased to exist. It was seized by merciless creditors, and sold piecemeal by public auction; when it appeared that the whole mystery consisted in the union of a constant current of electricity with certain aromatic vapours, and the delicious sounds of the glass harmonicon! All which combined, had certainly the tendency to procure a very pleasant and agreeable repose.

At another period, a famous personage, called "St. Germain," announced to the world the discovery of a wonderful mixture, which he sold under the name of "*Tea of Life*." It was capable of conferring extraordinary health and long life upon those who drank it; and, of course, the more of it was used, the longer life it would secure to the consumer. This celebrated tea was at last discovered to consist simply of *Sassafras chips, senna leaves, and sage*.

It would appear that from the earliest ages to the present times, even to our own day, mankind have endeavoured by varied, and even opposite means, to preserve health and prolong life. Whatever may be the influence of religion or philosophy in reconciling the minds of men, and making them resigned to their supposed fate, one thing is certain, that, apart from such influence, and in an ordinary state of health, all sorts and conditions of men, will from their hearts exclaim, in the language of an elegant author, "But is it not a dismal thing to die?—to leave this busy and beautiful world,—to close

the eyes for ever on all the engaging objects that surround us,—to forsake the pleasing and interesting pursuits of life,—to have done for ever with its pleasures,—to break off from every favourite scheme, and all our agreeable recreations—must not this be melancholy? And still more painful is the thought of leaving the dear circle of our friends,—to see those faces no more that are so familiar and so much beloved,—no more to make one of the social circle of which we have long formed a part,—for our voice to be heard no more in the lively discourse,—our smile never again to enliven the social intercourse! and even this is not all;—to die, is not merely to be absent (as we may frequently have been), at a distant place, from whence we could still hold some intercourse with those we love; but it is to go for ever whence we cannot either return to, or maintain any connexion with them: besides, whither is it to go? Is it not to the cold grave? This body, which has been nourished and cherished with so much care and tenderness, to which so much cost and pains have been devoted, to make it comfortable and agreeable; which has been perhaps tenderly screened from every blast—this body must lie and perish in the comfortless tomb! This is to die! thus death is naturally regarded; and therefore it is that it is an event so universally dreaded, and so carefully avoided. All ages naturally shrink from death, from the youngest child that is capable of any reflection, to the old man who has arrived at the utmost verge of life. All ranks fear it; the poor, who have so little to attach them to life, as well as the rich, whose treasure lies in this world; the servant and the slave as much almost as their master; the savage as well as the civilized." It is not in the nature of man, unless some peculiar and altogether adventitious state of mind leads him to seek relief in death, to do otherwise than exert himself for the preservation of his existence—of his present identity, and to avoid that, the consequences of which, are to all men yet a problem. The whole earth has been ransacked—probed as it were, in every possible direction, for materials to be applied for these purposes. Drugs, chemicals, minerals, herbs, nay, substances of every description, have been severally com-

pounded and administered in a thousand forms. Balsams, powders, pills, tinctures, extracts and compounds, in an almost endless variety; the application of hot, as well as of cold water internally and externally; electricity, galvanism, mesmerism, and other novelties, have for a time, occupied the minds of mankind; each in its turn, and by its particular votaries to be lauded, neglected, and forgotten. Notwithstanding, however, the knowledge and application of all these varied means, we are still deficient and dissatisfied—still we do not realize in practice any material improvement, either in our general health or the term of our existence. The very parties who made these discoveries and supposed improvements, and who rigidly carried them into practice, have been found to be no more certain in the preservation of health and life than those who, in respect to all such matters, were in perfect ignorance. These are considerations sufficient to lead us to the conclusion that the *source of the evil—the primary cause of natural death has hitherto been overlooked, has not yet been discovered.*

Let the reader then seriously remember that in the preceding pages no attempt has been made to solve this mystery upon anything like fanciful or theoretical grounds. A plain, straight-forward, common sense, practical mode of investigation has been adopted; the result of which is an unequivocal and perfectly satisfactory answer to the question, *why does old age terminate in death?* That answer may be summed up in a few words, viz:—

1st.—The body, throughout the whole period of life, is subject to a process of consolidation.

2nd.—This process of consolidation consists in the gradual deposition of earthy substances (principally phosphate and carbonate of lime); by which the various parts become ossified, or converted into matter approaching the nature of bone.

3rd.—This conversion into bone destroys the flexibility of the vessels, muscles, and other parts subject to motion; renders the blood thick and glutenous, and entirely chokes up the minute or capillary arteries; so that the circulation of the fluids, and the action of the system generally gradually diminish and terminate in death.

4th.—The introduction into the body of the earthy matter, which by thus accumulating produces what is called “natural death,” or “death from old age,” may be so controlled, that active vigorous life may be prolonged at pleasure.

The only means then by which health and life can be secured, consist in first ascertaining the nature and influence of the elements concerned in organization; secondly, learning to detect excess or deficiency in any one or more of these elements; and thirdly, obtaining the knowledge or power to supply when deficient, and abstract them when they superabound. Thus preserving health and life by maintaining the balance or equilibrium of the elements of which the body is essentially composed.

CHAPTER II.

ON THE CAUSE OF MOTION, SECRETION, DIGESTION, ETC.

IT has been distinctly ascertained, that every part of the body concerned in motion is penetrated by one or more divisions of the nervous system.

That if any one of these divisions or branches be cut asunder, the part thus separated is no longer capable of motion.

That if the stomach be filled with food, and certain nerves connecting it with the brain be divided, or even tied down, the food will remain unchanged, digestion will cease.

That if the nerves leading to the kidneys, or to the lungs, or to any other part be similarly divided, the secretion of urine ceases; the process of respiration is suspended, and the functions of every part thus separated disappear.

In cases where the suspension of any function arises from the nerves being pressed or tied down only, instead of cut asunder, immediately the pressure is removed the function recommences.

These demonstrable facts are quite sufficient to warrant the conclusion that motion, secretion, digestion, and other characteristics of living organised beings, such as man, *depend upon the brain and nervous system.*

CHAPTER III.

ON THE NATURE AND COMPOSITION OF THE BRAIN AND NERVOUS SYSTEM.

HAVING ascertained that the brain is the source of power to the body, it becomes a most important question, what is the cause of this power? Before this can be answered we must first ascertain the differences which exist between the substance of the brain and nerves, and the less or non-sensitive parts of the system. The following table exhibiting the *average* proportions of substances entering into the composition of bone, muscle, blood and brain will enable us to give this answer with the utmost certainty.

	Bone.	Muscle or Flesh.	Blood	Brain.
Gelatine	30	7	0	0
Albumen	0	22	3	7
Ozmazome	0	0	2	1.5
Phosphate, Sulphate, and Carbonate of Lime; also, Sulphates, Muri- ates, and Phosphates of Soda, Po- tass, Ammonia, &c.	70	2	12	6
White, Fatty Matter, somewhat like Spermaceti	0	0	0	5
<i>Free Phosphorous</i>	0	0	0	2.5
Water	0	69	83	78
	100	100	100	100

From this table we perceive that the only difference between the composition of the brain and the rest of the body, is the presence of white fat-like matter and phosphorus; but, as the fatty matter is composed of the same elements as the ordinary flesh, differing only in proportion, we must conclude that the presence of *Phosphorus* alone gives to the brain its peculiar properties and activity.

The proportion of phosphorus in the brain is found to vary in different individuals.

This phosphorus is the only ELEMENT of the brain which is found to vary in quantity.

This variation is found to correspond with the differences in the character of the individuals during life.

The amount of free phosphorus in the brain of idiots, is not more than from one half to one per cent.; in ordinary persons from one and a half to two and a half per cent., and in those of strong mental and physical powers, as much as three, and three and a half, and in one or two cases, four per cent. has been found. Several recent analyses of the brain matter of very powerful maniacs have given as much as from four-and-half to six per cent. of Phosphorus!

Persons who had suffered many years from lowness of spirits, melancholy, weakness of memory, and general nervous debility, were found to have less phosphorus in the brain than others of the same class and position in society, but of an ordinary state of health and mind.

In a number of experiments the brain matter of lively intelligent children has been found to contain more phosphorus than that of children of a dull and stupid disposition.

The brain matter of persons who have died of consumption has been found to contain a large proportion of free phosphorus.

Consumptive persons have been observed a short time previous to death, with a beautiful luminous appearance round the head, shining as a blue, lambent halo, or circular light.

The brain of persons who have indulged during a considerable period of their lives in drinking brandy and other spirits, has been found to contain much less phosphorus, than that of individuals who have not so indulged; in some of these cases, no more phosphorus was obtained than is found in the brain of idiots.

Similar differences have been observed in the brain and nervous system of the lower animals.

Many insects, reptiles, fish, and birds, are luminous, under given circumstances, in different parts of the body;

the glow-worm, for instance, and the millipedes, or woodlice. The slime of the white snail often leaves in the dark a luminous track. The "fire-fly," or "love-lantern," so common in many parts of America, will sometimes emit sufficient light to enable any one to observe the time upon a watch, in the darkest nights. Young females often place them in their hair when going to meet their lovers, where they shine with more splendour and beauty than the most costly jewels in the diadems of royalty. Mackarel, and other fish, will sometimes appear luminous; indeed, the ocean swarms at times with animal and vegetable structures, emitting the most brilliant and variegated lights.

"The great American bittern has the power of emitting a light from its breast, equal to the light of a torch."—SIR RICHARD PHILLIPS, *Million of Facts*, p. 153.

In most of these instances, the luminosity has been ascertained to arise from the presence of free phosphorus.

Throughout the whole animal and vegetable kingdoms, the degree of susceptibility, sensibility, vitality, and power, has been found to correspond to the proportion of free phosphorus in their composition.

The greater activity and sensibility of the nervous system over the rest of the body, is evidently *owing to the greater proportion of Phosphorus which enters into its composition!*

If then, phosphorus is the agent of both intellectual and physical power and vitality, it is of the very highest importance that we discover every property of this element, in reference to animal life, as well as the means of supplying it to the body generally, but to the brain in particular, in order that the power and activity of both body and mind, may be developed to the greatest extent.

CHAPTER IV.

ON PHOSPHORUS, AND ITS INFLUENCE ON THE BODY.

PURE phosphorus is a colourless, tasteless, odorless, transparent, semi-solid substance. It is seldom, however, obtained perfectly pure, but is often contaminated with arsenic and other substances, from which it may easily, and should imperatively be purified, when intended for internal use.

It is beautifully luminous in the dark, sometimes shining with a blue, lambent flame, and at others with a silvery, and occasionally, a rich, golden appearance. These differences probably arise from the state of the atmosphere, and its own degree of purity.

It possesses the singular property of burning brilliantly, even in a vacuum, under the receiver of an air pump.

Its specific gravity (or density, as compared to water, which is 1.000) is 1.770; at 113° it melts, at 572° boils, and passes into an invisible vapour, or gas; when exposed to the air, it gradually disappears by a slow combustion, and should be kept under water. It dissolves readily in olive oil, oil of turpentine, and most other, both fixed and volatile oils; in sulphuric ether, sulphuret of carbon, alcohol; also, in hydrogen and nitrogen gases, and to some degree in water.

If a solution of phosphorus (purified from arsenic and all other substances) be used internally as medicine for some time, it promotes both sensible and insensible perspiration; the power of the various glands and secreting surfaces is very greatly augmented, and the strength and activity of the body generally much improved. The action of the stomach is also greatly increased, sometimes to such a degree, that the individual can scarcely satisfy himself with food! yet, whatsoever amount be taken, or of whatever quality, from the lightest to the most solid, the whole will digest and pass away, without oppression or other inconvenience. If this increased action of the stomach be followed up by corresponding increase in the

supply of food, more especially if a large proportion of flesh be included, a most ferocious, tiger-like disposition is soon produced, not only in voracity and strength, but also an ever-restless tendency to exercise these, almost without scruple. Experiment has not yet determined to what extent this increase of power can be carried; but, in several cases, it has been more than trebled! Persons have been made to endure, and to overcome resistance, nearly four times greater than they ever did before. But such experiments require the utmost possible caution, or fearful mischief might result. It is believed (from some of the evidences) that it would produce the most terrible madness! On the other hand, however, it has been found of great service to persons of a dull, idiotic, or moping disposition; and there is no experience to contradict the conclusion, *that the physical and intellectual powers of even born idiots, could be very much improved.* If the *size* of the brain could not be altered, its susceptibility and activity, or *quality*, might be much increased; and, as it is a well-established law in physiology, that exercise increases, or rather determines power to any given part, and as the brain is divided into physical and intellectual regions, what should prevent the increased power which the use of phosphorus gives, from being determined by exercise or education, to the intellectual regions, and thus the mental power of the idiot improved? From the experiments which have already been tried, such an expectation is warranted. To what extent, however, such improvement could be carried, remains a question, the solution of which is worth every effort.

Another invariable effect of the internal use of phosphorus, in certain doses, is the increased action of the bowels and kidneys, so as to remove at once, and permanently, both habitual costiveness, and such symptoms of dropsy, as arise from an undue retention of urine; and even in these cases, great caution is requisite, or the excessive contrary states may arise.

But the most extraordinary consequence of the use of this element, is the great increase in sexual and propagative power, which, in nearly every case, is raised to a pitch of intensity beyond credibility; and this without

corresponding subsequent depression and debility. Persons who have lived for many years in the married state, without offspring, have soon manifested symptoms of impregnation, and the capability of procreation. Aged persons of both sexes, who for twenty or thirty years, have been entire strangers to sexual pleasures, have quickly manifested in this respect, all the conditions of vigorous youth and maturity.

Another curious result of the internal use of phosphorus, is the great *retrospective* power it gives to the mind. All the little incidents of youth and childhood, the ways and features of the earliest playmates and friends, living or dead, nay, the whole circumstances of the past, together with all the characteristics of those who have ever associated with you, up to the present moment, are recollected with a distinctness and "reality" truly astonishing! So much and of so startling a nature, could be said on this point that, for the present, and until numerous repetitions of the experiments can be instituted, silence is excusable.

The power of the brain, usually called "Perception," or the capability of "seeing through" our subject, is also rapidly and extensively increased. Dreams of so grand and delightful a character ensue during sleep, that, to avoid the thoughtless remarks of the "wise," silence may again for the present be the greatest prudence. Drowsiness and inactivity, or that peculiar state called by the French *ennui*, are at once destroyed. The strength and vigour of the whole frame increase to an inconceivable degree,—but, if great care be not exercised, and *certain changes in the composition and texture of the body be not COINDUCED, general emaciation, and the worst form of consumption will be the inevitable result.*

CHAPTER V.

ON PHOSPHORIC ACID, AND ITS INFLUENCE ON THE BODY.

WHEN phosphorus is exposed to the air, it slowly combines with oxygen, and forms a liquid compound called *phosphorus acid*. If this liquid be long exposed to the air, or currents of air be made to pass through it for some time, it imbibes a second portion of oxygen, and becomes *phosphoric acid*.

The method ordered in the London Pharmacopœia for the formation of this acid is as follows:—

“Take phosphorus one ounce; Nitric Acid, four fluid ounces; Distilled Water, ten ounces. Add the phosphorus to the nitric acid, mixed with the water, in a glass retort, placed in a sand-bath; then apply heat until eight fluid ounces are produced (distilled). Put these again into the retort, that eight fluid ounces may distil, which are to be rejected. Evaporate the remaining liquor in a capsule made of Platina, until of the whole only two fluid ounces and six drachms remain. Lastly, add to the acid, when it has cooled, as much distilled water as may be sufficient to make it accurately measure twenty-eight fluid ounces.”

By the above means, a most agreeable acid is produced, inasmuch as it is rendered free from nitric acid, and from nitric oxide, which are not so pleasant to the taste as might be desired. Still, this process is somewhat complex and more tedious than is absolutely necessary.

Phosphoric acid, however, may be formed in various ways. Besides those already named, the following are simple and easy. Take a large, round dish, capable of holding one quart of cold water. In the centre, place a pile of penny pieces, so as to stand about three inches above the surface of the water. (A piece of common brick will do equally well, or indeed any fire-proof substance.) On this pile, place a piece of phosphorus, the size of a horse-bean, set it on fire, and while burning, insert a large bell-glass (or confectioner's glass) moistened inside with water over it. Let the mouth of the bell-glass rest on the bottom of the dish, and under the

water. The white fumes which rise from the burning phosphorus are owing to the union of phosphorus with oxygen (that contained in the air within the jar), and constitute *dry* phosphoric acid. These fumes collecting on the sides of the jar, will condense, be attracted by, and combined with the water in the dish, forming *liquid* phosphoric acid. When the white fumes have been absorbed, and the glass become clear, another piece of phosphorus may be burnt underneath it, as before, and when the fumes have again subsided, another piece of phosphorus may be burnt in like manner, and so continued until one or two ounces be consumed in this way.

To obtain a given strength of the acid, say that of the London Pharmacopœia, viz., "Acidum Phosphoricum Dilutum," every twenty-eight ounces (by measure) of water, will require the combustion of one ounce of phosphorus.

Another mode is to put four ounces of the strongest and purest nitric acid in a pint glass bottle. Place this in a basin of hot water. Drop into the acid a piece of phosphorus, the size of a pea; when this melts, and begins to effervesce, or boil, add more phosphorus, by degrees, and in small pieces. If it should boil too rapidly and appear in danger of overflowing the bottle neck, it may be checked and regulated by dropping in a little cold water. But care must be taken not to add any more cold water than is just sufficient to check the boiling, otherwise it will cease altogether, and some difficulty will be experienced in causing it to recommence.

In this way, four ounces of nitric acid ought to take up one ounce of phosphorus. If, however, the effervescence ceases before the full ounce be used, then more acid must be added, until the whole ounce of phosphorus is consumed. To make the phosphoric acid which remains, of the proper or standard strength, as in the last instance, cold distilled water must be added to it, until the whole makes up twenty-eight ounces.

Phosphoric acid may also be obtained by indirect means,—the decomposition of burnt bones, pearl, ivory, blood, urine, milk, and indeed from the ashes of burnt animal matter of every kind; from many roots and fruits,

and from the leaves, stalks, &c. of all kinds of vegetables. The following table will exhibit the proportions in a few articles :—

100,000 parts of

Linseed, contain of Phosphoric Acid ...	880 parts.
Stalks of do.	118 ,,
Carrot (dry)	395 ,,
Leaves of do.	*963 ,,
Lucern (fresh)	353 ,,
Beans	292 ,,
Stalks of do.	226 ,,
Barley (dry)	210 ,,
Straw of do.	160 ,,
Saint-foin (fresh)	220 ,,
Peas	190 ,,
Straw of do.	240 ,,
Buckwheat	170 ,,
Straw of do.	288 ,,
Beet root (dry)	167 ,,
Leaves of do.	*690 ,,
Parsnip	111 ,,
Leaves of do.	*1784 ,,
White Clover (fresh)	96 ,,
Oats (dry)	70 ,,
Straw of do.	12 ,,
Rye (dry)	46 ,,
Straw of do.	51 ,,
Wheat (dry)	40 ,,
Straw of do.	170 ,,

Phosphoric acid is also found in considerable abundance in the grape, some kinds of gooseberry, sage, onions, oysters, and shell-fish generally; sugar-cane juice, but not in the refined sugar; strawberry, mustard-seed, and in the husks of most seeds; mushrooms, white snails, young frogs, kidney beans, cloves, water-cress, asparagus, mangle-wurzel root and leaves, pine-apples, dates, acorns, fennel, young radish tops, turtle, eels, soles, plaice, and other flat fish, "Sea Tang," and all sea weeds; tripe, "trotters," cowheels, and all other gelatinous parts of animals; eggs of all kinds, both white and yolks; harts-horn shavings, ivory and pearl dust; all fish and animal

* The amount of phosphoric acid in the *leaves* of carrot, beet, and parsnip over and above the roots is somewhat striking, and might be turned to great advantage in feeding animals.

bones; cheese, buttermilk, blood, and all animal solids and fluids; fine branches, bark, buds, leaves, and spring sap of all trees and shrubs; and the leaves and stems of vegetables generally.

Besides with oxygen, forming phosphoric acid, phosphorus combines with many other elements, and with many curious and pleasing results. Numerous beautiful experiments may also be performed with it, the particulars of all which may be obtained by reference to the chemical works of the day.

The influence of phosphoric acid upon the body is, if possible, more remarkable than that of free phosphorus. When taken internally, it gradually *diminishes* the ordinary decomposition or waste of the whole system. Both sensible and insensible perspiration, as well as the action of the various glands and secreting surfaces, by degrees abate. Hence, the necessity for renewal or nourishment, and the consequent desire for food and drink are correspondingly diminished.

This acid may be taken in such a manner, and with *safety*, that a person may go for several days and nights without food or drink of any kind, *except a little cold water, without suffering either from hunger, cold, or debility!* Under its influence abstinence may be practised to an incredible degree, almost with impunity!

Those who suffer from a sensation of uneasiness, or "a sinking" at the stomach for want of food, as well as those who feel an ungovernable longing for food whenever they see or smell it, will find themselves perfectly relieved from such symptoms after the use of this acid has been continued for a little time.

Those also of a thin, half-starved and cadaverous appearance (yet may be great eaters) will, by using phosphoric acid somewhat freely, soon fill up with flesh, become stout and plump to any desired degree, produce a soft and healthy skin, and remove all rough and scorbutic appearances; and, at the same time, an indifference to the most inviting food, and a perfect command of the appetite will be created. Not that the "gusto" or "relish" for food will be destroyed, but that the power of restraining the stomach, and subduing the feeling of hunger, so as to

be able to do "with or without" eating, at pleasure, which is so desirable to every refined and intellectual person, will be produced. Instead of the whole body being made a perfect slave to the appetite, and a large amount of thought being devoted to the choice of preparations to cram into the stomach, this organ will be brought under control—"broken in", as a wild colt, and be made subservient to the purposes of necessity only, and the objects and powers of the mind. Thousands of persons in civilized countries—of respectable and intelligent persons too, consider the pleasures of the table superior to any other. This feeling is quite as prevalent, if not more so, among the lower, as the middle and upper classes. Indeed, more instances of abstemiousness, and simplicity of diet, are to be found among the very highest in society, than among the middle and lower classes. But what numbers in every sphere look forward to their ordinary dinner or supper, or still more to a public feast, as the chief and greatest pleasure of life! A good "Blow out," or, as the Londoners have it, "Tuck in," is one of the most charming subjects for contemplation the mind can suggest. Many in the middle and lower classes are known to actually starve themselves for a whole day, when the prospect of a public dinner is before them, the very idea of which often makes their "mouths water", the mind gloat, and the stomach twitch again, with anxiety and expectation. It is not a rare instance on these occasions, when the stomach is loaded to excess, for the animal to vomit, either spontaneously, or by an emetic purposely taken, to clear away, and relieve the oppression of the system, that a repetition of the "glorious feast", the splendid beastiality, may be indulged in. Of all degradation, submission to the appetite is the deepest! Of all slavery, it is the worst! and of all tyrants, the stomach is the greatest! If there is one obstacle greater than another to the improvement and perfection of humanity, it is the indulgence of the digestive organs! And such is the waywardness of mankind, that the facilities offered for this indulgence, are looked upon as the index or measure of a nation's progress and civilization! These remarks, however, are not intended to convey a

reproach to those who yield to the pleasures of the table, however anomalous this may appear, but only to hint that whenever the feeling of hunger is in abeyance, whenever there is no strong or inordinate desire for any particular kind of food, it is most conducive to health, to the exercise of thought, and far more rational and becoming a man of intellectual refinement, to be sparing in quantity, and simple in quality. If the decomposition and waste of the body is great, and the stomach correspondingly active, the most nutritious food, and in the greatest abundance, ought and must be taken, otherwise the system will be injured. What is here suggested is simply this;—that whether in children or adults, when an ever-craving appetite exists, and the feeling of hunger is severe, and, as it often is, unbearable, rather than give way to these symptoms and become an immoderate eater, it is better to use phosphoric acid freely, until this state of the system is removed, *and then to practise abstinence, both in eating and drinking, as much as possible!*

Another very desirable result of the use of this acid is constant good temper and cheerfulness. Ill-temper and moroseness are as much a disease as fever and influenza, and ought to receive equal remedial treatment. A snarly, selfish, “good-for-nothing” person is as much an invalid, only of a different kind, as any that ever received the attention of a physician. A patient afflicted with these disorders commands our pity and assistance as much as any other. An asylum or hospital for bad temper and selfishness, is quite as much needed as those which exist in such abundance for other infirmities. What greater, both mental and physical misery, can a sensitive mind experience, than the constant presence of a morose, ill-tempered, ungenerous, and suspicious partner? What greater relief could be given to such a mind, than the removal of such a partner to some hospital expressly suited for such cases? These remarks are intended to convey the idea that persons thus afflicted are deeply and seriously diseased, and require sympathy and help, rather than blame and resistance! It is possible to cure such persons; and the means whereby this may be accomplished, is a fit subject for the investigation of philo-

sophers. It cannot be too strongly impressed upon the mind, that *the moral tendencies of mankind depend entirely upon their physical condition!* The influences of education and religion are only required for, and are entirely expended upon the constant promptings of the physical nature! It depends then upon the condition of the body, what effects religion and morality produce! One species of food will create a disposition to cruelty and brutality which the strictest religious training can only restrain and keep down, but never destroy; whilst another dietary will produce habits and feelings in which the purest religion and morality are embodied.

The use of phosphoric acid, with suitable diet, offers both a preventative and an antidote to these very disagreeable and misery-producing disorders!

There are reasons (though as yet but few) derived from experiment, for concluding that the proper use of phosphoric acid would *greatly diminish the ferocity of maniacs!* No doubt, madness may be mitigated; its savageness subdued, by pathological treatment, more than by discipline; but to what extent, requires a proper course of experiments, and constitutes a problem worthy of our utmost efforts to solve.

The use of this acid also increases beyond ordinary credibility, the power of enduring labour and fatigue, and of resisting the influence of the weather,—winds and rains seem to have little effect upon the body! It also greatly improves the voice and the power of the lungs. It augments the natural and healthy temperature of the system, so as to diminish the necessity for clothing and artificial heat.

Another singular effect of phosphoric acid is, that, the direct contrary to the influence of free phosphorus, it very much diminishes *not the capacity* for sexual enjoyments, but the *desire* for them! That, although in the highest state of health, cheerfulness and activity, that carelessness and indifference is experienced, such as we observe in healthy, buoyant, and well-trained children!

As the use of free phosphorus produces watchfulness and an incapacity for sleep, phosphoric acid, on the contrary, in large doses, produces a perfectly narcotic effect.

If it be taken largely, long-continued and perfectly oblivious rest is the result.

The continued use of this acid also produces a dislike or loathing for narcotics of every other kind. Fermented liquors, spirits, tobacco, opium, heated atmospheres, heavy clothing, confined apartments, and other artificial things and habits become perfectly obnoxious; and a strong desire is constantly experienced for a more simple, free, and natural state of existence.

The many experiments which have been instituted prove, that phosphorus, in various forms, is an element possessing extraordinary power over the system; and which, at no distant period, will draw the attention of medical philosophers to its properties and uses in the animal economy. Its successful application in great numbers of cases of the worst and most complicated forms of disease, warrant the assertion, that *it is the most valuable remedial agent known to the world*. Properly prepared, purified from all adventitious matter, and cautiously administered, it will restore the essential functions of the system with a promptitude and certainty unknown of any other article of the *materia medica*. Every disorder which can be traced to deficient vitality, to want of energy, will immediately yield to the presence of phosphorus; and simply, because it is the agent of power, the only active element of the brain and nervous system. In several instances, the ordinary infirmities of old age have been almost entirely removed. Some, both male and female, between seventy and ninety years old have had all the powers and vivacity of the "prime of life" restored, not only in one or two, but in all respects. The practical experience which has already been had with this substance, in its application to the body, is pretty extensive; but to give the particulars, would fill a volume of considerable magnitude; and, besides, would necessarily become of too technical and tedious a character for the popular reader. It would in fact be nothing less than a strictly pathological treatise.

CHAPTER VI.

GENERAL SUMMARY AND PRACTICAL SUGGESTIONS FOR
ATTAINING LONG LIFE.

FROM the several preceding chapters, may be gathered the following essential conclusions :—

1st.—That the living human body is a mechanical structure, consisting of elastic, moveable solids, vascular branches, porous masses, and circulating fluids.

2nd.—That these solids and fluids, are composed of various organic and inorganic elements—constituting, in fact, a chemical compound :—

The whole unceasingly acted upon and kept in motion by some imponderable, invisible agent, or entity.

3rd.—The constant tendency of this agent is to produce change or motion among the fluids and solids of the body :—

If the blood, as the chief fluid of the system, be unopposed, unobstructed in the vessels and chambers which contain it, simple, *mechanical* change, or “circulation,” is produced. If, however, resistance is offered in the vessels, and either the whole or a part of the blood becomes nearly or entirely stationary, then *chemical* change, or *decomposition*, constituting disease in various forms, is the result.

Illustrations.—If the materials for making ale or wine, be kept in constant motion, *mechanically*, no *chemical* change, or *fermentation*, will take place.

The same in making bread. The flour, water, yeast, &c. will not ferment, no *chemical* change will be produced, if the whole be kept in a state of agitation, or *mechanical* change.

Water, although confined in vessels, if kept in constant motion, will remain pure; but, when allowed to be at rest, putridity, or decomposition, soon occurs. Brooks and rivulets preserve their sweetness, whilst stagnant waters quickly become subject to decay, or *chemical change*.

So it is with the body. As long as the fluids *circulate freely*, or move *mechanically*, no decay, or *chemical change* can occur; but the moment obstruction takes place, and the blood stagnates, decomposition commences, the degree and rapidity of which, indicate the extent and severity of the *consequent disease*!

“It cannot be told in fewer words, than that Health is a *free circulation*, and that Sickness is an *obstructed circulation of the blood*.”—HARVEY, *the Discoverer of the Circulation*.

4th.—The comparative fixidity and rest of the solid parts of the body, render them subject to chemical change, or decomposition—constituting the decay, or waste, of the system.

5th.—The free mechanical motion, or “circulation” of the blood, throughout and among the solids, is essentially necessary to the supply of new matter, that the various wasted or diminished parts may be restored.—*This constitutes in full the process of nutrition*.

6th.—The blood thus depositing in its course the elements of restoration and renewal, necessarily requires, for a continuation of this process, to be recharged with nutritious matter.

7th.—This re-supply of nutriment is derived from food. Hence alone, the *necessity* for eating and drinking. If the body were not subject to chemical change or decay, no food or drink would be required to preserve its identity!

8th.—Different kinds of food possess different properties. Some are lightly, others heavily, charged with earthy substances; which, depositing in the tissues, fibres, and vessels of the body, render them rigid and resisting; obstructs the circulation of the blood, creates disease, pro-

duces the infirmities of old age and decrepitude, and finally results in that solid, choked-up, immovable, insensitve state, called "Natural Death".

Illustrations. — The waters of different springs and rivers, hold in solution different proportions of earthy and saline matters, and the vessels in which these waters are boiled and evaporated, become more or less, incrustated, or "furred up"; the degree and extent of incrustation being in proportion to the amount of solid matter held in solution.

Different kinds of coal, wood, or other fuel, contain different proportions of inorganic elements; and, after combustion, leave different quantities of ashes.

So it is with the food of man. The proportion of inorganic elements in general, but of earthy matters in particular, is exceedingly various, and tends correspondingly, to the consolidation and inactivity of the body.

So again, some kinds of food are more liable to chemical change or decomposition, than others. Hence it is that articles of diet differ in value.

Illustrations.—Some kinds of fuel burn away, or decompose much more rapidly than others. One kind of coal, for instance, is much "swifter" than another. Oak wood again, will not burn so quickly as pine, and other light timber.

Different fluids ferment and decay, with different degrees of rapidity. Sugar and water, flour and water, and different vegetable decoctions, quickly decompose, and form vinegar and other products: whilst solutions of animal and vegetable matter, impregnated with different acids, minerals, earths, and neutral salts, will preserve their conditions for various lengthy periods.

So with food. Some kinds decompose, and pass away much sooner than others. The substances which resist chemical change, and preserve their identity in the body for the longest period, are the most valuable as food, the most conducive to health and activity, destroy the necessity of eating and drinking for the longest period, and thus prove the most economical in the end, whatever might have been their original cost.

9th.—The direct cause of obstruction is the presence of earthy, inorganic matter, deposited in the system by the blood, and derived originally from the food and drink.

10th.—The cause of the *necessity* for food and drink, is the constant decay, or decomposition of the system; the extent and rapidity of which, depends solely upon the composition of the body, as a whole—*upon the degree of resistance it offers to chemical change!*

Here then, is the grand secret to preserve health, activity, and life, at pleasure! That secret, which the philosophers of all past ages have sought in vain to discover! A few words will express this secret, and embody the substance of many years' anxious labour and investigation:—Check the waste or decomposition of the body, and thus diminish the necessity for eating and drinking! In proportion as this can be done, the deposition of earthy substances in the body, the consequent obstruction to the circulation of the blood, and liability to disease, decrepitude, and death, will be prevented!

To check the waste of the system, numerous experiments have proved that the *best means* is the judicious use of *Phosphoric acid*.* Then, as the appetite diminishes, and the strength and activity of the system continue the same (which will be the case if proper care be taken), let the use of food be avoided! Practise abstinence, long fasting, and take as much exercise as possible, in order to increase the *mechanical* motion, or circulation of the blood. But, in no case, let fasting be continued long after a feeling of hunger is experienced. When a desire for food comes on, take it, and let it be such too, as can be enjoyed. But continue to increase the doses of Phosphoric acid, as it is found to be convenient and congenial to the feelings. Whatever be the quality of the food taken, let it be remembered, that, the decomposition or waste of the body proportionally checked, **THE LESS A MAN EATS AND DRINKS, THE LONGER WILL HE LIVE!!!**

* The dose of phosphoric acid is, for an adult, from one drachm, to half-ounce; but the reader had better seek the advice of the author, which will be given freely

There is no law of nature which limits the period of human life! On the contrary, disease and death, at any period, are *consequences of violated* natural laws! Health and life, so far as the physical structure is concerned, are placed entirely in our own keeping; and, in this respect, ignorance is the curse of mankind. The wise man hath said, "Seek not death in the error of your life; and pull not upon yourselves destruction with the works of your own hands."

"Fools die for want of wisdom."

THE END.



