



*A Thesis*

*on the*

*VIS MEDICATRIX NATURÆ*

*by*

*John Southey Warton.*



*To*

*James Miller*

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*of Edinburgh*

*This Thesis is respectfully dedicated*

*by*

*the Author.*



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“And I can speak of the disturbances  
that nature works and of her cures” —  
*Shakespear Pericles Act III Scene II*

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Lend me an arm;— the rest have worn me out  
with several applications: nature and sickness  
debate it at their leisure  
*Shakespear Alls well that ends well Act I Scene II*

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In time of old we read that Pythagoras required from his disciples a silence of five years before they expressed an opinion upon his doctrines. And yet in the present time, when science as applied to the "Healing Art" is extending day by day in all directions; a student of medicine is expected in a course of four years, to shew a competent knowledge of eleven subjects, besides sending in for the approval of the examiners a Thesis, written by himself on some branch of study connected with the profession.

My reason for making this comparison, in limine, is, not because I would discourage the teaching of science or knowledge, but because I cannot help feeling that in my four years of students life, I have gained of the numerous subjects required but a very superficial

knowledge; while of the actual practice of the Healing Art, the very climax of my studies; I, as yet, for lack of time know barely the rudiments.

Under these circumstances, sooner than devote myself to write on any special branch of the profession, in exclusion of the others, I have chosen rather to place together a few of those cases illustrative of the "*Vis medicatrix Naturæ*" which, in the course of my studies, both theoretical and practical, have fallen under my notice.- As I believe that the practice of the Arts of Medicine and Surgery both have been, and can be, often best advanced by following in the path she leads, and by aiding her in the efforts which she is making, for the subjugation of disease, or at least for its relief and amendment.

In the consideration of this subject, I purpose; First; to dwell upon it generally, that is, as applied to the well being of mankind at large. Secondly;- by passing from the general to the special, to instance in a few separate diseases, the methods apparently adopted by Nature for their alleviation or cure. And lastly;- to point out in conclusion the analogy existing in a few cases between the treatment of disease in the present age, and that which is often adopted by

Nature



If we look around us on two of the primary divisions of nature; I refer to the Animal and Vegetable Kingdoms. We cannot but be struck by the beautiful and remarkable relation, which binds them together. Both living; yet both antagonistic: the one removes, as nourishment from the atmosphere, the very excretions of the other, giving out, in its turn, those very elements which alone can restore the vitiated ether to its balance! But let us examine this a little more in detail.

The important function of Respiration in Animals, consists essentially of the arterialization of the venous blood in its passage through the lungs. This is accomplished in two ways: partly, by the escape of Carbonic Acid as an excretion, and partly, by the absorption of Oxygen. - Let us now suppose for a moment, that there was no Vegetable Kingdom, and what would be the result? For a while all would be well, the "Diffusion of Gases" would scatter the expired Carbonic Acid and Respiration would still go on. But after a time the balance would be altered; Oxygen being constantly absorbed and Carbonic Acid expired, the atmosphere would become loaded with the latter, while the former was reduced in amount: And as, according to Liebig "Diffusion of Gases" ceases between the lungs and external air, when the latter contains 10 per cent

of Carbonic Acid and only 10 per cent of Oxygen, the whole of the Animal Creation would perish asphyxiated, and man with all his science and knowledge would die poisoned by the very act of living! We will now enquire how the vegetable kingdom in the hands of nature becomes actually compensative for the poisonous effects of animal respiration.

By a wondrous arrangement, Plants absorb from the atmosphere by their leaves and roots the noxious carbonic acid excreted by animals. This they decompose, converting the carbon ultimately into their own tissues, and restoring to the now purified air the life preserving Oxygen. Thus a healthy balance is restored, and thus, through ceaseless ages, silently and surely, nature is working on, intent on the preservation of her offspring!

Passing from Respiration to another of the great functions of life, namely, "The maintenance of the body at a proper temperature" we again find nature by the voice of instinct regulating our lives, and this time through the medium of food; so that in all circumstances, whether in the regions of the eternal snows, or in the burning climate of the tropic's, the range of temperature necessary for the preservation of life, is still uniformly preserved! Leaving the mineral food of Man as in this case unimportant, out of the

question; we may, adopting Liebig's classification, arrange food under two heads: firstly the Respiratory or Calorific; and secondly the Sanguigenous or tissue forming elements. The former, as Oils, Fats, etc; when taken into the system, undergo direct oxidation being transformed into carbonic acid and water; the heat given out in this process supporting the temperature of the body. The latter on the other hand are converted at once into the tissues of the body, and are not except at a great loss, used for calorific purposes. -

Nature sometimes however, by creating an appetite for an excess of sanguigenous matter, compensates by increased quantity, for its deficient quality in heating power. If we visit the Polar Regions, or any other cold climate, we find the inhabitants there living largely on oil, fat, and other respiratory kinds of food; as if nature had actually given them both appetite, and powers of digestion for those very substances, which would best preserve in such a clime the body in a state of health. The quantity eaten by them is sometimes surprising, and Dr. Playfair mentions in his lectures, while on the subject of food, that the Esquimaux can consume actually in a day, twenty pounds weight of flesh and oil: Nor indeed can we much wonder at it, when we consider the intense

cold they are called upon to resist. Were it not for this inherent compensation of nature, man would in cold climates for a time keep warm, by burning his own living tissues; but soon the daily waste being greater than the supply, life would cease, for want of fuel to keep up the necessary temperature.

This indeed seems to be the mode of death in starvation, for we then find the temperature of the body decreases but little at first, although rapid wasting takes place.—soon however the supply of fuel becomes deficient, and when the temperature once sinks it falls very rapidly, life then becoming extinct. Speaking of temperature, it has been noticed that alcohol as an alimentary agent, will support life when food is deficient; and hence perhaps the use of ardent spirits among the very poor, may have sprung originally more from necessity, than from the indulgence of naturally vicious habits.

Another interesting fact, with regard to nature's selection of food, may in conclusion on this subject be mentioned; namely; that many of our daily combinations for the table, naturally suggested, have been now proved by the light of Chemistry, to supply the mutual deficiencies of each other. Thus with Beans, almost entirely a sanguiferous food, we combine fat Bacon, a supporter

of combustion. With Fowls we combine Ham, with white  
 Fish melted Butter, and many other such examples  
 are of daily occurrence. Surely, if for the preservation  
 of health in every day life, nature is so entirely  
 efficient, we may not irrationally à priori expect,  
 that in disease she will not desert us!

Ere I pass to the second part of my subject - I  
 shall quote one more example of what appears to me  
 to be a case in point. The Brain, is as we  
 know, the most important organ in the body. When  
 this is diseased, man remains no longer a responsible  
 agent, but is carried here and there by his uncontrolled  
 fancies; as a helmsless ship is tossed at the mercy of  
 the waves! For any organ, or system of organs however,  
 to retain the healthy performance of its functions,  
 periods of repose, as well as periods of excitement  
 are necessary. If our muscles are tired, we rest them;  
 and they are renovated. If the brain is exhausted,  
 to use words of Shakespear in an altered sense; -

"Sleep gentle sleep will weigh our eyelids down,  
 And sleep our senses in forgetfulness."

*Henry IV Act III Scene I.*

It is to this very sleep that I allude:  
 for nature seems to have adopted a method to gain  
 it, whether we will or no. Light is one of the most  
 powerful stimuli to wakefulness, and therefore when

the brain is tired, by causing closure of the eyelids, she at once shuts off its influence: whilst even sound, becoming sometimes to a tired brain monotonous, actually aids in the production of sleep. Ask any student tired with his days work, how hard it is at night to keep his eyes open.- In vain does he attempt to prolong his reading, the pages grow dim, his eyelids close, and nature's remedy is triumphant. Thus by sleep is the brain restored to its balance, and its healthy action preserved; and thus is nature ever striving to maintain the balance and the harmony of Creation



I cannot introduce the second part of my subject in a better manner, than by quoting a short passage from Dr. William's "Principles of Medicine"

"There is says he in Organized beings a certain conservative power, which opposes the operation of noxious agents, and labours to expel them when they are introduced into the body. The existence of this power has long been recognized and in former days it was impersonated. It was the Archæus of Van Helmont; the Anima of Stahl; and the *Vis medicatrix naturæ* of Cullen." Dr. Watson also, in his "Practice of Physic" speaks of the *Vis medicatrix naturæ* in these words.

"This is a phrase that has been much sneered at; but (as I conceive) very unjustly, and sometimes ignorantly. It is simply a short formulary, expressive of a great general truth, viz, that the animal frame is so constituted as to contain within itself the elements of repair, and of conservative adaptation."

With this short introduction I shall now dwell on some few diseases, in which nature's efforts to relieve or cure seem to me to be the most apparent; illustrating them occasionally, where space will permit, by such suitable examples, as may fall under my notice.

### "Plethora"

This state, dependant on general excess of Blood in the System, verges closely on the borders of disease if it may not be called disease in itself; and hence persons labouring under it, are liable to Apoplexy, or structural disease of the heart, of the great blood-vessels, lungs, kidneys, or liver. Nature frequently however in such cases interferes, ere these worse consequences arise: either by diarrhoea or epistaxis, by bleeding piles, or by an attack of gout or gravel, she loosens the general tension of the system, and compels the patient to restrain his excesses and attend to her warnings, while there is yet time to do so.

## "Anæmia"

D<sup>r</sup>. Laycock speaking on this head in his lectures on the "Practice of Medicine", states - that sleepiness in Anæmia is natural, and accounts for it by saying, that there is less waste of the tissues during sleep than during any other time. Hence we may conclude that it is one of nature's methods, to restore a healthy relation again, between the blood which is in this case deficient, and the body which suffers in consequence.

## "Pyæmia"

Lecturing on this bane of surgery, D<sup>r</sup>. Watson after describing other symptoms goes on to say "The disease is also commonly attended with profuse sweats, and occasionally with copious and very unnatural discharges from the bowels. These last have been noticed in animals soon after the introduction of pus, or of putrid matters into their veins. Nature seems to attempt to eliminate the poison in this way: and where the quantity of pus so introduced has been small, the attempt is now and then successful.

## "Phthisis Pulmonalis"

This disease, so fatal to the young and beautiful, for which in all ages so many drugs and remedies have been used, - used for the most part in vain, is

state not unfrequently under the hand of nature, capable of being either cured, or at least arrested in its deadly progress. Tubercle when first deposited in the lung, both can be, and sometimes is, completely absorbed; and thus perfect restoration to health, is by the healing power of nature accomplished. In attempting to cure the disease however, when absorption of the deposited tubercle is no longer possible, her method of proceeding appears to be twofold - either, by causing concretion of the earthy salts and absorption of the more fluid matters, she calcifies the tuberculous deposit, which may then either be coughed up or remain inert; or, by softening and expectoration, she causes the whole mass of tubercle to be removed, and then the walls of the vesicle which contained it falling in, the cavity contracts and heals up, leaving only a cicatrix to mark its former position.

Sometimes in tuberculosis of the pulmonary organs, inflammatory adhesion seems to be nature's remedy, for preventing the occurrence of worse complications.

When tubercle is deposited near the surface of the lung; it is liable during its softening and ulceration to perforate the pleura covering it; and thus "Pneumothorax" a most distressing and fatal complication would arise.

By causing however adhesions to form, between the pulmonary and costal pleura, she effectually prevents

the occurrence of this much to be dreaded complication.

### "Pleurisy"

Speaking of this disease, I shall give in a few words nature's method of cure, as explained by Professor Bennett in a clinical lecture on the subject. When the disease has gone on to effusion, he states; That the pleura in ordinary circumstances becomes covered with numerous minute vascular villi; these villi absorb the fluid that has been poured out from the inflamed surfaces, and thus again allow the lung to be expanded, which had been compressed and rendered useless so long as the effused fluid remained. The pulmonary & costal pleura then become adherent and even these adhesions may be of use, as they would effectually prevent effusion taking place again on that side, which has now become weakened by the inflammatory attack.

### "Valvular disease of the Heart"

In this affection perhaps more prominently than in any other, we see the beneficial effects of nature's efforts in trying to compensate for the results of disease, when the cure of the original is beyond her power; let us take an example from disease of the valves of the aorta

If the aortic valves are diseased, so as to interfere with the natural onward passage of blood through that orifice, the body must of necessity suffer, as sufficient

healthy blood for its nutrition will not reach it in a given time. To correct this evil, nature causes the left ventricle of the heart to become hypertrophied; and thus by increasing the rapidity of the current which is expelled, she contrives to make up for the diminished aperture through which the blood is passing. I have heard no one dwell more strongly and forcibly on this point than Dr. Bennett, who in a clinical lecture on "Heart Disease" gives a caution, and not an unnecessary one, on the too free administration of sedatives, stating that the main indication of treatment in this malady, is to keep up as much as possible the vigour of the constitution.

In the treatment of inflammation occurring in internal organs and tissues, which has gone on to suppuration; nature's method of procedure seems to consist in causing adhesion between the diseased part and some hollow organ opening externally, thus insuring the discharge of the matter formed, at some place where its presence will cause no undue irritation. Illustrations of her efforts in this direction, are well seen in the two following diseases..

#### "Abscess of the Liver"

This disease (rare in this country) terminates not infrequently

in three ways. First;— by the lung diaphragm and liver becoming adherent, the pus formed in the latter then bursting through the lung. Secondly;— by the liver becoming adherent to some part of the intestinal canal, the discharge of matter then taking place by its orifice.

And thirdly;— by the abscess bursting through some part of the abdominal wall, the liver having previously become adherent to it. The following case quoted by Dr. Watson is a very interesting one, as it shews a natural termination of the disease in the first manner, and also the preparation for another termination in the third, which however was anticipated by the physician.

A gardener aged 45 was seized four weeks before entrance into the hospital, with severe pain in the right loin. After admission there was found on examination at the edge of the short ribs and not far from the spine on the right side a large elastic swelling, very tender and of a bluish red colour;— As the patient's urine was loaded with amorphous deposits, suspicion was at first directed to the kidney. It soon however became evident, that although the tumour was below the diaphragm, the parts above that muscle were involved in the disease.

The right side of the thorax was dull to percussion, no vesicular breathing was there audible, but only some scattered crepitation and bronchophony. Four days

after admission, the patient began while coughing to discharge from his mouth, a quantity of grey putraceous fluid of the thicknes of gruel and horribly fetid; this amounted altogether to two quarts, the pain then ceased and the swelling became less. This swelling was afterwards punctured and a quantity of the same kind of matter let out. The issue of the case is not mentioned, as the patient left the hospital, but in all probability he recovered. Bile being ultimately found both in the discharge from the wound and also in the expectoration, proved that the abscess was situated in the liver. In the only case which I have seen of this disease, the abscess burst once through the lung, and once through the abdominal wall, the patient recovering after each illness.

### "Pelvic Cellulitis"

D<sup>r</sup>. Simpson speaking of this disease in his lectures on the diseases of women, says - If suppuration occurs the pus usually bursts into the vagina, rectum, or bladder, or sometimes lifting up the fascia it points over the symphysis pubis; bursting of the matter into the cavity of the peritoneum is of rare occurrence.

In relation to this subject I shall quote a case given by D<sup>r</sup>. West as one of nature's cures in his book "On the diseases of women"; - Speaking of an inflammation

of the cellular tissue contained within the folds of the left broad ligament which had occurred in one of his patients, he says - "The results of examination, when she was admitted into the hospital, six weeks after delivery, were as follows: the abdomen generally was soft and painless, but immediately over the symphysis, extending about two inches above its level, and about the same distance transversely, was a firm, globular enlargement, very slightly moveable, tender on firm pressure. The vagina was hot, its anterior wall from about half an inch from the orifice of the urethra was swollen into a distinct elastic tumour, which gave the sensation of containing fluid, and projected so as to contract to half its ordinary dimensions the calibre of the canal. In this tumour which was not modified by the introduction of the catheter, the anterior lip of the uterus was lost, while the posterior lip was small and natural. The right side of the uterus was free from any unnatural condition, the swelling existing to the left and anteriorly. The uterus and tumour, when pressed on, moved together, but their mobility was very small. In a few days the tumour felt per vaginam was greatly lessened after a profuse discharge of pus, and when the patient, after six weeks sojourn, left the hospital, there was said to be no other morbid condition than a thickening at the left side of the

uterus, by which it was almost completely fixed in the pelvis." I myself have seen in the ward for diseases of women at St. Bartholomews Hospital, several cases in which pelvic cellulitis terminated by a discharge of pus through one or other of the natural passages.

"Ulcer of the Stomach"

D<sup>r</sup> Brinton conjectures, speaking of Gastric Ulcers, that out of every hundred, fifty will undergo a spontaneous cure. Relief or cure of this disease may take place in several ways, either by the ulcers cicatrizing, or by the stomach forming adhesions with some neighbouring viscus, thus perforation into the peritoneal cavity being averted; or, as sometimes happens, by the stomach becoming adherent to the abdominal wall and Gastric Fistula being permanently or for a time established. An interesting illustration connected with the subject in hand occurred in the case of Napoleon Bonaparte, who died of Cancer of the Stomach - "That organ (says D<sup>r</sup> Watson) after death was found strongly adherent to the concave surface of the left lobe of the liver which formed a part of the wall of the stomach; and this adhesion, no doubt, prolonged his life." D<sup>r</sup> Brinton states also I believe, that at least twenty cases are on record, in which ulceration took place between the stomach and the colon - adhesions having been previously formed. I need hardly speak of the beneficial results

of such adhesions in prolonging life, as it is well known that the escape of matter from the intestinal canal into the peritoneal cavity is almost uniformly fatal.

Before quitting the subject of disease occurring in this organ, I may mention as illustrative of nature's wondrous recourses, the case of Alexis S<sup>r</sup> Martin. In this instance owing to a gunshot wound perforating the stomach, an opening was established communicating between that viscus and the external air; subsequently we read - "A small fold of the mucous coat of the stomach appeared, which gradually increased till it filled the aperture, and acted as a valve so as completely to prevent any efflux from within!"

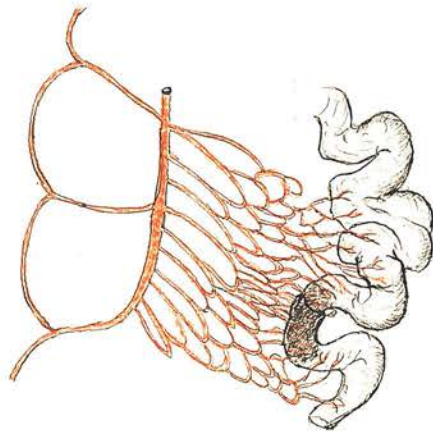
### "Intussusception"

I know of no disease more distressing to both patient and practitioner, than that of invagination of the bowel. Life, perhaps in its prime, is suddenly arrested, and after a short while of intense mental and bodily anguish, the patient sinks exhausted to the grave. Yet even this fearful malady nature takes sometimes in hand, and when the most learned physician's skill is powerless, conducts the case safely to an issue. Intussusception consists of the enclosure of one portion of the bowel within another, as a finger of a glove is sometimes ensheathed when

pulled off. - In illustration of this, I have introduced the accompanying diagram. Now it is evident that if adhesion were to take place at the parts BB, and the piece of bowel AA were to be removed, the canal would again be rendered patent, and this is what is sometimes accomplished by nature. - Inflammatory adhesions unite the two portions of the bowel together and the enclosed piece sloughs off and is passed per anum. Dr. Laycock speaking on "Intestinal Obstruction" in his clinical lecture, states that in these cases stercoraceous vomiting tends sometimes to keep the patient alive, for; "Bile and other matters accumulating in the intestine, are apt to be reabsorbed and poison the patient." Sometimes indeed he even recommends vomiting to be induced in order to gain this end, when it is not already present. He also quotes an apt illustration of nature's curative power, in a patient who suffering from intussusception, had stercoraceous vomiting for a fortnight, then passed by stool a yard of intestine, and finally recovered perfectly.

#### "Abscess, and other affections of the kidney"

Renal abscess not unfrequently illustrates the tendency of purulent matter to burst anywhere rather than into the peritoneal cavity, for it may burst after adhesions are formed; - either externally,



*"Diagrams of Intussusception"*

*A Port of Intestine that Sloughs*  
*B Points of Adhesion.*

or into some part of the colon or duodenum, or else after perforation of the diaphragm through the lung the matter being expectorated; sometimes also the Pus escapes by the ureter into the bladder, and is passed with the urine. I have only seen two cases illustrative of this. Both occurred in men, and in both the abscess burst through the lung; one I lost sight of, the other was convalescent when I left the hospital in which he was a patient.

Conservative hypertrophy one of nature's great remedies, is well seen in what takes place in disease of the renal organs. No sooner does one kidney begin to fail in the performance of its functions, than the other becomes enlarged and sets to work with renewed vigour, in order to carry on effectually its own and its brother's work.

Looking also at hypertrophy of the bladder in stricture of the urethra, we again observe the beneficial efforts of nature, who by increasing the *vis a tergo* strives to overcome the impediment, which exists anteriorly to the natural inward flow of the urine.

Turning our attention now to a few surgical cases, we here observe the *Vis medicatrix naturæ* used by the surgeon at every turn. What would his skill avail in setting a broken limb, if she did not by

healing powers of her own unite the fractured bones together? What surgeon so bold as to perform an amputation, if she did not by her vital processes, prevent the occurrence of fatal hemorrhage? Nay; how would he even dare to take his knife in hand, did she not by her wondrous skill, unite and heal the wounds that he has made!

### "Union of Fractured Bone"

In speaking of this, I shall only dwell on "Union by Bone", and not on "Union by Ligament", as the latter occurs in comparatively such a few cases.

At first the blood which is extravasated round the fracture is absorbed, the bones, periosteum, medullary membrane, and the surrounding tissues, become very vascular and pour out lymph between and around the place where the fracture has occurred. The lymph deposited round the fracture, then becomes gradually more consolidated, and at last has bony matter deposited in it, and thus nature encloses the fracture as it were in a splint, the "Provisional Callus" of surgeons. The last process effected is the ossification of the lymph which is poured out between the broken ends of the bone, and then nature like a careful workman sweeps up the excess of ossific deposit, leaving only what surgeons call the "Definitive Callus", as the



*"Humerus of a Fowl, shewing Nature's unaided cure  
of Fracture."*

ultimate bond of union for the fracture.

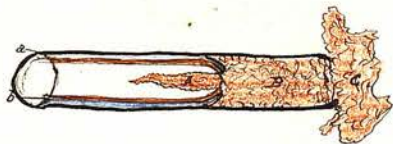
### "Arrest of Arterial Hemorrhage"

When an artery is cut across its orifice contracts, and the vessel then becomes retracted within its sheath, the interior of which is left rough and uneven; as the blood flows over this roughened surface it becomes coagulated on it; and this coagulation proceeds with more rapidity as the loss of blood continues, owing to the increased plasticity of that fluid. Faintness or collapse next supervenes, the heart's action becomes more feeble, and as a sequence, not only does the blood from its diminished force of movement coagulate round the wound more readily, but the stream is now no longer able to wash away the clots as they are formed. Thus an "external coagulum" is deposited, and a primary barrier raised to check the arterial bleeding; during this time also the cut artery is contracting, and fibrine is being gradually deposited as an "internal coagulum", from the margin of the wounded vessel; lastly, the blood coagulating in the surrounding tissues forms yet another barrier to resist the arterial hemorrhage. These are the temporary means used by nature to arrest bleeding, and I shall now shortly describe how she closes permanently the orifice of a divided artery. Not many hours after the vessel has

been cut, lymph is poured out both within and outside of it, from the cut surface of its internal and middle coats. This plug of lymph so important in its office, is effused if an internal coagulum has been formed, either beneath it or into its base. While this change is going on inside the vessel, inflammation takes place in its sheath and in the surrounding tissues; fibrine is effused, which though at first mixed with the external coagulum soon becomes colourless, and completely blocks up the end of the vessel from outside. The artery under the influence of the inflammation still goes on contracting, and encloses yet more firmly the enclosed plug of lymph. Finally, both artery, internal, and external deposit, develop into a fibrous cord, and thus close the cut vessel up to its nearest collateral branch which then carries on the circulation. I shall not speak of hemorrhage from a partially divided artery, as the means used for its arrest are the same, though the process is rather different.

### "Union of Incised Wounds"

For the union of wounds both surgical and accidental, nature seems to have adopted several methods, which I shall now attempt shortly to describe. The first; Hunter's "Union by the first intention" consists in the actual coalescence of two clean cut surfaces without the



*"Diagram to illustrate Nature's Hæmostatic's"*

- A Internal Coagulum.*
- B External Coagulum.*
- C Coagulum in surrounding textures*
- a External Coat of Artery*
- b Middle and Internal Coats*

intervention of any inflammatory product; this may be not inaptly illustrated by the union which takes place between two freshly cut pieces of india-rubber, when pressed close together. The second process, (common in animals) consists of the direct adhesion of the wounded surfaces under a crust of dried blood, hair, or other matters; this also takes place without inflammation.

The third, now called by modern surgeons "Primary adhesion" is the union of two surfaces by an interposed layer of plastic lymph which ultimately develops into fibro-cellular tissue; for it a certain amount of inflammation is necessary, but this must not be present in excess. - The common process of glueing or cementing broken articles may be used as a simile for this method. The fourth and last variety "Union by the second intention" takes place by the formation of granulations, and the ultimate levelling and cicatrization of the wound.

When we consider the importance of this subject, we cannot but marvel at the healing power of nature, who contrives by the use of these several processes to cure all the varieties of wounds, which human ingenuity or accidental occurrence can inflict on the human body.

### "Necrosis"

Watching the course of this disease, we see nature

not only separating by the ulcerative process the bone that has perished, but also forming new bone in its place; adapting her amount of reparative action to the quantity of bone which has been diseased.

The process of separation of the sequestrum is a slow one but even this appears to be essential, as it allows time for a sufficient thickness of new bone to be formed to supply effectually the place of the old. When the outer lamella alone are necrosed, new bone is formed by the surrounding periosteum. If central necrosis has taken place, the outer layers of bone become consolidated and thickened by osseous matter deposited from the periosteum, apertures called "cloaca" being left generally for the extrusion of the inflammatory products and for the sequestrum. And lastly, when the whole of the shaft dies bone is reproduced both by the periosteum, medullary membrane, and also by the living tissues which surround the diseased parts. An interesting case in connection with this disease is related by Cruveilhier. - It was that of a young man in the hospital at Limoges, who had lost the middle third of his tibia from necrosis. Here the tibia was not reproduced, but its companion the fibula had become hypertrophied, and was thick and strong enough to bear the whole weight of the body.

Professor Miller in his "Lectures on Surgery" gives also the following interesting case applicable to this subject.

A young boy one day was smoking a clay pipe, when one of his companions in joke struck him and broke off the pipe short in his mouth; part of the stem was driven into the substance of the lower jaw and lodged there, causing by its presence inflammation, and as it was not removed necrosis of nearly a third of that bone. Nature then not having been able to dislodge the foreign body by suppuration, cut off by her "Line of Separation" the portion of dead bone, which with the exciting and maintaining cause of the inflammation was expelled. The accompanying rough sketch of the piece of bone and the contained pipe stem, was taken from the original kindly lent to me for that purpose by the Professor.

### "Rachitis"

It is highly interesting to observe in this affection the method adopted by nature in order to render bones which have been bent, useful to the patient in after life. The reparative process consists in a deposit of bone taking place in such a manner as to correct the infirmity, and give the patient a limb useful for the ordinary purposes of life. - The supplementary ossification is found on a vertical section of a long



*"Portion of Necrosed Jawbone separated by Nature"  
(To the right is seen the piece of tobacco-pipe which caused  
its death).*

bone, to be chiefly on the concave side (nearest the line of gravity) so that this part of the shaft may present double or treble the thickness of the opposite side, the structure in this case is also very dense, and composed of an ivory-like texture.

### "Caries of the Teeth"

On this point I shall speak from an observation of Mr. Jones. — When a portion of dentine becomes dead, the tubes around it become filled up and rendered solid, cutting off the circulation from the dead mass which is thus circumscribed. This consolidation takes place in zones, a second taking place when the first is attacked, and afterwards a third when the second gives way. Secondary dentine is also produced by the surface of the pulp. — This vascular papilla, says Dr. H. Jones, originally the formative organ of the dentine which had for years confined its action to nourishing the perfected structure, under the stimulus of disease renews its formative action and throws out a barrier between itself and the advancing mischief.

### "Aneurism"

Cure of this disease by nature though rare is still sometimes accomplished, and seems to take place in two ways. In the first, inflammation occurs in

the tumour and the artery becomes in consequence obliterated but this is very rare. In the second, the curative tendency is very gradual, and consists in the deposition of laminae of fibrine which gradually fill up and occlude the sac; the artery below the aneurism first becomes contracted thus diminishing the force of the circulation through it, by which the deposition of fibrine is greatly increased; at the same time the collateral vessels given off above the sac enlarge, and thus carry away the excess of blood.

Here all the conditions for the deposit of fibrine are present; a stream of blood still circulating but with no great impetus; and in consequence the sac becomes gradually filled with layers of fibrinous deposit. The efforts of nature may, and alas often do stop here, and thus only a postponement of the evil day is effected; but sometimes by causing adhesive inflammation to occur in the sac, she glues completely together the layers of fibrine, and thus effects a perfect cure. The sac afterwards undergoes shrivelling and absorption, and becomes ultimately converted into a small mass of fibro-cellular tissue. Sometimes even at the last when an aneurism has ruptured into some neighbouring part and the case seems hopeless, nature again comes to our aid and rescues our patient for a while from

dying of fatal hemorrhage. In these cases she plugs the open orifice temporarily with a fibrinous clot, and afterwards causes the wound to close and cicatrize.

The case of the great surgeon "Liston" is a good illustration of this. He had been taking violent exercise one morning as was his usual custom, and afterwards went into a cold bath. While in the bath an aneurism that he had ruptured, and he spit up two pounds of blood and fainted; then the hemorrhage ceased, and from that hour never again returned.

For six months he lived on getting gradually weaker, and ultimately died of the constitutional disturbance occasioned by the tumour. After death it was found that he had suffered from aneurism of the arch of the aorta which had burst into the front of the trachea by three or four perforations, thus causing the hemorrhage; these apertures had been stopped pro tempore by fibrinous clots, and then nature had perfected the cure by causing the wounds to heal and cicatrize.

### "Wounds of the Intestine"

In cases where the abdominal wall is pierced and the intestine wounded, nature is not behind-hand in coming to our aid, and by her remedial measures preventing fecal extravasation into the cavity of the

abdomen. The first thing that takes place is the contracting and narrowing of the wound; and then eversion of the mucous membrane of the gut takes place and plugs up the abnormal orifice. The pressure of the surrounding parts also tends to keep the wound closed, and it is at length permanently sealed by the effusion of plastic lymph. Travers has shown experimentally that lymph is in these cases poured out, not only from the peritoneal surface of the part injured but also from the neighbouring coils so that the aperture in the gut becomes permanently glued and attached to the neighbouring structures. It is also a beautiful provision of nature, that the very inflammation that closes the wound arrests also the peristaltic action of the intestine; thus insuring for the repair of the wounded part that important rest, which is so well calculated to aid in its permanent closure.

### "Gangrene"

When some part of a limb as the foot for example has become gangrenous, and is hence no longer of use in the animal economy: we find nature taking her knife in hand, and by a slow but certain method severing completely the diseased extremity. Standing between the dead and living tissues she commences

her incision by the ulcerative process, and by this agent cutting through the limb she performs effectually its amputation; while, by the effusion of plastic material into the vessels of the part, she prevents the hemorrhage which must otherwise, inevitably follow.

Many more interesting facts in relation to the subject in hand, might be adduced in this place; but, as Virgil says—

"Sed fugit interea, fugit irreparabile tempus,  
Singula dum capti circumvectamur amore.

and therefore leaving the rest unspoken of, I must pass on to the third part of my subject.

It now only remains for me having sufficiently illustrated the workings of the *Vis medicatrix nature*, to point out in concluding this subject how much may often be gained in the treatment of disease, by either assisting her efforts or adopting some plan of treatment in harmony with them. I shall draw my conclusions chiefly from the diseases about which I have previously spoken, and first let me speak of "Plethora".— In this affection nature's method of relief is not difficult to trace; for we see her relieving the system by hemorrhage or other drains on the constitution as diarrhoea, or by

a peculiar ulcer which she establishes apparently as her issue, for when its discharge is most the patient feels best. Are we then in headlong haste to check these discharges? no; rather let us taught by them restrain the excesses of our patients, and thus prevent the continuance of that hyperemia which she is striving so plainly to get rid of; sometimes even as in threatened apoplexy we may follow her path directly, and abstract blood from the system to prevent worse mischief accruing.

In "Anæmia" the very opposite condition, we cannot honestly say that nature will help us much in pointing out a line of treatment, still we may profit by her teaching, in allowing full time for the all necessary sleep, and by not condemning as laziness that rest, which is really useful and necessary in aiding our patients cure. "Pyæmia" alas too often defies all our treatment; still the only rational mode of procedure seems to consist; in aiding nature in the elimination of the poison by those channels, which observation has proved she most commonly makes use of; while, by the due administration of food and stimuli we sustain as much as possible the vital powers of the system.

With regard to the treatment of "Phthisis Pulmonalis" I shall quote a passage from Dr. Bennetts book on the "Practice of Medicine", in which it will be seen how

plainly he appreciates the value of assisting nature, in her efforts to cure this fatal disease." Although the curability of Phthisis Pulmonalis can now no longer be denied, it has been argued that this is entirely owing to the operation of nature, and that the physician can lay little claim to the result - - - - - But if it be true according to Hoffman that "Medicus natura minister non magister est", it follows that by carefully observing the operations of nature, learning her method of cure, imitating it as closely as possible, avoiding what she points out to be injurious, and furnishing what she evidently requires, we may at last arrive at rational indications of treatment". Acting up to the principles laid down in this passage; we now endeavour, by careful attention to diet and exercise, and by giving those oleaginous matters most easy of assimilation which are plainly deficient in the economy, to supply nature with those substances in which she is wanting, so that with renewed vigour she may oppose and arrest in its deadly progress, the onward ravages of this disease. I do not say that this alone is to be trusted to, excluding symptomatic treatment, but I do say that without it, all other methods of treatment are utterly useless. In "Pleurisy" our study of nature's cure is of great use, for as we have learned from pathology, that the formation of villi

and their absorption of the effused lymph is necessary; so now by not using in excess the former violent anti-phlogistic treatment; we keep up our patients strength sufficiently, for their healthy growth and formation.

In the latter stages too, the foreshadowing, and safety of the operation of Paracentesis Thoracis, has long been pointed out by nature, who in this case performs her Paracentesis, by ulcerating through some part of the thoracic parietes.

Pathology and sound reasoning in regard to "Valvular Disease of the Heart" has now taught us the beneficial effects of nature's cardiac hypertrophy, in keeping as it were the balance of the circulation at rest. Hence our treatment now of this affection is directed chiefly to keeping up the patients strength by iron etc, preventing only by sedatives such unnecessary palpitation, as arises from irregular nervous action.

On the subject of "Hepatic Abscess" I may mention, that the process of causing adhesion of the liver to the abdominal wall and evacuating the abscess externally, either has, or might have been derived from the observation, that nature sometimes adopts this method of relief. In "Pelvic Cellulitis" too when matter has formed, we do but follow in nature's path by tapping the abscess through the vagina as recommended

by D<sup>r</sup> Simpson.

The treatment of "Ulcer of the Stomach" as laid down by D<sup>r</sup> Brinton, consists mainly in placing that organ under the most favourable conditions, for nature's curative efforts to take place unchecked. And the greatest care has to be taken, by avoiding rough handling of the patients and preventing any violent exertion on their part, to prevent rupture of those salutary adhesions formed by nature, by which alone often an ulcer is kept, from perforation into the abdominal cavity.

Taking next the subject of "Intussusception" it seems to me that the treatment of that disease is plainly marked out, from the observation of nature's time, and method of cure. Whatever remedies the physician chooses to have recourse to, should be used at once when the invagination takes place. If relief follows well and good; if not, the patient should be kept under opium and at perfect rest, so that if nature's method of cure does take place, it may not be frustrated and rendered void, by the doctor's well meant, but now fatal remedies.

It may be well to observe that speaking of this subject I leave out entirely the question of Gastrotony, as it is an operation so formidable that comparatively few patients would submit to its performance.

Let us look for a moment at "Fever" and their

treatment in this age enlightened by science. Do we now attempt to cure them by empirical drugs? No; but by aiding nature in the attempts she is making to eliminate them by the skin and other excretory organs, and by keeping up the powers of the system; we guide them safely to a happy issue, when perhaps in older times their end would have been fatal.

In the treatment of Uremia at the close of "Bright's Disease" much might also have been learnt, from watching the efforts of nature to eliminate the *materies morbi* from the system. Vomiting is a frequent symptom in this state says Dr. Handfield Jones, and diarrhoea sometimes takes place and seems to avert the dangerous consequences of uremia: Ferriehi mentions that the perspiration of persons labouring under this state (when it occurs) is ammoniacal, pointing evidently to elimination by this channel: Experiments on animals by Bernard and Barreswill proved also that when the kidneys were extirpated, large quantities of ammoniacal fluid were poured out by the mucous membrane of the stomach and intestinal canal, and that while elimination of the *materies morbi* was taking place by these channels the cerebral functions remained unimpaired; no sooner however did these discharges cease, than symptoms of uramic poisoning began to appear. The treatment of

this disease consists now, as is well known, in encouraging excretion of the poisonous matter by the skin, bowels, etc thus following out and assisting nature in her efforts.

I remember seeing at the commencement of my professional career, a patient at St. Bartholomew's Hospital who was half comatose from uramic poisoning. The physician in attendance ordered a dose of elaterium to be given him and the beneficial effects of that purgative seemed to me then almost magical; indeed I hardly recognized him the next day.

A strange instance of recovery when following out an indication of nature, is related by Dr. Laycock in his lecture's on the "Practice of Physic". The case was that of a man with chronic destructive mania, who was observed one day when taking exercise in a courtyard to be picking up and eating all the weeds he could find, and especially some chicory which grew there.

Taking a hint from this circumstance Dr. Laycock ordered vegetables ad libitum to be supplied to him; and of these, commencing with celery and carrots he partook freely, and in three weeks was well. Whether the vegetables taken supplied something wanting in the system and thus cured him, or whether he would have got well without them, I cannot say; but it seems to me often worth while to indulge the natural

fancies of patients, when they are only directed to such substances as are in their effects harmless. The common longing for salt things also by patients out of health, may perhaps sometimes point to a deficiency of this element in the system, for at any rate their judicious employment, seems to have been of use in some cases.

In Surgery perhaps more than the sister art, the lessons derived from nature's teaching seem often to be the most apparent. - What says M<sup>r</sup>. Erichsen speaking of the surgical treatment of "Arterial Bleeding"? "The object of the surgeon in any means that he adopts for the suppression of arterial hemorrhage is to imitate, hasten or assist the natural processes, or to excite analogous ones." As an apt illustration of this I subjoin the following. - Sometimes when (as by a bayonet thrust) some internal vessel has been wounded, and hemorrhage profuse and dangerous is continuing; we take advantage of nature's lessons, and bleed the patient from the arm to syncope trust to her hemostatic's to save, when ours are acknowledged inert, and powerless. In "Concussion of the Brain" also where rupture of some internal vessel may have taken place; we rest our hope on nature's hemostatic's to prevent "Compression" arising from effusion of blood, which without her aid

would infallibly occur. The rational treatment of Concussion indeed is founded on this, for except where death threaten inevitably, we are not active in reviving the patient by stimuli, lest nature's hemostatics should be frustrated, ere she has time to complete them.

If we take treatment of a "Fractured Limb" we find the surgeon placing carefully in apposition the ends of the broken bone, and then applying external splints; so as to assist nature in her reparative process as much as possible by preventing movement of the injured parts.

Should the fracture be compound, he often endeavours to convert it into a simple one, by closing the wound with an artificial scab, thus imitating one of nature's processes for the healing of an "External Wound".

In the rational treatment of "Necrosis" too, how much aid we daily derive from nature. Does the surgeon when a portion of bone dies, proceed at once to its removal? No: He waits till she by her "Line of Separation" has severed the dead from the living tissues, and then, not till then, does he further her efforts by removing the now irritating and useless foreign body.

In the modern method of treating "Aneurism" by pressure, we attempt to establish those very processes which occur in the natural cure of that disease. For by applying pressure to the artery above we lessen the

flow of blood to the aneurism, and thus increase the deposition of fibrine there; while by compressing the tumour itself we seek to induce in its lamina that thorough consolidation, which alone can render its cure permanent.

Mr. Syme writing on the subject of "Spina Bifida" says: "The thin parietes of the tumour sometimes ulcerate so as to form a minute orifice, which opening from time to time, allows the fluid to escape, and thus at length completes the cure. In imitation of this natural process, small punctures have been made with a needle (Sir A. Cooper) pressure being afterward carefully exercised, and the practice has occasionally proved successful."

Even in many capital operations as "Amputation", the surgeon only follows a path which nature has previously marked out, and sometimes even as when "Idiopathic Gangrene" attacks a limb, has to wait for her to perform the main part of it, before he steps in to aid and assist her in her efforts. Truly indeed, as says Dr. Watson "A great part of both physic and surgery consists in learning what are the expedients of repair and preservation for which provision has been made in the living body; in promoting or controlling, in directing or imitating, those natural actions

which generally tend and often suffice to restore health, and to save life."

Here I must pause, for I fear I have already made too long a subject so indifferently treated of. Ere I conclude however I wish the aim of what I have written to be once for all clearly understood. I do not say that nature is to be trusted to in all cases, thus falling into the errors of hydropathy, mesmerism, and other specialties, which are wrong because they profess to cure everything; but what I do say and hold to strongly is this, - that as we use mental impressions, bathing, and other remedies derived from the specialties with frequently the greatest advantage; so we may often with the utmost benefit, trust to nature for the cure of disease, only attempting by our knowledge of Therapeutics to aid her in her efforts as much as possible.

Finis.

