

An essay on the wear and tear of human life : and the real remedy for this complaint / by G.T. Hayden.

Contributors

Hayden, G. T. 1798-1857.
Royal College of Surgeons of England

Publication/Creation

Dublin : Fannin ; London : W.S. Orr, 1846.

Persistent URL

<https://wellcomecollection.org/works/ausrc3g3>

Provider

Royal College of Surgeons

License and attribution

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

AN ESSAY,

&c. &c.

CHAPTER I.

GENERAL IDEA OF ABSORPTION—ANALOGIES IN A SOCIAL POINT OF VIEW BETWEEN MIND AND MATTER!—EXCITANTS OF ABSORPTION—DEPRESSION OF THE VITAL POWERS—SOCIAL RELATIONS RESPECTING ABSORPTION.

THE principal functions for the preservation of the individual are, owing to the seat of their performance, and the end in view, called internal, nutritive, and assimilating. They comprise the following :—1, Digestion eliminates the nutritive part of the food ; 2, Absorption conveys the latter into the blood ; 3, Circulation carries the blood to all parts of the body ; 4, Respiration, and 5, Secretion, purify this fluid. The blood, so replenished, purified, and animalised, becomes now suitable for the end in view, namely, 6, Nutrition.

Having treated of Digestion at considerable length,* the next function in order I shall have to consider is—

ABSORPTION,

for it is by the agency of this important process that the nutritive chyle—the product of digestion—is conveyed to the blood.

* "Physiology for the Public," Part I., price 6s., which completes the subjects of Digestion, Diet, and Regimen.

Absorption, general Idea of.—Well, every body knows that to absorb means to suck up, consequently the vessels which perform this function ought to be named absorbents.—The blood is that wonderful fluid which, when sent to the different parts of the body, constitutes the material from which the specific product is elaborated by the respective organs; for example, gastric juice by the stomach, bile by the liver, phosphate of lime in the bone, and fibrin (flesh) in the muscle. This curious and inscrutable process is called secretion, the deeply-veiled offspring of life! We may now add, that the vessels which carry out the blood from the heart for the foregoing purpose, are named *arteries*; those that return the blood which remains after this process of secretion, are called *veins*; the third set of vessels found in the body are *absorbents*; these, when they open on the internal surface of the intestine, absorb the nutritive portion of the food, eliminated by digestion, and as this product (chyle) so resembles milk, the vessels which convey it to the blood were hence named by their discoverer, *lacteals* (*lac*, milk). I have given you, as yet, but an incomplete general idea of this function, inasmuch as the act of absorption is constantly going on throughout the whole body as well as in the digestive tube; for the arteries are always depositing (secreting)—renovating the machine, consequently the old particles have to be removed as a preparatory process to make room for their substitute, the new matter. This latter function is, also, appropriately named absorption; the vessels in this case, as in the instance of the lacteals, are named, from their appearance, lymphatics (*lymp^ha*, water), because the contents are a colourless liquid like water.

You will perceive from what we have just stated, that

it is almost impossible to convey an adequate idea of any one function without alluding to others ; all are so mutually linked, associated, and reciprocally tributary ; but this, instead of burdening the memory will be found to assist it, increasing the interest of the subject ; calling forth our admiration, and securing our attention.

The matter may be briefly stated thus :—The heart sends out from its left cavities pure arterial blood by vessels (arteries), which fluid ministers to all the wants of the system. The veins receive and return the remaining blood, now impure—having lost a certain quantity of its constituents—to the right cavities of the heart ; whence it is sent to the lungs to be purified by the function of respiration ; after this, it is again brought back to the left cavities of the heart, and thence reconveyed, by the arteries, to the general system, for the purposes above-mentioned. The constant waste of the vital fluid, caused by the formation of the various secretions, must be compensated or balanced ; this is effected by the supply called chyle, the nutritive product of digestion, brought by the absorbents (lacteals) to the blood. Into this latter fluid is also poured the contents of the lymphatics, the other branch of the absorbent system, which we have just described as destined to remove the old materials ; which, according to a law in the animal economy, become incapable of discharging their appropriate functions ; they must, therefore, be replaced by new matter, secreted by the arteries. An accidental circumstance led to a demonstrative proof of the rapidity of the foregoing absorption and substitution in the hardest parts of the body. A young animal, having had madder mixed with its food, will soon present the following curious phenomenon, namely, its bones becoming tinged with a reddish colour. If the madder be suspended, even

for a *short* period, the bones will be restored to their original colour, owing to the speedy absorption of the recently deposited phosphate of lime of the carmine tint.

We shall next endeavour to elucidate generally this function—absorption—by a reference to familiar circumstances. It is plain that neither a plant nor an animal will preserve a healthy existence without sufficient support; the roots of the former imbibe nourishment from the earth; the lacteals, true internal roots, of the latter, absorb from the food contained in the alimentary canal, its appropriate aliment.

Now, a nation, like a plant or an animal, must have its needful supplies, or it will be starved out. So that look at the function as you will, individually or nationally, it is indispensable and paramount. Support, growth, and renovation are a constant demand or expenditure, and consequently should be met by a commensurate supply or income.

If an individual, a family, a nation, expend, in the ordinary affairs of life, all they respectively receive, it is “a tight pattern,” nothing to spare; however, they “make both ends meet,” and there is no embarrassment suffered, nor national debt incurred.

Was it not the shrewd and prudent Franklin that once said, “Save a sixpence?” ay, “lay something by for a wet day or a sore leg,” as we say in Ireland; for it is not quite enough to keep your condition only, you should put up a little additional flesh and fat, as a sort of saving-bank stock. Adelon and Adouin conceive that the principal use of the fat of animals is to serve as a reservoir* of nutritive matter when the body is deprived of its regular supply

* Fat is four times as nutritive as lean.

by the ordinary channel. Hybernating animals afford a striking and interesting proof of this fact, for they are reduced, at the termination of their torpid state, from a condition, previously very full, to one of an opposite kind, owing to absorption of their fat; but still starvation is thus prevented by this provident provision of nature, for "the cold day."

I need not dwell upon the inevitable results, in a social point of view, which must be consequent upon a supply insufficient to meet expenditure or wants. The individual, the family, and the nation, thus circumstanced, are all alike affected and beset with debt, difficulties, and dangers. In the case of the individual, observe how his body corporate has lost its round, plump, and fair proportions—the pallid cheek, lack-lustre and sunken eye—the attenuated limbs—the shrunken and shrivelled skin, all proclaim that the blood, *unreplenished* by healthy and sufficient absorption, no longer sends its current rich with supplies for the gnawing wants of its hungry expectants. In short, emaciation "marks him for her own!"

Having thus far attempted to illustrate, generally, nutritive or lacteal absorption, I shall next direct attention to that species of this function by which the old material is removed to make room for the new; for after the lapse of about seven years, it is concluded that our physical organisation has undergone a total change. The absorbed matter so removed, is thrown into the general circulation, and is either expelled by *excretion*, as effete, or employed in some secondary way in the system by the help of *secretion*.* What an analogy do we observe every day in the

* Both *excretion* and *secretion* are performed by blood vessels; in the former case, the matter produced is generally either useless or injurious, and hence is expelled from the system, while, in the latter instance, the product is useful for the body, and consequently it is retained.

social world; when friends, acquaintances, servants, and furniture, have served their turn, one and all are either ejected from our houses, or come to play "second fiddle!"—They are supplanted by the new.—The old rectangular sofa, and the antique straight-backed easy chair, give place to their more springy and graceful rivals which display the Grecian bend, and the Hogarthian curve of beauty;—the former are either banished as rubbish and *lumber*, or transferred to a bed-room, or an attic, as their *now* appropriate abode.*

We next come to consider *the circumstances that put the action of the organs into play, and which are named the excitants of the function.* Amongst the most prominent excitants we may rank all causes which depress the vital powers: as inanition, depletion, fasting, nausea, fright. The lean and hungry man has his absorbing system in an active and craving condition, as one would naturally expect, in order to obtain the needful supply for the urgent wants of his body. We have before, when on the subject of breakfast, alluded to the well-ascertained fact—generally known—that the fasting individual is much more obnoxious to contagion, and all other causes of disease, than he who has breakfasted, owing to the stimulus thus given to the absorbing vessels.

Collections of matter (abscesses) have been absorbed during the nausea of sea-sickness—a *quid pro quo*, or "value received!" The *depressing passions* are popularly known to render the system of the individual thus influenced, more susceptible of contagious disease. He who fears a fever, is often but too sure to catch it! The predispo-

* *Tempora mutantur et nos mutamur in illis:*

"Men change with fortune, manners change with climes,
Tenets with books, and principles with times."

sition in the last instance is, however, double,—physical and mental. We before alluded to a case in which a lady, that had previously suffered from fever, was seized with a second attack of this disease, from merely seeing the fever-cart pass by, and at such a distance and under such circumstances, as completely precluded the idea that the malady had been caused by absorption.

A damp and cold atmosphere proves a decided excitant—hence, foggy days and night air prove so insalubrious; acting in two ways, indirectly, by their depressing influence, and, directly, by the stimulus which such an atmospheric condition is well known to produce. This will be still more aggravated should the damp air be tainted with miasmata—the foul exhalations emitted from vegetable and animal matter during decomposition—which occur in fenny, marshy countries, and in crowded, filthy, ill-ventilated, and densely populated city districts.*

Fumigation excites the absorbents. It proves a speedy mode of introducing substances into the system—the minute division of the matter, and the extent of surface to which it can be thus applied, readily explain the effect so produced. The injurious influence caused by arsenic and mercury, when these metals are in a state of sublimation, is but too well known to artists—this fact is attributable to the activity of the lining membrane of the lungs, as an absorbing surface.

* My esteemed friend, Dr. Meyler, in his admirable work on Ventilation, observes (page 112): "Though the sources of most of these contagions have been covered by an impenetrable veil, the human body may truly be considered as the hot-bed in which these monstrous compositions are multiplied, fructified, and diffused." Again, (foot note,) he adds: "It seems to be a general law of animal nature, at least among the *mammalia*, that the accumulation and stagnation of the exhalations of the living body produce disease. The *glanders* of horses arise only in large stables, and the *distemper* of dogs in *kennels*. During the American war, live sheep were sent across the Atlantic. In a few weeks, in consequence of being crowded in a ship, they all died of a febrile disorder."

Friction is well known to increase the action of the absorbents : besides directly stimulating these vessels it tends—when a substance is rubbed on the surface—to force it mechanically into their interior, as is well conveyed by the common phrase “rubbing in” where mercurial ointment is thus used, as for example, in the treatment of liver disease. Friction, more especially when conjoined with pressure, used to stimulate the absorbents of the extremities, should be uniformly employed from below upwards, as this is the natural course of the contents of the absorbents ; and also, as their valves do not permit of regurgitation. Simple friction only has been employed successfully in the removal of white swelling, owing to its well-known influence over indolent absorbents.

Pressure,* slight and temporary, produces thickening, and consequently deposition ; but, when firm and long continued it excites absorption of the part so acted upon. The attenuated limbs of the mendicant afford abundant proof of this position. The sturdy beggar with the legs of a chairman would be quite out of character, and therefore, an unsuccessful suitor for sympathy and alms :—he, skilled in practical physiology, tightly bandages his legs,† in order to reduce their fair and plump proportions to suit the calling of one who has an indignant horror of “*vrk*,” and such-like laborious exertions.

* The whole function of external absorption has been said by Barry to be a physical effect of atmospheric pressure. Although we may not yield our assent to this sweeping assertion in reference to the influence of pressure from without, we should not, however, be prevented from the partial and practical application of the principle : “The same dose of poison which, under ordinary circumstances, destroyed an animal in a few seconds, was rendered completely harmless by the operation of the vacuum ; and when the symptoms had commenced, and even when they had proceeded so far as to impress the spectators with the idea that the life of the animal was destroyed, still the vacuum had the effect of speedily and entirely removing them.”

† Bandaging the legs in dropsy is well known to contribute materially to the absorption of the morbid fluid from this situation.

Exercise must hasten the contents of the absorbents by the pressure of the muscles sending—owing to the valves—the absorbed fluid uniformly inwards.

Irritants excite absorption, as may be familiarly instanced by the effects of turpentine and a common blister; in this case, the cantharides may be absorbed and quickly produce strangury.

The lining membrane of the lungs, of the alimentary canal, and the skin, are the great absorbing surfaces; of the first and the last I shall have to treat when considering the subjects of respiration and the sense of touch; but for the present, I need only say that the absorbents of the lining membrane of the lungs are those which are most speedily affected; as may be directly proved by the effects produced upon the kidneys, when breathing an atmosphere impregnated with the odour of turpentine.*

The cuticle, or thin outer layer of skin, tends very much to prevent absorption, but it has been abundantly proved that simple immersion of any part of the body will be followed by imbibition: still when we wish to secure quick absorption, we remove—as by blistering—the cuticle; or we scratch the latter through, as in ordinary vaccination with cow-pock.

When speaking of income and expenditure, in illustration of the physical functions of absorption and secretion, I then mentioned that, in a social point of view, it had been better to lean towards an excess of the latter: laying up, as in hybernation, something for “a cold day.” We have seen that whatever depresses the vital powers, increases the tendency to absorption. So it is, or should be, in the ordinary affairs of life; when a man perceives that there is a

* In this case, the secretion of the kidneys has the odour of violets.

general depression of trade—a want of healthy reaction and steady return in all the departments he is concerned with, it then becomes him to expend with cautious calculation and prudence; and, also, to gather in with energy those means which depressing contingencies are found naturally to demand.

We have seen that depletion excites absorption. In the same way, if the considerable demands of creditors drain a man's purse, it is only natural and provident that he should, under such excitation, get a sharp desire to restore the loss thus incurred. With an appetite so keen for scraping in, his debtors will often call him a dun, a leech, and vote him a bore. His apology should be what John Hunter assigned very often, in physiology, as a cause, for want of a better explanation: namely, the "stimulus of necessity," or the plain aphorism that those who would always pay, must, to support their credit, be paid in return.

Now, when a poor frog is placed in dry air, he exhales a considerable share of moisture; i. e., meets the demands made upon him by his thirsty neighbour, atmosphere. Is it any wonder that his provident legs, when next immersed in water, should, as they really do, quickly absorb nearly his own weight of the fluid so supplied!

Now, the condition opposite to depletion is repletion, and so, in the animal economy, their effects are also opposite. In the latter condition—the body saturated with fluid—absorption goes on slowly, but exhalation takes place speedily. Here the body teaches a useful lesson by analogy to the mind. It indicates that when Providence has blessed you with plenty, you should say, "*Ohe jam satis!*" i. e. arrest not only your absorption—scraping and hoarding—but also commence exhalation, namely, giving to the hungry, the thirsty, and the naked, of your abundance, until you

bring exhalation and absorption to nearly balance each other—the healthy standard, that is, neither riches nor poverty, but the happy equilibrium, *content*.

How different is the worldling! You may observe that in our physical nature absorption and exhalation mutually adjust each other; they are in inverse proportion. The wealthy man, as long as he is such, ought freely spend (exhale), but his rich condition (repletion) should be a barrier to his scraping and hoarding. The poor man, as long as he is such, ought carefully gather (absorb), but his poor condition (depletion) should be a check to his freely spending, or idly scattering his remaining substance. How opposite is our experience of the world! The more money a man makes, the greater is his desire to hoard and to gather—"Much will have more!" *Amor nummi crescit quantum ipsa pecunia crescit*: or, the despised wretch gloats over his wealth and exclaims—

"—— Populus me sibilat; at mihi plaudo
Ipse domi, simul ac nummos contemptor in arcâ."

His money bags are his idol!

See the poor man, whose condition would render economy—nay, almost parsimony—prudent and praiseworthy: what is his course? if not one of reckless extravagance, it is frequently, to say the least, improvident: aping, without the means, the condition, and appearances of his rich neighbour, and with, *nitor ultra vires*, sacrificing, by a ruinous expense, all real comfort upon the absorbing and seductive shrine of vanity!

Well, *fasting* is certainly a good mode of creating an appetite: we have seen that it is a decided excitant of absorption. Empty pockets, like empty stomachs, are craving, gnawing, and gapping things, crying, "give, give!" Some

fast and keep "a black lent" for the good of their souls but we rarely find this mortification inflicted voluntarily, for that purpose, in relation to the tempting article, *cash*! We all of us "remember to forget" how hard it is for the rich man to enter into the kingdom of heaven!

Should dame Fortune suspend the usual supply, and leave us to exclaim with the poet—

"She's gone unkindly, and refus'd to cast
One glance to feed me for so long a fast,"

our craving is not a whit the less; and if the goddess will not choose to let fall a golden shower, we crave her condescension for some silver favours; nay, sometimes driven to desperation, we fain put up with vulgar fare, worse than crumbs and leavings—vile rubbish, copper money! We should excuse the poor starving dogs. Hunger breaks through stone walls to appease her gnawing, greedy officers,—the absorbents.

The Chancellor of the Exchequer, after a falling off of the revenue, gets a craving, absorbing appetite, owing to short commons; gathers in with goût the proceeds from quack medicines; never putting his nose to the cash to ascertain whether it be rank of the carcasses prematurely consigned to mother earth by the population-thinning empiric. The dirty work and dirty hands of the quack earn clean money for the government. "It would," the Chancellor avers, "be very foolish and cruel to *make* folks wise and prudent, when to be ignorant is far more blissful." The Home Secretary echoes the sentiment, and adds, "how can we change human nature?—'she's a rum'un'; credulity is our besetting sin—

'For sure the pleasure is as great
Of being cheated as to cheat!'"

Nausea, we observe, excites absorption. We suppose with reference to cash, it is like turning up our noses at what we cannot procure; affecting to despise the sordid crew that seek the vile pelf; saying, that we are *sickened* at the sight of what we are longing, and languishing, and craving to possess—the sour grapes that cause us to lick our lips and silently regret that they are placed beyond our reach! It is truly Spartan-like, to cloak the vulture appetite under the nauseated aspect of sovereign contempt of the very thing for which we would fiercely grapple, if we could but dare to clutch!

Fright excites absorption. Observe what an effect the depression of the funds produces! The monomaniac miser trembles from head to foot, for he cannot exclaim with Lovegold, “all’s well, Lappett; my dear money is safe!” The man with almost countless treasures, labouring under the insane dread that he and his family may perish from privation, sells the last blanket of the poor man—casts others into prison, in order to wring from the starving wretches that which his affrighted soul absorbs so greedily!

Some substances will affect by *fumigation*, which if merely applied on the surface will not be absorbed, as we may observe in the example of *quicksilver*. Some, also, we see so fastidious, that they will not receive money under the influence of ordinary stimuli: these must be essayed by *sublime* methods, in order to induce them to condescend to receive the insinuating metal, introduced after so penetrating a fashion!*

* A party of tourists after visiting the splendid mansion of an illustrious nobleman, were at a loss to determine whether his lordship’s housekeeper would be offended by the offer of a gratuity, when one of the company, an American gentleman, said he would give her a hint; whereupon he stepped up to the lady housekeeper and said, “Pray, ma’am, do you take vails?” The lady replied to his *Yankee sublimity*, by saying, “anything presented by so polite a gentleman she

Friction, we have seen, proves to be, in the animal economy, a decided excitant of absorption. It will be understood that the friction of man against man produces the same effect in the social system:—the wear and tear—the rough rubs—the elbowing—the grinding—the rubbing out from recollection of the impressions of kindnesses bestowed and favours conferred: the obliteration of the laws of honour and honesty, and also the traces of gratitude, from the tablets of memory: all constantly remind man that while he continues in the haunts of his fellows, he ought ever hold in recollection the fact, that one of the uses of this attrition is, to produce proper notions of the world, and, consequently, induce us to provide plenty of the lubricating fluid (cash)—the ameliorating oil, which causes us to glide smoothly through the pressing and jostling crowd; or—again, enables us, like a soaped pig, to elude the grasp of the “great unwashed;” or—still better, while smeared with this cod-liver oil,* more antidotal than Rowland’s Macassar, we become as slippery as eels in their own slimy bed, or muddy medium, escaping the grasp and observation of the hand and eye!!

Pressure is well known to excite absorption. Of all kinds of infliction the pressure from without caused by want of cash, is the most intolerable. It is a law in physics, that the elasticity of the air contained within the body, is equivalent to the pressure of the external atmos-

could not think of refusing.” If the offer of money for acceptance (absorption) requires *sublimier* methods than the “American hint” for its successful ingress, we may set down such cases as rare ones—the exceptions, for

“ ’Tis a very good world we live in,
To lend, or to spend, or give in,
But to beg, or to borrow, or get a man’s own,
’Tis the very worst world that ever was known!”

Old Truism.

* This wonderful oil is a panacea for all the ills that flesh is heir to

phere. Now, if nothing be within to counteract this external pressure, I need scarcely add, that the individual thus circumstanced must yield: he cannot by any chance escape the circumambient agent, for air is everywhere; so, in the social world, the pressure (imposition) exercised, and the demands made on our purses are besetting and unremitting, and should constantly excite our *absorbing* powers, in order to preserve the balance of power, *i. e.* duly regulate income and expenditure.

Irritation is a term of very extended signification, both in the physical and moral world. In the social circle we suffer so much from this agent, and cash so protects us from its consequences, that, hence, irritation naturally proves the most salutary stimulus in exciting our absorbing powers for the production of income, or the realization of money.

In this case, a negative cause (want of cash) proves to be a positive irritation; present necessities, postponed demands should, and do rouse the sluggard, exciting him to be "up and doing," to escape want and mortification, otherwise inevitable.

CHAPTER II.

SUMMARY ANATOMICAL DESCRIPTION OF THE ORGANS WHICH CONCUR IN THE FUNCTION OF ABSORPTION, OR OF THE APPARATUS BY WHICH THIS IS EFFECTED—VARIETIES OF ABSORPTION—RELATION OF ABSORPTION TO OTHER FUNCTIONS—UTILITY OF ABSORPTION—SOCIAL AND PRACTICAL ANALOGIES.

THE special organs engaged in the performance of this function are fourfold, namely, the lacteals, the lymphatics, the conglobate glands, and the thoracic duct; but it has been unequivocally proved that blood-vessels, arteries, and veins, and membrane* also possess a power of absorbing both in their living and dead condition. I shall next proceed to describe, generally, these parts in the order of their enumeration. When alluding to the circulation, I mentioned the three leading parts of it, namely, a heart to propel the blood; arteries to carry this fluid to all parts of the body; and veins to bring back the vital current to the great central organ—the heart. In this function we commence with the egress; in absorption we begin with the ingress of a fluid, by means of vessels, named lacteals and lymphatics, which pour their contents into the conglobate glands—sort of stopping-houses—on the way to the great reservoir called thoracic duct; which tube finally empties the product of these two tributary streams into the current of the circulating blood. The *lacteals* are the vessels destined to convey the nutritive

* Cellular plants absorb from every part of their surface, e. g. *algæ*. In vascular roots there are special organs—spongioles only absorb.

product of digestion to the thoracic duct: they were thus named by their discoverer Aselli (1622), owing to their contents (chyle) appearing milky (*lac*, milk). The lacteals commence upon the lining membrane of the alimentary canal by very minute orifices, and, as capillary tubes; their numbers are incalculable. These innumerable and minutely delicate vessels communicate freely with each other—increase in size while they diminish in number, and ultimately form trunks; these consist of two coats—a lining one, which is thrown into valves, to prevent the retrograde motion of the contents towards the intestine; and an outer contractile membrane, to propel the chyle. These tubes, though fine, possess considerable strength—they may be distended far beyond their natural dimensions without being ruptured: when thus injected they resemble a string of beads, owing to the jointed appearance which these numerous semilunar valves, disposed in pairs, cause them to assume.

The *lymphatics*, in their coats, valves, communications, and destination, as well as in contractile power, resemble the lacteals: they, however, differ from the latter in their situation, contents, and universality; the lacteals are confined to the digestive apparatus, and convey only chyle, while the lymphatics are everywhere, absorb everything, and are filled with a transparent and colourless fluid, which resembles water, and hence their name (*lymphe*, water). The trunks of the latter are arranged into two principal systems—superficial and deep: both sets follow generally the course of the great veins. So numerous are they in the skin, that when injected its surface is said to resemble a sheet of silver. The main trunks of this branch of the absorbent system finally pour their contents, like the lacteals, into the *thoracic duct*, the anatomical variations of which are here unnecessary to describe. It is the main trunk

of the absorbent system runs along the spine, rises out of the chest (thorax), and pours its contents into a large vein (left subclavian) near to the heart. This, in structure, resembles the other absorbent trunks, being thin, transparent, valvular, and remarkably contractile.* One valve is placed at its entrance into the subclavian vein, in order to prevent the ingress of blood into this important duct, and also, perhaps, to graduate the delivery of the absorbed fluid into the sanguiferous system.

The *conglobate* or *absorbent glands* are connected with the lacteals under the name of mesenteric glands; with the lymphatics they are either called conglobate or lymphatic. We find groups of them in the groin, the neck, arm-pit, and at the roots of the lungs: their use is not understood. These glands are found in the higher orders of animals only, in the lower vessels without the glands, and in the still lower neither vessels nor glands can be discovered; in this class absorption must be effected by simple imbibition, as in the cellular plants. Some important change is, doubtless, effected in the human being by these bodies, for we find in disease of the mesenteric glands, the individual thus affected is reduced to a fatal state of marasmus or wasting, named *tabes mesenterica*. Scrofula, and all its train of evils, have their seat most markedly in these structures, as we too commonly observe both in the neck and groin. Independently of the foregoing special organs of absorption, it has been proved by unequivocal experiments that vessels and membranes, animal and vegetable, living and dead, have the power not only of absorbing but even of absolutely decomposing† the

* According to recent researches, parts have been discovered connected with the absorbents analogous to hearts. It is said that the frog has four of them, which may be useful for propelling the lymph.

† "There is indubitable evidence that the mucous membrane of the stomach at

fluids in contact with their surfaces. Membrane also possesses the curious property of permitting currents of fluids to pass through them in opposite directions. A membranous bag containing fluid, secured and thrown into water, if the fluid contained in the bag (say milk) be of greater density than that in which it is immersed, the stronger current will be from without inwards (water to milk); the weaker from within, outwards (milk to water). These processes are named respectively *endosmose* (*ενδον*, in, and *ωσμος*, impulse), and *exosmose*, *εξ*, out, and *ωσμος*, impulse). The energy of this process is influenced by other circumstances besides the difference of density of the respective fluids but the latter* condition is essential to the mutual interchange.

Modern† physiologists include the veins amongst the active agents of absorption. There cannot be a more clearly ascertained fact, than that of endosmose and exosmose in relation to veins; the exercise of this species of imbibition is of course equivalent to absorption. There is a striking analogy between veins and lymphatics—both return a fluid

the moment it imbibes, decomposes and analyses the alimentary and medicinal substances in contact with its surface; and consequently that in all animals, membrane becomes a most important agent in carrying on the digestive process."—*Smith's Philosophy of Health*.

* "It is by these powers that water holding in solution nutrient matter diffused through the soil, penetrates the spongiolæ of the capillary rootlets, always filled with a denser fluid than the water contained in the soil—that the energetic motion of the sap is generated—that the ascending sap is attracted into fruits, always of greater density than the crude sap—that buds are capable of emptying the tissue that surrounds them when they begin to grow, and that almost all the phenomena connected with the motions of fluids in plants and the chemical changes which those fluids undergo in consequence of this admixture, is effected, and there cannot be a question that analogous phenomena take place in the various cells, cavities, and minute capillary vessels of the animal body."—*Philosophy of Health*.

† Hunter contended for the *exclusive* agency of lacteals and lymphatics as the organs of absorption. Magendie's ingenious experiments go to prove that veins also absorb.

to the heart; both have valves, the free edges of which look towards this organ; both are deep and superficial; and the area of each system diminishes as it approaches to its termination: this, together with the aid derived from muscular action, accelerates the contents of both.

Study of every Action of the Organ in particular.—We shall dismiss this section with a few brief observations. The *lacteals* are destined to provide chyle, to replenish the blood; the innumerable capillary mouths of these important agents are supposed to exercise a sort of selection; a *vita propria*—which enables them to absorb some, and reject other fluids; besides, it is conceived, that an electric attraction exists between the mouths of the lacteals and the chyle. The most rational conjecture is the *vita propria*, for it is plain that if the lacteals did not possess this power of selecting and rejecting, they could not take in with such unerring certainty the chyle only, when they are immersed in the heterogeneous contents of the intestine. All physiologists admit that these vessels are the specific agents for absorbing and conveying the nutritive product of digestion to the thoracic duct, and finally this duct deposits the subsidies so obtained, in the sanguiferous system.

The *lymphatics* are the antagonists of the secreting arteries, for the former remove what the latter had deposited. This branch of the absorbent system takes up all the integrant parts of the body; is the remover of the *old* material, while the lacteals are the carriers of but one fluid (chyle), and that is the *new* product. The lymphatics are, as J. Hunter justly described them, the architects or modellers* of the system. It is by the action of these ever-busy agents, that the body is fashioned and

* Such absorption is called "the modelling process."

preserved from infancy to manhood—from the miniature to the full length likeness—in the appropriate and due relative proportions of its individual parts to each other and to the whole. It is plain, that the particles just deposited must be absorbed (so as to afford a space), before the deposition of the new ; and in the case of progressive growth, the space left for the secretion of the substitute should be so moulded as to accurately admit a certain sized integrant particle, and no more. The material so absorbed is, in the next place, commingled with the chyle in the parent trunk—the thoracic duct—and then returned to the sanguiferous system, by which it had been originally produced, to be either ejected, or, perhaps, employed for some secondary purpose. Since this process is constantly going on, the absorption of old, and deposition of new material, throughout the whole body—a period must arrive when it may be truly said, we are re-made—having none of the original integrant particles. The *re-formation* is supposed to take place in about seven years. We before alluded to this process in bone*—*a fortiori*, if it goes on so rapidly in the hardest parts, how much more speedily must it progress in the soft and more vascular parts of the animal body. We shall endeavour to exemplify this matter by an instance of every-day occurrence. Let us take an individual who is plump and fat ; suppose him to be seized with fever—confined to bed for a month or six weeks. He now rises thin, nay, emaciated. What is the explanation ? It is this. His digestive apparatus had

* “Du Hamel fed a pig with madder for a few days, and found its bones deeply tinged of a pink colour. Confining it then to a different food, the pink colour went off. On examination it was found that the pink colour adhered to the earthy part of the bone, and consequently that this, the hardest material in the body, was deposited and absorbed in a very short time.”

been incapacitated, during illness, for the formation of the nutritive chyle, to supply the wants of the system, by replenishing the blood. The lymphatics absorbed the store of nutriment laid up, namely, the fat, and threw it into the circulating system—precisely as occurs in the hybernating animals (bear, sloth, and swallow), during their dormant state. The skin that had been tense and smooth,* owing to the full deposition of fat beneath its surface, previous to the fever, has now become lax, flabby, and wrinkled, because the subcutaneous adipose development no longer exists. It has been all absorption but no secretion. However, there is no breach of surface; the patient has lost fat and flesh, which loss has been caused by an *interstitial* absorption from the cellular substance that had contained both; collapse is, therefore, the inevitable result. Returning health—country air—keen appetite—generous diet, soon afford an abundant supply of nutritious chyle to the blood, which, in its turn, furnishes to the secreting arteries, the rich vital current; the latter quickly reproduces the adipose substance. Voila! our “fat friend,” soon reappears “himself again!”

When the balance between absorption and secretion is accurately adjusted, there is no loss of condition. Dr. Smith has proved by experiments, that healthy and strong men, engaged in hard labour, and exposed to intense heat, sometimes lose, in the space of a single hour, upwards of five pounds of their weight. Though daily engaged, for months together, in this occupation, at two different periods of the day, for the space of an hour each time, and

* The quantity of fat deposited beneath the skin in mankind is greater in the female than the male, consequently the angles are rounded off by *en bon point*; smoothness and softness of surface increased; all of which convey to sight and touch those agreeable impressions, the recognition of which we designate as elements of beauty.

though consequently these men lost five pounds twice every day, yet when weighed at intervals of three, six, or nine months, it is found that the weight of the body remains stationary, not varying, perhaps, more than a pound or two. It follows that the bodies of these men must absorb, twice every day, a quantity equal in weight to that which they lose.

If active exercise be taken daily, together with diminished solid and fluid food, a surprising diminution in size and weight will be the consequence. A much-respected friend, an eminent literary character and physician, having an hereditary* tendency to obesity, determined to try and reduce his size, by means of active exercise and less aliment; he succeeded, in a short time, by eating one-third less than usual, and walking upwards of ten miles daily, in reducing himself as follow: from eighteen stones ten pounds, to thirteen stones ten pounds! from fifty-three inches around his waist, to thirty-two inches! This gentleman also mentioned that his thirst, which had been previously considerable, became much diminished when he adopted the limited diet. In these cavities, head, chest, and abdomen, where watery vapour is constantly bedewing the opposed surfaces, so long as secretion and absorption are accurately balanced, the healthy state in reference to these processes is maintained; but should the balance be lost by absorption being diminished or disproportioned to secretion, dropsy is the inevitable result.

The *lymphatics* not only absorb all the different parts of the animal body, but also those extraneous substances which

* This gentleman's father had been very fat, "and even the story ran" that he went to Dublin, annually, in order to undergo the operation of "larding;" so thoroughly were the country folk convinced that a man might be relieved of fat, by "larding," as of a dropsy, by tapping.

are placed in contact with their mouths. One of the most familiar examples, is the immediate effects produced upon the secretion of the kidney—giving it the odour of violets—by the vapour of turpentine, contained in the inspired air which is thus more quickly conveyed into the circulation, than if it had been absorbed from the stomach. The most malignant diseases are thus produced: marsh miasmata, or malaria, are a vegetable poison which is well known as an active agent in producing ague.* Rome is rendered insalubrious by the Pontine marshes near that city. The annual mortality of the population is stated to be so great as one in twenty-five. Persons living in marshy districts may not contract ague; they generally call their complaints bilious and nervous derangements; they get a jaundiced complexion and capricious appetite, are ailing without being actually sick,† frequently complain of cold and clammy perspiration, owing, perhaps, to

* In some instances these marsh miasmata produce their effects almost immediately; in other cases these poisons will lie latent in the system for several months; and, besides, the marsh fever or ague will, in many cases, not occur until the individual returns to a salubrious district. The following is a remarkable instance of the former:—"In the island of St. Lucia, in the West Indies, two boatmen were employed hauling their canoe up on the beach, close to a dangerous swamp, when they perceived a small cloud of vapour approaching which gradually enveloped them. One immediately fell down insensible, and the other was so much affected as to be unable to render him any assistance. The vapour soon passed away, and both men recovered, so far as to be able to walk home. The one most affected, however, was seized with fever, and died within forty hours afterwards."

† I attended a gentleman's family residing in a marshy district, beside a large city. I was constantly called to attend, professionally, some one or other of this numerous family. At length the father took my advice—at which he laughed in the first instance—and removed his family to a dry, upland, and salubrious neighbourhood. The result confirmed my prognostic, for the whole family were quickly restored to health and spirits. This gentleman sometime after observed with a roguish twinkle of the eye: "Doctor, although we *now* seldom see you *professionally*, we don't forget to drink your health, and give you all due praise for driving us out of the marshy district."

the atmosphere being saturated with moisture, and therefore unfit to carry off the excretions of the skin in an insensible form.

Animal poisons, or putrid effluvia, were found by Magendie to destroy dogs about the tenth day. The animals were confined in the upper part of a barrel, the lower part being filled with putrefying animal substances, which were separated from the dogs by a grating. The animals took food, and were even lively, but became much emaciated before death. Putrid water, even a few drops, injected into the veins of dogs, produced symptoms exactly resembling those of yellow fever.

The poisons producing infectious disorders are most probably introduced by inhalation.* The greatest possible care should be taken to remove all putrefying and excrementitious matters, more especially in cities and close places; indeed, though there is a popular feeling in favour of this act of common cleanliness—for we often hear it said that, “such things are enough to breed a fever;” yet, still, we find that inattention in this way is by no means confined to the humbler ranks of society.†

* “A nurse in one of the Dublin hospitals, apparently in excellent health, was desired by the physician to assist a patient, labouring under fever, to turn in bed. Being very feeble, he endeavoured to support himself by placing his arms round the nurse’s neck, when she suddenly drew back, struck by the offensive odour from his person, and exclaiming that she had caught fever. She instantly became cold, pale, and ghastly, and appearing about to faint, had to be removed to her room. Malignant fever of a very severe description succeeded, and lasted for thirteen days.”

† I some time ago attended five patients, whose ages varied from seven to eighteen; they were all seized suddenly with a most malignant form of typhus fever, when the disease was not epidemic, nor in the neighbourhood; in fact, there was no local or constitutional cause that could be deemed exciting, but the obstruction of a sewer communicating with a water-closet. The whole atmosphere of the house was obviously contaminated with effluvia, which, doubtless, caused the malignant typhoid fever which proved fatal to one of the patients. I

When considering the functions of respiration and secretion, I shall have to treat of this interesting subject more fully. The *skin* is much less active as an agent of absorption than the lining membrane of the lungs. When considering the sense of touch, we shall have to examine this tissue particularly; at present it is only necessary to state, that although its absorbents are exceedingly numerous, yet they do not act energetically, for they are covered by a thin layer (cuticle) of solid, inorganic, and insensible matter, which acts as a barrier, moderating the activity of not only absorption, but also of exhalation. The layer of mucus on the gastric and pulmonary membranes does not offer such an obstacle to absorption as the cuticle or scarf skin does on the cutaneous surface. Dr. Edwards' experiments go to prove that the skin absorbs, when we are simply immersed either in water* or in air, without the aid of friction or pressure. When the cuticle has been removed, as by a common blister, the surface then exposed is found to be supplied with absorbents, arteries, veins, and nerves, in such abundance as to constitute one sheet of vascular and nervous network, exquisitely fine and dense: the absorption which will take place on the surface so exposed, will be rapid and energetic: arsenic, mercury, or opium applied to the skin so denuded of cuticle, will quickly produce their well-known effects. The operation of vaccination is performed by inserting an almost inappre-

have been induced to enter into detail in this case, in order to point out the necessity which exists of obviating, by all possible precaution, similar causes of disease.

* Nourishment will be supplied to the system by immersing the individual in milk baths: to which some spirit may be added, in order to stimulate the absorbents to take up the milk more speedily. I remember one remarkable instance where a new-born infant was supported in this way, not having the power of swallowing, for several weeks, and it ultimately recovered.

ciable portion of cow-pock beneath the cuticle, which is absorbed, and produces its powerfully antidotal and specific action upon the system.

That formidable disease, glanders, has been conveyed into the human system from the horse by absorption. The slightest abrasion of the cuticle presents a surface greedy for imbibition. Need I say how carefully we should avoid bringing an animal, vegetable, or mineral substance in contact with an excoriation, if the former should possess properties inimical to animal existence.

Absorbent glands receive on one side either lacteals or lymphatics, and send them forth on the other; they have been said to delay, to purify, or to add something to the contents of these vessels, which are also described as being either coiled up on themselves so as to form the gland, or to end in its cellular structure. The anatomy and physiology of these bodies are, in truth, unknown. The *thoracic* duct, we have seen, does not differ essentially from the trunks of the absorbent system generally. Its large size renders it a fit receptacle for the due admixture of the chyle and lymph before they are poured into the blood, which deposition takes place slowly.

In studying the *actions* of the absorbents, we have a varied and extended field to contemplate :

1. As lacteals, they are the primary agents of *nutritive* absorption.

2. We find them moulding in “the *modelling* process” the several parts, as the architects of the system.

3. We learn, both in health and disease, that they take up from the several *interstices* of the body, the parts deposited therein; a familiar example of which may be cited in the removal of fat when an individual becomes, from *en bon point*, thin. This is *interstitial* absorption.

4. When matter is formed in a cyst or bag (an abscess), say at an inch distant from the skin, that fluid is allowed to approach the surface, and finally obtain exit by the action of the absorbents*—this process is well named *progressive absorption*.

5. When a breach of the surface occurs, independent of any mechanical or chemical cause, and an ulcer is formed, this process is named *ulcerative absorption*.

6. When a part of the body has been deadened, as in mortification from local or constitutional causes, the part which has lost its vitality sloughs off: this separation of the dead portion from the living whole is effected by the absorbents of the latter nibbling away the part to which the former adheres; this, its hold being destroyed, is cast off. The process is therefore well named *disjunctive absorption*.

I next come to consider briefly *the relations of the function of absorption with those previously examined*. It is plain that the product of digestion, chyle, is destined to compensate the blood for the loss it has sustained in supplying the wants of the system, according to the experiments of Prout, Vauquelin, and Marcet, chyle was found to consist of a coagulum and a fluid part which bore a general resemblance to the corresponding ingredients of the blood. We observe that before the blood so replenished is sent out to the body, it undergoes the changes effected by the process of respiration, which probably contribute to the further animalization of the chyle and its identification with the vital fluid. It will also be remembered that the lymph poured into the thoracic duct by the remaining portion of the absorbent system, must be also delivered together with the chyle to

* In popular parlance, the abscess is erroneously said to *burst* or *break*. It is plain the process by which the matter is discharged is not mechanical, but *vital*.

the sanguiferous system. A triple compound is thus sent to the lungs for oxidation or purification, and subsequently returned to the heart, by which and the arteries this important fluid is finally sent forth and delivered to the general system, for the purposes of secretion and nutrition.

We shall now consider generally, *the modifications which absorption presents according to age, sex, temperament, climate, season and habit or occupation*. In early life, this function is exceedingly energetic; for abundant and speedy supply is then required for the purposes of growth. In late life, an opposite condition obtains in relation to lacteal absorption, while that of the lymphatics (interstitial) appears to be increased (in relation to deposition), which is but too plainly manifested by the spare, attenuated, and wrinkled condition of old age. In manhood, absorption—more especially lacteal—stands as a mean between these extremes; neither so active as in the former, nor so sluggish as in the latter period of existence. As the habits of man are generally considered more active than those of woman, the function of absorption is, consequently, proportionately increased in the former. In the sanguine and muscular temperaments the active condition of the functions of digestion, circulation, and locomotion renders the energetic development of absorption more necessary than in the other temperaments. Wet and damp countries, where the atmosphere is constantly loaded with moisture, and the body surcharged with fluids, must—from the principles already proved—be less favourable for absorption than an opposite condition of climate.

Nutritive absorption goes on much more actively in winter than in summer, as digestion is then more energetic, and besides the demand for supply is more urgent in the former than in the latter period, owing to a greater exercise

of the muscular system during the cold season. It is obvious that those of active habits, and accustomed to laborious occupations, must have more of wear and tear—greater expenditure, than those of sedentary habits who eschew exercise, and “the sweat of the brow.” We have seen (page 23) that an individual lost daily during two hours’ hard labour in a warm atmosphere so much as ten pounds of his weight, and that on being weighed at three, six, and nine months a difference of but one or two pounds only was observable in relation to his original weight. It is plain that, in this instance, nutritive absorption must have taken place to a similar extent in order to compensate the system for the large loss sustained by exhalation.

General Recapitulation, showing the Utility of the Function.—We shall now proceed to draw some practical conclusions, in a social point of view, in reference to the absorbing system.

We may compare the several actions of the digestive apparatus—for the purpose of obtaining the nutritive product, chyle—to the acts, business, and occupations of various kinds which engage us daily—ay, hourly, for the purpose of obtaining *money*; one destined to be blood, the grand element in the physical world, which supplies the wants of every part of the body with constituents appropriate for its nutrition, growth, and repair; the other, the grand agent in the social world, which ministers to our wants and gratifications, with a certainty and permanence alike unerring and enduring.

We have seen, that whether the food be animal, vegetable, or mixed, the product obtained, in each case, is essentially alike, namely, nutritive chyle. In the same way, whether we be professionals, merchants, or artizans, the product obtained by our labours in each case, is vir-

tually the same, namely, life-preserving money. It will be readily granted, that if the chyle so produced by the digestive apparatus be in one instance absorbed and poured into the sanguiferous system, and thus identified with the blood, the object of nature is fulfilled, this vital current is thus kept rich and ready in order to dispense a supply, when required, to each part of the system. In another instance, if the chyle, instead of being absorbed and finally becoming blood, is either wholly carried off with the excrementitious matter, or is but partially absorbed, the result must be, in the former case, utter starvation; in the latter, defective nourishment. How analogous are the states of social life. If the money made be duly husbanded and retained, the needful will be always "handy," in order to supply the wants of each member of the family. If, on the contrary, all the cash is spent foolishly, runs away with the rubbish, or rogues, or spendthrifts,* that daily and hourly surround, beset, and seduce us; or the gains are but partially collected into the stock or house purse, either utter destitution or an impoverished condition of the family must be the inevitable result.

The greatest earthly blessings may be summed up in the possession of *mens sana in corpore sano*—a healthy mind in a sound body.

When the functions of the body over which life presides progress in all respects rightly, we call that state, health; on the contrary, when there is any departure from that condition of the functions—*i. e.* the healthy standard—we name that derangement, disease. Again, when the functions of the mind over which reason ought to preside, pro-

* "The son bred in sloth, becomes a *spendthrift*, a profligate, and goes out of the world, a beggar."—SWIFT.

gress in all respects rightly, we call that state simply, sanity, or *compos mentis* ; indeed it is often designated by saying that the individual has "his wits about him," is "a knowing one," and such-like pithy phrases.* On the contrary, when there is any departure from this same condition, the individual so affected is slow to agree with others who call it by the right name—derangement of mental functions—*i. e.* folly or insanity—he, small blame to him, is indisposed to treat himself harshly, softens down his faults and failings by a great many pretty terms, polite phrases, and nice distinctions, such as innocence for folly, generosity for prodigality ; then his errors and blunders are mere misconceptions and misunderstandings. When at a pinch, he does confess, with a redeeming clause, that his conduct was unwise, imprudent, inconsiderate, or rash, his views imperfect, his conclusions hasty, his resolves passionate, his friends are not so indisposed to call things by their proper names, they designate, in his absence, the state of his mind ; perhaps, as it deserves, a condition more or less characterised by passion, folly, or insanity, or probably by all three *combined*.

Life, then, is to the body what reason is to the mind. As we ought to call everything by one name, and that, its proper name ; we should, in truth, designate any derangement of the functions, either of body or mind respectively, disease or folly.

Before we consider the practical analogies of absorption, in a social point of view, we shall beg to offer some brief remarks on digestion, viewed in the same light. I think

* Several slang phrases are used to express this state—such as "sharp practitioner ;" "no sand in his eye ;" "has taken three jumps through the hoop ;" "has the dead knowledge ;" "rises early ;" "wide awake ;" "not a wink upon him ;" "no fool ;" "has got his wise teeth : " &c., &c.

it was the well-informed Mrs. Glass, that, in her "System of Cookery," directs us thus, "bone your fowl, having *first* caught it." Now, in order to eat food, you must either get it yourself, or have it provided for you by another. The former is the better plan; it excites "hunger," which, you know, "is the best sauce;" the meal is, therefore, relished and well digested.

In like manner, one is obliged to hunt for business, that is, get it by his own endeavours; while another receives it by the aid of friends, the kindness of relatives, or as a birthright;* in fact, thrown into his lap. Need I say that it is pleasanter, more refreshing, and independent to get the business in the former way, and in the end is much more wholesome and enduring.

Mr. A. is a hasty feeder, bolts his food, while Mr. B. chews it with care proportionate to its nature and difficulty of division. In like manner, Mr. C. (more especially if he gets plenty of employment without personal effort) hastily examines the business got, and dismisses it, on a first examination, without a due division and consideration of its parts; while Mr. D. (getting employment sparingly and by personal exertion) carefully and slowly examines the matter, divides accurately the subject, ponders and ruminates well before he decides and acts.

In the next instance, Mr. A. does not carefully attend to either the quality or the quantity of his aliment; also postpones his meals, owing, perhaps, to being engaged in some trifling matter or amusement; sometimes eats without appetite—gets down the meal because it is set before him. Well, Mr. B. duly attends both to the quantity and

* This individual is often said to be "born with a silver spoon in his mouth."

quality of his food; and has habituated himself to stated periods for meals, which he will not forego on trivial accounts; he has made it a rule not to eat without having an appetite—the healthy indication. Mr. C. is irregular, desultory, and procrastinating; you cannot find him at home; he is diverted from business constantly, by trifles, amusement, or dissipation; endeavours (as he says) to “pull up,” or make amends, for lost time by too much work at one time; he next devotes himself over much to one thing, to the prejudice of other matters. From desultory, and irregular, and idle habits, he finally gets a disrelish for work, and when driven to it by necessity, he acts in a listless, inefficient way. Mr. D. is always found at home at stated times; devotes his attention to business at certain and regular periods; as he does not procrastinate he does not require to overtask his industry by extra-work at any period. He uniformly declines such business as cannot profit himself or others, in a moral, intellectual, or pecuniary point of view.

Mr. A., again, has a weak stomach (original or acquired); he takes more food, and of a stronger kind, than he can digest; healthy chyle is not produced; he is oppressed—sickens; finally ejects the contents of his stomach. Well, Mr. B.’s stomach digests well, because it is naturally vigorous and healthy; and never impaired by improper aliment, nor in inordinate quantity; the product is consequently good value—nutritious chyle. Mr. C. has but a weak understanding, rendered still more feeble by lack of mental culture and study of his business; he wants, besides, that necessary ballast, common sense and prudence. He not only undertakes too much, but he does not understand half of what he thus confidently encounters; he is finally embarrassed and distracted, consequently he fails to realise

any profit for himself or others; at length he is so oppressed and unfit for business, that he either throws up what he had undertaken, and declines business altogether, or, in future, cautiously selects what he conceives he has calibre enough to manage profitably. Mr. D. has a fine sound understanding—prudence, common sense, and vigorous intellect, with business-like habits. He undertakes so much good business only, as he can manage without haste or oppression. He realises profits for those who employ him, and also for himself; the latter he enjoys rationally by procuring for himself and family all those comforts and elegancies which are so much the more prized and enjoyed as they are the sweet rewards of judicious and well-directed personal energies and abilities.

I shall next beg to direct attention to the analogies which exist between the absorbing system and social life.

The absorbents may be briefly described as engaged either in removing the old material of the body, or in carrying in the new, for the purposes of nutrition, growth, and repair.

In like manner our servants and dependents are constantly and busily employed in carrying off our old clothes, while we are industriously scraping together the means of procuring new attire—not to be made “*bloods*” but to incite Mr. Blood—“*de tailor, de schneider, dat make de gentleman!*”*—to fit us out anew!

We have numerous lacteals, lymphatics, glands, vessels,

* “But de tailor, de schneider, make de gentleman! It is Mr. Frantz of St. James’s who take his measure and his cloth, and who make the fine handsome noblemen and gentry, where de faders and de mutthers make only de ugly little naked boys.”

and membranes, together with the thoracic duct, all employed in this function, each at its appropriate and prescribed work : so in ordinary we find that many hands make light work ; and, as order is " heaven's first law," we observe this principle rigidly adhered to where business is rightly performed.

The lacteals are those valuable vessels which take up the nutritious chyle only ; they possess a *vita propria*, or distinctive sensibility ; a vigorous contractile power, and valves arranged in pairs, to prevent a retrograde course of their contents ; they communicate freely with each other ; pressure upon them, instead of retarding, hastens their contents ; these vessels are transparent, and they bear the subsidies to the glands named mesenteric, thence to the thoracic duct, and by this tube finally to the blood itself. Well, when we desire to have particular things well done, we employ those who have made the avocations belonging to them their trade or special business, not amateurs or jack-of-all-trades ; those trustworthy folk, like the lacteals, are people to be relied upon, not to be diverted from their valuable occupations ; while they delve and search for the real thing, they are sure to reject the trash and rubbish that lie in their way : they possess a tact as singular in this respect as the *vita propria* of the absorbents : they are not only active and vigorous in their efforts to procure the needful and send it towards its destination, but their pockets, like the valves of the lacteals, are arranged in pairs (pull together like man and wife), and do not permit the contents to run in the wrong direction. Most judicious arrangements, communications, and understandings exist between the brotherhood ; such an *esprit de corps* that if one or more of them suffer from pressure, or adverse circum-

stances, the neighbouring ones take on their duty.* Their pockets are so trustworthy that any pressure they may endure serves to send their contents with accelerated velocity into the legitimate channel only. They thus give practical proofs of their determination to send to the proper destination, their scrapings and gatherings; thereby intimating that what is obtained in this way should go forward to the stock-purse for the benefit of the whole family. There is, besides, nothing secret nor mysterious about their proceedings; they are as fair as the contents, and as transparent as the coats of the lacteals—the prototypes of their simplicity and usefulness.

This brotherhood journey on, side by side, in troops loaded with the crude material—the precious ore—hereafter to become the circulating medium. There are certain stopping houses (lymphatic glands)—on the way which are to these gentlemen and their saddle-bags, what the mesenteric glands are to the lacteals and their contents. In neither case is it clearly understood what is done there; but as it is customary on a long journey for fellow-travellers to stop at hotels or inns on the road, we find the brotherhood make it a point to step into these places of entertainment that lie *en route*. Some conjecture that the refreshments there obtained, are not mere rest nor a closer communication with their companions, nor what is understood by “entertainment for man and beast,” nor yet the still more unpromising fare indicated by “good dry lodgin’,” but that the contents of the saddle-bags—the precious ore—are so mixed with

* The Society of Friends, called Quakers, I understand assist their bankrupt brethren in this way, a specimen of practical pity that is truly worthy of imitation by all denominations of Christians. It is to be regretted that the following pithy piece of advice is but too commonly acted upon: “Read your Bible!—mind your purse!”

each other and with something added at the road-side inns, that traveller, beast, and burden are all three somehow or another improved by the sojourn. One thing, however, is certain, that the number of out-going gentlemen-travellers are not as numerous, as those that had previously entered these inns. It is rather a suspicious circumstance to find, that the former are more heavily laden at their exit than at their entrance.* Notwithstanding this, the character of these travellers, and the excellent understanding subsisting between them, should disincline us to imagine that the missing portion of the party had been "*Burked*"—for such things have occurred in obscure inns and solitary secluded spots. It is probable that the latter (those not forthcoming) might be too tired to proceed—or perhaps they drank over much—or did not drink enough, or each had induced a friend to take his load and his own, saying, that he would be happy to return the compliment on a future occasion!—about ninety-nine other *most likely* explanations might—did space permit—be here cited in explanation of these anomalous facts;† it is indeed, strange, that one or more travellers should depart—in all fairness—from hotel, inn, tavern, house of entertainment, or "dry lodgin'," a richer man than he had been on entrance into any of the aforesaid houses or premises respectively;—dear-bought experience being strongly and strikingly opposed to so paradoxical a conclusion! Well, the travellers finally arrive at their destination, and deposit

* The lymphatic glands receive a greater number of vessels into the parts turned towards the extremities, than they send out from the parts directed towards the heart; but the latter though less numerous, are yet larger than the former.

† It would be truly amusing, if not instructive—did space permit—to recount the various theories, speculations, and phantasies that have engaged from time to time the philosophic world in relation to the structure and functions of glandular bodies. We have been indulging in our vagaries!—why not? but we must "pull up," for our motto is "*utile*" as well as "*dulce*."

their precious burdens with the great central agent of the supplies, Mr. Thoracic Duct, who is a most trustworthy officer. Having no inclination to turn from a straightforward, upright course, receiving all that is brought to him, forwarding the supplies by vigorous action; and preventing any backsliding, by means of those valvular checks with which, we before observed, all the fraternity of absorbers are uniformly furnished. The stock-purse has now been furnished with the life-preserving element—the precious ore, and so we have concluded the analogies between the lacteals and those trustworthy gatherers of capital that we have just described.

We shall next consider some of the practical analogies between the lymphatics and the social system. These absorbing vessels are everywhere throughout the body, and take up everything. They are constantly removing the old material, while the lacteals are engaged in bringing in the new; they have been well named the architects, planning and preparing the sites for the arteries to deposit, as the builders or operatives. While a just and balanced action takes place between these two powers of absorption and deposition, “all’s right.”

The constant removal of the old, and deposition of the new material in relation to our bodies, indicate that our minds should progress after the same fashion; the crude and imperfect knowledge of youth should be removed or replaced by the firm, digested, and expanded material of our ripe years: the moral and physical systems are alike conditions of perpetual change.

How accurately in health do the absorbents clear the ground and arrange the situation, and the precise quantity of material to be deposited by the arteries! malformation or morbid growths will be the inevitable result of a want

of this harmony of action. A skilful architect in ordinary lays down his plans, whether it be for a new house, or the repairing of an old one, before he sets the labourers to work ; his preparatory excavations are all carefully made. Under reverse circumstances how often do we see as the result awkward buildings, and unfinished houses, commonly called “the follies” or “blunders” of such and such projectors !

In order to indulge a rational hope of success, certain preparatory steps are often required before other matters ought to be undertaken ; for instance, the rubbish created by superstition and credulity in uninformed minds, the false notions, the perverted views, and often the prejudices of sects and parties* that have grown with their growth, in what have been called educated minds, have all to be removed before the true foundation can be laid, and the goodly temple raised by the Divine artificers, truth and reason. Although our earthly tabernacle is constantly undergoing change and repair, yet the same tenant life is always there controlling, directing, and preserving. In like manner, although the notions which make up mind and cast of character, change under varying circumstances—become in succession baseless fabrics—yet still, the soul is ever capable of forming new associations—interminable chains of thought ; for immortality is its birthright. After a certain period the rebuilding and repairs of the earthly tabernacle do not progress favourably : the architects and the builders do not improve with age—the same energies are not mani-

* What a blessing it would prove to society, if we could obtain in the moral world an agent analogous to the gastric juice, which would purify to preserve ; melt the most obdurate and opposite ; and finally, assimilate all into one mass, in which the peculiarities, the prejudices, the passions, and the parties would be all lost in the formation of one homogeneous, harmonious whole, suitable, as in the physical world, for the wants of the body *social* !

fested—the materials are not so abundant—the quality not so good—too much earth in them—it suffers breaches,* which remain unrepaired ; dilapidation and decay finally seize upon the unrepaired edifice, the once stately and beautiful building, so admirably designed, and exquisitely constructed, finally, alas ! becomes a ruin, proving that “the house of clay” was not only “wonderfully,” but also “fearfully made.”

In like manner in our moral nature, after certain bad habits have been formed, they often—too often—become unalterable : religion and reason have frequently to complain that their plans are not executed—their advice unheeded—the rubbish unremoved ; folly or vice, or perhaps both, usurp their place, and entail ruin on the individual : or even in the natural and favourable course of events, when religion guides and reason rules, an inevitable failure of the functions of mind occurs ; memory, judgment, and imagination fail in old age, the wear and tear of four score years—the rough rubs of life—disappointed hopes—blighted affections—corroding care, crossed, or hopeless love—the gnawings of envy, the never-to-be-satisfied cravings of morbid ambition, or of absorbing avarice, all tend to sap the energies of mind, and often shake to its foundation the citadel itself of reason. We observe that the absorbents take up both vegetable and animal poisons most readily through the lungs, and thus either immediately or remotely proving injurious or destructive to the body—the marsh miasmata of fens, and the decomposition of leaves and trees in woods and wilds, on the one hand ; or, on the other, the putrid and contagious effluvia arising from the animal world—the haunts of men—dense, foul, and pestiferous. Hence, the pathless wilds of the desert, and the

* Ulceration or mortification.

densely populated district are each pregnant with a poison, different in its kind, and though the offspring of life (vegetables and animals), yet still the parent of disease and death. The senses of sight and smell often act as vigilant sentinels, warning us of the approach of the swampy vapour, and the putrid effluvia; they cry, "fuge, fuge, longe, late!"

What a striking analogy here obtains with the moral world! It would appear from experience that extremes are both injurious; the human mind is known to generate, in absolute solitude, a poison as destructive to its health as the exhalations of the wilds and swamps are to that of the body. Again, in the crowded city—the busy haunts of man—the almost certain contamination or deterioration of mind in such situations, is too obvious to need comment or proof. It is through the respiratory apparatus the poison acts most energetically. It is also by *this* means man holds converse with his fellows, whether at home or abroad. In some—the predisposed—we find the effects of bad company manifest themselves almost immediately; while, in other instances, like the malarious seeds of ague, the poison, though absorbed from evil communication, lurks in the system—will not manifest its corrupting effects on the manners of the individual, until he shall have been unsuspectingly admitted, without quarantine or question, into innocent and virtuous society. Some, with good principles, acknowledge that the society they keep is not unexceptionable, but like those in rude health—and consequently, prone to undervalue and neglect the prevention of disease—they do not fly from, nor avoid the danger which they must confess is present, although not urgent. These will finally become contaminated.

Conscience and reason, like sight and smell in relation

to physical agents, warn us of those individuals and agents whose breath is contamination—whose touch, is pollution—whose principles are destruction, and the cause of moral death. We have seen that the cuticle—the thin outer layer of the skin, acts as a sort of barrier to too ready absorption by the surface of our bodies ; but, when this protective layer is removed, as in excoriation or by a blister, the skin so denuded rapidly absorbs.

Prudence or caution appears in the social world to discharge a function somewhat analogous to the cuticle of the body. When either of these mental qualities is absent, we are readily identified with those that surround and beset us — contract, by unreserved intimacy, their ways and habits ; the bosom-friend has too often proved to be, finally, the concealed foe ; often, the base betrayer of our confidence, or of our love. But again, it is indeed, sometimes, the reverse, and, as in the natural body, the removal of the cuticle may be caused for the purpose of introducing an antidotal,* or anodyne agent ; wounding and excoriating, to finally preserve and to soothe ; so the personal distress produced by denuding the inmost secrets of the heart to a kind, a sympathising, and judicious friend, may, though it should feel painful on the instant, yet subsequently, this act will prove both salutary and consolatory to the communicant.

We have shown that both in hybernation and in disease the fat and the flesh of animals are absorbed, to replenish the blood, which, under the foregoing circumstances, is cut off from any nutritive supply from the digestive organs, by the usual tributary agents—the lacteals.

* Vaccination with cow-pock is performed by dividing the cuticle and thus bringing the antidotal agent in contact with the true skin, the active absorbing surface. We have also shown that anodyne ointments act with great energy and speed upon the system, when applied to a blistered or scalded surface—the cuticle being removed.

These circumstances should remind us of our duties in the social world. The kind friend whose purse has been ever open from our youth upwards, to supply all our wants with generous liberality, may, by unforeseen and unexpected reverses, be unable to continue that bounty, nay, may be so impoverished as to be unable, from temporary distress of his tenantry—perhaps, from bad crops and so forth—to meet his ordinary expenditure; under such dispensations, should we not willingly yield up some of our own means to aid our generous friend, now so much in need himself, and thus take a useful and practical lesson from the function of absorption.

We have seen that when a part of the body mortifies, the part so affected is separated or cut off by the action of the absorbents: this is *disjunctive* absorption; further, the space so left is quickly filled up by the re-production of parts similar to the original structures.

Here, again, we are taught a useful lesson in the social world. If our desires, our habits, our relatives, our friends, become gangrened spots—such as “smell to heaven”—too rank to suffer near us without peril of our immortal souls, we should exorcise the offending thing, were it as precious as the right eye or the right hand, and replace it, as in the physical world, by a suitable substitute.

We observe, also, that fluids pass, by a species of imbibition, through membranes and vessels; this process, when the direction of the current is *inwards*, has been called *endosmose*, when in an opposite direction, *exosmose*. If a membranous bag containing milk be secured and thrown into water, the latter will make its way in a stronger current to the former than v. v.

The analogy in social life is obvious: the poor and weak are always desirous to make towards the rich and strong, rather than remain with those in the same condition.

CHAPTER III.

THE WORLD?—LOT OF GENIUS!—SONS OF SCIENCE—WEAR AND TEAR—
 THE REAL REMEDY—EMPLOYMENT—VALETUDINARIAN—HIS CONCERNS
 —EXERCISE AND AIR—ENJOYMENTS—ARTICLES OF FOOD.

WE must, indeed, acknowledge the difficulties that encompass us when we come to lay down rules that will be suitable for all, in reference to physical and moral matters; enabling them to preserve the “even tenor” of their way, and to enjoy the greatest of all earthly blessings—a sound mind in a healthy body.

We need not remind you of the tendency of the majority to run into extremes—either Scylla or Charybdis—sloth or toil. Again, we are such creatures of imitation and habit; so constantly and fallaciously arguing from the particular to the universal; none of us, we must admit, is content at the end of his tether. It is the age of locomotion; the demon of the day is ever shouting out, or whispering, “Onward—go a-head!”

While ever progression is possible, the spur of emulation, of ambition, or of avarice is felt without ceasing at the side of their jaded votaries in pursuit of so-called—happiness, deceived by the “fairy promiser of joy;” for

“What is Hope? The puffing gale of morn,
 That robs each flow’ret of its gem, and dies
 The cobweb hiding disappointment’s thorn,
 Which stings more keenly through its thin disguise.”

We selected* Cheyne’s professional progress as a *home*

* “The world, with all its pretensions, is empty!” See “Cheyne’s Life,” and, also, “Hayden’s Physiology for the Public.”

specimen of the wear and tear of human life, consequent upon unceasing toil, mental labour, and corroding anxiety, while in the pursuit of fame and wealth.* Before we part now the medical man, let us look *abroad* at human nature

* The pursuit is often—too often—the sad health-undermining struggle, not for fame nor fortune, but for a scanty subsistence. The contrast between the English country gentleman and the professional drudge, as well as the case of Brain and Hands *versus* Money and Lands, were well and ably stated by an eloquent advocate on a late occasion in the following terms :

“ It is unjust—it is all but iniquitous to tax at the same rate the intellect of one man and the acres of another. Look at your English country gentlemen—the proprietors of hereditary possessions—with every comfort which wealth can bestow or health prolong, in the daily enjoyment of the most salubrious pursuits, exempt from every mental care, and affected by no discomfort, save what Edmund Burke characterised as the laborious lassitude of having nothing to do ; look at him, secure in the retention of his great estate—transmitting it unimpaired to a line of posterity as long, perhaps, as that ancestry through which, to him, it has been unfailingly transmitted ; and then turn to look upon the professional man, engaged from morning to night, and from night till almost break of day, in the most laborious occupations from which a precarious subsistence is derived ; but you can mark only the toil he endures : who, alas ! can tell the feelings of anxiety which he must experience—who can mark the consuming excitement, the constant sense of insecurity, the perpetual apprehension of the period when of his support may be deprived those who are dearer to him than life itself, and may, perhaps, be reduced to positive penury ? Look, I say, to these two pictures—you know they are not imaginative—and tell me if it be just, if it be fair, if it be humane, that on both of these two the income tax should press with equal weight ? Is it just ? I appeal to you, of whom so many I observe around me—you, born to affluence—you, who never knew the care of a to-morrow—you

‘ Gentlemen of England, who live at home at ease’—

you, who never drank of adversity’s bitter cup—it is of you I ask whether it be just that on you, and the great capitalists of this land, should be levied no greater impost than is exacted from the hard-working professional, from the clergyman of a small living, from the officers of our two gallant services, from all those classes who, with slender means, have a desire to educate their children as gentlemen, and are, of all others, entitled to our sympathy and respect ; from the poor widows with their limited jointures, supporting, perhaps, their families ; from small tradesmen, who eke out a wretched sustenance by devoted toiling at business for twelve or sixteen hours a day ; is it just to levy from all these this oppressive tax, and to put it to their consciences to make the confessions by which liability is to be estimated ? ”

in this department, and we shall find that although Paris is esteemed the capital of pleasure, yet there the most distinguished sons of science are as elsewhere, and every where, alike the victims of ambition, envy, and uncontrolled mind. It has been well remarked, that "there are some features which in people of genius are always the same. They are uniformly dissatisfied, restless, longing after something better, nobler, higher than the present life. They are awkward in little things, benevolent, modest, yet ambitious; with violent passions, and a long train of virtues or vices, according to the direction which these passions happen to take;" and may we not add in the words of James: "There are two paths before every man, the right and the wrong one; and every fresh power of mind or body that he acquires or discovers, but hurries him on, at every step, farther and farther from the one he has not chosen. Well for those who make their first choice wisely."

The following observations upon the lives of two eminent foreign medical men are so judicious, so truly philosophic, that I shall doubtless be pardoned for introducing them here, as affording such a striking illustration of the inevitable wear and tear, and premature decline of life, consequent upon the absence of mental control, and strict moral discipline:

"It is useful to every one to muse occasionally on the characters of the leading men in our profession, especially after they have been withdrawn from our eyes, and when all partiality and prejudice have ceased to influence our judgments. The lives of such men as Dupuytren and Richerand may suggest many a useful hint to the medical practitioner. Both were gifted with great talents, but both, alas! were destitute of that well-adjusted poise of mind, and that guidance of the higher moral feelings, without which, although intellectual and professional eminence may be

attained, the real prosperity of personal happiness and of cotemporary respect is not to be won. Let it be ever borne in mind that no person can continue to give way to the impulse of any one extreme and energetic feeling, without compromising his own comfort and welfare. Dupuytren and Richerand suffered most bitterly from this fatal mistake. And what has been the result? Not only were they unhappy in themselves, but they also failed in doing for science what science had a right to expect from them. Both of them died in the strength of their age, worn out less by the decay of their bodily powers, than by the corrosion of mental anxiety and disappointment. In the latter years of Dupuytren's life, notwithstanding his ever-increasing celebrity and worldly success, the care-worn expression of his features, and the cold mechanical smile that often played upon his lips, indicated too clearly the inward distress and deep-rooted melancholy which were preying upon his soul. The germ of death was already sown. His reputation with posterity will not be at all commensurate with the great fame which he had in his day. Richerand, on the other hand, vexed at the acknowledged superiority of his rival, wasted his talents in angry contentions, and at length gradually retired from the field, in which, had he been satisfied with the second command, he might have won honourable laurels. The manhood of his professional career by no means fulfilled the bright promise of his early days; not that his capacities and attainments had at any time been over-estimated, but simply because they were not directed in a right course, nor matured under the fostering influence of a peaceful and contented spirit.*

I should hope that the foregoing observations read a lesson applicable alike to us all, no matter what may be our professions or callings. I have selected† the medical man as *dramatis persona*, to illustrate that which belongs to human nature in all its departments, in every age, in every clime. Those practical hints may be readily referred

* Medico-chir. Review, April, 1842, p. 531.

† See "Physiology for the Public."

to each one of the public in his individual character :
“ *Mutato nomine de te fabula narratur* ;” or as Nathan said to David : “ *Thou art the man.*”

I am not disposed to trust much to the so-called specifics ; but I cannot withhold my assent to the *true* panacea proposed for those ills by Dr. Abercrombie, in the following terms :—

“ Among the phenomena presented by human character, none will strike you as more remarkable than the various objects which men propose to themselves in this life. In all, a certain vision of happiness seems to float over the scene ; but how various are the courses by which the phantom is pursued ? and how many enter upon the pursuit without proposing to themselves any definite course at all ? They never seem distinctly to put to themselves the question, in what the imagined enjoyment consists, and what are the elements by which it is constituted ? One expects to find it in wealth—another in power—a third in rank—a fourth in fame—while not a few are found to seek it in a mere round of excitement, perishing with the hour which gave it birth. Thus a large proportion of mankind pass through life, pursuing an imagined good, which too often eludes their grasp, or which, even after it has been attained, is found incapable of giving satisfaction. They live upon the opinions of other men, and are thus left at the mercy of a thousand external circumstances, by which the good they had so long pursued is blasted in the enjoyment. They enter upon life without forming any definite conception of what the great business of life ought to be ; and when they perceive that it is drawing to a close, they look back with astonishment to find that it has passed over them like a dream ; that they cannot say for what purpose they lived ; or perhaps are compelled to acknowledge that they have lived in vain.

“ But life presents another aspect, when we view it as a scene of moral discipline ; when we look not at its pains and its pleasures, but its high duties and its solemn responsibilities, and at the discipline of the heart, from which springs a true and solid happiness which external circumstances cannot destroy. All,

then, is defined and clear ; the object is definite, and the way to it is marked as by a light from heaven. Each step that is gained is felt to be a real and solid acquirement, and each imparts a sense of moral health, which strengthens every principle within for farther progress. I know that I carry your best feelings along with me, when I thus call your attention to that course of life which alone is adapted to its real and solemn importance—which alone is worthy of those powers of our intellectual and moral nature, with which we have been endowed by Him who formed us. In the culture of these is involved not only a duty and a responsibility, but a source of the purest and the most refined enjoyment. For there is a power which is calculated to carry a man through life, without being the sport and the victim of every change that flits across the scene ;—this power resides in a sound moral discipline, and a well-regulated mind.”*

The late Surgeon M'Evoy, of Dublin, when congratulated upon the fame he had earned, and the wealth he had acquired, replied, “ I knew most of happiness and contentment when I dined for eighteen pence, and had no more in my pocket.”†

Dr. Johnson, who has watched and noted the “ stream of human life, from the cradle to the grave,” with the eye and ability not only of a profound physician, but as a philosopher and philanthropist of the first order, has touchingly observed of himself, what we shall all have, in our turn, to echo, when “ the race of competition is abandoned—the goal of ambition has dropped the mask, and assumed its real character—the scoffing TERMINUS of man's vain hopes—the withering finger-post pointing to

* See “ Mental Culture”—Dr. A.'s admirable little work. A treasure for *one* shilling.

† The person in search of a happy man, at length found the latter ; but, lo ! this happy fellow had no shirt ! !

the tomb," forcing us to exclaim at last, "There's nothing true, bright, or calm, but heaven."*

"Est modus in rebus ; sunt certi denique fines
Quos ultra citraque nequit consistere rectum."

Need I add another word to induce you, in pursuit of the health of body and mind, to adhere to the happy medium ; but if you should err in this respect, let your "failings lean to virtue's side," to labour and toil—the handmaids "that lead to the Elysian fields,"—rather than to pleasure and sloth ; for it has been amply proved by observation and experience, *that the nearest approach to happiness in this life will be found in the daily occupations of a successful struggler, guided by judgment, perseverance, and industry, united with the "power of mastering the mind"—requisites much more essential for every-day business and professional success, than great talent and towering genius.*

In concluding this portion of the subject, I shall now direct attention to a few brief observations in reference to every-day business.

It may be inferred from what I have already stated, firstly : that it is as essential to health as to success in any lawful pursuit that we should be governed by a principle of regularity and order. Besides the grounds of this rule, which are obvious to all, arising from the impossibility, without order carefully observed, of pursuing any system of dietetics and regimen, it will be evident that irregularity

* Happiness, I contend, is only to be found in religion—in the consciousness of virtue, and the sure and certain hopes of a better life, which brightens all our prospects and leaves us no room to dread disappointment ; because, the expectation of it is built upon a rock, whose foundations are as deep as those of heaven and hell.—STERNE.

in the discharge of one duty or pursuit, must lead to the disturbance or total omission of all the other prescribed duties.*

Secondly : when there is occasion (and when is there not ?) for any mental application, it will be found that the mind is in the fullest vigour for a few hours after breakfast. In fact it is well known to all engaged in literary labour, that the period immediately succeeding this repast is what is called "the cream of the day." The reason is pretty obvious : all the wants of the system are by that time either sympathetically or actually supplied ; and as the body may be compared to an instrument upon which the mind as it were plays, we should naturally look for the happiest efforts when the instrument is in full tune.

Breakfast generally consists much more of fluid than of solid material. Beaumont has shown† that most fluids are not affected by the gastric juice, but pass off from the stomach soon after they have been received. This accounts for why we are equal to either corporeal or mental labour so soon after breakfast, while owing to the more solid and heavy nature of the supply at dinner, we are naturally averse to any exertion either of mind or body for some time after this meal. It is well known that liquids recruit the strength, when received by the stomach, more quickly than if solids be taken under similar circumstances. It is obvious that the first effect produced by the ingestion of food is upon the nervous system, for the feeling of languor and weakness is removed long before either liquid or solid food could be absorbed. The stomach appears to exercise a discriminating power in such instances. It should also be recollected, that the wants of the system in infancy are supplied at first by liquid nourishment.

* See "Popular Physiology," p. 128.

† "Physiology for the Public," p. 77.

Thirdly ; avoid, if possible, prolonging your ordinary occupation beyond the moment at which you feel your attention flags : but you must not confound this feeling with indolence, or an indisposition to exert that control and discipline of the mind which is so truly characteristic of the man of business, and without which you are the slave of each passing contingency. But there are occasions when an individual of the most industrious habits feels he is unequal for further energetic effort—when his attention can no longer be kept fixed, and his memory fails to be as faithful as usual ; recollect the rule of *non quantum sed quam bene* : nor do not spur, when jaded, the willing horse.*

Fourthly ; if your occupation should be of a sedentary nature, tax your ingenuity to find, if possible, without any material interference with your duties, a means of change, occasionally of your body, more especially of your lower limbs. The late Commissioner Parsons, when very much employed with chamber practice as a barrister, mentioned an ingenious mode of effecting this object, which he had adopted. It was by placing the inkstand at one extremity of the study, and his books and brief at the opposite side. This arrangement of course compelled him, of necessity, to walk to and fro, when he required ink. A change of pursuit or study is often found to produce some of the relief obtained by absolute rest ;† which, if I recollect aright, was the only kind of relaxation Lord Brougham had permitted

* A gentleman obtained, with considerable eclat, a fellowship in T. C. D., to the no small surprise of his friends, because they were aware that he had not been a reading man. When asked how he contrived to obtain the necessary information, the fellow replied, "True, I read only one hour a day, but then, I thought the rest."

† This is observed relative to the physical powers, as in locomotion ; e. g. running will relieve as a change. Horses alter their gait spontaneously, prompted, doubtless, by this principle.

himself to enjoy before he attained the eminence his ambition had aimed at. Recollect, that I do not recommend this plan but as a substitute when there's no choice, nor do I think any individual should put himself into such a position, as to render relaxation and out-of-door exercise during some portion of the day unattainable. I think that the end does not always sanctify the means, more especially when the latter leads inevitably to habits which undermine the health both of body and mind.*

General considerations have already detained me so long that I am constrained now to concentrate my further observations, and direct them chiefly to the concerns of the valetudinarian; more especially as this personage is privileged to be fastidious and irritable, consequently he cannot be put off with brief speech. Accordingly I shall,

* "ENGLISH BUSINESS HABITS.—The great facilities of communication, not only throughout our own country, but with distant parts of the world, are rousing men of every description to tenfold exertion in the field of competition in which they are engaged, so that their whole being is swallowed up in their effects and calculations relating to their pecuniary success. We would fain hope and believe of our countrymen, that many of the rational and enlightened would now be willing to reap smaller gains, if by doing so they could enjoy more leisure. But a business only half attended to, soon ceases to be a business at all, and the man of enlightened understanding who neglects his, for the sake of hours of leisure, must be content to spend them in the debtors' department of a jail. Thus it is not with single individuals that the blame can be made to rest: the fault is in the system, and happy will it be for thousands of immortal souls when this system shall correct itself. In the meantime, may it not be said to be the especial duty of women to look around them, and see in what they can counteract this evil, by calling back the attention of man to those summer spots in his existence by which the growth of his moral feelings has been encouraged and his heart improved. We cannot believe of the fathers who watched over our childhood, of the husbands who shared our intellectual pursuits, of the brothers who went hand in hand with us in our love of poetry and nature, that they are all gone over to the side of Mammon, that there does not lurk in some corner of their hearts a secret longing to return; yet every morning brings the same hurried and indifferent parting, every evening the same jaded, speechless, welcomeless return, until we almost fail to recognise the man in the machine."

having dismissed the subject of every-day business, proceed to consider what chiefly belongs to him, under the following heads:—1, Exercise and Air; 2, Enjoyments; 3, Articles of Food; 4, Period of Meals; 5, Sleep; 6, Modifications, Contingencies, &c.; 7, Recapitulation and Conclusion.

With reference to exercise, I need not spend much time in proving how necessary this is, both for our general comfort and the preservation of health. When we observe a certain anatomical development, we may infer it has been ordained, that this apparatus should discharge its appropriate function, for nature never creates anything in vain. In man and most animals the organs of locomotion—bones and muscles (flesh)—constitute the main bulk of the body, consequently we must be inevitably led to conclude, that exercise, either in the form of labour or otherwise, is indispensable. This rule of determining the function by the anatomy comes home to every one with the force of mathematical reasoning. It is also in reference to this mutual relation of means and end that the division of temperaments takes place—hence, we say of one whose limbs are large and bulky, that he is of the muscular temperament. It is plain that this individual was formed for a life of corporeal exertion. Should such a one, either regardless of nature's decree, or constrained by necessity, lead an inactive life, he will be punished for disobeying the laws of organization, and disease will finally be the inevitable result. We are wiser in our conclusions and practice with relation to the brute creation than in reference to ourselves. How well we estimate the comparative merits of horses and dogs, and the kind of labour or exercise each is suitable for in respect to their muscular development. When upon the subject of the skeleton and the

active agents of locomotion, I shall have occasion to consider bone and muscle then, somewhat in detail; at present it is my purpose to speak of these structures generally, and in reference to locomotion as related to the function of digestion.

Exercise, may be active, passive, or mixed. Walking is an example of the first; that of a carriage or sailing, of the second; and riding on horseback, of the third; to which may be added that which takes place without motion of the body, by friction, &c.

I shall briefly consider each of these modes in the order above mentioned. Firstly; *active* exercise.*—Walking appears to be that intended for us by nature; it is what we are fondest of, engages uniformly all the locomotive parts of the body, promotes circulation, respiration, &c.—Its endless modifications in reference to our rate of progression from slow motion—creeping—to running, leaping, dancing, &c., are alike applicable to the power and inclination of the tardy and the quick, the feeble and the strong. We are all aware of the buoyancy and exhilaration produced by a walk in the pure, open, country air. He who takes this exercise is enabled to increase considerably, by cautious degrees, the distance; but this rule must be ever borne in mind, that *fatigue* ought on all occasions be avoided. The valetudinarian should recollect that he has to return, and consequently ought to husband his strength. It is always desirable to have some other object in view—a visit to a friend, some little business, &c., people in

* "LONGEVITY AND PEDESTRIANISM.—On Saturday, Mr. William Eaton, travelling packman, died at Brechin, Forfarshire, at the age of 95. He had travelled with the pack 74 years, and walked on an average 15 miles a day, exclusive of Sundays, amounting to 347,430 miles, nearly 14 times the circumference of the globe."

general are averse to go out for the mere walk. We must never lose sight of the necessity, on these occasions, of employing the mind. The dyspeptic should, if possible, enlist some agreeable companion in his walks. Thus, exercise, pure open air, pleasing scenery, and the lively conversation of a kind and considerate friend, all conspire to divert and sooth the spirit of him who, if left to his own thoughts, would move mopingly along engrossed with the horrors of his invalid condition. Sometimes a walk to an adjoining spa, or to drink goat's whey at Dundrum, will be found much more efficacious than exercise only; the latter should be associated with some medicinal or dietetic plan. I have known all the credit of a cure having been given to dandelion and even watercresses, when the healthful walk into the country to procure them had been altogether overlooked. I have already cited several remarkable examples of our credulity in this respect.* The following story by Voltaire, will serve to illustrate still further this truth in reference to exercise:—

“Ogul,† a voluptuary, who could be managed but with difficulty by his physician, on finding himself extremely ill from indolence and intemperance, requested advice:—‘Eat a basilisk, stewed in rose-water,’ replied the physician. In vain did the slaves search for a basilisk, until they met with Zadig, who, approaching Ogul, exclaimed, ‘Behold that which thou desirest; but, my lord,’ continued he, ‘it is not to be eaten: all its virtues must enter through thy pores: I have, therefore, enclosed it in a little ball, blown up, and covered with a fine skin; thou must strike this ball with all thy might, and I must strike it back again, for a considerable time, and by observing this regimen, and taking no other drink than rose-water for a few days, thou wilt see and acknowledge the effect of my art.’ The first

* See “Popular Physiology,” lecture 7.

† Paris’ Pharmacologia, p. 52.

day Ogul was out of breath, and thought he should have died from fatigue ; the second he was less fatigued, and slept better ; in eight days he recovered all his strength. Zadig then said to him, 'There is no such thing in nature as a basilisk, but thou hast taken exercise,* and been temperate, and hast, therefore, recovered thy health.' "

Dr. Paris adds, "But the medical practitioner may, perhaps, receive more satisfaction from a modern illustration ; if so, the following anecdote, related by Sydenham, may not be unacceptable :—

"This great physician having long attended a gentleman of fortune with little or no advantage, frankly avowed his inability to render him any further service, adding at the same time, that there was a physician of the name of Robinson, at Inverness, who had distinguished himself by the performance of many remarkable cures of the same complaint as that under which his patient laboured, and expressing a conviction that, if he applied to him, he would come back cured. This was too encouraging a proposal to be rejected ; the gentleman received from Sydenham a statement of his case, with the necessary letter of introduction, and proceeded without delay to the place in question. On arriving at Inverness, and anxiously inquiring for the residence of Dr. Robinson, he found, to his utter dismay and disappointment, that there was no physician of that name, nor ever had been in the memory of any person there. The gentleman returned, vowing eternal hostility to the peace of Sydenham, and on his arrival at home, instantly expressed his indignation at having been sent on a journey of so many hundred miles for no purpose. 'Well,' replies Sydenham, 'are you better in health?' 'Yes, I am now quite well, but no thanks to you.' 'No,' says Sydenham, 'but you may thank Dr. Robinson for curing you. I wished to send

* We need scarcely, after this example, say how much we recommend the exercises of the gymnasium and fencing, and also the "Ladies' exercises." On *very* wet days, the skipping-rope or shuttlecock will afford a healthful pastime : as this is home exercise, and expands the chest, we would recommend our fair young friends to dispense with stays on these occasions, or, if worn, they should be short and LOOSE. We may also add that our *own* morality is not so tight-laced as to forbid the elastic, airy tread of youth and beauty through the mazes of the sportive and healthful dance.

you a journey with some object of interest in view ; I knew it would be of service to you ; in going you had Dr. Robinson and his wonderful cures in contemplation ; and in returning, you were equally engaged in thinking of scolding me.' Had the patient been sent on a journey without the contemplation of some plausible object, the result would probably have been less satisfactory ; we see, therefore, how much more sagacious was Sydenham's prescription than that of Hippocrates, under similar circumstances, for he sent his patients from Athens to Megara, with no other object than to touch the walls and return."

It would, no doubt, prove highly beneficial to public health, if a standard time-piece were placed at the Phoenix in the Park near Dublin—and that this clock should be the grand regulator : "the corrector of the sun." How many would be then induced to walk or ride into this splendid Park—perhaps the finest in the world—in order to regulate their watches, instead of strolling up sunken Sackville-street to take a peep at the post-office oracle. It would be truly becoming for the visitors of a Phoenix to rise, if not out of the ashes, at least out of the smoke of the city, and thus become, like the prototype, regenerate in health and vigour by the ascent. As a rule, our walks should be, if possible, in the clear, pure atmosphere, for "God made the country, man the city."*

* The vital portion (oxygen) of equal measures of air, is the same, both in the city and in the country. The vitiated condition of the former is caused by impurities resulting from respiration, combustion, animal exhalations, &c. Mr. Farr, the Registrar-General, has ascertained from the census returns, that the mean duration of life in the two classes of districts—towns and rural places—differs by nearly seventeen years, the average of life being fifty-five years in the country and only thirty-eight in the towns. The density of the population in the country districts referred to, compared to that in the towns, is as 10 to 242 ; the mortality as 100 to 144.

SCALE OF EUROPEAN MORTALITY.

It appears by the "6th Report of the Registrar-General of England," that England is the healthiest country in this quarter of the globe ; the mean annual deaths being about 1 to every 45 persons living. In France, the yearly mortality is as 1 to 42 ; in Prussia, as 1 to 38 ; in Austria, as 1 to 33 ; in Russia, as

Passive Exercise.—When the individual is too weak for walking, or the mixed exercise of riding on horseback, then we must substitute for these the conveyance by some form of carriage. All the different kinds of vehicles may be reduced to two classes, open and close. When the valetudinarian can bear the exposure, the former is greatly to be preferred. Our experience of all the *half* covered vehicles is unfavourable. You will find that even the robust are disposed to take cold in such carriages. If the weather and season prove favourable, the valetudinarian may drive into the country, and when in a fine upland, dry position, he will generally find himself equal to a short walk; having the carriage at hand he will be able to resume it before fatigue shall have occurred. It is well known that the individual who on leaving a city had to be helped into his carriage, will be so strong, after a drive of some miles in the open, bracing, and exhilarating pure air of the country, that he shall be able to alight, and even walk about with a degree of strength and buoyancy that surprises himself.

Sailing is a very desirable form of gestation, provided the dyspeptic can undertake it without apprehension; if this should occur in any form of exercise, it would more than neutralize the proposed advantage. A nervous friend of mine declared that his hydrophobia had been so great on all occasions, that a fit of indigestion followed upon his crossing in a row boat a narrow ferry. Several *in-door* modes of exercises, as spring boards and spring chairs, have been recommended as substitutes for carriage exercise; but *all* such fail in producing that salubrious exhilaration which the open air only can realize. There are some who will not go abroad, more especially if the day be not most in-

1 to 28. The average duration of life in England, is 41 years—that of Russia, is less than 27 years.

viting; I would say to them, home exercise is better than none at all.

The third form of exercise, the *mixed*—of which riding on horseback gives us a familiar example—is most desirable for the valetudinarian, particularly if he should labour under a sluggish or torpid condition of the bowels; the shaking and compression which the abdominal organs undergo favour the action of the bowels directly and indirectly: by referring to pages 118, 119, and 121 of my “Physiology for the Public,” it will appear how this exercise must cause the free descent of bile from the liver, and a vigorous contraction of the muscular coat of the intestinal canal.*

The several paces of the horse in walking, trotting, and galloping, enable the dyspeptic to determine the rate of progression, and the degree of shaking that he may find most suitable.†

Friction and *pressure* are used when the invalid is so weak as to be unable to bear any other exercise. The former may be well employed with horse-hair gloves, particularly over the region of the abdomen, for reasons already mentioned. Philip states, that “it (friction) is the principal

* This effect is observable in reference to horses themselves, when taken from the stable for exercise or work.

† A modern fine lady, in our times, never pleads guilty to more than the “wing of a lark” as a supplement to her toast and tea; while “a maid of honour in the court of Elizabeth breakfasted upon beef, and drank ale after it.” This can be readily accounted for by considering how much health, appetite, and digestion, are influenced by early rising, active habits, and out-of-door exercise, all of which were practised by the latter; while the former appears to avoid “all those causes that put the action of the organs in play, and accelerate the nutritive process with which hunger is essentially connected.” I must certainly make a most important and meritorious exception in favour of *equestrian* exercise, which I am glad to find is now so generally the fashion. If I could add “early to bed and early to rise” to this wholesome and inspiring exercise, how much more blooming would our fair countrywomen look; and although they might not be able for beef or mutton in the morning, we would venture to say either would be very acceptable at dinner hour.

exercise among the higher rank of some Asiatic nations, and was used both by the Greeks and Romans after they became luxurious ;” and he adds, “ that mere pressure is a mode of exercise inferior to friction ; but, if generally applied to the limbs in an interrupted manner from the valvular structure of the veins, it has a considerable effect in promoting the circulation.” Indian rubber bandages, accurately applied, will often so brace and strengthen the muscles of the lower limbs,* as to enable the invalid to walk, who, without this aid, had felt such exercise impossible.

Enjoyments.—Under this head we have to consider what it is difficult to define in reference to people in general. Our physical, as well as our mental tastes are almost as different as our faces and figures. Each is ready to exclaim, “ It is a matter of surprise to me that Mr. A. can find so much enjoyment in business — eternal business — night, noon, and morning.” Again, Mr. A. says, “ Well, I wonder how Mr. B. can continue to live in what *he* calls a round of pleasure and amusement.” Each sees the mote in his brother’s eye, but observes not the beam in his own. In other words, is tolerant of his own folly† only.‡ Change or variety appears to be desired by all, unless by those labour-

* The Irish peasantry when they undertake long journeys on foot, often invest their legs with hay ropes, owing, doubtless, to a practical knowledge of this circumstance.

† “ *Nonsense.*—Generally applied to any sense that happens to differ from our own !”

‡ The Rev. Sydney Smith’s account of himself, is it not the picture of a contented man ? “ I am 74 years old, and being canon of St. Paul’s, in London, and a rector of a parish in the country, my time is divided equally between town and country. I am living amidst the best society in the metropolis, am at ease in my circumstances, in tolerable health, a mild whig, a tolerating churchman, and much given to talking, laughing, and noise. I dine with the rich in London, and physic the poor in the country—passing from the sauces of Dives to the sores of Lazarus. I am upon the whole an happy man, have found the world an entertaining world, and am heartily thankful to Providence for the part allotted to me in it.”

ing under a species of monomania. The traveller—by occupation—sighs for rest, while he doomed to drudge in the same locality, longs for the freedom of a loose leg and change of scene ; all illustrate the truth of Horace's maxim :

“ Qui fit Mæcenæ ut nemo contentus vivat.”

In truth, enjoyment is quite a relative idea, depending upon a host of contingencies, such as age, temperament, habit, peculiarities, &c. The influence of age or period of life, needs not a reference to the sacred Scriptures to prove its well-known effects.

In childhood, manhood, and old age, we make a retrospect *tête-à-tête* with Experience, not at all complimentary to the preceding stage—and although we may cast “a longing, lingering look” on boyhood's days, owing to the pleasures they *then* afforded ; yet, still, we too often regret that so much time was idly spent.* The objects of ambition or of avarice—unlike the straws and rattles of child-

* “ Those days of old, when Youth was bold,
And Time stole wings to speed it ;
And Youth ne'er knew how fast time flew,
Or knowing, did not heed it !”

“THE QUARTERS OF LIFE.—The seven ages of man have become proverbial ; but in respect to the condition of our minds, there are granted to the best of us but four periods of life. The first fifteen are childhood. We know nothing—we hope. The next fifteen are passion and romance—we dream. During the period of fifteen years, from 30 to 45, we are what nature intended us to be. Character has formed ; we pursue a course of life ; we reason ; we meditate. This is the period in which we may be said with most propriety to *live*. The fourth period is that of commencing decay. We may grow wiser, but it is the wisdom that speaks in a shake of the head. Pain and penitence begin—we sorrow. Nevertheless, if the third period has been passed in providing against the fourth, nature is changed, our declining years are lighted with happiness and love, and as they approach their destined end, instead of the gloom naturally accompanying decay, they are tinged with a ray from before them, the shadows are cast behind us on our path, feelings spring up unfelt even in the magic periods first traversed by us—we rejoice.”—*Dublin Magazine*.

hood, or the finely gilded toys of the emulation of riper years—are persistent, besetting delusions to the very last—even on a death-bed.

The conqueror still sighs after fame—darling fame—that “nerved his arm and steeled his sword.” The miser hugs his money-bags and petitions death to spare him yet a little until he receives some valuable post-obits. We have *heard* a great deal of how valueless the things of this world appear to the dying man; but we have too often *seen* the reverse, to give assent to this assertion as the rule, which forms but the mere exception; men generally die as they have lived, “The ruling passion strong in death.”*

On the subject of enjoyments, we can only say, that each individual must determine upon what he likes best in this respect, and act accordingly. The man who pays most attention to the culture and discipline of his mind, is laying the true and firm foundation for such a taste as will lead him to seek for enjoyment in moral and intellectual†

* A late baronet, on the day of his death, had himself carried to a window which commanded an extended view of his magnificent demesne. He exclaimed, after surveying the sylvan scene, “Ah! must I then leave you, B—l Park!”

The late Sir William Follett, M. P., said: “attached to my home and professional pursuits, a foreign air breathes no pleasure for me.” Such was his anxiety about public affairs, that he kept the *newspapers* continually by his side while consciousness remained.

‡ The Vicar of Wakefield showed, that “books were sweet, unrepublishing companions to the miserable, and that if they could not bring us to enjoy life, they would at least teach us to endure it.”

“We had forgotten a most characteristic speech of Archbishop Whately, on behalf of the Church, of which he said, the motto should ever be, ‘Let there be light,’ and what light was better than the light of letters?”—*Examiner*.

Cicero’s opinion on *Education*.—“*Studia adolescentiam alunt, senectutem oblectant, adversis perfugium ac solatium præbent, delectant domi non impediunt foris, pernoctant nobiscum peregrinantur rusticantur.*”

M. THIERS’ STUDY.—At the present time peculiar interest attaches to the following description of M. Thiers’ “study”—his *cabinet de travail*—from which an idea may be drawn of the chamber in which the late prime minister of France

pursuits, those that leave no sting behind. Remember that the pleasures of the sensualist and of the voluptuary perish in the very enjoyment.

I shall dismiss this subject with a consideration of a state which is best described by *ennui*, in which the healthiest of us are too often found, and are then as incapable of enjoyment as we are of undertaking business. If we attempt either, we do so in a listless, languid way, which inevitably fails of attaining the desired result. Whenever this state is recognized, we should allow the transitory fit of mental or physical depression to subside. With some this condition is periodical; but we are not to give way on all occasions, nor confound indisposition with inability. I would have you understand that *ennui*, although very like indolence, is not identical with the latter. The most active mind is often invaded by the former, which bestrides it as an incubus, prostrating and paralyzing the energies of him who glories in employment, and whose motto is "*work.*"

Articles of Food. — I have already shown* from Magendie's experiments, the importance that should be attached to a variation of diet; and also, that Dr. Prout

writes his historical works and passes a large portion of his time. This "*cabinet picture*" is given in a recent French paper:—"The study of M. Thiers, at his residence in the Place de St. George's, is assuredly one of the most beautiful that can be beheld. Let the reader imagine a large square apartment, with a richly ornamented ceiling, and the floor covered with one of those splendid and thick carpets such as they make at Gobelins or at Aubusson. Two windows light the room, and two doors, on opposite sides, lead to it. In the middle of the room stands an immense desk, carved in the fashion *de la renaissance*. Around, and breast high, there are bookcases, laden with books: standing on the top of these cases there are numerous beautiful little statues, busts, Japan vases, globes, &c. A lovely Venus is in front of the desk, and on the right is the statue of Mercury. An arm chair, *a la Voltaire*, is placed before the desk; it is that belonging to the master of the house. Twelve beautiful but smaller chairs stand round the room, near the bookcases; and lastly, valuable and costly pictures literally cover the walls."

* "*Popular Physiology*," pp. 91, 92.

reduced all the articles of nourishment among the higher animals, to three classes: 1, The *saccharine*; 2, the *oily*; and 3, the *albuminous*. In Lecture IV., p. 99, of the same work, a condensed view of the relative digestibility of the different kinds of food was given, according to Dr. Beaumont's experiments on St. Martin, to which were added, some observations upon condiments and ardent spirits. As I have entered already pretty fully into the consideration of the articles consumed at breakfast, it next only remains to consider briefly those used at dinner, more especially in relation to the valetudinarian, reserving for a future occasion the modifications or changes required in reference to age, sex, temperament, &c.; the adult male being the individual we have now to deal with.

I have before shown that all the articles employed in diet may be reduced to either of the two great divisions, animal or vegetable: at page 95 of "Physiology for the Public," I alluded to both the proximate principles and ultimate elements of these substances. The former are, in animal food, fibrin, albumen (white of egg), jelly, oil, &c.; in vegetable aliment they are gluten, farina (starch), gum, oil, and sugar. The latter, in animal substances, are oxygen, hydrogen, carbon, and nitrogen; the last in *large* quantity. Vegetables contain oxygen, hydrogen, and carbon, and are either *without nitrogen* or contain it in small quantity only. It would be reasonable to suppose that animal food, approximating so much both in its proximate principles and ultimate elements to the nature of our bodies, ought to be that almost exclusively employed; but, observation of the masticating and digestive apparatus throughout of man, and the results of experience, have shown, that both kinds of aliment should be used in order to preserve his health. The region we inhabit, seasons, habits, &c., influence our choice most materially in this respect. The hardy Irish

peasantry are strong and vigorous, although living on a diet almost exclusively vegetable.

The following is from "*Book of the Farm* :"

"Every part of a plant contains nitrogen as well as carbon ; but, as an invariable rule, the seed of all plants contains a much larger quantity of nitrogen than the leaves and stalks, and a lesser quantity of carbon, and inversely, the leaves and stalks contain a much greater quantity of carbon, and a lesser quantity of nitrogen. Now, when the horse is fed on grass, his food consists almost entirely of carbon ; and the result is, that with a sufficient supply he gets fat—that is, that particles of oily, fat matter, are deposited on the muscles under the skin ; but, as it is well known, a horse in this condition is quite unequal to any work, and the least exertion reduces its bulk. But when the same horse, under other circumstances, is fed on corn, his food consists principally of nitrogen ; and, although he may never, under this keep, get as fat as on the other, still the increase he does acquire will be pure muscle, or, as it is technically termed, sound flesh ; and on this keep he can perform infinitely more work, with less fatigue, than on food containing no nitrogen. A more complete instance could not be adduced to show that animals, as well as plants, can only assimilate that food which is presented to them ; in the first place, carbonaceous matters being the food of the horse, carbon is deposited in the shape of fat ; in the latter, when more nitrogen enters into the composition of his food, the deposit of muscle preponderates. So it is with wheat. With a manure that only supplies carbonaceous matter, starch is the result. With a manure containing nitrogen, gluten is formed ; both cases being completely analogous, and affording unerring proof of one simple and unerring law."

Richerand says, "Living bodies are real laboratories, in which there are carried on combinations and decompositions which art cannot imitate : methinks one may infer, that the power of nature in the composition and decomposition of bodies far exceeds that of chemistry."* He adds, "The excrements of a hen fed

* When a chemist "rides his hobby," he often excludes the wonder-working actor *life* ; this, in the *living* body, is obviously tantamount to acting the play of Hamlet, "the part of Hamlet being omitted by particular desire !!"

for ten days on oats only on being calcined and analysed by M. Vauquelin, produced twice as much phosphate and carbonate of lime as was contained in the oats, with a small deficiency in the quantity of silex, which might have been employed in furnishing the excess of calcareous matter; a transmutation depending on the absorption of an unknown principle, to the amount of nearly five times its own weight."

Now let us take the familiar examples of the colt, calf, and lamb. All feed on grass—perhaps on the same pasture, when they arrive at maturity; they may be fat, no doubt, but they have put up flesh also. Look at the display of blood, bone, and *muscular* beauty of the thoroughbred four year old, that will, on or off grass, never grow fat; observe, either in the market or at table, beef and mutton, and you will at once conclude, that in the growth of the ox and the sheep the development of muscle *preponderates* over that of fat. Magendie states, "That the nations which fed on rice, maize, or *potatoes* (aliments possessing little or no nitrogen), take also milk or cheese." We could, from personal knowledge, point out districts in Ireland, where—miserable to relate—many of the peasantry are specimens of vegetable-feeders, in the exclusive sense of this appellation. When on the subject of salt, it was mentioned,* that when the destitute Irish cannot procure milk—even butter-milk—they dissolve salt in water, into which they dip the potato before eating it. This solution they designate by an Irish term which signifies "blind herring." These, according to the theory, should be fat and not muscular, because they feed on carbonaceous food: but the facts prove the reverse, they are muscular but not fat; and if you require a proof, select one of those vegetable-eaters, and start him on the mountain or

* Vid. p. 105, of my "Physiology for the Public."

on the plain against an individual who eschews potatoes, and lives almost exclusively upon bread and animal food, and you may be assured, that the former will afford ample proofs that active and enduring sinews can be produced by unazotised aliment.* Experience at once points out, that although the proximate principles and ultimate elements of animal and vegetable food are so different, yet by the assimilating powers of the system, nutriment may be obtained from either, separately, but perhaps best from both conjointly.

I have before alluded to secretion as the deeply veiled offspring of life, but I am not desirous to hide my ignorance by referring the difficulty to the vital principle, which “does all sorts of work for all sorts of people.” Bostock judiciously says, in his chapter on secretions: “To suppose that we are affording any real explanation of the phenomenon, by ascribing it to the operation of the vital principle, or to any vital affinities, which is merely a less simple mode of expressing the fact, is one of those delusive attempts to substitute words for ideas, which have so much tended to retard the progress of physiological science:” and, indeed, he might have added, of science in general, the difficulties of which are not unfrequently encumbered by wordy stuff, which Mr. Burchell, in the “Vicar of Wakefield,” would call “*fudge*,” and which in Ireland we apostrophise by the classical term “*botheration*.”

* Azote and nitrogen are synonymous. MM. Macaire and Marcet, of Geneva, say, that the chyle as well as the blood of herbivorous and carnivorous animals is identical in its ultimate analysis; that whatever food an animal habitually eats, the quantity of nitrogen is essentially the same in both the chyle and blood. There is less nitrogen, they say, in chyle than in blood.—(See *Elliotson's Physiology*, p. 137.)

As Indian corn has been lately imported into Ireland largely it may not be uninteresting to give the following a place here:—“*The nutritive Properties of Indian Corn compared with those of the Potato*.—Proportion of nutrition in 100 parts of potatoes, 24; proportion of do. in Indian corn, 88. Proportion of water in 100 parts of potatoes, 72; proportion of do. in Indian corn, 9.”

Professor Liebig states in his "Organic Chemistry" (p. 132), "If the substances which do not contain nitrogen preponderate, either they will be expended in the formation of fat, or they will pass unchanged through the organism. This is particularly observed in those people who live almost exclusively upon potatoes."* He also adds:—"Potatoes, which, when mixed with hay alone, are scarcely capable of supporting the strength of a horse, form with bread and oats a strong and wholesome fodder."

According to the theory of the German professor, Pat, that lives exclusively upon potatoes and "blind herring," should be one lump of fat; or be a living skeleton, having neither fat nor lean. This may be the case with German digestive organs and German potatoes; but Irish chylopoietic organs and Irish potatoes are more compassionate. What an awful event it would be, if those obdurate German potatoes should be imported under the new tariff?—nothing could remain but a choice of evils; our friend Pat *must*, from such aliment, put up fat—*all* fat—or "they will pass *unchanged* through the organism," *i. e.* through and through Pat's body, "like the baseless fabric of a vision," and leave not even "a wreck" (of nourishment) "behind!!"†

* NUTRIMENT IN POTATOES.—As to the quantity of nourishment, as human food, contained in the potato, as compared with some other ordinary articles of food, the experiments of MM. Berry and Herring give the following result:—"One hundred pounds of potatoes are equal for nutriment, to meat without bone, 25; beans, 28; wheaten bread, 35; parsnips and carrots, 190; turnips, 300; cabbage, 400." The experiments of MM. Berry and Herring establish the fact, that 3lbs. of potatoes are equal for nourishment to 12 ounces of bread, and 5 ounces of meat.

† It would be curious to ascertain whether Mr. Bernard Cavanagh—the total abstinence man!!—was induced to try and live upon *nothing*, owing to his knowledge of the German discovery, that "life supported by potatoes is a gradual starvation!!"—See p. 55 of "Physiology for the Public."

Need I inform you that an Irish horse fed on "hay and potatoes," would work the whole year round on such fodder, and if the dumb creature could speak, he would say it was excellent diet even for a Lord Mayor's horse.

If man, as I have shown, and as several in Ireland will testify, can be supported upon potatoes as his *exclusive* diet, is not the following assertion of Liebeg very questionable?

"A horse may be kept alive by feeding it with potatoes, which contain a very small quantity of nitrogen, but life thus supported is a gradual starvation; the animal increases neither in size nor strength, and sinks under every exertion." I happened not long since to have a large horse that lost condition sadly, although fully fed on hay and oats. Less of the latter, combined with boiled potatoes, were now given, and in a short time this horse was restored to condition, spirits, and *muscular* vigour. I would feel obliged to some of my country friends to put a horse upon potato diet *exclusively*, and report the result.

Well, in sober seriousness, I do agree with the illustrious Giessen professor, that the duty of the physiologist "is not to show that others are erroneous, but to discover truth, and that alone." My opinion has been drawn from the observation of phenomena and from every-day experience, both of which are directly opposed to Liebeg's conclusions. The following quotation from this admirable work furnishes me with a reply:—

"Nature speaks to us in a peculiar language, in the language of phenomena; she answers at all times the questions that are put to her: and such questions are experiments.* An experi-

* The following investigations by Dr. Bayly bear the stamp of true induction. He finds, as a practical fact, that potatoes both prevent and cure scurvy, and consequently, he is led to conjecture, that they possess an organic acid; and, the

ment is the expression of a thought: we are near the truth when the phenomenon elicited by the experiment corresponds to the thought, while the opposite result shows that the question was falsely stated, and that the conception was erroneous." —(p. 37).

Dr. Coombe says, that in the United States of America an active and numerous sect has of late years sprung up

interesting results prove his conjecture to be well-founded. Here is a good example of both observing and inventive genius combined. Dr. William Bayly, Physician to the Penitentiary at Milbank, after the most extended examination and comparison of the various dietaries in this and other prisons, has shewn most satisfactorily, that the liability to scurvy bears a strict relation to the amount of succulent vegetables consumed by the prisoners, *especially of potatoes*. And adds, "wherever this disease has prevailed, there the diet of the prisoners, *though often abundant in other respects*, has contained *no potatoes*, or only a very small quantity. In several prisons the occurrence of scurvy has wholly ceased on the addition of a few pounds of potatoes being made in the weekly dietary. There are many prisons in which the diet, from its unvaried character, and the absence of animal food, *as well as green vegetables*, is apparently most inadequate to the maintenance of health; and where nevertheless, from its containing abundance of potatoes, scurvy is not produced."

Dr. Watson (from whose work on "Practice of Physic," I quote) adds, "now potatoes are *food* as well as medicine, and they are a cheap kind of food, and it may be hoped that a more general *knowledge of their anti-scorbutic properties*, even when cooked, will abolish this wretched complaint, wherever a good supply of them is obtainable. Dr. Bayly believes that from three to six pounds weekly for each person would suffice. He thus accounts for their salutary influence." A glance at the chemical analysis of the potato at once explains its anti-scorbutic virtue. The various fruits, succulent roots, and herbs which have the property of preventing and curing scurvy, all contain dissolved in their juices one or more organic acids—such as the citric, tartaric, and malic acids. Sometimes these acids exist in the free state, but more generally they are combined with potash or lime, or with both these bases. Now potatoes have been submitted to most elaborate chemical examination by Einhoff and Vauquelin; and by both these chemists they have been found to contain a vegetable acid in considerable quantity. According to Einhoff this acid is the tartaric combined with potash and lime. According to Vauquelin it is citric, partly in combination with those bases, and partly in the free state. The farinaceous seeds, as wheat, barley, oats, and rye, which are *destitute of anti-scorbutic property*, contain no organic or vegetable acids.

Early in November, 1845, I wrote a Letter on "Substitutes for Potatoes," which appeared in several of the public journals, in which I briefly considered the all-absorbing question—how are the people to be fed during spring and next summer?—what may, I fear, be contemplated as a scarce and hard summer. As my views

under the auspices of Sylvester Graham, against the use of animal food in any form or quantity, and in favour of the exclusive use of vegetable aliment and water as the natural food of man."* He also states that the monks of

on this momentous question are confirmed by the researches of Dr. Bayly, I will here make some extracts from the letter above alluded to:—

"It is plain that the *grievous* pinch will probably be *then* (*summer*) most felt by the population of Ireland.

"Reflecting upon what would supply an early crop, and prove both a substitute for potatoes and a wholesome food for the vegetable-feeding Irish, it struck me that cabbage and turnips were the first that could lend their aid, and subsequently carrots and parsnips.

"I have just returned from making inquiries at Mr. Grimwood's seed-shop; I learned that kale plants now put out would yield a crop fit for use so early as February next, and that cabbage seed sown now would supply food in April, turnip seed sown in March would yield a supply of aliment about the middle of June, carrot and parsnip seed sown at the same time would yield their respective crops in September and October. Thus, from February to October, kale, cabbage, turnips, carrots, and parsnips, would afford an abundant and varied supply of food, and that in the *best* form, namely, as afforded by *nature*.

"I have already, in my 'Physiology for the Public,' insisted upon what Beaumont had proved, namely—'that *bulk* as well as *nutriment* is *necessary* to the articles of diet;' and again, 'that the digestibility of aliment does not depend upon the quantity of nutrient principles it contains.' Acting in conformity with the first principle, we never think of feeding either man or horse upon all meat (flesh) or all oats: and in compliance with the second rule, we would not disorder a man's digestion by giving him *all* fat, instead of both fat and lean; although the former is found to be four times as nutritive as the latter. 'Feed me with food convenient for me,' is alike applicable to mental and to physical supply—mischievous results from a too-concentrated diet:

" 'The prudent taste
Rejects like bane, such loathsome lusciousness.'

"Rice was tried as a substitute for potatoes in the poor-houses, and, though more nutritive than the latter, as regards chemical analysis, it was rejected *even* by the *paupers*.

"Magendie has proved the great importance that should be attached to a *variation* of diet. The plan proposed, with the addition of oatmeal and starch, would be in perfect accordance with his *established views* in this respect.

"There is another advantage that would probably accrue. It is the beneficial effect which is well known to result from an alteration of crops, especially in Ireland, where the soil has been so *constantly* producing *potatoes*."

* "Dr. Alcot and others, of America, have published numerous examples of

La Trappe make it part of their religion to eat only once a day, and *nothing but vegetable food*, unless when sick, in which case milk is allowed.

Bostock states, that fat differs from albumen and fibrin in *not* containing nitrogen. Adelon and Adouin conceive that the principal use of the fat is to serve as a reservoir of nutritive matter, when the body is deprived of its regular supply by the ordinary channel.* Beaumont says, that oily food contains "a large proportion of the nutritive principle." Paris, that "it has been calculated that an ounce of fat affords nutriment equal to four ounces of lean." Here, then, we have two aliments—fat and lean; although the former does *not* contain *any* portion of nitrogen (azote), and the latter *abounds* in nitrogen, yet the *non-azotised* aliment is *four* times as nutritive as the azotised!!

I have dwelt longer than I had intended upon this portion of my subject, but I trust its importance will plead as a sufficient excuse. Prout observed, with the acumen of a sound philosopher, that milk being the only article furnished and intended by nature as food, the examination of its constituents might naturally lead to a knowledge of these proximate principles and ultimate elements

restored and improved health, arising from the exclusive use of vegetable food, when every other means had failed." This sect realise the picture drawn by Goldsmith's Hermit, of his dietary:—

"No flocks that range the valley free,
To slaughter I condemn;
Taught by that power that pities me,
I learn to pity them.

"But from the mountain's grassy side,
A guiltless feast I bring;
A scrip with herbs and fruits supplied,
And water from the spring."

* As in sickness and hybernation.

which are essentially necessary for the nutrition of man. Those, as was before stated,* he found to be saccharine, oily, and curdy or albuminous matter. Does it not follow from the analysis, as nature is ever simple, that Prout is correct, when he states that "it is perhaps impossible to name a substance employed by the more perfect animals as food, which does not essentially constitute a natural compound of at least two, if not all three, of the above three great classes of alimentary matters?"

Instead of looking upon nitrogen as the essential element in nutritive substances, we should perhaps, from the analysis of Prout, be led to consider *carbon* as better entitled to that pre-eminent position (were it at all legitimate to fix upon any isolated element), because the latter is found in *abundance* in *both* animal and vegetable substances, while vegetables contain but little nitrogen.

The following are the results of Prout's experiments in reference to carbon :†—

The characteristic property of saccharine bodies is, that they are composed simply of carbon, united to oxygen and hydrogen, in the proportion in which they form water; the proportion of carbon varying in different instances from about thirty to fifty per cent. The other two families—oily and albuminous—consist of compound bases (of which carbon constitutes the chief element) likewise mixed with, and modified by water, and the proportion of carbon in oily bodies, which stand at the extreme of the scale in this respect, varies from about sixty to eighty per cent. Hence, considering carbon as indicating the degree of nutrition, which in some respects may be fairly done, the oils may be regarded in general as the most nutritious class of bodies.

* "Popular Physiology," p. 92.

† "Popular Physiology," p. 93.

And the general conclusion from the whole is, that substances naturally containing less than thirty, or more than eighty per cent. of carbon, are not well, if at all, adapted for aliment.

I shall now proceed to make some additional observations upon animal and vegetable food, the dietetic qualities of which are mainly determinable by the proximate principles* just now referred to, and which I shall next proceed to examine.

1. *Fibrinous Aliments* are so named from a fibrinous ingredient constituting their chief or preponderating proximate principle. The blood—as was before stated†—is that wonderful fluid which, when sent to the different parts of the body, constitutes the material from which the specific product is elaborated by the respective organs. Now, this substance called the coagulable lymph, gluten, fibre of the blood, and fibrin, exists ready formed as the coagulable part of the blood; the clot of the latter being fibrin united with the colouring matter, from which, by

* Dr. Paris distributes the *nutrientia* into the following nine classes:—

Cl. I. *Fibrinous aliments*. Comprehending the flesh and blood of various animals, especially such as have arrived at puberty: venison, beef, mutton, hare.

Cl. II. *Albuminous*. Eggs; certain animal matter.

Cl. III. *Gelatinous aliments*. The flesh of young animals: veal, chickens, calf's foot, certain fishes.

Cl. IV. *Fatty and oily aliments*. Animal fats, oils, and butter; cocoa, &c.; ducks, pork, geese, eels, &c.

Cl. V. *Caseous aliments*. The different kinds of milk, cheese, &c.

Cl. VI. *Farinaceous aliments*. Wheat, barley, oats, rice, rye, potatoes, sago, arrow-root, &c.

Cl. VII. *Mucilaginous aliments*. Carrots, turnips, asparagus, cabbage, &c.

Cl. VIII. *Sweet aliments*. The different kinds of sugar, figs, dates, &c.; carrots.

Cl. IX. *Acidulous aliments*. Oranges, apples, and other acescent fruits.

To this we may add *CONDIMENTS*; such as salt, the varieties of pepper, mustard, horse-radish, vinegar, &c.

† See p. 2, and "Popular Physiology," p. 121.

washing, it may be freed. "When the fibrin is thus procured in a pure state, it is found to be a solid of considerable consistence, elastic and tenacious, and in its general aspect, as well as its chemical relations, very similar to the pure muscular fibre," or flesh of animals, which abounds in nitrogen, and constitutes the most nutritive and stimulating of alimentary substances.

When muscular fibre (beef or mutton) has been macerated in water for some time, it is reduced to a pure state, and is then nearly white, without much taste or smell, and if it be kept free from moisture, it will remain a long time without undergoing decomposition or experiencing any change. If the water which has been employed in the maceration, and which contains albumen, jelly, extract, and various salts, be evaporated to dryness, and then treated with alcohol, the extract alone is dissolved, and, by the evaporation of the alcohol, may be obtained in a pure state. This substance was discovered by Thouvenel; it has a brown colour, an acrid taste, and an aromatic odour, is soluble both in alcohol and water, and would seem to be the ingredient which gives the specific flavour to the flesh of different animals, and especially to the part which forms the brown crust on roast meat. It is to this substance that Thenard has given the name of osmazome. (*Bostock.*)

I shall have, presently, occasion to show that this osmazome is a most important ingredient. We are all familiar with the aromatic odour of roast beef, and with the deeply brown gravy which flows from it, both of which are caused by this peculiar substance. Mutton, beef, venison, hare, goose, duck, &c. are examples of aliment in which fibrin and osmazome abound. It is plain that where we wish to employ a highly nutritive and stimulating regimen, this is the form of food we should select.

Paris observes, "that the texture of animal food influences its digestibility, and the latter is mainly affected by the age, sex, habits, condition, diet, and description of death of the animal which furnishes it." He adds, "The mode of killing an animal has been considered from the remotest ages, as capable of affecting the quality of its meat. The flesh of hunted animals is characterised by peculiar tenderness. The same effect is produced by any lingering death. This fact probably explains the policy of those old municipal laws, which ordained that no butcher should offer or expose any bull-beef for sale unless it had been previously baited; and it is upon the same principle only, that the quality of pig's flesh could be improved by the horrid cruelty of whipping them to death, as said to be practised by the Germans. The action of vinegar administered to an animal some hours before killing it, is also known to be capable of rendering it less tough. It is a common practice in the country, to give a spoonful of this acid to poultry when they are intended for the immediate service of the table." The observations of Philip, as agreeing with the results of Beaumont's experiments, have been already detailed at page 199 of my "Popular Physiology."

2. *Albuminous Aliments.* White of egg is the most simple and familiar example we can cite of albumen. This form of aliment is nutritive without being stimulating, and hence, is very suitable for convalescents. We find associated in ordinary animal food, fibrin, albumen, and gelatine. The fibrin and albumen are observed to preponderate in the older animal, the gelatine in the younger. Hatchell performed an experiment to illustrate the difference between the chemical constitution of albumen and jelly. "He found that if coagulated albumen be immersed for some time in diluted nitric acid, at the temperature of the atmos-

phere, it is gradually converted into a substance resembling jelly." Bostock supposes that in this case the nitric acid parts with a portion of its oxygen to the albumen, and consequently that jelly is to be regarded as differing from albumen, in containing a greater proportion of oxygen; an opinion which is supported by the analysis of Gay-Lussac and Thenard. Glue and white of egg are familiar examples of gelatine and albumen. The former abounds in the structure of the young, the latter in those of the old animal—hence, we employ calf's feet to make jelly. The first is rendered fluid by heat, the second is solidified by the same agent, the removal of which will cause the gelatine (glue) to become solid; while no such effect will be produced upon the albumen, for the white of egg once rendered hard remains in that state. "Londe considers albuminous aliments, such as oysters, brains,* eggs, &c., very suitable when the stomach is irritable, and during convalescence, when much nourishment is required. He thinks them well adapted for old men, females, and literary people." Beaumont states,† that calf's feet jelly was digested in little more than half an hour, eggs, raw, two hours—hard-boiled or fried, three hours thirty minutes.

3. *Gelatinous Aliments*, like albuminous, are nutritive without being stimulating: hence, they are in such common use, and when patients are convalescent chicken broth or calf's feet jelly is, in ordinary, first directed on these occasions. The younger the animal the more this principle abounds. Although Beaumont's experiments prove that

* According to German principles, those that have not been blessed with much brains of their *own*, ought to live very much on the brains of *others*. Persons that eat pig's marrow are said not to keep secrets. We suppose such as live on swinish brains must be confounded blabs and stupid grunTERS!!

† "Popular Physiology," p. 100.

calf's feet jelly was digested in half an hour, yet, we are not to conclude that veal or lamb is so quickly chymified. As the rule, the fibrinous aliments are more readily digested than either the gelatinous or albuminous, but the latter are less stimulating.*

The following inferences are drawn by M. Edwards from the whole of his useful experiments, to ascertain the value of this form of aliment :—

“1. That gelatine alone is insufficient for alimentation. 2. That although insufficient, it is not unwholesome. 3. That gelatine contributes to alimentation, and is sufficient to sustain it when it is mixed with a due proportion of other products, which would themselves prove insufficient if given alone. 4. That gelatine extracted from bones, being identical with that extracted from other parts : that bones being richer in gelatine than other tissues, and able to afford two-thirds of their weight of it ; there is an incontestable advantage in making them serve for nutrition in the form of soup, jellies, paste, &c. ; always, however, taking care to provide a proper admixture of the other principles in which the gelatine soup is defective. 5. That to render gelatine-soup equal in nutritive and digestible qualities to that prepared from meat alone, it is sufficient to *mix one-fourth of meat-soup with three-fourths of gelatine-soup*, and that, in fact, no difference is perceptible between soup thus prepared and that made solely from meat. 6. That in preparing soup in this way, the great advantage remains, that, while the soup itself is equally nourishing as meat-soup, three-fourths of the meat which would be required for the latter, by the common process of making soup, are saved and made useful in another way, as by roasting, &c. 7. That jellies ought always be associated with some other principles, to render them both nutritive and digestible.”

Sheep's head broth is a popular and efficacious remedy for bowel complaints. The bones of the head should be

* “Popular Physiology,” p. 100.

broken into small pieces, which causes them to yield the gelatine more readily to the boiling water.

Under the class of gelatinous aliments, I have to refer to *fish* ;* I before stated† that this form of aliment does not afford as eligible nourishment as flesh meat, unless for such as find the latter too stimulating for every-day use. The white kinds of fish, though not easily digested, are often selected for the convalescent, owing to their not tending to excite fever. They do not possess osmazome, that principle which gives the peculiar flavour and odour to roast meat. In the healthy and vigorous fishermen we find abundant proof, that fish and potatoes form excellent nutriment for those of *active* habits. When on the different temperaments, I shall have occasion to point out the diet most suitable for each : from what has been just observed, it is plain, that for such as require a concentrated, highly nutritive, and stimulating regimen, this form of food will not be eligible.

Dr. Paris states, “ Turbot, cod, whiting, haddock, flounder, and sole, are the least heating of the more nutritive species ; and the flakiness of the fish and its opaque appearance after being cooked, may be considered as true indications of its goodness, for when the muscles remain semi-transparent and blueish after sufficient boiling, we may reject it as inferior in value, or not in season.” Whi-

* After stating that milk consists of an emulsion of albumen, oil, and sugar, suspended in a large quantity of water, and that the eggs of birds, which likewise contain a peculiarly nutritive species of food, consist chiefly of albumen with a quantity of oily matter, Bostock adds, “ Fish consist of a much greater proportion of albuminous and gelatinous matter, in some cases united with a considerable quantity of oil ; and the same would appear to be the case with the testacea and the crustacea that are employed in diet.” (See also p. 142 of “ Popular Physiology.”)

† “ Popular Physiology,” p. 197.

ting, haddock, and cod, are estimated in the order of enumeration. The operation of *crimping* improves the flavour and digestibility of the fish, and also causes it to keep longer.

Turbot, sole, and salmon, are very nutritive; the last, though most nutritive, is heating and oily—vinegar aids the digestion of fish best of all. Lobster sauce is an abomination for invalids at all times. Eels are still more oily than salmon, and hence very indigestible.

Shell-fish is, generally speaking, indigestible. Some species of it, as well as salmon, are prone to produce cutaneous affections; giving another proof of the sympathy which exists between the stomach and skin, and a useful warning to those disposed to eruptive complaints, to avoid fish as a constant article of diet. Paris recommends boiling as the process best adapted to render fish wholesome—he also states, that potatoes and parsnips are the only vegetables that should accompany a meal of any species of fish; and that the invalid should abstain, upon all such occasions, from fruit. It is a well-known circumstance that milk should be also interdicted.

4. *Fatty and oily Aliments*.—These substances afford a great deal of nourishment; fat meat being esteemed four times as nutritive as lean; but it requires considerable digestive effort for its chymification. Dr. Beaumont states, “That oily food is difficult of digestion, though it contains a large proportion of the nutrient principle.” It is perhaps owing to this latter property, that fat pork and bacon are so much prized by the working classes. In England,* beans and bacon are highly esteemed by labourers; the latter even in a *raw* state. Geese and ducks

* Beans and peas are more nutritive for horses, than oats or barley.

are well known to be an oppressive kind of poultry, owing to the quantity of fat mixed with the meat.*

5. *Caseous Aliments*.—The different kinds of milk† and cheese belong to this class. There is a strange and popular error on the subject of cheese. It is supposed—why, I cannot learn—that it promotes digestion; “the more mouldy the better.” It may be owing, perhaps, to the notion, erroneously entertained, of helping *putrefaction*,‡ which was at one time supposed to be identical with digestion.

Dr. Paris says, “Cheese, which is nothing more than the coagulum (curd) of milk, pressed, salted, and partly dried with a portion of butter, which, having been enveloped in the curd, is not afterwards separable, is one of the least digestible of our aliments, and is only adapted to strong stomachs, and to such persons as use great and constant exercise. When *toasted*,§ it is still more injurious, from acquiring a tenacity of texture highly hostile to the digestive function of the stomach.”||

* “Popular Physiology,” pp. 192–199. † “Popular Physiology,” pp. 94–172.

‡ The gastric juice suspends the putrefactive process—see p. 83 of “Popular Physiology.”

§ This is what has been named Welsh rabbit.

|| Philip says, “Cheese is in general still more difficult of digestion than either butter or fat. With their oily nature it combines the hardness and toughness of the dry and compressed-curd, which is very difficult of minute division.”

CHAPTER IV.

ARTICLES OF FOOD CONTINUED, VIZ.—VEGETABLES ; FRUITS ; CONDIMENTS ; DRINKS—PERIOD OF MEALS—SLEEP—MODIFICATIONS, VIZ. AGE ; SEX ; TEMPERAMENT ; CLIMATE ; SEASONS ; HABIT.

THE alimentary products of the *vegetable kingdom* have been ranked under the following heads : fruits, seeds, roots, tubers, seed-vessels, stalks, and leaves ; which owe their nutritive qualities to the presence of what I called* *proximate* or *immediate principles*, the most important of which are gluten, farina (starch), gum oil, and sugar.

Gluten and starch may be separated from the dough of wheaten flour inclosed in a piece of linen, by letting a small current of water fall upon the dough, and subjecting it at the same time to pressure between the fingers, until the liquid passes off quite clear. The gluten of the flour is left in a pure state, the saccharine and mucilaginous matters are dissolved, and the starch is washed away mechanically, being deposited from the water, on standing, in the form of a white powder. Very pure starch may be procured in a similar manner from the potato. It is remarkable that the process which flour undergoes to free it from the parts combined with the *gluten*, is similar to that which blood is subjected to in order to procure the *fibrin* pure. These substances—the representatives of the most nu-

* "Popular Physiology," page 95.

tritive parts of each kingdom — are very analogous to each other.

The following concise account of the proximate principles of vegetables, is given by Dr. Bostock :*

“ *Gluten* has been the best adapted for the purposes of nutrition of any of the vegetable principles, both in consequence of its being of easy digestion, and of its containing, in proportion to its bulk, the greatest quantity of nutriment. This circumstance depends upon its being the substance, the elements of which the most nearly resemble those of the animal kingdom, hence the most animalized of any of the vegetable principles, and this chiefly in consequence of the large quantity of nitrogen which it contains. It exists in the greatest proportion in wheat, while it is found in small quantity only in the other kinds of seeds, or in the parts of plants generally. Next to gluten, in point of importance as an article of nutrition, comes the *farina* (starch) ; this is also found copiously in wheat and the other grains, and it likewise forms a considerable proportion of the nutritive parts of the various kinds of pulse and of tubers. The nutrition of leaves, stalks, and of seed-vessels, and the green parts of plants, resides in the *mucilage* (gum) which they contain, although, in most cases, this is united with a portion of saccharine matter, which naturally contributes to their nutritive powers. Most fruits contain a basis of mucilage or farina, which is combined either with sugar or with oil. In the pulpy fruits, with the exception of the olive, the former chiefly prevails ; they generally also contain a quantity of *acid*, in addition to their other ingredients, but it may be doubted whether the acid serves directly for the purposes of nutrition, or whether it should not be rather considered as indirectly promoting digestion, by its effect upon the stomach† or the palate. The principal ingredients of the chesnut, which, in

* The four last classes of Paris are here briefly described.

† The antiscorbutic properties of vegetables containing acids, have already been considered ; and the paramount value of potatoes, on this account, fully explained : *vide* p. 72.

many countries, composes a large share of the diet of the inhabitants, are farina and sugar, while many of the nuts are composed of a basis of albumen, united to a quantity of sugar and oil. *Sugar* enters into the composition of many vegetable substances that are employed in diet, and although it is generally regarded rather as a condiment, than as a direct source of nourishment, yet it has been supposed to be the most nutritive of all the vegetable principles. Nearly the whole of the sugar that is consumed in Europe is produced from the sugar-cane, the juice of which contains it in large quantity and in a state of comparative purity. Sugar is also procured from the root of the beet in considerable quantity, and in some parts of America from the sugar-maple. *Oil*, either animal or vegetable, is commonly employed, more or less, in diet, and is likewise conceived to be highly nutritive : in the warmer climates vegetable oil is principally used, whereas in the colder regions animal oil is employed, as procured from milk in the form of butter."

The potato is reduced to the rank of farinaceous aliments. From its general use as an article of diet, the following account of this substance will doubtless be received with interest :

Dr. Paris, in *Pharmacologia*, pp. 44, 45, after his eloquent description of tobacco, says :—

"The history of the potato is perhaps not less extraordinary, and is strikingly illustrative of the omnipotent influence of authority. The introduction of this valuable plant received, for more than two centuries, an unexampled opposition from vulgar prejudice, which all the philosophy of the age could not dissipate, until Louis the Fifteenth wore a bunch of the flowers of the potato in the midst of his court on a day of festivity ; the people then, for the first time, obsequiously acknowledged its utility, and ventured to express their astonishment at the apathy which had so long prevailed with regard to its general cultivation.

"That which authority thus established, time and experience have fully ratified, and scientific research has extended the nume-

rous resources which this plant is so wonderfully calculated to furnish : thus its stalk, considered as a textile plant, produces in Austria a cottony flax—in Sweden, sugar is extracted from its root—by combustion its different parts yield a very considerable quantity of potass—its apples, when ripe, ferment and yield vinegar by exposure, or spirits by distillation—its tubercles, made into a pulp, are a substitute for soap in bleaching—cooked by steam, the potato is the most wholesome and nutritious, and at the same time the most economical of all vegetable aliments. By different manipulations it furnishes two kinds of flour, a gruel and a parenchyma, which in times of scarcity may be made into bread, or applied to increase the bulk of bread made from grain—to the invalid it furnishes both aliment and medicine : its starch is not in the least inferior to the India arrow-root ; and Dr. Latham has shown, that an extract may be prepared from its leaves and flowers which possesses properties as an anodyne remedy.”

Excellent cheese has been also obtained from this valuable plant.*

Dr. Paris in alluding to the potato as the most economical of vegetable aliment, says :—

“ What other discovery or invention ever produced such political consequence as the introduction of the potato as an article of food ? From its operation as the main constituent of national sustenance, the population of Ireland has advanced from little more than one million to near seven millions within the last century and a-half !”

The mealy potato is the best ; when new or young they are soft ; these and the waxy kind are indigestible.

The results of Dr. Beaumont’s experiments coincide with our ordinary observation. He found that potatoes *roasted*, took two hours thirty minutes ; boiled, three hours

* It may be truly said to combine in itself all the elements of “ meat, drink, and clothing.”

thirty minutes, for their chymification. It is remarkable that invalids will be able to digest this vegetable if cooked in the former way only; probably this mode of dressing renders them mealy, or less of the character commonly called "*wet*."

The following practical hint should not be lost upon those who consume this valuable species of aliment:—

"*Steaming Potatoes*.—The secret of 'steaming' potatoes is very little understood, and rarely carried into full effect, although it is indispensable to the nutritious development of the vegetable. The whole mystery consists in suffering the steam to escape, and at the same time keeping the potatoes hot. When the cook throws off the water, under the jurisdiction of the cookery book, what is she to do next? The steam rushes out, and she places the vessel opposite the fire; but fearful that the potatoes may cool in the meanwhile, she puts on the cover. Thus she undoes one process by the other, for the steam no sooner escapes from the potatoes than, being confined by the lid, it condenses rapidly, and falls back in water upon the vegetables. And thus, through the ignorance and obstinacy of our cooks, we are perpetually served with what are familiarly called wet potatoes—a sort of vague excuse which helps to throw the fault against the season or the gardener, or anything or anybody rather than the real culprit. The Irish peasant woman, wholly ignorant of science, but with instinctive sagacity, gets rid of the difficulty by the simplest process imaginable. Placing the vessel without the cover in a slanting direction opposite the fire, so as to hasten the process of steaming by the external heat, she throws a napkin over the potatoes, which receives and retains so much of the steam as does not make its escape, while it performs the equally essential office of preserving the heat of the vegetable below."

When potatoes are boiled—the usual mode of dressing in Ireland—it should be recollected, that they are deprived of their nutritious qualities by over-boiling. The peasantry are well aware of this; and, say, that they are "strongest"

when the "bone" is left in them, *i. e.* hard-boiled. In this condition they require the powerful digestion of the labourer. Philip says, "That fresh vegetables, on account of their tendency to ferment, are, on the whole, injurious in digestion. Some vegetables, however, are less so than others. Peas, beans, cabbage, and waxy potatoes he has found the worst. Mealy potatoes, turnips, and brocoli are among the best. They should always be boiled till they are soft. Raw vegetables of all kind are oppressive; lettuce appears to be the least so. The tough, thready, and fibrinous parts of vegetables are of most difficult digestion."

In Dr. Kitchener's "Cook's Oracle," you will find no less than sixteen ways for dressing potatoes. He approves strongly of the plan already mentioned, and says, "That if you let the potatoes remain in the water a moment after they are done enough, they will become waxy and watery;" after pouring off the water, he recommends what is commonly practised in Ireland, that the saucepan containing the potatoes shall be uncovered and set at such a distance from the fire as will secure it from burning, their superfluous moisture will evaporate, and the potatoes will be perfectly dry and mealy. You may afterwards place a napkin, folded up to the size of the saucepan's diameter, over the potatoes, to keep them hot and mealy till wanted.

Sir J. Sinclair says, "That next to bread there is no vegetable article, the preparation of which as food deserves to be more attended to, than the potato."—(*Code of Health.*)

It is a common error to conceive that potatoes are rendered more digestible by being finely mashed. Philip justly adds, "The coarser division which our food undergoes in mastication is better suited to assist digestion. Most dys-

peptics find, that potatoes, for example, finely mashed, although without any admixture, are more difficult of digestion than when properly masticated. During mastication the saliva is freely mixed with them, and a loose mass is formed. When they are mashed they resist admixture with the saliva, as well as the gastric fluid."

Potatoes, in all forms, frequently disagree with the dyspeptic—the addition of salt and pepper will often enable the invalid to eat one or two without suffering from distressing flatulency, which they so commonly produce in these habits.* *Rice* may often be substituted, with advantage, in such cases; but its insipidity will call for the addition of some seasoning; indeed most of those farinaceous substances require either condiment or wine to induce the invalid to eat them. How often is it asked, "May I have some wine in the *sago*, *tapioca*, or *arrow root*?"† *Nuts* belong to the farinaceous class of aliments; "they are oily, viscid, and glutenous;" and Dr. Paris adds, "when eaten they should always be accompanied with salt; but it would be wise to banish them entirely from our tables." The fits of indigestion that occur after All Hallowed-eve, when so much nuts and apples are consumed, are not unjustly attributed to this, as the cause. Hoffman observed, "That dysenteric complaints are always more common in those years in which the harvest of nuts is plentiful."

The distention produced by the bulk of the vegetables, &c., included under the 7th, 8th, and 9th classes of Paris' arrangement, both immediately by the mass of these sub-

* The inmates of the South Union Workhouse, Dublin, rebelled against rice as a substitute for the favoured potato.

† According to Dr. Beaumont's experiments upon St. Martin, rice boiled soft was perfectly converted into chyme in an hour; sago, in one hour forty-five minutes; tapioca, barley, &c., two hours.

stances, and remotely by the fermentation commonly caused by such mucilaginous, saccharine, and acidulous aliments, renders them in general ineligible food for dyspeptics. In despite of all this, we will often find that what we have already observed* holds good in reference to the vegetable kingdom; namely, that although certain aliments are to be esteemed unwholesome, or in ordinary difficult of digestion, yet, if they are eaten with a decided liking or "relish," it is surprising how rarely they disagree with the stomach. I have frequently alluded to the powerful and enduring efforts made by the Irish peasantry, many of whom are supported almost exclusively upon potatoes. It is a curious fact, that certain vegetable aliments are found to be digested in the *intestinal* canal, and it is a matter of familiar observation, both in man and brutes, that some substances of this class, if not sufficiently bruised or divided, pass off without being deprived of their nutritive properties. It is a strange circumstance, and quite at variance with our usual experience, that, according to Dr. Beaumont's experiments, *raw* cabbage was digested in two hours thirty minutes—boiled, four hours; vinegar much assisted its digestion. The following observations, by Dr. Paris, on esculent roots and herbs, agree so entirely with our own observations, and the results of Dr. Beaumont's experiments upon St. Martin, that we shall quote them in his own words:

" ESCULENT ROOTS.

"These are of two kinds—those used as food, and those which principally answer the purposes of condiments or seasoning. Under the first division may be classed turnips, carrots, parsnips,

* "Physiology for the Public," p. 164.

Jerusalem artichokes, radishes, &c., many of which, it will be seen, are seldom used solely for aliment, but are rather brought to our tables to qualify our animal food. Under the second division may be arranged onions, garlic, horse-radish, &c. It will be necessary to offer a few observations upon the qualities of these several roots. The *carrot*, from the quantity of saccharine matter which it contains, is very nutritive, and slightly laxative; but it also possesses a large proportion of fibrous matter, which in some stomachs prevents the digestion of the root, and it passes through the bowels with but little change; to obviate this effect, it ought to be very thoroughly boiled, and should be eaten when young. It appears to have been introduced by the Flemings in the reign of Elizabeth. The *turnip* is a very excellent vegetable, and, although it has the character of being flatulent, is less liable to disagree with the stomach than the carrot; it ought, however, to be well boiled, and the watery part separated by pressure. Lord Townsend, secretary to Charles I., was the person who introduced its use into England, but it appears that the ancient Romans, in the best period of their republic, lived much upon this root. The *parsnip* is nutritive and digestible, although many persons dislike it on account of its sweet flavour. The *Jerusalem artichoke* is agreeable, but watery and flatulent; it ought, therefore, never be eaten without a proper accompaniment of salt and pepper. *Radishes*, all the varieties of which have a pungent and acrid taste, in consequence of a peculiar stimulating matter, which resides in the cortical part of the root. They may be said to contain little else than water, woody fibre, and acrid matter, and cannot, therefore, be very nutritive; they may act as a stimulant, and thus prove useful, but they ought never to be eaten when old, as the quantity of inert matter, in such a condition, is apt to disagree with the stomach. From the consideration of radishes we pass, by an easy transition, to that of *onions*, &c., for they appear to form the connecting link between alimentary roots and those used principally as condiment. The onion, however, although classed under this latter division, and must be considered as valuable on account of its stimulating matter, certainly contains a considerable proportion of nourishment. This appears evident in its boiled state, by which process its acrimony

is exhaled, and a sweet mucilage separated. Sir John Sinclair says, 'that it is a well known fact, that a Highlander, with a few raw onions in his pocket, and a crust of bread or some oat-cake, can travel to an incredible extent, for two or three days together, without any other sort of food.' The French are fully aware of the quantity of nourishment this plant affords; hence the soup à *l'oignon* is considered by them as the best of all restoratives. As a stimulant to the stomach and bowels, the onion, in a raw state, is certainly of value, and this is much enhanced by its diuretic qualities. The leek, garlic, shallot, are of the same species, and possess qualities of the same nature. *Horse-radish* is a warm and pungent root, and is highly valuable to the dyspeptic; as a stimulant it is, perhaps, the best of all condiments for the prevention of flatulence."

" ESCULENT HERBS.

"Some herbs are still eaten in a raw state; but they are far less digestible than when cooked. During the heats of summer they are refreshing, and are well calculated to assuage that febrile state which full meals of animal food are known to occasion. Of all these herbs, the water-cress is the most beneficial, for, by operating in some degree as an aromatic, it promotes digestion, and corrects that tendency to flatulency which other raw vegetables are apt to produce. According to Xenophon, the ancient Persians lived upon water-cresses, which they considered the most wholesome of vegetable productions. The lettuce is generally eaten with other herbs, in the form of a salad dressed with oil and vinegar. Some difference of opinion has arisen with respect to the propriety of such additions. Gösse, of Geneva, found that vinegar retarded its solution in the stomach: and oil has been stated by others to render it less digestible. I have generally found such condiments useful, and that dressed lettuce is less likely to ferment in the stomach than that which is eaten without them. Oil is known to have such an effect in checking fermentation, and the vinegar is not found to promote it. The lettuce contains a narcotic principle, and the effect of this is, in a great measure, obviated by the vegetable acid. Those persons, therefore, who eat lettuce with a view to obtain such effects, ought

to take it without vinegar. Whatever difference of opinion may exist with regard to lettuce, there is none with regard to celery, the digestibility of which is greatly increased by maceration in vinegar. Cucumbers are by far the most unwholesome of all raw vegetables, and should be avoided as poison by dyspeptics.

“The vegetables which require to be boiled are the different species and variety of colewort; the value of which does not depend so much upon their nutritive quality as the tenderness of their texture. On this account the cauliflower and brocoli are the species to be preferred, particularly the younger sprigs of the former. Of the kinds where the leaves only are employed, the savoy is of a sweeter and more tender texture than the others, particularly its central and upper leaves. The cabbage tribe appear to contain a peculiar essential oil, whence the unpleasant odour of cabbage water; this matter is liable to produce offensive effects on the stomach; the vegetable should therefore be boiled in two successive waters, in order to free it entirely from the noxious ingredient, and at the same time to render its texture soft and digestible. Asparagus is quickly dissolved in the stomach, and when sufficiently boiled, is not disposed to create flatulence or acidity: along with its mucilage it frequently contains some sweetness, which affords proof of its nutritive quality. Asparagus is only wholesome when in an intermediate state between root and plant, when older than this it is remarkably acrid.”

Paris' experiments have led to the conclusion, that this vegetable does not possess diuretic properties.

With reference to *fruits*,* I have to remark that, generally speaking, they are to be esteemed by the valetudinarian, as difficult of digestion. We are not, however, to interdict them altogether, for some species, particularly during a warm season, prove grateful, refreshing, and wholesome; and indeed the fact of their being so abundantly

* “Different parts of the same fruit have frequently very different properties. The lemon offers a very good example of this fact, for its juice is *acid*, its seeds *bitter*, and its peel *aromatic*.”—Paris.

supplied by nature at this period, joined with the instinctive desire we have for them, would argue strongly in favour of their use. We will generally find that the derangement produced is caused by an injudicious selection of fruit,—an excess in its quantity, and the fact of it being eaten at an improper time. Melon and stone fruits, with the exception of the ripe peach, are to be esteemed indigestible—melon and all the cold fruits, cucumbers, &c., particularly so—if the dyspeptic *will* eat the former, the horrible and dangerous act should be perpetrated with a plentiful supply of pepper and salt. Apples and pears are less prone to fermentation than most fruits: those that are disposed to torpid bowels will often be benefited by the last mentioned. Strawberries, raspberries, gooseberries, and grapes will be found, if eaten in moderation, and when perfectly ripe, cooling, digestible, and aperient. The husks, seeds, and skins of all fruits should be carefully avoided. Black currants are considered very wholesome. Oranges are general favourites, and, when ripe, may be freely used—the pulp should not be swallowed—the juice of this fruit and water make a grateful drink. Apples sliced and boiled in water also make an agreeable beverage. An observation we have often made in reference to articles of diet, is peculiarly applicable in relation to fruits, “if eaten with a decided liking, it is surprising how rarely they disagree with the stomach.” Acescent fruits are most prone to interfere with digestion. The different forms of jams, jellies, &c., are very indigestible, owing to the large quantity (equal parts) of sugar added to the fruit to preserve it. It is fortunate that we are not often required to request children to eat little (*jam satis*) of these preserves, for they generally associate the latter with physic, and hence are inclined to “throw both to the dogs.” Dried fruits are also open to objections for the same

reasons that jams and jellies are interdicted. We have somewhere heard it, as an "old say," that "fruit was as gold in the morning; as silver at noon; and as brass in the evening." Paris says, "The most proper period for indulgence in fruit appears to be in the morning and evening. On some occasions it may be taken with advantage at breakfast, or three hours before dinner, and it affords a light and agreeable repast if taken an hour before bed-time; but," he judiciously adds, "these regulations are to be influenced by circumstances which no general rule can possibly embrace." It is therefore so necessary that the close and accurate observation of the valetudinarian *himself* shall constantly be directed to time, quality, and quantity, as the grand tripod upon which dietetics rest.

Condiments.—I have in Lecture IV. (page 101 of "Physiology for the Public") already spoken of these substances; I then stated that they were injurious on two accounts, by pleasing the palate at the expense of the stomach, thus inducing us to eat too much: and secondly, by injuriously stimulating this organ, they produce a corresponding collapse afterwards. *Vinegar* appears, according to the experiments of Beaumont, to assist the digestion of vegetable aliment. The digestion of rich soups, fat and luscious meats, is aided by the addition of this condiment,* lemon juice, &c. I have seen very injurious consequences result in several cases where vinegar had been perseveringly taken in considerable quantity in order to make the individuals "thin and genteel," and remove "a vulgarly high complexion."† Paris states, "That it has been well said

* Hence lemon-juice with veal and young meats that are not easy of digestion on account of the quantity of mucilage they contain.

† A lady who now pleads guilty to 40, told me that when a girl, she used to drink quarts of vinegar, with this purpose in view.

that the best quality of spices is to stimulate the appetite, and the worst to destroy, by insensible degrees, the tone of the stomach." It is but a bad excuse for their use to say, that they are necessary to enable us to chymify indigestible substances.*

Drinks include not only such fluids as are taken in ordinary to satisfy thirst, but also all those liquids, nutritive or stimulating, which contain considerable portions of aliment or alcohol. At pages 51-54, of "Physiology for the Public," I have already considered the subject of thirst. I shall now, therefore, confine my observations to a brief description of the properties, &c. of those fluids in ordinary use.†

Water,‡ being the natural beverage of man, should be first considered. It is plain, that the qualities of this important fluid will be greatly influenced by the quarter from

* A patient said to Abernethy, "I get a pain when I do that," and at the same time raised his arm. The Doctor laconically replied, "Well, don't do that!" *Mutato nomine*, we say, don't eat indigestible substances.

† A short account of tea, coffee, chocolate, cocoa, milk, whey, barley-water, gruel, &c., will be found from p. 133 to 151, of "Physiology for the Public."

‡ DRINK.—There is no axiom of health more just than that "men never have a true appetite till they can eat with relish any ordinary food." It is told of John Bailes, who lived to the age of 128, that his food for the most part consisted of brown bread and cheese, and his drink water and milk. He had buried the whole town of Northampton twenty times over, excepting three or four, and said strong drink killed them all. Water manifestly is the natural beverage of all animals; whole nations, as the Mahometans and Hindoos, use it alone as beverage, and, unlike other drinks, it does not sate the appetite, but the contrary; indeed it was observed by Hippocrates, above two thousand years ago, that water drinkers have generally keen appetites. It is a fluid that requires no digestion, for it is not necessary that it should undergo any changes; it is the natural menstruum which holds in solution both what is essential for the nutrition and healthy functions of the body, and what has become refuse after having served its destined office and intention in the animal economy. Water, therefore, from its congenial qualities, can never much disturb the system, and when it does, it is speedily expelled by its natural outlets, the skin and kidneys. It is told of Lord Heathfield, so well known for his hardy habits of military discipline and watchfulness, that "his food was vegetables, and his drink water, never indulging himself in animal food nor wine;" and Sir John Sinclair, in his work on longevity, says, in his account of Mary

which it comes, the substances that may be combined with it, the way in which it is conducted, and the kind of reservoir in which it is kept. Like the atmosphere in the country and in the city, we find that equal measures of water, pure or impure, contain the same proportions of oxygen and hydrogen, considered in relation to their ultimate elements only. The substances superadded to air on the one hand, and to water on the other, produce those important differences which influence, more or less, the salubrity of these elements. I shall, in the first place, speak briefly of the different varieties of water in ordinary use. *River water* is that which, in great cities, is chiefly used, conveyed, as we find in Dublin, by canals to two large basons at the north and south sides of the city. This kind of water is, of course, obtained from a number of tributary springs and rivulets in the course of the canal or river, and the commingled rain. It is a *soft* water, suitable for all domestic purposes. River water is, in the country, generally very pure, less so in the neighbourhood of large towns, for obvious reasons. We have good grounds to congratulate the citizens of Dublin upon the admirable arrangements adopted, by which they are insured a supply of perfectly pure water by canals, spacious basons, and metal mains. Thus the country becomes as it were a heart to the city, sending by the canals, as by two arterial trunks, the pure vital fluid, to be circulated through the remotest ramifications of Dublin, while the River Liffey, running from west to east, carries off, like great Cloacæ, or a main sewer, all the filth, &c. of the city, to be finally “in the deep bosom of the ocean buried.”

Campbell, then aged 105, that “she prefers pure water to any other drink.” The great captain of the age is remarkable for his temperate and regular habits, his early rising, the strength and clearness of his intellect, and his good health, notwithstanding his advanced age.—*Weatherhead*.

Rain Water.—Paris states that this is the purest natural water, being produced as it were by a natural distillation. That collected near large towns derives some impregnation from the smoky and contaminated atmosphere through which it falls; and if allowed to come in contact with the houses will be found to contain calcareous matter, in which case it ought never to be used without being previously boiled and strained. Hippocrates gave this advice; and M. Magraaf, of Berlin, has shown the wisdom of the precaution, by a satisfactory series of experiments.*

Liebeg† has proved that ammonia hartshorn (a combination of hydrogen and *nitrogen*) is present in rain water. It will be remembered that this—ammonia—is considered a most essential ingredient in manure (see p. 67). The simplest test that he gives for its presence is, “the addition of a little powdered lime, which separates the ammonia, and thus renders its peculiar pungent smell sensible.” The learned professor adds, “The sensation which is perceived upon moistening the hand with rain water, so different from that produced by pure distilled water, and to which the term *softness* is vulgarly applied, is also due to the carbonate of ammonia contained in the former.” How exquisitely does his explanation of the source of ammonia prove the beautiful simplicity of the means by which nature works her wondrous ways; the elements produced by death and decomposition becoming ultimately subservient to the support of vegetable and animal life.‡

* See Note p. 25, of “Physiology for the Public,” for the method of removing the insipidity of boiled water.

† “Organic Chemistry in its Application to Agriculture and Physiology.” 1841.

‡ Liebeg says (p. 73), “A generation of a thousand million of men is renewed every thirty years: thousands of millions of animals cease to live and are re-produced in a much shorter period. Where is the nitrogen which they contained during life? There is no question which can be answered with more posi-

How admirably distinct and yet connected are all the works of the Creator! How separate in nature the organised and inorganised kingdoms, by that inexplicable attribute—life; yet still how linked are the dependencies of one on the other. Animals cannot derive nourishment directly from the inorganic kingdom, while vegetables, although possessing life, can; the latter become the connecting link; the crude and innutritive elements, as regards animals, contained in the soil, are all sufficient for the humble wants and development of plants, upon which they thrive and have their being. Plants now come, in their turn, to support exclusively the classes of animals called herbivorous and granivorous; these, by a complicated apparatus of digestion, elevate the vegetable food so highly, that it now becomes part of themselves: their flesh finally serves as the food of the carnivorous animal, or of the omnivorous, as man. Here we find an endless unbroken chain! Its links are thus arranged: the earth subserves to the plant; the plant to the lower animal; the lower animal to the higher; while by the death and consequent decomposition of both the latter, ammonia is diffused in the atmosphere, which

tive certainty. All animal bodies, during their decay, yield the nitrogen in the form of ammonia." Again he adds, "The nitrogen of putrefied animals is contained in the atmosphere as ammonia, in the form of a gas which is capable of entering into combination with carbonic acid, and of forming a volatile salt. Ammonia in its gaseous form, as well as its volatile compounds, are of extreme solubility in water. Ammonia, therefore, cannot remain long in the atmosphere, as every shower of rain must condense it, and convey it to the surface of the earth. Hence also rain water must, at all times, contain ammonia, though not in equal quantity. It must be greater in summer than in spring or winter, because the intervals between the showers are in summer greater; and when several wet days occur, the rain of the first must contain more of it than the second. The rain of a thunder storm, after a long protracted drought, ought, for this reason, to contain the greatest quantity which is conveyed to the earth at one time." Ammonia has been detected in snow water. The fertilising effects of snow may be, perhaps, attributed to this circumstance.

gas, commingled with rain, descends to the earth to nourish plants.

Spring and *Well** *Water* are pretty nearly the same. If they dissolve soap they are called *soft*, if not, *hard* water; the former should be preferred. "Sulphate of lime in the proportion of five grains to the pint will constitute *hardness* unfit for washing with soap, and for many other purposes of domestic use." *Snow* water is not unwholesome. *Lake* and *marsh* water, from being stagnant and usually the depository of decomposing animal and vegetable matter, is the most impure of all water. Considerable mischief has arisen from conveying water by leaden pipes and keeping it in vessels lined with this metal. The acidity of foul water produces this bad consequence.

The impurities of water may be removed by filtration through alternate layers of sand and charcoal, which is the best mode of abstracting animal or vegetable matter. Boiling should not be omitted. "The *hardness* of water will generally be removed when it depends on *sulphate of lime*, by the addition of from ten to fifteen grains of an alkaline carbonate (soda) to every pint twenty-four hours before it is used. If it should depend upon *super-carbonate of lime*, long boiling, without any addition, will be found sufficient for its cure."

Fermented and Distilled Liquors.—All things in life have been reduced to one or other of the three classes, good, bad, or indifferent. These epithets may be affixed to the fermented or distilled liquors in a dietetic point of view, according as we come to consider them in relation

* A pupil of mine mentioned that he had lived where there were three excellent wells; and that having been seized with a severe fever, he drank alternately and exclusively the waters of these springs. His sense of taste had been so accurate, that he could discriminate with certainty, between the three different waters, and name them accordingly.

to the different classes of valetudinarians. Paris says, "That there is a great fallacy in reasoning against the *use* of a custom from its *abuse*;" and adds, "There exists no evidence to prove that a temperate use of good wine, when taken at seasonable hours, has ever proved injurious to healthy adults. In youth, and still more in infancy,* the stimulus which it imparts to the stomach is undoubtedly injurious: but there are exceptions even to this general rule. The occasional use of *diluted*† wine has improved the health of a child by imparting vigour to a torpid stomach: we ought, however, to consider it rather as a medicine than a luxury." I should mention now that wines, malt drink, whiskey, &c. owe their stimulating property to the presence of a principle common to all, namely, alcohol or spirits. When I speak of alcoholic liquors I necessarily include amongst them all the beverages above mentioned. Philip, after observing how injurious to the digestive organs and to the system generally these stimulants are, when taken in considerable quantity, says, "Like most substances capable of powerfully affecting the animal frame, they possess valuable as well as pernicious qualities; and, even were the former of these less eminent than they really are, so general is their use in one form or other; and in most people the habit which requires their continued use so fixed, that they seldom can be wholly

* An ingenious surgeon tried the following experiment:—He gave to two of his children, for a week alternately, after dinner, to the one a full glass of Sherry, and to the other a large China orange. The effects that followed were sufficient to prove the injurious tendency of vinous liquors. In one the pulse was quickened, the heat increased, the secretions morbidly altered: *diminished flow of bile*. Whilst the other had every appearance that indicated high health. The same effects followed when the experiment was reversed.—*Beddoe's Hygeia*.

† I have known some instances in which even claret could not be used in an undiluted form. The stimulus becomes less active, and the greater effect, with a less quantity of spirit, has been explained by the more general application of the stimulant to the stomach.

withdrawn, except in very early life, without doing more harm than good." Paris' experience coincides with this view of the subject. The pre-eminently useful labours of the great and good apostle of temperance, the revered and Very Reverend T. Mathew, have proved in Ireland that teetotalism may be adopted by even the most intemperate without leading to injurious effects by the sudden removal of the wonted stimulus which they had so much abused. The transition from intemperate habits to complete abstinence from all alcoholic beverages, was, in thousands of instances, immediate. Instead of producing the depression and collapse which one would suppose should immediately result under these circumstances, the reverse was the case. The improvement produced in the general health—the "mind, body, and estate"—of such individuals was as rapid as the changes were remarkable. It is true, some required a *small* allowance of the usual alcoholic potation, but these were so few as to constitute but very unfrequent exceptions to the rule, and proceeded very often more from weakness of resolution than that of body. This exemption from bad consequences was found equally true in reference to all ages and sexes.*

I fully coincide with the following opinion of Philip:—

"All will agree that alcohol, in every shape, is unnecessary to those who are in health, and have never been accustomed to the use of it; and that had no beverage but water ever been known, however we might feel the want of a stimulus in many cases, doubtless the most valuable we possess, some of the most fatal diseases we are subject to would have been less frequent."

* A professional friend was threatened with all the symptoms of heart disease. He had been accustomed to suppers and *stimuli*. He *suddenly* left off these habits and as quickly got quite well.

A lady informed me that a most disagreeable feeling of stiffness and uneasiness at the joint of her lower jaw follows the use of port wine!

I have already (see pages 105 to 116, of "Physiology for the Public,) dwelt at some length upon the evils, physical and moral, that have resulted from the habitual use of alcoholic fluids: need we ask if the benefits and evils following from these beverages were weighed in the balance, which would preponderate?

*Wine** is generally understood to mean that beverage obtained from the fermented juice of the *grape*. Foreign wines contain tartaric acid; domestic wine, malic acid; "hence, the great defect that is necessarily inherent in the wines of this country, and which leads them to partake of the properties of cider."

I have already included wine amongst the beverages containing alcohol; it is owing to the greater or less quantity of this element that the different kinds owe their strength.† The wine is called *red* when coloured by the

* "WINES.—Counterfeit wines are sometimes so skilfully made, that an experienced connoisseur is required to detect them. Red wines are often artificially coloured with brazil-wood, myrtle-berries, elder-berries, beet-root, and even it is said with a solution of indigo. Mr. Accum states, that spoiled cider is employed in the manufacture of artificial port wine; and beet-root, logwood, rhatany-root, and a portion of brandy, are added to it. Sweet-briar, orris-root, laurel water, and elder flowers, are employed to form the aroma or bouquet of high flavoured wines. Weak wines often become acid, and to correct this state it was frequently the practice at one period to add litharge or an oxide of lead to them; but this plan is more rarely adopted at the present day. This addition communicates to the wine a sweetish taste, by the formation of acetate of lead, but renders it more or less poisonous. This sophistication may be detected by adding to the wine a solution of hydro-sulphuret of potass, which produces a black precipitate if lead be present. Chalk or carbonate of lime is more frequently employed than lead, and is not injurious in small quantities."

† "Daily experience convinces us that the same quantity of alcohol applied to the stomach under the form of wine, and in a state of mixture with water, will produce very different effects upon the body, and to an extent which it is difficult to understand. It has been, for instance, demonstrated beyond the reach of doubt, that Port, Madeira, and Sherry contain from one-fourth to one-fifth their bulk of alcohol; so that a person who takes a bottle of either of them will thus take nearly half a pint of alcohol, or almost a pint of pure brandy."—*Paris*.

astringent matter derived from the husk of the grape. If the hulls and stalks be kept apart during the fermentation, *white* wine is in all cases produced.

Philip says, that the form in which alcohol is most beneficial and in general does least harm, is in that of foreign wines. He gives a preference to Port. Paris recommends white wine for the dyspeptic. The kind of wine—the quantity, diluted or not, must be determined in a great degree by the experience of the invalid himself. If acidity of the stomach—flushing—excitement—irritability (fidgets) followed by depression of spirits, supervene the use of wine, it should be changed, diminished, or wholly discontinued. I have before observed, in reference to diet, that each individual should be guided by what *he* finds to agree and disagree, as we cannot lay down a rule that will be equally applicable to all. The digestive, circulating, and nervous systems will not fail to afford those that will attend to them admonitions of a useful kind which are sufficiently intelligible for all. In the gratification of the palate, we too often compromise the interests of the stomach. When we wish to give a wine less stimulating than Port, Sherry, or Madeira, we direct *Claret*, owing to its containing about one-third less of alcohol : when *genuine*, it is considered the most salubrious of our wines, more especially in warm weather. *Champagne* and the sparkling effervescing wines, are said to owe their suddenly intoxicating influence to the combination of the alcohol with carbonic acid gas, and the former being thus applied to a very extended nervous surface. Diluted wine, in a given quantity, may, for a like reason, be more intoxicating than an equal portion of wine undiluted. The *domestic* wines cannot be recommended, owing to the great tendency they have to run into the acetous fermentation : this is accounted for, because they contain but a small quantity of spirits.

Malt Drinks present us with examples of substances which, although very nutritive, are not in the same degree digestible; though malt drink generally requires the powerful digestion earned by labour or active habits and out-of-door exercise, yet, we will often find that delicate, and even sedentary females, more especially when nursing, will improve in health and strength while taking XX porter* and ale: they often prove as sedative as an anodyne draught and also tonic; this is said to be caused by the hop, which is well known to be narcotic as well as bitter.

Ardent Spirits.—There are some dyspeptics with whom all fermented liquors disagree in a marked manner, and with whom either habit or debility will render diluted alcohol indispensable. In such rare cases, “the mixture of spirits and water should be made twelve hours before it is used, as spirits and water do not easily combine.” The addition of lemon and sugar (punch) add to the indigestibility of the compound, which is besides objectionable on the grounds of the high temperature at which it is drunk.

Having said as much respecting the articles of diet, &c. in ordinary use, as our space and purpose will permit, I

* A gentleman informed me lately, that he was constantly plagued with indigestion until he hit on XX porter, a pint of which, taken in the morning early, produced all the good effects attributed to *Abernethy's* claret. The origin of the beer called *entire* is to be thus explained:—Before the year 1780, the malt liquors in general use in London were ale, beer, and two-penny; and it was customary to call for a pint or tankard of half and half, *i. e.* half of ale and half of beer, half of ale, and half of two-penny. In course of time it also became the practice to call for a pint or tankard of *three-threads*, measuring a third of ale, beer, and two-penny; and thus the publican had to go to three casks, and turn three cocks for a pint of liquor. To avoid this inconvenience and waste, a brewer of the name of Harwood conceived the idea of making a liquor which should partake of the same united flavours of ale, beer, and two-penny. He did so and succeeded, calling it *entire* or *entire butt*, meaning that it was drawn entirely from one cask or butt; and as it was a very hearty and nourishing liquor, and supposed to be very suitable for porters and other working people, it obtained the name of PORTER.—*Paris.*

shall next beg to direct your attention to a no less important subject, namely :

4. The *Period of Meals*.—We have before stated what may be justly named an aphorism, in reference to man, both in a mental and physical point of view, “that he is the creature of habit.” There is no more decided truism than this ; that definite periods should be fixed for the taking of food, for no sensation is more influenced by habit than that of appetite. The stomach, like all other agents, requires a proper period of repose after its labours ; consequently, we should not oppress this important organ by over work, fallaciously influenced by our solicitude to nourish the system, or to gratify the palate at the expense of this patient sufferer. To eat when we are hungry, and drink when we are thirsty, would appear to be an excellent rule, as these sensations are the indications given of the respective wants of the system. I have shown* that the valetudinarian is apt to confound morbid feelings with appetite, and will often say that he cannot determine whether he is very sick or very hungry ; the influence of stimulants, wines, spices, &c., joined with inviting odours and flavours that so successfully appeal to our senses, often induce us to eat when appetite—true appetite—indicating the wants of the system—is not present.

I shall on this occasion confine my observations to the dyspeptic only. I have (in my “Popular Physiology,” p. 128) already made a division of the day—twenty-four hours—into three equal parts, as my plan ; namely, eight hours for sleep, eight hours for employment, and the remaining eight for prayer, meals, exercise, enjoyments, &c. Now let not our valetudinarian start and exclaim, “I am not a man of business !!” “Most likely,” I

* Page 48, of “Physiology for the Public.”

would reply, "for if you were a man of business you probably would not be so much of a dyspeptic." There is no better way of getting over the day, "killing time" as it is said, than by having something to do as a definite* *indispensable* employment; the best banisher of *ennui*, the incubus of both body and mind. Well, you are to rise at six o'clock, or say six in summer and seven in winter if you will, but for uniformity sake, I would recommend six all the year round. We must admit that there are many—not exclusively invalids—that can never acquire the habit of early rising. How commonly we hear them say, "I am

* A literary friend—a book-worm—once observed to me, when attending him for aggravated dyspepsia, that he conceived independence and want of active employment were the root of his disease. "Had I been bred a carpenter," he added, "and obliged to earn my daily bread, I might now have been a healthy man."

THE "LABOURING POOR."—The vigorous and laborious class of life has lately got, from the *bon ton* of the humanity of this day, the name of the "*labouring poor*." We have heard many plans for the relief of the "*labouring poor*." This puling jargon is not as innocent as it is foolish. In meddling with great affairs, weakness is never innoxious. Hitherto the name of poor (in the sense in which it is used to excite compassion) has not been used for those who can, but for those who cannot, labour—for the sick and infirm, for orphan infancy, for languishing and decrepit age; but when we affect to pity, as poor, those who must labour, or the world cannot exist, we are trifling with the condition of mankind. It is the common doom of man that he must eat his bread by the sweat of his brow, that is, by the sweat of his body or the sweat of his mind. If this toil was inflicted as a curse, it is—as might be expected from the curses of the Father of all blessings—tempered with many alleviations, many comforts. Every attempt to fly from it, and to refuse the very terms of our existence, becomes much more truly a curse, and heavier pains and penalties fall upon those who would elude the tasks which are put upon them by the great Master Workman of the world, who, in his dealings with his creatures, sympathises with their weakness, and speaking of a creation wrought by mere will out of nothing, speaks of six days of *labour* and one of *rest*. I do not call a healthy young man, cheerful in his mind, and vigorous in his arms, I cannot call such a man *poor*; I cannot pity my kind as a kind, merely because they are men. This affected pity only tends to dissatisfy them with their condition, and to teach them to seek resources where no resources are to be found, in something else than their own industry, and frugality, and sobriety. Whatever may be the intention (which because I do not know, I cannot dispute) of those who would discontent mankind by this strange pity, they act towards us, in the consequences, as if they were our worst enemies.—*Burke*.

sick all day when I rise early—I'm good for nothing, can't read nor work." Well I believe there is a peculiarity (idiosyncrasy) in this respect; when it is not attributable to habit or sheer indolence—the failing not the fault—why we must needs let these folk have their way. You'll generally find that such individuals are disposed to sit up to a late hour; while *v. v.*, you'll find that the early riser cannot read or occupy himself in comfort after nine or ten o'clock at night. As I am just now to consider sleep as a distinct subject, I shall, without further preface, proceed to the period of breakfast. I have considered this point before* and said, that both the dyspeptic and those in robust health are alike benefited by taking this repast, soon after rising; owing to the empty condition of the stomach and upper bowels then existing, the valetudinarian is peculiarly unfitted for any active exercise of either mind or body before breakfast. By the time the shower bath—friction with horse-hair gloves†—shaving and dressing for the day, &c. are all over, even the six o'clock riser will have approached very near to eight o'clock.

Some will tell you they cannot eat at that hour—well, they can drink, and so let them have then a cup of tea, coffee, cocoa, or any of the beverages we have already mentioned (see Lecture V., of “Physiology for the Public”), and postpone breakfast to ten, eleven, or twelve, when appetite shall have arrived; they will at that time usually be able for substantial fare, often animal food will prove serviceable, more especially if the interval be spent in gentle exercise in the open air, such as walking or gardening. We have known some instances

* “Physiology for the Public,” p. 132.

† An eminent divine mentioned, that ever since he had been in Germany, he spent an hour daily in rubbing his body with horse-hair gloves, and that it proved to be the pleasantest period of the twenty-four hours.

where the invalid possessed a good deal of vigour, and was of the *muscular* temperament, to admit of a long walk before breakfast, a crust of bread or a biscuit being the only thing taken at starting. We will find that such cases constitute the exception not the rule. Writers on the subject of dietetics have differed much as to the number of meals recommended during the day, varying from one to five,* According to our experience, three would appear to be the *best* number: it is a lucky number—as we say in Ireland—in harmony with the division we have made of the day; morning, noon, and night will also correspond to breakfast, dinner, and supper (tea). The results of Beaumont's experiments upon St. Martin induce him to conclude, "that the time required for digestion is various, depending upon the quantity and quality of the food, state of the stomach, &c.; but that the time ordinarily required for the disposal of a moderate meal of the fibrous parts of meat with bread &c., is from three to three and a half hours." Now, as our dyspeptic should not be supposed to possess the digestion of the healthy St. Martin, let us take four hours, or four and a half, as the average period required by the former; this would—supposing we say eight o'clock for breakfast and two for dinner—give from an hour and a half to two hours' repose to the stomach after the digestion of the morning repast: in like manner, by fixing on eight o'clock for tea, we give a similar interval between the second and third meals.

* The best time for dining has been said to be, "for a rich man, when he can get an appetite, and for a poor one, when he can get food." Celsus recommends the healthy to take food rather twice in the day than once; and Sanctorius says, "that the body becomes more heavy and uneasy after six pounds taken at one meal, than after eight taken at three; and that he who takes but one meal in the day, let him eat much or little, is pursuing a system that must ultimately injure him."—*Paris*.

As the habits of society and various contingent circumstances, often without the control of the valetudinarian, may prevent him from carrying the foregoing plan into effect, we give three plans in which the intervals between the first and second differ from the third :

1. Breakfast, eight o'clock.
 Dinner, two o'clock, }
 Supper or tea, eight o'clock, } Interval
 From supper to breakfast, twelve hours. } six hours.
2. Breakfast, nine o'clock.
 Dinner, three o'clock. }
 Supper or tea, nine o'clock, } Interval
 From supper to breakfast, twelve hours. } six hours.
3. Breakfast, nine o'clock, }
 Luncheon, one o'clock, } Interval
 Dinner, five o'clock, }
 Supper or tea, nine o'clock, } four hours.
 From supper to breakfast, twelve hours. } four hours.

For those that possess a rapid digestion, the last plan would be the best ; less being taken at each meal, it will be also applicable to those who have contracted the injurious habit of taking " little and often," conceiving that strength will be gained in proportion to the quantity of food delivered to the stomach. I will here repeat what was before mentioned (" Physiology for the Public," p. 86) : This is a remarkable and important fact, established by the experiments of Dr. Beaumont, that the quantity of gastric juice secreted bears relation, not to the mass of food received by the stomach, but to the quantity of aliment required by the system. Hence, if we should eat more than the wants of the body require, we are punished by indigestion supervening, owing to that portion of food which is in excess not being chymified. A clerical friend mentioned, that having on some days to discharge

from twelve to thirteen hours of professional duty, he found that when he had eaten little he was equal to the labour, and that his powers of mind were much more vigorous than when he had taken as much as appetite would indicate.* He also informed me that the late Lord Drogheda was most abstemious, always rose from table with appetite. This nobleman lived to the advanced age of ninety-nine. The rule we would wish the valetudinarian to adopt is, that he should appease hunger *only*, but not *wholly* remove appetite. We cannot too often repeat the caution, not to gratify the palate at the expense of the stomach, therefore plain food is that which is least likely to overload† this organ.

* A foreigner told me that he could not teach the languages with which he was most familiar, after a dinner of animal food. Should an individual be required to sit up to a late hour, and at the same time to exercise the mind, he ought under such circumstances abstain from animal food.

† Paris has so judiciously alluded to the mischief arising from the too prevailing fashion of introducing at our meals an indefinite succession of incompatible dishes, that I shall introduce here his graphic sketch of a modern dinner amongst the higher classes of society in England. The habits of this rank in all countries are said greatly to approximate. "The stomach being distended with soup, the digestion of which from the very nature of the operations which are necessary for its completion would in itself be a sufficient labour for that organ, is next tempted with fish, rendered indigestible from its sauces; then with flesh and fowl; the vegetable world, as an intelligent reviewer has observed, is ransacked from the cryptogamia upwards; and to this miscellaneous aggregate are added the pernicious pasticcios of the pastry cook and the complex combination of the confectioner. All those evils and many more have those who move in the ordinary society of the present day to contend with. It is not to one or to two good dishes, even abundantly indulged in, but to the overloading the stomach, that such strong objections are to be urged; nine persons in ten eat as much soup and fish as would amply suffice for a meal, and as far as soup and fish are concerned would rise from the table not only satisfied but saturated. A new stimulus appears in the form of stewed beef, or *Cotelettes a la Supreme*: then comes a Bayonne or Westphalia ham, or a pickled tongue, or some analogous salted, but proportionably indigestible dish, and each of these enough for a single meal. But this is not all; game follows; and to this again succeed the sweets, and a quantity of cheese. The whole is crowned with a variety of flatulent fruits and indigestible nick-nacks, included under the name of dessert, in which we must not forget to notice a mountain of sponge cake. Thus, then, it is, that the stomach

Sleep is well known to be as indispensable for us all as food. It is, peculiarly, the repose of the nervous system. During our waking moments, the relative functions are constantly exercised; the external senses, by their respective nerves, convey the impressions made upon them to the brain or sensorium, the perception of which constitutes ideas, "immediate objects of the mind in thought." Here the agent causing the impression, which subsequently produces the perception, acts primarily from without. The second chain of phenomena proceed in an opposite direction, commencing with the mind; secondly the brain; thirdly the nerves; fourthly the muscles; the actions of which produce those motions which the mind had primarily determined. It is plain that there are two distinct functions exercised by the nerves: one conveying impressions from without inwards, and hence called nerves of sensation; the other, carrying the mandates of the will to the muscles, and, therefore, named nerves of motion. During our waking

is made to receive, not one full meal, but a succession of meals rapidly following each other, and vieing in their miscellaneous and pernicious nature with the ingredients of Macbeth's cauldron. Need the philosopher, then, any longer wonder at the increasing number and variety of dyspeptic complaints, with their long train of maladies, amongst the higher classes of society." "*Innumerabiles morbos non miraberis, coquos numera.*" King George III. dined at three o'clock, although the fashionables had got into the habit of dining at five. Now, the elite dine from six to nine!! Luncheon is dinner—dinner is supper.

THE EVILS OF LUXURY.—The luxury of man revenges itself upon its rapacity, and brings forth fever, gout, rheumatism, and brings out almost all the contents of Pandora's box, to infest the human species in every part of the civilised world. Some authors say physic and physicians are necessary evils; they certainly are so, but we by our excess and intemperance make them necessary. A young spendthrift considers the law, with its writs and its bailiffs, one of the greatest nuisances, but let him be frugal and a better economist, and the evil ceases. The philosopher, Pythagoras, after having travelled over India, Italy, and Sicily, asserted that the most remarkable circumstance he had remarked in his travels, was a people who made two meals a day.—*German Philosopher.*

moments the brain and nerves are constantly engaged. Each organ must have its period of repose as well as that of action : even the heart is not an exception, for its several cavities are found to act and rest alternately. Now the length of repose of any organ should be determined chiefly by the duration and degree of its previous action. This is a law which applies generally to our organization. Take, for instance, the eye of a watchmaker, that by occupation is compelled to look attentively at minute objects for several hours daily ; secondly, observe the man who has laboured all day at manual employment ; thirdly, we find an individual living by the “sweat of his brain,” this organ worked with intensity of thought. It is plain that all three require an allowance of repose, commensurate to action, to recruit their respective systems by “nature’s soft nurse, balmy sleep.” He that lives by the sweat of his brow, has earned, compared with the other two, by his employment—so much in accordance with nature’s laws—a weariness that most sweetly invites to delicious repose. Again, there are some so indolent that they have eyes, and see not ; ears, and hear not ; muscles, and move not ; brain, and think not ; who merely vegetate, live in the “laborious lassitude” of doing nothing. There is here no work, no exertion ; consequently they may be said, not to require sleep, because they have not engaged either in corporeal or mental exertion ; still this unexcited state of the system predisposes to sleep. Some of this class—the gormondizers—do sleep, like apoplectics, or a boa constrictor after his enormous meal ; but this is the brutish sleep of the glutton,* for we have seen that when the stomach is loaded with food, there is a marked disposition for repose.† With them eating is the great business of life—

“They live to eat, not eat to live.”

* “Physiology for the Public,” p. 89.

† Ibid.

They come—they go—

“They eat, they drink, they sleep—what then?
Why eat, and drink, and sleep again.”

The period allotted to sleep varies generally from six to eight or ten hours. It has been just now shown that the demand for repose ought to be proportionate to the corporeal and mental exercise of each individual. Bad consequences have been known to result from running into either extreme. From the principles already proved, it will appear that the necessary period of sleep should, more especially in the case of the dyspeptic, be directly as the quantity of food taken. An invalid will often complain about the restless nights he spends, as an excuse for morning sleeps—the latter are in all cases to be proscribed; the plan we would have him adopt is the following:—He should rise at the usual hour instead of courting morning slumbers, and he shall find that he will be desirous to seek his couch at an earlier hour the following night, and accordingly enjoy sound sleep. There is a popular feeling in favour of sleep before twelve o'clock, which we think is well founded. If the invalid will at one time retire to rest, say at twelve o'clock, and rise at eight o'clock, and at another go to bed at ten and rise at six, although in each case eight hours' rest shall have been obtained, yet, the result will be decidedly in favour of the latter. Two obvious salutary effects may be here mentioned, as consequent upon this plan, namely, the avoidance of exhaustion, and the advantage of enjoying two hours of solar, instead of artificial light. The different effects produced on the human organism by the air of day and night are familiar to all. The invalid should carefully avoid reading deeply interesting books before bedtime, more especially tragedies and romances. But it is

well known that vigilant individuals are often "read to sleep:" in this case, the subject should not be *Popular Physiology*, but some prosy work on political economy or a dull dry debate in parliament, in which some long-winded gentleman, for the sake of perspicuity and *brevity*, divides his speech into twenty-four heads. I have before mentioned, that excess of exercise produces a feverish condition, which of course indisposes us for sleep. Those agents that act as excitants upon the external senses, should be as much as possible withdrawn. I shall have, when treating of the sensitive functions, to consider the indisposition to sleep produced by an over-active brain and over-anxious mind. The bedroom should be one of the best and most airy apartments in the house, not crowded with furniture—and in despite of such nakedness the bedstead should be without curtains. If the valetudinarian be a benedict (all men should be so) we will compromise the affair with his lady, and permit a light and airy suit of curtains in *winter*, which should be of a texture permeable by the atmosphere of the apartment. He should lie on a hair or alva mattress (either may be placed *over* a feather bed) and lightly covered. For those disposed to headache or fulness of habit the head and *shoulders* should be well raised; indeed the whole surface of the bed ought to form an inclined plane instead of a horizontal one. It is of great importance that those disposed to remain a-bed too long, shall not be tempted to indulge this habit by making them "snug," sunk in a downy bed "like a diamond in cotton." Some *say* they are very desirous to rise early in the morning, but then they do not awake; and, if called, they fall fast asleep again, and quite forget that they had been called. Well, in the first place, let the valetudinarian *determine* upon rising without fail at a given hour; secondly, let him sleep with his shutters

open and suffer the sun to rouse him;* lastly, if he will not rise when called, let him take something—suppose a key—that will be required in the morning, bolt his door, and direct the servant to knock until our bed-loving invalid shall start up and deliver the key. If he should go back to bed after this ingenious contrivance to dislodge him, his is a hopeless case of confirmed sloth. Some delicate individuals, as well as those in advanced life, will be benefited by a sleep of an hour or two after dinner; like the siesta of the warmer climates, it materially contributes to promote digestion. The celebrated John Hunter slept for an hour after dinner. It has been also stated that he slept but four hours out of the twenty-four, a practice we by no means recommend, even the healthiest, to follow. All tight garments should be loosed on such occasions, and the head and shoulders elevated, to counteract injurious determination of blood to the former, which might result from the ordinary horizontal posture.

Modifications.—Under this head I have to consider the influence exercised over the functions of digestion, by age, sex, temperament, climate, seasons, habit. I must be *now* very brief upon these subjects, which would afford, did time and space permit, interesting texts for observations of paramount physiological importance. I shall proceed to make some remarks upon each of them, taken *seriatim*.

Age.—In infancy the breast milk of the mother or of a suitable nurse, I need scarcely add, is the most appropriate: when this cannot be procured, we have already

* The eyelids permit strong light to affect the eye, as may be proved by looking at the sun or a candle with the eyes closed. Moore, when describing a page reposing said, "His sleepy lids like snow on violets lay." A pretty poetical way of indicating *blue* eyes and *transparent* lids.

("Physiology for the Public," p. 145) mentioned that ass's milk is the best and cheapest substitute; in this case we can guard against dietetic errors on the part of the nurse, which we can by no means prevent in other instances. Nature, in the development of the teeth, affords us useful hints as to the changes in aliment that should take place in the progress from infancy to childhood. Our own experience would lead us to conclude, that there is more of mismanagement manifested in relation both to quantity and quality of food during childhood, than at any other period of our existence. There is a popular knowledge respecting the injurious consequences caused by bad nursing; the delicacy of individuals during after life being not unjustly attributed to that circumstance. After the appearance of teeth—ass's milk, cow's milk diluted with barley water, thin gruel, and arrow-root may be given in *small* quantity, and thus by increasing them by cautious degrees they may be wholly substituted for breast milk after the first year, *weaning* being thus gradually accomplished; after this period the nourishment may be somewhat of a solid character, and more nutritive, depending upon the temperament of the child, as panada, rusks, &c., and in some instances light animal broths, thickened with one or other of the foregoing farinaceous substances, will be admissible. The first set or milk teeth do not all appear until about two years; after this period we may venture, by slow degrees, to combine solid animal food with the farinaceous diet, but in this respect an error generally lies on the side both of the quality and quantity of the new aliment, the digestion of which requires to be aided by open air and exercise, and *no* schooling.

Well, the school-master is abroad with a vengeance! *Infant schools*, "to teach the young idea how to shoot,"

may be a "delightful task" for preceptors *paid* for such avocations, but it is perfectly plain that this is an *unnatural* task—nay, preposterous in the extreme for the babe—to send the little innocent, playful, gamboling thing, from its home—its mother's apron string—to "discipline," moral, intellectual, and physical, at such an age, and in such a place! crowded—heated—and often ill-ventilated!

I showed, in a lecture published long since, the pernicious consequences resulting from this mania of the day: that often *exclusive attention* is devoted to the cultivation of the intellect of young people of both sexes at too *early* ages; thus bringing about a premature failure of minds, often naturally too precocious. I do not object to a fair proportion of cultivation of the nobler part of our nature at *all* times, but I seriously object at *an early period of life* to *intense* application to study, and to abstruse objects for consideration, owing to the necessarily injurious influence thus exercised on the complete development of both mind and body. It is a violation of common sense to put the boy to man's labour—to demand that the dwarf shall raise the giant's load! Too often have I seen the baleful consequences of confining children—mere children—during the greater part of the day, with a view of making their literary progress the admiration and the envy of their neighbours. "The most intelligent child that ever was seen—every man's own child." In such instances the health of children is often seriously undermined, before the parents or guardians take the alarm; some organic derangement, not unfrequently hydrocephalus, has now to be contended with, owing to the great excitement of the brain, and the medical practitioner is compelled, in many cases, to deliver a most unfavourable prognosis.

The philosopher may, at the moment, smile, and consider the time as misspent, which is occupied in the hopeless pursuit of a butterfly, or in urging the revolving hoop over the grassy plain. But he will, on mature reflection, say with the sage, there is a time for all things. He will exclaim, in the language of the Omniscient Disposer of all his works, the child should think and act as a child. Seemingly idle pursuits are but the dictates of nature ; it is the age for physical, not mental development ; for the wholesome exercise of the muscles, not for the injurious employment of the brain ; the season for the accumulation of health, not for the dissemination of the baleful seeds of disease. Let us not suffer the scenes of youth, “ when every sport can please,” to be embittered by irksome and unprofitable employment, and cultivation utterly unsuitable for such tender years.

Well, before and at puberty boys are so bold and headstrong that they will have air, exercise, and cheerful recreations ; they earn an appetite for all kinds of food by such natural means, that staves dyspepsia quite out of countenance. Alas ! the poor girls !—the boarding school ladies—that slowly march two and two with measured steps : they should “ turn out ” and determine, one and all, that they will not enter any establishment that is not out of the city, with airy dormitories, good garden affording a plot for each (*her own*), a *large* field to scamper about, skipping-ropes, shuttlecocks, &c. Let them but add to this, teetotal abstinence from stays, and a new era occurs in female existence—in education, moral and physical. Avaunt ! dumb bells, back boards, reclining planes, *et hoc genus omne*. The offices of the doctors and apothecaries of such establishments, would—lamentable to relate—come under the denomination of sinecures ; while those of the

purveyors, vulgarly called butchers and bakers, would increase in an inverse ratio.

In adult age, the temperament of the individual will mainly influence the kind of diet to be employed. I shall presently turn to this subject.

In advanced life there is in general too much food consumed, and also of too stimulating a nature, which frequently acts as the predisposing or exciting cause of an apopléctic seizure. These individuals had acquired a habit of eating a certain quantity and kind of food; such aliments, while their habits were active and out-of-door, were then easy of digestion, but which now, under opposite circumstances, prove quite the reverse. The aged, when *unemployed*, are prone to think too much about eating and drinking—they are then often in a second childhood, and when edentulous, nature gives us a significant hint that milk and farinaceous food, as not requiring much mastication or powers of digestion, would prove most suitable.

Sex.—We find that males require, owing to their active and often laborious habits, a greater quantity of food than females, and also of a more nutritive character. We shall see hereafter that the original and innate temperament of the female differs widely from that of the male, and consequently the former requires, owing to that circumstance, a corresponding change in diet.

Temperaments.—I purpose considering this subject fully in its proper place. At present I shall offer such cursory observations on the influence which temperament should exercise over diet, as I think ought not be omitted. “A temperament may be defined a peculiar state of the system depending on the relation between its different capacities and functions, by which it acquires

a tendency to certain actions." Peculiar conditions of the mind, certain tastes, as they are called, are analogous to this physical distinction ; and, indeed, we often have occasion to acknowledge how much the peculiar development of the body is indicative of certain habits and dispositions of the mind. The names which Bostock applies to those temperaments, originally described by Hippocrates, I shall employ on the present occasion, as they are in common use, and well understood : they are the nervous, the sanguine, thetonic, the relaxed, and the muscular temperaments.

1. The *nervous* temperament—need we define it? It is like Locke's simple idea—everybody knows that it depends upon undue susceptibility of the nervous system, more commonly superinduced than congenital. It is a sort of aristocratic constitution, consequent upon civilization, the refinements, the excitements of the higher walks of life—the offspring of the ball-room and the boudoir, as well as of the inevitable wear and tear of the system, which must be suffered when wealth, fame, and distinction are to be purchased by the "sweat of the brain" and the anxious throbbings of the heart. Richerand says, that Tronchin, a Genevise physician, acquired great wealth and reputation by the treatment of nervous affections. His whole secret consisted in exercising to fatigue women habitually inactive, keeping up their strength at the same time, by simple, healthy, and plentiful food. I have already furnished you with an anecdote (p. 57) in reference to the benefits to be derived from exercise ; but, it should be discontinued the moment fatigue supervenes. Well, as to the dietary indicated above for this class, we have nothing more to add than that I would define "healthy food" for the nervous, to be that which will be nutritive without being stimulating.

2. *Sanguine* temperament.—This constitution is indi-

cated by the predominant activity of the heart and blood-vessels, consequently we have a ruddy complexion and the countenance animated ; and, indeed, there is a marked disposition to enjoy the good things of the table as a characteristic feature in its development. Here we have an active, excitable blood-making system, not prone to run into disease ; but, such as occur are of the inflammatory kind, and hence, we should best consult the welfare of one of this temperament by enjoining a light form of diet, good proportion of farinaceous and vegetable food, and abstinence from fermented drinks and “ alcoholic potations.”

3. *Tonic* temperament. — This has also been named *bilious*, owing to the marked superabundance of the biliary secretions. In such examples the skin will be of a brownish yellow tinge—hair black—muscles and veins well marked—character firm and inflexible. “ As love is in the sanguine, so ambition is in the bilious—the governing passion.” Richerand adds, “ Bold in the conception of a project, constant and indefatigable in its execution, it is among men of this temperament we find those who, in different ages, have governed the destinies of the world ; full of courage, boldness, and activity, all have signalised themselves by great virtues or great crimes, and have been the terror or the admiration of the universe.” What a good illustration did his own emperor, Napoleon, afford of such a character, which he here so graphically describes, always ready with “ head to plan and hand to execute.” Napoleon was not sufficiently attentive to regimen, which in his case (the bilious) should have been pretty nearly what we have mentioned as suitable for the sanguine temperament. Diseased condition of any of the abdominal organs, or derangement of the nervous system, often converts this temperament into what is called

the *melancholic* or *atrabilary* ; the skin puts on a leaden hue—the imagination gloomy—the disposition suspicious—cancer is the disease of this habit—and of that malady Napoleon died. Clerc considers the last temperament less as a primitive and natural constitution than as a diseased affection, hereditary or acquired. The state of mind and body of the exile of St. Helena, was well calculated to induce the deadly disease of which he died.

4. *Relaxed* temperament.—In this form the proportion of the fluids to the solids is too great—it is also called *pituitous* and *lymphatic* ; there is bulk without firmness—countenance pale—deficiency of the vital powers—imperfect development of the functions—the memory treacherous—the attention not continuous. The individual of this habit is generally phlegmatic, slothful, and apathetic ; one of those “ fair and easy going people ” that is never carried away by passion, feeling, or sympathy, because these are either languid, or altogether absent. Such are sedentary from choice. The diet suitable for this temperament should be nutritive and stimulating ; animal food—wine—malt drinks and spicy condiments, &c., may be directed with advantage.

5. *Muscular* temperament is often originally *sanguine*, but when the individual applies himself to labour, the nutritive current is directed towards the working organs, and the former habit is then converted into “ the muscular or athletic temperament conspicuous by all the outward signs of vigour and strength.” There is a lack of nervous energy—consequently “ the perceptions are blunt, and deficient both in strength and accuracy.* ” The state of the mind

* When a pursuit exercises rather the muscular than the mental powers, the demands made upon the former are never favourable to the development of the latter. Indeed, we have observed a marked difference in the *form* of the head in individuals whose occupations call into play, in different degrees, the mental facul-

corresponds to that of the body ; the feelings are not easily roused, but when the mind is once excited it obstinately retains the impression, and perseveres in its object with unshaken resolution." The Farnese Hercules joined to his strength so little subtlety, that he was cheated by all the kings he served, and all the women he loved. A nutritive and chiefly animal diet will be suitable for such temperaments, although we find, as in the case of the Irish peasantry, the most enduring efforts, while they are confined to a diet almost exclusively vegetable—the never ending potatoes.

6. The *mixed* temperament is one in which we observe the characteristic features of two or more of the preceding united like the blending of the prismatic colours.* How commonly do we find the bilious and nervous temperaments united. "The nervous man a man of nerve." From what we have stated, it will be easy to determine the proportion

ties. We are not disposed to ascribe this to an original difference of conformation, but to the different degrees in which the mental powers are exercised. Nature will not allow, to any great extent, an expenditure of energy in two different divisions. The vigorous muscular exercise of the body must always be at the expense of the intellectual faculties. The supply which is necessary to support the body in constant and severe labour, leaves only a limited stream of blood and nervous energy to stimulate and feed the anterior region of the brain. Hence in the forgers, and in all persons similarly circumstanced in the trades in this town, we perceive a large development of the head posteriorly and laterally. The forehead is usually low and retreating, and the space between the crown of the head and the ears exhibits a very limited expansion. On the contrary, in artisans whose business exercises the thinking faculties in a greater degree than the muscles, the head gains in height and development both in the anterior and lateral portions of it.—*Statistics of Sheffield*. It is said that the block on which Napoleon's hat had been made, required to be changed for a larger one, owing to an increase in the size of his head.

* The rainbow represents the effects of a prism, the light decomposed ; but seven prismatic colours are observed, yet by the combination of these what an endless variety of tints and shades are produced as well as white, the result of *all*.

of each which exists in any individual case, and adapt or modify the regimen according to the prevailing attributes and indications. It will be seen from the foregoing, how physical development may point out certain mental tendencies or peculiarities; and again, how certain employments and modes of thinking give a characteristic expression to the air, gait, and countenance of the individual. Hence, we speak of a countenance "mild, pale, penetrating," or if of the dyspeptic cast, "pale, bilious, and interesting." Need we add the common observation made on the *first* interview, the *prima facie* indications, which induce one to exclaim, "how intellectual," "how cross," "how good-humoured" he looks—and all this without even a single glance at his phrenological development, *i. e.* with his hat on.

It is strange that the inhabitants of Great Britain and Ireland, though so closely knit together by locality, government, common interest, and constant social intercourse, yet should be so dissimilar in national character and temperament. Doubtless the position which the individual holds in society produces a decided influence.

Madame de Staël disposes of the several grades of the English, in a pithy sentence—more terse than just—when she states that they are like their malt drink—the top all froth, the bottom all dregs, but the middle excellent.

Dr. Johnson observes that the wear and tear complaint is almost peculiar to England, and explains why it should predominate in London so much more than in Paris, because in London business is the almost only pleasure; in Paris, pleasure is the almost only business. In this respect Dublin may be said to hold a middle place—neither so busy as the former, nor so idle as the latter; hence its inhabitants, generally speaking, enjoy good health. If

Pat had the prudence of John Bull, would eschew gentility, the besetting sin of Ireland, not ape his loftier and richer neighbours' habits, and consequently their expenditure, he would learn to live more contentedly and tranquilly in that state of life "into which it had pleased God to call him."

My countrymen are too vain to be proud, while the Englishman is too proud to be vain; hence the former is always striving for that extrinsic, *nitor ultra vires*, to make his neighbours *stare*: the latter constantly working to produce intrinsic domestic *comforts* for himself and family.

Are we to look for an explanation of this in organization, climate, soil, and its productions? A learned friend of ours attributes a vast deal of the development, physical, moral, and intellectual, of the Irish, to—what do you think? You cannot guess!—you must "give it up!" Well, then, "*Potato-diet* is the cause of all!"

The following is, we think, an elegant, concise, and true description:—

"To sum up the view of English, Scottish, and Irish character, I may observe that sincerity and independence distinguish the English; intelligence and sagacity, the Scottish; and a gay and gallant spirit, the Irish. The best qualities, however, are apt to associate with bad ones. The independence of the English sometimes degenerates into coarseness and brutality; the sagacity of the Scottish into cunning and time-serving; and the gaiety of the Irish into fickleness and faithlessness. Could we combine the independence of the English with the sagacity of the Scottish, and with the gallantry of the Irish, we should form almost a god. Could we, on the contrary, unite the brutality of the first with the cunning of the second, and with the faithlessness of the third, we should form a demon."

"Somebody once remarked that the Englishman is never happy but when he is miserable: the Scotchman is never at home but

when he is abroad ; and the Irishman is never at peace but when he is fighting."

An Irishman is *par excellence* an enthusiast, and possesses many of the prominent features of a genius, none more marked than the following, namely, "violent passions and a long train of virtues or vices, according to the direction which these passions happen to take." Unfortunately these attributes, for good or for evil, are but too often neglected, uncontrolled or misdirected.

As enthusiasm is said to be an essential difference in the Irish character, by a distinguished member of the bar,* I will, as an humble disciple of Physic, transcribe here what I stated relative to enthusiasm, in my "Physiology for the Public" published, MDCCCXLII—and, in which, also, the paramount influence of the *morale* over the *physique* is plainly pointed out.

* "You will not punish your countrymen for the enthusiasm of their character—remember what it has affected, and forgive its excesses. Recollect that the same enthusiasm has borne them triumphant over fields of peril and glory—impelled them to shed their dearest blood, and spend their lives in defence of the liberties of England. The broken chivalry of France attests the value of that fiery enthusiasm, and marks its power. Their high spirit has its uses not merely in the storm of battle: it cheers their almost broken hearts—lightens their load of misery, well nigh insupportable—sweetens the bitter cup of poverty which thousands of our countrymen are doomed to drink. Without enthusiasm, what that is truly great has been achieved for man? The glorious works of art, the immortal productions of the understanding, the incredible labours of patriots and heroes for the salvation of the liberties of mankind have been promoted by enthusiasm, and by little else. Cold and dull were our existence here below unless the deep passions of the soul, stirred by enthusiasm, were sometimes summoned into action for great and noble purposes: the overwhelming of vice, wickedness, tyranny—the securing and spreading the world's virtue; the world's happiness; the world's freedom. The hand of Omnipotence by whose touch this island started into existence amidst the waters which surround it, stamped upon its people noble qualities of the intellect and heart—directed to the wise purposes for which heaven designed them, they will yet redeem, regenerate, and exalt this country."—*The Speech of J. Whiteside, Esq., Q. C., delivered at the Irish State Trials, MDCCCXLIV.*

ENTHUSIASM.—*It was the remark of Napoleon that, in war, the moral are to the physical means as three to one—so highly did that consummate general rate the influence of mere mind on the issue of any great military enterprize. Now the same will often be found to hold good in the more peaceful operations of the healing art.—Medico-Chirurgical Review, October, 1841.*

It was observed that the officers engaged in the last war bore the fatigue, hardships, and privations inseparable from a campaign, at least as well, if not better, than the soldiery, although the former were in many instances the elite of the land; reared in the lap of luxury, with all the care and downy comfort which ingenuity or wealth could devise or afford. How are we to account for this elastic endurance of unwonted bodily suffering? We are to find its explanation by reference to the mind, which has now its turn. I have already shown (p. 143, of “Physiology for the Public”), that the state of the corporeal functions influences to a humiliating extent the moral portion of our being; you have here to look at the converse of the proposition; the body now is enabled to endure the most unusual suffering, by the aid of the attributes of mind, call that agency and those attributes what you will, which are the secret springs of human actions, and of man’s endurance.

“Life’s smallest miseries are perhaps its worst :
Great sufferings have great strength : there is a pride
In the bold energy that braves the worst,
And bears proud in the bearing ; but the heart
Consumes with those small sorrows, and small shame,
Which crave, yet cannot ask for sympathy :
They blush that they exist, and yet how keen
The pang that they inflict.”

L. E. L.

Shall we call this supporting spirit, pride or patience—

emulation or energy? It is easy to assign the final cause, that "God fits the back to the burden, and tempers the wind to the shorn lamb;" but it is not so easy to name that attribute which is the offspring of God's grace. We will venture to call this divine essence—enthusiasm, without which there is no greatness of character. It is the elevating principle of the best—the highest aspirations alike of religion, of morals, and of intellect.

I speak now, remember, of enthusiasm, in its best acceptation, which Johnson, our great lexicographer, defines to be "elevation of fancy, exaltation of ideas."

"At last sublim'd
To rapture and *enthusiastic* heat
We feel the present deity."—THOMSON.

I have already* alluded to this attribute. I cannot resist the present opportunity of putting before you my notions in reference to the extensive range of its application.

The fondest thing in nature—the most disinterestedly fond—is a mother of her offspring: this, generally, is alike true amongst all tribes of animals, as we are fully prepared, from experience, to admit. It is equally true that the end of existence is enjoyment; consequently, pleasure and pain should be the most operative and influential agents, in inducing us to pursue and persevere upon the one hand, and to decline and desist on the other.

Do but balance these—pleasure and pain—in the scale of an anxious mother's existence; how much will the latter preponderate? Yet, observe, how an occasional transient gleam of sunshine, shed over the pallid countenance of the

* "Physiology for the Public," p. 127.

sickly but smiling child, lights up the mother's care-worn countenance with the radiance of hope and joy, which repays her for days and nights—nay, months and years, of devoted solicitude and harassing watching. It is obvious that reason is not the uplifting influence here: the soul-supporting spirit is instinctive, absorbing love—"less akin to earth than heaven"—which inspires that exalted train of ideas we so justly call the enthusiasm of the mother.*

Observe, in the next instance, the child—the mere child—its young mind expanding—bursting into beauty like the opening bud under the sun's vernal influence. Its nature ardent, generous, so innocent, so unsuspecting: its extacy to caress and be caressed. The lively senses that drink in with eager thirst, the things of outward world—all delightful, because they are gilded by the sunny light of fairy fancy and bright enthusiasm.†

Next mark *the* energy of that sapling son;—the soul-awakening spirit that fires the youth—implants the "will invincible"—bids the march of mind never halt, and cheers on industry and genius in their glorious struggle up the rough and rugged steep that leads to knowledge and to virtue's temple. May we not name *this*—the boy's enthusiasm?

* "It is said that a mother's love springs up in her bosom just as the milk in her breast *for her* offspring."

"In the wilds of America there is a tribe whose women, after losing their infants, for some time go every day to their graves, and, with silent and pathetic eloquence, which shames all noisy grief, press some milk from their bosoms upon the grass that covers their remains."

"A MOTHER'S LOVE.—A mother bending over her first child with a love which no created being but herself can ever feel for another—so intense, so pure, so utterly devoid of selfishness—bathing its cheek, chin, lips, eyes, and brows, in a flood of kisses—is a picture which earth cannot surpass."

† "Suffer little children, and forbid them not, to come unto me, for of such is the kingdom of heaven."

In riper years—in manhood—what marks the man of genius—what the man of soul? What raises him above the vulgar herd? What elevates him so high above the heads of those who are merely rich in pelf, but, poor indeed in worth? What gives the fire to music, to poetry, and to thought? What makes the great be good, the good be great? Shall we not call that spirit divine enthusiasm?

In the heart's affection!* where shall we look for the secret subtle essence—the thrilling soul-felt influence, which makes woman a spirit of light and loveliness? That sheds a hallowed atmosphere of “sainted chastity” around her, and bids man almost worship the idol-object of his love? Is it not because her thoughts—her feelings—her sentiments—are the purer offspring and the brighter emanation of an unshackled enthusiasm?

Finally; should we not cherish, then, this glorious attribute—the parent of all that's good, that's great, that's noble, and that's generous: the blessed emanation of divinity itself: that teaches ransomed man to rise above his fallen self, and proudly feel how grovelling and unsatisfying are things of earth; and bids the imprisoned and anxious eye of Time to look to Heaven and to Eternity for the enjoyment of unalloyed enthusiasm.

* “WOMAN'S INFLUENCE.—Oh, woman! the man of old was hardly wrong when he declared that thy power was greater than any other on earth. It is, indeed, great: thou hast power over man in all intimate and endearing relationships, instructing him by precept and example, and drawing him from the rough and the rugged path by thy own beauty and gentleness. It requires but that thy education should be such that Truth should be thy attendant, and then wouldst thou be invincible. As it is, thy power is vast and wonderful; strong only by being weak, conquering by being gentle. Binding by kindness and compassion, thy power is like an enchanted circle, beyond which none can pass, though thou holdest them in no restraint, for thy chains are nothing firmer than a wife's a daughter's, or a sister's love.”—*Woman's Worth*.

Dr. Johnson has well observed—

“It is by studying the mind, the feelings, and passions of his patients with more than usual tenderness and sagacity, that one physician so often outstrips another in the extent and success of practice. We believe that the want of such a study is apt to be a besetting sin of those medical men more especially, who have been long occupied with hospital practice. M. Parise very pertinently remarks on this subject, that ‘patients in these institutions are almost quite unknown to the physician, and the physician to the patients; when they are once discharged, they are completely forgotten; there is no unbosoming of the heart either attempted on the one side, or encouraged on the other. The patient suffers, or is cured—dies, or leaves the hospital, bearing within his own breast the arrow that has wounded his feelings, and which has been the cause of the disturbed equilibrium of his bodily functions.’”

Climate has considerable influence upon man in reference to his appetite for different kinds of food and their illegibility. Nature, ever kind, supplies abundantly that species of food which is most suitable in relation to our wants, and the quarter of the world in which we happen to be located. The most striking contrast in this respect, is the difference in aliment provided for the inhabitants of the southern and northern quarters of the globe. How suitable are the products of the vegetable kingdom for the former, the delicious fruit, the perfumed air, the verdant landscape, the endless and enchanting notes of the feathered tribe!—all prepare a refreshing banquet for the senses of the man whose frame, subjected to the heat of the southern climate, would soon become exhausted but for these precious aids and antidotes that the bountiful Creator supplies. Let us now look at the inhabitant of the northern region—pent up by icebergs—nought meets his eye save sky and snow

—his music is the blustering blast of rude Boreas. The vegetable world, locked up in iron bonds, affords no store tributary to his wants or gratifications. His country—one wild, bleak, icy prison; yet still it is preferred—nay loved—before the south with all its downy comforts, because her hardy son calls it the land of his birth and of liberty, in a word—Home. In this region the animal kingdom most appropriately affords a diet, at once nutritive, concentrated, and stimulating, to meet those wants which vegetable food could not adequately supply.

Seasons.—Here again we will find it necessary to profit by the indications given from the supplies afforded by nature during the different periods of the year; we should be also guided by the instinct that prompts the inhabitants of the cold and warm climates to select the most appropriate food: hence the proportion of animal food should be greater in winter, and that of vegetable in summer. Ought it to be a matter of surprise, that those who live habitually inattentive to nature's laws, should be punished with dyspepsia? In some instances it becomes a stretch of recollection to remember when vegetables had been touched, if ever, when lo! the dandy gentleman exclaims—"Yes, I once eat a—pea;" or he says in the language of Beau Brunnell:—

"Why, what could I do, my good-fellow, but cut the connexion? I discovered that Lady Mary ate cabbage!"

Habit.—Man has been justly said to be the creature of habit—his second nature. No one of his functions is more influenced in this respect than that of digestion—appetite comes at the accustomed hour; if not satisfied it soon disappears: again, we change the period of meals, and after this custom has been persevered in for a short time we have

a new habit formed, and come to look for food at hours of the day quite different from those of the first arrangement. One lives exclusively on vegetable food, another almost as exclusively on animal aliment: change of climate, or some such contingency, causes a necessity for a *vice versa* proceeding; the new custom is very soon followed by the contentment that springs from habit. I am quite certain that much mischief has been done to the valetudinarian by establishing a habit of almost constantly taking something in the shape of refreshment, which a morbid feeling, nearly allied to that of appetite, gives rise to. The regular periods pointed out (p. 111) should be resorted to as soon as possible. A habit which we are all prone to, is that of eating much more than is either requisite or salutary. The stomach becomes accustomed to undergo a certain degree of distention at given periods, the palate a given length of gratification, the nerves of the stomach, and, indeed, those of the whole system, a certain degree of stimulation; all these are regularly looked for—sought after, and become in time necessary for our comfort when the habit is confirmed. When considering condiments (p. 101, of “Physiology for the Public”), we referred to a judicious remark of Dr. Bostock, that such is the force of habit with reference to articles at first disagreeable to the palate, that they become those for which we afterwards acquire the strongest partiality: tobacco, garlic, and assafoetida, afford remarkable illustrations of these circumstances.

CHAPTER V.

RETROSPECT—A WORD IN CONCLUSION.

As a reference to the headings of each chapter constitutes a sort of bill of fare, I think it unnecessary, with the exception of the *morale* of the whole, to enter into a recapitulation now, more especially as this essay has already extended far beyond its contemplated limits.

Well—the infant mind is “like a sheet of white paper,” void of all characters without any ideas, until it comes to be furnished with them by experience. The impressions made by outward objects upon our senses are accompanied with a consciousness of such agency, the latter we call perceptions or ideas; these, thus observed, are next compared: the result of that comparison is the formation of a judgment* or determination; volition follows, and usually terminates in motion or action.

The foregoing facts obviously demonstrate that whatever may be the amount of our knowledge—the varied stores of intellect—the utmost depths of feeling—the wide-spread regions of fairy fancy, all are referrible to the handmaids of experience, namely, sensation and reflection.

* Judgment is sometimes called a proposition or thought. In this process we must employ at least *three* ideas, even in the most simple form; *e. g.*: 1, God; 2, is; 3, love; the first is the *subject*—the person or thing about which we make some assertion; the second is the *copula*—the connecting link between the subject and what is affirmed of the latter; that so affirmed of the subject is the *predicate*, or thing *predicated*.

Out of comparison grows volition ; because pleasure and pain have been annexed to most of our ideas as healthy stimulants of our faculties, in order to incite us to pursue on the one hand, and avoid on the other. The objects which we wish to obtain induce that condition of mind called *desire*. The acts we have an instinctive or intuitive desire to perform in relation to others are called *affections* : both desires and affections precede volition. We must all acknowledge that connected with our desires and affections are inevitably linked our hopes or fears ; our joys or sorrows ; our self-approbation or remorse. They are the painters of our chequered life ; the causes of opposite results—of repose, of strife ; of harmony, of discord ; and, finally, of happiness, or of misery. How interesting—vitally interesting, must be the consideration of all or any of those important agents, how urgent the necessity that they shall be carefully watched, regulated, and controlled ! When a desire or affection produces an *emotion*, we name that effect, *passion*. Now, although passion, generally considered, is the constant result of the action of either of the former, yet still it is not until they produce *emotion*—vehemence of passion, or pleasing, or painful—that this feeling is from its intensity designated *passion, properly so called*. As our passions when not inordinate or vicious, may be the ministers of good as well as of evil, it is plain that some excellent writers* have defined their abuse not their use. The distinction made by Watts is just :—“ The word passion signifies the receiving *any* action in a large philoso-

* “ When either a desire or an affection has acquired an *undue* influence, so as to carry us forward in a manner *disproportioned* to its real and proper tendencies, it becomes a *passion*.”—ABERCROMBIE.

“ And *passion* like the sun at noon,
That burns o’er all he sees.”—MOORE.

phical sense ; in a more limited philosophical sense, it signifies any of the affections of human nature, as love, fear, joy, sorrow : but the common people confine it only to anger."

In disciplining the desires and affections—"mastering the mind"—we should adopt the admirable rule of Bishop Butler, which is of universal application, namely, "Is this I am going to do right, or is it wrong—is it good, or is it evil?"

The reader is requested to turn to the real remedy, for wear and tear, which will be found at pp. 49-51, as prescribed by the late Dr. Abercrombie and myself ; from the former I will here also add, in his own pithy and eloquent language, what he so justly observes relative to human nature :—

"Constituted as we are, indeed, and placed in certain relations to objects of sense and to other sentient beings, we are, in some degree, under the influence of external things ; but the powers which wield the destiny of our happiness are chiefly within. It is there that we trace the elements of those noble faculties, which, if duly cultivated, secure at once our usefulness and our happiness ; and it is there that we find the germs of those vulture passions, whose dominion is worse than eastern bondage, and under whose relentless tyranny, a man who is master of the world may be himself a slave. In the conquest of these consists the highest dignity of our nature, and in the control and subjugation of them is our only solid peace."

Dr. Zimmerman, in his exquisite work on Solitude, says (p. 95) :—

"The highest happiness which is capable of being enjoyed in this world, consists in *peace of mind*.

"The wise mortal who renounces the tumults of the world, restrains his desires and inclinations, resigns himself to the dis-

pensations of his Creator, and looks with an eye of pity on the frailties of his fellow-creatures; whose greatest pleasure is to listen among the rocks to the soft murmurs of a cascade; to inhale as he walks along the plains, the refreshing breezes of the zephyrs, and to dwell in the surrounding woods on the melodious accents of the ærial choristers, may, by the simple feelings of his heart, obtain this invaluable blessing."

Thus then the road to enjoyment, if not happiness, is simply and beautifully indicated by one who knew the world well.

Peace of Mind is indeed a "coy maid" to most of us. Poor Cowper had found her so; and, perhaps, under the infliction of disappointed hopes, he penned the following interesting and touching verses:—

"ODE TO PEACE.

"Come, peace of mind, delightful guest!
Return, and make thy downy nest
Once more in this sad heart:
Nor riches I, nor pow'r pursue,
Nor hold forbidden joys in view;
We therefore need not part.

"Where wilt thou dwell, if not with me,
From av'rice and ambition free,
And pleasure's fatal wiles?
For whom, alas! dost thou prepare
The sweets that I was wont to share—
The banquet of thy smiles?

"The great, the gay, shall they partake
The heaven, that thou alone canst make?
And wilt thou quit the stream
That murmurs through the dewy mead,
The grove, and the sequester'd shed,
To be a guest with them?

"For thee I panted, thee I priz'd,
For thee I gladly sacrificed
Whate'er I lov'd before;
And shall I see thee start away,
And helpless, hopeless, hear thee say—
Farewell! we meet no more?"

Cheyne truly observed that "the world with all its pretensions is empty"—*Tinnit inane est!*

It is, of course, wisely ordained that contentment should not be found in our present probationary state—the fullness of joy and of beatitude belong to "another and a better world, where the wicked cease from troubling and the weary are at rest." Hence, must we not all exclaim in the truthful verse of Moore, that we are—

" Poor wanderers on a stormy day,
From wave to wave we're driven ;
And Fancy's flash, and Reason's ray
Serve but to light the troubled way ;
There's nothing calm but Heaven."

May I not add from Cowper:—

" But oars alone can ne'er prevail
To reach the distant coast ;
The breath of Heaven must swell the sail,
Or all the toil is lost."

A WORD IN CONCLUSION.

A MAN destined for a profession and an individual determined to write an essay should be guided by the same principle, both in the choice of the calling and the selection of the subject; that principle ought to be preference, inclination, or the adoption of one and the other, *con amore*. Thus the labours of each will be the more successful, and they will be virtually their enjoyments, obviously, because they are occupied in doing what they like best.*

It is plain, that two personal pleasures are by this plan secured to the luxuriating author; but as

"True self-love and social are the same,"

his subject should be profitable for society, as well as useful and gratifying to himself.† Happily this, in the present instance, is indeed the case; for the consideration of the "Wear and Tear of Human Life" must be esteemed, both in a social and personal point of view, as a matter of paramount importance; and though, while the pool of the passions is troubled, I neither profit myself nor society much by its virtues, I may at least claim the credit belonging to "the man who working beyond the surface of things, though he may be wrong himself, yet he clears the

* Vide p. 64.

† "Philosophy is no more than the art of making ourselves happy; that is, of seeking pleasure in regularity, and in reconciling what we owe to society with what is due to ourselves."—GOLDSMITH.

way for others, and may chance to make even his errors subservient to the cause of truth."

I would also add, that I have been a pretty close observer of men and manners, in all grades of society, for many years; my thoughts on the preceding interesting subject have been chiefly drawn from that source; but I wish it to be here clearly understood, that, should I prove so unfortunate as to have sketched what may be esteemed striking likenesses of some; and have made close fitting caps for others; while I am, in my simplicity, but describing classes and not individuals; I should hope, neither my fair fame as an author, nor my innocent essay, will be prejudiced in public estimation, by unfounded accusations of personal malice and uncharitableness!

I have throughout uniformly endeavoured to support the cause of virtue—commend that purity and freshness of feeling which spring instinctively and directly from the heart; while I have reprobated vice and condemned the fatuity or delusion that would sanction or dictate the compromise of liberty and independence, or the sacrifice of feeling and honour upon a golden shrine.

I know I have attempted much; but I am not so Utopian as to conceive that I can cleanse, like another Hercules, the human heart of all its vile dross and vain follies! To have "shewn up" some of them in their true colours; again, to have contrasted these with thoughts, feelings, and sentiments of an opposite kind, will, it is hoped, prove a work of some practical use; and, still further exemplify the truth, that

"Virtue alone is happiness below."*

* "Religion *only* is the prime foundation of *true* virtue; and that religion has been again defined as, virtue founded upon reverence of God and expectation of future rewards and punishments."

I will now conclude—comparing small things with great—in the language of that sturdy moralist, S. Johnson—
“For negligence and deficiency, I have, perhaps, not need of more apology than the nature of the work will furnish: I have left that inaccurate which never was made exact, and that imperfect which never was completed.”

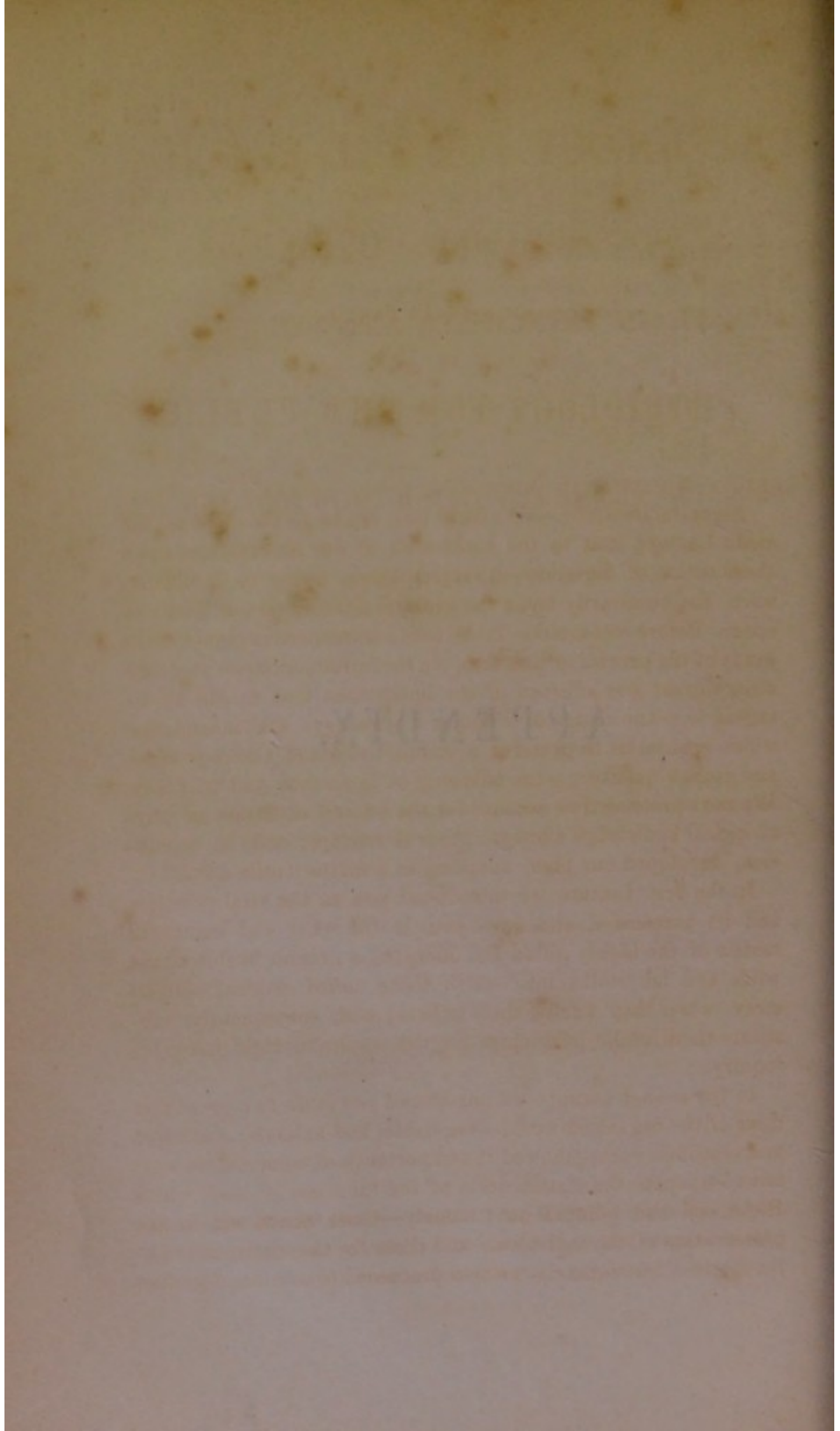
THE CITY OF BOSTON
FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
BY SAMUEL JOHNSON
VOLUME I
BOSTON: PUBLISHED BY S. JOHNSON, 1785.

ALPHABETICAL INDEX

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

THE HISTORY OF THE CITY OF BOSTON
FROM THE FIRST SETTLEMENT
TO THE PRESENT TIME
BY SAMUEL JOHNSON
VOLUME I
BOSTON: PUBLISHED BY S. JOHNSON, 1785.

APPENDIX.



DIGESTION, DIET, AND REGIMEN
COMPLETED IN PART I.
OF
PHYSIOLOGY FOR THE PUBLIC.

Recapitulation, &c.—We have now drawn to the close of the tenth Lecture, and to the conclusion of our observations upon the function of digestion—a subject which, owing to its importance, has necessarily made the greatest demand on our time and space. Before we conclude, I shall take a retrospective glance at the heads of the preceding Lectures. In the introduction, we presume, strong proof was afforded of the importance that should be attached to a knowledge of Popular Physiology: that information which enables us to preserve a sound body and vigorous mind, and eschew quackery—the offspring of ignorance and credulity. We next proceeded to account for the limited extension of physiological knowledge amongst general readers; and, in conclusion, developed our plan, adopting as a motto “*utile dulci*.”

In the first Lecture we introduced you to the vital principle and its properties, and gave you, in the witty and humorous review of the highly gifted Dr. Johnson, a graphic sketch of the wilds and labyrinths into which those *called* rational animals stray, when they stretch their tethers; and, consequently, substitute their insane imaginings for the results of rigid inductive inquiry.

In the second Lecture we introduced you to the two great sections of the organised world—vegetables and animals; compared and classified each—showed the importance of comparative anatomy—adopted the classification of the functions of man, which Richerand had pointed out; namely—those concerned in the preservation of the individual, and those for the continuation of the species: consequently, we next proceeded to consider digestion

—the first process in the series of functions destined to effect the end—nutrition. We concluded with the consideration of hunger, thirst, and Irish Cavenagh.

In Lecture three, we presented you with a brief account of cases of abstinence, voraciousness, and knife swallowing—an outline of the anatomy of the digestive organs—human and comparative; their functions—the qualities of gastric juice—important conclusions drawn by Magendie and Prout respecting alimentary substances—and finally, the consideration of the proximate principles and ultimate elements of all kinds of food.

In Lecture four, we presented you with a condensed view of the relative digestibility of the different kinds of aliment according to the results of Beaumont's experiments on St. Martin, whose case afforded the most valuable opportunity on record, of inspecting the functions of the human stomach. Secondly, condiments and ardent spirits were considered; the baleful effects of the latter—physical and moral—were subsequently developed, and allusion made to the regenerating effects produced by the labours of that apostle of benevolence and teetotalism, the great and good Father Mathew.

In the fifth Lecture, chyfication—the second stage of digestion—was considered, and the important agency of the liver in this process was fully explained; as well as the influence which bile is known to exercise on the functions of the remaining portion of the digestive tube. The reciprocal influence of body and mind was then explained—the plan of spending the day was next detailed. Finally, breakfast, and the fluid aliments usually taken at that repast, were considered; namely—tea, coffee, chocolate, cocoa, milk, whey, barley-water, gruel, &c.

In the sixth Lecture, the solid material of breakfast was discussed—moral therapeutics, or the influence of mind over the different organs was considered with relation to each, taken separately.

In the seventh Lecture this subject was concluded. Observations were next made respecting butter, honey, fish, and meat. Having concluded the subject of breakfast, we sought to consider how the individual we had selected ought to dispose of his time between breakfast and dinner—this became the more necessary as we had previously proved that the function of digestion was,

at all times, materially influenced by the nature of man's avocations.

We selected the medical man as *dramatis persona*, to exemplify the inevitable wear and tear of human life, belonging to all its departments—perhaps more especially to his; but we conceive that those practical hints, which we have there afforded, may be readily referred to each one of the public in his individual character: *Mutato nomine de te fabula narratur*; or, as Nathan said to David, “*Thou art the man.*”

In the eighth Lecture we continued the sketch, selecting the late Cheyne as an illustration of the wear and tear consequent upon unceasing toil, mental labour, and corroding anxiety, while in the pursuit of fame and wealth. The characters of the English, Scotch, and Irish are contrasted.

In the ninth Lecture we cited the examples of Dupuytren and Richerand abroad, to show that there, as well as at home, the power of mastering the mind was not possessed by the most distinguished sons of science, and that human nature is immutable, in every age, in every clime; alike the victim of ambition, envy, and uncontrolled mind. We next alluded to the admirable work of Abercrombie on mental culture; and the true panacea proposed by him, which we quoted at length in his own forcible and eloquent language.

Having dismissed the subject of every-day business, we finally came to concentrate our observations upon the concerns of the valetudinarian; which, in the present as well as the last Lecture, have occupied our attention under the following heads:—exercise and air; enjoyments; articles of food; period of meals; sleep; modifications; contingencies, &c. The observations made on each of the foregoing are all so fresh in your recollection as not to need any further remark at present, except this general one, that each of these departments requires to receive its due share of consideration, for if otherwise, that complete equipoise of the respective functions cannot be expected which is essential to the enjoyment of the *mens sana in corpore sano*.

A WORD IN CONCLUSION RESPECTING THE FIRST PART.

"Once upon a time—and a very good time it was—days of my youth when every sport could please"—a student of Alma Mater, Trinity College, Dublin, whose propensities turned more upon thrashing the Charleys (*olim* watch) than upon the cultivation of the Muses, replied thus to the inquiry of his friend; "My examiners and I are not on speaking terms, consequently, I will be 'cautioned.'"

Now we have always ardently admired the following aphorism, which is here quaintly rendered into English by old Lily :

"Felix quem faciunt aliena pericula cautem :

Happy is he whom other men's harms do make to beware."

Accordingly, we started with the conviction, that to keep on "speaking terms"—*i. e. intelligible* terms—with the public, we should eschew the jargon of the schools—in other words—descend from the dignity and gravity which proverbially belong to our profession ;* and communicate what we had to say in plain Queen's English ; in a familiar and light style, what, perhaps, some of our friends may esteem too light.

We have also ever evinced a becoming horror of a "*caution*," more especially of that given by the public, when they consign—as it deserves—a dull, difficult-to-be-understood, *unreadable* book, "to the grave of all the Capulets."

A common error a professional man falls into—which we have endeavoured to avoid—is the conception that his hearer is, by a sort of intuitive knowledge, familiar with the terms and technicalities of his calling. If the unfortunate listener be engaged in a Chancery suit, "the limb of the law," in "*de lunatico inquirendo*," bewilders him with this, in the "*matter*," that, in "the *cause* ;" the ill-fated client being all the while perfectly innocent of what constitutes the difference between one and the other.

So much for the manner—the "fashion" of our Lectures ; now for the matter—*not de lunatico*. We have shown in the course of the preceding discourses what Beaumont had proved, "that

* Vires gravi doctique :—Sadly learned men.

bulk as well as *nutriment* is *necessary* to the articles of diet ;” and again, “that the digestibility of aliment does not depend upon the quantity of nutrient principles it contains.” Acting in conformity with the first principle, we never think of feeding either man or horse upon all meat (flesh) or all oats : and in compliance with the second rule, we would not disorder a man’s digestion by giving him* *all* fat, instead of both fat and lean ; although, the former is found to be four times as nutritive as the latter. “Feed me with food convenient for me” is alike applicable to mental and to physical supply—mischief invariably results from a too-concentrated diet.

“The prudent taste
Rejects like bane, such loathsome lusciousness.”

Well, then, the public are, at best, but babes in relation to physiological knowledge ; and should, consequently, be supplied with light and agreeable food—“*utile dulci*.”

Although “there’s nothing new under the sun,” I do lay claim to something of originality, not so much perhaps in the arrangement of the materials, as in giving expression—unreserved expression—to reflections somewhat novel, that arose out of the foregoing process. It is not for me to deplore, with nauseating mock modesty, my sins of omission and commission. Each successive wrapper of the six numbers, has exhibited a mantle of kindness thrown over my labours and errors—such as they are—by an indulgent Press. I am also proud to add, that I have not had any lack of support from a “*discriminating* public,” as well as my highly valued and esteemed friends, to all of whom I now most respectfully and gratefully tender my best acknowledgments ; and, as in duty bound, will soon have the honour of presenting them with the Second Part.

* Printers are exceptions ! They relish “*all fat* ?” and ’tis remarkable that it *never* disagrees with them !!

PHYSIOLOGY FOR THE PUBLIC.

OPINIONS OF THE PRESS.

"We have received the first Number of a new and interesting medical work, entitled 'Physiology for the Public,' and containing the two first Lectures of a series delivered by Dr. Hayden, in the Original School of Medicine, Peter-street. The annexed extracts, from the introduction, will explain sufficiently the objects of the learned lecturer:—

"The value of an acquaintance with the principles of Physiology, in reference to every-day concerns, may be still further indicated by referring to familiar circumstances. How many cases of disease, nay, even of death, have occurred, owing to tight lacing? Now, had it been shown to parents and children that such practices were positively injurious, before the continuance of the custom had fastened it upon them as a habit, we should not have had our young ladies cheated of their fair and natural proportions, nor robbed of that grace and beauty which is the birthright of their unimprisoned figures. It should, at the outset, have been clearly proved—which we shall do in the proper place—that elasticity is so much and constantly employed in the animal economy, but more especially in the vital functions of respiration and circulation. This being done, the necessity for the perfect freedom of the person would be a self-evident truth. Occasions will necessarily arise in which, in the absence of a practitioner, ordinary persons will be called on to attempt some remedy for urgent symptoms of disease. Nothing but a knowledge of the principles of popular physiology can possibly save them, in such cases, from the charge and reproach of mere quackery, or impart to a parent or clergyman that decision and confidence so requisite on sudden emergencies.

"When in the enjoyment of health, we are prone to undervalue and neglect the prevention of disease. It is the suspension of this first of earthly blessings that induces us to look back, and reflect with regret upon our reckless inattention to so important a subject.

"Again, we would at the outset deprecate the criticism of the learned, by stating, that we write not for them, but for the information of the tyro and non-professional. We also have eschewed any claim to the dignity and gravity which proverbially belong to our profession, by adopting a familiar and, what some of our friends may call, too light a style. Indeed it is the fault of our temperament: for we have always clung with fond fidelity to the *utile dulci*, and love to learn and laugh to the end of the chapter."—*Evening Packet*.

"Of all the branches of medical science, physiology is least indebted to the book-makers. They have, with few exceptions, by their ignorance, stupidity, and credulity, rendered a subject eminently interesting, dull and unattractive. They are all nought, from sky-rocket Majendie to egotistical Muller. We repeat it, Dr. Hayden can succeed by simplicity only. Let him eschew the gibberish of the schools, and keep clear of classification manufacturers, and zoological hair-splitters. A man can be told how food is digested, or his blood circulated, in as plain language as he can be informed of the best way to plant cabbages or dig potatoes."—*Medical Press*.

"Publications of this description, combining the essentials to recommend them in every particular, are seldom to be found, but when met with, should be duly

appreciated. Mr. Hayden has displayed considerable talent in the subject-matter of this valuable production; and although he has given the most important physiological information, much more than we have seen condensed in one book before, he has made his ideas so intelligible, that the most unintellectual can fully comprehend them."—*Warder*.

"The second Number of Dr. Hayden's 'Lectures on Popular Physiology' is rife with valuable and interesting matter, which must prove infinitely beneficial if widely circulated. One peculiar feature which this work possesses, and which is calculated to make its usefulness general, is the simplicity of the details and examples afforded. In most medical books, the technical terms are so numerous, that the non-professional readers are often unable to ascertain the author's meaning. In Dr. Hayden's admirable Lectures, every thing is clearly and agreeably narrated, and the plain, lucid, and unaffected style of the learned lecturer renders his labours really useful to all classes of the community. We cordially recommend his Lectures to the public."—*Evening Packet*.

"He handles his subject in a familiar manner, making it comprehensible to all; it is divested of those technicalities with which such writings are usually encumbered, while it enters deeply enough into the science to make the reader feel that he has not lost his time in the perusal, but that he has added to his fund of knowledge such matter as will often, in his leisure moments, afford him subjects of interesting speculation."—*Leicester Herald*.

"We have just received the second Number of Mr. Hayden's interesting work upon this subject. As we promised to investigate each Part as it proceeds monthly from the Press, we will, on the present occasion, redeem that promise. The author states, *in limine*, that this work is not written with the view to make every man his own doctor; and he observes:—'It was truly said, that even "the physician who prescribes for himself has a fool for his patient." It is, therefore, with reference to the *prevention*, not the remedy of disease, that popular physiology should be perused by the public.'

"Indeed, we must admit that hitherto writers upon the subject of popular physiology have not been successful in diffusing knowledge in this department amongst general readers. Our author assigns the following as the causes of their want of success:—

"Firstly—It is to be regretted that hitherto even popular works on physiology have been much encumbered with anatomical details, which have rendered them a study instead of a species of relaxation. The public will never be made either comparative or human anatomists; they will prize and admire the gold and gems that you shall have raised for their use and gratification; but you cannot persuade them to become miners, although you should hold out the pleasing prospect of the possession of such treasures as the reward of their own labour.

"Anatomy, then,

"Does but encumber what it means to enrich;"

and hence popular physiology, thus burdened, is often considered by the general reader as dull and difficult to be understood.

"The object, we presume, should be to present the public with the results of professional labours and researches, without inflicting upon them, what proves not unfrequently dry and difficult to be remembered—anatomical descriptions. We all wish to see the panorama; but few of us would care to study the details of the machinery by which motion is given to the pleasing prospect.

"Secondly—We are of opinion that it is sufficient to state in such works those plain facts only which are generally received by physiologists, avoiding as much as possible unexplained technical terms, and the consideration of subjects either involved in obscurity, or still the objects of doubt or of discussion.'

"We would recommend such of our readers as love a hearty laugh, to read the humorous account given by the facetious doctor of the 'Vagaries,' as he

calls them, of authors that have written upon the discovery of the vital principle."—*Warder*.

"If we can judge of the forthcoming work by the Numbers now before us, we should say it will prove a useful addition to our popular literature. In asserting a physiological doctrine, Dr. Hayden invariably illustrates it by some anecdote at once amusing and instructive, thus conveying information in the most pleasing form, and that most calculated to leave an impression on the reader. It is hardly necessary to add, that we strongly recommend the perusal of 'Physiology for the Public' to such of our readers as are not content to remain behind their age in the knowledge of those physical sciences which are calculated to fit them for that better and more rational enjoyment, which an acquaintance with the laws that regulate our functional existence would point out."—*Freeman's Journal*.

"This is the first of a series of publications, to be issued monthly, on Popular Physiology, 'comprising plain principles and rules for the preservation of the functions of both body and mind in a state of health.' The work will not extend beyond twelve Parts. The subject is one which concerns every human being; yet there is scarcely any which is so little known to the great mass of mankind, so little has been done by competent writers to treat it in a really popular manner. The members of the Faculty appear to have been anxious to keep their craft a mystery, or else they have imparted the knowledge they possess in such a form, as that none but the initiated—those who intended to adopt it as a profession—could derive any material benefit from their instructions. Through the medium of the Press, indeed, several valuable suggestions on this, as well as every other subject, have in modern times found their way to the public, and these have not been without their good effect; but the information thus communicated has consisted only of a few general rules for the preservation of the corporeal and mental faculties in a healthy state. There has been no attempt that we are aware of to treat the subject fully and systematically, or to free it from those technicalities which make it a sealed book to the vast majority of readers. The work of Surgeon Hayden seems likely to go far towards filling up this desideratum, and to prove what its author designs it to be, 'a truly popular treatise upon the physiology of man.' The style is of that simple and familiar kind which at once wins the attention and adapts itself to the capacity of every reader. Let it not be supposed that we wish every man to become his own doctor. Far from it. We agree with the writer of this treatise in thinking that physiology should be studied by the public more with a view to the *prevention* than the *cure* of disease. The complicated mechanism of the human frame, and the intimate, yet subtle relation that subsists between mind and body, require the highest skill to rectify any derangement of the system; and here the aid of the professional man is necessary. But there are many of 'the thousand ills' that we now fall into, which might be avoided by an acquaintance with the principles of the science. One of the most prominent illustrations of the value of this knowledge is referred to by Dr. Hayden in the 'Introduction.'"—*Londonderry Sentinel*.

"It is an aphorism which cannot be too often repeated, that the surest enemy to quackery is he who, by opening the flood-gates of knowledge, diffuses that stream of information which, irrigating the dry and barren soil of popular mind, imparts to it that susceptibility to cultivation and productiveness which, by its inward workings, shall make its latent seed to spring up, and bear so rich a harvest as shall scare from its presence the intestine craving after wonders and miracles."—*Old England*.

"When a man can, by the evidence of his own senses, ascertain that he possesses a piece of intricate machinery, he is ever anxious to preserve it in perfect repair, and should any derangement occur in its working, he not only does not venture to meddle with it himself, but he is very cautious in his selection of an artificer to whose hands he may intrust it. If it be a chronometer, he is enabled, on mere

inspection, to understand that it is made up of many wheels and other parts which are admirably adapted to fulfil the offices for which they were designed; another may explain to him the purposes with which all the parts were co-adapted, and the manner in which they act; but such information does not tempt him to meddle in the repair, but only serves to stimulate his caution in his choice of an artisan whom he may consider as qualified, by his knowledge in such matters, most able to remedy the defect. He does not, therefore, take his chronometer to a blacksmith to be mended, or even to an individual who, although accustomed to manufacture machinery of the greatest delicacy, is not in the habit of constructing this particular kind. He would go to a chronometer maker, and if we could suppose that such a person could not be found, he would have recourse to whomever he supposes to pull the greatest number of chronometers to pieces; because, he would argue, this man cannot have failed to observe the relation of the different parts, and must consequently be aware of the conditions necessary to their due performance, and therefore know how to remedy this accident. If, then, so much wariness should be exercised in the disorders of a piece of simple clock-work, how much ought to be practised in the numberless derangements to which that complex machine, the animal frame, is subject? The author of the work now before us will, in a popular manner, convey that degree of knowledge which shall fit society to become judges of their own case."—*Conservative Journal*.

"We are glad to see that the *vexata questio* of a 'Vital Principle' has been altogether avoided in these Lectures; it is one on which much has been said, and which appears only to become the more entangled by discussion. Our author thus treats this question:—'As life,' says he, 'can be known through its manifestations only, we shall next proceed to consider generally the vital properties, which are as follow:—1, the power life confers of resting the laws which influence organic bodies; 2, organization; 3, assimilation; 4, reproduction; 5, death. We shall take each seriatim, and briefly enumerate some facts illustrative of these important vital properties.' He does not follow implicitly the system laid down by any physiologist in particular, but culls his materials from those different sources which may each, in their branch, give the matter under consideration in the most perspicuous manner, classifying the subject upon the system of Richerand. We make no doubt, from this specimen, that when completed, the whole will form a mass of entertaining and valuable information."—*Dover Telegraph*.

"We have perused with much interest this pleasing monthly periodical, the third Number of which is now before us. The following extracts will prove how amusing and instructive popular lectures on physiology may be rendered, by adopting the plain admirable plan that the lucid lecturer pursues:—

"'Providence has closely linked industry and happiness, and ordained them to be Siamese sisters. "The gods," says the poet, "have placed labour and toil in the way leading to the Elysian fields." Whether we labour with our hands, or with our heads, or with both together, or now one, and again the other, we would have you undertake your work, more especially the mental portion of it, with energy—ay, with enthusiasm—the soul-awakening spirit that fires the youth, implants the "will invincible"—bids the march of mind never halt, and cheers on industry and genius in their glorious struggle up the rough and rugged steep that leads to knowledge and to virtue's temple. But you must ever bear in mind the principle so well established in the animal economy, that power and action should be always commensurate. We must not be deluded by the fascinating pleasures connected with mental enjoyment, nor banish "nature's soft nurse, balmy sleep;" although we can truly say that these seductive occupations are professional or literary pleasures—pleasures which will never pall—that bring with them the delightful conviction that we are laying up a store for hereafter, upon which fond memory may dwell and ruminate in pleasing and unalloyed contemplation. You must steer between Scylla and Charybdis—idleness and labour. The preservation of health, and we may add, of sound digestion, will be best effected by order, re-

gularity, and temperance. Every thing should have its own time and its own place, and be performed and found accordingly. This is a most admirable practical rule, by the observance of which you will be taught the habit of punctuality as a duty; and you will be preserved from that besetting sin—procrastination, which causes so many persons to cheat themselves of natural repose, in order to make amends for misspent time; not unfrequently at the sacrifice of personal comfort—nay, often at the risk of health itself.

"Our space permits us to make but another short extract. When speaking of the exhilarating influence of green tea, &c., in such requisition at large parties, the Doctor adds:—

"The secret, the very essence of enjoyment is, that we harmonize—co-operate with the occasion, or in the midst of mirth the sullen spirit of melancholy will hover round us. The song, the music, and the dance—nay, even the "ruby wine," but too often deepen the melancholy which the individual in low spirits can neither shake off nor subdue. In short, the excitement produced by green tea, aromatic coffee, nectareous wine, soul-soothing music, and all the endless mirth that the most splendid rout can afford, will fail to cheer or shed a ray of enjoyment, when care lies cankering at the heart's core; for who then, or what then, "can minister to a mind diseased," or to him who fancies that he can fly from melancholy, and find in the midnight revel a sanctuary from sorrow, which but too painfully proves the very mockery of his woe?"—*Warder*.

"The second Number of Dr. Hayden's 'Lectures on Popular Physiology' is rife with valuable and interesting matter, which must prove infinitely beneficial if widely circulated. One peculiar feature which this work possesses, and which is calculated to make its usefulness general, is the simplicity of the details and examples afforded. In most medical books the technical terms are so numerous that the non-professional readers are often unable to ascertain the author's meaning. In Dr. HAYDEN'S admirable Lectures, every thing is clearly and agreeably narrated, and the plain, lucid, and unaffected style of the learned lecturer renders his labours really useful to all classes of the community. We cordially recommend his Lectures to the public."—*Evening Packet*.

"To the able lecturer and author we wish every encouragement, and hope he will be well rewarded for the pains he has taken to enlighten the public mind in a species of knowledge in which every individual is personally, we might say vitally, concerned, &c."—*London Medico-Chirurgical Review*.

"The third Number of this interesting and eminently useful work is fully equal in manner and matter to its predecessors, and as they have won the approval of the Press generally, we need add little more to recommend the publication to our readers. Heads of families and conductors of public schools, where there are numerous boarders and no resident physicians, could not possess a better guide for the preservation of the health of those entrusted to their charge; and we are pleased to find that a rapidly extending circulation is affording the best proof of the correctness of our former criticisms."—*Evening Packet*.

"PHYSIOLOGY FOR THE PUBLIC, No 4.—The Number before us is highly amusing and instructive. It enters fully into the consideration of moral influences on the bodily functions, and will well repay perusal."—*Warder*.

"The knowledge of this fact should insure it a very wide circulation among the reading public of all tastes and classes, who will find it as interesting as a fairy tale; for Dr. Hayden appears to possess, in a pre-eminent degree, the same faculty as our countryman, Goldsmith—namely, giving to a dry subject the interest of romance."—*Londonderry Sentinel*.

"The design of this work is to give information on the principles of human nature with reference to the preservation of health, and to do so in language intelligible to the people—a design which claims the approbation of every well-

wisher of mankind. That such general ignorance should prevail on a subject so vital as physiology, has been among the worst defects of modern education. To remedy this defect is the object of Dr. Hayden. We shall watch the progress of the work with interest, and wish it all the success it deserves."—*Morning Press*.

"On the first appearance of this highly entertaining work, we entered at some length, both on an examination of the utility of treating such subjects in so familiar a style as to render them intelligible to general readers, and upon the manner in which the present author entered on his task. We then ventured to foretell that the performance would be found to answer the expectations and cravings of the unprofessional part of the community, who might be anxious to satisfy either their curiosity or thirst for knowledge. We have, since then, purposely abstained from further notice of the work, in order to give time for the verification of our prediction; and we are now in a condition to give it our fullest recommendation. The matter is given in a plain and perspicuous manner; and there is so total an absence of affectation and avoidance of technical terms, as cannot fail to render it acceptable to all; while by the medical practitioner it will be hailed as a boon, as being a work to which he can refer to refreshen his memory, and which he can with pleasure see in the hands of his patients, as tending to confirm their confidence in him, by rendering them aware of the amount of knowledge he must possess, and to put them on their guard against quackery."—*Conservative Journal*.

"One of the great characteristics of the present day is the devotion of literary men to rendering science comprehensible to the meanest capacities, by giving them popular views of subjects which have hitherto been so shrouded in technicalities as to be sealed books to all but the initiated. This prevailing feature of the literature of the day has done almost as much towards the enlightenment of the public as was effected by the invention of printing. The object of Mr. Hayden in this series of Lectures, which are publishing periodically, is to present the general reader with a TRULY POPULAR treatise on the physiology of man, in reference both to his mental and his corporeal functions, and to lay down plain principles and rules for the preservation of both—in short, to tell us how man lives, moves, and has his being. Nothing can be more interesting to mankind in general than such a subject as this; and when we find it treated in a simple and perspicuous manner, totally divested of the technicalities of anatomy, and of the abstruseness of science, we feel convinced that Mr. Hayden is publishing a work which will be as extensively useful as it ought to be extensively read. He very properly decries the publications which induce ailing persons to become their own physicians, and many of which produce diseases by the hypochondriacism which they engender; but he suggests that though, according to the poet, 'a little learning is a dangerous thing,' yet ignorance is still more so. Interesting as the study of physiology certainly is, it has hitherto been extremely limited, principally from the anatomical details which have but 'encumbered what it means to enrich.' These details have rendered this science difficult of comprehension. To remedy this evil, to simplify this study, and to lay before the reader a panoramic view of the machinery by which the human frame is moved, has been the object of the author; and as far as he has proceeded, he has been highly successful, and this work bids fair to form a popular cyclopædia of the physiological construction of man."—*Era*.

"All science is now popularized. Every road to it is macadamized. Technicalities, which once perplexed the inquirer, no longer mask the face of truth. Nay, by a sort of intellectual railway, we find ourselves in the very heart of knowledge, before we have hardly started in its pursuit. In evidence of this fact, we may cite the present work, published in monthly sections, which, notwithstanding there are many other publications on popular physiology, is peculiarly deserving attention. It is written with much simplicity and precision, and—a desideratum always acceptable—rendered so popular as to be comprehensible to every class of readers."—*British Queen*.

"This is the first Part of a very valuable publication, namely, 'Physiology for the Public;' 'comprising' as it does 'plain principles and rules for the preservation of the functions of both body and mind in a state of health.' Those principles were developed in a series of Lectures, the lecturer being Mr. G. T. Hayden, A.B., M.B. of Trinity College, Dublin, &c. This first Part contains the contents of ten Lectures; and they are so varied and instructive—so affecting all the interests of life—and so contributory, if read with requisite attention, to the means of maintaining health—that we regret the pressure of urgent intelligence prevents our selecting some extracts. The minuteness of the details, and the able arrangement of them, cannot fail to secure for the publication the perusal of the general reader. Independently of its scientific merits, it is a most readable work; and Mr. Hayden's pupils, who requested the publication, have rendered good service to society thereby, while so successfully doing justice to their own feelings."—*London Morning Advertiser*, February 16, 1844.

"*Physiology for the Public.*—We feel that we perform a meritorious service for the public, in calling their attention to the above-named work. We are not, of course, in a position to recommend it to our readers with any thing like professional authority on our parts; but the high position of the author, Dr. Hayden, both as an eminent member of one of the most distinguished surgical colleges in the world—that of Dublin—and as a well-known and much esteemed lecturer in one of the most distinguished schools under that college, will, we doubt not, be deemed an ample sanction of the orthodoxy of the work in a medical point of view. The utility of the subject, we take it for granted, is sufficiently palpable to all. Physiology is a study which, even in its scientific and technical form, is vested with the liveliest interest and the highest importance. Divested of its more abstruse and technical character, and brought within the scope of the unprofessional reader, the sphere of its interest is extended, while its importance is undiminished. It is a subject with which no one should be unacquainted; and Dr. Hayden's efforts have been, perhaps, more successful than those of any other writer in bringing it in a manner at once useful and pleasing within the reach of the public at large.

"In his introductory chapter, Dr. Hayden thus explains the object and order of his work:—'The object, we presume, should be to present the public with the results of professional labours and researches, without inflicting upon them what proves, not unfrequently, dry and difficult-to-be-remembered anatomical descriptions. We all wish to see the panorama, but few of us would care to see the details of the machinery by which motion is given to the pleasing prospect. Secondly, we are of opinion that it is sufficient to state, in such a work, those plain facts only which are generally received by physiologists, avoiding, as much as possible, unexplained technical terms, and the consideration of subjects either involved in obscurity, or still the objects of doubt or of discussion.'

"The importance and practical utility of the work can best be shown by extracts from its own pages."—*Tablet*.



MISSING
0148-151

24ColorCard Camera Tray.com

