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AN
ARGUMENT ON BEHALF
OF THE
PRIMITIVE DIET OF MAN.

BY
DR. FREDERIC R. LEES.

The Essay to which the Vegetarian Society awarded its First Prize.

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LONDON :

1857

A P L E A
FOR THE
PRIMITIVE DIET OF MANKIND.

NOR THINK IN NATURE'S STATE THEY BLINDLY TROD;
THE STATE OF NATURE WAS THE REIGN OF GOD.

POPE.

§ 1. INTRODUCTION.

WITHIN the compass of a score of pages, we cannot pretend to offer an elaborate and exhaustive argument on behalf of vegetal diet. We present simply a few of the leading Facts and Principles involved in this discussion, the importance and character of which may fairly be presumed to determine the solidity of many minor and subsidiary considerations.

The writer is not a member of the Society whose leading principles he here endeavors to sustain by reasons which are perfectly satisfactory to himself; and the fact is stated for the purpose of showing the Reader that no partizan prejudice, nor *esprit du corps*, either stimulates his pen or distorts his perceptions. He writes from the simple love of Truth, and with a sincere desire to contribute something useful towards the settlement of a problem of great practical moment and theoretic interest.

To avoid mistake, as regards the scope of his proposition, Vegetarianism is here advocated on the ground of the *highest-good*, not on the basis that a Flesh-diet is bad. We acknowledge the distinction made in the Laws of Menú, that while abstinence from flesh is '*becoming*,' that from intoxicants is '*necessary*.' The former is a lesser-good or partial evil, the latter are simply and essentially poisonous. It is assumed as a matter of course, that the wisest-men will desiderate the best practices, and not be content with the *passable*. What we can barely *do* with, is one thing; what is *perfectly-adapted* to the perfect condition to be aimed at, is another. Our adaptability to get on with second-best circumstances, in nowise alters the truth of *absolute* '*adaptation*'; and certainly will not intercept the higher blessings which flow to us thro' the channel of the higher law.

I. *The Authority of Nature.*

§ 2. That the aboriginal diet of mankind was fruit, and that amongst persons and tribes of any degree of sensibility and refinement, *butchering* has been regarded as offensive, disgusting, and barbarous, are facts that indicate beyond controversy, on which side pure Nature and our moral Instincts range themselves in this discussion. * In the early ages, ere the Art of Cookery was invented, unless Man was a savage and an eater of raw-flesh, he was *necessarily* a fruit-eater. But if Man was *not* a savage, then assuredly was he a being created with high physical perfections, fresh from the plastic hand of the Divine power, placed in a prepared garden, and endued with the purest *selective dietetic* Instincts. True, man is a 'progressive' being, in some wise senses of that phrase. Progress, indeed, may be evidenced by ascertaining the laws of Nature and using the power they confer for the increase of our own—but progress cannot consist in *VIOLATING* the instinctive principles, or despising the original adaptations, of our organic being. † So employed, the word either expresses a fallacy, because involving the conception of a *re-gressive* state; or it is an unmeaning term, used as an unconscious evasion of the argument. Instinct, then, with our pure Parents in Eden, did not simply evince that THEY '*knew* no better' than to be content with the viands of Paradise, as a celebrated physiologist has somewhat loosely affirmed; ‡ it shows, in our judgment, that GOD who appointed it, and knew what things were best fitting his creature's need, also *KNEW* that it *was* absolutely best. Genuine Instinct is a far more certain criterion of Natural-want than Reason, and is in fact of the highest authority as the *direct* witness of hidden but Divine Laws behind it. All the discoveries of modern science serve to illustrate and confirm the veracity of this instinct, as we shall show by-and-bye, but the truth of it did not wait upon discovery; it was attested by the earliest revelation made to man, whereof the substance has been preserved to us in these sacred and remarkable words:—

"And GOD said, *Behold, I have given you every herb bearing seed,*

* WILLIAMS relates, that after some years of Vegetarianism, the missionaries were *disgusted* with the sight and smell of beef, and one poor woman lamented the absence of the relish for English beef as a proof of barbarism! See admissions of *Westminster Review* and *Medico-Chirurgical Review*.

† "Reason and Instinct are but different modes of attaining the same end; nor can the former be more wisely employed than in rendering our habits conformable to the dictates of the latter."—Dr LAMBE.

‡ Professor CARPENTER, M.D.

which is upon the face of all the earth, and every tree in which is the fruit of a tree yielding seed, to you it shall be for food." (Gen. i. 29.)

§ 3. Justifications of the slaughter and consumption of animals founded on the *permissions* of Scripture, prove far too-much. They would not only justify slavery, divorce, and polygamy,—which were equally departures and deseents from the original and highest order of social-life,—but they would destroy all faith in scripture revelation itself. Christ, with a Divine indignation, has for ever rebuked and repudiated this shocking style of inference. He taught the perverting Pharisees, that whatever the tolerance of polygamy and divorce by Moses and the Rabbins might logically imply, to *Him* it signified the hardness of their hearts—not that the Edenic Constitution of Marriage was from the beginning a *mistake*, and demanded abrogation and repeal. He asserted, that as it was in the *beginning* so was it now, and must be to the end of the world. In the same way, we imitatively assert, that the permission to eat-flesh does not destroy that scripture-declared law and Edenic constitution, whereon the Eternal looked, and *saw* that it was 'very good.' Whatever else it may mean, it can not mean that the first-law was a *blunder*: it cannot alter, therefore, the fact of Divine adaptation. It was, in truth, nothing but a verbal allowance to sink to a lower platform of life, granted to those who *refused* to re-ascend to the higher one—so that, with an inveterate propensity and habit of sensuality, they might not also further profane a *consciousness* of law. SWEDENBORG has a wise passage on this point:—"When men began to grow fierce like a wild beast, then first they began to kill animals and eat their flesh, *and because man was such a character*, it was even permitted; and so far as he does it out of conscience, so far it is lawful; for his conscience is formed of those things which he *thinks* to be true; wherefore also at this day no one is by any means condemned for this, that he eats flesh." This is but saying, however, that man abdicated his aboriginal constitution, and preferred an inferior element of life; but while he sank below the law, the *law itself* as much remains his highest dietetic rule and good, as if he was still a denizen of Paradise. It is true that men *can* live on flesh-diet, and if not so long, so purely, and so nobly as on grain and fruit, still live passably a lower-life. Under choice, as under necessity, man *is* in fact Omnivorous: and this power (or *adaptability*) to be so, is the very fact involved in the Divine permission. It is Nature saying to us—"You are a free-agent; and since you decline to be *wise*, I shall allow you to be *other-wise*."

Permission
not sanction

Nature's road must ever be preferred:
Reason is here no guide, though still a guard—
'Tis hers to rectify, not overthrow.

POPE.

II. *The Analogy of Nature.*

§ 4. It has been frequently alleged by the advocates of Flesh-eating, that the organism of man is *intermediate* between that of herb eating creatures, and that of the purely flesh-eating animals. Now, granting such to be the case, what is the legitimate inference? Is it that half his food must be grass and grain, and half of it blood and brawn? Does not the eating of half-a-rabbit demand the *same kind* of adapted organization as the eating of a whole one? Would not Nebuehadnezzar as much require instruments for *herb-eating* and digesting, the first half of the day as the second?—and if he had them on the first part, would they not equally serve their turn for the remainder of the diurnal cud-chewing? The objector shrinks from the logical conclusion. The fact is, man is *not* constructed either for chewing the cud, or for champing and tearing flesh. The ox is *not* his cousin-organique; the hyæna, even the laughing one, is *not* his brother. Certain generic *types*, or homologies, are to be found in the Skeleton of man, as in his viscera and organs—but the ‘forms’ of those types which are *special* to the graminivora and carnivora, are in him only latent, not developed. He has *canine* teeth, so called because they are *typical correspondents* of certain teeth characteristic in the Dog, with which it tears flesh; but in reality, these teeth in man are so *undeveloped*, so *modified*, as no more to answer the special use of the dog-teeth than of a wild Boar’s tusks. By the same superficial and absurd application of analogy, it could be shown that as Man possessed a nose, which is the *rudimentary correspondent* of the Ant-Eater’s snout—ergo, Man is Antivorous!

§ 5. What then, we repeat, is the true inference from the fact that Man is neither herbivorous nor carnivorous? A subjective-alteration of structure implies an objective-alteration of conditions. If man’s organization is *so* altered that he can neither chew grass nor raw-flesh, then we must expect to find some sort of objective-food that is *neither* flesh nor grass. If his organization is intermediate, *so* must be his food. And so, undoubtedly, the most valuable and the most delicious food of man actually is. ‘The staff of Life’ is the gift of Ceres—the rich and exquisite dessert, the gift of Pomona!

§ 6. It would be tiresome and needless to summon a multitude of scientific authorities to bear witness of the FACT. ‘One is as good as a thousand’—says the proverb: but we will cite that one who is above a thousand, and who is confessedly the great master of Comparative Anatomy in our day—Professor OWEN. “The apes and monkeys, which man nearly resembles in his dentition, derive their staple food from fruits, grain, the kernels of nuts, and other forms in which the most sapid and nutritious tissues of the vegetable kingdom are elaborated; and the *close resemblance* between the quadrumanous and human

Osteology
of man.

Professor
Owen.

dentition, shows that *man was, from the beginning, adapted to eat the fruit of the trees of the garden.*" *

§ 7. Experiments (as with St MARTIN) and experience show that every form of vegetal-food is *as digestible*, some more so, than the correspondent element found in flesh.

BOUSSINGAULT found the different substances of the following table, pass in one hour from the intestinal canal into the blood, in the quantities indicated:—

TABLE OF RESORPTION OR DIGESTIBILITY.

Rice (8½ per cent Albumen, 89 starch)	= 4.20	Grammes. †	
Dry Cheese (70½ per cent oil)... ..	= 2.50		
Bacon (96 per cent fat)	= 0.88		Digestion.
Cacao seed (Cocoa, 48 per cent oil)	= 1.77		
Starch (yielding 2.37 carbon)	= 5.26		
Sugar (yielding 2.36 carbon)	= 5.62		
Beef, boiled and freed of fat	= 1.41		
Dry Casein (curd, or cheesy-principle)	= 1.37		
Dry Gelatin 	= 4.40		
Albumen (white-of-egg boiled)... ..	= 1.25		

As to *time* of digestibility, FRERICHS found that fish and the flesh of *old* animals (whose *cordage* is more developed) form an almost homogeneous mass, very slowly acted upon by the digestive fluids from the surface inwards; the connective tissue having to be first dissolved, before the gastric solvent can reach the openings upon the primitive bundles beneath. In the stomach of a cat, four hours after eating, pieces of raw-beef were but slightly softened on the surface; and *cooking* made but 30 minutes difference, since the breaking up of the tissues was counteracted by the coagulation of the albumen. In an abundant diet of flesh, large numbers of muscular fibres are found unchanged in the *fæces*.

According to the Dorpat experiments of BIDDER and SCHMIDT, performed on a female Esthonian peasant who had a gastric-fistula in the left side, between the cartilages of the ninth and tenth ribs, the secretion of the *digestive-juice* was 31lbs daily. When mixed with the saliva, it is always either neutralized or alkalized, but when obtained from the stomach directly, by irritating the mucous membrane with peas, SCHROEDER ‡ obtained a clear acid juice, containing free-hydrochloric acid. The gastric juice holds in solution nearly 46 parts per 1000 of the following solid constituents (the remaining 954 parts being water).

* Other analogies in favor of Vegetarianism will be given further on.

† 1 Gramme = (equals) 15½ grains Troy (less .62).

1 Kilogramme = 2lbs 3 oz. 4 dwt. Avoird. (plus .17).

‡ Succi gastrici humani Vis digestiva, etc. Dorpat, 1853.

|| Gelatin is hardly food; being incapable of nourishment, and slowly combusted.

Analysis of
gastric juice.

An albuminate (<i>Pepsin</i>) coagulating with heat	0.780
Sugar, <i>uncoagulable</i> albumen, lactic and butyric acids and ammonia	38.430
Chloride of potassium	0.704
Chloride of sodium (common salt)... ..	4.263
Potash (combined with the organic acids)	0.179
Phosphate of Lime... ..	1.030
Phosphate of Magnesia	0.470
Phosphate of Iron	0.010

After vegetal-diet, the latter element is increased. *Vegetal oil* is readily digested, or resorbed, not in the stomach, but in the small intestine, *if taken in small quantities*; and it essentially promotes the digestion of albumen and starch.

III. *The History of Nature.*

§ 8. Man is God's work—and man's individual and collective *experience* is the unfolding of the laws which govern his manifold nature—laws impressed upon him by sovereign power and wisdom. As a matter of fact, then, we may ask here—before proceeding to any deeper scientific analysis of man's wants and nature's provisions, and postponing the question as to the absolutely *best*-diet,—“Does the use of common vegetal, or non-animal food, rationally selected, sustain human beings in health and strength, for the easy and satisfactory performance of mental or manual labor?” As to physical-power, there can be little room for doubt. Whole tribes and nations, both in ancient and modern times, have practised the system with very apparent advantage. The standard-works on Vegetarianism give many pregnant examples. But there is scarcely any need to go further than our own country for evidences of its compatibility with a full physical development. The hardy peasantry of Yorkshire—of Fifeshire and the North of Scotland—are sufficient examples. Flesh-meat with them is a rarity—oat-meal porridge and milk, with bread and kail broth, their staple food.

§ 9. Whether the regimen be tried in low latitudes or in high ones, it is found to be equally successful. In one of the early Reports of the Poor Law Commissioners on Education (1841), Mr WILLIAM FAIRBAIRN, of the great Iron-foundries in Manchester and London, gives the following emphatic testimony:—

“I observed, on a late journey to Constantinople, that the Boatmen or rowers to the Caiques, who are perhaps the first rowers in the world, drink nothing but water; and they drink that profusely in the hot months of the summer. The boatmen and water-carriers of Constantinople are decidedly, in my opinion, *the finest men in Europe*, as regards their physical development, and they are all water-drinkers; they may take a little *sherbet* [syrup and water], but in other respects are what we should call, in this country, teetotalers.

“*What is their diet?—Chiefly bread; now and then a cucumber,*

with cherries, figs, dates, mulberries, or other fruits which are abundant there. Now and then a little fish.

Turkish porters.

“Do they ever use animal food? Occasionally, I believe, the flesh of goats; but I never saw them eating any other than the diet I have described.

“Did they appear to eat more than the European workmen?—About the same; if anything, more moderate as respects the quantity.”*

This last remark is important: for instinct infallibly guides men to eat enough: so that these fine large-men find a somewhat less quantity of vegetal food, equal in *satisfying power* to a larger and more costly supply of flesh. Nature, like wisdom, is justified of her children.

§ 10. After all the noise we have heard about the NECESSITY of fat-meat and tallow in low latitudes, Sir JOHN RICHARDSON, M.D., one of the Arctic voyagers, says “that the servants of the Hudson’s Bay Company are now finding out by *experience*, that altho wheaten-bread does not give them adequate support, bread composed of *maize-flour* [which contains 10 per cent of oily matter] *answers every purpose* ;” 2½lbs being fully equal in sustaining the capacity both for *muscular exertion* and for *bearing cold* to the 8lbs of fat-meat of the ordinary ration.

Let us here remind the medical world of a fact which it seems to have forgotten in its discussions on this topic, but one distinctly proved in the experiments on Respiration by BOUSSINGAULT, † viz. that the organism will not *resorb* that quantity of fat which is adequate for the restitution of the carbon consumed—showing that fat is an exceptional food, required, as it is supplied, only in small quantities. A duck, for example, expired in one hour 1.25 grammes of carbon; but 0.84 of a gramme of fat is all that is resorbed, which contains only 0.7 of a gramme of carbon. But the carbo-hydrates are resorbed by the intestine as fast as Respiration can need them; and what is singular, 5.26 parts of starch and 5.62 of sugar are resorbed in one hour, thus yielding *the same value*; the difference in absorption compensating the difference in composition.

§ 11. As respects individual experience in relation to mental power, philosophic thought, and moral character, the Vegetarian-system is interwoven with the History of Philosophy, Philanthropy, and Religion. Few ‘world-compelling men,’ as the *Westminster Review* observed, have been its disciples: but many glorious, world-impressing, world-improving men! The laurels of *its* heroes are not crimsoned with blood. The amaranthine wreaths which encircle *their* brows, sparkle

* The luxe-consumption of Flesh, which runs rapidly into decomposition in the system, is in itself much worse than excess of Vegetal-food. As LEHMANN observes, “large quantities of urea, far exceeding the normal mean, are excreted” (iii. p. 360).

† *Ann. de Chemie*, 3 sér. T. 18. p. 444—78.

with the dews of mercy, and are laved in the waters of life;—they are green with unfading hope, and blossom with immortality! The lust of ambition and the love of power, the rage of conquest and the impulses of ferocity, are never fed by the feasts of Nature. Towering amidst a host of famous men—prophets, priests, philosophers, sages, poets, authors, philanthropists, apostles—there are DANIEL and JOHN, PYTHAGORAS and EPAMINONDAS, EPICURUS and PORPHYRY, SIDDHARTA, CYRUS, and MANAHEM, MILTON and SHELLEY, SWEDENBORG, HOWARD, FERGUSON, FRANKLIN, WILLIAMS, and the sainted WESLEY. * If we consult the records of Longevity, we shall also discover that the Vegetarian-practice has been concomitant with many of the most noteworthy instances of the extreme prolongation of a happy, conscious human-life.

Historic
names.

§ 12. Even hostile critics have been compelled to concede the sufficiency of grain and fruit to sustain the physical-man. The late Dr SAMUEL BROWN, in the *Westminster Review* article, says:—"We are ready to admit that Vegetarian writers—especially the author of 'Fruits and Farinacea'—have triumphantly proved that physical, horse-like strength is not only compatible with, but also favored by, a well-chosen diet from the vegetable kingdom; and likewise, that such a table is conducive to length of days." Dr CARPENTER, in the *Medico-Chirurgical Review*, says:—"As regards the *endurance* of physical labor, there is ample proof of the capacity of what is commonly called the vegetable regimen, to afford the requisite sustenance. ... The vegetable kingdom is *perfectly capable of supplying the necessary wants of man under all ordinary circumstances*. ... The advocates of Vegetarianism have a wide and secure basis of Experience, such as can scarcely be shaken by any negative testimony—certainly not by the fullest proof of the unsuitableness of vegetable regimen to *individuals*."

IV. *The Dietetic Laws of Nature.*

§ 13. A law is a relationship—a method of action—a procession of facts, after a fixed invariable order. To understand the relation, we must understand the things related, which, in this case, are Man, with his multifarious wants, and Diet, the adapted-means of their satisfaction. Man is an organized being—a warm-blooded animal—intended for action and material conquest. "Go, and subdue the earth," is the primal announcement of his mission: and his body is the machine and enginery wherewith he must accomplish the task. Let us, then, glance at its statics, its structure, and its conditions.

§ 14. All who know anything of the Chemistry of Nature, know that the surface of our globe and the atmosphere which envelopes it—from

* Sir ISAAC NEWTON thought-out and wrote his famous *Principia* under the vegetal-regimen.

soil and sea to azure sky, from the tender grass and 'embattled grain' to the majestic woods—with the myriad shapes of beauty and of sentient-life that creep, or fly, or roam therein—are mainly composed of some few primitive substances. In a different sense indeed from the ancient formula, which made Earth, Water, Fire, and Air into the elemental-bases of the world, we can almost resolve them into the same mystic number.

How nature
is built-up.

Four elements in one firm band,
Give form to Life—build sea and land. *

The organic Man is no exception: from these earth-born elements he came, and to the same he must return. Vegetal and animal-life are but passing-apparitions of a Power and Will beneath them—an evanescent development of eternal Thought and Love—a step in that golden-ladder which connects the present with the future—the material and fleeting forms of Life with the abiding spiritual Verities.

§ 15. Whether we analyze vegetable or animal-organism, the same result comes out. 1, CARBON—the black-matter of charred wood, bone, or flesh; crystalized in the diamond—the platform or skeleton of organized matter. 2, OXYGEN, the vital, stimulating element of the air we breathe; the magical transformer of all things; the active spring of change, and the *timely* Destroyer and Regenerator of Nature. 3, HYDROGEN—the Light-gas (in combination with a little carbon) with which we inflate our balloons, and the combustible element of our gas-lights. 4, NITROGEN—another gaseous-body, essential to all vital organism,—one which is largely interfused in our atmosphere as chip-in-pottage, and from its low affinity, or negative attribute, seems to be used as a *pivot* of transformation. Yielding itself up to the varying attractions of other bodies, it occasions the rapid breakings-up of organized forms essential to the idea of *life*. Besides these, in the structure of vegetal cells and of blood, we find certain bodies in *minute*, almost infinitesimal quantities, which belong to the Earth-Kingdom—such as iron, lime, phosphorus, sulphur, sodium, chlorine, and potassium.

§ 16. The *bulk* of our bodies, however, consists of the first four elements: not even excepting the bones, which almost entirely disappear under the consuming power of time or heat. What then is the natural history of these elements—up to their becoming a portion of our own frames? The succession of a single-season will show. The Carbon first exists in union with Oxygen, as *Carbonic-acid* (CO_2), being breathed from animals, or arising from combustion of wood and coke, and steaming from the craters of volcanoes. It forms, indeed, but a very small proportion of the atmosphere,—for it is a gas fatal to

* SCHILLER.

Food of
vegetables.

animal life,—yet in sufficient quantity for the wants of the vegetable. Oxygen and Hydrogen exist in happy-monogamic union as *Water* (HO), which is distilled from the vast reservoir of the ocean, and descends as dews and fertilizing showers upon the bosom of the longing Earth. Nitrogen exists as the volatile alkali *Ammonia* (NH₃), the result of the decomposition of organized matter, and in small part as *Nitric-acid* generated by the action of thunder-storms in the tremendous laboratory of the clouds. The minor elements exist in the soil. The *cells* of seeds and plants are centres of a peculiar force, which is excited to action under the influence of light and heat. The seed *grows*—in other words, assimilates extraneous matter to itself—enlarges into roots and spires, forming a plant, which branches, and buds, and blossoms, and bears fruit. The plant feeds upon the carbonic-acid, which it decomposes, *fixing* (that is, solidifying) its carbon, and setting free its oxygen for the use of animals. It drinks up the water, which it uses as the solvent of its mineral elements and the diluter of its ammonia, using of each what is needful for seed and structure *after its kind*. Thus within its living cells it transmutes gas, liquid, and earth, into solid-alimentary matter—into wholesome grain and delicious fruit—which, within the higher organism of man, is destined to become a part of his own structure, or of his vital-fluids, fulfilling its temporary purpose of action or of heat, and then to be resolved into gas, water, ammonia, and earthy-salts once more. “Eternal round! wherein Death is quickened and Life appears, but in which Matter changes only its place and its form.”

Relation of
blood.

§ 17. Our *blood* is our food transformed and vitalized, not converted, with a certain amount of waste-matter in addition;—our bone, flesh, nerve, and tissue are varied *deposits* from our blood, moulded and modified by varying chemical affinities under vital attractions and forces. It is an expressive fact, that from the remotest periods of history, every nation which has retained the slightest traces of primeval civilization, has enjoined abstinence from blood. Think of a civilized-man—of a lady or gentleman of any taste or culture—feasting on a *blood-pudding*! The very idea is barbarous and disgusting. Man has clearly a true ‘natural prejudice’ against the custom: and even up to the time of the Christian Apostles, notwithstanding the permission to consume the *carcasses* of animals, the prohibition survived against “blood and things strangled.” This was ranked amongst the ‘necessary’ things to be observed. In reality, however, flesh is *more akin* to our own organism than blood, and blood *more akin* to our natural food than flesh. Why we do not equally revolt from the custom of using flesh as from the use of blood, must be ascribed very much to its *being* custom, which has a disastrous power in blunting

our perceptions of the truth of things. Besides, the red flesh *contains* blood, and is colored by it.

§ 18. In our blood, therefore, we must find the USE of our food.* It is our food naturalized in the new republic of life to which it is introduced—as men from the different provinces of a country, by dwelling in the capital, merge their provincial dialects and habits in a common language and common manners. The *essence* of food and the *essential elements* of blood, are in a CHEMICAL sense identical. They contain the ‘elements’ of which we have been speaking, united in the following proximate forms:—

Albumen and Fibrin = *Organizable and Organized Matter.*

Oil and Sugar = *Organizing and Heat-forming Matter.*

Potash, Soda, and Phosphate of lime, etc. = *Ash.* *

Essence of
food.

§ 19. The ALBUMEN is the great plastic principle out of which our living structures are reared, with the aid of OIL, always present in the primitive cells and seeds of life, and constituting, so to speak, the mortar and instrument of organization. Out of these, and under various essential conditions, our osseous system is constructed—at once the pillars and walls of the temple of Life, and the levers of its power † Out of these, too, are strung and twisted the vital cordage of our muscles, and the tough ligaments which bind them in their places. Out of these our wondrous net-work of Telegraphs, the Nerves of sensation and of motion, are all nourished—and out of these is built-up that Regal habitation of the Soul, the sovereign Head and Brain.

§ 20. There are other structures also, but as these have reference to the *conditions* of life, they cannot be understood until those condi-

* In 1000 parts of the Circulating stream we have in exact quantities of the various ingredients, as follow:—

Blood Globules (white and red together)	131
Albumen	7½
Fibrin	2
Fat and Sugar	2
Chlorine and Salts	5
Water, the vehicle and menstruum of life	789

Analysis of
blood.

The *Edinburgh Review* (April, 1855) mistakes in affirming that modern chemistry “abolishes the artificial distinction which mere sense has long established, between animal and vegetable food.” In flour and fruit, for example, where do we find the *excretive elements* (matters tending to dissolution) which are present in the juice of meat and in blood? Vegetable-food is the work of *progressive* formation, but Flesh contains the same elements advanced to the *turning point of change*, and mingled with the *results* of actual decomposition.

† To avoid the need of dwelling specially on *bone-nourishment*, we observe that the *blood* of the carnivora of course contains more *phosphates* than that of the herbivora, yet the *flesh* of these latter always contains as much as the flesh of the former. In other words, the excess is *excreta*; and not wanted for nourishment.

What is life ?

tions are explained. What attributes are covered by this word 'Life'? What is it *to live*?—to have 'Vitality' as men have? Man is organized, but so is a watch or a steam-engine: for 'organization' denotes the forming and fitting of solid matter to accomplish some special work—as the marking of Time, or the drawing of a Train. Besides organism, there must be added *warmth* and *movement*: and of course all which these involve. Not outside-warmth, which may be communicated, but *central-warmth*, generated from within. The snowy mantle of December is over nature now: but as we look abroad, we note the thawing-influences of vital conditions. On the boughs of the dead-fir in the plantation, the snow-flakes lie thick and unmelted; on the living Deodora and verdant Laurel, it has dissolved under the higher temperature. The snow vanishes from the surface of Vegetation first—because Vegetation is *alive*. Life, therefore, implies heat—necessary alike to its commencement and its continuance—for heat is the great condition of change. On the summits of the Andes and the Alps there is no life—because no heat;—in the ice-waves and pinnacles of the *mer de glace*, we look upon a stereotyped, because a frozen, page of Nature's book. Heat, however, is but an attribute of change—the result of material action and reaction—of slow decomposition or rapid combustion. Hence it is a *passing* state—or in common parlance, it radiates or evaporates. It is a condition dependent on two-factors: adapted *fuel* to burn or change; and *oxygen* (air) to support, with incombustible salts to promote, the combustion. To live, then, we must have warmth, and therefore fuel; air, and (so to speak) a furnace within us, to generate that warmth. In other words, we must have the conditions and the organism needful for inducing change of matter within the body. Without this the blood would as surely cool as does the water in the kettle when removed from the fire. The body may be viewed as an animated Engine for the production of mechanical force. The SUGAR, OIL, and Effete matter are the fuel, from the transmutation and decomposition of which force is derived—a force always equivalent to that originally absorbed by the food from the solar beams. A strong-man generates every day a measure of heat sufficient to lift 13,500,000 lbs weight one foot from the ground—if *directed* to the production of mechanical power, as in the steam-engine.

Heat and movement.

§ 21. Perpetual *movement*,—organic, if not voluntary,—is the end of heat; and is therefore another essential attribute of the living tissues. Bones and every other part are continually being renewed; because to live is to grow old. Nerves, brain, and muscle perform mental and mechanical work under a voluntary impulse, over and above. Each action brings on its reaction—its fixed inevitable collapse,—because to *do* is to *suffer* change. Daily 'wear and tear' of

the vital-organs needs 'daily-bread' to repair it: needs, not simply fuel to burn for warmth, but food capable of being transformed into the structure itself—in short, plastic nutrient substance, whereof albumen is the type. FOOD or bread, therefore, must be of a *dual-nature*, adapted to these dual and distinct uses: but DRINK of a *single-kind*, like water, its use being that of a vehicle for the circulation, thro' tube and tissue, thro' artery and cell, of the different solids which it holds in solution.

§ 22. The organism necessitated by these conditions of the vital structure, may now be indicated. The Respiratory and Arterial system for the conveyance of oxygen thro' all the ramifications of the frame;—the Respiratory and Perspiratory systems for the exhalation of the gas and vapor of combustion, and of the salts;—the Excretory system devoted to the elimination of the nitrogenized, sulphurous, and drossy-elements of our food, so that the waste effete matter may not be retained beyond a certain period;—and finally, the Digestive and Assimilating system for the transformation of food into blood.

The bodily organism.

§ 23. Nature, however, in her infinitude, freedom, and many-sidedness, refuses to be 'cribbed, cabined, and confined' by these rude verbal Outlines of her plan. All we have said as to the *distinctions* and *contrasts* in the use and properties of Food is true indeed—but not the whole truth. Behind and besides the general portrait we have drawn of the fundamental aspect of CHEMICO-PHYSIOLOGY, there is (so to speak) a wonderful elasticity and play of individual features and expression—beneath the broad and profound adaptations we have indicated, there is another deep, in which are displayed contrivances of a more complex and multitudinous description still. For example, while OIL is unquestionably an element of Fuel, and not of itself plastic-nutrient—it is *also* a substance essential to the brain, and an agent contributory to the nutrition of every organ—and it has *also* yet a fourth use as a mechanical padder and lubricant, and *also* a fifth use as an auxiliary-digester of albuminous and amylaceous food. SUGAR, again, while correctly placed in the category of Fuel-food, has other important functions; it is essential to the beginning of organization in the egg, where, as likewise in the serum of the blood of man, and even in the fœtus where it is generated, it contributes to the *solution* of the carbonate and phosphate of lime; * and it has, in addition, a kind of preservative-power in the blood, moderating the metamorphosis of organism in the young, who require to be built-up, an use which explains their instinct for saccharine matter; and it has still a further use as the natural 'constituent' of the important Lactic-acid, and of the Fatty-acids, if not of fat itself. The molecular change which food and

Complexity of use.

* Vide BARRESWIL. *Moniteur Industriel*. No. 1542. 1850.

Internal
changes.

effete matter undergo in the system may be here *illustrated* in its nature by the transformation of sugar within the body. Recall the composition of Grape-Sugar (*glucose*), whether formed within the body from starch, or preformed in food: $C_{12} O_{12} H_{12}$. Oxidized—i.e. split-up by the action of oxygen—its 36 atoms may pass into this form:—

Carbonic acid	=	4 C,	8 O	
Butyric-acid	=	8 C,	7 H,	3 O
Hydrogen	=	4 H,	uniting with extraneous O as HO.	
Water	=	1 H,	1 O	

Or two atoms of Sugar ($C_{24} H_{24} O_{24}$) may be decomposed thus:—

Carbonic acid	=	8 C,	16 O	
Caprylic-acid	=	16 C,	15 H,	3 O HO.
Hydrogen	=	4 H,	which combine with O as HO.	
Water.	=	4 H,	4 O	

By like changes, in the carnivora especially, sugar, whether of the muscles (*inosite*), or of the blood (*glucose*), is derived from the *decomposition* of albuminates and of fibrin; for no matter whether sugar or starch has been given in the food, sugar is still found in *requisite* amount within the body. *Oxidation*, it will be seen from these remarks, is a slow process; yet one which must be extended step by step, and atom by atom, to all the tissues and organized elements of the frame; and not only must it change an atom of Sugar, or of Albumen, but it must do this by discrete degrees and intermediate processes.

§ 24. Here is perhaps the place to notice those elements of the Food referred to as *ASH*; mineral ingredients which divide, as to use, into three classes: viz. *Physical*, *CHEMICAL*, and *Incidental*. (*WATER*, it may be observed, is a mineral element of the frame, essential to the play of chemical affinities, and to the development of the properties of certain tissues.)

Amongst the first class, we place Carbonate and Phosphate of Lime, and Magnesia, found in the osseous system, Fluoride of Calcium, for the enamel of the teeth; and amongst the third we put Silica, Sulphates, Carbonate of Magnesia, Manganese, Copper, etc. The second class of substances, and their uses, remain to be explained.

PHOSPHORUS is an essential element of the Brain and of the Nervous system; and is associated with what is called Cerebric-acid; and, after this substance and lime, we find the great bulk of the ashes of Food to consist of either one or both of the alkalis, *POTASH* and *SODA*. These perform an important part in those perpetual molecular movements which occur thro'out the body—and are truly magical agents of vital Metamorphosis. How important, may be compre-

hended from the fact, that they are essential to the Digestive Fluids (the saliva, the bile, gastric, pancreatic, and intestinal juices), which are secreted by a man of 10 stone weight, to the extent of 10 kilogrammes (containing 310 grammes of solids) daily. When we recall the fact that the juices of the flesh are acid, and that when two fluids are separated by a membrane, the main current of the interchanging fluids will be towards the *alkaline* side of the partition, we shall see how important it is that the blood should be (what it is) an alkaline fluid, resorbing into it, as it were, the effete-acids and elements of the tissue, by endosmosis, and thus *completing* the circulation, and at the same time *neutralizing* those acids. These alkalis, moreover, are found powerfully to promote *combustion* and change of matter, thus aiding the oxygen in its work. This explains the popular prejudice for green vegetables in spring, which are rich in alkalies; and for the various ways in which they are taken (as the phrase is) 'to purify the blood.' It is nearer the truth than is generally supposed. *

Uses of the salts.

The perfect *sufficiency* of the vegetal-kingdom for the dietetic wants of man, appears as clearly from this analysis of his nature, as it before did from the records of Experience.

V. *The Histology and Pathology of Nature.*

§ 25. Amongst the one-sided and extravagant aspects of modern physiology *popularized*, that which has reference to the alleged necessity, utility, or importance of *animal-fat* (from dripping and lard to cod-liver-oil), is the most notable. Addressing ourselves to inhabitants of the temperate climes—the seat of the truest civilizations—we have no call to consider what is either allowable or needful to the squalid races occupying the frigid regions of Nova Zembla, or the dreary wastes of Lapland. Hyperborean latitudes are not within the limits of this argument: we have to do with the choice seats of Industry and Science, and with the most favored sons of Japhet. In providing for these, her advanced children, Nature, which has so nicely adjusted her edible gifts to the varying circumstances of her offspring, carefully *limits* the quantity of oil elaborated in her vegetal productions. For the infant organism, too immature to make much fat for itself,—and of which at all times indeed but a very minute proportion should exist in the blood,—the mother is appointed to prepare the *cream*, delicately mingled with the casein (curd = albumen), the absorption and deposit of which it has to promote. As the organism, however, becomes more

* We take little account of the sulphur associated with the salts in Spa-water, and may parody an old distich:—

It is the *Salts* perform the healing-feat;
Sulphur, if not all, is much of a cheat.

Histology
of man.

matured, and the masticating apparatus fitted for the permanent forms of food, the proportion of *ready-formed* oil is lessened. In the dietary now appointed in the order of Nature, starch takes the place of sugar-of-milk, and common saccharine-matter that of much of the oil. Why? Because, in the teleology * of nature, it is best that the stomach and liver should not be disordered or oppressed with an excess of such material, or the general circulating current impeded in its course; and therefore the salivary and pancreatic juices, and the liver, are destined to *convert* starch into sugar. The histology of Nature illustrates the law of gradation and procession—and altogether abhors the stuffing-plan which our fashionable Dripping-doctors so rudely recommend.

§ 26. The practice of consuming fat-of-cattle, or fat-of-cods, is however not more discordant with the analogy of nature, than the *theory* of it with the most certain facts of physiology. LIEBIG had need to have rendered great services to science to make amends for his huge and often pernicious mistakes, amongst which we must rank the representation that *oxygen* is the foe of life, always bent upon 'consuming' the organism, and to be made placable only by burnt-offerings of the 'fat-of-rams' and the fluid oblation of *oleum jecoris Aselli*! The latest *dictum* of science is thus stated in the magnificent work of LEHMANN: "There are no acute, and but few chronic diseases in which the oxidation of the constituents of the blood is not DIMINISHED or impeded. There is no disease characterized by a TOO SUDDEN or rapid oxidation of the blood." † (The italics are not ours.) *Oxyphobia*—the fear of fresh-air—is a foolish-fear: for oxygen is the necessary correlate of high vitality and health. The use of animal-fat, beyond all doubt, contributes to clog the vital functions, and to retain within the circulation effete matter, and especially interferes with the function of the Liver, which is that of renewing the blood-corpuscles and preparing a more vital-fluid for absorbing oxygen and inducing energetic reaction. Dr CARPENTER, in his strictures, recommends the vegetal-regimen as a cure for dyspepsia, liver complaint, and similar disorders: but the virtue of it, as cure, is negative—it *relieves nature* from accumulated oppression, so that the constitutional forces are at liberty to manifest their recuperative and repairing action. The organism, as a matter of course, returns to its normal functions. ‡ "The first thing," says LEHMANN, "in many diseases, is to furnish a copious supply of oxygen to the blood, which has been laden with imperfectly decomposed substances, and

Lehmann on
oxygen.

* Teleology is the science of final-causes—of adaptation to purposes.

† *Physiological-Chemistry*. Vol. i. p. 219. † iii. On Respiration.

‡ In *epilepsy*, Vegetarianism always prolongs the interval of attack—often cures permanently.

to remove as speedily as possible the carbonic-acid which has accumulated in it." *

§ 27. The fact is, that the amount of oxygen absorbed depends much upon the *quality* of the blood, as the right condition of *that* upon the nature of the food. Now we have striven to impress upon the reader the fact, that in the beautiful adjustments of the organism, the great thing for health is *balance*. Each organ has, in its appointed task, enough to do; while none can permanently have *extra* duty imposed without disturbance and disease. We insisted on the continual-creation of effete matter; not only the gases, vapor, and ashes of the directly 'fuel'-food, but of that resulting from the metamorphosis of the tissues. The old-furniture of the house, so to speak, is wisely broken-up and used as fuel, on the road towards final elimination. (These bodies consume a portion of oxygen for the oxidation of their hydrogen, which is given out as water.) Now it must be obvious, that blood made out of animal flesh and juices *already loaded with effete elements in the act of change, and on their passage and descent towards the excreting organs of elimination*, must be of a morbid description, *susceptible* of more rapid transformations of a regressive character, and absorbing therefore more of the vital oxygen.

Vital balance.

It is a remarkable confirmation, that the bodies of Vegetarians after death, do not decompose and putrefy nearly so rapidly as those of flesh-eaters. Sir EDWARD BARRY, by feeding on Partridge for a few days, developed a strong tendency to putrefaction.

It is worth remembering the remark of LEHMANN, that blood *fibrin* is "formed by a process of oxidation from albumen." True, "the augmentation of fibrin in inflammation is *due to a diminution in the supply of oxygen*;" but that arises simply from the fact, that the short respirations are incompetent to convey *enough* of oxygen *completely* to oxidize certain substances, which therefore remain and accumulate as *fibrin*. Flesh-diet *increases* fibrin by robbing the system of oxygen originally designed for other purposes. Now, as LEHMANN says, "an

Fibrin.

* BIDDER and SCHMIDT and NASSE have shown that a *flesh-diet* induces a much more copious secretion of Bile than vegetal, amylaceous food. A dog, fed on bread and potatoes, daily secreted 171 *grammes* of bile, containing $6\frac{1}{4}$ grammes of solid matter, but when fed with Flesh, 208 grammes of fluid, containing 7 grammes of solid bile. An *exclusive* fatty diet was found to have no influence on this secretion; but the *addition* of animal fat to the ordinary diet greatly increased the bile. NASSE makes the important remark, that the mineral (and essential) substances secreted in definite times remain nearly constant, the variations in the solid constituents are chiefly induced by the *organic* matters. Over-feeding was found to increase both fluid and solid by 1-5th the amount over that secreted after a simply abundant meal. Flesh-diet, therefore, is equivalent to *overloading and overworking* the hepatic system with partly effete organic matters. (The secretion reached its maximum about the 14th hour after the last meal.)

augmentation of the fibrin *coincides* with those states in which nutrition and renovation are most affected; and is found to be increased when *more* albuminous food has been consumed than *could* be applied to the reparation of effete tissue." The truth is, *fibrin* is albumen TREMBLING UPON THE VERGE OF DECAY—which sufficiently explains the proclivity of Flesh eaters to putrid and inflammatory disorders.

§ 28. One of the greatest blunders of LIEBIG as a physiologist, was associated with one of his greatest chemical triumphs: we refer to the substance (obtained from chopped flesh, from the smooth muscles, from the blood, and the urine) called *Creatine* ($C_8 H_9 N_3 O_4$), and to its alkaloid *Creatinine* ($C_8 H_7 N_3 O_2$), which is ammonia conjugated with a highly nitrogenized substance, containing one atom less of hydrogen than Caffein. It is found like *Creatine* in the muscles, the blood, and the urine, where the two occur in an inverse ratio—(*Creatine* never in *putrid* urine)—facts which clearly indicate that *Creatinine* is the derivative. Yet how confidently was this substance, for a season, bruted as the NUTRIENT-ESSENCE of beef!—ready made nourishment—and the solid fibre cast to the credulous cats! Under the guise of beef-tea, or gravy soup, and commended as the at last discovered *Elixir vitæ*, gentlemen and ladies drank basins of *Excretive-soup*! The poisonous stimulus which it gave to the weakened system, was, as in the case of strong-coffee or alcohol, mistaken for strength! "This substance" (*Creatinine*), says MOLESCHOTT, "may be considered as decidedly an *excrementitious body, which has passed into that stage in the tissues themselves.*" * The acid *peculiar to the flesh*, technically called *tyrosinic acid*, which is to be found in the muscles associated with lactic-acid, most probably belongs also to the products of regressive transformation." *Tyrosine*, says LEHMANN, is formed during the *putrefaction* of albumen, fibrin, and casein: formula $C_{16} H_9 NO_3$. †

As vegetal-food is rich in oxygen, its changes necessarily become an *internal* source of supply to the blood. ‡ Thus experience shows Vegetarian divers can remain longer under water than Flesh-eaters; and that Vegetarians do not suffer so severely from deficient ventilation as consumers of flesh.

§ 29. Here, then, it must be apparent, the flesh-eater has no advantage over the Vegetarian as regards the albumen and fibrin of tissue—which is essentially the same in both kingdoms,—but in absorbing its juices, he adds to his own living system the *excrementitious* materials of the dead organism whereupon he feeds! Morbid reactions must be

* *Lehre der Nahrungsmittel* (Theory of Nutrition), § 25. Erlangen, 1853.

† "LIEBIG's investigations," says LEHMANN, "constrain us to regard *creatine* as a PRODUCT OF EXCRETION."—*Phys. Chem.* i. p. 129.

‡ For example, where, for conversion into CO^2 (carbonic acid) and HO (water), 100 parts of muscle require 147 parts of extraneous oxygen, and Fat 202, starch only wants 118, sugar 106, and fruit-acids 83.

Liebig's
blunder.

Creatine.

set up, and unnatural wasting excitement and oppressive labor follow as a matter of course. It is precisely this fact which explains the great exemption of fruit-eaters from *zymotic* and infectious disorders—the ferment of the floating poison finds no adapted factor for development in the pure and thoroly oxygenated blood of the Vegetarian.

§ 30. The multiform and perpetually increasing diseases of our people, and their strange complication, are exactly what we might expect from such universal habits of diet, and the concomitant, and *partly* consequent, indulgence in strong-liquors. (See § 39.) In other words, blood-corruption united with constant excitement of the nervous system, must result in constitutional proclivity to disease, in strange and varied lesions of the internal organs, and in sudden stagnation of the vital-powers.

Take, by way of example, that new, terrible, and increasing disorder, the *bronzed or copper skin*—a disorder which, in every instance known, has terminated fatally. It is associated with disease and tubercle of the Supra-renal-Capsules—which, if not also blood-perfecting organs, are undoubtedly in close relationship with the nervous system thro' the solar plexuses. Here is the last case we have met with.

A new disease
of stimulation.

“A Lady, aged 58, of remarkably tall and robust frame. Her habits of life were peculiar, especially in her partiality for fat, and *her abstinence from farinaceous diet*. She was also a considerable consumer of porter and wine.”*

Up to January, 1855, she believed that her diet and drink did her good: and her acquaintances would refer to her as an undoubted illustration of ‘good-living.’ But mark the sequel—observe the ravages which had been slowly but surely effected, during the course of years, in that robust frame!

“She first consulted me in Aug. 1855. Her chief complaint was debility: appetite bad: nausea and pain in the stomach. Her hands resembled those of a creole. I examined the heart, lungs, and the urine: but the only conclusion I could come to was, that I had a case of general decadeuce of the digestive powers from over-stimulation, with fatty degeneration of the heart. She made no satisfactory progress; and the bronzy discoloration deepened. I informed the friends of my conviction of its fatality. The *post-mortem* exhibited the heart in a state of fatty degeneration: the liver softened: stomach dilated, coats atrophied and destitute of rugæ: kidneys congested and flabby: the supra-renal-capsules enlarged, and filled with *tuberculated deposit* of various consistency; some portions almost cartilaginous, others of the fluidity of serofulous pus.”

§ 31. The inference is unavoidable from the facts detailed—that

* Dr RANKIN in *Ass. Med. Journal*, Aug. 9, 1856.

Premature
bankruptcy.

while Nature seeks to avert disease and economize vital-power to uses beyond itself, by reducing the REGRESSIVE COMPOUNDS of the blood to a *balanced minimum* both as regards their sum and the time of their circulation, the flesh-eater establishes a *maximum* which cannot fail to clog and overwork the excretory organs, to impair the general nourishment, and by continual morbid excitement to exhaust the constitutional power of the system.

VI. *The Economics of Nature.*

Flesh wasteful.

§ 32. There is nothing in the organized tissue of the animal which was not in the plant—*save the excrementitious elements of itself*. 'All flesh is grass'—and something more: otherwise all grass would be flesh, which it is *not*. The three kinds of Aliment—1, the inorganic; 2, the fat constituents of fuel and organization; 3, the nitrogenized or plastic nutrient substances—are originally contained in the products of the field and orchard. To procure them thro' the blood and intercession of an ox or a hog—after months of feeding and fattening, during which the body of the beast has been, many times over, burnt-up and dissipated in the processes of combustion and waste necessarily involved in eating, breathing, and living—is certainly a circuitous and wasteful method, which would demand very weighty compensations to vindicate it. As a matter of clear calculation, to select a medium example, it can be shown that £3 worth of wheat would restore as much the waste of the body as £12 worth of English beef.* By adapting

* TABLE OF COMPOSITION OF FOOD.

100 lbs of each of these articles of diet.	CONTAIN		SUPPLY TO BODY.			
	Solid Matter.	Water.	Flesh-forming principle.	Heat-forming principle.	Ashes.	Starch excluding wax, fat, etc.
	lbs	lbs	lbs	lbs	lbs	lbs
Turnips ...	11.0	89.0	1.0	9.0	1.0	—
Red Beet Root	11.0	89.0	1.5	8.5	1.0	—
Carrots	13.0	87.0	2.0	10.0	1.0	—
Potatoes	28.0	72.0	2.0	25.0	1.0	—
Butcher's meat	36.6	63.4	21.5	14.3	0.8	—
Bread (stale) ...	76.0	24.0	10.7	64.3	1.0	—
Peas	84.0	16.0	29.0	51.5	3.5	38.8
Lentils,	84.0	16.0	33.0	48.0	3.0	39.0
Barley-meal ...	84.5	15.5	14.0	68.5	2.0	64.0
Wheat-meal ...	85.5	14.5	21.0	62.0	2.5	66.0
Beans	86.0	14.0	31.0	51.5	3.5	37.3
Sago	88.0	12.0	3.4	84.0	0.6	—
Maize-meal ...	90.0	10.0	11.0	77.0	2.0	66.8
Oat-meal	91.0	9.0	12.0	77.0	2.0	37.0
Rice	92.4	7.6	8.4	82.0	2.0	86.0
Onions	—	93.7	7.5	—	8.5	—

the productions of our soil to the wants of man as indicated by Instinct and demonstrated by the analyses of Science, we could support an increasing population in comparative affluence, add prodigiously to the industrial wealth of the country at large, and give at once a new direction and a vast impetus to its agricultural improvement.

§ 33. MOLESCHOTT, who confounds a vegetal-diet with a diet of green-vegetables!—concedes, again and again, both the positive and negative basis of our plea.

“The legumes,” says he, “are *superior* to meat in the abundance of solid constituents which they contain; and while the amount of *albuminous* substances may surpass that in meat by one-half, the *constituents of fat*, and the *salts*, are also present in a greater abundance. ... Meat, bread, and *leguminous* seeds are serviceable in supporting the *nutrition of the brain*. ... Blood, flesh, milk, etc., are *abundantly formed* by peas, beans, lentils; and for this reason they are the comfort of poor-people, to whom flesh is so seldom and so sparingly allotted. ... Potatoes, combined with a certain proportion of *white-of-egg* [albumen], becomes as nourishing as milk or flesh. ... The growing-youth should be provided with cooling aliments, fruits and vegetables, water and acidulated beverages; and if then his mind is sufficiently occupied, and he takes abundant recreation in the open air, the *tissue-change* will harmoniously promote the proportionate development of every part.”

Moleschott's
admissions.

§ 34. He even recognizes the evil of stimulants, both in general and particular. “An excess of stimulants is more dangerous than a superabundance of nutriment. ... The Roe, leading in the woods a free and active life, takes in a greater quantity of oxygen, which transforms the nitrogenized bases of the tissues into *creatine*. ... The excitation of the activity of the heart, observed after a copious meal of venison, is due not only to the abundance of albuminous matter in the venison, but also probably to the proportionately large quantity of *creatine*. ... The sexual impulse is more excited.” *

VII. *The Ethics of Diet.*

§ 35. It is time we ceased to consider this question from the low ground of chemical-equivalents and exchanges: or from the standpoint of the Prize-show or Cattle-market. It is not how much fat and flesh a given fodder will enable us to lay upon the carcase of a *beast*, but how shall we best subserve, by our regimen, the great moral and social

There is probably but one or two things which can be referred to as a *Model food*; such as the Grape in a temperate region, and Mother's milk. Accepting this last as a standard, as regards its solids, then a near approach to a *perfect diet* would include the following parts and proportions:—

Perfect diet.

Albumen 10; Fat 10; Sugar 20; Salts 0.6 of a part.

* *Theory of Nutrition*, § 58. § 42. § 97. § 89.

purposes of *Human-life*? We do not live to eat, but eat to live: and, therefore, whether we eat or drink, we are bound to have some reference to the honor of the Divine Law and the happiness of our fellow creatures. The crowning organisms of man are the sensorium and the brain—the seats of consciousness and of the Moral Will: and the point to be determined is, what relation does a carnivorous diet bear to this momentous and mysterious part of our being—the very ‘Holy of Holies’ in this Temple of Life?

§ 36. It cannot be denied that the sight of slaughtered and quartered beasts, nay, the very scents of the *abattoirs*, are revolting to the unsophisticated taste. “Animals living on plants,” says MOLESCHOTT, “not unnaturally convey the impression of a greater purity upon our fastidious senses;” and no doubt, could we look apart upon ourselves, we should desire to retain the same associations in connexion with our own diet. “Whether food has a yet higher influence,” says FORSTER, in his dissertation on the utility of the bread-fruit tree, “whether mind and heart may directly or indirectly be tuned by it, will be left to our grandchildren for discussion. *We only know that gentleness, love, and sensibility of heart, are the prominent traits of the people living on bread-fruit.*”^{*} The instinct is more than justified by the fact. But there is another phase of the experience. “If we consider,” says MOLESCHOTT, “that even now the Pastoral tribes are the gentlest,—that the character of the beasts of prey is softened by getting accustomed to a mixed or vegetal-diet,—why should it sound fabulous if we connect the noble tenderness of heart and pacific meekness of the pastoral tribes, with the milk and the fruits whereon they subsist?” †

§ 37. It is an established fact, familiar to observation, that not only does beef with its abundant *creatine* (or gravy) primarily excite the heart and vascular system at large, but it exercises, secondarily, a very sensible *narcotic* effect, disinclining to mental effort, and inducing an almost irresistible drowsiness. This is evidently a frequent condition of the Carnivora, but one hardly indicated as proper to man. What *must* be the effect of such a morbid, and necessarily excessive stimulus, upon the blood and brain of man? ‡ One fact will serve to show the

^{*} See our *Paradise of the Pacific* (Works, vol. i) for the beautiful history of the Pitcairn Islanders.

† *Theory of Nutrition*, § 71.

‡ Experiment will show, in 9 cases out of 10, that a generous dinner of Flesh *indisposes* for mental efforts. But if literary men persist in their pursuits, under the stimulation of alcoholics and of flesh-suppers conjoined, a most fatal disturbance of the mental balance will sometimes follow. The late HUGH MILLER is a melancholy illustration. Several of the deceased contributors to *Punch*, illustrate the influence of flesh-eating and wine in breaking down and paralyzing prematurely the organic system.

essential-connexion between material conditions and general social departures from the normal state. QUETELET has fully shown that the stimulation of the summer season is always attended by a large increase of Insanity and Crime : a circumstance only explained by the supposition, that where there is a proclivity to passion, the augmentation of a vital-stimulus will destroy in many the balance of self-control. He has also demonstrated that age represents an important factor in crimes of a certain kind : that factor is but another form of the preceding condition :—namely, *the summer season of life*, when the brain is most matured. (The maximum for men is the 25th year.) Thousands of our people whose passions are morbidly excited by stimulants, beyond all self-control, and who pass thro' society like Plague-ships, carrying disaster and pollution in their path, might, under the mild and beneficent *regime* of Vegetarianism, postpone the development of erotic impulses to a later age, when discipline and culture would be adequate to rule and direct them aright.

Quetelet.

§ 38. The most certain, positive proofs exist of the direct connexion of flesh-diet with some of the saddest and most incurable affections of the nervous-centres. We will go to New Zealand for an illustration : citing the admirable papers of Dr ARTHUR THOMSON on the Diseases of the New Zealanders. *

“Far elevated in virtues, altho debased by many vices, above other races. ... The great prevalence of diseases of the lungs arises from *badly-ventilated* houses, insufficient clothing, etc. ... Europeans are as liable to affections of the liver as in England. I attribute the *rarity of the disease* amongst New Zealanders to their not using any fluid containing alcohol, the injurious effects of which, when taken to excess, or in habitual moderation, on the functions of the liver, are now well known.

Thomson on
the New
Zealanders.

“*Diseases of the Stomach and Bowels.* The exciting causes are excess in eating food, often bad in itself (as maize and potatoes in a state of decay) and badly cooked, long abstinence from food, cold, exposure, wet. *Rheumatism* is common.”

We give these particulars to show that their exemption from other disorders cannot be ascribed to their generally happy circumstances.

“*Diseases of the Brain.* The small number of cases of apoplexy, I attribute to the New Zealanders not using wine, spirits, or beer as common drinks, *the use of a vegetable diet*, etc. ... Paralysis, the result of cerebral disease, is almost unknown. ... *Insanity and idiocy* are rare.

“The exemption of the New Zealanders from *epilepsy* is worthy of the most particular attention. From the absence of epilepsy, we may infer that the *proper treatment for that malady is to be found in the use*

* *Medico-Chirurgical Review*; Oct. 1854. p. 461 et seq.

of a vegetable diet, without any stimulants. ... Many of the attacks in Great Britain arise from eating and drinking too much. ... It may be said that the Polynesian race are little liable to disease of the brain, but this is not the case; for among the Malays in Ceylon—a similar race—apoplexy, epilepsy, mania, paralysis, and delirium tremens, are all to be seen; but if they do not drink alcohol [which they *do* in today], they stupefy themselves with opium.

“The exemption of the New Zealanders from *Dropsy* and *Kidney* disease, may be chiefly attributed to their abstinence from spirituous liquors; and part to *Scarlatina* being as yet almost unknown among them.”

Such facts are proper to remind us that our sufferings as a nation are self-inflicted—not the result of some inscrutable Providence, but the penalty most wisely and justly attached to our wilful persistence in evil.

Favorable to
other
Temperance.

§ 39. Amongst the ethical reasons for preferring vegetal to animal food is the fact, that while a free flesh-diet *tends* to intemperance in liquor, the use of vegetal-oils, or the *constituents* of fat (starch and sugar), give a distaste for alcoholies, since the two substances would retard each other's combustion. Vegetarianism, therefore, is a physiological guarantee of fidelity to Temperance. *

§ 40. The intimate bond which exists between the food, the blood, the nerves, and the brain, is never questioned by reflecting men. Nay, even physiologists will admit the truth of our theory in relation to certain persons or classes, but make some door of escape for men in general! They cannot be made to see the absoluteness of a tendency, or the essence of a principle.

The fact of the relation between *creatine* (or gravy-essence) and *caffein* has been already stated: and to show how impossible it is to rank such substances amongst nutrient matters, we will give Professor LEHMANN'S experiment:—

Coffee.

“Five persons, one of whom was Prof. BUCHHEIM, now at Dorpat, after taking from 5 to 10 grains of this substance, were unfit for any business the next day. †

“It may be assumed that Nature would not suffer substances even more highly nitrogenized than creatine, as creatinine, to *escape thro' the kidneys*, if they could be employed to further advantage in the organism; since we find so careful a providence over recognized nutrient matters, as for instance, albumen, etc., that even in disease they are only rarely found to escape with the excreta.”

* “Those who take much fat, *butter or oil*, cannot take wine, and feel no desire for it.”—Prof. GREGORY'S *Organic Chemistry*. 1852.

† *Physiological Chemistry*, vol. i. p. 142.

§ 41. That food of an exciting character, or improper kind, beclouds the intellect and depraves the disposition, is generally admitted in reference to *peculiar* temperaments: but how is it that men do not perceive, that all persons have fundamentally the same physical susceptibilities and proclivities to depravation—and that this ‘peculiarity’ simply expresses a prominent degree of a common quality? It has been sufficiently shown that flesh-food, from its very nature, contains in itself, and creates and retains in the system, a large amount of obstructive and regressive-matter. Let MOLESCHOTT explain how this operates on the nutrition and functions of the brain:—

“The limited size of our lungs, and the definite range of our movements, restrict the power of the change-of-matter. If man introduces *more than he excretes*, the tissues become over loaded, endangering their activity,—fat is collected beyond the normal quantity which the oxygen should consume,—and the *albuminous substances and salts* assume a *fixity which at once enfeebles the intellect and destroys the pleasure and power of thought*, diminishing at the same time the strength of the muscles and the inclination for movement.

Moleschott on stimulation.

“The more vivacious the disposition, the more readily is the man excited by stimulants. With individuals of this habit, too nutritious or *exciting-food* is to be avoided, because it increases their nervous irritability. *Vehement, passionate natures become still more ardent from partaking of game, beer, wine, spirits, etc.* By these more fermenting-aliments the circulation is accelerated; *the tissues, especially the brain, are overladen with blood.* This heat is moderated by cooling aliments and beverages. FRUIT AND VEGETABLES, therefore, with lemonade and similar drinks, are *more advantageous* for irritable constitutions.”*

§ 42. These principles apply with increased emphasis to the diet of Woman—woman, our companion and civilizer—but more especially to woman in her holy character of Mother.

The Mother.

“It is no empty prejudice to state,—nay, it is a real belief in the general prevalence of a demonstrated natural law,—that the nature of the mother is communicated by the milk to the child. And there is no thought more natural than the belief, that on the breast of its mother, the infant may imbibe, together with the milk, her very nobility of soul, with the love which devotes that food to the most sacred uses, and fastens still more strongly around the feeble child and the tender mother the ties of their endeared relationship.” † Let Chris-

* *Theory of Nutrition*, § 97.

† *Idem*; § 95. A simpler diet, in economizing the labor of woman, would free her from the drudgery of “fattening household sinners,” and leave her more of leisure to be devoted to the instruction of her children and herself. The *Cooks* of England are hardly dealt with, tho no Hood has yet given us the ‘Song of the Spit.’

tian mothers keep pure the fountain of life, and they will be rewarded by the health and purity of their offspring.

§ 43. Without exposing ourselves to the charge of sentimentalism, we may be allowed to refer to the needless and systematic slaughter of our animated fellow-creatures. As the fields advance, the forests must recede: the higher good justifies the infliction of the evil of death; just as the old generation must retire for the tenancy of the new. It would be another thing, however, if the young, *by choice*, put away the 'old-people'—as some Indians are said to do—a thing indicating, or tending to, hardness of heart. If the Lion is in your path, by all means kill it—if you can—but do not set up the life of Mr GORDON CUMMING as that of the 'model-man'—do not attempt to defend the frivolous fallacy, that Lions exist *for the sake* of sportsmen, and are therefore to be *perpetuated*. Butchers have been called 'the helots of civilization': but while we admit the helotism, we may be suffered to doubt the civilization, and to regard the fact as a mark of barbarism not yet erased. Without stopping to defend the 'rights' of 'dumb-driven cattle'—tho rights they have—we object to beastly slaughter and all the horrid paraphernalia and adjuncts of the system, *for the sake of Man himself*. It is a sort of practical education which tends to blunt our finest feelings and to lower the æsthetic taste and moral tone of all connected with it. This was strongly expressed in a sentence ascribed to PYTHAGORAS:—"He that has hardened himself by killing a sheep, will with less reluctance shed the blood of a man."

§ 44. And at this point we close our brief but earnest Plea for the primitive Food of Man,

While yet he lived in innocence, and told
A length of golden years,—unflesh'd in blood,
A stranger to the savage arts of life,
Death, rapine, carnage, surfeit, and disease,—
The LORD, and not the Tyrant, of the world.

Thomson:

Starting in search of the regimen which would best promote the sound-mind in a sound-body,—examining into the authority and significance of Nature's testimony,—carefully consulting the archives of a broad and varied experience,—analyzing the conditions and laws of Diet in their multiform aspects,—observing the histological methods of Nutrition and the contrasted Pathological symptoms,—entering into the æconomics as well as the character of supply and demand,—and, finally, pursuing the relations of food to the ultimate purpose and highest aspirations of human life,—we come to the clear conviction, not only that Vegetarian Regimen is compatible with bodily-strength and mental-vigor, but that a return to the normal-diet of mankind,

"Woven with sunshine and ethereal fires,"

would, *par excellence*, be a return to that which is most consonant with the greatest amount of enduring toil, with the deepest reach and clearest perceptions of the human intellect, with the highest purity of moral feeling, the utmost serenity of temper, the completest mastery of passion, and, by consequence, accordant with the truest development of Christian feeling, and the most permanent Civilization which is possible to the nature of Man.

ILLUSTRATIONS.

It is almost superfluous to add examples of the experiential results of Vegetarianism, in regard to varying climate, labor, circumstance, and age, but we have not seen the following published in any accessible work, and therefore give them as they have turned up in our reading:—

EGIDIUS GIRS, in his *Swedish Chronicle* (1581), observes upon the obstinate defence of Wesenberg by the Russians—"Their valor in defending fortified places arises from their being habituated to rough work, while few things are needful to their subsistence, such as *flour, salt, and water.*"

PHILIP BALDÆUS, minister of the Word of God in Ceylon, in his *Description of the East India Coasts of Malabar, etc.* (published at Amsterdam, 1672, and London 1703), observes in regard to the habits of the Dutch in the Indies as follows:—"Strong liquors are not much used by the *wiser sort* in the morning. It has been found by experience that *cauwa*, or coffee, increases the gall, and *chocolate* nourishes too fast, whereas *tea* is much more moderate in its nature, notwithstanding which its immoderate use hinders the concoction of the stomach (especially taken after dinner), which is the reason the Chinese never take it after meals. I have found by experience that four or five cups make one light headed" (p. 660).

Hindoos.

"The *Brahmans* are, for the most part, men of great morality—sober, clean, industrious, and obliging—and *very moderate* both in their eating and drinking. They use no strong-liquors. If you tell them of the Christian liberty in victuals and drink, they reply, that as the essence of Christianity does not consist in eating and drinking, so *they did not feel themselves obliged to feed upon such things as are contrary to their nature and education*, being from infancy used to much tenderer food,—*which agrees best with their constitutions, and makes them generally live to a great age*" (p. 814).

Colonel PINKNEY, the American, in his *Travels* (London, 1814), says of the Diet of the French Peasantry:—

"*Bread and fruit* is the constant summer dinner of the peasantry of the Loire" (p. 242). "They are *temperate*, unceasingly gay, and sufficiently clad" (p. 247)

French peasantry.

Of the Touraine peasantry he says:—

"Average daily wages, 1s. They are allowed 3 *pints* of the [weak acid] wine of the country" (p. 297).

“In Ireland, how many robust bodies are nourished solely on *milk and potatoes*: now chesnuts and grapes, and turnips and onions in France, are what potatoes are in Ireland. The breakfast usually consists of bread and fruit, dinner of bread and an onion, his supper of bread, milk, and chesnuts. Sometimes a lb of meat may be boiled with the onion, which, with management, will go thro’ the week” (p. 299).

“The abundance of fruit gives an air of great plenty. The *health of the peasantry may perhaps in good part be imputed to this vegetable abundance*. It is a constant maxim with physicians, that those countries are most healthy, where, from an ordinary laxative diet, the body is always kept open. Half the diseases in the world originate in *obstruction*” (p. 373).

In contrast with this, we make an instructive extract from an article on ‘The last Census of France,’ in the *Edinburgh Review* for April 1857:—

“It is however certain, with the exception of some departments which are suffering from exceptional causes of distress—such as inundations or failure of crops—the general aspect of the French rural population [as to comfort] shows a marked improvement in the last 20 years. Every new house is better built and better arranged than the old cottages. The blue linen blouse is not the only garment of the peasant, winter and summer, but it is worn over good woollen clothing; the bread of the common people is whiter and purer [*not therefore better*], and *the consumption of meat increases*. Five and twenty years ago in a small market-town of Normandy, which we have sometimes visited, there lived but *one* butcher, who earned a precarious subsistence from the neighboring gentry; in the same town there are now *nine* persons living by the sale of meat. The same progress is even more striking in Touraine, Picardy, and the environs of Paris. But this progress in the well-being [flesh-eating] of the community has not led to any corresponding increase in the population. On the contrary, whether the doctrines of Mr MALTHUS are followed or not in that country, *some such check as he contemplated seems powerfully to operate against the rapidity* of increase; and the more the advantages and luxuries of increasing wealth are felt and enjoyed, the less disposed are the French to meet the demands of numerous families” (pp. 348-9).

C. H. SCOTT, in his recent *Travels in the Black Sea*, observes:—“We particularly noticed the power of endurance, while subsisting on scanty fare, of our Volga boatmen, who worked hard day and night, while living literally on *black bread, salt, and water*.”

In conclusion, we shall only observe that the preservation and extension of human-life is the gravest of all problems in Social Economy, while the removal of the causes of disease *within* the body, tho often ignored by noisy sanitary reformers, is the most important of all the branches of Sanitary Law. We commend to the sincere Patriot and simple Christian, a pregnant passage from the *Census Report*:—

“As there is no apparent reason why the mean ‘lifetime’ in England should be 40 years, and as it is found to range in extent, under different circumstances, from 25 years in Liverpool and Manchester, to 45 years in Surrey, and *in other*

localities to a number of years still higher, there is good ground for believing that it may gradually be raised yet nearer to the complete *natural* lifetime. The way is not closed to great and immediate ameliorations; but as it has pleased the Author of the universe to make the food of mankind chiefly the product of labor, their clothing of skill, their intellectual enjoyments of education, their purest emotions of art—so *health and the natural lifetime of the race are, in a certain sense, evidently to be the creation of the intellect and the will*; and it is only with the observation, experience, science, foresight, prudence, and decisions of generations of men at command, that the battle of life can be fought out victoriously to the end.”



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The Objects of the Society are, to induce habits of Abstinence from the Flesh of Animals as Food, by the dissemination of information upon the subject, by means of tracts, essays, and lectures, proving the many advantages of a physical, intellectual, and moral character, resulting from *Vegetarian Habits of Diet*; and thus, to secure, through the association, example, and efforts of its Members, the adoption of a Principle which will tend essentially to true civilization, to universal brotherhood, and to the increase of human happiness generally.

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OBJECTS.

The objects sought to be attained by the above Associations in their organization and activities, coincide with those expressed in the Prospectus of the General Society, page 3.

VEGETARIAN FACTS AND STATISTICS.

TRUE THEORY OF NUTRITION.

The faith placed in the superlative properties of the flesh of animals is prodigious. Let us see what LIEBIG states in relation to this. "Grain, and other nutritious vegetables, yield us, not only in starch, sugar, and gum, the carbon which protects our organs from the action of oxygen, and produces in the organism the heat which is essential to life, but also in the form of vegetable fibrine, albumen, and caseine, our blood, from which the other parts of our body are developed.*" "These important products of vegetation are especially abundant in the seeds of the different kinds of grain, and of peas, beans, and lentils, and in the roots and juices of what are commonly called vegetables. They exist, however, in all plants, without exception, and in every part of plants, in larger or smaller quantity." Again:—"Vegetable fibrine and animal fibrine, vegetable albumen and animal albumen, hardly differ, even in form; if these principles be wanting in the food, the nutrition of the animal is arrested; and when they are present, the gaminivorous animal obtains in its food the very same principles on the presence of which the nutrition of the carnivora entirely depends." The next statement is very important to be remembered. "Vegetables

produce in their organism, the blood of all animals, for the carnivora, in consuming the blood and flesh of the gaminivora, consume strictly speaking, only the vegetable principles which have served for the nutrition of the latter." LIEBIG thus refers to the fact that the nutriment of flesh is the same as that of vegetable food, which is an answer to those who say that flesh contains some desirable quality that is not to be found in vegetables. When you eat flesh you do not get a superior article of nourishment, but just what is in vegetables, *merely the proximate principles of vegetables transferred through the body of an animal.*—*Extract from the Speech of J. SIMPSON, Esq.*

COMPARATIVE VIEW OF THE DIGESTIBILITY OF CERTAIN ARTICLES USED AS FOOD.* H. M.

Barley Soup	1	30
Bean Soup	3	0
Soft boiled Rice	1	0
Boiled Tapioca, Barley, Milk	2	0
Bread (fresh)	3	15
Eggs, variously cooked	2	37
Potatoes, Beans, Parsnips	2	30
Custards	2	45
Chicken Broth	3	0
Mutton Soup	3	30
Chicken	3	15
Roast Beef, Beef Steak	3	0
Roast Mutton	3	15
Broiled Veal	4	0
Roasted Duck	4	15
Roasted Pork	5	15

* *Animal Chemistry*, pp. 106, 45, 47, 48.

* From Dr. BEAUMONT'S *Experiments on Digestion*