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J. Taylor Snow

Miss A. D. 1836.

21 Latham St. Edin^g

Healthy and Diseased
Nutrition. —
—

Most Physiologists have ceased to consider - the assumption of a distinct entity in a 'Vital Principle' - as at all necessary to their researches into the phenomena of Organic life, or as tending to remove any of the difficulties that accompany their investigations; and when, therefore, it is said that, Life is inseparable from Organization, and the latter essential to the former, instead of implying that there is a principle manifested in organization, which is independent of organized structure, it is rather meant that Life is 'Organization in action', while the so called 'vital facts' are but the general expressions of the conditions under which its operations are accomplished -

Those who assume the existence of the distinct Entity referred to derive therefrom no clue to the series of Organic phenomena, or insight into the mode by which Nature

Nature ~~thus~~ accomplishes her operations; — on the contrary — they resemble in this respect untutored men not arrived at the state of mental development which gives the facility of studying the phenomena as the effects of laws — the offspring of some ultimate fact. Thus, the Savage is in possession of this 'essential idea' (the vital principle) when he instinctively separates the sand of the desert from the ostrich that treads over it the ocean from the fish that inhabits it: respecting the perceptible world, his ideas are perhaps not equally distinct, yet he fails not to mark how different is the soil of the valley from the forest in its bosom, how unlike the rock is to the wild-flowers of its crevices. But there his observation finds its limit, he forms no idea of what

what is meant by organization. It is otherwise with the wise physiologist unbiassed by the light of tradition. The Nature that he sees, likewise, seems with wonder, & is contemplated through the medium of science, and while he magnifies the great Creator who ^{governed} framed the laws and elements, he ascribes to no supernatural principle in continued agency, what he feels it easier and more reasonable to ascribe to proper fixed & perennial in their general effects.

Life - Organization - are but terms - indicative of certain conditions different from unorganized matter. We cannot assert that the one is the cause of the other, the other the effect, they are inseparable; - Take away the life, the organization is dissolved, - destroy the organization, the life ceases.

But

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But it may with propriety be asserted that, Nutrition consisting of the constant interchange of organic fluids in plants and animals is the source and sustenance of Life

In considering the nature of this process, the Microscope is the pioneer of discovery. People may doubt its value in Therapeutics, never in Physiology. It has placed the vital elements within the sphere of visual analysis and demonstrated the common structure of living bodies. Human blood is known to be no more homogeneous fluid, capillaries something else than simple tubes and nerves on the other hand but a multiplication of other structure, the phenomena of growth and Nutrition have been simplified and Physiology placed on a simple basis, while the ignorance which shrouds over the processes



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*Pagination is inaccurate in original
volume*

processes of life is removed and
 there is drawn aside the line
 which imagination has placed
 between the living and the
 dead. — "11

In this consideration we have no-
 thing to do with the existence of
 the soul. The sublime dogmas of our
 religion, more science never could
 have revealed. While as regards the
 origin of Mind the conjectures of
 philosophy are but darkness. It
 is to be sought in a close inspection
 of its organ — the cerebrum, and our
 idea of it must be that it is an
 outgrowth of the Body, for how
 was it educed, how is it sustained?
 We cannot thoroughly unfold
 the mystery of Thought, but it was
 the offspring of the Organism in
 which it dwells — it grows with
 its growth — it fades with its
 decrease. "Where is the mind of the
 Fetus when that of the Child just
 born? His trust up before us
 by

(1) This refers merely to physical structure.

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by the acture of the senses and the
development of the faculties."
All Consciousness is dependent
on Cerebral Nutrition - every
form of Blood poisoning modifies
it - and to anticipate, what
is the nature of physical death?
The process of Nutrition is character-
istic of Plants and Animals; -
between the Kingdoms, so called,
which here respectively form
there is in the lowest extremes
no distinct boundary in point
of appearance, far less in point
of nature. The primary forms of
either, are all organisms, and
what is of prime importance in
our consideration of them, Man
the noblest development, is, es-
sentially speaking, a congeries
of cells - a collection of
Monads. The primordial Monads
are typically of globular figure,
composed of four parts, - an
anterior integument or wall, a
nucleus

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nucleus, and an intertypy nucleus
of granular matter. Such af-
food by their simple selves the
simplest type of existence, Leri
of ascent clearly traced lead
through to the higher develop-
ments till pollen grains from
stamens enclosed with blossom
fall on the ova of the seed-
pencil, or Man of complex struc-
ture and placed above his
fellows, holds converse with
the Father of his being: - both
the plant and the animal
gifted with the capacity of
double conception of similar
existence, and thereby with con-
tinuance of the species. Indeed
the normal ultimate ~~part~~ ^{function} of
living structure is the regular
metamorphosis comprehended in
the process by which the type
& texture, form & qualities es-
tablished by the species are
faithfully handed down from
parent

parent to offspring without
 fault, deviation or change?
 To repeat: the perfect plant or
 animal is an elaboration of the
 lowest. The transformation of the
 vegetable cellular embryo in the
 special organs is perfectly establish-
 ed: the variety of plant structure
 is executed by modification of
 the parenchymatous texture - There
 is an uninterrupted passage from
 leaves to bractea from bractea
 to calyx, from calyx to corolla
 from corolla to stamens and
 from stamens to pistillum?

The ovum of the animal is a
 simple cell; the structure of the
 embryo is corpuscular that is
 to say composed of corpuscles
 with slight cohesency; when first
 weeks old nothing can be
 detected but texture soft and
 cellular, not fibrous or coherent,
 neither vessels nor nerves, nor
 anything in the shape of cartilage
 or bone.

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But, in time, according to the multiplied observations of competent observers, in this order, are evolved the final elements of the structure — cells — fibres — cartilage — bone, while the formative association of the cell organisms into tissues takes place previous to the formation of blood-vessels & nerves so that, in this far, the growth of the human embryo is identical with that of the vegetable prior to the formation of a green leafy parenchyma, — and further, — as thereafter — the parenchyma spaces & stomata of the leaf and the spiral cells of the stem, are necessary to the perfect existence. — In Man, the cells of the blood and brain and the interstitial capillaries, in the solid textures, prolong the scope of vitality.

Such is the morphology of life — most imperfectly sketched in a
very

very general way and it is of
parent, that, while the miss
of the plant is towards more
increase of structure, that of
the animal is pre-eminently
Asymmetrical

The animal functions are the
visible expressions of this miss
and an elaborated structure
is produced more remarkable for
differentiation than extent; while
health & disease are the result
of the ratio of the co-ordinated
actions of the tissues whose descent
we have traced: for we should
never allow consideration of these
functions to separate from our
ideas of the living system, the
recollection of the framework on
which they depend - of it
they are ~~the~~ outgrowths - as
the horn - of the Rose or the
matrix - of the Coral.
Take the case of the Nervous
System, the glory of our social
elevation

elevation. The simplest animal has as definite an end as the highest. In fact, after all, arising from the adjustment of cells. The contractility of the vegetable exists in the reflex phenomena of the higher existence. In the lowest being there are the rudiments of neurone and the diffused properties of the nervous system. Thus in the Radiata, you can trace groups of ganglionic cells with afferent and efferent branches — a nervous system; the development advances, the reproductive instincts predominate at first, but in proportion as the relations of the animal multiply, and it begins to repay its obligations to the organic system, the differentiation of special organs is induced, and more particularly is developed the apparatus necessary for the phenomena of generation. In the brain of Man are concentrated the

the scattered foci of the Nervous System, while the cerebrum is but a series of cells and tubes, washed every one of them by the blood of the Body.

Again, it is the same with the Circulation, that is, with the current of the Blood. For while the progress is caused by the vital attraction of the tissues and the stimulus that results from the form and mechanism of the heart, the blood itself is like the rest — 'moving flesh' — composed of corpuscles of two kinds which go to form through decomposition the other constituents the 'Liquor Sanguinis' —

But ~~not~~ dwell further on this point — such is the nature of our earthly tenement — we have already said that, the membranes diffusible of organic fluids is the ultimate basis of physical life.

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In the lowest forms, when the associated performance of attraction and repulsion is accomplished through the medium of a single cell this is very apparent. and as regards Man, we have built him up and seen him to be composed of Morada, and it were easy to show that the fluid interchange referred to in him maintained by a repetition of the primordial plan, in which cells, tubes & fibres prolong the existence of the simple cell. All must admit the propriety of the view with respect to the foetus in the womb, before the appearance of placenta, while it is yet attached to the vascular system of the parent, and grows by interstitial absorption by the villi of the chorion from the reflecting surface of the uterus. But that unseen life will hesitate before subjects

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The 'wonderful' frame of the adult
to the same education: yet here, too
traditional wonder must ~~also~~ cease
its influence, and for that purpose,
let all arbitrary distinctions
between Nutrition, Secretion, and
Absorption as three separate functions,
be dismissed — such distinctions
are but coloured lenses that
distort the view — the three
may be fitly styled — one process —
which is properly expressed by
one of the terms — Nutrition —
expression of the continual inter-
change of organic matter in living
bodies.

The food of life is not immediately
applied to the tissues, but enters
the current of the circulation and —
diffused by means of the Osmotic
force — is thereby accumulated to
the tissues of the body. For the
maintenance of life, moreover, it
is not enough that they take place
the deposit of building materials
— there

There must take place the constant
 removal of effete matter which is
 in turn replaced by the materials
 aforesaid. Hence, as has been observed
 in a recent publication, *vegetable*
life is confined to the buds
 the flowers and the leaves in
 trees and shrubs so that in
 them the place of the earth is supplied
 to these parts by the consistent
 trunk - a mass of organized earth.
 For, the living interchange of
 material has no place in the
 economy of the solid stem -
 We thus notice that vital action
 as such, is of short duration
 - it may be said to cease
 on the completion of the structure
 it produced, unless the structure
 has a special object to serve
 other than connected with its
 existence as a new organized
 material. But, in the other part
 secreting cells, muscular fibres,
 pericellular neurine &c continues

to exist in the exercise of special function, apart from the necessities of growth, and the greatest is maintained by the full play of molecular nutrition. The absence of which from any tissue after its structural development is equivalent to the state of Inorganic matter. — It is further observed that, the greater the energy of growth, the ~~the~~ shorter the duration of life. —
'Nascentes morimur' —



"Having now learned the order of Nature in forming the perfect individual we may thereby estimate the deviations which constitute disease."

By the Ancients the blood was usually made the seat of all disease: it was the vital humor of the Humoralists; the seat of death of those Orientalists that styled it the

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the 'life of the body', Harvey's discovery of the circulation caused a change of opinion; it made men look on disease with mechanical eyes, and there was constituted a new kind of enquiry - the 'dynamical'. This tended to Solidism, which drew exclusive attention to the solid tissues, and the tendency was upheld by the increased study of the Nervous system & the prevalence of such disputes as the Hallerian about irritability, - while amid the confusion of systems, emerged the doctrine of disease from spasm or relaxation of the vessels from variations of tonicity, and the 'error loci' theory of Boerhaave. - Cullen was the ornament of the dynamical school - it reached its climax in John Hunter. - The present century has promulgated the theory that disease consists of a peculiar perversion of Nutrition, - as we have defined

defined it — in the part affected.
 Now this is no phantastic theory
 — no valueless hypothesis — if
 it be true — and by enlightened
 consent, it is true — we are thus
 provided with a guide of great
 practical importance. For instance
 Hunter held that Cartilage could
 not inflame because it had no
 vessels, but unluckily for the
 pathologist in question it pre-
 sented to the eye of those days,
 the stereotyped phenomena of in-
 flammation. To meet the diffi-
 culty, many views were
 propounded; one held it was not
 subject to ulceration in the proper
 sense, but merely to attrition;
 another that there was superin-
 duced a vital process atten-
 ded with development of
 vessels; but through the recent
 researches of Professor Gosselin &
 Dr. Keegan, we are able to
 understand the nature of the affection.

Yours
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You can hardly call this an
 'inflammatory ulceration' — but it
 is a diseased condition of the
 ultimate nutrition of the tissue
 characterized by excessive en-
 dogenous development of the corpus-
 cles — And as a conclusive
 example — because the latest
 & furthest development of the
 doctrine — we have but to rec-
 lect the extraordinary influence
 exerted by the opinions and
 researches of Professor Bennett,
 on the practice of the day.

Yet, it may be asked, do not
 modern pathologists ascribe a too
 pre-eminent influence in disease
 to the elements of non-^(or, extra)vascular tissue?
 To determine this, let us shortly
 institute a comparison between
 the parts played by the vessels
 and the ~~parts~~ ^{structures} referred to.

1. The tissues distinct from the
 vessels — extravascular.

We have seen what is meant
 by

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by the 'individual existences' in the lowest forms; now, if a diseased action were induced in one of those primordial organisms, it would be ~~merely~~ merely a disturbance of the vital relations of Attraction and Repulsion, independent of vascular action. And what is true of the solitary cell, is true of each permanent cell which in its congeries goes to constitute the human texture - *mutatis mutandis*; and the diseased action might be termed a change in the normal relations of the permeating fluids of the organism. This view, it is important to remember, is applicable to the tissue of the blood principally composed of corpuscles, as most pass, but plasma, texture of inherent vitality, subordinated to the wants of the organism. The whole is exemplified on a large scale in those non-vascular tissues

lymph, nourished by imbibition from porous sacs, as Cartilage and the Humors of the Eye —

2. The Vessels

We have viewed the vessels as something else than mere carriers of nutriment — they are living textures which live by imbibition like the others — and they of course exercise an influence on the contained tissue. It is through them, that the mutual reactions of the circulation are accomplished, and ~~both~~ the alliance amongst the tissues is so intimate that, in lesion of Nutrition, the whole are similarly involved. This takes into consideration the three doctrines of Solidism, Humorism, & Vitalism, and it is difficult to perceive how Pathology is to be advanced unless some such simplification be generally adopted.

We can now answer the Question

Ed -

Question - How much in a morbid lesion is due to the extravascular, how much to the vascular tissue? - Let us suppose the vessels suddenly become dead membranes, all the action of Nutrition stops. - That is the natural result. - Subjected to the ordinary play of physical laws on granular matter - ex- osmosis and endosmosis in abnor- mal action - the hematics of the corpuscles will join the serum - the serum take the place of the dense fluid without. And this shows that were it not for the power of the vessels to retain the blood within normal limits, disease or death would be the inevitable result from abnormal transudation of the liquor sanguinis, and this, most properly, has 'exudation' been made the essential phenomenon of inflammation, while the other types

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types of disease, as Cancer and
Scrophla are similarly produced.
All disease is impairment of
Nutrition, Hypertrophy & Atrophy
are relative terms, - hence, the
therapeutical conclusion - treatment
shd consist of exaltation
of function.

"Having learned the ways of
Nature, we shall be able
to succour her and turn her
about." - (Bacon)

End