THE DISCOVERY

OF

THERMO-MOTOR FORCE;

The Secret Spring that Wields the Power

OF

LIFE AND DEATH:

Its Seat, Process of Production, and Modus Operandi.

THE RESULT OF CLINICAL, PATHOLOGICAL AND EXPERIMENTAL RESEARCHES AT GUYS HOSPITAL, LONDON, AND OF THE WIDE FIELD OF OBSERVATION PRESENTED AT THE BELLEVUE AND OTHER NEW YORK HOSPITALS.

By JOHN AYLWIN BEVAN, M. D.,

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To My Beloved Parents,

AND

TO HER

WHOSE CHEERFUL COMPANIONSHIP, POWER OF COMPARISON,
JUST DISCRIMINATION, NO LESS THAN DISINTERESTED
UNSELFISHNESS AND HEROIC ENDURANCE,
I OWE SO MUCH;

TO MY BELOVED WIFE

THIS WORK IS DEDICATED,

WITH THE HOPE,
THAT THEIR SHARE IN ITS PRODUCTION, AND THE GOOD IT
WILL ACCOMPLISH, MAY BE RECOGNIZED BY
THE WORLD, AS IT IS

BY THE AUTHOR.

DISCOVERY OF THERMO-MOTOR FORCE.

CHAPTER I.

DEAR READER:

If you were dead, and yet retained the capacity of seeing all that is going on in the world, "the cause that lacks assistance," "the wrongs that need resistance," the strong trampling on the weak, women and children the great sufferers from weakness, and men from ignorance and want of self-control in the struggle of life, and if, when in Hades, you saw all this still going on, and reflected that during your lifetime, when you *could* have fought for the weak, and taught the ignorant, you allowed indolence, indifference, fear, or selfishness to step between you and action, and did *nothing*, and if then, whilst longing to stretch out the friendly hand, to give the sympathizing look, you were doomed forever to watch sufferings which you were eager to prevent, and think over and over again the same thought, that the opportunity was *once* given you to do this, but that *now* it is lost to you *forever*, would you not inwardly resolve that if ever again your spirit should assume the human form, and you should mix again with your fellow-mortals, you would seize the present moment and stamp it with all the intensity of *action* of which your soul was capable before it was *again* beyond your grasp?

Such, dear reader (inasmuch as we are all dead [*as regards action*] to the past) is *my* position, and such my resolve.

For I, only a few weeks ago, had a near relative, whom I dearly loved, and I had also recently made an important discovery on the subject of health, of which he was ignorant, and which it was my duty and intention, no less than my privilege, to communicate to him, but at that time my mind was occupied with urgent and important business, and I therefore wrote that I *intended* sending him a long letter *soon*, and put it off to a more convenient season. A brief interval elapsed, but instead of a reply from him came a *black-edged* envelope, and you know the rest. Typhoid was

the cause. Had I written that letter when the thought *first* occurred to me I might have saved him, but *now* the opportunity is lost to me *forever*. My relative, a few weeks before his death, was in as *apparent* good health as you, dear reader, and yet he was cut off in youth, leaving his young wife and children to the world. Why or how? From want of money? No, he was wealthy. Simply *from want of knowledge of Thermo Motor force and how it may be controlled.*

I purpose, therefore, dear reader, with divine assistance, to communicate this knowledge to you,—to analyze the causes of premature death—to show that either misery or happiness is in store for you, as you remain in ignorance or acquire this knowledge, and, by a familiar comparison, how to avail yourself thereof; to show how I discovered the existence seat, process of production and *modus operandi* of the *thermo-motor* force. and how, not only cholera, but all diseases brought on by defective nutrition, viz., degenerations and emaciations of organs, including pulmonary consumption, and also paralysis of the voluntary muscles and premature decrepitude, are caused, and how they may be prevented.

To bring to light the concealed process essential to pain, its object and use, and how it may be *permanently* removed, To point out the remedies, that it is a fact, the American differ from other peoples, in this, that their minds are *not fixed*, they are open to new ideas, and ready to act on them, *if they find they can profit thereby.* It is this characteristic, derived from the blending of the Norman and the Saxon races, which gave them the moral courage to resist the encroachments of king, and priestcraft, and to throw them off, thus acquiring the power of governing themselves, like their ancestors in the old Norse song.

The Norman and the Saxon foe
  Are long since dead and gone,
Their language and their races, both
  Are blended into one.
But we, their children, still maintain
  Their old supremacy,
Wherever vessel spreads a sail—
  We rule the stormy sea."

In the same way, if it can be demonstrated to them that they are held in bondage by erroneous notions, caused by want of knowledge of this discovery, that same indomitable spirit of independence of thought and action, will make them throw off said erroneous and mischievous, and adopt true and beneficial conceptions like these same Danish ancestors of theirs in the old song:

"Too narrow was their native land
For hearts so bold and free,
From bay and creek they sailed forth
And conquered Normandie.
And let their glory oft be sung,
In thrilling harmonie,
And let it, aye, be borne in mind,
They ruled the stormy sea."

And that it is no less a fact, that there exists two *dominant* causes of disease.

I shall endeavor to exhibit these causes in the clearest light of which the subject admits, and which, from their importance, they deserve, and if the American people are in earnest, they must go to the root of the matter, by employing the same sagacity and resolution which won them their independence and their constitution, to devise and execute a plan for their removal.

CHAPTER II.

It is now my privilege to bring to light the hidden process essential to pain, its object and use, and how it may be *permanently* removed.

Let us inquire by what process is pain, that mighty engine of cruelty, that great test of endurance, through which we all pass, in different degrees, from that caused by "a grain of sand, a gnat, a wandering hair—any annoyance to that precious sense," to that of the racking headache, the agonies of labor, or the excruciating torture of an extensive burn, brought about?

Who has not observed swellings and discolorations in the leaves of living plants?

Have you ever opened them, and also observed the ova of some parasitic insect deposited therein, and asked yourself how this destruction and discoloration of the tissue of the leaf has been caused? and perceived that the growth of these ova pressing on the surrounding tissue cells diminished their resistance to the oxygen to such a degree that they were not only incapable of performing their usual function of decomposing the carbonic acid and assimilating the carbon, but they could not even protect themselves from the action of the oxygen, which accordingly decomposed them, producing discoloration and death of said tissue cells?

If so, you will have no difficulty in comprehending how pain is produced when I assure you that just as you may have seen parasitic growths in the leaves of living plants cause their discoloration and destruction, so I have observed the same cause, viz., a parasitic growth, in the brain of a child of nine years (by its growth and expansion, compressing the surrounding cells of one of the centres of sensation (right optic thalamus), thus diminishing the resistance of its cells to the oxygen to such an extent that they could no longer withstand its decomposing action, gradually changing it into a cavity containing a clear fluid) induce severe pain in head and also in corresponding side of the body, increasing with the increase of its rate of growth, until the whole of the structure of said sensory centre was destroyed, when the pain also ceased, thus proving not only that the optic thalami are the seat of sensation, which is distributed from them by means of conductors or nerves throughout the surface of the skin, mucous and serous membranes, but that the essential cause of pain, in *every* instance, is the destructive or burning action of the oxygen on the cells of said sensory centres themselves or on their conductors or nerves, whether induced by compression of their substance, as in this case, or by waste of the thermo-motor force, as is proved by that which follows, and which being the first case under my charge at Guy's Hopital, I shall not easily forget.

It was that of a middle aged man whose body presented a most extraordinary contrast in form: his limbs and face

being shrivelled to that of a mummy, whilst his abdomen was that of a second Daniel Lambert.

This poor fellow could eat nothing but a little rice, and his sufferings were terrible.

Now, why did this man die in such agony?

The essential cause was the decomposition or burning of his centres of sensation (optic thalami), by the circulation of oxygen, which is demonstrated and rendered *absolutely certain* by his own words, for the day before hfs death, he said to me, "Whenever I take even *a little tea* to drink, it feels like *a burning coal* all over my body," for as tea is known to increase the rate of respiration and the amount of oxygen therefore, they prove that burning pain increased and decreased with the quantity of said oxygen in the circulation.

Pain, therefore, may be allegorized as chaos (ignorance and destruction) applying a pencil of flame (the oxygen) either to the substance of the optic thalami themselves, or to the nerves or the conducters of the sensitive fluid therefrom to the skin, mucous and serous membranes.

The quacks, as Mephistopheles, applying a shield (opium) between the nervous substance and the flame (oxygen) so long as he is paid for so doing.

Whilst knowledge of this force and principle may be typified by Pallas Athene, teaching the sufferer how to economise this force, by controlling the emotions and by regulating the actions and appetites, thus warding off pain by increasing the resistance of the cells of said sensory centres to the action of the oxygen, and by increasing the power of the digestive organs to produce those fluids necessary to protect their cells from its destructive action.

The object and use of pain may be compared to that of the alarm whistle in the steam engine, for as the latter gives us notice when there is an excessive degree of pressure to the square inch, thus preventing a boiler explosion, so the former warns us when the optic thalami, or any part of the skin, mucous, or serous membranes are in danger of destruction, thus preventing fatal inflamations of those membranes.

CHAPTER III.

I will now analyze the causes of disease and premature death.

"Felix qui potuit rerum *cognoscere* causas," "Happy is he who *knows* the causes of things." Wherefore? Because having witnessed certain phenomena in others, and traced them to their causes, he *knows* how to avoid them.

Thus, he who has attended two men during their last illness, one of whom has habitually drank beer to excess and the other whiskey, and who has done his best to alleviate the nausea, headache and delirium of the one, and the intense pain of the other, and who after death has traced these effects to Bright's kidney in the former, and cirrhosed liver in the latter, ever afterwards, by the law of association of ideas, connects excess in dilute alcohol with all the miseries of premature death by Bright's kidney, and excess in concentrated alcohol, with the torture of a similar end by cirrhosed liver, and perceiving how easily alcohol may become an instrument of suffering to himself and others, whilst it in no way nourishes the body, but tends to blunt the feelings and impair the memory, he instead of encouraging others to partake of it by being a moderate drinker, resolutely denounces, avoids, and thus treads it under foot.

My analysis furnishes me with thirteen cases of men of different occupations who partly from the want of this association in their minds of the penalty with the indulgence, which actual experience alone can give, partly from want of that self control which a proper education ought to supply, perished prematurely by this predominant cause.

Their occupations were: 1, brewer's drayman; 2, lawyer's clerk; 3, valet; 4 workman; 5, shipping-clerk; 6, bricklayer; 7, brushmaker; 8, engineer; 9, laborer; 10, soldier; 11, barkeeper; 12 and 13 not stated.

Or, he who has attended those in the last stage of disease, who have habitually overworked themselves physically in a moist climate, and who has exerted himself to diminish to the utmost their troublesome cough, bloodspitting and diarrhœa, their profuse perspiration, their great pain and

tenderness across the chest, and their gasping for breath, and who after death, has similarly seen these results linked with tuberculous lungs, always thereafter by the same law, unites excess in physical work with all this distressing suffering; and if before inclined to such excess he now not only regulates his own work by the amount of his strength, but gives his best efforts to enforce this truth upon others.

My analysis supplies me with nine cases of persons in different callings, who, from want of the practical knowledge: 1, *that excessive physical work in a moist climate and flesh meat instead of properly prepared cereal, vegetable fruit and milk diet, tend directly to pulmonary consumption;* 2, *that all occupations which drive the blood to the lungs tend to the same end;* 3, *that all work, continued when you are fatigued, is excessive;* 4, *that a winter cough is the first stage, for which medical advice ought to be sought*—paid the penalty of their ignorance by an early and painful death. The victims are arm-workers, viz: laborers, carpenters, coopers, warehousemen, gunners, cartridgemakers, occupations which tend to send the blood to the lungs, and which should therefore be avoided in such cases.

Or, he who has seen those in the dying stage, who have habitually given way to sexual excesses, and who has essayed to mitigate their shivering and convulsions to arouse their unconsciousness, or to control the violent delirium that ensues on the sudden suppression of Urine and consequent blood poisoning by urea, and who after death has found the other end of the chain which joins these symptoms to a stricture, and consequently diseased kidneys, and perhaps a partially destroyed brain, cannot fail in afterwards, by the same law, associating sexual excess, with all this severe physical and mental suffering, and will not he warn his fellowman?

My analysis supplies me with 6 cases of premature death, in which this cause was predominant, in 4 there was Stricture, in 1 Disease of the Brain and in all Disease of the Kidneys.

Or, he who has been at the bedside of patients dying prematurely, who have lived and worked in a marshy dis-

trict, and who has endeavored to remove their pains in the limbs and back, their shivering and labored breathing, their violent cough, delirium and unconsciousness, and, who after death, has traced these phenomena to an extremely wasted Brain and a degenerated Liver, Kidneys and Spleen, must by the same law always connect Marsh Miasma with its corresponding suffering from Atrophied Brain and degenerated Abdominal Viscera, and will not feel it his duty to warn those living on undrained land that unless they either remove themselves elsewhere, or the cause, by draining their land, not all the Quinine on the slopes of the Andes will prevent them from ultimately sharing a similar fate?

My analysis gives 2 cases of premature death from Miasma. Both laborers on undrained land in whom the above changes were found after death.

Or, who that has vainly treated the pain and breathlessness of one patient, or the continuous vomiting and purging of a second, or the constant paralysis, headache and irritability of a third, dying from the habitual use of food deficient the first in Gluten, the second in the Phosphates, and the third in soundness, and who, after death, has connected these symptoms with Heart Disease in the first, with fatty Liver and Kidneys in the second, and with hydatid tumor in the Brain and Liver in the third, will fail afterwards by the same law to connect want of food containing Gluten with the pain and breathlessness of Heart Disease, want of food containing Phosphates with the constant purging and vomiting of fatty Liver and Kidneys, and diseased pork, with the paralysis pain and irritability of Brain Tumor? And will he not impress on those around him the necessity of a diet which shall include in some form or other the albumen, fibrin and casein of fruits and properly prepared cereals and vegatables, and which shall exclude all animal food whatever?

My analysis shows, as might have been expected, that the victims are poor women and children. The first case was a waiter, the second a poor widow with five children, and the third a girl of 9 years.

Or, who that has alleviated the intense abdominal pain in extreme cases of Typhoid, in those who have habitually

worked in unventilated rooms, without either fresh air, sun or exercise, and in whom ordinary Typhoid has been aggravated by taking mercury in any form, whether as the so-called Anti-Bilious Pills or the officinal Pill, and who, after death, has followed these symptoms to their origin, an ulceration and perforation of the glands of the large intestine, can help, by the same law, linking together deficient air, sun and exercise, and the habit of taking Anti-Bilious Pills with premature death, and the intense abdominal pain of perforated intestine?

My analysis states two cases, Eliza C., *æt* 13, an envelope folder, and David B., *æt* 21, a storekeeper's assistant. Both victims to the above predominant causes.

Or, he who has attended women in the final stage of disease, who have habitually oversuckled their infants, who has observed the deep yellow color of their skins, and has used every means to alleviate their constant headache, blindness, their unquenchable thirst and excessive vomiting, their foaming at the mouth, restlessness and spasmodic breathing, and who, after death, has found these symptoms originated from an acutely atrophied and yellow liver—will, by the same law, thereafter associate the habit of oversuckling infants with the acute physical and mental suffering of atrophied liver, and he will take care to impress ignorant nursing mothers with the magnitude of the danger to which they are exposing themselves.

My analysis shows two such cases, in one of which the Jaundice came and went, as the suckling was renewed or discontinued, up to a certain point, when it proved fatal.

Or, he who has attended at the bedside of the man who has constantly overworked his brain, and who has observed his vacant expression, loss of sight and memory, and has done all in his power to alleviate his headache and sleeplessness, his delirium and unconsciousness, and who, after death, has pursued all these phenomena until he has found them joined to a brain tumor,—will, by the same law, after this, unite excess in mental work with premature death, physical pain and Dementia. And he will teach all those who have entered on a similar path to avoid it.

My analysis presents one case, that of an East India merchant's clerk, who brought this on himself by excessive hard headwork converting Indian into English money. *Excessive here meaning, as before stated, mental work continued when feeling languor or headache.*

Or, he who has been at the bedside of the man who has habitually chewed and smoked tobacco to excess, who has observed his emaciated and haggard look, his great soreness of throat and pain in neck, and such difficulty in swallowing as to interfere with his proper nutrition, who has seen this man sink in spite of an operation to introduce food direct into the stomach, and who, after death, has sought out the hidden origin of these symptoms in an extensive ulceration of the Œsophagus—*will later ever incorporate excessive chewing and smoking with premature death, and the pain and starvation of Œsophageal ulceration. Excessive, here, means chewing and smoking continued in spite of relaxed or sore throat.*

My analysis offers but a single case of premature death from this predominant cause, that of a tobacco cutter.

Or, who that has seen a man with tumor in the groin, subjected to the improper treatment of mercurial vapor baths, and has observed, immediately after the first bath, shivering and sickness, and after the second raving delirium and death, and who knows the action of mercury is to destroy the red blood cells, and who, after death, finds the degeneration of organs, which always accompany this blood state, will omit in future, by the same law, to associate the taking of mercury into the system with premature death, and all the physical and mental suffering of a decomposed blood? And will he not denounce its use accordingly?

CHAPTER IV.

Before unfolding my discovery of the thermo-motor force I will endeavor to place the subject in a clear light by a familiar comparison. We know that paper money is the equivalent of several combined powers or forces, and yet it is valueless unless there is corresponding specie in the bank.

So also is the health of the body, and yet in it too apparent prosperity is equally fictitious unless there is a corresponding reserve of thermo-motor force in the brain to preserve it. Therefore, as specie, not paper, is the measure of solvency, so the *reserve* of thermo-motor force and not *apparent* health is the measure of that power of resistance to opposing conditions and processes in which real enduring health consists. Or we may divide the money force spenders into three classes: those that *exceed*, those that live *up to*, and those that live *below* their income, and we observe that the first class come to grief in prosperous times, that the second get along until reverses occur, when they too succumb, and that the third only escape disaster in times of general depression. Now, we may with equal truth similarly classify people as regards the expenditnre of the thermo-motor force essential to health.

Some use it *excessively*, and they are continually sick, even youth. Others use it freely by what is termed "*generous*" living, every variety of fish, flesh, fowl, wine, beer, spirit, tea, coffee and condiment, and although always on the verge of sickness maintain *apparent* fair health, unless any *unusual* strain be brought to bear upon them. Directly this is the case, either from some *unusual* exertion, or perhaps the breaking out of an epedemic, and they too are attacked and perhaps carried off.

Others, again, use it *economically* by a plain and simple properly prepared cereal fruit and vegetable diet, and an open air life, and these in times of excessive exertion, hardship and pestilence maintain their wonted health, and live to an advanced age, whilst thousands of the members of the other classes are dying around them, or live hale and hearty to a patriarchial old age, whilst *they* sink into premature decrepitude.

Now. why the superior endurance of those of the third class of brain force spenders?

Is not the reason to be found in the same cause that gives the corresponding class of specie money force spenders that power of *tiding over* reverses, not present in the other two; viz., the possession of a *reserve* of power or force?

Is it a fact, that those who economise thermo-motor force by a simple diet of properly prepared cereals, fruits and vegetables, an out-of-door life, avoidance of stimulants, and excesses of every kind, enjoy a length of life, freedom from disease, and a clearness of intellect to which the flesh-meat eaters, self-indulgers, who take as their motto, "*Dum vivimus, vivimus,*" are strangers.

How is it that the length of life of the Brahmins of India is so extraordinary?

Does not their caste oblige them to follow this mode of life?

What was it that enabled Howard, originally of a weak constitution, to live forty days in a filthy lazaretto, to mix freely with those suffering from cholera, and yet escape unscathed?

Was it not his simple cereal fruit and vegetable diet?

And did he not give it as the result of his experience that those who partook of animal food were the *first* to be attacked by the disease; and is not this a well-established fact, and if so, why is it?

By the aid of this discovery the explanation is sufficiently simple. I will demonstrate in its proper place that the medulla has a certain quantity of stored up thermo-motor force in a state of rest, which *once* expended in motion can *never* be restored.

We also know that the red blood cells are the oxygen carriers which convey that gas all over the body, that they release it in the capillaries, where it performs its function of decomposing the tissues and brain substance and releasing said force. The more freely, therefore, these cells are supplied the quicker the rate of decomposition and the release of this "ONCE lost NEVER regained" force, and the *sooner* its exhaustion, which is death, must occur, whilst the slower these blood cells are produced the more tardily these cells are decomposed and said force released, the *longer* it is before itsexhaustion and death takes place.

Now, the chief difference between animal and vegetable food is this: in the former the animal albumen and fibrin of the blood and muscular fibre is contained ready-made in a

concentrated form, and only has to be *dissolved*, whilst in the latter the vegetable albumen and fibrin have to be *prepared and concentrated* by the organism before it can nourish the blood cells. Therefore animal food multiplies them rapidly, vegetable food *slowly*, and the rate of expenditure of thermo-motor force corresponds. Hence the superior endurance and length of life conferred by the simpler diet.

Thermo-motor force resides in the medulla oblungata, and as before stated, being essential to the digestive process, wields the power of life and death, for upon its integrity depends the preparation of those fluids which perform a three-fold office, for they are the nourishers of the body defending it from the destructive action of the oxygen, and diffusing through it Animal Heat.

Everything which tends to weaken said force, helps also to hand over the body to destruction.

Nor does the oxygen when it *once* commences, do its work slowly. A couple of years on the average suffices.

How jealously then should mankind economise this force!

By the help of this discovery, man will become his own saviour for he will now need no physician to teach him self-control. For just in the same way that the discovery that the principle of "do as you'd be done by" based on love of others underlies the thousand varieties of religious creeds, will overthrow the wily devices of priestcraft, and the evils of fanatical hatred and persecution amongst races of different religions, by causing them to recognize that they are all members of one great brotherhood, animated by one great sentiment and its harmonious principle. So the discovery of Thermo-motor force, *and that waste of said force is the concealed cause of every form of disease*, and its corresponding principle, based on love of self, will overturn the rival schools of medicine, by rendering them superfluous, and priest armed with threats of eternal woe, and physician with bolus and globule will be consigned along with the rack and the thumb screw to the merited oblivion of the dark ages, and in their stead will rise up under the shelter of friendly colleges, men who will consecrate their lives to the discovery and promulgation of those great truths, upon which man's physical and mental welfare depend.

CHAPTER V.

I will now proceed to show how I discovered the existence and seat of Thermo-motor Force.

When I commenced the study of medicine, of all diseases, Cholera appeared to me the one involved in the deepest mystery. I therefore determined to solve it. It seemed to me most probable that it was caused by arrest of the action of the secreting and excreting organs, which I subsequently proved by inducing it, by ligaturing the ducts of said organs in dogs and rabbits. The next point to settle was; *how* this arrest of action of said organs was produced? At this time we had a marked case of Cholera and also of arsenical poisoning, at the Hospital, and I thus had an opportunity of comparing the *post mortem* appearances and symptoms, in said cases with each other, and I was struck with the similarity between them, vomiting, watery discharges and degeneration of the digestive and excretive organs, being present in both cases. The idea therefore suggested itself that Cholera was brought about by the inhalation of some irritant poison, exhausting the brain forces, and thus causing this degeneration of said organs.

To test to truth of this theory, I caused dogs to inhale Arseniureted Hydrogen Gas, which experiments, owing to the excessively poisonous nature of this gas, were performed with considerable risk, and found that on the one hand, whilst it failed to produce the essential symptom of Cholera, viz., excessive purging, yet on the others, it induced indigestion, retching, thirst, spasmodic contraction of voluntary muscles, loss of animal heat, and a gradual arrest of heart's action, whilst an examination of the viscera, showed that the Heart, Liver and Kidneys were highly fatty, (the Hepatic Cells and Renal Epithetium being converted into said substance), and a microscopic examination of the brain disclosed the fact that *many of the Cells in the Medulla at the origin of the Pneumo Gastric Nerves, were ruptured, and their Cell contents escaped*, which facts point the following process. Entry of Arseniureted Hydrogen into the circulation, its arrival at the brain (Medulla ablongata and Corpora striata) at which part, the heat being greatest, it induces such an

excessive production of the Thermo-motor force as to cause its rapid exhaustion, hence diminished supply of said force, to the voluntary muscles and their spasmodic contraction, to the heart and its gradual arrest of action, to the stomach, and a corresponding deficiency of its action, and therefore also in the preparation of those fluids necessary to nourish the organs, and for the general diffusion of animal heat, *hence* fatty degeneration of liver, kidneys, and heart and a loss in the animal heat, which I found by accurate thermometrical observations to be *less* in the brain than in its dependent viscera, thus although in this experiment I failed to induce Cholera, *yet by it, I discovered the existence, seat, production and modus operandi of the Thermo-motor force, upon the deficiency of which all forms of disease depend*, and the following case proves that in Cholera this exhaustion of the Thermo-motor Force is brought about not in a comparatively sudden manner by an irritant poison as I at first conceived, but *gradually* by a deficiency or absence of a *necessary* element to its production, Phosphorus, viz., that of Hannah F——and her three children, who after living for five months on white flour, water and tea (starch without Phosphorus), died of Cholera.

CHAPTER VI.

I will now make it clear that not only cholera but that all diseases brought on by defective nutrition, viz.: Degenerations and emaciations of organs, including pulmonary consumption; also paralysisof the voluntary muscles and premature decrepitude, are caused by a waste of that form of brain force which resides in the *corpora striata* and *medulla oblongata*, which is the most important of all the brain forces, as it wields the power of life and death, and which, being a compound of heat and motion, I call the thermo-motor force. Or, to prove that the cause of cholera and all degenerations of organs, pulmonary consumption, paralysis, and premature decrepitude, is one and the same, viz.: Waste of said thermo-motor force, and that the only difference is in the *modus operandi.*

And firstly to demonstrate the *modus operandi* of cholera: By showing that if there were steam engines so constructed as to prepare and supply their own furnaces with fuel, their boilers with water, besides turning other machinery, and if, owing to an accident to the feeding machinery, an essential element of the fuel were omitted, then the heat of the furnace would proportionately diminish, and with it the action of said feeding machinery, which would thus supply the furnace with a less quantity of fuel, and the quantity and quality of the fuel being thus simultaneously reduced, the heat of the furnace would gradually diminish, and the action of the machinery become slower and slower, until at last it would stop *altogether*.

Now, what mechanic would not understand the cause of this arrest of action to be a breakage of the feeding machinery, the furnace being dependent on said machinery for the preparation and supply of its proper quantity of fuel; and if he can understand this, what greater difficulty can he have in comprehending that the inducing cause of death from cholera is identical, viz.: *An accident to the feeding machinery.*

For what takes place in cholera? The same thing that occurs when *the nerve which conveys heat and motion from the brain to the stomach, in a dog, is divided.*

Its digestive organs can no longer prepare the fuel to be burnt in the furnace of the capillaries, the temperature and action of the vital organs is arrested.

The only difference between this mode of death and that from cholera, is first in degree, not in kind; the shutting off the supply of heat and motion to the stomach being sudden in the former and gradual in the latter, thus allowing time for the effects of the blood poisoning from the arrested action of the secretory and excretory organs to manifest themselves, and secondly, in the mode of induction, the accident affecting that part of the feeding machinery in the living animal, which selects the food, thus depriving the brain of that element by which it maintains its power of producing and supplying the stomach with heat and motion necessary to support the vital processes, and *thus wasting*

this force. I have already proved this essential element is phosphorus.

As the above described cholera process is the same as that by which thousands of infants die yearly, in this city, viz.: Cholera infantum or summer complaint, I shall give this case in full.

A poor woman with a a family of three children had been existing for upwards of six months on nothing but white flour, water, and tea, during which time all they suffered from was a feeling of weakness, and who came into the hospital to endure all the miseries of death by the vomiting and purging of cholera.

Now, why did she and her children die thus miserably? From want of knowledge of the principle of the economy of thermo-motor force, and that by living on food deficient in that element essential in its production (phosphorus), she was wasting the power of producing said force, and that the same money with which she starved herself and her children to death on white flour would, if invested in properly prepared (unbolted) flour, and crushed wheat, have kept them not only alive, but in good health, because the former contain what the latter do not, viz.: The gluten containing the phosphates or the essential elements of brain and muscle.

The woman knew they were in want of food, but because the suffering was not great, she did not think it dangerous; neither was it at first, but each time this principle was infringed, and her thermo-motor force wasted the capacity of her medulla to generate said force diminished until at last it reached such a degree that it could no longer digest her food, and this poor family died in the agonies of starvation, although wine and beef-tea were constantly poured down their throats.

It is the same with the victims of cholera infantum; every time this principle is broken, the infant's thermo-motor force wasted by giving it food deficient in gluten, such as a decoction of starch, adulterated or swill milk, &c, instead of pure milk; thin gluten, or the starch and gluten strained from steamed crushed wheat the mother unwittingly takes

a step in a course of action which will ultimately starve her infant to death, and all the drugs and stimulants poured down its throat will only hasten that end. In this connection I take pleasure in directing public attention to the great value of the cereal foods prepared by the Health Food Company, and also Mr. E. C. Smith's crushed wheat.

Secondly.—To demonstrate the *modus operandi* of pulmonary consumption: By showing that if there were such a self-feeding steam engine, and if the draught being greatly increased to intensify the heat, the engine were caused to supply wet fuel *around the sides* of the furnace so that the oxygen might decompose this fuel instead of its sides; and if, owing to an accident to the feeding machinery, it supplied this fuel so as to expose the sides, then the oxygen would act on those sides instead of on the fuel, making holes therein, through which a part of the fuel would escape, and the whole temperature of the furnace be lowered to such a degree as to prevent it from causing that union of the oxygen with the remaining carbon essential to the production of heat and motion, and the machinery would be stopped.

In the same way, who can fail to understand the cause of this arrest of its action to be an accident to the feeding machinery, or that part of it which governed the direction of the distribution of the fuel; and if this is easily understood, what greater impediment is there to comprehending that the cause of death from pulmonary consumption is the same, viz., an accident to the feeding machinery, or that part of it which supplies to man a food deficient in carbon, viz., the perverted appetite which prefers flesh meats to properly prepared cereals, fruits and vegetables, and which is demonstrated to a certainty by the case of William H——, a laborer, æt. 32, who, inheriting deficient power of producing thermo-motor force, and wasting that force by a diet of flesh meats and by overwork, died from pulmonary consumption within three years; whereas, had he economized this force by living on carbonaceous foods, milk and properly-prepared cereals and vegetables, and obtained some suitable light employment, not involving arm work, he might have prolonged his life for many years. Also, by the case of Anna C——, æt. 14, who

inherited a similar deficient power of generating this force, and who, being compelled to work at making cartridges, involving considerable arm work, inducing cough, headache, loss of muscular strength and voice, and which symptoms the use of flesh meats not only increased, but added others, viz., loss of appetite and vomiting *on the slightest exertion*, and who thus died in a few months, when, by a judicious economy of this force, by the use of the same carbonaceous diet, especially milk, and an open air life in the country, her life might similarly have been prolonged.

And all this applies with equal force to the thousands of cases of pulmonary consumption which occur annually in this city.

Thirdly.—To demonstrate the *modus operandi* of paralysis of the voluntary muscles: By showing that in a steam engine, if you were to cause the furnace to reach the degree of heat of the oxy-hydrogen blow-pipe, the boiler coverings would melt, and the boiler, emptying itself into the furnace, would extinguish and arrest the heat and motion of the machine.

In this case it would be plain to all that the cause was excess or waste of heat.

In the same way in the body, by the habitual use of alcoholic irritant poisons, the thermo-motor force may be wasted, causing, by the process previously demonstrated, degeneration of the organs and of the coats of the arteries of the brain, which, on the slightest strain, rupture, pouring the blood upon the source of this force, the *medulla oblongata* and *corpora striata*, which, by its coagulation and pressure, causes an arrest of its production and supply, first to the voluntary muscles (hence arrest of voluntary motion), and secondly, to the heart, which consequently ceases to act.

Is it not, therefore, equally clear that the cause of paralysis of the voluntary muscles is waste of the thermo-motor force by alcoholic irritant poisons?

This is further demonstrated by the case of a man æt. 50, a shoemaker by trade, who, from wasting this force by intemperance, was seized suddenly whilst at work with loss of power of voluntary motion of the muscles of the right side, the heart gradually ceasing to act, and after death I observed

blood clots compressing the *medulla oblongata* and left *corpus striatum.*

It can be no less plain, that had he economized said force by supplying his thermo-motor centres with nutritive liquids instead of irritant poisons, that degeneration of his arterial coats, and of those fluids which nourished his arterial coats, and consequently the destruction of the latter, and his own death, would have been prevented; *and the adoption of this course of action would save hundreds of persons, annually, in this city, from death by appoplexy.*

Fourthly.—To demonstrate the *modus operandi* of premature decrepitude.

By showing, that if two locomotives were running a race across the Continent for a heavy wager, and each started with an equal but limited amount of fuel, and if one engineer piled it on as fast as he could, whilst the other proportioned the rate of combustion to the quantity of his fuel, then, whilst the former at first would far outstrip his rival, yet, before he had half accomplished his journey, would find his engine at a standstill for want of fuel; the latter, though at first left far behind in the race, would slowly but surely overtake his more impetuous rival, and would reach the gaol, and thus triumphantly carry off the prize, whilst the other would be left helplessly in the rear.

This is further demonstrated by the case of William B—— *æt* 27, who had been employed in the Cornish Mines, and had always enjoyed health until 2 years before entering the hospital, when, having attended a funeral on a wet day, and being anxious to reach home early, being just married, he walked a distance of 6 miles in an hour, and whilst doing so was seized with a sudden pain across the abdomen; he felt cold internally, and then went to bed. Three weeks afterwards was attacked by burning pain across the stomach and vomiting.

On going to bed the pain left him, and he felt well. On rising and moving about, it always returned, with choking feeling.

He couldn't do any hard work; confining himself to light work, sifting the ores or breaking them; in doing which the

symptoms always returned; but on leaving work and going to bed, they always left him.

At last was obliged to leave off work entirely. One doctor treated him for inflammation of the stomach, another for the lungs, but neither did him any good.

Had been continuously employed in the mines for 7 years, working underground, at a distance of 1,500 feet, at a temperature quite as high as summer heat in New York; the perspiration would stream down him, and on an average he would lose in this way 7 to 9 lbs. a day of 10 hours.

At times, working through the lodes was very severe; sometimes using the pick on his knees, or on his back, or standing up, this necessitates bending forwards with every blow, thus calculating he would work continuously 8 hours a day, and throw the pick stooping forwards 1,500 times every hour, or 12,000 times a day, or 3 million times a year, or 21 millions such actions in seven years in an atmosphere deprived of solar light and at a high temperature.

Can it, therefore, be a matter of surprise that such an excessive expenditure of the thermo-motor force should manifest itself in all the symptoms of the exhaustion of that force, breathlessness and vomiting on the least exertion, observed only in the last stage of disease and of decrepitude.

And, did not this young Cornish miner bring his body into a precisely similar position to that into which the impetuous engineer just referred to brought his locomotive, and by the same identical cause, viz.: by allowing impulse to predominate over judgment, and thus causing the waste of that force, which by a judicious economy, would have carried him like the successful engineer's locomotive, by a regulated course of action, to the goal, and secured him the prize of length of days?

Now, if these cases demonstrate anything it is this, that the elation of wine, the energy induced by a flesh meat diet, the weakness by food deficient in phosphates, the exhaustion of overwork, and similar causes, are all so many excessive drains on this thermo-motor force, of which we all have a certain limited amount, which we can never replace, and the exhaustion of which is certain to cause degeneration of the

digestive organs, and of those fluids upon whose integrity as before stated, depends the nutrition of all the organs of the body, including the brain (and, therefore, of the source of this force itself), also the diffusion of animal heat, and the protection of the organs from the decomposing action of the oxygen, causing death, either from deficient nutrition and degeneration of the organs of digestion, and excretion in such a degree as to induce fatal blood poisoning as in cholera.

Or from degeneration of the digestive organs and of those fluids necessary to protect the organs from the decomposing action of the oxygen in such a degree as to destroy the air cells of the lungs, inducing fatal apnea or breathlessness, as in pulmonary consumption.

Or from degeneration of the digestive organs and of those fluids necessary to nourish the organs in such a degree as to destroy the arterial coats and cause them to rupture, as in apoplexy.

CHAPTER VII.

Thus deficiency of the thermo-mator force is the great latent or concealed cause of disease and death in all cases, and therefore this force, as before said, wields the power of life and death, for if its deficiency exists in a high degree, death is certain, whilst if there be a reserve of said force it will enable the weak organs to hold out by supplying them with the requisite degree of resistance and protection.

Thus no local application to nor bolus nor globule treatment of the liver, kidneys and alimentary canal of the lungs or of the arterial coats can prevent or remove the vomiting and purging of cholera, the breathlessness of pulmonary consumption, or the annihilation of sensation and motion of apoplexy.

But all these sufferings, diseases, and premature death itself can be warded off by a judicious economy of this force, based upon an adequate comprehension of the importance of the application of this great truth to the saving and prolongation of life.

If this is true, then it is equally so that there is but one great disease and a corresponding treatment, whose single

aim it is to judiciously economize this force and aught else as far as effectually removing pain, disease and premature death is concerned, is sheer quackery.

The all-important question then is, how best to economize this force?

Let us first trace and comprehend the mode of its production, and then the application of the principle of its economy will be sufficiently easy.

How is the thermo-motor force produced?

Just in the same way as the electric current; by the application of conductors of force to the galvanic battery.

Or as a motor current derived from vegetable cell growth would be if it were possible to convert the vegetable reproductive cell force into a current of heat and motion by the application of conductors of force to the living plant.

But although vegetable cell force cannot be thus converted *directly* into heat and motion, yet it is *indirectly* by the vegetable cells being dissolved and raised into a higher kind of vegetable cell reproductive action owing to their assimilation by the brain cells, and this higher vegetable cell action being supplied with conductors of force (nerves), is by them converted into a current of force, which being conducted to the digestive and muscular organs produces voluntary and involuntary muscular action and diffuses animal heat. If this is true, then the basis of all life or of the thermo-motor force in the animal organism is that higher kind of vegetable cell reproductive force stored up in the nervous centres of motion and heat (the corpora striata and the medulla oblongata) and *every time our hearts contract, every time we move, we lose a part of that stored up force, which once expended in motion can never be replaced.*

Hence death's necessity, to live we must die.

But have we no control over this force?

If, indeed, this is really so, "what skills it to mourn or talk?"

We are the victims of a blind fate, and pain, disease and premature death are inevitable. But, if it is not, then in proportion as we can acquire control over, we can regulate the expenditure of this force and thus stamp out all these evils.

I consider it superfluous to prove what is already manifest to all, or that to control his actions is the prerogative of man; and who has a greater right to assert this proud prerogative than the citizens of this great republic? for have they not ably defended those rights of self-government and unity of action which their fathers so nobly won?

But the question of the future is, Will this republic be able to maintain these rights and unity of action perpetually?

Or will she, like her great prototype, the Roman republic, pass through the same phases of growth, maturity, decay, and death?

And will this decay be preceded by the same cause, or the loss of her public spirit, of that sentiment of the sacred nature, of this principle of liberty, love of country, and unity of action for the common good, which inspired her great founders?

The answer to this question is bound up in the one, as to whether America's free citizens can and will remove all the evils of pain, disease and premature death from, and confer all the benefits of length of life and happiness on themselves, by raising the moral feeling and increasing the self-control of the masses, by means of a well-digested plan, which shall *regulate the hours of work and keep them within such limits that the average man shall have both time and mental energy left for self-improvement*, and which shall found and endow public schools or colleges of anatomy, physiology, hygiene, divinity, music, painting, sculpture, biography and history, and make them not only accessible but attractive to all classes of mind, for, though, theoretically, man can regulate his actions, yet, practically, this is no easy task to the best of us, for man has within him two enemies to his welfare that he must combat and conquer, before he can seize the crown which confers on its possessor length of days and happiness, viz.: appetite and ignorance.

The remedy for the former consists in elevating his moral feelings, hence the necessity of public colleges for the teaching of those subjects tending to raise noble sentiments to which I have already referred, in which path Mr. Peter

Cooper, having taken the first step by the establishment of schools of art for women and lectures for the people, and Mr. Cullen Bryant, by his splendid translation of the Odyssey, will ever place them in the front rank of public benefactors.

That for the latter, public schools for teaching those subjects which give him a knowledge of those laws which govern his body, and the action of different foods and substances thereon, thus enabling him to regulate the motion of his organs of so-called involuntary action, as the former gives the highest direction to his voluntary efforts, whilst to still further economise this force, and thus win ampler time for and power of self-improvement—colleges for the study of the theory and practice of mechanics and experimental chemistry should be established.

It is almost needless to point out that the money saved by the suspension of medical hospitals and asylums would *in the end* more than repay the expenses of the colleges for anatomy, physiology, organic chemistry and hygiene.

That by the abolition of workhouses and prisons, those of schools of divinity, music, painting and sculpture.

That by the arrest of the traffic in alcohol, those of the schools of mechanics and inorganic chemistry.

If the American citizens of the centennial period are in earnest, they will go to the root of the matter by devising and executing a plan by which these objects will be attained and they will receive the homage of all posterity, as having not only shown themselves equal to their fathers, by perfecting their work and conferring thereon endurance; but they will shine superior to them in this, that they will take the front rank among the Benefactors of mankind by teaching them how to eradicate from their midst that triple curse—pain, disease and premature death, and to substitute in its place, happiness, beauty of form and length of days.

New York, December, 1877.